The Translation in Spine Care

ASIA SPINE 2016

Sep. 22~24, 2016

The K Hotel SEOUL, KOREA

www.asiaspine2016.org

Organized by _ The Korean Spinal Neurosurgery Society | THE KOREAN NEUROSURGICAL SOCIETY

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The Translation in Spine Care

ASIA SPINE 2016

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The Translation
in Spine Care

Welcome Message

I am proud and excited to welcome everyone to the 7th Asia Spine Meeting held on September 22nd to the 24th in Seoul, Korea.

Asia Spine is the largest regional meeting for all spine specialists. Asia Spine succeeded the "Korea-Japan Conference on Spinal Surgery" which had been held biennially since 1997. In 2010, the society was transformed to "Asia Spine" in order to represent all the Asian spine specialists, and has been held annually since then.

The main theme of Asia Spine 2016 is “The Translation in Spine Care”. You will see plenary sessions unravelling recent advancements in basic research, which have immense clinical repercussions. Also you will see scientific programs, which the scientific committee selected from bottom up symposium proposals. I am very confident that you will see topics as well as opinions, and also the pros and cons concerning spine practices covering basic researches as well as complex surgeries suiting all the requirements you might envision. I hope that Asia Spine 2016 will be a venue for promoting professional and academic cooperation as well as establishing new friendships and strengthening old ones. Previously in year 2013, we held Asia Spine in the southern part of Korea, Gyeong-ju. Hence, this year in 2016, we invite you to Seoul, the Capital of Korea, where the rich history is in perfect harmony with the dynamic daily Korean lives. You could opt indulging into the tranquil traditional environment or into the bustling heart-beating IT dense culture. I am looking forward to seeing you at the 7th Asia-Spine 2016 in Seoul, Korea.

Chun Kee Chung, MD, PhD

President of Asia Spine 2016
President of the Korean Spinal Neurosurgery Society

Organizing Committee

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Congress Information

Congress Title	AsiaSpine2016
Date	Sep 22 (Thu) ~ 24 (Sat), 2016
Venue	The-K Hotel, Seoul, korea
Official Language	English
Educational Point	14Points (22nd 4Points, 23rd 6Points, 24th 4Points)
Website	http://www.asiaspine2016.org/
Hosted by	The Korean Spinal Neurosurgery Society
Organized by	The Korean Neurosurgical Research Foundation The Korean Neurosurgical Society
Congress Secretariat	#603, 6F Halla SigmaValley II . 7, Seongsui-ro 7-gil, Seongdong-gu, Seoul, Korea Tel +82-2-2273-8551 Fax +82-2-2273-7651 E-mail asiaspine2016@ibmed.co.kr

Operating Hours

Registration Desk

Lobby (2F)	Sep 22 (Thu) 11:00~18:00
	Sep 23 (Fri) 07:00~18:00
	Sep 24 (Sat) 07:00~12:00

Preview Room

Speakers are required to check-in at the preview room to review their ppt slide(s) and save the final version.
Final presentation file(s) must be uploaded at least 4 hours before the start of their sessions.

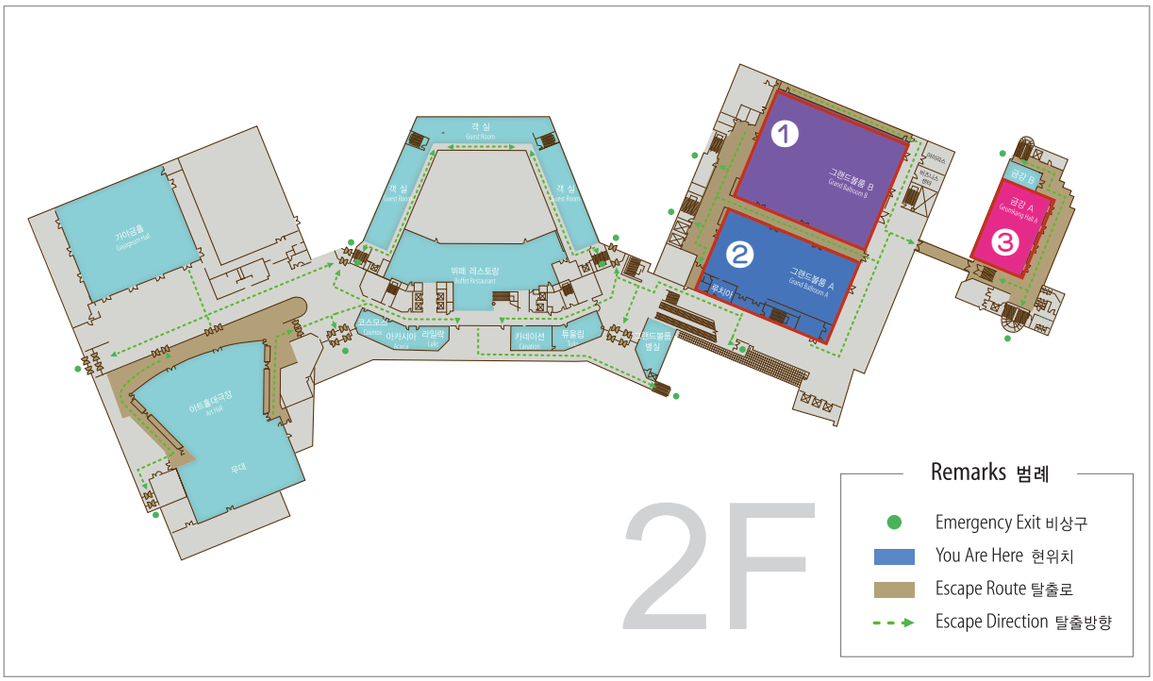
Lucia Room (2F)	Sep 22 (Thu) 11:00~18:00
	Sep 23 (Fri) 07:00~18:00
	Sep 24 (Sat) 07:00~12:00

E-poster, Internet Lounge & Booth Exhibition

Grand Ballroom A (2F)	Sep 22 (Thu) 11:00~18:00
	Sep 23 (Fri) 07:00~18:00
	Sep 24 (Sat) 07:00~12:00

Floor Plan

Convention center(Main Floor) / Annex 2F

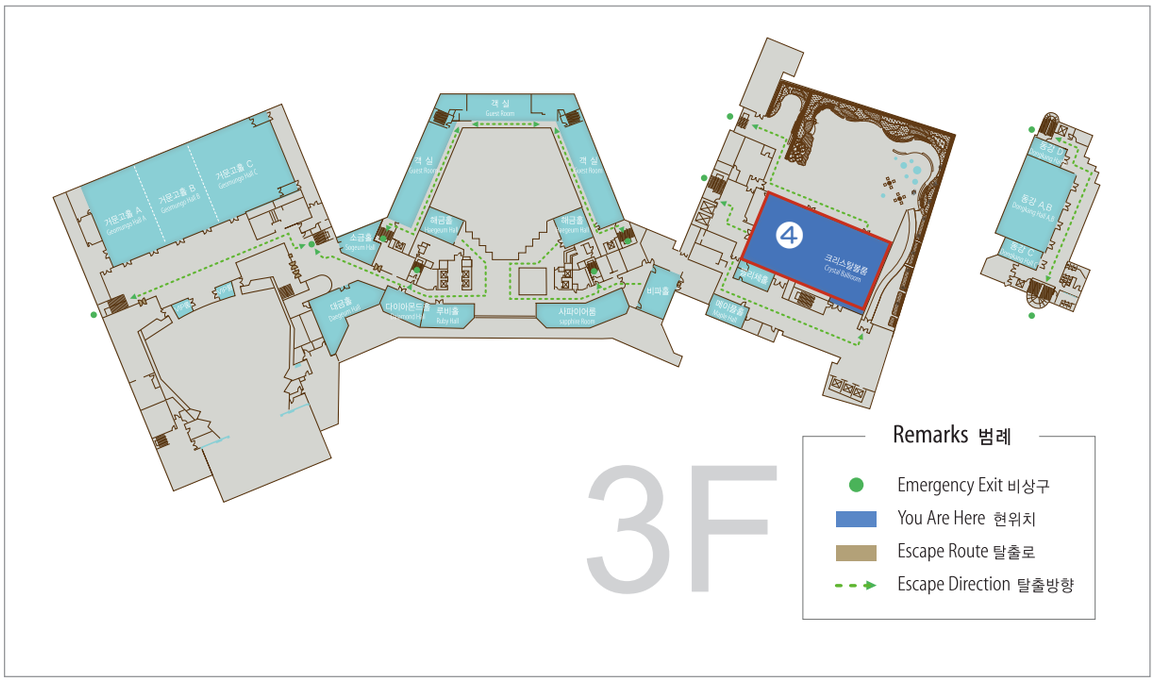


❶ Grand Ballroom B hall : Main Hall
❷ Grand Ballroom A hall : Booth Exhibition, E-poster, Internet Lounge, Coffee Break
❸ Geumkang hall : Flash Presentation

※ Lucia : Preview Room
※ VIP Room

Floor Plan

Convention center 3F



❹ Crystal hall : Free Paper, Symposium, Luncheon Seminar

※ Lobby : Rest area

Program at a Glance

Time	Sep.22(Thu)	Sep.23(Fri)	Sep.24(Sat)
7:00		Asia Spine Board Meeting	
8:00		Opening Remark & President Address Congratulatory Address	Symposium V Symposium VI
9:00		Current Status and Future Perspectives of Spine Surgery in Asian Countries ASIA SPINE : The Past, Present and Future	Honored Guest's Speech
10:00		*Coffee Break & E-Poster Presentation*	*Coffee Break & Poster Exhibition*
11:00		Honored Guest's Speech	Symposium VII Symposium VIII
12:00	Luncheon Seminar I Luncheon Seminar II	Presidential Symposium Luncheon Seminar III Luncheon Seminar IV	Free Paper Session Session V Free Paper Session Session VI Flash Presentation Session III Award Ceremony Adjourn
13:00	Opening Remark Congratulatory	Symposium I Symposium II	
14:00	Young Spine Surgeon Award Session Basic Research Award Presentation Special Lecture Honorary membership award	Free Paper Session I Free Paper Session II Flash Presentation Session I	
15:00	*Coffee Break & Exhibition*	*Coffee Break & E-Poster Presentation*	
16:00	Honored Guest's Speech Treatment of SPINE : Where we are and Where we are going ?	Symposium III Symposium IV	
17:00	Ceremony of 30th Annual Meeting of KSNS	Free Paper Session III Free Paper Session IV Flash Presentation Session II	
18:00	KSNS General Assembly Opening Reception	Gala Dinner	

Scientific Program

Sep. **22**nd, Thursday

12:00-13:00	**Luncheon Seminar I**	Seung-Won Park (Chung-Ang University)	Crystal A (3F)
	Frequent statistical mistakes in manuscripts of JKNS	Im-Hee Shin (Daegu Catholic University)	
	Luncheon Seminar II	Ki-Jeong Kim (Seoul National University)	Crystal B (3F)
	What is the Value of Pregabalin in Neuropathic Pain Management?	Dong Ah Shin (Yonsei University)	
13:00-13:05	Opening Remark	Chun Kee Chung (President of The Korean Spinal Neurosurgery Society)	Grand Ballroom B (2F)
13:05-13:10	Congratulatory Address	Yoon Seung Lee (President of Korean Academy of Medical Sciences) Young-Soo Kim (Honorary President of The Korean Spinal Neurosurgery Society)	
13:10-14:30	**Young Spine Surgeon Award Session**	Young-Baeg Kim (Chung-Ang University) Sang-Jin Kim (Ewha Womans University)	
	2016_S0124 Why the diabetes is poor prognostic factor in spinal cord injury? - Laboratory investigation	Kyoung-Tae Kim (Kyungpook National University)	
	2016_S0015 The influence of notochordal cells to the symptomatic intervertebral disc degeneration during hypoxia; anti-angiogenic capacity on human endothelial cell proliferation.	Woo-Keun Kwon (Korea University)	
	2016_S0173 Foraminotomy alone through Wiltse approach for foraminal or extraforaminal L5 root entrapment: risk factor analysis for poor outcomes	Sung Ik Cho (Catholic University)	
	2016_S0179 The usefulness of a wearable device in daily physical activity monitoring for the patients undergoing lumbar surgery	Dong Hwan Kim (Pusan National University)	
	2016_S0180 Is Kambin's triangle Safe for Lumbar Interbody Fusion? Minimally Invasive Extraforaminal Lumbar Interbody Fusion (ELIF)	Jong-Yun Woo (Nanoori Hospital)	
	2016_S0183 Can We Perform Real 1 Day LumbarFusion Surgery for Degenerative Lumbar Spinal Disease?: Minimally Invasive 1-Day Lumbar Interbody Fusion Surgery	Jun Ho Lee (Nanoori Hospital)	
	2016_S0197 The Effect of OLIF and OLIF51 on the Correction of Degenerative Lumbar Deformities	Jin Bum Kim (Chung-Ang University)	
	2016_S0213 Can Modified K-line in Magnetic Resonance Imaging Predict Surgical Outcome of Cervical	Young Jin Kim (Catholic University)	

Scientific Program

14:30-14:45	**Basic Research Award Presentation**	Jae-Won Doh (Soonchunhyang University)	Grand Ballroom B (2F)
	Electrical stimulation in differentiation of spinal cord-derived neural stem cell	Kyoung-Tae Kim (Kyungpook National University)	
14:45-15:05	**Special Lecture**	Joo-Kyung Sung (Kyungpook National University)	
	Degenerative sagittal deformity	Whoan-Jeang Kim (President of Korean Society of Spine Surgery)	
15:05-15:10	**Honorary membership award**	Chun Kee Chung (President of The Korean Spinal Neurosurgery Society)	
		Hiroshi Nakagawa (Kojinkai Social Medical Corporation Spine Center, Japan)	
15:10-15:30	*Coffee Break & Exhibition*		
15:30-16:00	**Honored Guest's Speech**	Sung-Min Kim (Kyung Hee University)	
	How much correction may we get from one-level PSO for thraco-lumbar kyphosis associated with anklosing spondylitis?	Yong Qiu (Nanjing University)	
	Immunotherapy for spinal malignancies	Michael Lim (Johns Hopkins University)	
16:00-17:20	**Treatment of SPINE : Where we are and Where we are going ?**	Hyun-Jib Kim (Seoul National University) Hyoung-Chun Park (Korean Medical Dispute Mediation Arbitration Agency)	
	왜 우리는 척추변형수술을 알아야하는가?	**장지수** (나누리수원병원) Panelists : 김성민, 진동규	
	경추 수술의 발전과정과 미래는?	**조용은** (연세의대) Panelists : 신현철, 김우경	
	척수내 종양 치료의 예후를 좋게 하려면?	**정천기** (서울의대) Panelists : 어환, 백광흠	
	내시경 수술의 미래는 어떻게 발전할 것인가?	**박춘근** (굿닥터 튼튼병원) Panelists : 최건, 박춘근(월스)	
17:20-18:20	**Ceremony of 30th Annual Meeting of KSNS**		
18:20-18:40	**KSNS General Assembly**		
18:40-20:00	Opening Reception		Crystal Hall (3F)

Scientific Program

Sep. **23**rd, Friday

07:00-08:00	Asia Spine Board Meeting		Jasmin Room (Hotel 1F)
08:00-08:10	Opening Remark & President Address	Chun Kee Chung (President of Asia Spine 2016)	Grand Ballroom B (2F)
08:10-08:20	Congratulatory Address	Jin Woo Chang (President-Elect of The Korean Neurosurgical Society) Soo Han Kim (Honorary President of The Korean Spinal Neurosurgery Society)	
08:20-09:30	**Current Status and Future Perspectives of Spine Surgery in Asian Countries**	Yong-Eun Cho (Yonsei University) Junichi Mizuno (Southern Tohoku General Hospital, Japan)	
	Actual Status of Spine Surgery in Vietnam, Future Challenges and Opportunities	Nguyen Ngoc Ba (Danang Hospital, Vietnam)	
	India	Sarat P. Chandra (All India Institute of Medical Sciences, India)	
	Translating Spine Surgery Services at Remote and Limited Region "Indonesia's Experience to Develop Spine Surgery Services."	Wiryawan Manusubroto (Sardjito Hospital, Indonesia)	
	"Resources-Limited Setting"	Iv Vycheth (Preah Kossamak Hospital, Cambodial)	
		Won-Han Shin (Soonchunhyang University) Cheng-Hsing Kao (Jhong Jheng Orthopedic Hospital, Taiwan)	
	Gulf and Arabic Countries	Abdul Karim Msaddi (Neuro Spinal Hospital, UAE)	
	Change in the trend of management of Cervical injury in Nepal	Krishna Sharma (Nepal Medical College, Kathmandu, Nepal)	
	The Opportunities Of Spinal Surgery In Mongolia, Present And Prospective Challenges	Gonchigsuren Dagvasumberel (Grand Med Hospital, Mongolia)	
09:30-09:45	**ASIA SPINE : The Past, Present and Future**	Jung-Keun Suh (Korea University)	
		Hiroshi Nakagawa (Kojinkai Social Medical Corporation Spine Center)	
09:45-10:10	*Coffee Break & E-Poster Presentation*		
10:10-11:00	**Honored Guest's Speech**	Whan Eoh (Sungkyunkwan University) Phyo Kim (Dokkyo Medical University)	Grand Ballroom B (2F)
	Scientific journals, where do we stand?	Robert Gunzburg (Editor-in-Chief of European Spine Journal)	
	Improving quality of spine care	Daniel K. Resnick (Vice President of NASS)	
11:00-12:10	**Presidential Symposium** **Translation in Spine Care**	Chun Kee Chung (President of ASIA SPINE 2016) Toshihiro Takami (Osaka City University)	
	Make a Huge Transparent Brain and Spinal Cord	Jeong-Yoon Park (Yonsei University)	
	Advancement in Cells and Surfaces for Spinal Fusion	Hyun Bae (Cedars-Sinai Hospital and The Spine Institute, CA, USA)	
	Future of Artificial Intelligence for Physicians	Syn Ho Do (Harvard Medical School, MA, USA)	

Scientific Program

12:10-13:10	**Luncheon Seminar III**	Woo-Kyung Kim (Gacheon University)	Crystal A (3F)
	Degenerative Spondylolisthesis: Is it always unstable? A New Scoring System to Aid Decision Making and Apply Value Based Spine Care	Arvind G Kulkarni (Bombay Hospital, India)	
	Inflammatory reaction in the Spine; Pathogenesis and NSAID treatment	Joo-Han Kim (Korea University)	
12:10-13:10	**Luncheon Seminar IV**	Jung-Kil Lee (Chonnam National University)	Crystal B (3F)
	Treatment of Severe Spine Deformity: What to do and what not to do?	Yong Qiu (Nanjing University)	
	The importance of bone strength in surgeon's perspective	Sung Uk Kuh (Yonsei University)	
13:10-14:20	**Symposium I** **Surgical Strategies in Osteoporotic Spine**	Keung-Nyun Kim (Yonsei University) Masahito Hara (Inazawa Municipal Hospital, Japan)	Crystal A (3F)
	Minimally invasive approach for compression Fx. Including vertebroplasty and Kyphoplasty	Toshiyuki Takahashi (Fujieda Heisei Memorial Hospital, Japan)	
	Anterior vs. Posterior surgery for compression Fx. With myelopathy	Jung-Kil Lee (Chonnam National University)	
	Role of adult deformity surgeries in osteoporotic patients. How to prevent complications.	Anthony Sin (Louisiana State University)	
	How to achieve strong mechanical stability in osteoporotic spine.	Yoon Ha (Yonsei University)	
13:10-14:20	**Symposium II** **Minimal Invasive and Endoscopic Spine Surgery**	Choon-Keun Park (The Leon Wiltse Memorial Hospital) Sung-Choon Park (Myongji Hospital)	Crystal B (3F)
	Evolution of endoscopic thoracic discectomy	Hae Dong Jho (Drexel University and Allegheny General Hospital, PA, USA)	
	Can full endoscopic spine surgery replace open surgery for lumbar decompression?	Jin-Sung Kim (Catholic University)	
	Target oriented techniques in endoscopic spine surgery – selection of approach according to various types of disc herniation	Kyung-Chul Choi (The Leon Wiltse Memorial Hospital)	
	Oblique lateral interbody fusion for L5-S1 level; rationale and technique	Seung Won Park (Chung-Ang University)	
14:20-15:30	**Free Paper Session I** **Lumbar Spine Disease**	Ho Shin (Sunhan Hospital) Shinsuke Suzuki (Sendai Medical Center, Japan)	Crystal A (3F)
	2016_S0011 Usefulness of non-penetrating titanium clips for dural closure in spinal surgery	Kiyoshi Ito (Shinshu University,Japan)	
	2016_S0041 Changes in HbA1c levels and body mass index after successful decompression surgery in patients with type 2 diabetes mellitus and lumbar spinal stenosis: Results of a two-year follow-up study	Kyoung-Tae Kim (Kyungpook National University)	
	2016_S0174 Lumbar root diagnostic Radiofrequency sensory stimulation in order to find the symptomatic lumbar root in multiple lumbar stenosis	Suk-Hyung Kang (Hallym University Medical Center)	

Scientific Program

	2016_S0148 A comparative radiographic analysis of fusion rate between L4-5 and L5-S1 in a single level posterior lumbar interbody fusion	Sang Hyun Han (Seoul National University)	Crystal A (3F)
	2016_S0157 Stand-alone lateral recess decompression without discectomy in patients presenting with claudicant radicular pain and MRI evidence of lumbar disc herniation. A prospective study	Ravish Patel (Bombay Hospital, India)	
	2016_S0170 Comparative analysis between different 3 lumbar interbody fusion techniques (ALIF, LLIF, PLIF) in L4-5 spondylolisthesis with regard to the development of adjacent-segment degeneration (ASD).	Chul-Woo Lee (St.Peter's Hospital)	
	2016_S0201 The efficacy of hydroxyapatite coated polyetheretherketone cage for transforaminal lumbar interbody fusion : preliminary report	Seung Ho Yoo (Yonsei University)	
	2016_S0147 The Effect of Teriparatide Started Immediately after Lumbar Fusion Operation on the Pedicle Screw Loosening in the Osteoporotic Patients	Jae Wook Kim (Chung-Ang University)	
	Complication of lateral interbody fusion at L4-5	Brian Kwon (New England Baptist Hospital, MA, USA)	
	Minimal Invasive Non-fusion Technique for Noncontiguous Burst Fracture	Bong Ju Moon (Chonnam National University Hospital)	
14:20-15:30	**Free Paper Session II** **Cervical Spine**	Nobuyuki Shimokawa (Tsukazaki hospital, Japan) Krishna Sharma (Nepal Medical College, Kathmandu, Nepal)	Crystal B (3F)
	2016_S0205 The formation Extragraft bone bridging after anterior cervical discectomy and fusion: Finite element model analysis	Jong-Myung Jung (Seoul National University)	
	2016_S0043 Preoperative cervical sagittal imbalance provokes C1 anterior arch fracture after C1 laminectomy	Shinji Kumamoto (Fukuoka Kinen Hospital, Japan)	
	2016_S0045 Surgical Treatment for Degenerative Cervical Spinal Disease in Over 80 years old Patients	Takahiro Tanaka (Yokohama City Univercity, Japan)	
	2016_S0050 Cervical osteoplastic degeneration observed in professional wrestlers	Manabu Sasaki (Iseikai Hospital, Japan)	
	2016_S0062 Advantages of Minimally Invasive Spinal Procedure: 3-cm Skin Incision and 60 minutes of Cervical Expansive Open-door Laminoplasty offers less invasive experience	Shigeo Ueda (Katano Hospital, Japan)	
	2016_S0128 Finite Element Analysis of Osteoplastic Anterolateral Oblique Vertebrotomy for Cervical Ossification of the Posterior Longitudinal Ligament	Daisuke Umebayashi (Inazawa Municipal Hospital, Japan)	
	2016_S0169 Characteristics of patients with herniated discs at the cervicothoracic junction	Sung Uk Kuh (Yonsei University)	

Scientific Program

	2016_S0211 Changes of Sagittal vertical axis (SVA) and T1 slope after multiple level cervical posterior fixation- comparison with radiologic changes and clinical outcome	Sung Bum kim (Kyung Hee University)	Crystal B (3F)
	2016_S0198 Quantitative Alterations of Signal Intensity as a Prognostic Factor in Cervical Compressive Myelopathy	Jun Jae Shin (Inje University)	
	2016_S0223 The longitudinal change of segmental ROM following cervical artificial disc replacement	Jung Hyeon Moon (Seoul National University)	
14:20-15:30	**Flash Presentation Session I**	Yong-Tae Jung (Inje University) Eun-Sang Kim (Sungkyunkwan University) Moon Jun Sohn (Inje University)	Geumkang A (Annex 2F)
	2016_S0055 Analysis of associating factors with C2-7 sagittal vertical axis after 2-level anterior cervical fusion: Comparison between plate augmentation and stand-alone cages	Hong Joo Moon (Korea University)	
	2016_S0193 Hemorrhagic and granulomatous ligamentum flavum cyst of lumbar Spine, Analysis of clinical and radiologic characteristics	Dong Hwa Heo (The Leon Wiltse Memorial Hospital)	
	2016_S0156 Surgical results of pedicle subtraction osteotomy(PSO) in patients with sagittal imbalance	Sung-Min Kim (Kyung Hee University)	
	2016_S0105 Contribution of fibronectin type III 9-10 and 17-β estradiol to the adhesion and proliferation of mesenchymal stem cell and osteoblast of rats and MC3T3-E1 osteoblast cells	Sung Bae Park (Seoul National University)	
	2016_S0115 Advanced Studies of the Optically Transparency of Rat Central Nervous System by Tissue Clearing Techniques	Ji Won Woo (Yonsei University)	
	2016_S0164 Effect of progesterone on the expression of δ-opioid receptor in chronic neuropathic peripheral nerve lesions	Bambang Priyanto (West Nusa Tenggara Public Hospital, Indonesia)	
	2016_S0175 Evaluation of biosafety of adult human multipotent neural cells for transplantation in spinal cord injury	Kee Hang Lee (Sungkyunkwan University)	
	2016_S0187 Complications after Bone Cement Augmented Pedicle Screw Instrumentation in Elderly Osteoporotic Patients	Chang Il Ju (Chosun University)	
	2016_S0113 Modified Iliac Screw Fixation: Technique, Its Clinical Application, and biomechanics validation	Se Il Sohn (CHA University)	
	2016_S0126 The Impact of Thoracolumbar Back Muscle Volume on Proximal Junctional Kyphosis after Spinal Deformity Correction	Do Keun Kim (Inha University)	
	2016_S0044 What effects does necrotic area of contrast-enhanced MRI in osteoporotic vertebral fracture have on further compression and clinical outcome?	Young Seok Lee (Gyeongsang National University)	

Scientific Program

	2016_S0056 Safe margin beyond dens tips to ventral dura for anterior odontoid screw fixation : Analysis of three-dimensional CT scan of Odontoid process	Dae-Chul Cho (Kyungpook National University)	Geumkang A (Annex 2F)
	2016_S0099 Paraspinal Muscle Sparing Versus Percutaneous Screw Fixation : a Comparative Enzyme Study of Tissue Injury During the Treatment of L4-L5 Spondylolisthesis	Se Ho Jeong (Chosun University)	
	2016_S0144 One stage posterior minimal laminectomy and video-assisted thoracoscopic surgery (VATS) for removal of thoracic dumbbell tumor	In Ho Han (Pusan National University)	
	2016_S0151 Differences in Multimodality Intraoperative Neurophysiological Monitoring Changes Between Spinal Intramedullary Ependymoma and Hemangioblastoma	Ki-Jeong Kim (Seoul National University)	
	2016_S0177 Clinical Outcome of Ultra-early Decompression for Traumatic Cervical Spinal Cord Injury	Kyoung-Suok Cho (Catholic University)	
	2016_S0199 Role of Surgery in Spine Tuberculosis	Eko Subagio (Airlangga University, Indonesia)	
	2016_S0204 The effect of perioperative radiation therapy (RT) on spinal bone fusion following spine tumor surgery	Ung-Kyu Chang (Korea Cancer Center Hospital)	
	2016_S0207 Surgical strategies for improving surgical outcome for patients with intramedullary ependymoma	Yong Eun Cho (Yonsei University)	
	2016_S0145 Usefullness of percutaneous pedicle screw fixation for thoracolumbar burst fracture	Tae Hoon Kim (Soonchunhyang University)	
15:30-15:50	*Coffee Break & E-Poster Presentation*		
15:50-17:00	**Symposium III** **Surgical strategies for Cervical OPLL, PRO and CON**	Hyun Chul Shin (Sungkyunkwan University) Toshiyuki Takahashi (Fujieda Heisei Memorial Hospital, Japan)	Crystal A (3F)
	Timing of Surgery for Asymptomatic Cervical OPLL	Chen Zan (Capital Medical University)	
	Anterior approach	Keung-Nyun Kim (Yonsei University)	
	Laminoplasty	Junichi Mizuno (Southern Tohoku General Hospital, Japan)	
	Laminectomy and Posterior fusion	Youn-Kwan Park (Korea University)	
15:50-17:00	**Symposium IV** **Spinal and Spinal Cord Tumors**	Keun-Su Kim (Yonsei University) Yukoh Ohara (Shin-yurigaoka General Hospital, Japan)	Crystal B (3F)
	ICG image-guided surgery of spinal intramedullary tumors: Benefits and limitations	Toshihiro Takami (Osaka City University)	
	Management of adult non-glial intramedullary non-cord tumors	Dar-Ming Lai (National Taiwan University)	
	Intradural Vascular Tumors	Chun Kee Chung (Seoul National University)	
	Primary Spinal Tumors	Sun-Ho Lee (Sungkyunkwan University)	

Scientific Program

17:00-18:10	**Free Paper Session III** **Basic Research and deformity**	Kyoung-Suok Cho (Catholic University) Manabu Sasaki (Iseikai Hospital, Japan)	Crystal A (3F)
	2016_S0010 Complications encountered in surgical management adult spinal deformities- Prevention and management- a retrospective study in 193 patients	Hiteshkumar Modi (Zydus Hospital, India)	
	2016_S0017 Frequency of PICA end Vertebral Artery, Potential Risk for Cervical Spine Surgery	Takeshi Aoyama (Teine Keijinkai Hospital, Japan)	
	2016_S0065 Management of spinal Tuberculosis (TB) in developing country	Mahadewa Tjokorda (Indonesia Spine Society, Indonesia)	
	2016_S0111 A Distal Start Point Facilitates Safer Insertion of S2 Iliac Screw Fixation	Jin Hoon Park (Ulsan University)	
	Advantages of MIDLF (Cortical Bone Trajectory Techniques), MI-TLIF, OLIF and PLIF	Cheng-Hsing Kao (Jhong Jheng Orthopedic Hospital, Taiwan)	
	2016_S0116 Morphometric study of the lumbar posterior longitudinal ligament	Sang Beom Lee (Armed Forces Dae Gu Hospital)	
	2016_S0112 Prevalence of sarcopenia and its implication of obesity and osteoporosis in each definitions according to the different skeletal muscle mass indices : a population-based sectional study in elderly Korean people	Byeong Woo Kim (Champodonamu Hospital)	
	2016_S0171 Dose prophylactic vertebroplasty on proximal junctional vertebra have effects to prevent Proximal junctional vertebral compression fracture?	Jee-Soo Jang (Nanoori Hospital)	
	Promotion of Interbody Fusion in a Sheep Cervical Spine Model via Stem Cell Mobilization and Chemokine-directed Homing	Daniel Park (William Beaumont Hospital, MI, USA)	
	Entrepreneurship in Spine Surgery in the US	Doug Won (Surgical Treatment And Recovery Medical Center (STAR), TX, USA)	
17:00-18:10	**Free Paper Session IV** **Spinal Tumor**	In-Soo Kim (Keimyung University) Yung-Hsiao Chiang (Taipei Medical University)	Crystal B (3F)
	2016_S0190 The Novel Comparison of Radiologic Characteristics and Surgical Results in Ossification of the Ligamentum Flavum(OLF) ; Dural Laceration, Revision Rates due to Cerebrospinal Fluid(CSF) Leakage	Sung Uk Kuh (Yonsei University)	
	2016_S0184 Short time follow up of denosumab treatment for osteoporosis	Takahiro Miyahara (Kurume University, Japan)	
	2016_S0057 The surgery of intramedullary spinal cord tumors focusing on the procedure of tumor dissection	Hidetoshi Murata (Yokohama City Univercity, Japan)	

Scientific Program

	2016_S0063 Muscle motor evoked potential monitoring has limited abiity to predict postoperative weakness during surgery for intramedullary tumors	Ryu Kurokawa (Dokkyo Medical University Hospital, Japan)	Crystal B (3F)
	2016_S0042 Modified Galvestone Procedure for sacrum tumor	Tommy Numberi (Sardjito Hospital, Indonesia)	
	2016_S0123 A Nationwide Study of Surgery and Stereotactic Radiosurgery in Newly Diagnosed Spine Metastasis Population	Se Il Sohn (CHA University)	
	2016_S0150 Feasibility study of D-wave monitoring in spinal cord tumor surgery; Preliminary report	Ji In Kang (Yonsei University)	
	2016_S0153 Occipito-cervical fusion in huge clival chordoma; before or after tumor resection?	Dal Sung Ryu (Yonsei University)	
	2016_S0185 Survival period and affecting factors of surgical treatment of cervical metastasis : Is there any possibility that surgery improves the survival period of cervical metastasis ?	Jong Hyeok Park (Sungkyunkwan University)	
	2016_S0120 Survival analysis and prognostic factors for spinal cord glioblastoma surgery; Based on the 14 years of registry from single institution.	Seong Yi (Yonsei University)	
17:00-18:10	**Flash Presentation Session II**	Chung-Kee Chough (Catholic University) Jae-Chil Chang (Soonchunhyang University) Seung-Myung Moon (Hallym University)	Geumkang A (Annex 2F)
	2016_S0019 3-Years Outcome of Microdiscectomy via Paramedian Approach for Lumbar Foraminal or Extraforaminal Disc Herniations in Elderly Patients Over 65 Years Old	Dong Woo Yoo (Yeungnam University)	
	2016_S0140 Clinical examination about poor results especially for leg symptoms in decompressive surgery for intervertebral foramen lesions caused by lumbar degeneration	Masahito Hara (Inazawa Municipal Hospital, Japan)	
	2016_S0154 Comparison of the radiologic outcomes obtained with hybrid- versus rigid- fusion system in multilevel lumbar fusion surgery : preliminary, matched cohort study.	Man Kyu Choi (Yonsei University)	
	2016_S0012 Biomechanical effects of hybrid stabilization using interspinous device versus pedicle screws on the risk of proximal adjacent segment degeneration following the fusion on the lumbar spine	Chang-Hyun Lee (Ilsan Paik Hospital)	
	2016_S0158 The effect of sacropelvic parameters on lumbar disc herniation on L4-5 vs L5-S1	Yong Jun Jin (Seoul Paik Hospital)	

Scientific Program

	2016_S0028 Lumbar peripheral disease treatment for the intractable low back pain of the very elderly patients: 2 case reports	Rinko Kokubo (Chiba Hokuso Hospital, Japan)	
	2016_S0069 Predictors of reoperation after microdecompression in lumbar spinal stenosis	Gwang Soo Lee (Soonchunhyang University)	
	2016_S0013 Percutaneous biportal endoscopic surgery for lumbar degenerative diseases	Jung Hyun Lee (The Leon Wiltse memorial hospital)	
	2016_S0085 Piriformis syndrome after lumbar degenerative spine surgery	Masahiko Akiyama (Sapporo Tesishinkai Hospital, Japan)	
	2016_S0086 Referential outcomes after conventional 1 or 2 level PLIF with bilateral Smith-Peterson Osteotomy(SPO) using autologous iliac bone.	Woo-Keun Kwon (Korea University)	
	2016_S0090 Surgery of spinal hemangioblastoma	Mitsuru Sato (Yokohama City Univercity, Japan)	
	2016_S0100 Implant Removal after Percutaneous Short Segment Fixation for Thoracolumbar Burst Fracture: Does it Preserve Motion?	Pius Kim (Chosun University)	
	2016_S0125 Treatment strategy for unstable cervical spine injury accompanied by traumatic intracranial hemorrhage	Kazunori Shibamoto (Saso Hospital, Japan)	Geumkang A (Annex 2F)
	2016_S0208 The Relationship between the Deep Paraspinal Muscles of the Cervical Spine and Fusion Rate after Anterior Decompression and Fusion	Sung-Bum Kim (Kyung Hee University)	
	2016_S0209 Natural history of subclinical patients with severe OPLL: which patients could we reassure for observation?	Yong Eun Cho (Yonsei University)	
	2016_S0083 Motoric Evaluation of Patients with Ossification Of Posterior Longitudinal Ligament (OPLL) Post-Open Door Laminoplasty With Titanium Mesh-Preliminary Study	Adiguno Suryo Wicaksono (Dr. Sardjito Hospital, Indonesia)	
	2016_S0104 Corner remodeling as orthotopic ossification after cervical TDR	Sung Bae Park (Seoul National University)	
	2016_S0196 Comparison of Bioglass ceramic to allobone cage in anterior cervical discectomy and fusion with anterior plate fixation. 12month follow up	Du Su Kim (Yonsei University)	
	2016_S0018 Analysis of spinal conditions requiring salvage surgery in the patients with multi-segments cervical OPLL	Ik Chan Jeon (Yeungnam University)	

Scientific Program

	2016_S0091 Decompression alone versus fusion for pyogenic spondylodiscitis: Which is appropriate?	Sung Hyun Noh (N.H.I.S Ilsan Hospital)	
18:30-20:00	Gala Dinner		Grand Ballroom B (2F)

Sep. **24**th, Saturday

08:00-09:10	**Symposium V** **Cutting-Edge Innovation in Spine Surgery**	Seong-Hoon Oh (Nanoori Hospital) Makoto Taniguchi (Tokyo Metropolitan Neurological Hospital, Japan)	Crystal A (3F)
	Update on Robotic Spine Surgery	JAE Y. LIM (Atlantic Brain & Spine, VA, USA)	
	Neuronavigation in Spine Surgery	Kevin Yoo (San Diego Neurosurgery, CA, USA)	
	Novel spinal surgery methods using 3D printing technology	Taku Sugawara (Akita Hospital, Japan)	
	What is new bone substitutes more than BMPs?	Seung Hwan Yoon (Inha University)	
08:00-09:10	**Symposium VI** **Translational Research**	Tae-Ahn Jang (Seoul National University) Seung-Won Park (Chung-Ang University)	Crystal B (3F)
	Testosterone promotes corticalization of long bones via SOCS3-dependent signalling in osteocystes	Dae-Chul Cho (Kyungpook National University)	
	Stem cell therapy for IVD regeneration	In-Bo Han (CHA University)	
	Strategy and present of stem sell therapy for spinal cord injury	Sang-Ryong Jeon (Ulsan University)	
	Present and future of the minimally invasive spine procedures	Sang-Heon Lee (Korea University)	
09:10-09:50	**Honored Guest's Speech**	Dong-Kyu Chin (Yonsei University)	Grand Ballroom B (2F)
	Current status of adults spinal deformity surgery	Yong Jung Kim (Columbia University, USA)	
09:50-10:10	*Coffee Break & Poster Exhibition*		
10:10-11:20	**Symposium VII** **Spinal deformity, PRO and CON**	Seung Hwan Yoon (Inha University) Yong Jung Kim (Columbia University, USA)	Crystal A (3F)
	Global Sagittal Alignment in Spine Surgery	Stephen Ryu (Stanford University)	
	Spinal Deformity surgery by Neurosurgeon	Seung-Jae Hyun (Seoul National University)	
	MIS Reconstruction of Complex Scoliosis	Jeffrey Roh (President of the Korean American Spine Society (KASS))	
	P-A-P Staged Surgery for Degenerative Flatback Deformity	Sung-Min Kim (Kyung Hee University)	

Scientific Program

10:10-11:20	**Symposium VIII** **Craniovertebral junction**	Youn-Kwan Park (Korea University) Chen Zan (Capital Medical University, China)	Crystal B (3F)
	Application of posterior atlantoaxial fixation surgery in the treatment of upper cervical spine disease	Da-Geng Huang (Honghui Hospital, China)	
	Complication and its prevention of upper cervical instrumentation	Nobuyuki Shimokawa (Tsukazaki hospital, Japan)	
	Reduction of severe basilar invagination and atlantoaxial dislocation from a posterior only approach– The DCER principle	Sarat P. Chandra (All India Institute of Medical Sciences, India)	
	Significance of intraoperative neuromonitoring for the CVJ surgery	Jae-Taek Hong (Catholic University)	
11:20-12:30	**Free Paper Session Session V** **Trauma, Vascular Lesion and Infection**	Yong-Jun Cho (Hallym University) Sang-Gu Lee (Gachon University)	Crystal A (3F)
	2016_S0014 The Korean Spinal Neurosurgery Society ; Are we reimbursed properly for spinal neurosurgical practices under the Korean Resource Based Relative Value Scale (K-RBRVS) service?	Woo-Keun Kwon (Korea University)	
	2016_S0022 Extended DREZ-lesion for alleviating pain following brachial plexus avulsion injury	Makoto Taniguchi (Tokyo Metropolitan Neurological Hospital, Japan)	
	2016_S0059 Medical issues in Japan concerning spinal and peripheral nerve disease. ~~Why are they not diagnosed correctly?	Noji Masato (Kanagawa prefectual Ashigarakami Hospital, Japan)	
	2016_S0075 Early vertebroplasty associated with a lower risk of mortality and respiratory failure in aged patients with painful vertebral compression fractures: a population-based propensity score matched cohort study in Taiwan	Jiann-Her Lin (Taipei Medical University Hospital, Taiwan)	
	2016_S0109 The management and problems of spine and spinal injury in acute stage	Shinsuke Suzuki (Sendai Medical Center, Japan)	
	2016_S0093 The radiologic and clinical results of multilevel Anterior Cervical Discectomy and Fusion (ACDF) using standalone synthetic interbody cages	You-Sub Kim (Chonnam National University)	
	Percutaneous vertebroplasty in treatment of agressive vertebral hemangiomas	Sukhrob Saliev (MoH of Uzbekistan)	
	2016_S0030 Sagittal imbalance in patients with lumbar spinal stenosis and outcome after simple decompression surgery	Chi Heon Kim (Seoul National University)	

Scientific Program

	2016_S0103 Prevalence of Parkinson's disease with osteoporosis or osteoporotic vertebral fracture in national inpatient sample of Korea: focusing on differences in socioeconomic status	Sung Bae Park (Seoul National University)	
	2016_S0188 Spontaneous Spinal Canal Remodeling after Postural Pillow Reduction and Lordotic, Posterior Column Compressive Percutaneous Transpedicular Screwing in Thoracolumbar Burst Fractures	Byapak Paudel (Nanoori Hospital)	
11:20-12:30	**Free Paper Session Session VI** **Minimal Invasive Spine Surgery**	Geun-Sung Song (Pusan National University) Dae-Hyun Kim (Daegu Catholic University)	Crystal B (3F)
	EVALUTION RESULTS OF ENDOSCOPIC DISCECTOMY OF L5-S1 DISC HERNIATION VIA AN INTERLAMINAR APPROACH	Nguyen Ngoc Ba (Danang Hospital, Vietnam)	
	2016_S0024 Long-term minimum clinically important difference in Health Related Quality of Life Scores after instrumented lumbar interbody fusion for low-grade isthmic spondylolisthesis.	Ju Wan Seuk (Woodidul Hospital)	
	2016_S0031 Comparison of cervical sagittal alignment and kinematics after posterior full-endoscopic cervical foraminotmy and discectomy according to preoperative cervical alignment	Chi Heon Kim (Seoul National University)	
	2016_S0054 Preliminary Results of Minimally Invasive Posterior Lumbar interbody Fusion in Mongolia	Temuujin Murun (Grandmed Hospital, Mongolia)	
	2016_S0102 Early experience with contralateral keyhole endoscopic surgery (CKES) for lumbar spinal stenosis and lumbar disc herniation: surgical technique and preliminary results	Cheulwoong Park (Daejeon Woori Hospital)	
	2016_S0135 Multifidus muscle changes after posterior lumbar interbody fusion with intraoperative CT and fulltime navigation systems.	Yu Yamamoto (Inazawa Municipal Hospital, Japan)	
	2016_S0141 Endoscopic Lumbar Interbody Fusion by New Endoscopic Technique, Unilateral Biportal Endoscopy(UBE)	Sang-Kyu Son (Busan Gang-Dong Hospital)	

Scientific Program

	2016_S0172 Endoscopic foraminal decompression: myth? or trustworthy?	Chul-Woo Lee (St.Peter's Hospital)	
	2016_S0143 The clinical outcome of posterior lumbar interbody fusion(PLIF) with percutaneous pedicle screw fixation(PPS) between lumbar and lumbosacral spine.	Sang Don Kim (Bucheon St.Mary Hospital)	
	2016_S0131 Is it Possible the Percutaneous Endoscopic Lumbar Discectomy for All Types of Lumbar Disc Herniations?: Evolution of Rigid Percutaneous Endoscopic Lumbar Discectomy	Keun Lee (Nanoori Hospital)	
11:20-12:30	**Flash Presentation Session III**	Ho-Yeol Zhang (N.H.I.S Ilsan Hospital) Se-Hoon Kim (Korea University) Seung-Myung Lee (Chosun University)	Geumkang A (Annex 2F)
	2016_S0068 Muscle-preserving laminoplasty for lumbar spine	Ryohei Miyazaki (Yokohama city University hospital, Japan)	
	2016_S0082 Relationship between posterior back muscle degeneration at adjacent segment and spinal curvature change following Lumbar Fusion	Farid Yudoyono (Padjadjaran University, Indonesia)	
	2016_S0121 Comparison of self-perceived spine mobility after long level lumbar fusion with iliac screw : Effect on the Asian sedentary lifestyle	Dong Hyum Chun (Yonsei University)	
	2016_S0067 Contralateral approach for the treatment of lumbar spinal stenosis in combination with foraminal disc herniations.	Sang Hyung Jun (Inje University)	
	2016_S0161 Characteristic Features on Gait in Patients with Lumbar Disc Hernia In comparison to 3D Motion Gait Analysis Data from Normal Volunteers	Takahiro IIZUKA (Nishinokyo Hospital, Japan)	
	2016_S0040 One option for the treatment of failed back surgery syndrome	Kyong Song Kim (Chiba Hokuso Hospital, Japan)	
	2016_S0165 Sacroplasty for sacral insufficiency fracture	Kyung-Chul Choi (The Leon Wiltse memorial Hospital)	
	2016_S0178 Feasibility of E-PASS and POSSUM system for Postoperative Risk Assessment in Patients with Spinal Disease	Do Young Kim (Yonsei University)	

Scientific Program

	2016_S0095 Lumbar spine fusion surgery with Cortical bone trajectory (CBT) technique is really more excellent Technique than traditional Technique?	Sang Hoon Lee (N.H.I.S Ilsan Hospital)	
	2016_S0027 BESS(Biportal Endoscopic Spinal Surgery) for spinal stenosis expanding guideline of endoscopic spine sugery	Chang-Myong Choi (Welcom Daejeon Hospital)	
	2016_S0036 Quantitative assessment of CSF movement with time-spatial labeling inversion pulse MR imaging in patients with Chiari malformation type I	Tatsuya Ohtonari (Ota Memorial Hospital, Japan)	
	2016_S0136 The importance of shoulder joint evaluation before cervical spinal surgery	Yasukazu Hijikata (Shinkomonji Hospital, Japan)	
	2016_S0066 Clinical and radiological features of hybrid surgery in multilevel cervical degenerative disc disease: over a 5-year follow-up	Hee-Seok Yang (The Joeun Hospital)	Geumkang A (Annex 2F)
	2016_S0076 Early predictor of solid bone fusion in anterior cervical discectomy and fusion 3 months postoperatively	Won Heo (Seoul National University)	
	2016_S0077 Posterior instrumentation of upper cervical spine	Nobuyuki Shimokawa (Tsukazaki Hospital, Japan)	
	2016_S0087 Anterior and posterior approach for cervical ossification of posterior longitudinal ligament	Takahiro Hayashi (Yokohama City University, Japan)	
	2016_S0096 Upper Cervical Subluxation and Cervicomedullary Junction Compression in Patients With Rheumatoid Arthritis	Gun-Ill Lee (Hanyang University)	
	2016_S0181 Risk factor analysis and decision making of surgical strategy for V3 segment anomaly: Significance of preoperative CT angiography for Posterior C1 instrumentation	JAE YOEL KWON (Catholic University)	
	2016_S0186 Risk factors related to post-operative dysphagia after anterior cervical decompression and fusion: a focused analysis of anesthetic consideration	Jong Hyeok Park (Sungkyunkwan University)	
	2016_S0222 Significance ofMultimodal intraoperative monitoring(MIOM) change for thepatients with Craniovertebral junction pathology	Jung Jae Lee (Catholic University)	
12:30-12:40	**Award Ceremony**		Grand Ballroom B (2F)
12:40-13:00	Adjourn		

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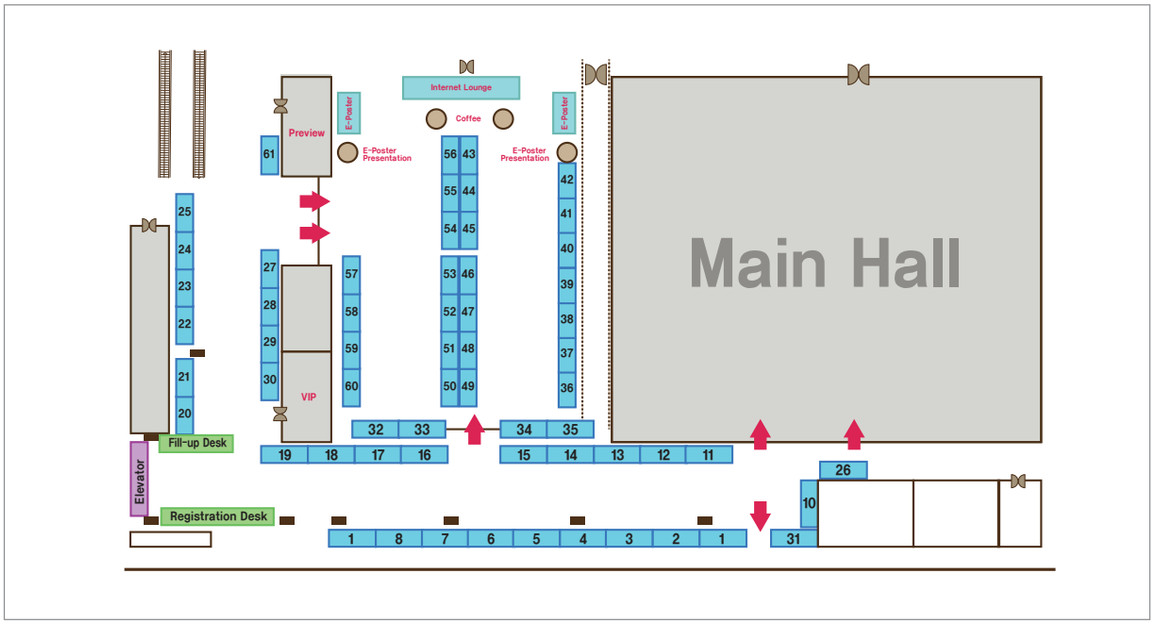
Exhibition Floor plan & List of Exhibitors



Name of Company	Booth No.
Lilly	16, 17, 18, 19
Hanmi Pharm	6, 7, 8, 9
Medtronic	12, 13, 14, 15
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Samjinpharm	33
BMKorea	10
Baxter	34
Mundipharma	11
U&I	49
Jmt korea	55, 56
GS Medical	24, 25
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Janssen	59, 60
DS hitech	45
World Spine Innovation	39

Name of Company	Booth No.
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SKchemicals	48
Bando spine	43
Lumenis korea	44
Chong Kun Dang	47
Kuhnil Pharm	35
Seoulmedbook	26
Koonja	61

Social Program

Opening Remarks
Sep. 22nd, Thursday
13:00 ~ 13:05
Grand Ballroom B

Ceremony of 30th Annual Meeting of KSNS
Sep. 22nd, Thursday
17:20 ~ 18:20
Grand Ballroom B

KSNS General Assembly
Sep. 22nd, Thursday
18:20 ~ 18:40
Grand Ballroom B

Opening Reception
Sep. 22nd, Thursday
18:40 ~ 20:00
Crystal Hall

Presidential Dinner
Sep. 22nd, Thursday
20:00
Cafe Terrace

Gala Dinner
Sep. 23rd, Friday
18:30 ~ 20:00
Grand Ballroom B

Award Ceremony
Sep. 24th, Saturday
12:30 ~ 12:40
Grand Ballroom B

Closing Remarks
Sep. 24th, Saturday
12:40 ~ 13:00
Grand Ballroom B

Registration Fee (KRW)

Category	Early Registration (by Aug 31, 2016)	Regular Registration (Sep.1-15, 2016)	On-Site Registration (Sep.22-24, 2016)
Attendee	200,000 KRW (200 USD)	250,000 KRW (250 USD)	300,000 KRW (300 USD)
Fellow	100,000 KRW (100 USD)	150,000 KRW (150 USD)	200,000 KRW (200 USD)
Resident	50,000 KRW (50 USD)	70,000 KRW (70 USD)	80,000 KRW (80 USD)

Payment Method

Payment methods are available both credit cards and wire transfer for domestic participants Foreign registrants card payment is available.

ASIA SPINE 2016

Curriculum Vitae

The Translation in Spine Care

ASIA SPINE 2016

◈ Luncheon Seminar I ◈

Im-Hee Shin

Catholic Univ. of Daegu, School of Medicine,
Department of Medical Statistics
(DCUMC:Daegu Catholic Univ. Medical Center)
Havard Univ. fellow (MRCT, Global Health Institute) / WIRB fellow

학 력

1981.3~1985.2	경북대학교 통계학 (학사)
1985.3~1987.8	경북대학교 통계학 (석사)
1988.9~1993.8	경북대학교 응용통계학 (이학박사, Ph.D)
2009.6~2009.8	Western IRB (WIRB) 연수 현재 : fellow
2013.3.1~현재	Harvard Univ. fellow (MRCT, DSMB)

경 력

2000.1~현재	대구가톨릭대학교의료원 IRB 위원
2005.1~현재	대구가톨릭대학교의료원 IRB/의약품IRB, 의료기기 IRB 전문간사/전문간사
2008.1~현재	WHO SIDCER/FERCAP 세계보건기구 산하 IRB 인증국/아시아 서태평양지역 국제실사위원(surveyor), 국내 실사위원
2009.6~현재	Western IRB (WIRB) fellow

◈ Basic Research Award Presentation ◈

Kyoung-Tae Kim

Department of Neurosurgery, School of Medicine,
Kyungpook National University

Education

2002	B.D. School of Medicine, Chung-Ang University
2011	M.D. Graduate school of Medicine, Chung-Ang University

Postgrduate Education

2002-2003	Internship, Chung-Ang University Hospital
2003-2007	Neurosurgical Residency, Chung-Ang University Hospital
2008-2009	Spine Fellowship, Chung-Ang University Hospital, Seoul, Korea
2010-2011	Spine Observership, Shoen Klinik, Munchen, Germany

Faculty Appointments

2009-2011	Clinical assistant professor, Chung-Ang University, Seoul, Korea
2011-Present	Assistant professor, Kyungpook National University, Daegu, Korea

Awards

2007	Best resident, Chung-Ang University Hospital
2010	Korean geriatric neurosurgical society (KGNS) Best oral presentation award
2010	Korean spinal neurosurgery society (KSNS) Lami award (Kim Young-Soo award)
2012	KSNS Award competition session (Nanoori award)
2013	KSNS Award competition session (Nanoori award)

2013	CNS Best poster award
2014	KSNS Best paper award (Kim Young-Soo award)
2015	Korean minimal invasive spine surgery society (KOMISS) Oral presentation award
2015	KSNS Basic research award

Membership In Professional Societies

Regular member, The Korean Spinal Neurosurgery Society (KSNS)

Executive director, The Korean Peripheral Neurosurgery Society

Executive director, The Korean Neurotrauma Society

Regular member, Korean Minimally Invasive Spine Surgery Research Society

Regular member, Korean Cervical Spine Society

International member, CNS (USA)

◈ Special Lecture ◈

Whoan-Jeang Kim

President of Korean Society of Spine Surgery

학 력

충남대학교 의과대학 졸업

경 력

1990	을지대학병원 정형외과 레지던트 및 전문의
2000	미국 Chicago Rush medical center에서 clinical fellow 척추 연수
	서울대학교 정형외과 척추외과 연수
	을지대학병원 진료부장 및 부원장 역임
	현 을지대학병원 척추센터 소장 및 교수
	International Spinal Learning Center (Depuy AcroMed) 지정교수
2014~2016	대한척추신기술학회 회장
2016~2017	대한척추종양학회 회장
2016~2017	대한척추외과학회 회장
	정형외과 교과서 공저
	-대한 정형외과학 교과서(7판) 퇴행성 척추 변형,
	-대한 척추외과학 교과서(3판) 퇴행성 척추 변형,
	-대한 정형외과 학생을 위한 교과서 퇴행성 척추 변형

학회활동, 수상경력

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SIROT (국제정형외과 연구학회) 정회원
International Spinal Learning Center (Depuy AcroMed) 지정 교수
대한정형외과학회 정회원
대한골절학회 정회원
대한정형통증학회 평의원
대한척추외과학회 편집위원 및 평의원
대한 정형외과 척추외과 학회 춘계 우수 논문상 수상 2015년

◈ Honored Guest's Speech ◈

Yong Qiu

Nanjing University

Dr. Yong QIU, Professor and Director of Orthopaedics, Drum Tower Hospital, Nanjing University Medical School. He had his orthopaedic resident training in France. He is now the president of Chinese scoliosis research society. His team has successfully operated on more than 9,000 scoliosis patients during last 18 years, who came from all over the country and from the southeast of Asia. His spine unit consists 142 beds and is one of the world-leading scoliosis centers. He also focused on the research of etiology and pathology of scoliosis. Since 2005, he has published more than 100 SCI articles, participated in compiling 47 professional books. He has presented in many international conferences such as SRS, IMAST, IRSSD, Euro-Spine and NASS. Because of his world renowned contribution to the treatment of spinal deformity, he has won great international reputation in the area of scoliosis treatment and research and was horned as the editorship of European Spine Journal, Spine Journal and BMC Musculoskeletal.

◈ Honored Guest's Speech ◈

Michael Lim

Associate Professor of Neurosurgery, Oncology, and Radiation Oncology and Radiation Molecular Sciences, The Johns Hopkins University School of Medicine

Education and Training

Undergraduate

1995 B.S., Biochemistry, University of New Hampshire, Durham, NH

Doctoral/Graduate

2000 M.D., The Johns Hopkins University School of Medicine, Baltimore, MD

Postdocatoral

2000-2001 Intern, General Surgery, Stanford University Medical Center, Stanford, CA

2001-2007 Resident, Neurosurgery, Stanford University Medical Center, Stanford, CA

Professional Experience

2007-2013 Assistant Professor of Neurosurgery, Oncology, and Radiation Oncology and Radiation Molecular Sciences, The Johns Hopkins University School of Medicine

2013-Present Associate Professor of Neurosurgery, Oncology, and Radiation Oncology and Radiation Molecular Sciences, The Johns Hopkins University School of Medicine

◈ Treatment of SPINE : Where we are and Where we are going ? ◈

Jee-Soo Jang

President of Seoul Nanoori hospital

Special Areas

- Complex multiplanar spinal deformity: adult deformity, anterior and/or posterior approaches, osteotomies, spinal tumor
- Minimally invasive cervical, thoracic and lumbar spine surgery
- Sponlylolisthesis, lumbar spine stenosis and instability
- Surgical solutions for radicular pain and weakness due to spinal pathology
- Endoscopic spine surgery

Academic Background

- Spine Fellowship, Dept. of Orthopedics, Spine Center State University of New York, C, Syracuse
- Ph.D. (Neurosurgery), Chung-ang University, College of Medicine
- M.S.(Neurosurgery), Chung-ang University, College of Medicine
- Bachelor, M.D., Chung-ang University, College of Medicine
- The Journal of Critical Spine Cases (JCSC), Senior Editor in Chief
- The Journal of Critical Spine Cases (JCSC), Editor in Chief

Experience

- Department of Neurosurgery, Cheongdam Wooridul Spine Hospital, President
- Department of Neurosurgery, Seoul Wooridul Hospital, President
- Department of Neurosurgery, Gwangju Wooridul Spine Hospital, President
- Department of Neurosurgery, Wooridul Spine Hospital, Training Director
- Chief, section III(Spine), Department of Neurosurgery, Korea Cancer
- Center Hospital, Chief, Pain Clinic, Korea Cancer Center Hospital
- Medical officers, Chief Neurosurgeon, Department of Neurosurgery, Kwang Joo Veterance Hospital

◈ Treatment of SPINE : Where we are and Where we are going ? ◈

Yong-Eun Cho

Department of Neurosurgery
Gangnam Severance Spine Hospital
Yonsei University College of Medicine

Education

1981	B.S. Yonsei University College of Medicine
1988	M.S. Yonsei University Postgraduate school
1992	Ph.D. Yonsei University Postgraduate School

Hospital Training

1984-1985	Internship, Severance Hospital, Yonsei University Medical Center
1986-1989	Residency, Department of Neurosurgery, Gangnam Severance Hospital, Yonsei University

Fellowship

1989-1992	Spine Fellow in Neurosurgery, Gangnam Severance Hospital, Yonsei University Medical Center, Seoul (Professor Young-Soo KIM, Spine)
1995-1996	Spine Fellowship, Pierre Wetheimer Neurosurgery & Neurology Hospital Lyon I Univ. Lyon, France (Professor Gilles Perrin)
1996	Visiting Fellow, Spine Center, Department of Orthopaedics Pellgrin Hospital Bordeaux Univ., Bordeaux, France (Professor J. Senegas)

Licenses

1981	M.D. (Issued in Korea)
1989	Korean Board of Neurosurgery

Academic Appointment

1992-1993	Lecturer, Dept. of Neurosurgery, Yonsei University.
1993-1998	Assistant Professor, Yonsei University
1998-2004	Associate Professor, Yonsei University
2004-	Professor, Dept. of Neurosurgery, Yonsei University

◈ Treatment of SPINE : Where we are and Where we are going ? ◈

Chun Kee Chung

Professor
Department of Neurosurgery
Seoul National University College of Medicine
Seoul National University Hospital

Education

1983.2	M.D., Seoul National University College of Medicine
1993.2	Ph.D., Seoul National University Graduate School

Postgraduate Training & Professional Career

1983.3-1988.2	Internship and Residency, Department of Neurosurgery, Seoul National University Hospital
1988.2-1991.4	Army Surgeon, Armed Forces, Korea
1991.5-1993.2	Clinical Fellow, Department of Neurosurgery, Seoul National University Hospital
1993.3-1995.2	Instructor, Department of Neurosurgery, Seoul National University College of Medicine
1995.7-1997.6	Research Fellow, Department of Neurosurgery, Cleveland Clinic Foundation, OH, USA
1995.3-2000.9	Assistant Professor, Department of Neurosurgery, Seoul National University College of Medicine
2000.10-2006.3	Associate Professor, Department of Neurosurgery, Seoul National University College of Medicine
2006.4-	Professor, Department of Neurosurgery, Seoul National University College of Medicine
2010.7-2014.7	Professor and Chairman, Department of Neurosurgery, Seoul National University College of Medicine
2013.3-	Professor, Department of Brain and Cognitive Science, Seoul National University College of Natural Science

Professional Society and Membership

1988	Korean Neurosurgical Society
1993	Korean Spinal Neurosurgery Society
1993	Korean Society of Stereotactic and Functional Neurosurgery
1994	Korean Society for Brain and Neural Science
1994	The Congress of Neurological Surgeons
1997	American Epilepsy Society
1997	Korean Epilepsy Society
2006	Human Brain Mapping Society

Special Interest and Research

Spine, Epilepsy, Brain Tumor
Human Brain Function

◈ Treatment of SPINE : Where we are and Where we are going ? - Panelists ◈

Sung-Min Kim

Chairman, Department of Neurosurgery, School of Medicine,
Kyung Hee University
Director, Kyung Hee Spine Center, Kyung Hee University Hospital at GangDong

Education

1987	M.D. Degree, College of Medicine, Kyung Hee University
1987-1992	Internship and Residency (Neurosurgery), Kyung Hee Medical Center, Department of Neurosurgery, Kyung Hee University
1998	Ph.D. Degree, Department of Neurosurgery
	Graduate School of Medicine, Kyung Hee University
2002-2003	Stanford University (Postdoc fellowship: Dr. Daniel Kim)

Career of teaching Staff

1995-2002	Hallym University medical center, clinical fellow, Instructor and assistant professor, Associate professor
2003-2006	Director of department of neurosurgery, HanGang Sacred heart hospital
2006-2011	Kyung Hee University, Director, Department of Neurosurgery, Kyung Hee University Hospital at GangDong

Certification

1987	Korean Medical License (32280)
1992	Korean Board of Neurosurgical Society (782)

◈ Treatment of SPINE : Where we are and Where we are going ? - Panelists ◈

김 우 경

가천대 길병원

학 력

1981.3-1987.2 한양대학교 의과대학 의학사
1989.7-1991.8 한양대학교 대학원 석사
1994.3-1997.2 한양대학교 대학원 박사

해외연수경력

1999.5-2000.5 University of Pittsburgh 신경외과 연수(Center for Minimally invasive spine&Brain)
2005.9-2007.11 UCSD 정형외과 교환교수, UCSD Children's Hospital 청소년측만증 센터 연수

경 력

현 대한신경외과학회 총무이사
대한척추신경외과학회 상임이사
대한노인신경외과학회 상임이사
대한 척추신기술학회 학술 이사
대한 신경통증학회 상임이사
아시아태평양 경추 학회(APCSS) 상임이사
대한경추연구회 회장(2013-2015)
국토해양부 자동차분쟁심의회 자문위원
한국 소비자 보호원 자문위원
심평원 척추분과 자문위원

◈ Treatment of SPINE : Where we are and Where we are going ? - Panelists ◈

어 환

성균관대학교 의무부총장

학 력

1978.2	서울대학교 의과대학 졸업 (의학사)
1982.2	서울대학교 대학원 의학과 (석사)
1989.8	서울대학교 대학원 의학과 (박사)

경 력

1994.3-현재	삼성서울병원 신경외과 전문의
1997.3-현재	성균관의대 신경외과학교실 교수
2003.3-2007.1	성균관대학교 의과대학 신경외과 주임교수 & 삼성서울병원 과장
2007.2-2011.2	성균관대학교 의과대학 학장/ 의학전문대학원 원장
2007.9-2009.9	삼성서울병원 척추센터장
2008.9-2009.8	대한척추신경외과학회 회장
2016.5-현재	성균관대학교 의무부총장

◈ Treatment of SPINE : Where we are and Where we are going ? - Panelists ◈

Koang Hum Bak

Department of Neurosurgery Hanyang University Hospital

Educational And Training Background

1987	Graduated from Hanyang University College of Medicine, Seoul, Korea
1987-1988	Internship at Hanyang University Medical Center
1988-1992	Served residency in the Department of Neurosurgery, Hanyang University Medical Center
1993	Doctor of Philosophy in Medical science, Hanyang University
Feb-Aug 1999	Spine fellowship in the University of New Mexico
Sept 1999-Feb 2000	Spine fellowship in the Cleveland Clinic Foundation

Experience

1992-1994	Full-time staff in the Department of Neurosurgery, Gil General Hospital
1995-now	Professor of Neurosurgery, Hanyang University
2013-2016	President of Korean Spinal Oncology Research Society
2010-2016	Membership committee and founding member of AP-CSRS(Asia pacific Cervical Spine Research society)
2016-	Vice president of Korean Academy of Independent medical examiners

Awards

2004	Prof. Chung Award in Spine field from Korean Neurosurgical Society
2005	Young Neurosurgeon Award in Spine field from Korean Neurosurgical Society
2005, 2006	Best Professor Award in Clinical research field from Hanyang University.

◈ Treatment of SPINE : Where we are and Where we are going ? - Panelists ◈

Gun Choi

Wooridul Hospital

Education

2/2003	Ph.D. : Neurosurgery Hanyang University School of Medicine, Seoul, Korea
3/2003	M.D : Neurosurgery Hanyang University School of Medicine, Seoul, Korea
2/1988	B.S: Medicine Hanyang University School of Medicine, Seoul, Korea

Academic Appointments

5/2010- present	Attending Professor, Hanyang University Medical Center, Seoul, Korea
12/2010- present	Instructor of International Fellowship, Wooridul Spine Hospital, Gimpo Airport, Seoul, Korea

Hospital Appointments

12/2010-12/2014	President, Wooridul Spine Hospital, Gimpo Airport, Seoul, Korea
10/1999-12/2010	Surgeon, Department of Neurosurgery, Chungdam Wooridul Spine Hospital, Seoul, Korea

Teaching Experience

May 30th to 31st /2016	Director at 5th didactic Course of Endoscopic Spine Procedures
	Wooridul Spine Hospital, Pohang, Korea
Jan. 14th to 16th /2016	Director at 4th didactic Course of Endoscopic Spine Procedures
	Wooridul Spine Hospital, Pohang, Korea
2015	Director at 3rd didactic Course of Endoscopic Spine Procedures
	Wooridul Spine Hospital, Gimpo Airport, Seoul, Korea
	Instructor at the 1st International Spine Cord Basic Research and Clinical Innovation Seminar & the
	2nd Annual Meeting of the Orthopaedic in Tianjin
9/2014	Tianjin Medical University General Hospital
7/2014	Director at 2nd didactic Course of Endoscopic Spine Procedures
	Seoul Gimpo Airport Wooridul Spine Hospital, Seoul,Korea
	Director at 1st Didactic Course of Endoscopic Spine Procedures (including Cadaver Workshop)

◈ Treatment of SPINE : Where we are and Where we are going ? - Panelists ◈

Choon Keun, Park

The president of The Leon Wiltse Memorial Hospital,
Doctor of medicine,
Neurosurgery medical specialist

Medical Education

1992.9-1995.8	The Catholic University of Korea, Graduate School of Medicine (Ph.D. Degree)
1978.3-1984.2	The Catholic University of Korea, School of Medicine (M.D. Degree)

Internship & Residency

1985.3-1989.2	Neurological Surgery, Seoul, St. Mary's Hospital, the Catholic University of Korea, Seoul, Korea
1984.3-1985.2	Seoul, St. Mary's Hospital, the Catholic University of Korea, Korea

Overseas Education

1997.3-1998.12	Research fellow in the field of spinal biology and biomechanics, Supervisor: Hansen A Yuan, MD. State University of New York Health Science Center at Syracuse. Syracuse, New York, U.S.A.
1995.8-1995.9	Research fellow, Dallas Spine Center, Dallas, Texas, U.S.A. (Supervisor: David Selby, M.D.)

Teaching Experience

2012.3-	Adjunct Professor, Dept. of Neurosurgery, St. Vincent's Hospital, College of Medicine, Catholic University of Korea
2000.3-2003.10	Associate Professor, Dept. of Neurosurgery, St. Vincent's Hospital, College of Medicine, Catholic University of Korea
1997.3-1998.12	Research fellow, Department of Orthopedic Surgery, State University of New York Health Science Center at Syracuse, Syracuse, New York, U.S.A. (Invited by Hansen Yuan, M.D.)
1996.2-2000.3	Assistant Professor, Neurological Surgery, St. Vincent's Hospital, College of Medicine, the Catholic University of Koera
1992.3-1996.2	Instructor, Neurological Surgery, St. Vincent's Hospital, College of Medicine, the Catholic University of Korea

Medical Specialist License

Neurosurgery medical specialist, The Republic of Korea (1989.2)

◈ Current Status and Future Perspectives of Spine Surgery in Asian Countries ◈

Nguyen Ngoc Ba

Neurosurgical Dpt. Danang Hospital, Vietnam
124 Hai Phong St.
ba_neurosur@yahoo.com.vn

Biography

1985-2005	Neurosurgeon in Dpt.of Neurosurgery Danang Hospital
2006-2016	Head of Dpt.of Neurosurgery
2006-2016	Vice director of Danang Hospital
2003-2016	Vice President of National Neurosurgery Association, Vietnam

Education

1975-1981	Medical Student of Hue Medical College, Vietnam
1987-1990	Post Graduated of Neurosurgery Hanoi Medical College, Vietnam
1993-1994	Neurosurgery training in Angers, France
2000	Neurosurgery Training, Wakayama University, Japan
2002-2004	Post Graduated Neurosurgery in HCMCity Medical College, Vietnam

Work Experience

2500 cases lumbar disc herniation operated

150 cases cervical disc herniation operated

300 cases cervical spine injury operated

650 cases thraco-lumbar spine injury operated

130 cases cervical laminoplasty

220 cases spine tumor operated

120 cases spinal tuberculosis operated

Publication

1986-1990	Lumbar disc herniation operated at Danang Hospital, Vietnam
2004-2006	Evalution the results of surgical management of cervical fractures at Danang Hospital, Vietnam
2006-2008	Application study of cervical stenosis laminoplasty at Danang Hospital, Vietnam
2006-2015	Results of surgical management of spinal tuberculosis at Danang Hospital, Vietnam
2012-2015	Evaluation results of endoscopic discetomy of L5-S1 via an interlaminar in Danang, Vietnam

Visiting fellowship

1998	Fujita Health University, Nagoya, Japan
1999	Calmette Hospital, Phnom Penh, Cambodia
2005	Stroke center, Autria
2006	Neurosurgery Dpt, CUSF, USA
2009	Neurosurgery Dpt. Sydney, Australia
2013	Spine Unit Swansea, Wales, UK

President

2007	National Neurosurgery Conference, Danang, Vietnam
2011	National Neurosurgery Conference, Danang, Vietnam

◈ Current Status and Future Perspectives of Spine Surgery in Asian Countries ◈

Sarat P. Chandra

All India Institute of Medical Sciences, India

Current position

Professor, Dept of Neurosurgery, Neurosurgery, AIIMS, New Delhi

Other affiliations: Board member, Neurological Society of India, Secretary Skull base Society of India

Over 180 publications, 12 research projects, 3 patents

Area of expertise: cranio-vertbral junction anomalies, Spinal tumors, complex spine

◈ Current Status and Future Perspectives of Spine Surgery in Asian Countries ◈

Wiryawan Manusubroto

Neurospine Consultant,
Dept. Of Neurosurgery, Gadjah Mada University/
Dr. Sardjito General Hospital
Yogyakarta – Indonesia

◈ Current Status and Future Perspectives of Spine Surgery in Asian Countries ◈

Iv Vycheth

Preah Kossamak Hospital, Cambodial

Position

1. Current President, Cambodia Society of Neurosurgeons (CSNS).
2. Chief, Department of Neurosurgery, Preah kossamak hospital.

Society Membership

1. Cambodia Society of Neurosurgeons (CSNS)
2. Cambodian Society of Surgery(CSS)
3. ASEAN Neuroscience and Neurosurgeons Congress (ANNC)
4. Asia-Australia Neuro-Surgeons Society (AACNS)
5. World Federation of Neurosurgery (WFNS).
6. Global Neurosurgery

Correspond

- #271, Sangkat Teukla ak2, Khan Toulkok, Preah kossamak hospital, Phnom Penh, Cambodia.
- Phone:(+855)12892 983
- Email: vychethg@gmail.com

Education

1986-1990	Diploma of State of Medical Assistant, Faculty of medicine
1997-2000	Diploma of State of Medical Doctor, University of Health Sciences
2004-2005	Diploma of Neurosurgery, Soon Chun Hyang university (SCH), Republic of Korea.

Teaching Experiences

1. Professor and membership of Jury of thesis in University of Health Sciences (UHS).
2. Lecturer in the Institute of Health Sciences of Royal Army Forces (IHSRAF)
3. Professor and lecturer at University of Norton University.

Published In Journals And Webside

- 29 topics was published in local and internationals journal
- 01 topic was published in the World of Neurosurgery website

Working Experiences

1. 1991-1997	General surgeon at Kampot provincial Referral Hospital
2. 2000-2005	General surgeon at Preah kossamak Hospital
3. 2005-now	Neurosurgeon at Preah kossamak Hospital.

◈ Current Status and Future Perspectives of Spine Surgery in Asian Countries ◈

Abdul Karim Msaddi

Medical Director
Head of Neurosurgical & Spinal Department
Neuro Spinal Hospital, UAE

Specialty

Neurosurgery with special interest in Spine Surgery, Interventional Management of Spasticity & Intractable Pain

Degree/Fellowship

French Board in Neurosurgery

European Board Neurosurgery

University Diploma Human Neuro Anatomy

Experimental Surgery & Microsurgery – University of Paris, France

Memberships

Member of AANS (American Association of Neurological Surgeons), EuroSpine Society, NASS, NANS, INS, EANS, ISASS, WFNS, SIS, WSSFN, ArabSpine

· Chairman of Organizing Committee, Dubai International Spine Conference (DISC) & Local Organizer of European Association of Neurosurgical Societies (EANS) course in UAE.

· Chairman of Scientific Committee, ArabSpine

· Chairman of ArabSpine Course Diploma

· Past President of Emirates Neuroscience Society

◈ Current Status and Future Perspectives of Spine Surgery in Asian Countries ◈

Krishna Sharma

Department of Neurosurgery,
Nepal Medical College Pvt. Ltd.,
Jorpati, Kathmandu, Nepal

Qualifications

Diplomate of National Board of Examination (D.N.B.)
Neurosurgery
Ministry of Health, Government of India, India. May, 2004.

Diplomate of National Board of Examination (D.N.B.)
General Surgery
Ministry of Health, Government of India, India. June, 1996

M.S. General Surgery
Post Graduate Institute of Medical Education and Research
Chandigarh, India. May, 1996

M.B.B.S.
S.N. Medical College, Agra University, Agra, India, November, 1993

Previous Appointments

1. 1st November, 2003 to 1st September, 2015	Consultant Department of Neurosurgery, B & B Hospital, Gwarko, Lalitpur, Nepal.
2. 14th October, 2002 to 13th October, 2003	Registrar National Neurosurgical Referral Center, National Academy of Medical Sciences, Bir Hospital, Kathmandu, Nepal

3. 1st May, 1999 to 31st April, 2003	Registrar
	Department of Neurosurgery, Apollo Specialty Hospital, Chennai- 600035, India.
4. 17th April, 1998 to April, 16th 1999	Assistant Professor
	Department of Surgery
	B.P. Koirala Institute Of Health Sciences, Ghopa Camp, Dharan, Nepal.
5. 16th November, 1997 to 16th April, 1998	Senior resident
	B.P. Koirala Institute Of Health Sciences
	Ghopa Camp, Dharan, Nepal.
6. 16th February, 1997 to 1st November, 1997	Registrar
	Neurosurgical Unit, Bir Hospital, Kathmandu, Nepal
7. 15th August, 1996 to 15th February, 1997.	Medical Officer
	Neurosurgical Unit, Bir Hospital, Kathmandu, Nepal

Teaching Experiences

- Three years of teaching experience in the department of surgery at Post Graduate Institute of Medical Education and Research, Chandigarh, India, during postgraduate training from Jan 1993 to May 1996.
- Involved in teaching medical students and nursing students in B.P. Koirala Institute of Health Sciences (BPKIHS), Ghopa Camp, Dharan, Nepal from 16th November, 1997 to 16th April, 1999.
- Involved in teaching medical students, nursing students and paramedical students in B&B Hospital and Dhulikhel Hospital from November, 2003 to 2006.

Research

- Thesis:- "Study of the levels of enzymatic antioxidants in patients undergoing open heart surgery and their relation to myocardial protection" done in the department of surgery at Post Graduate Institute of Medical Education and Research, Chandigarh, India.
- Participated in STICH II trial, UK.
- Participating in CRASH 3 TRIAL, UK.

Fellowship

Received four weeks' WHO fellowship in Medical Education Innovation (Neurosurgery) training in All India Institute of Medical Science, New Delhi, India from 7th February to 5th March, 1999.

◈ Current Status and Future Perspectives of Spine Surgery in Asian Countries ◈

Gonchigsuren Dagvasumberel

Grand Med Hospital, Mongolia

Work Experience

2013-present	Medical Director, Grand Med Hospital, Ulaanbaatar, Mongolia
2011-2013	Director, Department of Policy Implementation & Regulation of Medical Service, Ministry of Health, Mongolia
2008-2011	Dean, School of Medicine, Health Sciences University of Mongolia, Ulaanbaatar, Mongolia
	Chairman, Department of Radiology, School of Medicine, Health Sciences University of Mongolia, Ulaanbaatar, Mongolia
2007-2008	Vice Director & Chief of Department of Radiology of Ulaanbaatar Song Do Hospital, Ulaanbaatar, Mongolia
1991-2007	Lecturer, Senior Lecturer, Department of Radiology, School of Medicine, Health Sciences University of Mongolia, Ulaanbaatar, Mongolia

Education

2002	Fellowship, Department of Diagnostic Radiology, Singapore General Hospital, Singapore
2001	Fellowship, Department of Diagnostic Radiology, Severance Hospital, Yonsei University, Korea
1998	PhD., Health Sciences University of Mongolia, Ulaanbaatar, Mongolia
1996	Fellowship, Department of Radiology, Teikyo University, Japan
1992-1994	Residency in Radiology, Health Sciences University of Mongolia, Ulaanbaatar, Mongolia
1984-1991	MD., Mongolian National Medical University, Ulaanbaatar, Mongolia

Award And Honors

2003	Visiting Professor, Nagasaki University, Japan

◈ ASIA SPINE : The Past, Present and Future ◈

Hiroshi Nakagawa

Hokkaido University School of Medicine, Sapporo, Japan

Residency

1966-1968	Hokkaido University Hospital (Prof. M. Tsuru), Neurosurgery
1968-1970	New England Medical Center (Prof. B. Selverstone), Boston, USA, Neurosurgery
1969-1970	Boston City Hospital, Boston, USA, General Surgery
1971-1973	Mount Sinai Medical Center (Prof. L. I. Malis), New York, USA, Neurosurgery

Present Affiliation

Kushiro Kojinkai Memorial Hospital, Kushiro City Japan

Director: Spine Center, 2011-

Medical Licenses: Japan 1965, New York 1973

Board Certification: 1981 American Board of Neurological Surgery

1983 Japanese Board of Neurological Surgery

International and National Organizations

1979	Congress of Neurological Surgeons
1982	American Association of Neurological Surgeons
1966	Japan Neurosurgical Society
1981	Japan Congress of Neurological Surgeons
1983	Japan Medical Society of Spinal Cord Lesion

1986	Japanese Society of Spinal Surgery (JSSS)
2001-2007	Editor-in-Chief "Spinal Surgery" (Official Journal of JSSS)
2003-2007	Board of Directors, World Spine Society
2006-2007	Chairman, Board of Directors, Japanese Society of Spinal Surgery

President

1994	The 8th Annual Seminar of Surgical Anatomy for Microneurosurgery
1996	The 11th Annual Meeting of the Japanese Society of Spinal Surgery
1996	The First International Symposium on Cerebral and Spinal Cord AVM
1997	The First Biennial Meeting of Japan-Korea Conference on Spinal Surgery
2000	The 29th Annual Meeting of the Japanese Society of Neuroradiology
2003	The 38th Annual Meeting of Japan Medical Society of Spinal Cord Lesion
2004	The 27th Annual Meeting of the Japan Society for CNS Computed Imaging

Honored Guest

2005	The 21st Annual Meeting of AANS/CNS Section on Disorders of the Spine and Peripheral Nerves, Phoenix USA
2005	The 5th Biennial Meeting of Japan-Korea Conference on Spinal Surgery, Sapporo Japan
2011	2nd Asia Spine & 9th JKCSS Fukuoka Japan

Academic Position

1994-2006	Aichi Medical University, Professor and Chairman, Department of Neurological Surgery
2006	Aichi Medical University, Professor Emeritus
2016.6-	Clinical Professor Tokushima University

◈ Honored Guest's Speech ◈

Robert Gunzburg

Editor-in-Chief of European Spine Journal

Education

1981	Graduate degree (doctorate years): 'Dokter in de Genees-, Heel- en Verloskunde' (= M.D.), cum laude, University of Louvain: Katholieke Universiteit Leuven (K.U.L.), Belgium
1981	Diploma in Tropical Medicine, cum laude, Prins Leopold Institute for Tropical Medicine of Antwerp, Belgium)
1991	Ph.D.: 'Agrégation de l'Enseignement Supérieur' "Contribution à l'Etude du Rachis Lombo-Sacré, Rotation et Flexion-Rotation, Approche Etio-Pathogénique de la Lombalgie Discale" Université Libre de Bruxelles, Belgium
1987	Specialist in Orthopaedic Surgery and Traumatology (RIZIV) n° 1-17496-68-480
1999	United Kingdom Certificate of Full Registration as a Medical Practitioner (Principal List) N°4595485 Orthopaedic Medicine, General Medical Council, 23/03/99

Professional Career

1987-	Senior Consultant in the Department of Orthopaedics, Brugmann University Hospital, Free University of Brussels, Brussels, Belgium.
1988-1889	Clinical Fellowship in Spinal Surgery with Prof. R. D. Fraser, Royal Adelaide Hospital, Adelaide, Australia
1992-	Private practice at the Eeuwfeestkliniek in Antwerp & at Edith Cavell Clinic, Uccle, Belgium
1989-	Expert for the Court of Law, particularly in matters concerning the spine
2003-2005	Consultant spine surgeon at the Al Noor Hospital, Abu Dhabi, United Arab Emirates.

Administrative Functions

1994-1998	Treasurer of the European Spine Society (ESS)
1993-2004	Treasurer of the Groupement Belge d'Orthopédie (GBS-VBS)
1986-1996	Treasurer of the EIBAL (Enseignement Interdisciplinaire de Biomécanique de l'Appareil Locomoteur)
1998-2006	Treasurer of the Spine Society of Europe (SSE)
2000-2004	European Representative for International Society for the Study of the Lumbar Spine (ISSLS)
2004-2007	Instructional course Representative for International Society for the Study of the Lumbar Spine (ISSLS)
2006-2008	General Secretary of International Society for the Study of the Lumbar Spine (ISSLS)
2007-2008	President of EuroSpine Society, The Spine Society of Europe
2015	President of International Society for the Study of the Lumbar Spine (ISSLS)
2014	Editor-in-Chief of the European Spine Journal (Springer Verlag / Heidelberg)

Other

Languages: fluent written and spoken: English, Dutch, French; conversational: Spanish, Afrikaans

Awards and grants: 7

International publications: 112 papers, 14 books, 7 book chapters

National Publications: 6

Invited lecturer or key-note speaker at international meetings: 76

International podium paper communications: 137

Number of international congresses or courses chaired: 34

Number if times served as session chairman and/or moderator at international scientific meetings: 65

Number of courses organised: 39

Membership of scientific societies and administrative functions: 21

Number of Editorial positions: 7

Teaching tasks: 16

Courses followed: 14

National podium paper communications 11

January 2016

◈ Honored Guest's Speech ◈

Daniel Karel Resnick

Department of Neurological Surgery
University of Wisconsin School of Medicine
Vice President of NASS

Education

A.B., 1987 (Psychology)	Princeton University
(Summa Cum Laude)	Princeton, NJ
M.D., 1991	University of Pennsylvania School of Medicine
(Alpha Omega Alpha)	Philadelphia, Pennsylvania
M.S., 1997	University of Pittsburgh
(Neuroscience)	Pittsburgh, Pennsylvania

Current Position

Professor and Vice Chairman for Academic Affairs
Residency Program Director
Department of Neurological Surgery
Professor, Department of Orthopedics and Rehabilitation Medicine
Co-Director, Spine Surgery Program
University of Wisconsin School of Medicine and Public Health
Madison, Wisconsin

Other Employment History

Assistant Professor,	July, 1998-2003
Associate Professor	July 2003-2011

Department of Neurological Surgery and Department of Orthopedics and Rehabilitation
University of Wisconsin School of Medicine
Madison, Wisconsin

Staff Neurosurgeon: July, 1998 to present
University of Wisconsin Hospital and Meriter Hospital
Madison, Wisconsin

Consulting Neurosurgeon July, 1998 to present
William H. Middleton VAH Madison, Wisconsin

Consulting Neurosurgeon August 2015 to present
University of Wisconsin Rehabilitation Hospital
Madison, Wisconsin

Consulting Neurosurgeon July, 1998 through July 2015
St. Mary's Hospital, Madison, Wisconsin

Captain- Lieutenant Colonel 1993-2012
United States Army Reserve MC (Honorable Discharge, 2012)
Staff Neurosurgeon October 2006- January 2007
William Beaumont Army Medical Center
El Paso, Texas

Resident in Neurological Surgery July 1992 to June, 1998
University of Pittsburgh Medical Center, Pittsburgh Pennsylvania
Chairmen: Peter J. Jannetta, MD, L. Dade Lunsford, MD

Rotating Spine Resident February, 1997 to June, 1997
University of New Mexico Hospital, Albuquerque, New Mexico
Chairman: Edward C. Benzel, MD

Associate Staff, Emergency Medicine July, 1995 to January, 1997
Forbes Regional Hospital
Monroeville, Pennsylvania

Internship in General Surgery June, 1991 to June, 1992
Pennsylvania Hospital Philadelphia, Pennsylvania
Chairman: David L. Paskin, MD

◈ Presidential Symposium - Translation in Spine Care ◈

Jeong-Yoon Park

Department of Neurosurgery, Gangnam Severance Hospital, Spine and Spinal Cord Institute, Yonsei University College of Medicine, Seoul, Republic of Korea.

Education and carriers

1992-1998	Chonbuk National University College of Medicine, Jeonju, Korea (M.D)
1999-2003	Internship and Residency at Department of Neurosurgery, Chonbuk National University Hospital, Jeonju, Korea
2006.3-2007.8	Clinical fellowship, Department of Spinal Neurosurgery, Gangnam Severance Hospital, Spine and Spinal Cord Institute, Yonsei University College of Medicine, Seoul, Korea
2007.9-2011.3	Clinical Assistant Professor, Department of Neurosurgery, National Health Insurance Corporation Ilsan Hospital, Yonsei University College of Medicine, Gyeonggi-Do, Korea
2006.9-2010.9	Yonsei University Graduate School, Seoul, Korea (PhD)
2011.3-present	Assistant Professor, Department of Spinal Neurosurgery, Gangnam Severance Hospital, Spine and Spinal Cord Institute, Yonsei University College of Medicine
2015.3-2016.8	Visiting Professor, Chung lab (PI: Prof. Kwanghun Chung) at Institute for Medical Engineering and Science (IMES), Picower Institute for Learning and Memory, Massachusetts Institute of Technology

Membership in Medical Societies

Korean membership

Korean Minimally Invasive Spine Surgery Research Society (KOMISS), committee member

Korean Neurosurgical society (KNS)

Korean Spinal neurosurgery Society (KSNS)

◈ Presidential Symposium - Translation in Spine Care ◈

Hyun Bae

Cedars-Sinai Hospital and The Spine Institute, CA, USA

Education

1990-	B.S. Bioengineering and Biomechanics, Columbia University, New York, NY
1995-	Doctor of Medicine (Cum laude, May 1995), Yale University School Medicine, New Haven, CT

Post Graduate Training

1993-1994	Molecular and Cell Biology NIH Howard Hughes Research Fellow Bethesda, MD
July 1995-June 1996	General Surgery Internship Northshore University Hospital, Manhasset, NY
July 1996-June 2000	Orthopedic Surgery Residency Hospital for Special Surgery, New York, NY
July 2000-June 2001	Spine Surgery Fellowship Case Western Reserve University, Cleveland, OH

Licensure

State of California, Medical Board of California, Certificate Number: A76189

Professional Experience

2015-present	Professor of Surgery, Dept. of Surgery, Cedars-Sinai Medical Center, Los Angeles, CA
2012-present	Medical Director, Director of Spine Education, Spine Center, Div. Orthopaedic Surgery, Dept. of Surgery, Cedars-Sinai Medical Center, Los Angeles, CA
2009-present	Medical Director, Director of Research, Center for Spinal Restoration (CSR) & The Spine Institute, Santa Monica, CA
2009-2012	Co-Fellowship Director, Spine Center, Div. Orthopaedic Surgery, Dept. of Surgery, Cedars-Sinai Medical Center, Los Angeles, CA
2001-2009	Spine Surgeon, Director of Research, The Spine Institute at Saint John's Health Center, Santa Monica, CA

◈ Presidential Symposium - Translation in Spine Care ◈

Syn Ho Do

Harvard Medical School, MA, USA

Synho Do, PhD, is a director at Laboratory of Medical Imaging and Computation (LMIC), Director of Rapid Collaboration Hub (RCH), Assistant medical director at Advanced Health Technology Engineering, Research, and Development, Massachusetts General Physicians Organization. He is an assistant Professor, Harvard Medical School, Department of Radiology, Massachusetts General Hospital and a member of IEEE Signal Processing Society in Bio-Imaging and Signal Processing (BISP).

Dr. Do received his Ph.D. degree in Biomedical Engineering from University of Southern California and currently, he is the Principal Investigator at MGH for NVIDIA CUDA Research Center (CRC). Some of Dr. Do's current research interests include statistical signal and image processing, estimation, detection, and medical signal and image processing, such as computed tomography and machine learning. He has been a Co-Investigator for multiple medical imaging projects, and also, a Co-PI/PI on medical (i.e., GE, Siemens, and Philips, etc.) and security (i.e., DHS, DARPA, etc.) image reconstruction projects and is one of the founders of the center for medical image machine learning at Massachusetts General Hospital and Harvard Medical School.

◈ Luncheon Seminar III ◈

Arvind G Kulkarni

Bombay Hospital, India

Surgeries performed by me : (Main Focus- Minimally Invasive Spine Surgery)

1. Micro-Endoscopic Discectomy with MetRx system for Prolapsed Intervertebral Disc (PID)
2. Micro-Endoscopic Laminotomy & Decompression (Microlumbar Laminoplasty) with MetRx system for Lumbar Canal Stenosis (Spinal Stenosis)
3. Laminectomy +/- Instrumented Fusion for Lumbar Canal Stenosis
4. Minimally Invasive TLIF (MIS-TLIF)
5. Artificial Disc Replacement (Total Disc Replacement) for Chronic Low Backpain
6. Spinal Fusion for Chronic Low Backpain, Spondylolisthesis, Spinal Trauma, Spinal Infections, Spinal Tumors etc
7. Anterior Cervical Decompression & Fusion for Cervical Myelopathy, Cervical Radiculopathy, Spinal Trauma, Spinal Tumors etc
8. Cervical Laminectomy and fusion for Cervical Myelopathy, Spinal Trauma, Spinal Tumors etc
9. Cervical Laminoplasty for Cervical Myelopathy
10. Atlantoaxial Fixation and Fusion for Atlantoaxial Instability (secondary to Rheumatoid Arthritis, Trauma, Developmental causes)
11. Occipitocervical Fusion for Trauma, Tumors, Compression etc around the craniovertebral junction
12. Deformity Correction - Scoliosis (Paediatric & Adult), Kyphosis (due to Scheuermann's disease, Post-infective, Post-tubercular, Post-traumatic, Ankylosing spondylitis, Osteoporosis etc)
13. Thoracoscopic Anterior Release & Fusion for Scoliosis
14. Anterior Spinal Decompression & Fusion at all levels (Cervical, Thoracic & Lumbar)
15. Posterior Spinal Decompression & Fusion at all levels (Cervical, Thoracic & Lumbar)
16. Vertebroplasty & Kyphoplasty for Osteoporotic Vertebral Fractures, Metastasis to the Spine etc

17. Surgeries for Spinal Trauma
18. Surgeries for Spinal Tumors
19. Facet joint injections
20. Transforaminal Epidural Injections
21. Dynamic Stabilization – Inter-spinous spacer, Pedicle screw based – Dynesys, Acuflex etc.

M.S: (Master of Orthopaedic Surgery) Post Graduate Degree in Orthopaedic Surgery from Seth G.S. Medical College and K.E.M. Hospital* affiliated to University of Mumbai, India. (2000)

D' Orth (Diploma in Orthopaedic Surgery): from the College of Physicians & Surgeons, Mumbai. (2000)

FCPS (Fellow of College of Physicians and Surgeons): from the College of Physicians and Surgeons, Mumbai. (2002)

Diploma (SICOT): Société Internationale de Chirurgie Orthopédique et de Traumatologie

Fellowship in Spinal Surgery: Department of Neurosurgery, KEM Hospital & Seth G S Medical College, Mumbai. (2002-2003)

Fellowship in Spinal Surgery: Department of Orthopaedics, National University Hospital, Singapore. (2003-2004)

Fellowship in Adult Spinal Surgery: Department of Orthopaedics, St George Hospital and University of New South Wales, Sydney, Australia. (2004-2005)

Fellowship in Adult Spinal Surgery: Spine Division, Toronto Western Hospital, Toronto, Canada. (2005-2006)

Fellowship in Paediatric Spine Surgery: Hospital for Sick Children, Toronto, Canada (2006)

Fellowship in Paediatric Spine Surgery: The Royal Alexandria Hospital for Children at Westmead Sydney, Australia. (2006-2007)

◈ Luncheon Seminar III ◈

Joo-Han Kim

Professor and Director of Department of Neurosurgery, Guro Hospital,
Korea University College of Medicine

Education

Feb 2002	Ph.D.(Neurosurgery), Korea University, Seoul, Korea
Feb 1997	Master (Neurosurgery), Korea University, Seoul, Korea
Feb 1992	Medical Doctor, Korea University, Seoul, Korea

Professional Experience

Sep 2012-present	Professor, Department of Neurosurgery, Korea University College of Medicine, Seoul, Korea
Sep 2006-Aug 2012	Associate Professor, Department of Neurosurgery, Korea University College of Medicine, Seoul, Korea
Sep 2006-Aug 2008	International Visiting Fellow, Department of Orthopaedic Surgery University of Pittsburgh, Pittsburgh, PA.
Sep 2003-Aug 2006	Assistant Professor, Department of Neurosurgery, Korea University College of Medicine, Seoul, Korea
Mar 2002-Aug 2003	Clinical Assistant Professor, Department of Neurosurgery, Korea University Guro Hospital, Seoul, Korea
May 2000-Feb 2002	Clinical Instructor, Department of Neurosurgery, Korea University Anam Hospital, Seoul, Korea
Feb 1997-Apr 2000	Chief of Neurosurgery, Nonsan General Military Hospital, Nonsan, Korea
Feb 1997	Korean Board of Neurosurgery
Mar 1993-Feb 1997	Residency, Department of Neurosurgery, Korea University Anam Hospital
Mar 1992-Feb 1993	Internship, Korea University Guro Hospital

Membership

Member of the Korean Neurosurgical Society
Member of the Korean Neurotrauma Association
Member of the Korean Spinal Neurosurgery Society
Member of the Asian Pacific Cervical Spine Society
Member of the International Society for the Study of the Lumbar Spine (ISSLS).
Corresponding Member of the North American Spine Society (NASS)

◈ Luncheon Seminar IV ◈

Sung Uk Kuh

Division of Spinal Neurosurgery, Department of Neurosurgery
Gangnam Severance Spine Hospital, Dokok-dong, Gangnam-ku,
Seoul, Korea

Education

1986-1992	College of Medicine, Yonsei University. (M.D., 1992)
1997-1999	Graduate School of Medicine, Inha University. (Master degree, 1999)
2001-2004	Graduate School of Medicine, Yonsei University. (Doctor degree, 2004)

Academic Career

2010.1-present	Editorial reviewer of Korean Journal of Medical Science (JKMS)
2010.1-present	Korean Journal of Spine reviewer
2010.9-2012.8	Vice Director of Gangnam Severance Education & Training in Yonsei University Medical School
2012-present	Professor in Neurological Surgery, Yonsei University, Gangnam Severance Spine Hospital, Seoul, Korea
2013.1-2014.8	Gangnam Severance Hospital, Associate Director, Division of planning & management
2016.8-present	Gangnam Severance Hospital, Director, Division of Public relations

Activities

The Korean Neurosurgical Society Member

The Korean Spinal Neurosurgery Society Member

Cervical Spine Research Society Member

North American Spine Society Member

Editorial reviewer of Korean Journal of Medical Science (JKMS)

The Korean Spinal Neurosurgery Society, Scientific, Community member

Korean Journal of Spine reviewer

◈ Symposium I - Surgical Strategies in Osteoporotic Spine ◈

Toshiyuki Takahashi

Spinal Disorders Center,
Fujieda Heisei Memorial Hospital, Japan

Education

1987-1993	Kanazawa University School of Medicine (M.D.)
1995-1999	Tohoku University Graduate School of Medicine (Ph.D.)

Professional Experience

2000-2004	Dept. of Neurosurgery, Kohnan Hospital
2004-2005	Assistant Professor, Dept. of Neurosurgery, Tohoku University School of Medicine
2006-	Spinal Disorders Center, Fijieda Heisei Memorial Hospital
2009-	Chief of Spinal Disorders Center, Fijieda Heisei Memorial Hospital
2011.3-6	UCSF Spine Center

Board Certification

2000	Japanese Board of Neurological Surgery
2005	Instructor of Japanese Society of Spinal Surgery

Societies

The Japanese Neurosurgical Society

The Japanese Congress of Neurological Surgeons

The Japanese Society of Spinal Surgery

The Japanese Spine Research Society

The Congress of Neurological Surgeons

◈ Symposium I - Surgical Strategies in Osteoporotic Spine ◈

Jung-Kil Lee

Department of Neurosurgery
Chonnam National University Hospital

Education

1983-1989 M.D.(Medicine), Chonnam National University Medical School, Gwangju
1990-1992 Degree of Master of Medicine, Chonnam National University Graduate School
1992-1998 Degree of Doctor of Medicine, Chonnam National University Graduate School

Post-Graduate Training

1989-1990 Internship-Chonnam National University Hospital, Gwangju
1990-1993 Residency-Department of Neurosurgery Chonnam National University Hospital
1994-1997 Military Service
1997-1998 Fellowship-Department of Neurosurgery Chonnam National University Hospital

Professional Experience

2013-Present Professor, Department of Neurosurgery Chonnam National University Hospital
2008-2013 Associate Professor, Department of Neurosurgery Chonnam National University Hospital
1998-2008 Assistant Professor, Department of Neurosurgery Chonnam National University Hospital
2002-2004 Postdoctoral Associate in Dept. of Neurology Yale University (Research topic – regeneration in brain infarction and spinal cord injury)

Professional Membership

Korean Medical Association
Korean Neurosurgical Society
Korean Spinal Neurosurgery Society
Korean Neurotraumatology Society
AOSpine
Eurospine

◈ Symposium I - Surgical Strategies in Osteoporotic Spine ◈

Yoon Ha

Department of Neurosurgery, Spine and Spinal Cord Institute
Yonsei University College of Medicine

2005.3-2008.2	Assistant Professor in Neurological Surgery, Inha University, College of Medicine, Inchon, Korea
2007.7-2008.2	Research Fellow in Neurological Surgery, University of Toronto, school of Medicine, Toronto, Canada
2008.3-2010.2	Assistant Professor in Neurological Surgery, Yonsei University, College of Medicine, Seoul, Korea
2010.3-2015.2	Associate Professor in Neurological Surgery, Yonsei University, College of Medicine, Seoul, Korea
2011-2012	Visiting Associate Professor in Neurosurgery, University of California, San Francisco, USA
2015.3-Present	Professor of Neurological Surgery, Yonsei University, College of Medicine, Seoul, Korea

◈ Symposium II - Minimal Invasive and Endoscopic Spine Surgery ◈

Hae Dong Jho

Drexel University and Allegheny General Hospital, PA, USA

Before moving his practice to Allegheny General Hospital in 2001, Dr. Jho was a professor of neurosurgery at the University of Pittsburgh Medical School. He also served as director for Center for Minimally Invasive Innovative Microneurosurgery at University of Pittsburgh Medical Center (UPMC) Health System. A native of South Korea, Dr. Jho received his medical degree at Chonnam University Medical School in South Korea. After serving military duty as a medical officer, he completed post-graduate training with a residency in neurosurgery at Hanyang University Medical Center in Seoul, South Korea. He earned a doctorate in neurobiochemistry from Hanyang University Medical School in Seoul. Then, he moved to U.S.A. and took a fellowship in microneurosurgery followed by a full-course of neurosurgery residency training at the University of Pittsburgh Medical Center.

Dr. Jho has published more than 110 scientific papers in peer-reviewed journals, 150 abstracts and 20 book chapters. Dr. Jho has clinical and research interest in the development and refinement of endoscopic neurosurgical techniques for treating a spectrum of neurological conditions, including cerebral aneurysms and other cerebral vascular disorders, complex skull base brain tumors and various spinal disorders. He has pioneered in developing endoscopic pituitary and skullbase surgery through a nostril, minimally invasive transcranial endoscopic brain surgery through a small incision, minimally invasive endoscopic crainial nerve surgery, minimally invasive cervical spine surgery without spinal fusion, minimally invasive endoscopic thoracic spine surgery and minimally invasive endoscopic lumbar spine surgery. Minimally invasive nature of his brain and spine surgery enabled patients to recover quickly with short hospital stay.

Dr. Jho is certified by the American Board of Neurological Surgeons and is currently on the board of directors for the American Board of Spine Surgery.

◈ Symposium II - Minimal Invasive and Endoscopic Spine Surgery ◈

Kyung-Chul Choi

Department of Neurosurgery,
The Leon Wiltse memorial hospital, Anyang, Korea

Education / Training

1995~2001	MD, Medicine, Kangwon National University, college of Medicine, Korea
2001~2006	Internship, Residency in Neurosurgery, The Catholic medical center, Seoul, Korea
2004~2012	MS, PhD degree The Catholic University, Seoul, Korea
2009~2011	Spine Fellowship, Wooridul Spine Hospital
2013	Fellow of American Board of Minimally Invasive Spinal Surgery
	Fellow of Royal College of Physicians and Surgeons

Administrative position

2006~2009	Doctor of Neurosurgeon in Emergency Medical Center of Ujeongbu, St Mary hospital
2009~2010.12	Fellowship Wooridul Spine Hospital
2011.1~2014.11	Wooridul spine Hospital, Seoul, Korea
2014.12~	Director, Wiltse memorial hospital, Anyang, Korea

Professional Affiliations

Academician of the Korean Pain Research Society
Editor of the Journal of Critical Spine Cases
Member of Korean Neurosurgical Society
Life Member of Korean Spine Neurosurgical Society
Member of Korean Neurotraumatology Society
Member of Korean Minimal Invasive Spine surgery Society
Member of Korean peripheral nerve Society

◈ Symposium II - Minimal Invasive and Endoscopic Spine Surgery ◈

Seung Won Park

Professor of Neurological Surgery Department
Director of Spine Center
Chung-Ang University Hospital, Seoul, Korea

Education

1982-1988	Chung-Ang University, School of Medicine, Seoul, Korea
1989-1993	Residency at Chung-Ang University Hospital, Seoul, Korea
1998	Ph.D. degree from Chung-Ang University, Graduate School, Seoul, Korea
2005-2006	Neuroscience Research Center, College of Medicine, UW-Madison, WI, USA

Position

1997	Clinical Professor, Dept. of Neurological Surgery, Chung-Ang University Hospital, Seoul, Korea
2002	Assistant Professor, Dept. of Neurological Surgery, Chung-Ang University Hospital, Seoul, Korea
2004	Associate professor, Dept. of Neurological Surgery, Chung-Ang University Hospital, Seoul, Korea
2009	Professor, Dept. of Neurological Surgery, Chung-Ang University Hospital, Seoul, Korea

Academic Interests

Clinical Practice: Minimally invasive spine surgery for degenerative spine disorders

Basic Research: Neuroregeneration in adult spinal cord and brain

Biomechanics and deformity of spine

Muscle regeneration

◈ Symposium III - Surgical strategies for Cervical OPLL, PRO and CON ◈

Keung-Nyun Kim

Department of Neurosurgery
Severance Hospital
Yonsei University College of Medicine

Academic Carrier

1989	Graduated from Yonsei University College of Medicine
1994	Graduated from Yonsei University Graduate School with Master degree
2002	Ph.D., Yonsei University Graduate College of Medicine

Professional Carrier

1989-1993	Intern and Resident, Neurosurgery, Severance Hospital, Yonsei University
1994-1996	Military service as a Captain and Neurosurgeon in Pohang Public Hospital
1997-1999	Clinical Fellowship, Department of Neurosurgery, Spine Center, Yongdong Severance Hospital, Yonsei University College of Medicine
2000-2001	Assistant professor, Department of Neurosurgery, Konyang University School of Medicine
2002-2011	Associate professor, Spine section, Department of Neurosurgery, Yonsei University School of Medicine
2012-present	Professor, Chief of spine section, Department of Neurosurgery, Yonsei University School of Medicine
2003-2005	Visiting Scholar, University of Miami, "Miami Project to Cure Paralysis" Theme: Stem Cell therapy for spinal cord injury Supervisor: James D. Guest M.D., PhD Associate Professor, Dept, of Neurosurgery Miller medical school, University of Miami, FL, USA

Memberships

1989-present	Korean Medical Association
1994-present	Korean Neurosurgical Society
1999-present	Korean Spinal Neurosurgery Society
2002-present	Korean Neurotrauma society
2007- present	Korean Cervical spine research society
2007- present	Asian-Pacific cervical spine society
2003-2008	Society for Neuroscience
2010-current	Congress of Neurosurgical Surgeon

◈ Symposium III - Surgical strategies for Cervical OPLL, PRO and CON ◈

Junichi Mizuno

Southern Tohoku General Hospital, Japan
Aichi Medical University

Education

Present Appointment

Head, Center for Minimally Invasive Spine Surgery
Shin-Yurigaoka General Hospital

Academic Appointments

Lecturer, Department of Neurosurgery, Juntendo University
Visiting Professor, Fujita Health University

Major Memberships In Professional Societies

Congress of Neurological Surgeons (CNS)-International Associate
American Association of Neurological Surgeons (AANS)-International Associate
International Congress of Minimally Invasive Neurosurgery (ICMINS)
Asian Congress of Neurological Surgeons (ACNS)
Joint Section on Disorders of the Spine and Peripheral Nerves of AANS/CNS
World Federation Neurosurgical Society (WFNS) Spine Committee
Asia Spine
Japan-Korea Conference on Spinal Surgery
Asia-Pacific Cervical Spine Society (APCSS)
Japan Neurosurgical Society
The Japanese Congress of Neurological Surgeons
The Japanese Society of Spinal Surgery
The Japan Medical Society of Spinal Cord Lesion
Japan Geriatric Neurosurgery Society

Conference on Neurosurgical Techniques and Tools
The Japan Neuro-endoscopic Society

Executive Boards

Microsurgical Anatomy for Neurosurgery
Japan-Korea Conference on Spinal Surgery
Japanese Society of Spinal Surgery
Society of Japanese Neuroemergency Care
Asian Congress of Neurological Surgeons
World Federation of Neurological Surgeons, Spine Committee
Asia-Pacific Cervical Spine Society
Asia Spine
Japan-Korea Conference of Spinal Surgery
Japan Geriatric Neurosurgery Society
Conference on Neurosurgical Techniques and Tools

Previous Presidency

2011 2nd Annual Meeting of Asia Spine in association with
9th Conference of Japan-Korea Spinal Surgery
2013 7th Annual Meeting of APCSS
2014 29th Annual Meeting of Japanese Society of Spinal Surgery
2016 6th Annual Meeting of Less-invasive and Endoscopic Spinal Neurosurgery

Future Presidency

2017 1st Shin-Yurigaoka Spine Academy and Work-shop
2020 18th Annual Congress of Japan Clinical Health Care and Welfare

Clinical Interests

Surgery of degenerative cervical and lumbar diseases
Surgery of spinal trauma
Pathology and treatment of OPLL
Biomechanics of spine
Anatomy and pathology of spinal cord and spinal column
Minimally invasive spinal surgery
Endoscopic lumbar discectomy
Surgery of cranio-vertebral junction

◈ Symposium IV - Spinal and Spinal Cord Tumors ◈

Toshihiro Takami

Neurosurgery
Osaka City University Graduate School of Medicine

Education

1998	Ph.D., Osaka City University Graduate School of Medicine
1991	M.D., Osaka City UniversityMedical School

Professional Affiliations

2016-	Associate Professor, Department of Neurosurgery, Osaka City University Graduate School of Medicine
2005-2015	Lecturer, Department of Neurosurgery, Osaka City University Graduate School of Medicine
1999-2001	Visiting Scholar, The Miami Project to Cure Paralysis, University of Miami School of Medicine, Miami, FL, USA (Prof. Mary B. BUNGE)
1998-	Clinical Research Associate, Department of Neurosurgery, Osaka City University Graduate School of Medicine
1991-	Residency, Department of Neurosurgery, Osaka City University Hospital (Prof. Akira HAKUBA)

Board Certification

Japanese Board of Spinal Surgery

Japanese Board of Neurosurgery

◈ Symposium IV - Spinal and Spinal Cord Tumors ◈

Dar-Ming Lai

Division of Neurosurgery, Department of Surgery,
National Taiwan University Hospital, Taipei, Taiwan

Education

2007	Institute of Clinical medicine graduated
1985	Medicine, Kaohsiung Medical Collage

Current position

2015-	President of Taiwan Neurosurgical Spine Society
2013-	Associate professor, Department of Surgery, National Taiwan University
2010-	Clinical associate professor, Department of Surgery, National Taiwan University
1996-	Faculty, Department of Surgery, National Taiwan University Hospital
1994-1996	Research Fellow, UT Southwestern Health Science Center at Dallas
1993-1994	Faculty, Department of Surgery, Chung-siao Provincial Hospital
1987-1993	Resident, Department of Surgery
1986-1987	Resident, Department of Internal Medicine, Sin-Chu Airforce Hospital

Specialty

Cerebrovascular Surgery

Spinal Surgery

◈ Symposium IV - Spinal and Spinal Cord Tumors ◈

Sun-Ho Lee

Department of Neurosurgery
Samsung Medical Center,
Sungkyunkwan University School of Medicine

Experience

Samsung Medical Center, Sungkyunkwan University, Seoul, Korea
• Associate professor- Department of Neurosurgery, Spine center, 03/2014~ Present
• Assistant professor-Department of Neurosurgery, Spine center, 09/2008~02/2014

Kyungpook National University Hospital, Daegu, Korea
• Assistant professor-Department of Neurosurgery, 03/2007~ 08/2008
• Spine fellowship – Department of Neurosurgery, 03/2005~02/2007
• Residency – Department of Neurosurgery, 03/2001~02/2005
• Internship, 03/1997~02/1998

Education

Postgraduate School Of Kyungpook National University, Daegu, Korea
• PhD Degree, 02/2014
• MS Degree, 08/2004

School Of Medicine, Kyungpook National University, Daegu, Korea
• MD Degree, 03/1997

College Of Natural Science, Kyungpook National University, Daegu, Korea
• Bachelor of Preliminary Medicine, 02/1993

Licensure And Certification

License of Physician in the Republic of Korea, 1997
License of Specialist of Neurosurgery in Republic of Korea, 2004

◈ Symposium V - Cutting-Edge Innovation in Spine Surgery ◈

JAE Y. LIM

Atlantic Brain & Spine, VA, USA
Director of Neurosurgery Trauma, Reston Hospital Center
Atlantic Brain and Spine

Work Experience

Immediate Past President KASS, 2015-2016
President KASS, 2014-2015
President Elect KASS, 2013
Secretary, KASS, 2012
Treasurer, Korean American Spine Society, 2011
Scientific Program Director 2010 KASS Annual meeting, Washington DC
Co –Scientific Program Director 2009 KASS annual meeting, San Diego, CA
Spine Center Development Committee, Fairfax Inova Hospital
Trauma Committee, Fairfax Inova Hospital
Osteobiologics Committee, Inova Hospitals
Cerebravascular Quality Committee, Fairfax Inova Hospital
Stereotactic Radiosurgery Taskforce, Fairfax Inova Hospital
Dept of Surgery Committee, Sacred Heart Medical Center, Spokane, WA
North American Spine Society Practice Management Committee
Paralyzed Veterans of America Research Center at the Yale Center for Neuroscience and Regeneration, 1990-1994

Training

Cedar-Sinai Institute of Spinal Disorder, Fellowship in Complex Spinal Surgery: 2001
UCLA Medical Center, Fellowship in Spine: January 2001 to March 2001
Resident in Neurosurgery: July 1995 to December 2000
Internship in Basic Surgical Training Program: June 1994 to July 1995

Education

Yale University School of Medicine	M.D., Sept. 1990 to June 1994
Stanford University	B.S. in Biological Sciences., Sept. 1986 to June 1990
	B.A. in Economics, Sept. 1986 to June 1990
Oxford University	Stanford Overseas Program, March to June 1989
Calabasas High School	September 1982 to June 1986

◈ Symposium V - Cutting-Edge Innovation in Spine Surgery ◈

Taku Sugawara

Akita Hospital, Japan

Education

1989	Akita University School of Medicine, M.D.
1995	Akita University School of Medicine, Ph.D.

Board Certification

1996	Japanese Board-Certified Neurosurgeon
2005	Certified Stroke Specialist, Japan Stroke Society
2006	Certified Spinal Surgeon, Japanese Society of Spinal Surgery
2008	Certified Instructor, Japanese Society of Spinal Surgery

Professional Positions

1992-1994	Researcher, Department of Neurobiology, Medical College of Pennsylvania, Philadelphia, USA
1994-1998	Assistant Professor, Dept. of Neurosurgery, Akita University School of Medicine
1998-2001	Senior Research Fellow, Department of Neurosurgery, Stanford University, Stanford, USA
2003-2014	Lecturer, Dept. of Neurosurgery, Akita University School of Medicine
2014-present	Director, Department of Spinal Surgery, Research Institute for Brain and Blood Vessels-Akita

◈ Symposium V - Cutting-Edge Innovation in Spine Surgery ◈

Seung-Hwan Yoon

Department of Neurosurgery
Inha University Hospital

Education

1984.2-1990.3	M.D. degree from Yonsei University, College of Medicine, Seoul, Korea
1996.8-1998.8	Master degree from Inha University, Graduate school, Incheon, Korea
1999.3-2001.8	Ph.D. degree from Inha University, Graduate school, Incheon, Korea

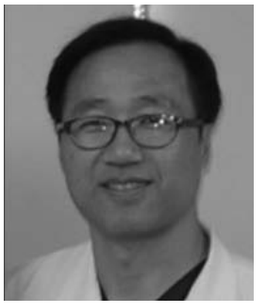
Career

1990.3-1991.2	Internship in Wonju Christian Hospital, Yonsei University
1992.3-1996.2	Residency of Neurosurgery in Wonju Christian Hospital, Yonsei University
1996.3-1996.12	Fellowship of Spinal surgery in Yong-Dong Spine Center, Yonsei University
1997.1-1998.8	Fellowship of Spinal surgery in Inha University Hospital, Inha University
1998.9-2000.8	Instructor of Neurosurgery in Minjoong Hospital, Konkuk University
2000.9-2002.2	Assistant Professor of Neurosurgery in Minjoong Hospital, Konkuk University
2002.3-2004.2	Assistant Professor of Neurosurgery in Inha University Hospital, Inha University
2004.3- 2010.2	Associate Professor of Neurosurgery in Inha University Hospital, Inha University
2010.3-Present	Professor of Neurosurgery in Inha University Hospital, Inha University

Oversea Study

2006.12-2007.7	Visiting Professor, Department of Orthopaedic and Neurosurgery, UCLA, USA
2007.8-2007.11	Visiting Professor, Department of Orthopaedic, UCSD, USA
2008.5-2008.7	Visiting Professor, Department of Neurosurgery, Stanford University, USA

◈ Symposium VI - Translational Research ◈



Dae-Chul Cho

Department of Neurosurgery
Kyungpook National University Hospital,
Daegu, Korea

Education / Training

1991.03-1997.02	School of medicine (M.D.), Kyungpook National University
1997.03-1998.02	Internship, Kyungpook National University Hospital
1998.03-2002.02	Resident, Department of Neurosurgery Kyungpook National University Hospital
2006.05-2008.02	Spine Fellowship Under Professor Joo-Kyung Sung Kyungpook National University Hospital

Employment History

2002.03-2003.02	General Neurosurgeon, Sedong Hospital, Daegu
2003.03-2006.04	Military Service
2008.03-2010.02	Director of Spine Division, Bogang Spine Hospital, Daegu

Present Position

2012.03–present	Assistant professor, Spine Center, Department of Neurosurgery, Kyungpook National University Hospital, Daegu, South Korea
2010.03-2012.02	Clinical Instructor, Department of Neurosurgery, Kyungpook National University Hospital

License, Certification

1997	Korean Medical License (60484)
2002	Korean Board of Neurosurgery (1611)
2005	USMLE Certification (passed step 2 CS; 0-663-123-8)

◈ Symposium VI - Translational Research ◈

In-bo Han

CHA University

Education

1991-1997	M.D. Yonsei University, Seoul, South Korea
2002-2006	Master, Ajou University, Seoul, South Korea
2006-2014	Ph.D., Yonsei University, Seoul, South Korea
2010-2012	Research fellowship
	Laboratory of Spinal Cord Injury & Stem Cell Biology
	Brigham & Women's Hospital/Harvard Medical School, USA

Employment

1997-2002	Internship & Residency in Neurosurgery
	Yonsei University, Severance Hospital, Seoul, South Korea
2002-2003	the Armed Forces Gwangju Hospital
2003	UN Peace Keeping Operation in Western Sahara
2004-2005	the Armed Forces Capital Hospital
2005-2007	Instructor, Department of Neurosurgery, CHA University
2007-2012	Assistant professor, Department of Neurosurger CHA University
2012-present	Deputy Research Director, CHA University
2013-present	Associate professor, Department of Neurosurgery, Spine center, CHA University

◈ Symposium VI - Translational Research ◈

Sang-Ryong Jeon

Neurological Surgery, ASAN Medical Center

Education and Training

1984-1988	College of Medicine, Seoul National Univ., Seoul Korea(M.D. degree)
1994-1996	Graduate School, Seoul National Univ., Seoul, Korea(M.S. in Medical Science)
1996-2001	Graduate School, Seoul National Univ., Seoul, Korea(Ph.D. in Medical Science)
1992-1996	Residency in Neurosurgery, Seoul National Univerv. Hospital, Seoul, Korea
1996-1997	Clinical Fellowship in Neurosurgery, Seoul National Univerv. Hospital, Seoul, Korea
1997-1999	Clinical Fellowship in Neurological Surgery, Asan Medical Center, Seoul, Korea
2002-2003	Research Fellowship in Neurological Surgery, University of Southern California Hospital

Professional Experience

1999-2001	Instructor of Neurological Surgery, Asan Medical center, Univ. of Ulsan College of Medicine, Seoul, Korea
2001-2006	Assistant Professor of Neurological Surgery, Asan Medical center, Univ. of Ulsan College of Medicine, Seoul, Korea
2006-2011	Associate Professor of Neurological Surgery, Asan Medical Center and Univ. of Ulsan College of Medicine, Seoul, Korea
2011-present	Professor of Neurological Surgery, Asan Medical Center and Univ. of Ulsan College of Medicine, Seoul, Korea

Research Interests

Spine Disorder, Movement Disorder, Stem Cell Therapy

◈ Symposium VI - Translational Research ◈

Sang-Heon Lee

Department of Physical Medicine & Rehabilitation
Korea University Medical Center

Certifications & Licenses

1999 Certified in the American Board of Electrodiagnostic Medicine (ABEM)

1994 Korean National Board of Rehabilitation Medicine

1989 Korean Medical Doctor, licensed

Membership Information

- Korean Academy of Rehabilitation Medicine
- International Spine Intervention Society
- American Association of Electrodiagnostic Medicine

Education & Training

1999 Ph.D. in Medical Science, Postgraduate Course, Korea University, Seoul, Korea1994, Master of Medical Science, Postgraduate Course, Korea University, Seoul, Korea

1994 Resident, Department of Rehabilitation Medicine, Korea University Guro Hospital, Seoul, Korea

1990 Intern, Korea University Anam Hospital, Seoul, Korea

1989 Graduated from College of Medicine, Korea University, Seoul, Korea

◈ Honored Guest's Speech ◈

Yong Jung Kim

Columbia University Medical Center,
Department of Orthopaedic Surgery, Spine/Scoliosis Service

Education

M.D.,	Mar. 1980-Feb. 1985
	Seoul National University, College of Medicine, Seoul, South Korea
PreMedic School	Mar. 1978-Feb. 1980
	Seoul National University, College of Science and Engineering, Seoul, South Korea

Present Position

Chief, Spinal Surgery in Columbia University Orthopedic, Dec. 2013-June 2015

Associate Attending Surgeon, Oct. 2010-present

Orthopaedic Surgery, New York Presbyterian Hospital, New York, USA

Chief, Spinal Deformity Surgery in Columbia University Orthopedic, Dec 2009-June 2015

Assistant Attending Surgeon, Sep. 2008-Sep.2010

Orthopaedic Surgery, New York Presbyterian Hospital, New York, USA

◈ Symposium VII - Spinal deformity, PRO and CON ◈

Stephen Ryu

Stanford University

Education

Seoul International High School, Seoul, Korea
Valedictorian
Stanford University, Stanford, CA
Bachelor of Science, Electrical Engineering, September 1990-June 1994

Stanford University, Stanford, CA
Master of Science, Electrical Engineering, September 1994-June 1995
University of California at San Diego, La Jolla, CA
Doctor of Medicine, September 1995-June 1999

Clinical Training

Stanford University Medical Center, Stanford, CA
Intern, Department of General Surgery, June 1999-June 2000

Stanford University Medical Center, Lucile Packard Children's Hospital
Stanford, CA, Resident, Department of Neurosurgery, July 2000-June 2005

Palo Alto Veteran's Affairs Medical Center, Palo Alto, CA
Resident, Division of Neurosurgery, July 2001-June 2002

Stanford University Medical Center, Stanford, CA
Resident, Departments of Neuroradiology, Neuropathology, and Neurology, July 2002-June 2003

Stanford University Medical Center, Lucile Packard Children's Hospital
Stanford, CA, Chief Resident
Department of Neurosurgery, July 2005-June 2006

◈ Symposium VII - Spinal deformity, PRO and CON ◈

Seung-Jae Hyun

Seoul National University

Present Position

Associate Professor Sep. 2015-Present

Department of Neurosurgery, Seoul National University Bundang Hospital, Seoul National University College of Medicine, Seongnam, Korea

Executive Professor of Neurosurgical Department Jan. 2014-Present

Department of Neurosurgery, Seoul National University Bundang Hospital, Seoul National University College of Medicine, Seongnam, Korea

Executive Professor of Spine Center Aug. 2015-Present
Mar. 2012-Jul. 2012

Spine Center, Seoul National University Bundang Hospital, Seoul National University College of Medicine, Seongnam, Korea

Education

Ph.D., Aug. 2007-Jun. 2009 Chung-Ang University College of Medicine, Seoul, South Korea
(Instructed by professor Young-Baeg Kim, M.D., Ph.D.)

M.S., Aug. 2004-Feb. 2007 Chung-Ang University College of Medicine, Seoul, South Korea
(Instructed by professor Jong-Sik Suk, M.D., Ph.D.)

B.S., Mar. 1999-Feb. 2003 Chung-Ang University College of Medicine, Seoul, South Korea
PreMedic School Mar. 1997-Feb. 1999
Chung-Ang University College of Nature and Science, Seoul, South Korea

◈ Symposium VII - Spinal deformity, PRO and CON ◈

Jeffrey Roh

President of the Korean American Spine Society (KASS)

Undergraduate Education

1989-1993 University of Washington, Seattle, WA, Degree: B.S.

Medical Education

1994-1998 Medical College of Wisconsin, Milwaukee, WI, Degree: M.D.

Residency Training

1998-1999 Case Western Reserve University, University Hospitals of Cleveland, Cleveland, OH, General Surgery Internship

1999-2000 Case Western Reserve University, School of Medicine, Cleveland, OH, Allen Scholar Research Fellowship

2000-2004 Case Western Reserve University University Hospitals of Cleveland, Cleveland, OH, Orthopaedic Surgery Residency

Fellowship Training

2004-2005 Cornell University | Weill Medical College, Hospital for Special Surgery, New York Presbyterian Hospital New York, NY, Spine & Scoliosis Surgery Fellowship

Business Education

2014-2016 University of Washington | Foster School of Business, Seattle, WA, Degree: Executive MBA

2016-2018 Columbia University | School of Professional Studies, New York, New York, Degree: Executive Masters of Science in Technology, Management

Academic Appointments

2001-2003 Affiliate Provisional Staff, Department of Surgery | Life Flight, Case Western Reserve University, MetroHealth Medical Center

2004-2005 Senior Clinical Associate, Department of Orthopaedic Surgery, Cornell University | Weill Medical College, Hospital for Special Surgery

◈ Symposium VIII - Craniovertebral junction ◈

Da-Geng Huang

Honghui Hospital, China

Summary

Da-Geng Huang M.D. is a spinal surgeon in the Department of Spine Surgery, Honghui Hospital, Xi'an Jiaotong University Health Science Center, China. He has specialized in the treatment and research of upper cervical spine diseases for years. By now, he has published more than 10 articles about upper cervical spine in top journals such as European Spine Journal and The Spine Journal, and has given many oral presentations on upper cervical spine in top meetings such as Annual Meeting of North American Spine Society (NASS) and Annual Meeting of American Academy of Orthopaedic Surgeons (AAOS). He is member of 5 professional organizations including North American Spine Society (NASS) and Chinese Association of Orthopaedic Surgeons (CAOS). He was awarded Excellent Staff of Chinese Association of Orthopaedic Surgeons (CAOS) in 2015

Professional Memberships

Member of North American Spine Society (NASS)

Member of AOSpine

Member of Chinese Association of Orthopaedic Surgeons (CAOS)

Member of Spine Infection Education Group, China Orthopaedic Association of Medicine Education (COAME)

Member of Spinal Rehabilitation Study Group, China Association of Rehabilitation of Disabled Persons (CARD)

Awards

Excellent Staff of Chinese Association of Orthopaedic Surgeons (CAOS) in 2015

Reviewerships

BMC Musculoskeletal Disorders

◈ Symposium VIII - Craniovertebral junction ◈

Nobuyuki Shimokawa

Tsukazaki Hospital, Himeji city, Hyogo, Japan

Education

1991-1997 Completed Residency at the Department of Neurosurgery, Osaka City University (Prof. Hakuba)

1985-1991 MD.College of Medicine, Osaka City University, Osaka, Japan

Professional Affiliations

2012-2016 Head of Spine Center, Tsukazaki Hospital, Himeji, Hyogo, Japan

2005-2016 Chairman of Department of Neurosurgery, Tsukazaki Hospital

2003-2005 Chief of Department of Neurosurgery, Tsukazaki Hospital

1997-2003 Staff of Department of Neurosurgery, Tsukazaki Hospital

Academic Interests

Spinal Instrumentation, Craniocervical junction, Posterior cervical fixation using Instrumentation in particular

1997 Board certification as Neurosurgeon by Japan Neurosurgical Society

2005 Stroke Specialist certified by the Japan Stroke Society

2006 Board certification as Spinal Surgeon by the Japanese Society of Spinal Surgery

2008 Board certification as Technical Specialist by the Japanese Society of Neuroendoscopy

2010 Board certification as Senior Member(Instructor) and Review Board SPINAL SURGERY(official journal of the Japanese Society of Spinal Surgery) by Japanese Society of Spinal Surgery

2010 Member of Board Trustee of the Japan Society for the Study of Surgical Technique for Spine and Spinal Nerves

2011-2013 Editing Manager of SPINAL SURGERY

2012 Review Board of Neurologia medico-chirurgica (official journal of the Japan Neurosurgical Society)

2012 Editorial Board of the Japan Society of Neurotraumatology

2012 Editorial Board of the Japan Society of Neurosurgical Emergency

2012 Editorial Board of the Japan Medical Society of Spinal Cord Lesion

2013-2015 Inspector of Japanese Society of Spinal Surgery

◈ Symposium VIII - Craniovertebral junction ◈

Jae-Taek Hong

Catholic University, St. Vincent Hospital
Department of Neurosurgery

Experience

2016-present	Reviewer, The Spine Journal
2012-present	Professor Dept. of Neurosurgery, Catholic University, St. Vincent Hospital
	• Responsible for spinal surgery and peripheral nerve surgery
2009-2012	Associate Professor, Dept. of Neurosurgery, Catholic University, St. Vincent Hospital
2011-present	Editorial Board Member, World Journal of Orthopedics
2009-present	Editorial Advisory Board, The Open Neurosurgery Journal
2010-present	Reviewer, Korean Journal of Neurological Surgery
2010-present	Reviewer, Clinical Anatomy
2003-2008	Assistant Professor, Dept. of Neurosurgery, Catholic University, St. Vincent Hospital
2009-present	Review Board of The Korean Journal of Spine
2008-present	Reviewer of the Surgical and Radiologic Anatomy (Springer)
2007-2009	Postdoctorial fellowship in Rush University Medical Center, Department of Orthopedic (Dr. Howard An)
2008	Clinical Fellow, Ohio University Medical Center, Department of Neurosurgery (Dr. Ehud Mendel)
2003-present	Review Board of The Journal of The Korean Neurosurgical Society
2005-present	Member of director of Korean Neurotrauma Society
1999-2002	Chief of Neurosurgery, Wonju National Army Hospital
	• Responsible for spinal neurosurgery and brain injuries
	• Managed surgical teams on a daily basis as well as during military operations
1998-1999	Chief Resident, Neurosurgery, Kangnam St. Mary's Hospital, Seoul, Korea
	• Responsibilities included educating students and performing research on new immunotherapeutic modalities for treating brain tumors

Education

2002 - 2003	Fellowshi - Catholic University, Dept. of Neurosurgery, St. Vincent Hospital
1995-1999	Residency - Catholic University, Dept. of Neurosurgery, Kangnam St. Mary's Hospital
1988-1994	B.S./M.D. - Catholic University Medical College of Korea

Licensure

1999	Board License - Korean Board of Neurological Surgery
1994	Medical License - Republic of Korea

The Translation in Spine Care

ASIA SPINE 2016

Thursday, September 22, 2016

The Translation in Spine Care

ASIA SPINE 2016

LS-I

Frequent statistical mistakes in manuscripts of JKNS and KJS

Im-Hee Shin

Catholic Univ. of Daegu, School of Medicine, Korea

임상연구시에 연구설계부터 분석 및 결과해석에 이르는 과정 중에 흔히 발생할 수있는 통계적인 오류 및 방법론을 최근 몇 년간(2013.8~2016.8) JKNS와 KJS의 논문을 통해 파악하고, 임상연구에서 많이 적용된 통계적 방법론의 적용에 대한 이해를 도우고자 한다. 임상연구 목적에 따른 효율적인 임상데이터의 수집 임상데이터의 관리 및 분석, 결과해석의 과정에서, 통계적 측면을 실제적으로 논문에서는 어떻게 적용되고 기술하였으며, 임상연구에 또한 어떤 영향을 미쳤는지를 살펴봄으로써, 합리적인 통계적 접근방법 및 올바른 적용이 임상연구에 적합한 도움을 줄 수 있음을 공유하고자 한다.

LS-II

What is the Value of Pregabalin in Neuropathic Pain Management?

Dong Ah Shin M.D.

Department of Neurosurgery Yonsei University College of Medicine, Korea

Neuropathic pain is derived from a lesion or disease of the peripheral or central nervous system. Chronic pain is sustained by mechanisms of peripheral and central sensitization. The molecular determinants of nociceptive sensitization are natural targets for potential analgesic drugs used in the treatment of different forms of pain. Most of these determinants are common to all forms of chronic pain, and it is therefore not surprising that drugs specifically targeted for the treatment of neuropathic pain are effective in relieving nociceptive pain and vice versa. The molecular mechanisms of sensitization that occur in peripheral nociceptors and the dorsal horns of the spinal cord are reasonable targets. Among these, pregabalin binds to the a2d subunit of voltage-sensitive Ca2+ channels, which sustain the enhanced release of pain transmitters at the synapses between primary afferent fibres and second-order sensory neurons under conditions of chronic pain. Pregabalin is believed to induce analgesic effects from its action at a critical step of nociceptive sensitization. In-vivo researches suggest that pregabalin is effective in the treatment of neuropathic pain and nociceptive pain including spinal pain in preoperative, preemptive, perioperative, and postoperative conditions.

Key Words : neuropathic pain, chronic pain, pregabalin.

AS-1

Why the diabetes is poor prognostic factor in spinal cord injury? – Laboratory investigation

Kyoung-Tae Kim MD., Dae-Chul Cho MD., Joo-Kyung Sung MD.

Dept. of Neurosurgery, Kyungpook National University Hospital, Korea

Introduction : Spinal cord injury (SCI) resulting in motor weakness, sensory loss and autonomic dysfunction is still an irreversible condition. SCI includes primary injury from tissue destruction and necrosis due to physiologic forces, followed by secondary injury that produces progressively augmented damage. There are many factors influencing the clinical prognosis after SCI. Especially, it is well known that diabetes mellitus (DM) is the poor prognositic in SCI. However, there is no pathophysiologic relationship between DM and SCI. The aim of this study was to evaluate how DM exacerbate the pathophysiologic condition after SCI in rat model.

Materials & Methods : To make the DM model, the rats were injected by streptozotocin at the dose of 40 mg/kg of the body weight intravenously. The dry powder was dissolved in 0.1 M citrate buffer, pH 4.5, and filtered. To evaluate the difference of oxidate stress in sham and DM-SCI model, following either sham operation or SCI, 36 male Sprague-Dawley rats were randomly distributed into two groups: sham-SCI group and DM-SCI group. Plasma MDA levels, the sensitive biomarkers for lipid peroxidation (LP), were estimated by the NWLSS NWKMDA01 assay (Northwest Life Science Specialties), and activity was expressed as micromoles per gram of protein. SOD activity was determined using a superoxide dismutase assay kit (catalog no.:706002-Cayman Chemical, Ann Arbor, MI, USA). SOD activity was expressed as units per gram of

protein. Immunohistochemistry (IHC) analysis was performed to analysis the inflammation activity after SCI. For evaluating of the proliferating and differentiating activity of neural stem/precursor cells(NSPCs) in sham and DM rat spinal cord, NPSC were suspended in 100 μl of a neurobasal medium and cultured in a 96-well plate for 5 days. A cell proliferation assay was performed using a 3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl)-2H-tetrazolium (MTS) assay. To evaluate the proliferation and neuronal differentiation after SCI, nestin and Tuj-1 as immunohistochemical marker were used, respectively. Locomotor function was assessed according to the Basso-Beattie-Bresnahan (BBB) scale for six weeks in rats. The injured spinal cord was then examined histologically, including quantification of cavitation.

Results : BBB scores were significantly lower in DM-SCI group than in sham-SCI group ($P < 0.05$). The cavity volume was significantly increased in DM-SCI group as compared to the control group ($P = 0.039$). Superoxide dismutase (SOD) activity was significantly decreased in the DM-SCI group at one and two weeks after SCI ($P < 0.05$). Malondialdehyde (MDA) levels were significantly elevated in the DM-SCI group ($P < 0.05$ at 1 and 2 weeks). The numbers of macrophage were significantly increased in the DM-SCI group ($P = 0.001$). In vitro, the activity of proliferation and differentiation of cultured NSPCs decreased in DM-SCI group from 6 hours to 5 days ($P < 0.05$). The nestin/BrdU immunoreactivity of the DM--curcumin group was lower than the sham-SCI group 1 week after SCI. The Tuj-1/BrdU immunoreactivity of DM-SCI group was lower than the sham-SCI group 4 weeks after SCI.

Conclusions : This study demonstrated that DM-II could exacerbate the pathophysiologic condition after SCI in rat model by increasing inflammatory reactions in early phase and decreasing neuronal regeneration in late phase after SCI

Keywords :

AS-2

The influence of notochordal cells to the symptomatic intervertebral disc degeneration during hypoxia; anti-angiogenic capacity on human endothelial cell proliferation

Woo-Keun Kwon MD., Joo Han Kim MD., PhD., Hong Joo Moon MD., PhD., Youn-Kwan Park MD., PhD.

Department of Neurosurgery, Korea University Guro Hospital, Korea University College of Medicine, Korea

Introduction : Chronic low back pain accompanied with degenerative disc diseases (DDD) can be associated with the ingrowth of blood vessels and nerves into intervertebral discs (IVDs). The notochordal cell (NC) is known to pattern the IVD during development and is a possible key cell that might lead to the regeneration of degenerative IVDs. However, it has not been known whether NCs would have activity for inhibition of symptomatic DDD development. In this study, we hypothesized that NCs might have potentials to inhibit neovascularization, the pathologic hallmark of symptomatic DDD, by interaction with endothelial cells (ECs) under hypoxia, which is real environment of IVD.

Materials & Methods : Human nucleus polposus (NP) cells were isolated from degenerated human surgical specimens, and then were cultured under two different oxygen concentrations; normoxia (21%) and hypoxia (3%). The conditioned media of NP cultures (NPCM) were assayed for vascular endothelial growth factor (VEGF), vascular cell adhesion molecule (VCAM) and Interleukin-8 (IL-8) by ELISA. Human microvascular ECs from cell line were cultured in the NP conditioned media (NPCM) with and without rabbit notochordal cell (rNC) co-culture, under two different oxygen levels as well. To investigate the ECs actual migration, as an essential step for angiogenesis, wound-healing migration assays of ECs were performed.

Results : EC cells cultured in NPCM significantly produced higher VEGF under hypoxia (212.14±47.97 pg/mL) compared to normoxic condition (172.82±38.68 pg/mL) while VCAM and IL-8 production were decreased under hypoxia. Under hypoxia, rNCs significantly decreased the production of VEGF from EC cells, while VCAM and IL-8 production did not show remarkable change after rNCs exposure. ECs cultured in NP significantly enhanced migration activity under hypoxia compared to normoxia, and ECs co-cultured with rNC in NPCM (156.00±17.17 cells) significantly decreased migration activity, compared to ECs in NPCM without rNC co-culture (200.75±13.47 cells) under hypoxia.

Conclusions : The present study investigated the anti-angiogenic effect of rNC on ECs, under different oxygen concentrations. The angiogenic capacity of ECs were significantly inhibited by rNCs under hypoxia. Therefore our result suggests that NCs in the juvenile IVD could possibly play a key role in developing an avascular environment by inhibiting vascular growth within the disc, and furthermore it could be a potential promising minimally invasive strategy targeting vascular ingrowth in the symptomatic DDD.

Keywords : hypoxia, notochordal cell, endothelial cell, angiogenesis, degenerative disc disease, low back pain

AS-3

Foraminotomy alone through Wiltse approach for foraminal or extraforaminal L5 root entrapment: risk factor analysis for poor outcomes

Sung Ik Cho MD., Chung Kee Chough MD., PhD., Jung Hwan Lee MD

Department of Neurosurgery, Yeouido St. Mary's Hospital, The Catholic University College of Medicine, Seoul, Korea

Introduction : The purpose of this study was to present the surgical outcome of the foraminotomy without fusion surgery for foraminal or extraforaminal L5 root entrapment at L5/S1 segment. Also, factors associated with persistent postoperative leg pain were analyzed.

Materials & Methods : We analyzed retrospectively 21 patients who underwent the foraminotomy surgery through Wiltse approach for foraminal or extraforaminal L5 root entrapment at L5/S1 segment. Clinical outcomes were assessed by the Visual analogue scale (VAS) scores for back and leg pain and Oswestry disability index (ODI). Failure of the foraminotomy surgery was defined when postoperative VAS scores for leg pain were over 4 point. Radiographic parameters such as posterior disc height, foraminal height, cobb angle of the segment, lordotic angle of the segment and existence of spondylolisthesis on preoperative radiograph were analyzed.

Results : The mean follow-up period was 18 months. Postoperative VAS score and ODI improved after the foraminotomy. However, there were 7 patients that complained persistent leg pain over VAS score 4. Two of them underwent fusion surgeries, and three underwent epidural nerve root block for pain control. Lordotic angles of the segment at preoperative neutral and extension radiograph were associated with persistent

postoperative leg pain (p=0.005). The optimal cutoff values were 17.3 and 24 degrees.

Conclusions : Foraminotomy for foraminal or extraforaminal root entrapment at L5/S1 segment can provide good clinical outcomes. But, poor outcomes are associated with large lordotic angles at preoperative neutral (over 17.3 degree) and extension radiograph (over 24 degree).

Keywords : Lumbar vertebrae, foraminal stenosis, lordosis, foraminotomy, L5 root

AS-4

The usefulness of a wearable device in daily physical activity monitoring for the patients undergoing lumbar surgery

Dong Hwan Kim MD., In Ho Han MD., PhD.

Pusan National University Hospital, Korea

Introduction : After spine surgery, the evaluation and comparison of functional outcome has traditionally been performed using subjective survey for symptoms and quality of life such as visual analog scores (VAS), Oswestry disability index (ODI), and Short Form-36. However, the major pitfall with these surveys is their subjective nature and inherent bias with personal evaluation influenced by the patients' perception of symptoms and disability. With the advance of wearable devices, Fitbit®, one of the most common wireless physical activity trackers can provide the accurate and objective measurement of physical activity including the number of such steps taken and the distance travelled. By using this device to the patient undergoing laminectomy, we could get the objective physical parameters that define ambulatory function, activity level, and degree of recovery. The purpose of our study is to investigate the usefulness of the wearable device to predict the relationship of VAS and number of steps and prognosis of the postoperative patients' functional outcome.

Materials & Methods : We prospectively studied 22 consecutive patients who underwent laminectomy for spinal stenosis or herniated lumbar disc between June 2015 and April 2016 by one surgeon. When they admitted for surgery and visited hospital first after surgery, preoperative and postoperative functional scores were recorded, including VAS, ODI, SF-36 mental composite score (MCS) and physical composite score (PCS)

for comparison. And we daily checked the patients' VAS and physical activity (number of steps, distance) from postoperative day (POD) 1 to POD 7. We statistically analyzed the relationship between daily VAS and daily physical activity by simple correlation analysis and the relationship between average number of steps and decrease in ODI after surgery by simple regression analysis. And we also statistically investigated whether there is a significant difference in preoperative and postoperative VAS, ODI, and SF-36 by Wilcoxon signed-rank test.

Results : The result of VAS ($p<0.001$), ODI ($p<0.001$), SF-36 MCS ($p=0.009$), SF-36 PCS ($p<0.001$) undertaken before and after surgery were statistically significant differences. And the number of steps measured by the wearable device from POD 1 to POD 7 has a significant linear correlation with the patients' daily VAS ($r=-0.981$, $p<0.001$). In addition, the average number of steps from POD 3 to POD 7 and the decrease in ODI conducted one month later after surgery were statistically significant ($p=0.029$).

Conclusions : Wearable devices are not only used increasingly in the market of lifestyle devices but also progressively enter the medical area with the development of IoT (internet of things) technology. This is the first study demonstrating usefulness of a wearable device to check objective patient's physical activity predicting the patient's pain and prognosis after laminectomy surgery. Daily VAS and number of steps were negatively a significant linear correlation. And average number of steps and the decrease in ODI after surgery was statistically significant. Therefore, we recommend that wearable device able to check objective physical activity has the potential to provide information of patient's pain grade as well as prognosis of patient.

Keywords : Wearable device, Fitbit, Laminectomy, Physical activity

AS-5

Is Kambin's triangle Safe for Lumbar Interbody Fusion? Minimally Invasive Extraforaminal Lumbar Interbody Fusion (ELIF)

Jong-Yun Woo MD., Taikwan Kim MD., Hyeun Sung Kim MD., PhD.,
Jae Hyeon Lim MD., PhD.,Il-Tae Jang MD.
Nanoori Hospital, Korea

Introduction : In the future, Percutaneous endoscopic posterior fusion will be an important part with the anterior lumbar interbody fusion in the degenerative lumbar spine surgery, due to it can diminish the surgical related problems and more comfortable to the patients during operation and postoperative period. Among them, the best approach route for percutaneous endoscopic posterior lumbar interbody fusion will be the Kambin's triangle of extraforaminal lumbar interbody fusion (ELIF). We introduce a minimally invasive ELIF that is the novel lumbar approach, a newly emerging minimally invasive technique for treating degenerative lumbar disorders.

Materials & Methods : This study was designed as a retrospective review of clinical and radiologic parameters. From November 2011 to December 2012, 23 patients who receive the minimally invasive ELIF through the Kambin's triangle included. All patients were followed for more than 24 months. Surgical procedures performed as following procedures: 1) epidural anesthesia, 2) exposing the Kambin's triangle toward the lateral part of dura (partial resection of superior articular process needed in the cases of severe degenerative change), 3) bilateral cage insertion for reinforcement of stabilization and fusion and 4) percutaneous transpedicular screwing. We checked the radiologic result as following: 1) implant related complications, and 2) fusion status. Fusion status was confirmed for 12 patients on computed tomography

scans and for 11 patients on lateral dynamic view of radiographs. Solid fusion was judged by 2 spine surgeons on radiographs by trabecular bony bridging and fused segments in less than 4 mm of translation or by less than 10° of angular motion between adjacent endplates. Clinical result checked as following: 1) Surgery related neurologic complications 2) Visual Analogue Scale (VAS) and 2) Oswestry Disability Index (ODI).

Results : Among 23 cases of degenerative instability with spinal stenosis, 6 cases combined with revision surgery. Implant related complications were 4 cases (17.39%): Screw failure (1 cases) and subsidence (3 cases). Fusion failures were 5 cases (21.74%). We experienced 5 cases (21.74%) of surgery related neurologic complications: transient Motor (2 cases) and Sensory (3 cases) changes. All patient's neurologic complications recovered within 1 month after operation. There was no dural injury cases. The mean VAS (Back) prior to surgery was changed as following: Preoperative: 6.43 ± 1.04, 7 days after operation: 3.13 ± 0.87, 1 year after operation: 2.87 ± 0.92 and 2 years after operation: 3.04 ± 0.71. The mean ODI (Oswestry Disability Index) score prior to surgery was decreased as following: Preoperative: 76.78 ± 6.08, 7 days after operation: 37.74 ± 6.67, 1 year after operation: 27.65 ± 3.60 and 2 years after operation: 29.91 ± 2.98.

Conclusions : According to the result, we obtained excellent clinical results using the minimally invasive ELIF without any serious traversing or exiting nerve injury. In spite of revision surgery, we could exposing the operation field without any adherent limitation and did not experienced any cases of serious surgery related complications. But, fusion rate and cage subsidence remained still overcome issue. If we developing this novel surgical technique, we will obtain the excellent clinical result using the minimally invasive percutaneous procedures.

Keywords : Endoscopy, Minimally Invasive Surgical Procedures, Spinal Fusion

AS-6

Can We Perform Real 1 Day LumbarFusion Surgery for Degenerative Lumbar Spinal Disease?: Minimally Invasive 1-Day Lumbar Interbody Fusion Surgery

Jun Ho Lee MD., Hyeun-Sung Kim MD., PhD., Jee Soo Jang MD., PhD.,
Il-Tae Jang MD., PhD., Seong Hoon Oh MD., PhD., Jin Uk Kim MD., PhD.
Nanoori Hospital, Korea

Introduction : The incidence of degenerative spinal diseases that need a lumbar interbody fusion surgery has increased with an increase in the elderly population. However, after the lumbar interbody fusion surgery, patients commonly have severe pain, requiring adequate bed rest for a long time. Moreover, associated complications can occur, and the chances of early rehabilitation can be inevitably delayed. We performed a 1-day minimally invasive spine (MIS) lumbar interbody fusion that required no hemovac insertion and no skin suture and led to early ambulation. Here, we report the surgical procedure and results.

Materials & Methods : This study was designed as a retrospective review of clinical and surgical parameters. From January 2013 to August 2014, 49 patients who received the MIS trnasforaminal lumbar interbody fusion (TLIF) for 1-day MIS lumbar interbody fusion surgery were included in this study. All patients received MIS TLIF with the MIS retractor system (Tubular/Caspar/Taylor) by using the MISS decompression technique (unilateral decompression/bilateral decompression/unilateral approach bilateral decompression). Two cases were of foraminal stenosis, 1 of recurred HNP, 13 of spinal stenosis, and 33 of spondylolisthesis. The surgical procedures performed were as follows: 1) epidural catheter insertion for anesthesia and postoperative pain control; 2) midline subdermal dissection procedure; 3) MIS TLIF (unilateral/bilateral); 4) bleeding control procedure; 5) percutaneous transpedicular screwing under the subdermal dissection plane; 6) tight subdermal

plan suture (conjoined suture of split fascia and subdermal skin); 7) skin sealing procedures: secure skin closure system and zip surgical skin closure system. We checked the surgery-related results using the intraoperative, postoperative conditions and postoperative complications and clinical results by using the Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI) in the immediate postoperatively (1~2day), 1 month, 3 month, 6 month and in the 12th month.

Results : The mean age was 65.27±9.57 years, and the sex ratio was (male/female) 20/29. The average follow-up period was 26.04±7.25 months. An average midline skin incision was 3.90±1.18 cm (per level: 2.80 cm). The possible ambulation time was 0.94±0.88 day. The discharge time after antibiotic injection for 3 days was 4.88±1.51 days. In the corresponding order of preoperative and immediate postoperative, 3-month, 6-month, and final follow-up, the VAS (back) were as follows: 6.33±0.94, 3.14±1.12, 2.47±0.58, 2.29±0.65, and 2.31±0.77; VAS (leg): 7.37±0.70, 2.69±0.85, 2.29±0.46, 2.14±0.58, and 2.24±0.80; and ODI: 39.37±3.05, 29.29±5.78, 22.59±2.99, 20.27±2.59, and 18.63±3.13. Postoperative VAS (back), VAS (leg) and ODI improved significantly immediate postoperatively ($p<0.0001$). Postoperative complications were two cases of transient motor weakness (all cases recovered sufficiently after the follow-up period), four of wound suture due to avulsion of operation field (all cases healed completely after the follow-up period), no cases of revision due to hematoma, one of dural tear, and two of cage subsidence or implant failure

Conclusions : The results indicated excellent clinical results of the 1-day minimally invasive lumbar interbody fusion surgery, without any serious complications. With the development of an infection control system for the lumbar interbody fusion surgery, a real comfortable 1-day lumbar interbody fusion surgery will be possible.

Keywords :

AS-7

The Effect of OLIF and OLIF51 on the Correction of Degenerative Lumbar Deformities

Jin Bum Kim MD., Seung Won Park MD., PhD., Young Baeg Kim MD., PhD.

Chung-Ang University, Korea

Introduction : Multilevel lumbar interbody fusion had been required as treatment of multiple lumbar degenerative deformities. However, there was a few reports studying multi-level minimal invasive spine surgery (MIS) using lateral lumbar interbody fusion (LLIF). We investigated degree of correction of scoliosis and restoration of lordosis with multi-level LLIF with percutaneous screw system (PPSF), and compared with the results of transforaminal interbody fusion (TLIF).

Materials & Methods : We studied with 40 patients who underwent multilevel lumbosacral interbody fusion with PPSF during the past 5 years. We divided into five groups, DLIF groups; DLIF with TLIF L5-S1 without Smith-Petersen osteotomy (SPO) (n=12), DLIF/SPO group; DLIF with TLIF L5-S1 underwent SPO (n=10), OLIF/TLIF51 group; Oblique lumbar interbody fusion (OLIF) with TLIF L5-S1 without SPO (n=8), OLIF/OLIF51 group; OLIF with OLIF L5-S1 without SPO (n=39), and TLIF group; TLIF for all lumbosacral level down to L5-S1 level (n=10). We checked scoliosis cobb angle, lumbar lordotic angle (LLA), spinopelvic parameters at pre- and postoperative time. Also, we checked segmental sagittal angle of 39 cases of OLIF L5-S1 with 30 cases of TLIF L5-S1 perioperatively.

Results : Mean pre- and postoperative LLA values were -14.8±8.6°and -40.2±6.4°in the DLIF group,

-22.2±14.9°and -46.7±0.6°in the OLIF/TLIF51 group, and -22.4±13.7°and -25.2±12.2°in the TLIF group. Mean pre- and postoperative scoliosis cobb angle were 17.5±9.4° and 9.5±3.5° in the DLIF group, 14.2±9.1°and 6.2±3.1°in the OLIF/TLIF51 group, and 8.9±7.5°and 8.4±5.2°in the TLIF group. There was no statistical difference in postoperative LLA and scoliosis cobb angle between DLIF and OLIF ($p>0.05$), but it showed significant difference between LLIF and TLIF ($p<0.05$). Mean pre- and postoperative LLA values were -16.0±8.2°and -45.3±5.8°in the DLIF group, -15.9±19.3°and -53.6±7.5°in the DLIF/SPO group, -18.9±18.4°and -51.9±9.4°in the OLIF/OLIF51 group, and -22.8±7.4°and -35.2±2.2°in the TLIF group. The postoperative LLA of the OLIF/OLIF51 was similar to that of the DLIF/SPO group ($p<0.05$) Mean pre- and postoperative L5-S1 segmental sagittal angle were -7.0±5.2°and -18.9±4.0°by OLIF51, and -7.0±3.4°and -9.3±10.5°by TLIF L5-S1 ($p<0.05$).

Conclusions : There was no difference in the postoperative lumbar coronal and sagittal angles between DLIF and OLIF. LLIF had excellent correction effect in the restoration of LLA than TLIF. The effect for making LLA by LLIF with TLIF L5-S1 and SPO was quite similar to that of LLIF with OLIF L5-S1, which suggests the OLIF51 could make sagittal angle similar to that of 1-2 level SPO's. It seems the LLIF with OLIF51 would be a valuable surgical option for MIS surgery for lumbar degenerative deformities.

Keywords : Multilevel lumbar fusion, DLIF, OLIF, TLIF, Scoliosis, Lumbar lordosis

AS-8

Can Modified K-line in Magnetic Resonance Imaging Predict Surgical Outcome of Cervical Laminoplasty?: A Critical Reappraisal

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Introduction : The K-line in plain radiograph has been established as a predictive index indicating that laminoplasty is required in patients with ossification of the posterior longitudinal ligament. Recently, modified K-line (MK-line) in magnetic resonance imaging (MRI) has been introduced to predict insufficient decompression of cervical laminoplasty for cervical spondylotic myelopathy (CSM). However, upright position during plain radiograph and supine position during MRI can cause difference of cervical alignment in plain radiograph and MRI. Purpose of this study is to analyze change of cervical alignment in plain radiograph and MRI and verify the predictability of MK-line for surgical outcome in patient with CSM.

Materials & Methods : We reviewed seventy-one consecutive patients who underwent laminoplasty for the treatment of CSM at our hospital. We measured C2-C7 lordotic angle in plain radiograph and MRI. A modified K-line (MK-line) was defined as the line connecting the midpoints of the spinal cord at C2 and C7 on a T1-weighted sagittal magnetic resonance image. We also determined the minimum interval between the tip of local kyphosis and a line connecting the midpoint of the cord at the level of the inferior endplates of C2 and C7 (INT min) on the midsagittal image. The recovery rate was calculated to compare pre- and postoperative JOA scores. Paired T-test was used to analyze changes of C2-C7 lordotic angle in plain radiograph and MRI and regression analysis was used to analyze the correlation between change of C2-C7

lordotic angle and INTmin. We also analyzed correlation between INTmin and recovery rate.

Results : Mean preoperative C2-C7 lordotic angle in plain radiograph was 13.1 degrees and mean preoperative C2-C7 lordotic angle in cervical spine MRI was 9.64 degrees. Mean change of C2-C7 lordotic angle between plain radiograph and MRI was -3.4620 degrees (3.462 degrees kyphotic) and showed significant difference (p=0.0005). Change of C2-C7 lordotic angle correlated to INTmin (p=0.0268). However, INTmin did not correlate to recovery rate (p=0.6367).

Conclusions : Different position in plain cervical spine radiograph (upright) and cervical spine MRI(supine) make significant difference of C2-C7 lordotic angles. These changes of lordotic angle have significant effect on predictability of MK-line for surgical outcome of cervical laminoplasty in CSM. The authors cautiously urge that MK-line should not be used as a guideline for selection of surgical approach and predicting factor for the treatment of CSM if there is notable change of C2-C7 lordotic angle between plain radiograph and MRI.

Keywords : Cervical spondylotic myelopathy, Cervical laminoplasty, lordotic angle, Modified K-line

AP-1

Electrical stimulation in differentiation of spinal cord-derived neural stem cell

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The use of non-chemical methods to differentiate neural stem cells has attracted researchers from multiple disciplines, including the engineering and the biomedical fields. No doubt, growth factor based methods are still the most dominant of achieving some level of proliferation and differentiation control - however, chemical based methods are still limited by the quality, source, and amount of the utilized reagents. We have developed a culture system that allows normal neural stem cell growth and the option of applying continuous and defined levels of electric current to alter the cell biology of growing cells. This biphasic current stimulator chip employing ITO electrodes generates both positive and negative currents in the same culture chamber without affecting surface chemistry. We found that biphasic electrical currents (BECs) significantly increased the proliferation of spinal cord-derived neural stem cells (SC-NSCs). Furthermore, BECs also promoted the differentiation of SC-NSCs into neuronal cells, as assessed using immunocytochemistry. Our results clearly show that BECs promote both the proliferation and neuronal differentiation of SC-NSCs. It may apply to the development of strategies that employ NSCs in the treatment of spinal cord injury.

SL-1

Degenerative sagittal deformity

Whoan-Jeang Kim

President of Korean Society of Spine Surgery, Korea

성인 척추 변형에 대한 수술적 치료가 고령 인구의 증가와 삶의 질에 대한 요구의 증가에 따라 빈번히 시행되면서 이에 따른 합병증으로써 인접 분절의 문제, 시상면 불균형 같은 문제가 빈번히 대두되고 있다. 일반적으로 성인 척추 변형 질환으로서 시상면 불균형이 있는데, 이는 크게 정적인 유형(static type)과 동적인 유형(dynamic type)으로 나눌 수 있다. 시상면 불균형에서 정적인 유형의 원인으로는 의인성(수술후), 외상성, 강직성 척추염과 같은 전신성 질환 등이 있고, 동적인 유형의 원인으로는 요추후만 변형 등과 같은 퇴행성 질환 등이 있다.

시상면 불균형에서 정적인 유형인 경우, 발병원인과 자연경과 등에 대한 많은 연구와 논문들이 있으며, 최근 수술 후 임상 증상과 관계가 깊은 척추골반지표와 시상균형의 지표, 시상균형을 유지하기 위한 보상작용에 대한 연구가 많이 이루어졌으며, 특히 수술적 치료에 있어 HRQOL (health related quality of life)와 관련이 깊은 ideal spinopelvic alignment로(SVA〈5cm; PT〈20°; PI-LL〈10°)충분한 교정시 만족할 만한 임상적 결과를 얻을 수 있다고 보고되고 있다. 우리나라에서 빈번히 시행되고 있는 성인 척추 변형인 퇴행성 시상면 불균형 Lumbar degenerative kyphosis환자에서는 보행시 방사선학적 소견과 다른 dynamic type의 sagittal imbalance로서 발생원인, 자연경과 등에 대한 연구가 부족하고, 대부분 고령이며, 골다공증이 심하여 내고정 기기 문제에 따른 교정력 소실에 의한 Re-stooping, 전만각 교정후 지속적인 stooping, 합병증 등의 발생 빈도가 높고 다양한 임상적 결과로 치료방법에 대해서 논란의 여지가 많다. 퇴행성 시상면 불균형 환자에서의 방사선학적 지표들과 환자가 느끼는 임상 증상간의 차이가 있어 수술적 치료 결정에 있어 방사선학적 지표들로 결정하면 안되며, 환자의 장애 정도에 따라 신중히 결정해야 한다.

HG-1

How much correction may we get from one-level PSO for thraco-lumbar kyphosis associated with anklosing spondylitis?

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Spine Surgery, Nanjing Drum Tower Hospital of Nanjing University Medical School, Nanjing, China

Study Design : A retrospective study

Objective : To compare the radiographic and clinical outcomes between closing wedge osteotomy (CWO) and closing-opening wedge osteotomy (COWO) for thoracolumbar kyphosis secondary to ankylosing spondylitis (AS).

Summary of Background Data : Patients in late stage of AS often suffered from thoracolumbar kyphotic deformity with sagittal imbalance. Several surgical techniques have been employed to correct the fixed thoracolumbar kyphosis. In the literature, many authors paid much attention to technical aspects, the functional outcomes and complications of CWO, with little focus on the outcomes of sagittal reconstruction. Recently, COWO has been adopted for the treatment of severe thoracolumar kyphotic deformity. To date, the comparison of the outcomes between CWO and COWO for AS-related thoracolumbar kyphosis has not yet been addressed.

Methods : Sixty-four patients were divided into two groups (CWO group and COWO group), according to the association with anterior edge opening or not shown on the postoperative radiographs. In the CWO group,

there were 35 cases（31 males, 4 females） with an average age of 35.5 years (range, 20-54 years). The COWO group included 29 cases (26 males, 3 females) with a mean age of 36.9 years (range, 22-52 years). Radiographic measurements were compared between the two groups, including thoracic kyphosis (TK), lumbar lordosis (LL), global kyphosis (GK), sagittal vertical axis (SVA), osteotomized veretbra angle (OVA), and the height of the osteotomized vertebra (HOV). Oswestry disability index (ODI) was used to evaluate patient outcomes at the final follow-up. Radiographic and clinical outcomes were assessed with a mean follow-up of 36 months (range, 24-84 months).

Results : TK did not change significantly during the period after surgery and the final follow-up in both groups. The mean correction of LL was 33.6°in the CWO group and 40.3°in the COWO group ($P< 0.05$). The average correction of GK was 35.4°in the CWO group, and 45.2°in the COWO group ($P<0.05$). The average improvement of SVA was 10.7 cm in the CWO group versus 16.8 cm in the COWO group. The COWO group demonstrated statistically significant improvement of SVA when compared with the CWO group ($P< 0.05$). The changes of OVA were also found significant different ($P< 0.05$) between the two groups (31.9°in the CWO group versus 41.8°in the COWO group). Notably, statistically significant differences ($P< 0.05$) were observed in the variation of HOV between the two groups (1.3 cm in the CWO group versus 0.7 cm in the COWO group). Four patients in the CWO group and five patients in the COWO group had perioperative complications. In both groups, no patients had pseudarthrosis at the osteotomy level at the last follow-up. There was no significant difference of ODI scores between the two groups at the final follow-up.

Conclusion : Both CWO and COWO are safe and effective surgical methods for correction of fixed thoracolumbar kyphosis in AS. COWO can obtain larger correction and better sagittal alignment without additional neurological complications by preserving more height of the osteotomized veretbra to avoid excessive dural buckling, curving and kinking. In addition, the fracture of anterior cortex in COWO will not lead to pseudoarthrosis, delayed union or nonunion because of the rigid posterior fixation, superior ability of the balanced AS spine in achieving fusion.

Keywords : ankylosing spondylitis, kyphosis, osteotomy

HG-2

Immunotherapy for spinal malignancies

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The advent of immunotherapy has created a revolution in the treatment of solid tumors. The of a class of immunotherapy drugs called checkpoint inhibitors has resulted in durable tumor control and FDA approval of multiple tumor types including melanoma, renal cell carcinoma, lung cancer, bladder cancer, and head and neck cancer. As a result, current treatment paradigms for the treatment of solid tumors that have metastasized are being reexamined. We will discuss the role of checkpoint inhibitors in the setting of patients with spinal disease.

TS-1

왜 우리는 척추변형수술을 알아야하는가?

Jee-Soo Jang

Nanoori Hospital, Korea

Adult Spine Deformity

- Neural compression
- Rotational subluxation
- Coronal imbalance
- Sagittal imbalance ; degree of disability

어떻게 접근할 것인가?

- 환자의 pain source는 무엇인가?
  - ➢ Neural compression?
  - ➢ Segmental instability?
  - ➢ Sagittal imbalance?

Surgical management of adult spinal deformity

1. Isolated stenosis on a patients with stable spine and acceptable alignment : Decompression without fusion
2. Stenosis and instability, with moderate malalignment : Decompression and fusion with instrumentation, with only small maneuvers in realignment
3. Instability and severe malalignment : Decompression, realignment, long fusion with appropriate osteotomies

The Text book of spine surgery, 3rd edition PP 934

What are the problems in adult spinal deformity surgery in Korea

- Life style
- Old age(medical problems) and osteoporosis
- Post-operative complications
  - Iatrogenic flat back
  - Junctional problems

척추 변형 수술을 결정하기 전에 환자의 동의를 얻어야 할 사항들

Gain

- 수술로 얻는 것
  - 허리 통증 없이 똑바로 오래 걸을 수 있다
  - 허리가 펴져서 모양이 좋아진다

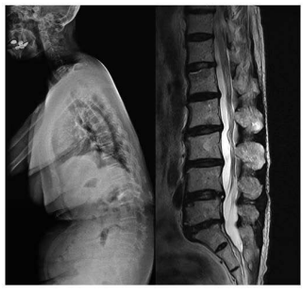
Lost

- 침대, 의자, 양변기 사용해야 한다.
- 땅바닥에 앉을 수 없다.
- 혼자 양말, 신발 신기 어려울 수 있다
- 대변 후 항문 닦기 힘들 수 있다
- 허리 구부리기가 힘들어서 밭농사일 못할 수 있다
- 수술 중 혹은 수술 후 합병증에 대한 설명

Life style

수술 후 환자가 호소 하는 증상

1. 바닥에 앉지 못한다. → 의자, 침대, 양변기 사용(65%)
2. 바닥에 있는 물건 못 집는다. → 집게사용 (50%)
3. 대변 처리가 힘들다. (전혀 27%, 가운데로 27%)
4. 양말, 신발 신고 벗기 힘들다. (73%)
5. 세수하고 머리 감을 때 허리가 구부러지지 않아 옷이 젖는다. (54%)



73/F

- 허리 끊어지고 잘라지는 듯 아파서 2-3분 이상 걸을 수 없다.
- 걸으면 곧 구부러지고 허리 통증이 생긴다.

- 땅바닥에 못 앉는다.
- 양말, 신발을 혼자서 못 신는다.
- 수술 전에는 걸을 때 허리 아팠는데 지금은 항상 아프다.
- 나를 병신으로 만들어 놨다.
- 수술 전 상태로 해놔라

- Neural compression과 Sagittal imbalance가 심한 환자
  - decompression과 동시에 deformity correction을 동시에
  - decompression or 1 level fusion

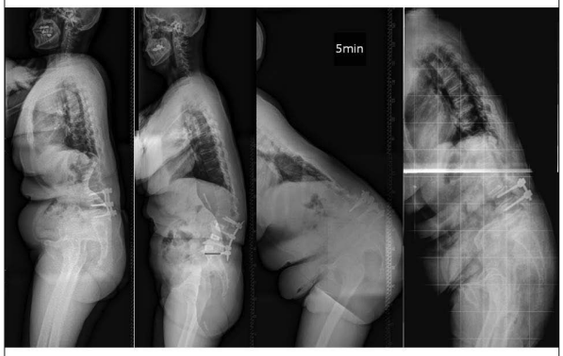
(환자 한테는 하나는 포기하고 사시라고 설명)

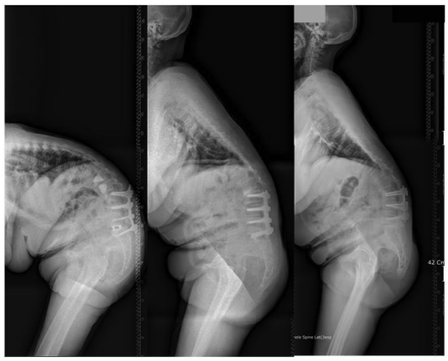
Preoperative medical consideration

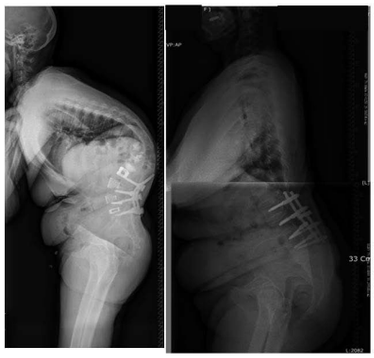
- Osteoporosis
  - Screw augmentation and preventive proximal PVP
  - Postop posteo
- Medical problems
  - Cardiovascular, DM, hepatorenal function

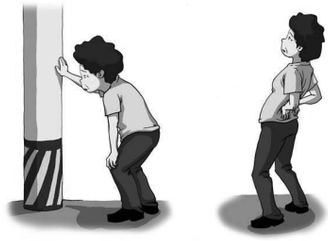
Iatrogenic flat back

- Lumbar fusion without concept of sagittal balance
- TL junctional compression fracture and kyphosis
- Disability가 수술 전 보다 더 심해진다.





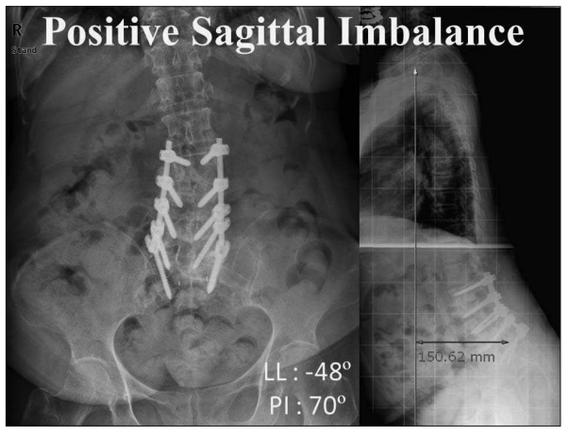


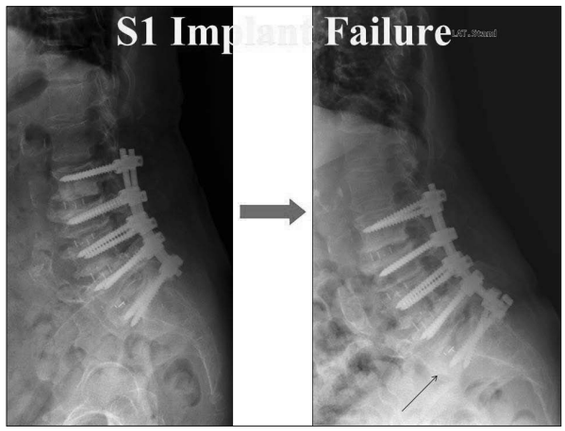


Common mistakes

- Thoracolumbar junctional problems
  - Fail to make adequate lumbar lordosis
  - Wrong fusion levels

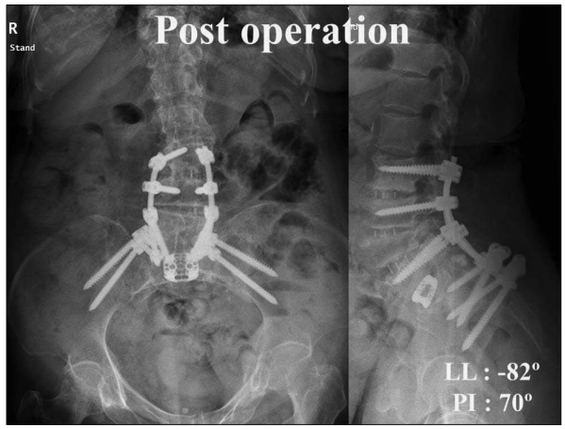
Case Reviews(complications)

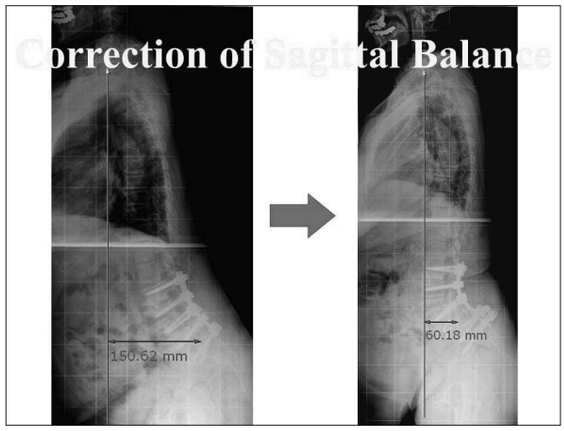




S1 screws loosening
Inadequate lumbar lordosis

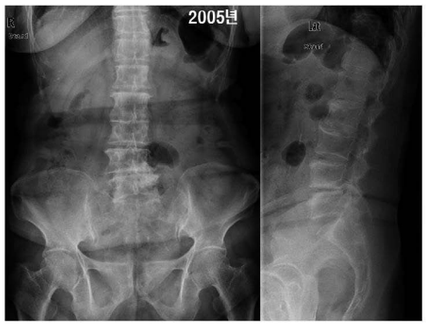
ALIF and 4 Iliac screws
L4 PSO

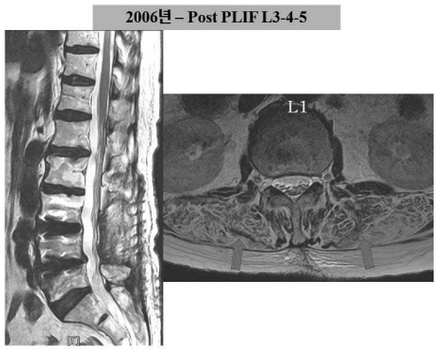




2809 김0자(75/F), 2013/6/25

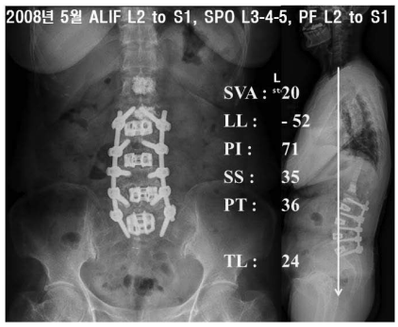
- C.C
  - back pain and stooping, Onset) 5years
  - 허리가 끊어지고 잘라지는 듯 아프다.
  - 걸으면 5분도 안 되서 구부러지고 허리 통증이 생긴다.
  - 양 다리로 쥐가 난다.
  - Sagittal imbalance 4 symptomes (+)
  - VAS 9
- PMHx
  - HTN, asthma
  - 2006.2 PLIF L3-4-5
  - BMD = 46.5, T-score -3.4

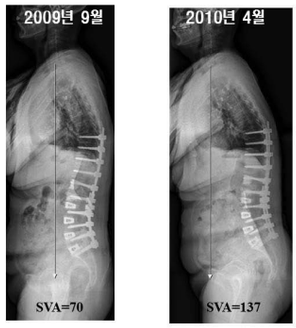


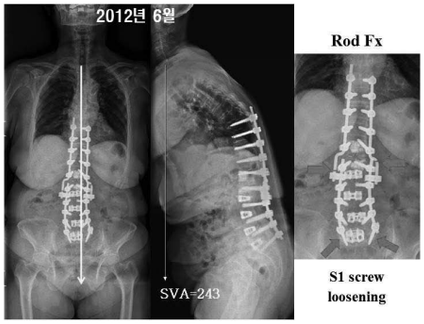


SVA : 192
LL : -5
PI : 71
SS : 20
PT : 51

TL : 21

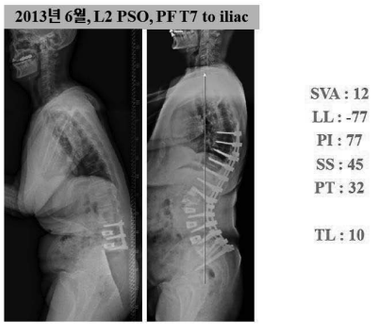






L2 PSO

PF T7 to iliac



Adult spinal deformity surgery

- 환자의 동의를 자세히 반드시 받아라.
- 어정쩡한 multilevel fusion 수술은 하지 말자.
  - Decompression or 1 level fusion 수술로 대치하자.
- Sagittal imbalance 수술을 하려면 확실하게 하자.

Sagittal imbalance 수술은 확실하게 하자

- Sagittal imbalance fusion level은 thoracic 10 이상 올려라. (TL junction는 반드시 넘어라)
- Lordosis는 PI 값 이상으로 반드시 만들자.
- Lower Lumbar는 interbody fusion (ALIF or PLIF 등)을 반드시 하자.
- Iliac screw는 반드시 하자.
- Preventive PVP at proximal levels

TS-2

경추 수술의 발전과정과 미래는?

Yong-Eun Cho

Yonsei University, Korea

Historically the first reported case of cervical disc herniation was done in 1905 by Watson and Paul as anterior extradural mass in the intervertebral disc. The first dorsal approach was performed by Elsberg in 1925 for "chondroma" in a quadriplegic patient.

Surgery for Cervical disc herniation was performed Posterior procedure including laminotomy, laminoplasty and foraminotomy was initially proposed by Spurling and Scoville for lateral disc rupture of cervical disc herniation in 1944.

Since 1958년 Smith and Robinson (1955), Cloward (1958) initially described anterior discectomy procedure, anterior approach in cervical spine disease allows direct decompression of osteophyte and disc herniation regardless of location relative to the dorsally located spinal cord and nerve root. Anterior procedure was extended its' territory to discectomy with or without fusion, corpectomy with reconstruction and recently foraminotomy. In Korea, cervical disc herniation was treated by posterior decompressive laminectomy in early 1960. From 1964, Cloward anterior discectomy and fusion technique was started as an anterior approach.

As an one of the most important event in cervical spine surgery, Surgical microscope gave us a great contribution for improve surgical skill and surgical outcome. Surgical microscope was introduced in spine surgery by Caspar (1977), Yasargil (1977) in lumbar disc herniation. In Korea Young Soo KIM was

introduced surgical microscope for cervical disc herniation operation in 1977 also. It gave us a fine surgical decompression of spinal cord and nerve root from compression and make dramatically improved patient satisfaction due to surgical outcome and minimal invasive surgery.

Surgical microscope has opened the concept of minimally invasive surgery in spine. As it's continuance, MIS techniques such as microendoscopic discectomy with tubular retractor and, endoscopic discectomy anteriorly or posteriorly were introduced to spine surgeon. Even though steep learning curve, excellence of optical technology can make these procedures as a future surgical option for soft cervical disc herniation.

Some kinds of spinal fusion are available through tubular retractor without severe tissue injury as a minimally invasive surgery.

With further understanding of biomechanics of cervical spine focusing stability, various surgical options were introduced in traumatic lesion from high cervical area to cervicothoracic junction anteriorly and posteriorly.

The development of more biocompatible implant such as screw, plate, wire leads further proper treatment for cervical spinal cord injured patients improving clinical outcome. In primary or metastatic bone tumor and spinal cord tumor, the outcome of surgery was dramatically improved by support of MRI, surgical microscope and various implants.

Dynamic stabilization with total disc replacement by artificial disc was a very fresh idea for degenerative cervical spinal disease especially with motion preservation. Even though it has still some debate for usefulness and efficacy, it will continue it's evolution in mechanically and ideally acceptable surgical option.

Recently with further understanding of idea about "Balance", we have strong interest in deformity surgery with regional and global balance. It is still on going hot issue to be investigated the idea and longterm surgical outcome.

In the future, MIS surgery will be a best option for soft disc herniation anteriorly and posteriorly in case of careful selection of indication. The concept of balancing spine globally and regionally will improve the outcome of fusion surgery with various implants.

The development of IT industry and biotechnology can give us totally different medical circumstance via artificial intelligence (AI) and virtual reality(VR) such as a robotic surgery. With improvement of biomaterials in biotechnology, fusion, degeneration and motion problems can be overcome in a near future.

TS-3

척수내 종양 치료의 예후를 좋게 하려면?

Chun Kee Chung

Department of Neurosurgery, Seoul National University, Seoul, Korea

Intramedullary spinal cord tumors (IMSCTs) are representing 2-4% of all CNS tumors in adults and less than 10% of all paediatric CNS neoplasms. Ependymomas are the most common tumors in adults and astrocytomas are the most common in children. Hemangioblastomas and cavernomas represent special entities and require specific strategies. The aim of this presentation is to explain the long-term surgical outcome of IMSCTs, to evaluate the prognostic factors influencing postoperative outcome, and to discuss surgical strategies using in Seoul national university hospital (SNUH).

In all spinal cord tumor surgery, I use the laminoplasty, not laminectomy. The laminoplasty with laminar screws had a 67.5% fusion rate, and migration of the grafted laminae was not observed in any of the patients probably due to additional fibrous union.

In the surgical treatment of spinal cord ependymoma, preoperative functional status and the extent of removal were the significant prognostic factors influencing postoperative outcome. Gross total removal alone is a good treatment strategy for spinal ependymomas. Early diagnosis and surgery, before severe paralysis, are important to obtain good functional outcomes. Subtotal resection with radiation therapy for intramedullary lesions appears to offer no advantages over gross total removal. In the surgical treatment of spinal cord astrocytoma, neither the extent of resection, nor radiation influenced the survival rate. The histological grade was the most significant predictor of survival in patients with astrocytoma of the spinal cord. In the surgical

treatment of spinal cord hemangioblastoma, total removal resulted in a better outcome for less than gross total resection. Additionally, multimodal intraoperative monitoring provides useful electrophysiological information, especially during the main surgical phases. Also getting attention is intraoperative imaging including fluorescent angiography, digital angiography and sonography. Postoperatively we ascertain that closed-suction drainage may not be essential.

I will present the long-term surgical outcome of IMSCTs with the prognostic factors, and will discuss surgical strategies based on our experiences in SNUH.

Key word : intramedullary spinal cord tumors, ependymoma; astrocytoma, hemangioblastoma

TS-4

내시경 수술의 미래는 어떻게 발전할 것인가?

Chun Kun Park

Gooddoctor TNTN Hospital, Korea

The Translation in Spine Care

ASIA SPINE 2016

Friday, September 23, 2016

The Translation in Spine Care

ASIA SPINE 2016

CS-1

Actual Status of Spine Surgery in Vietnam, Future Challenges and Opportunities

Nguyen Ngoc Ba M.D.

Head of Neurosurgical Dpt. Vice director Danang Hospital.

Vice president of Neurosurgery Association of Vietnam

With regard to the development of spine surgery in Vietnam. We should devide this into 3 stages:

Stage 1: 1975-1995 Decompression posterior approach

Cervical traction and Halo

Lumbar disc and spinal cord tumor myelogram diagnostic and operated.

Stage 2: 1995-2005: Regional and Global intergration, CT scan, Microscope, MRI

RoyCamille technic

Anterior and posterior approach

Cervical laminoplasty

Spondilolisthesis, Scoliosis, Cyphosis.

Stage 3: 2005-2015: C-Arms, DSA, Endoscope, Navigation, Robot.

Vertebroplasty, Kyphoplasty, Disc,Vertebral body replacement, C1C2 screw fixation, Endoscope, Minimun Invassive Surgery, Robotic surgery, Stem cell in spine injury.

The field of spinal care has changed because of economic situation. Many neurosurgeons and orthopaedic surgeons from the south, midle and north of Vietnam have undertaken post-graduate fellowships in the field of spine surgery from developed countries including USA, France, Japan, Korea...

In Vietnam spinal diseases to be seen by neurosurgeons and all other by orthopaedic surgeons.

I would like to focus on 1995-2000 because this is very important period, when the surgeons returned from their fellowships stimulated many changes in human resources, public and private special equipments such as : CT, MRI, C-Arms, Microscopes, Navigation, Spinal implants, so on...

Overtime many Neurosurgeons and Orthopaedic surgeons in Vietnam became specialist spine surgeons.

At present, in the whole of Vietnam 100 spine surgeons and 150 neurosurgeons specialize in spinal surgery.

Although have not enough spine surgeons. How get promotion to well traning.

Facing overload of spine disease patients. Difficulty to separate spine section from traditional neurosurgery strong power.

Lack of labo for spinal reseach and academic training in faculty of medicine. There is a national in drive to combine the network between many medical centers in Vietnam. Spinal surgeons interested

encouraged to follow the courses supported by regular training,hand-on experience

Through important comunication such as: team meeting,teleconference to develope regular training workshops, courses cadaveric training and practice and the supporting assistant surgeons. This allow the development of basic as well as the more advanced spinal surgery skill using new technics and modern technology on lamioplasty, scoliosis, cyphosis, posterior, lateral, anterior approach, minimal invasive spinal surgery, endoscopy,navigation.

Close from successful comunication between national, regional and international community will ensure advanced professional level of spinal care in Vietnam.

CS-2

India

Sarat P. Chandra

All India Institute of Medical Sciences, India

CS-3

Translating Spine Surgery Services at Remote and Limited Region. "Indonesia's Experience to Develop Spine Surgery Services."

Wiryawan Manusubroto

Sardjito Hospital, Indonesia

Spine care has been one of the most developed areas of medicine in recent years. It consists of basic science to advanced technology guided surgery, such as stem cell therapies, biological augmented implants to intrauterine surgery of spina bifida or fast growing minimally spinesugery. But all of this development are not a free thing. Spine industry requires a high cost investment with an expected revenue.

On the other hand, Indonesia is an archipelago country with a population of 250 million people spread over 17,000 islands and 34 provinces. Comprised of metropolitan areas through remote and limited areas. These things add up to the lack of government approaches and strategies in the field of medicine, including spine care.

Indonesia currently had 330 spine certified neurosurgeon and 100 spine orthopaedics. But 60-70% of them reside in 5 provinces of Java, the central Island of Indonesia. There are still 10 provinces without neurosurgeons and sufficient hospital.

Gadjah Mada University/ Dr. Sardjito General Hospital is one of Indonesia's leading institution that established a neurosurgical training center to help solve the issues. It actively enrolled candidates from remote or limited areas and have a commitment to encourage the local/state hospital to improve their facility. It also improve and translating the spine service by modifying and simplifying the use of instrumentation

in the education process, to adjust with the available resources in remote and limited areas. The improving and translating process are always based on maintaining patient outcome, maximizing the procedure of care efficiency, and minimizing the effective cost of care.

Key words : Indonesia, Spine services, Limited Facility Region

CS-4

"Resources-Limited Setting"

Iv Vycheth

Department of Neurosurgery, Preah kossamak hospital, Cambodia

A Trauma Spine Center in Cambodia has a litter in common. Yet the descriptor " Resource-Limited Setting" may be applied to both examining the broader issue of availability of spine implants in lower income countries and some of the way used to manage this issue may be helpful.

The Thoraco-lumbar spine Trauma, our goal is to fuse as few levels as possible without increasing the risk of failure. This approach reduces cost but also decreases morbidity by reducing the number of fused segments, and it shortens the incision and operative time. The McCormack Load-Sharing Classification is helpful in assessing the integrity of the anterior column by evaluating the degree of comminuting, angulations, and displacement of the vertebral body.

Points are added up from these 3 criteria for a final maximum score of 9 to decide if a short-segment posterior fixation will be sufficient.3 In situations where we feel equivocal about short versus long construct, we choose the shorter construct and keep the patient bed rested for 3 weeks to allow for the vertebral body fracture fragments to start healing while off-loaded.

It is still controversial about the optimal management strategy, from 2013 to 2016 we report a consecutive series of 56 cases were treated by that technique, however the clinical results are usually satisfaction and no evident of progressive kyphosis and hardware noted.

When the spine is grossly unstable (e.g., Arbeitsgemeinschaft fu¨r Osteosynthesefragen type C fracture

dislocations) or the McCormack Load Sharing score is 7 or higher, short-segment fixation has a high risk of failure. In such situations long lever arms with multiple fixation points are recommended. Here we choose between Luque rectangle with sublaminar wires or pedicle screws with rods.

Although Luque instrumentation pro-vides excellent stabilization in-situ, the inherent inability to apply compressive or distractive forces presents technical challenges to reduction of the dislocated spine. In such cases, pre-instrumentation traction on the operating table using simultaneous manual distraction of legs and upper trunk is often sufficient to achieve reduction.

Trans-pedicular fixation is also well suited in situations where the laminar are disrupted to the point where wires cannot be secured. Lastly, because most of our cases are traumatic, we use monoaxial pedicle screws exclusively for its superior rigidity.

All these procedures are currently being performed without having any form of intraoperative imaging, viz. portable X-Ray or fluoroscope. Such pricey and maintenance sensitive equipment is not a requirement in providing spine trauma care in resource-limited settings. With careful cross-referencing of anatomic landmarks with pathology visible on preoperative images, correct levels can be identified with certainty and hard-ware placed safely.

In resource-limited settings, all options should be take the approach “do the best with what we have” to provide rational, safe, and effective treatment. Just because a technique is not in vogue does not necessarily mean it is a poor procedure; Luque rectangles secured with sublaminar wiring were used widely to treat thoracolumbar fractures.

Starting with a clean slate and adding what is essential will be not only refreshing in its simplicity but also rewarding to know that patients are receiving safe and effective spine surgeries despite adversities.

CS-5

Gulf area and Arabic Countries

Abdul Karim Msaddi

Neuro Spinal Hospital, UAE

Spine surgery in middle east and Arabic countries started around 1950th, first by neurosurgeons and progressively followed by orthopedists.

Spine surgery as stand alone specialty attracted many neuro and orthoped surgeons, and the titles of neurospine surgeons and orthospine surgeons became popular.

National and regional academic societies mainly neurosurgical and orthopedic societies showed great interest in including spine surgery in their scientific meetings and many of them created spine chapters within the mother society. Spine societies started relatively recently by the creation of Pan Arab Spine Society in 1999 and Arab Spine in 2014. During that period many national spine societies were created.

From the clinical points spine unites within a neurosurgical or neuroscience departments and or orthopedic departments started to be recognized and approved, then many of them became separate entities

Spine surgery training and formation was first an individual interest and efforts from interested orthopedist or neurosurgeon, very rare are those who received combined training in both specialties.

Practical training programs such as the Euro Spine Course Diploma or other existing programs are not open to the majority of young surgeons interested to become spine surgeons due to many obstacles.

Because of the stressing need we could feel from the young generation many senior Arabic spine surgeons from both communities neuro and orthopedic surgeons and under the umbrella of the Arab Spine which is grouping 14 arabic countries the Arab Spine Course Diploma was started in 2014, it has 4 modules, each on is composed of 2 days theoretical lectures and workshops followed by one full day cadaveric hands on workshop, the modules are organized every 6 months and the first patches of trainees were graduated this year in April 2016 in Dubai after passing an oral assessment composed of a faculty from Arab Spine, from the NASS, and University of Basrah in Iraq.

The program of ASCD is as following:

Module 1: Basic sciences related to spine surgery and Lumbar degenerative spine diseases.

Module 2: Cervical spine degenerative diseases, spinal navigation, IOM.

Module 3: Spinal trauma, Tumors and Infections.

Module 4: Spinal deformities, malformations and complications.

The cadaveric workshops are done over 4 full days under expert faculty covering the major techniques in spine surgery.

In conclusion

spine surgery in the gulf region and Arabic world is on the good way of becoming as good as most of the developing countries with increasing interest in learning and practicing under the guidance of expert senior spine surgeons welling to teach and form a generation of good spine surgeons.

CS-6

Change in the trend of management of Cervical injury in Nepal

Krishna Sharma

Nepal Medical College, Kathmandu, Nepal

Introduction : Nepal is geographically and socially very prone for cervical injuries.

Treatment needs to be tailored according to the resources and expertise available. With the improvement in socio-economic conditions and the equipment, outcome of cervical injuries has improved. Providing treatment, physiotherapy and rehabilitation are still big challenges for Nepal.

Methods and material : A total of 528 patients were admitted in Nepal medical college from January 2004 to December 2015 who had undergone surgery for cervical injuries. They came from different parts of Nepal and presented within 2 hours to 6 weeks after the injury. The male to female ratio was 3.5:1 with age ranging from 8 to 79 years (mean: 36). 129 patients had upper cervical injuries while 399 had sub-axial cervical injures. Multi-level injuries were present in 79 (15%) patients. 180 (34%) patients had significant injuries in other parts of the body. Neurologically 112 had American Spinal Injury Association (ASIA) grade A, 113 had grade B, 124 had grade C, 73 had grade D and 106 had grade E.

All underwent surgery of cervical spine after resuscitation as early as possible; 45% within 48 hours of arrival. Stabilization was done with cervical traction in patients whose surgery was delayed for various reasons. In the first four years i.e. from 2003 to 2007, spinal fixation instrumentation was not available. Of the total 86 patients, 62% had sub-axial injuries and were fused anteriorly without fixation. The remaining 36 had

upper cervical injuries. 83% of these were fixed with Hartshill rectangle and 17% were fixed using stainless steel wires. From 2008 to 2012, out the 224 patients, 160 had sub-axial injuries and were fixed anteriorly using stainless steel plates and screws. The upper cervical injuries were fixed with bent Luque rods (44) and stainless steel wires (20). Titanium fixation devices became available from 2012. From 2013 to 2015, stainless-steel and titanium fixation devices were used depending on the affordability of the patient. Posterior wiring was performed in unaffordable patients or in children. Steroids were not used in any of these patients. Postoperatively, the neck was immobilized on cervical collar for 6 weeks to 3 months. Early mobilization and early institution of rehabilitation was tried postoperatively.

Results : The results of cervical injury management improved over the times with improved standards of care and the fixation devices, especially titanium screws and plates. The cervical collars were used progressively for shorter time and the patients were mobilized earlier reducing the complications related to prolonged immobilization. The later fixation devices provided better stability with less of complication rates of graft displacement, instrumentation failure, infections and re-subluxation. In those who had no other complications, the total hospital stay shortened from mean of 42 days in the initial days to the mean of 9 days in the later period. The overall mortality rates were mainly related to respiratory problem and infections, which was 15% in the first half (2003 to 2008) and improved to 8% in the later half.

Conclusion : With availability of better constructs, improved surgical expertise, better fixation techniques and postoperative care, hospital stay and complications have reduced significantly including the mortality and morbidity, more in those with higher ASIA grade and less in the lower grades.

CS-7

The Opportunities of Spinal Surgery In Mongolia, Present and Prospective Challenges

Gonchigsuren Dagvasumberel

Grand Med Hospital, Ulaanbaatar, Mongolia

Background : Mongolia has a population of around 3 million people, 30% of whom are nomadic. In 1966, Professor J. Hairulla, a pioneering neurosurgeon, performed the first successful brain surgery procedure in the country. Thus, the history of neurosurgery in Mongolia begins with Professor J. Hairulla, and through his initiative the first department of neurosurgery in the country was established at the 3rd State Central Hospital in May, 1971.

The history of Mongolian neurosurgery consists of the following stages : 1st Stage (1966-1973): Neurosurgery is established, and the first spinal decompression surgery is performed. At the time, radiology methods such as X-ray, pneumoencephalography, ventriculography and open carotid angiography are first used. Professionals, including Professor B.M. Rachkov (1970), are invited from the Soviet Union. Neuro-intensive care is introduced.

2rd Stage (1974-1981). Discography, myelography and epidurography procedures are first performed in Mongolia, as well as discectomy, posterior fixation, and transabdominal spinal surgeries.

3th stage (1981-1991). Period of treatment and diagnosis becomes more developed. In 1986, computed tomography is introduced, being mostly used to diagnosis neurosurgery diseases.

4th stage (1991-2005). Mongolia's transition to a capitalistic economy helps the health sector through the

expansion of foreign relations with Japan, Korea, Thailand, Germany, Israel, the United States, Turkey, and Taiwan, and the countries start exchanging practices. Fujita University in Japan makes a donation of German surgical microscopy equipment, which aids in the practice of microsurgery.

In 1999, Mongolia becomes a member of the Asian Neurosurgeon Society, and the Mongolian Neurosurgeon Association is established in 2010.

Operations such as spine corpectomy, pedicle screw fixation, bone-graft disc replacement, percutaneous vertebroplasty (PVD), and micro discectomy are first performed. Microdiscectomy is first performed in Mongolia in 2005, and posterior lumbar interbody fusion (PLIF) in 2012.

Present condition : Now over 1,500 spine surgeries are performed in Mongolia annually.

PVP (vertebroplasty), TLIF (translumbar lumbar interbody fusion), ACDF (anterior cervical discectomy and fusion), PELD (percutaneous endoscopy lumbar discectomy), and microdiscectomy surgeries are now routinely performed in Mongolia, although spinal and spinal-cord tumor, spondylitis, spondylodiscitis, and C1-C2 high-cervical surgery has not yet been fully developed. Nowadays in Mongolia three public and four private hospitals perform spinal surgery, with a total of more than 10 specialized doctors.

Prospect and partnership : The development of modern neurosurgery in Mongolia will be impossible without development in neuronavigation, functional neurosurgery, microsurgery and neuroendoscopic surgery. Therefore, it is critical to practice and implement such methods in Mongolia.

It is also necessary to focus on improving diagnostics and treatment of spinal infections, spinal tumor and spinal deformity in the Mongolian neurosurgical sector.

PF-1

Asia Spine: The past, present and future

Hiroshi Nakagawa, Toshiyuki Okazaki, Hitoshi Hayase, Koji Saito

Kushiro Kojinkai Memorial Hospital, Spine center and Department of Neurosurgery Kushiro City, Japan

Key Words: Asia spine Spinal surgery

Regarding Asia spine, I would like to mention how we started this spine meeting 20 years ago and later developed the present state of Asia spine and what will be the future.

In 1995 when I organized the 11th Annual Meeting of the Japanese Society of Spinal Surgery, spinal neurosurgeons in Korea and Japan including Dr. Young Soo Kim, Dr. Jung Keun Suh and me talked over to establish conference on spinal surgery between our countries. And in 1997 I had an opportunity to organize the first Biennial Meeting of Japan-Korea Conference on Spinal Surgery in Nagoya. Since then we held the meeting every other year in Korea and in Japan.

In 2010 younger generation of our spinal neurosurgeons decided to organize the first meeting of Asia Spine in Seoul and since then the meeting had been held every year including Taiwan.

In the near future I hope that Asia Spine will further expand to the other nations in Asia with advanced philosophy and refined technology.

HG(Ⅱ)-1

Do we still need Scientific journals?

R. Gunzburg, M.D., Ph.D., M. Aebi, M.D.

The European Spine Journal's perspective

In the old days, books were 'the' source of knowledge and journals came later and were slow in dissemination. Now there is a move towards internet platforms. Yet, peer review is a means of ensuring that the results of scientific research are meaningful and worth reading. The process of review, rejection, and revision helps improve the quality of the reports and the accessibility of the science. The greatest reward reviewers receive will always be that of seeing research to which they made an essential but anonymous contribution be published to help advance understanding, improve care, and advance health.

Without clinical expertise, practice risks becoming tyrannized by evidence, because even excellent external evidence may be inapplicable to or inappropriate for an individual patient.

Best available external evidence leading to Evidence Based Medicine is to be found in Scientific Journals.

Usefulness of a paper must be driven by context. Context includes: culture, populations, the organization of care, clinical personnel, technology, and payment systems. Local usefulness depends on the reader's understanding of their own populations and communities, the nature of the systems in which they work, and the financial and organizational incentives that support patient care.

Without it, clinicians may change their behavior based solely on the results of a study rather than the appropriate application of those results to differing health systems and populations of patients.

The public's faith in the biomedical-industrial complex is threatened by the specter of misconduct, including conflict of interest. The pressure on investigators to have their research published has led to abuses that threaten not only science but also the relationship between science and public funding. As the stakes get higher, the temptation to influence publication decisions grows. Just as investigators and authors must adhere to strict conflict-of-interest guidelines, so should grant reviewers and journal editors.

HG(Ⅱ)-1

Improving quality of spine care

Daniel K. Resnick

Vice President of NASS

PS-1

Make a huge transparent brain and spinal cord

Jeong-Yoon Park

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The biology of multicellular organisms is coordinated across multiple size scales, from the subnanoscale of molecules to the macroscale, tissue-wide interconnectivity of cell populations. Here we introduce a method for super-resolution imaging of the multiscale organization of intact tissues. The method, called magnified analysis of the proteome (MAP), linearly expands entire organs fourfold while preserving their overall architecture and three-dimensional proteome organization. MAP is based on the observation that preventing crosslinking within and between endogenous proteins during hydrogel-tissue hybridization allows for natural expansion upon protein denaturation and dissociation. The expanded tissue preserves its protein content, its fine subcellular details, and its organ-scale intercellular connectivity. We use off-the-shelf antibodies for multiple rounds of immunolabeling and imaging of a tissue's magnified proteome, and our experiments demonstrate a success rate of 82% (100/122 antibodies tested). We show that specimen size can be reversibly modulated to image both inter-regional connections and fine synaptic architectures in the mouse brain.

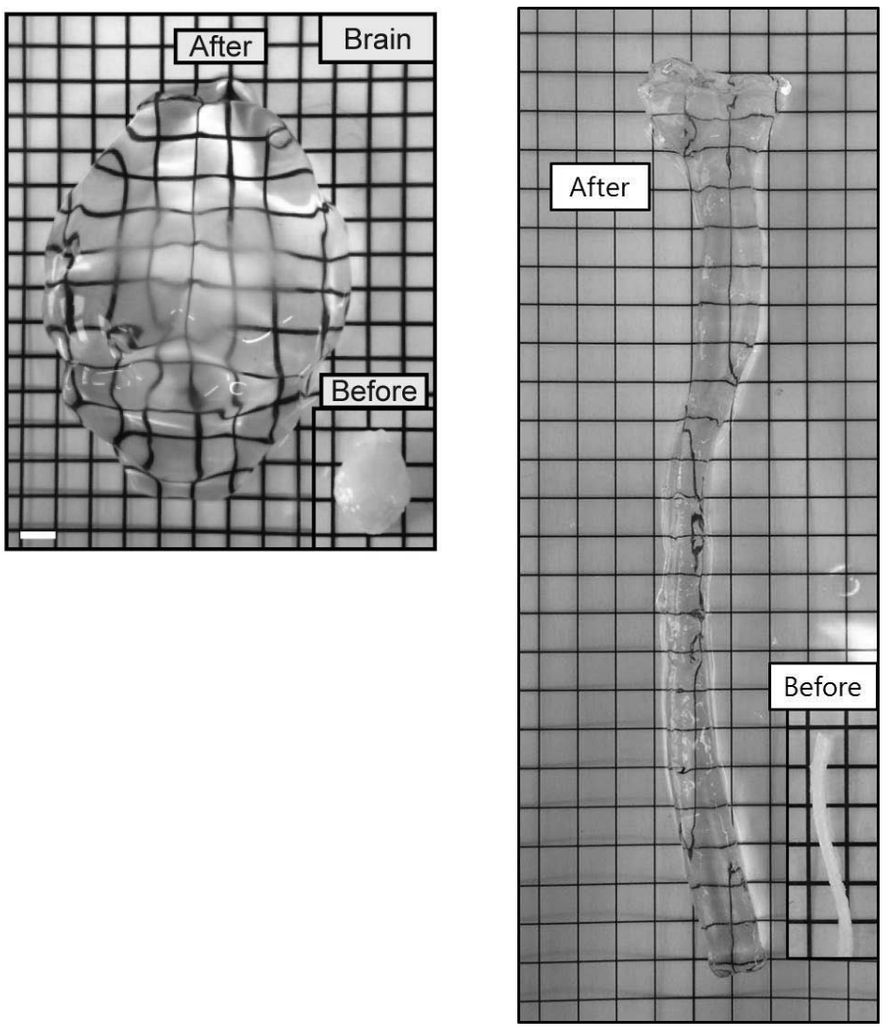

Figure 1. MAP applied to a whole mouse brain and spinal cord. Compared with the original organ size (pictures at right bottom corner), the final expansion of the brain and spinal cord showed a more than 4-fold increase in length. Scale bar, 5mm.

PS-2

Advancement in Cells and Surfaces for Spinal Fusion

Hyun Bae

Cedars-Sinai Hospital and The Spine Institute, CA, USA

PS-3

Future of Artificial Intelligence for Physicians

Synho Do PhD.

Massachusetts General Hospital and Harvard Medical School, MA, USA

Artificial intelligence (AI) to support the medical decisionmaking process has long been both an interest and concern of physicians and the public. New healthcare policy has indeed opened the gates of hospitals to many new patients and extra efforts are crucial to maintain the quality of the medical care. However, hospitals still operate in the old infrastructure such as old buildings, narrow band networks, old communication method and technologies and analog system while integrating the new systems. Even though there are ongoing efforts to improve current hospital system, it is time to begin to think about the next generation hospital. In fact, several efforts have proven that it is more efficient to redesign the optimal platform of the hospital system rather than to patch components to integrate the old infrastructure with the new system. Thus, we aim to build the AI healthcare system that utilizes AI algorithms and rich datasets to relieve current problems and to meet the new demands.

LS(Ⅲ)-1

Degenerative Spondylolisthesis: Is it always unstable? A New Scoring System to Aid Decision Making and Apply Value Based Spine Care

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Bombay Hospital and Medical Research Centre, India

Introduction : Herkowitz's study reported better outcomes of decompression and fusion (DF) over stand-alone decompression (SAD) in patients with lumbar degenerative spondylolisthesis. Since then, there has been a marked rise in the number of fusion procedures offered to these patients. Sporadic studies on stand-alone decompression with good results are also reported. However, no guidelines are available to help decide when only SAD will be adequate. This study was conducted to propose a scoring system to differentiate between stable and unstable lumbar degenerative spondylolisthesis (DS) and report the mid-term outcomes of SAD in stable DS. To evaluate the resultant economic implications of SAD in stable DS.

Materials & Methods : A single-centre prospective study was conducted from 2007 to 2012. Degenerative Spondylolisthesis Scoring System (DSSS) was developed and lumbar degenerative spondylolisthesis was classified into two groups: stable DS and unstable DS. All patients were scored pre-operatively and underwent SAD when DSSS score <6 or DF for DSSS score >/=6. Clinico-radiological parameters used for assessment were VAS (Visual Analogue Scale) back/leg; ODI, standing dynamic radio-graphs and MRI. A peri-operative cost analysis was done for both groups. Minimum follow-up period was 3 years.

Results : A total of 314 patients suffering from DS were studied. Forty-one patients scored below 6 and

underwent a SAD, while 273 patients scored 6 or more and underwent DF. Mean pre-operative ODI in group D and DF was 59.42 and 74.62 which improved to 23.14 and 26.66 respectively after surgery. Mean pre-operative VASleg improved from 7.4 and 8.2 to 3.2 and 2.8 respectively in both groups. Mean follow up was 54.5 months. Two patients of group D developed aggravation of symptoms and required subsequent fusion. Peri-operative expenses were significantly less in the group-D as compared to group-DF.

Conclusions : DS is heterogeneous condition requiring surgical intervention which needs to be tailored individually. DSSS helps in identifying a stable subgroup of DS, where-in stand-alone decompression gives excellent results.

Keywords : Degenerative spondylolisthesis, Decompression, Stable spondylolisthesis, Fusion

LS(Ⅲ)-2

The economics of avoiding cross-links (transverse connectors)

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LS(Ⅳ)-1

Treatment of Severe Spine Deformity: What to do and what not to do?

Yong Qiu

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Study Design : Retrospective case series.

Objective : The current study aimed to review the overall prevalence and indications of revision surgeries after the index spine fusion surgery to treat scoliosis at a single institution.

Summary of Background Data: Spine fusion is considered the final therapeutic intervention in the management of adult scoliosis. However, reports on repeat surgical interventions of adult scoliosis predate the use of contemporary advanced instrumentation systems.

Methods : The scoliosis database of a single center was searched for all indexes spinal fusion surgeries performed for adult scoliosis from 1998 to 2011 with minimum 2 year follow up. The clinical data and radiographs of patients were reviewed to provide information on the indications of initial operation and any subsequent revision surgeries. A total of 815 patients were identified, with a mean age of 30.49 years (20 years to 76 years). The mean follow-up was 6.4 years (range, 2 to 15 years) for the entire cohort, and 7.6 years (range, 2.5 to 12 years) for the subset requiring revision. Patients exhibiting multiple reasons for revision were classified under primary reason and subjected to subsequent analysis.

Results : Among the 815 patients, 62 (7.61%) underwent at least one revision surgery. The most frequent indications for revision were implant breakage (23/62 = 37.1%), deformity progression (10/62 = 16.1%), and infection (9/62 = 14.5%). Other indications included pseudarthrosis (8), implant dislodgement (6), junctional kyphosis (5), and neurological deficit (1). Revision rate was significantly higher in patients greater than 40 years (15.23% vs. 5.87%), in patients with degenerative or congenital scoliosis (15.12% and 12.82%, respectively) or in patients with hybrid constructs (12.12% vs. 5.82%).

Conclusions : In this large single-institution series, revision surgery after the index spinal fusion in patients with adult scoliosis was required for a relatively low proportion of surgical cases (7.61%). The main indications for revision were implant breakage, deformity progression and infection.

Key words : adult deformity, scoliosis, revision surgery

LS(Ⅳ)-2

The importance of bone strength in surgeon's perspective

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Osteoporotic hip and spine fracture is a serious medical problem and a notable burden on the healthcare system. Many patients will experience significant functional loss, poor health-related quality of life (HRQoL), and higher mortality rate.

Bisphosphonates are pyrophosphate analogues in which the oxygen bridge has been replaced by a carbon with various side chains. Although the detailed mechanism of action of bisphosphonates has not been elucidated, it is clear that at the tissue level all active bisphosphonates inhibit bone resorption, bone turnover, and, therefore, bone loss. The effect is due to a decrease in the generation of new bone remodeling units. At the cellular level, bisphosphonates inactivate osteoclastic bone resorption directly and/or indirectly. They induce the disappearance of osteoclast ruffled border and inhibit proton extrusion.

Teriparatide is a recombinant form of parathyroid hormone consisting of the first (N-terminus) 34 amino acids, which is the bioactive portion of the hormone. It is an effective anabolic agent used in the treatment of some forms of osteoporosis. It is also occasionally used off-label to speed fracture healing. Teriparatide is identical to a portion of human parathyroid hormone (PTH) and intermittent use activates osteoblasts more than osteoclasts, which leads to an overall increase in bone.

Teriparatide is the only anabolic agent indicated for use in postmenopausal women with osteoporosis at a high risk for fracture or with a history of osteoporotic fracture, patients with multiple risk factors for fracture, and for patients who have failed or are intolerant to other available osteoporosis therapy.

S(I)-1

Minimal invasive surgery for osteoporotic vertebral compression fracture including kyphoplasty and vertebroplasy

Toshiyuki Takahashi, Junya Hanakita, Yusuke Funakoshi, Manabu Minami, Yasufumi Ohtake, Takeshi Kawauchi, and Nobuhiko Nakajima

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The number of patients with osteoporotic vertebral compression fractures (VCFs) in the thoracolumbar spine has been increasing in line with our aging society. These fracture may result in significant morbidity and has become a major health concern and a serious social problem. Patients with an osteoporotic VCFs can commonly show a good clinical course after conservative treatment in the form of activity modification, analgesics, and brace therapy. However, up to 30-40% of patients with acute fracture develop unfavorable outcome caused by prolonged low back pain. In the last few decades, percutaneous vertebroplasty and subsequently kyphoplasty have emerged as minimally invasive treatment and resulted in a major paradigm shift in the management of these patients. Although there is still controversy about the appropriate surgical indication and timing, several comparative studies have supported that veretbroplasty and kyphoplasty are superior to conservative treatment with significant pain relief and improvement of health related QOL. In our institute, 420 patients were diagnosed as osteoporotic VCFs from January 2011 to December 2015. In total, 159 patients were hospitalized for treatment, and 62 patients were discharged from our department after conservative treatment. 91 balloon kyphoplasty (77 cases), 19 long-segment posterior fixations were performed. Surgical indication of long-segment posterior fixations is delayed neurological deficits subsequent vertebral collapse or instability. Clinical scores and radiological findings of the patients who underwent BKP or long-segment posterior fixation were significantly improved. And minor neurological problem such as radiating pain after osteoporotic VCFs were successfully treated by only BKP. As an option among minimal invasive intervention for treatment of osteoporotic VCFs, clinical apply and effect by other procedures such as thrmorhizotomy and pulsed radioprequency for incapacitating spinal or root pain are also discussed.

S(I)-2

Anterior vs. posterior surgery for compression fracture with myelopathy

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Osteoporotic compression spine fractures are associated with morbidity and mortality, and have a different clinical course and outcomes when compared to spinal fractures occurring in the younger patients. Progressive collapse of the fractured vertebra is associated with severe pain and neurologic complications. Although there are various accepted surgical techniques for single level corpectomy in case of osteoporotic compression thoracolumbar spinal fractures, the choice depends on the surgeon's preference, and the combined posterior-anterior approach has been widely employed. However, anterior corpectomy and fixation is technically demanding and has several disadvantages such as massive blood loss and high morbidity. Therefore, I want to focus on the posterior decompression and fixation. We tried the posterior approach only for decompression and circumferential reconstruction using two small titanium mesh cages.

All patients suffered from severe kyphotic deformity with or without neurological deficits. After unilateral or bilateral PSO, upper and lower discectomy and total corpectomy were performed. 360-degree reconstruction with two small titanium mesh cages insertion and correction of kyphosis by posterior transpedicular screw fixation were performed.

All patients experienced pain relief after the procedure. There was no intraoperative complication such as root injury and newly developed neurological deficit after surgery and during follow-up period. A Successful restoration for kyphotic change was achieved in all patients. There was no newly developed kyphotic change on follow-up radiographs.

Posterior lumbar corpectomy and anterior reconstruction with two small titanium mesh cages in combination with posterior instrumentation is a reliable, effective and safe treatment option and can be a good alternative modality for various spinal disease. Circumferential reconstruction and correction of kyphosis can be possible with this less invasive surgical technique without additional ventral approach. Long-term follow-up study with large number will be required to clarify the effectiveness of this technique in the future.

S(I)-3

Role of adult deformity surgeries in osteoporotic patients. How to prevent complications

Anthony Sin

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S(I)-4

How to achieve strong mechanical stability in osteoporotic spine

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Osteoporosis is a clinical problem that is characterized by decreased bone strength and density. It predisposes patients to compression fractures and debilitating spine deformities. Several complications are associated with spine surgery in patients with osteoporosis, such as pseudoarthrosis, hardwaire failure or adjacent segment degeneration. A multidisciplinary approach to improve surgical outcome is encouraged. Several surgical techniques have been developed to treat osteoporosis-related spine diseases, including posterior instrumentation with fusion. However, achieving fixation and fusion in these patients can be difficult secondary to poor bone quality. Augmentation methods to improve pedicle screw fixation including bioactive cement augmentation, bicortical purchasing, cortical screw fixation have been introduced. In this presentation, we review methods to achieve strong biomechanical stability in osteoporotic spine to have better clinical outcomes.

S(II)-1

Evolution of endoscopic thoracic discectomy

Hae Dong Jho

Drexel University and Allegheny General Hospital, PA, USA

S(II)-2

Can full endoscopic spine surgery replace open surgery for lumbar decompression?

Jin-Sung Kim

Catholic University, Korea

S(II)-3

Target oriented techniques in endoscopic spine surgery – selection of approach according to various types of disc herniation

Kyung-Chul Choi

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Percutaneous endoscopic lumbar discectomy (PELD) is a minimally invasive spinal technique that has several advantages over open discectomy, including less paravertebral muscle injury, preservation of bony structure and rapid recovery. PELD has gained popularity for removal of herniated disc (HD) material over the past few years since Kambin introduced the percutaneous posterolateral approach in 1983. Remarkable evolution of endoscopic techniques and instrumentation lead to successful outcomes comparable to conventional open surgery. PELD has been applied to various types of disc herniation and the indication has been expanded. I propose various strategies for PELD according to various types of disc herniation.

- Migration

Herniated disc (HD) with migration was classified into four zones: low-grade up/down and high-grade up/down based on the extent and direction of migration. High-grade up HDs can be removed with the outside or outside-in techniques from L1-2 to L4-5. High-grade down HDs can be removed using the outside technique with additional foraminoplasty. Low-grade up/down HDs with disc space continuity can be removed using the inside-out technique. Without continuity, the outside technique or foraminoplasty may be needed. Meanwhile, at the L5-S1 level, interlaminar PELD is used to treat high-grade up/down HD with migration.

- Central disc herniaton or huge central disc herniation

The approach angle is approximately 15~20° from the horizontal plane on the axial section, which is much lower than that of the existing posterolateral transforaminal approach. During the procedure, if herniated discs are small in size, there may be risks of approach-related complications such as dural tears or nerve root injuries. However, a large disc can be safely removed because the thecal sac and nerve root have dorsally migrated because occupation of the epidural space by the ruptured disc. The needle tip targets the posterior border of the vertebral body line on the lateral view (intra-annular subligamentous approach), whereas the epidural space, dural sac, and nerve root are located on the more dorsal side due to the bulging of the disc.

- Foraminal/extraforaminal disc herniation

The approach angle is steeper than conventional posterolateral approach. The entry point is about 7~10cm depending on disc location. The approach angle is about 30~50°. In case of foraminal/extraforaminal disc herniation, invading the axilla of the exiting root, the area available for cannula insertion increases due to the lateral displacement of the corresponding nerve root. It is concerned about postoperative dysesthesia with manipulation of exiting nerve root. We should use a radiofrequency probe, laser and working cannula carefully.

Proper surgical indications and good working cannula position are important for successful PELD. PELD techniques should be specifically modified to remove the disc fragments in various types of HD.

S(II)-4

Oblique lateral interbody fusion for L5–S1 level; rationale and technique

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Lateral lumbar interbody fusion (LLIF) is a minimally invasive technique approaching retroperitoneal space, which was designed to apply at L1-L5 levels. The interbody fusion at L5-S1 was done with transforaminal interbody fusion, posterolateral interbody fusion, or anterior lumbar interbody fusion before the introduction of OLIF51, an oblique lumbar interbody fusion of L5-S1 level through retroperitoneal space in a lateral position.

The skin incision for OLIF51 is made between two lines, parallel to S1 endplate and vertical from the center of L5-S1 disc space, at two fingerbreadths anterior to the iliac crest. After blunt dissection of the three abdominal muscle layers, approach to the retroperitoneal space by retracting the peritoneum. Dissect the annular surface of the L5-S1 disc and retract the peritoneum and left common iliac vessels with three selfretractors.

The annular window is made at the left anterolateral portion, and endplate preparation is done.

According to the size determined by a trial, a proper cage filled with graft material is inserted into the center of disc space in an oblique direction. Percutaneous pedicle screw system is used for fixation of L5-S1 level posteriorly.

Indications are same as other types of interbody fusion technique. Acute infection and history of previous operation of retroperitoneal space are contraindications. Advantages are an increased stability by using a wide cage, less invasiveness with less bleeding, and possible indirect decompression. The OLIF51 can make high lordotic angle by using a cage with a high angle, 12 degrees. The patient position is right lateral decubitus wich is same as the LLIF for lumbar spine, and a lone level interbody fusion from L1 to S1 can be done in a single position. There may be an intraoperative problem of bleeding form the common iliac vein, which can be prevented by careful dissection. No major complication was noted in our OLIF51 series.

The OLIF51 is a minimally invasive technique for L5-S1 level interbody fusion providing indirect decompression, high mechanical stability, and high lordotic angle at the level. The combination of LLIF and OLIF51 also seems to be suitable for long level fusion in the patients with a degenerative deformity.

Free Paper Session I Lumbar Spine Disease

Ho Shin (Sunhan Hospital)
Shinsuke Suzuki (Sendai Medical Center, Japan)

2016_S0011	Usefulness of non-penetrating titanium clips for dural closure in spinal surgery **Kiyoshi Ito (Shinshu University)**
2016_S0041	Changes in HbA1c levels and body mass index after successful decompression surgery in patients with type 2 diabetes mellitus and lumbar spinal stenosis: Results of a two-year follow-up study **Kyoung-Tae Kim, Joo-Kyung Sung, Dae-Chul Cho, Chi-Heon Kim (Kyungpook National University Hospital)**
2016_S0174	Lumbar root diagnostic Radiofrequency sensory stimulation in order to find the symptomatic lumbar root in multiple lumbar stenosis **Suk-Hyung Kang, Jin Seo Yang, Yong-Jun Cho (Hallym University Medical Center)**
2016_S0148	A comparative radiographic analysis of fusion rate between L4-5 and L5-S1 in a single level posterior lumbar interbody fusion **Sang Hyun Han, Ki-Jeong Kim, Seung-Jae Hyun, Tae-Ahn Jahng (Seoul National University)**
2016_S0157	Stand-alone lateral recess decompression without discectomy in patients presenting with claudicant radicular pain and MRI evidence of lumbar disc herniation. A prospective study **Ravish Patel, Arvind Kulkarni (Bombay Hospital, India)**
2016_S0170	Comparative analysis between different 3 lumbar interbody fusion techniques (ALIF, LLIF, PLIF) in L4-5 spondylolisthesis with regard to the development of adjacent-segment degeneration (ASD). **Chul-Woo Lee, Kang-Jun Yoon (St.Peter's Hospital)**
2016_S0201	The efficacy of hydroxyapatite coated polyetheretherketone cage for transforaminal lumbar interbody fusion : preliminary report **Seung Ho Yoo (Yonsei University)**
2016_S0147	The Effect of Teriparatide Started Immediately after Lumbar Fusion Operation on the Pedicle Screw Loosening in the Osteoporotic Patients **Jae Wook Kim, SeungWon Park, Youngbaeg Kim, Jinbum Kim (Chung-Ang University)**
	Complication of lateral interbody fusion at L4-5 **Brian Kwon (New England Baptist Hospital, MA, USA)**
2016_S0094	Minimal Invasive Non-fusion Technique for Noncontiguous Burst Fracture **Bong Ju Moon (Chonnam National University Hospital)**

Free Paper Session II Cervical Spine

Nobuyuki Shimokawa (Tsukazaki hospital, Japan)
Krishna Sharma (Nepal Medical College, Kathmandu, Nepal)

2016_S0205	The formation Extragraft bone bridging after anterior cervical discectomy and fusion: Finite element model analysis **Jong-Myung Jung, Chun Kee Chung (Seoul National University)**
2016_S0043	Preoperative cervical sagittal imbalance provokes C1 anterior arch fracture after C1 laminectomy **Shinji Kumamoto (Fukuoka Kinen Hospital, Japan)**
2016_S0045	Surgical Treatment for Degenerative Cervical Spinal Disease in Over 80 years old Patients **Takahiro Tanaka (Yokohama City Univercity)**
2016_S0050	Cervical osteoplastic degeneration observed in professional wrestlers **Manabu Sasaki, Shunji Asamoto, Masao Umegaki, Kazuyoshi Tamura, Katsumi Matsumoto (Iseikai Hospital, Japan)**
2016_S0062	Advantages of Minimally Invasive Spinal Procedure: 3-cm Skin Incision and 60 minutes of Cervical Expansive Open-door Laminoplasty offers less invasive experience **Shigeo Ueda (Katano Hospital, Japan)**
2016_S0128	Finite Element Analysis of Osteoplastic Anterolateral Oblique Vertebrotomy for Cervical Ossification of the Posterior Longitudinal Ligament **Daisuke Umebayashi, Yu Yamamoto, Yasuhiro Nakajima, Masahito Hara (Inazawa Municipal Hospital, Japan)**
2016_S0169	Characteristics of patients with herniated discs at the cervicothoracic junction **Sung Uk Kuh (Yonsei University)**
2016_S0211	Changes of Sagittal vertical axis (SVA) and T1 slope after multiple level cervical posterior fixation-comparison with radiologic changes and clinical outcome **Sung Bum Kim (Kyung Hee University)**
2016_S0198	Quantitative Alterations of Signal Intensity as a Prognostic Factor in Cervical Compressive Myelopathy **Jun Jae Shin (Inje University)**
2016_S0223	The longitudinal change of segmental ROM following cervical artificial disc replacement **Jung Hyeon Moon (Seoul National University)**

Flash Presentation Session I

Yong-Tae Jung (Inje University)
Eun-Sang Kim (Sungkyunkwan University)
Moon Jun Sohn (Inje University)

2016_S0055	Analysis of associating factors with C2-7 sagittal vertical axis after 2-level anterior cervical fusion: Comparison between plate augmentation and stand-alone cages **Hong Joo Moon, Woo-keun Kwon, Joo Han Kim, Youn-kwan Park (Korea University Guro Hospital)**
2016_S0193	Hemorrhagic and granulomatous ligamentum flavum cyst of lumbar Spine, Analysis of clinical and radiologic characteristics **Dong Hwa Heo, Choon Keun Park (The Leon Wiltse Memorial Hospital)**
2016_S0156	Surgical results of pedicle subtraction osteotomy (PSO) in patients with sagittal imbalance **Sung-Min Kim (Kyung Hee University)**
2016_S0105	Contribution of fibronectin type III 9-10 and 17-β estradiol to the adhesion and proliferation of mesenchymal stem cell and osteoblast of rats and MC3T3-E1 osteoblast cells **Sung Bae Park, Chun Kee Chung (Seoul National University)**
2016_S0115	Advanced Studies of the Optically Transparency of Rat Central Nervous System by Tissue Clearing Techniques **Ji Won Woo, Yong Eun CHO (Yonsei University)**
2016_S0164	Effect of progesterone on the expression of δ-opioid receptor in chronic neuropathic peripheral nerve lesions **Bambang Priyanto (West Nusa Tenggara Public Hospital, Indonesia)**
2016_S0175	Evaluation of biosafety of adult human multipotent neural cells for transplantation in spinal cord injury **Kee Hang Lee, Sun Ho Lee, Hyun Nam (Sungkyunkwan University)**
2016_S0187	Complications after Bone Cement Augmented Pedicle Screw Instrumentation in Elderly Osteoporotic Patients **Chang Il Ju (Chosun University)**
2016_S0113	Modified Iliac Screw Fixation: Technique, Its Clinical Application, and biomechanics validation **Se Il Sohn, Chun Kee Chung, Chi Heon Kim, Inbo Han (CHA University)**
2016_S0126	The Impact of Thoracolumbar Back Muscle Volume on Proximal Junctional Kyphosis after Spinal Deformity Correction **Do Keun Kim, Inbo Han (Inha University)**

2016_S0044	What effects does necrotic area of contrast-enhanced MRI in osteoporotic vertebral fracture have on further compression and clinical outcome? **Young Seok Lee (Gyeongsang National University)**
2016_S0056	Safe margin beyond dens tips to ventral dura for anterior odontoid screw fixation : Analysis of three-dimensional CT scan of Odontoid process **Dae-Chul Cho, Dong-WooK Shin, Kyoung-Min Lee, Kyoung-Tae Kim, Joo-Kyung Sung (Kyungpook National University)**
2016_S0099	Paraspinal Muscle Sparing Versus Percutaneous Screw Fixation : a Comparative Enzyme Study of Tissue Injury During the Treatment of L4-L5 Spondylolisthesis **Se Ho Jeong, Seok Won Kim (Chosun University)**
2016_S0144	One stage posterior minimal laminectomy and video-assisted thoracoscopic surgery (VATS) for removal of thoracic dumbbell tumor **In Ho Han, Hyo Yeoung Ahn, Byung Kwan Choi (Pusan National University)**
2016_S0151	Differences in Multimodality Intraoperative Neurophysiological Monitoring Changes Between Spinal Intramedullary Ependymoma and Hemangioblastoma **Ki-Jeong Kim, Kyeong Seok Park, Sang Hyun han, Ji Soo Ha, Ho Yong Choi, Seung-Jae Hyun, Tae-Ahn Jahng (Seoul National University)**
2016_S0177	Clinical Outcome of Ultra-early Decompression for Traumatic Cervical Spinal Cord Injury **Kyoung-Suok Cho, Sang-Bok Lee, Min-Soo Kim, Pil-Woo Huh (Catholic University)**
2016_S0199	Role of Surgery in Spine Tuberculosis **Eko Subagio (Airlangga University, Indonesia)**
2016_S0204	The effect of perioperative radiation therapy (RT) on spinal bone fusion following spine tumor surgery **Ung-Kyu Chang (Korea Cancer Center Hospital)**
2016_S0207	Surgical strategies for improving surgical outcome for patients with intramedullary ependymoma **Yong Eun Cho, Kyung Hyun Klm, Sung Uk Kuh, Sung Uk Kuh, Keun Su Kim, HanJoo Lee(Yonsei University)**
2016_S0145	Usefullness of percutaneous pedicle screw fixation for thoracolumbar burst fracture **Tae Hoon Kim, Jaejoon shim (Soonchunhyang University)**

S(Ⅲ)-1

Timing of Surgery for Asymptomatic Cervical OPLL

Chen Zan

Capital Medical University

S(Ⅲ)-2

Anterior approach

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Anterior decompression and fusion (ADF) for ossification of the posterior longitudinal ligament (OPLL) is technically demanding and associated with complications. Although various factors affecting clinical outcome have been investigated in posterior decompression, prognostic factors of ADF remain unclear. Between 2005 and 2012, 913 patients underwent decompression surgery for cervical OPLL at our institution. Among them, 131 who underwent ADF and 221 who underwent laminoplasty were enrolled. Inclusion criteria were (1) diagnosis of OPLL; (2) cervical compressive myelopathy; and (3) no trauma, infection, tumor, or previous surgery. Finally, 71 patients with ADF and 64 patients with laminoplasty were enrolled in this study (mean follow-up, 48 vs 41 months). Neurologic assessment was conducted using the Japanese Orthopedic Association (JOA) scoring system for cervical myelopathy. Rate of neurologic improvement was calculated by comparing preoperative and postoperative JOA scores. We investigated the effects of such variables as age, gender, body mass index (BMI), presence of diabetes mellitus (DM), smoking history, type of OPLL, shape of the ossified lesion, occupying ratio of OPLL, presence of intramedullary increased signal intensity (ISI) on magnetic resonance imaging (MRI), and sagittal alignment of the cervical spine on surgical outcome. In patients with an occupying ratio >60% or with presence of ISI on MRI, ADF yielded better surgical outcome than laminoplasty. A higher ISI grade and a higher occupying ratio were significantly associated with a lower recovery rate. Older age also was associated with a lower recovery rate. Anterior decompression and fusion has favorable outcome in patients with an occupying ratio >60% or with presence of ISI on MRI. Presence of higher ISI grade, higher occupying ratio, and older age were associated with a poor long-term surgical prognosis. Therefore, evaluating ISI and occupying ratio on preoperative MRI is important for selecting the appropriate surgical approach and for predicting clinical outcome after surgery for cervical compressive myelopathy due to OPLL.

S(Ⅲ)-3

Posterior approach of OPLL–Laminoplasty

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Laminoplasty was introduced as an alternative surgical method to wide laminectomy to cervical OPLL in 1980s, and has gained popularity as a main stay of the surgical treatment of OPLL for over 30 years. Cervical OPLL is one of the unique pathological conditions causing myelopathy or radiculopathy. Asymptomatic patients or patients with mild symptoms are generally treated with conservative treatment, however patients with moderate or severe myelo-radiculopathy need surgical decompression of the spinal cord. Anterior approach provides direct decompression of the spinal cord by removing OPLL, and gives a good outcome. This is a basic and ideal surgical method to OPLL, but carries certain risk of dural and nerve injury resulting in CSF leakage with deterioration of myelopathy. This serious complication is mainly due to dural and arachnoidal ossification. Unlike anterior approach, posterior approach is relatively safe and effective surgical method. Posterior approach shows good outcome by getting wide decompression. Complications include axial pain, C5 palsy, limitation of ROM, kyphotic deformity and more. Laminoplasty reduced these complications in the points of both frequency and degree, and many modified and new techniques have been considered for less-invasiveness. Maximum preservation of the paraspinous muscles, avoidance of bone harvesting at the different site and titanium spacer and screw system were proposed.

In this presentation, the role of laminoplasty to cervical OPLL is discussed with review of references.

S(Ⅲ)-4

Laminectomy and Posterior fusion

Youn-Kwan Park

Korea University, Korea

S(Ⅳ)-1

ICG image-guided surgery of spinal intramedullary tumors: Benefits and limitations

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Introduction : Developments in microsurgical instruments, medical equipment and neurophysiological monitoring techniques have contributed the safety and precision of spine surgery. Intraoperative image guidance using near-infrared indocyanine green videoangiography (ICG-VA) has been used to provide real-time angiographic images during brain tumor or vascular surgery. Here, we demonstrate the utility of ICG-VA for intraoperative vascular flow assessment in the surgery of spinal intramedullary tumors.

Materials & Methods : ICG-VA has been utilized in 49 of 73 cases of spinal intramedullary lesions (67%) that were treated surgically over the past 5.5 years (2011-present). ICG was injected intravenously just prior to each ICG-VA. The dose of ICG was 0.1–0.3 mg/kg, with a maximum dose of 5 mg/kg/d. Informed consent for the use of ICG was obtained from the patient before surgery.

Results : There were no complications or side-effects related to ICG-VA. All angiographic images were well integrated into the microscopic view. ICG angiographic images could be divided into arterial, capillary and venous phases, and the image resolution was in high quality, even for small perforators that are usually almost impossible to see using standard intraoperative digital subtraction angiography. Intraoperative ICG-VA was helpful for localization of normal spinal arteries and veins, assessment of the posterior spinal venous

circulation, or differentiation of feeding arteries, tumor stain and draining veins.

Conclusions : Intraoperative vascular flow assessment using ICG-VA was easy, repeatable, and practical without any significant procedure-related risks. ICG-VA can be used for careful analysis of spinal microvascular flow or anatomical orientation, which is necessary to ensure safe and precise surgery for spinal intramedullary tumors. Analysis of the flow dynamics of spinal microvasculature using ICG-VA would enable us to achieve an additional level of safety as well as precision with the surgical procedure. Benefits and limitations of ICG image-guided surgery will be discussed with video presentation of illustrative cases.

Keywords : Cavernous malformation, Ependymoma, Hemagioblastoma, Indocyanine green videoangiography, Spinal intramedullary tumors

S(Ⅳ)-2

Management of adult non-glial intramedullary non-cord tumors

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Intramedullary spinal cord tumors are rare, accounting for about 4% of all CNS tumors and for 20% of all intraspinal tumors in adults. Most, around 80-90%, of the intramedullary tumors are glial tumors, which include ependymoma and astrocytoma. The non-glial intramedullary tumors are rarer, among these hemangioblastoma are most common.

Treatment of intramedullary tumor primarily involves resection, while radiotherapy and chemotherapy are often reserve for tumor recurrence, high grade tumors, infiltrating tumors, or resection being difficult or dangerous. The effect of chemotherapy and radiotherapy are non-effective or has long term complications in most of the cases. Right now, resection is generally considered a good indicator of good outcome. With modern microsurgical instruments, operative microscope, and intraoperative sensory and motor evoked potential monitoring, resection can be performed safely. Here we will share our experience in resection of non-glial intramedullary tumors like hemangioblastoma, cavernous hemangioma, and solitary metastatic lung tumors, which show clear dissection plane. In addition, we will show our intramedullary lipoma cases, which have no clear margins, yet require partial resection.

S(Ⅳ)-3

Intradural Vascular Tumors

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Purpose : Intradural vascular tumors are uncommon lesions that can affect any age group or sex. However, numerous tumors exist and the clinical course of each tumor varies. The following article addresses the various management options and outcomes in patients with intravascular tumors.

Materials And Methods : The authors reviewed patients with intradural vascular tumors, which include spinal arteriovenous malformation, cavernous malformation, hemangioblastoma, epidural capillary hemangioma and hemangioendothelioma.

Results : Each intravascular tumors have specific imaging characteristics, which help in the clinical decision-making. A comprehension of the tumor pathology and the clinical course associated with each tumor can allow for the proper surgical and nonsurgical management of these tumors, and reduce any associated morbidity and mortality. Recent advances in the operative management of such lesions have increased the success rate of tumor removal while minimizing iatrogenic-related trauma to the patient and, in tandem, improving patient outcomes.

Conclusion : Awareness and understanding of intradural vascular tumor is imperative to design proper management and obtain optimal patient outcomes. Meticulous operative technique and the use of surgical adjuncts are essential to accomplish proper tumor removal, diminish the risk of recurrence, and preserve neurologic function. Operative management of intradural vascular tumor should be individualized and based on tumor type, location, and dimensional extensions.

S(Ⅳ)-4

Primary Spinal Tumors

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With advancements in spinal imaging and reconstruction/stabilization techniques, surgical treatment of primary spine tumors has improved. Proper diagnosis and careful preoperative multidisciplinary planning are paramount when dealing with patients harboring these lesions. Histopathologic diagnosis is critical to understanding the natural history, aggressiveness, and likelihood of the tumor to respond to chemotherapy, radiation, or other adjuvant treatments. A patient-specific treatment strategy should be based on histology and spinal column location aiming to preserve as much neurologic function as possible, ensure spinal stability, and improve oncologic prognosis. Surgical planning requires knowledge of the tumor grade; its relationship with surrounding osseous, vascular, and neural structures; and the presence or absence of systemic metastasis. And a multidisciplinary treatment team can create a definitive approach aiming for maximal oncologic control while preserving functional status and spinal stability.

We attempts to define a strategy to stage, plan, and treat primary spine tumors based on histology and location in this session.

Free Paper Session III Basic Research and deformity

Kyung-Suok Cho (Catholic University)
Manabu Sasaki (Iseikai Hospital, Japan)

2016_S0010	Complications encountered in surgical management adult spinal deformities- Prevention and management- a retrospective study in 193 patients **Hiteshkumar Modi, Bharat Dave, Shakti Goel (Zydus Hospital, India)**
2016_S0017	Frequency of PICA end Vertebral Artery, Potential Risk for Cervical Spine Surgery **Takeshi Aoyama, Naoshi Obara (Teine Keijinkai Hospital, Japan)**
2016_S0065	Management of spinal Tuberculosis (TB) in developing country **Mahadewa Tjokorda (Indonesia Spine Society)**
2016_S0111	A Distal Start Point Facilitates Safer Insertion of S2 Iliac Screw Fixation **Jin Hoon Park, Choi Stephen Lewis, Sam Keshen (Ulsan University)**
	Advantages of MIDLF (Cortical Bone Trajectory Techniques), MI-TLIF, OLIF and PLIF **Cheng-Hsing Kao (Chi-Mei Medical Center, Taiwan)**
2016_S0116	Morphometric study of the lumbar posterior longitudinal ligament **Sang Beom Lee, Jae Won Doh, Chang Jae Chil (Armed Forces Dae Gu Hospital)**
2016_S0112	Prevalence of sarcopenia and its implication of obesity and osteoporosis in each definitions according to the different skeletal muscle mass indices : a population-based sectional study in elderly Korean people **Byeong Woo Kim, Sunkyu, Do Heum Yoon, Keung Nyun Kim, Seong Yi, Dong Ah Shin, Dong Youp Lee, Poong Gee Ahn, Su Yeon Heo, Yoon Ha (Champodonamu Hospital)**
2016_S0171	Dose prophylactic vertebroplasty on proximal junctional vertebra have effects to prevent Proximal junctional vertebral compression fracture? **Jee-Soo Jang, Sung Kyun Chung, Il-Tae Jang, Hyeun Sung Kim, Jeong-Hoon Choi, Jung Sup Lee, Jeong Hoon Kim (Nanoori Hospital)**
	The effect of stem cell mobilization and chemokine-directed homing on the development of fusion in an ovine anterior cervical spine model **Daniel Park (William Beaumont Hospital, MI, USA)**
	Entrepreneurship in Spine Surgery in the US **Doug Won (Surgical Treatment And Recovery Medical Center (STAR), TX, USA)**

Free Paper Session IV Spinal Tumor

In-Soo Kim (Keimyung University)
Yung-Hsiao Chiang (Taipei Medical University)

2016_S0190	The Novel Comparison of Radiologic Characteristics and Surgical Results in Ossification of the Ligamentum Flavum (OLF) ; Dural Laceration, Revision Rates due to Cerebrospinal Fluid (CSF) Leakage **Sung Uk Kuh (Yonsei University)**
2016_S0184	Short time follow up of denosumab treatment for osteoporosis **Takahiro Miyahara (Kurume University, Japan)**
2016_S0057	The surgery of intramedullary spinal cord tumors focusing on the procedure of tumor dissection **Hidetoshi Murata (Yokohama City Univercity)**
2016_S0063	Muscle motor evoked potential monitoring has limited abiity to predict postoperative weakness during surgery for intramedullary tumors **Ryu Kurokawa (Dokkyo Medical University Hospital, Japan)**
2016_S0042	Modified Galvestone Procedure for sacrum tumor **Tommy Numberi (Sardjito Hospital, Indonesia)**
2016_S0123	A Nationwide Study of Surgery and Stereotactic Radiosurgery in Newly Diagnosed Spine Metastasis Population **Seil Sohn, Chun Kee Chung, Moon Jun Sohn, Ung-Kyu Chang (CHA University)**
2016_S0150	Feasibility study of D-wave monitoring in spinal cord tumor surgery; Preliminary report **Ji In Kang, Sung Yi, Do Heum Yoon, Keung nyun Kim, Yoon Ha, Dong Ah Shing (Yonsei University)**
2016_S0153	Occipito-cervical fusion in huge clival chordoma; before or after tumor resection? **Dal Sung Ryu, Hunho Park, Changki Hong, Kyusung Lee, Dongkyu Chin (Yonsei University)**
2016_S0185	Survival period and affecting factors of surgical treatment of cervical metastasis : Is there any possibility that surgery improves the survival period of cervical metastasis ? **Jong Hyeok Park, Sun Ho Lee (Sungkyunkwan University)**
2016_S0120	Survival analysis and prognostic factors for spinal cord glioblastoma surgery; Based on the 14 years of registry from single institution **Seong Yi, Keungnyun Kim, Doheum Yoon (Yonsei University)**

Flash Presentation Session II

Chung-Kee Chough (Catholic University)
Jae-Chil Chang (Soonchunhyang University)
Seung-Myung Moon (Hallym University)

2016_S0019	3-Years Outcome of Microdiscectomy via Paramedian Approach for Lumbar Foraminal or Extraforaminal Disc Herniations in Elderly Patients Over 65 Years Old **Dong Woo Yoo, Ikchan Jeon, Sang Woo Kim, Chang Gi Yeo (Yeungnam University)**
2016_S0140	Clinical examination about poor results especially for leg symptoms in decompressive surgery for intervertebral foramen lesions caused by lumbar degeneration **Masahito Hara, Daisuke Umebayashi, Yuu Yamamoto, Yasuhiro Nakajima (Inazawa Municipal Hospital, Japan)**
2016_S0154	Comparison of the radiologic outcomes obtained with hybrid- versus rigid- fusion system in multilevel lumbar fusion surgery : preliminary, matched cohort study **Man Kyu Choi, Keun Su Kim (Yonsei University)**
2016_S0012	Biomechanical effects of hybrid stabilization using interspinous device versus pedicle screws on the risk of proximal adjacent segment degeneration following the fusion on the lumbar spine **Chang-Hyun Lee, Youngeun Kim (Ilsan Paik Hospital)**
2016_S0158	The effect of sacropelvic parameters on lumbar disc herniation on L4-5 vs L5-S1 **Yong Jun Jin (Seoul Paik Hospital)**
2016_S0028	Lumbar peripheral disease treatment for the intractable low back pain of the very elderly patients: 2 case reports **Rinko Kokubo, Kyongsong Kim, Toyohiko Isu, Daijiro Morimoto, Naotaka Iwamoto, Shiro Kobayashi, Akio Morita (Chiba Hokuso Hospital, Japan)**
2016_S0069	Predictors of reoperation after microdecompression in lumbar spinal stenosis **Gwang Soo Lee (Soonchunhyang University)**
2016_S0013	Percutaneous biportal endoscopic surgery for lumbar degenerative diseases **Jung Hyun Lee (The Leon Wiltse memorial hospital)**
2016_S0085	Piriformis syndrome after lumbar degenerative spine surgery **Masahiko Akiyama (Sapporo Tesishinkai Hospital, Japan)**

2016_S0086	Referential outcomes after conventional 1 or 2 level PLIF with bilateral Smith-Peterson Osteotomy (SPO) using autologous iliac bone **Woo-Keun Kwon, Hong Joo Moon, Youn-Kwan Park, Joo Han Kim (Korea University)**
2016_S0090	Surgery of spinal hemangioblastoma **Mitsuru Satoc (Yokohama City Univercity)**
2016_S0100	Implant Removal after Percutaneous Short Segment Fixation for Thoracolumbar Burst Fracture: Does it Preserve Motion? **Pius Kim, Seok Won Kim Kim (Chosun University)**
2016_S0125	Treatment strategy for unstable cervical spine injury accompanied by traumatic intracranial hemorrhage **Kazunori Shibamoto, Koshi Ninomiya (Saso Hospital, Japan)**
2016_S0208	The Relationship between the Deep Paraspinal Muscles of the Cervical Spine and Fusion Rate after Anterior Decompression and Fusion **Sung-Bum Kim, Man-Kyu Choi (Kyung Hee University)**
2016_S0209	Natural history of subclinical patients with severe OPLL: which patients could we reassure for observation? **Yong Eun Cho, Kyung Hyun Klm, Sung Uk Kuh, Dong Kyu Chin, Keun Su Kim, HanJoo Lee (Yonsei University)**
2016_S0083	Motoric Evaluation of Patients with Ossification Of Posterior Longitudinal Ligament (OPLL) Post-Open Door Laminoplasty With Titanium Mesh-Preliminary Study **Adiguno Suryo Wicaksono, Wiryawan Manusubroto (Dr. Sardjito Hospital, Indonesia)**
2016_S0104	Corner remodeling as orthotopic ossification after cervical TDR **Sung Bae Park, Chun Kee Chung (Seoul National University)**
2016_S0196	Comparison of Bioglass ceramic to allobone cage in anterior cervical discectomy and fusion with anterior plate fixation. 12month follow up **Du Su Kim (Yonsei University)**
2016_S0018	Analysis of spinal conditions requiring salvage surgery in the patients with multi-segments cervical OPLL **Ik Chan Jeon, Sang Woo Kim, Dong Woo Yoo, Yong Eun Cho (Yeungnam University)**
2016_S0091	Decompression alone versus fusion for pyogenic spondylodiscitis: Which is appropriate? **Sung Hyun Noh, Ho Yeol Zhang, Sang Hoon Lee, Young Sub Kwon, Yun Ho Lee, Kook Hee Yang (N.H.I.S Ilsan Hospital)**

The Translation in Spine Care

ASIA SPINE 2016

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The Translation in Spine Care

ASIA SPINE 2016

S(V)-1

Update on Robotic Spine Surgery

JAE Y. LIM

Atlantic Brain & Spine, VA, USA

S(V)-2

Neuronavigation in Spine Surgery

Kevin Yoo

San Diego Neurosurgery, CA, USA

S(V)-3

Novel spinal surgery methods using 3D printing technology

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Recent progress in 3-dimensional (3D) computer technology has enabled spinal surgeons to make accurate diagnosis and detailed preoperative planning. Spine models in actual size can also be made by 3D plastic printer so that the surgeons can perform preoperative simulation of the procedures. The author introduces two novel applications of this technology; pedicle screw guiding method for cervical/thoracic spine and ordermade titanium spinal stabilization implants. For the screw guiding method, preoperative bone images of the computed tomography (CT) scans were analyzed using 3D multi-planar imaging software and the trajectories of the screws were planned. Plastic templates with screw guiding structures were created for each lamina by 3D design and printing technology. Three types of the templates were made for precise multi-step guidance, and all templates were specially designed to fit and lock on the lamina during the procedure. More than 200 patients were treated with this method and postoperative CT scans showed a mean deviation of the screws from the planned trajectories was less than 1 mm at the coronal midpoint section of the pedicles. The multistep, patient-specific screw guide template system is useful for intraoperative pedicle screw navigation.

For the production of order-made titanium spinal stabilization implants for instable spinal diseases, bone data were also extracted from CT images, and the implants that cover posterior surface of the lamina were designed with industrial 3D technology. The titanium cover for each lamina was connected with artificial joint/spring structure, providing stabilization preserving intervertebral segmental motions. These order made

implants were printed by a 3D titanium printer, and physical property and precision of the products were determined. Animal study showed excellent kinematic capabilities and long term safety, and preclinical studies are now ongoing with the grant from Japanese Ministry of Economy, Trade and Industry. 3D computer technology is making an epoch in spinal surgery and new applications are still to be developed.

Key words : 3D printer, spinal fixation, pedicle screw, spinal stabilization

S(V)-4

What is new bone substitutes more than BMPs?

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The use of bone substitutes in spinal surgery has increased worldwide, and bone grafting is reported as the second most frequent tissue transplantation. An ideal bone substitute should be biocompatible, not evoke any adverse inflammatory response, easily molded into the bone defect within a short setting time, osteoconductive, osteoinductive, resorbable, checkable with optimal radiographic assessment, thermally nonconductive, sterilizable, and readily available at a reasonable cost. While many bone substitutes have been introduced, recombinant bone morphogenetic protein 2 (rhBMP2) is most commonly used to enhance bone fusion after spinal fusion operation. To achieve a therapeutic effect, high doses of rhBMP2 are frequently required; however, the use of rhBMP2 can induce undesirable side effects, such as abnormal soft tissue swelling, dysphagia, heterotopic bone formation, cyst–like bone formation, cancer, and transient postoperative renal insufficiency. Thus, BMP2 substitutes with higher therapeutic potency that generate fewer side effects are desired. Recently, the novel Activin A/BMP2 (AB2) chimera AB204 was shown to much more potently and effectively promote osteogenesis and bone healing than rhBMP2. In fact, a previous study provided in vitro and in vivo evidence that treatment with AB204 completely heals tibial and calvarial defects of critical size in mice at concentrations 10–fold lower than in treatment with rhBMP2. Interestingly, AB204 shares and shows greater activity at the same signaling receptors and Smads as BMP2, according to in vitro signaling assays. Reportedly, AB204 exhibits insensitivity to the BMP2 antagonist Noggin, and its affinity for the Activin/BMP type II receptor ActRII is 100-fold greater than that of BMP2. These results suggest that lower dosages of AB204 can be used to achieve the desired effects of treatment with rhBMP2 with fewer unwanted side effects, as the side effects of rhBMP2 treatment may be inherently associated with activation of the BMP2 signaling pathway. Accordingly, we finished small animal study successfully and have been conducting human trials to be hopefully fully replacement to BMPs with low costs.

S(VI)-1

Osteocytic JAK/STAT signalling controls corticalisation by estradiol and testosterone–dependent mechanisms

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Metaphyseal cortical strength is a predictor of forearm fracture risk. Formation of cortical bone at this site occurs by coalescence of trabeculae arising from the growth plate; a process that is poorly understood.

SOCS3 (Suppressor of Cytokine Signalling 3) provides negative feedback for STAT3 signalling, and osteocytic deletion of SOCS3 in DMP1Cre.SOCS3f/f (f/f) mice showed a sex-divergent bone phenotype at 12 weeks of age: in f/f males trabecular bone volume (BV/TV) was half of w/w ($p<0.05$) while female f/f mice had a 7-fold higher BV/TV ($p<0.001$) than female w/w. This high bone mass in f/f females was most dramatic in the metaphysis where trabecular bone could not be distinguished from highly porous cortical bone, suggesting a defect in corticalisation.

To determine the role of estrogen in this phenotype, male and female f/f and w/w mice were orchiectomized (ORX) or ovariectomized (OVX) at 6 weeks of age, and treated for a further 6 weeks with 17-β-estradiol (E2) or non-aromatizable dihydrotestosterone (DHT) replacement (10μg/kg/day). These doses prevented OVX/ORX-induced bone loss in w/w mice. In female f/f mice,DHT normalised cortical thickness and porosity to w/w levels, while E2 significantly increased cortical porosity. When male f/f mice were treated with E2, the phenotype fully recapitulated that of female f/f mice: cortical bone in the metaphyseal region was highly porous and indistinguishable from trabecular bone.

These data suggest that the process of trabecular coalescence is controlled by SOCS3 in the osteocyte, and indicates that testosterone and estradiol have opposing actions on the process of corticalisation.

S(VI)-2

Stem cell therapy for IVD regeneration

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Mesenchymal stem cells (MSCs) have been considered to hold promise for treating intervertebral disc (IVD) degeneration. However, the different therapeutic efficacy of MSC has been a major problem and so far the derivation of MSCs for use in IVD degeneration has not been optimized. Preclinical study using Wharton's jelly-derived MSCs (WJ-MSCs) was performed in a rabbit model of IVD degeneration. We evaluated the effectiveness of human WJ-MSCs loaded in a cross-linked hyaluronic acid (XHA) scaffold for IVD regeneration according to the levels of transforming growth factor-β (TGF-β) receptor I/activin-like kinase receptor 5 (TβRI/ALK5) and II (TβRII) in a rabbit model. T2 MRI analysis after 12 weeks of transplantation showed significant restoration of disc water content when treated with MSC-highTR loaded XHA as compared to the scaffold only and MSC-lowTR loaded XHA. In addition, morphological and histological analyses revealed the highest IVD regeneration at MSC-highTR loaded XHA transplanted groups. Taken together, clinical study using autologous adipose-derived stem cells are performing in patients with chronic discogenic back pain.

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S(VI)-3

Strategy and present of stem sell therapy for spinal cord injury

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Mortality of spinal cord injury (SCI) was 95% before World War II, but decreased to 5% during WW II by treatment improvement. However, SCI is still intractable disorder and the survived patients suffer from disability. Until now, innovative treatment is not developed, and we are recently paying attention to the availability of stem cells to treat this disorder as stem cells have the characteristics of proliferation, differentiation, restoration of neuronal structures by several mechanisms including secretory factors.

The strategies are different depending on diseases to treat. In cerebral infarction or brain injury, stem cells should function as neuronal precursors replacing neurons to restore new neuronal circuits, and in degenerative CNS disorders such as Parkinson's disease, multiple system atrophy, or ALS, they should suppress neuronal apoptosis as well as replace neurons. On the other hand, they should function as enhancing axon regeneration in SCI.

The authors performed clinical trials with mesenchymal stem cells (MSCs) for chronic SCI treatment as pilot study and following phase III. MSCs were autologous cells harvested from the patients' iliac bone and expanded by culturing for 4 weeks.

Through these studies, we observed not only the evidence of MSCs effects in chronic SCI but also the weakness of pure MSC power regarding therapeutic effect which appeared only in upper extremity (not in lower extremity). Regarding these results, the future strategy should focus on the ways to enhance the effects of stem cells such as materials to be combined with stem cells, gene modification for secreting trophic factors or cytokines based on the safety of MSCs. When these developments progress continuously, successful treatment of SCI comes true.

S(VI)-4

Present and future of the minimally invasive spine procedures

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Minimally invasive disc decompression procedures have been developed over the last 20 years to treat radicular pain caused by disc herniation. Various interventional techniques include chemonucleolysis, ozone, automated percutaneous lumbar discectomy, intradiscal laser discectomy, intradiscal electrothermal therapy, and percutaneous nucleoplasty [1-6]. Introduced in 1999 and promoted to cause minimal collateral thermal damage, Nucleoplasty (ArthroCare Co.,Sunnyvale, CA) is representative of nuclear decompression devices that remove nuclear tissue through introducer needles that is typically inserted into a lumbar disc using a posterior lateral approach. The disadvantage of the Nucleoplasty device, and indeed the disadvantage of most other minimally invasive devices and techniques, is the inability to easily reach the herniated nucleus [7].

In contrast to most percutaneous nuclectomy devices that use a rigid and uncontrolled tip, L'DISQ has a navigable tip that can be curved to the desired angles by rotation of the control wheel. Direct removal of the herniated tissue by the L'DISQ allows access to larger herniations and extruded fragments that are currently considered a contraindication for most percutaneous devices. According to Lee et al., the average VAS fell from 7.08 ± 1.22 to 1.84 ± 0.99 scores at 24 weeks post-procedure. Also, statically significant improvement were noted in the angular change of SLR test, RM, and SF-36 BP score at 24 weeks post-procedure ($p<0.05$). None of the patients reported procedure-related complications [8]. On 2-year follow-up study, the VAS, SLR, RM and SF-36 BP score still showed significant improvement after the procedure ($p<0.05$).

Also, a variety of minimally invasive procedures including mechanical, chemical, and thermal/heat (radiofrequency and laser) methods have been developed to decompress the discs in patients with cervical disc herniation [9,10]. Most currently developed percutaneous decompression devices that use plasma energy are designed to decompress the center of the nucleus rather than the herniated disc directly. Therefore, a comparatively large amount of tissue reduction in the central disc would be required, and excessive disc tissue removal would accelerate the disc degeneration. To overcome this liability, Lee et al. developed a navigable decompression device named L'DISQ®C. The average NRS fell from 7 to 1 at 48 weeks post procedure ($p<0.05$). In addition, statistically significant improvement was noted in the NDI and SF-36 BP scores ($p<0.05$). Lumbar spinal stenosis is another common degenerative spinal condition which is a major cause of pain and functional disability for the elderly. Once various conservative therapies such as physical therapy, home exercise programs, oral analgesics, and epidural injections no longer provide relief, patients may ultimately choose surgery. However, the newly developed treatment, called mild® procedure provides an alternative treatment option via minimally invasive lumbar decompression in lumbar spinal stenosis [11]. In randomized controlled trial, ODI, NRS, and all Zurich Claudication Questionnaire demonstrated statistically significant superiority of mild® at 1-year follow-up. For primary efficacy, the 58.0% ODI responder rate in the MILD group was higher than the 27.1% responder rate in the epidural steroid group ($P < 0.001$) [12].

New and evolving minimal invasive spine treatments will be developed in the future.

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HG(III)-1

Current status of adults spinal deformity surgery

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Adult spinal deformity (ASD) is one of the most challenging spinal disorders associated with broad range of clinical and radiological presentation. Surgical intervention of ASD is notorious for higher perioperative complications related with longer operation time and perioperative blood loss, neurologic deficit, catastrophic junctional failure, poor restoration of sagittal balance, and pseudarthrosis. This lecture will discuss the stable selection of fusion levels in coronal and sagittal plane including proximal stop and distal stop, restoration of sagittal plane alignment, shortening of operation time though less blood loss, and better fusion strategy.

S(Ⅶ)-1

Global Sagittal Alignment in Spine Surgery

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Stanford Universicy

All spine surgeons are deformity surgeons. The role of sagittal alignment is now well recognized as an important factor is post-surgery outcomes, disability, and additional surgery. In fact, the preservation of sagittal alignment is as important as the restoration of sagittal alignment in spine surgery. This talk will explain how to become aware of sagittal alignment, how to measure alignment, how to create a surgical plan, and how to execute and followup surgery. Such awareness and treatment of sagittal alignment can be learned and incorporated into practice by spine surgeons and is an increasingly important part of spinal surgery.

S(Ⅶ)-2

Spinal Deformity surgery by Neurosurgeon

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Among the spinal disorders, the treatment approach for spinal deformities has been discussed least among department of neurosurgery. However, neurosurgeons have expanded their interests into complex spinal deformities and made a trend of field spinal surgery. By high-level technical ability of the spinal cord handling to preserve neurological function, better synergistic effect could be expected. In addition, an understanding of spinal deformity disorders, the biology and biomechanics of bones, and metallurgy are also required for successful surgery. The purpose of this talk is to introduce radiographic and clinical outcomes of patients with spinal deformities treated by a neurosurgeon at a single academic center. In conclusion, radiographic/clinical outcomes of patients with spinal deformities treated by a neurosurgeon were acceptable. Step by step training such as basic knowledge, orthopaedic as well as neurosurgical disciplines and surgical skills would be mandatory. We need senior mentors and good surgical and neuromonitoring team. A fundamental understanding of pediatric spinal deformity and growing spine should be needed for the best spinal deformity surgeon

Key Words : Scoliosis, Instrumentation, Spinal deformity, Neurosurgeon, Outcomes

S(Ⅶ)-3

MIS Reconstruction of Complex Scoliosis

Jeffrey Roh

President of the Korean American Spine Society (KASS)

S(Ⅶ)-4

P–A–P Staged Surgery for Degenerative Flatback Deformity

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Introduction : Lumbar flat back deformity (LFBD) with sagittal imbalance is the main causes of negative impacts on the quality of life. Corrective osteotomies should be needed to achieve ideal lumbar curve correction and to maintain good sagittal balance in these patients.

Objectives : To review the radiographic and clinical outcomes of LFBD patients treated with staged PAP surgery including multilevel anterior lumbar interbody fusions (ALIFs) combined with polysegmental Smith-Petersen osteotomies (SPOs) and/or pedicle subtraction osteotomy (PSO).

Methods : 39 patients with degenerative LFBD and 23 patients with post-fusion LFBD who underwent corrective osteotomies were divided into 4 groups (PI-LL≤ -10°; A, PI-LL= -9° to 0°; B, PI-LL= 1° to 9°; C, PI-LL ≥10°; D). All 62 patients had more than 2- year follow-up period. Spino-pelvic parameters, such as thoracic kyphosis (TK), lumbar lordosis (LL), pelvic incidence (PI), pelvic tilt (PT), pelvic incidence/lumbar lordosis (PI-LL), T1 pelvic angle (T1PA), and sagittal vertical axis (SVA) were analyzed at preoperative, postoperative 1 month, and final whole standing spine radiographs. Clinical outcomes were evaluated as Oswestry Disability Index (ODI), visual analogue scale (VAS) of back and leg pain, and Scoliosis Research Society (SRS)-22r at same periods. Early or delayed complications were also reviewed.

Results : As differences of SVA values at final follow-up (≤50mm or >50mm), there were significant differences in TK, LL, PT, PI-LL, and T1PA at postoperative 1 month and final (all p-values<0.05). Spinopelvic parameters in Group A were better corrected than others. The score of ODI, VAS, and SRS-22r was improved at the final follow-up in all groups. Among them, Group A showed better clinical outcomes than other groups. Reoperations were performed in 9 cases due to postoperative complications.

Conclusions : For ideal restoration and maintenance of global sagittal balance in patients with lumbar degenerative flatback deformity, Staged PAP surgery including multilevel anterior lumbar interbody fusions (ALIFs) combined with polysegmental Smith-Petersen osteotomies (SPOs) are very effective. Postoperative LL values should be made larger than PI for good sagittal balance and clinical outcomes.

Key Words : Lumbar flat back deformity, Multilevel ALIFs, SPOs, PSO, PI-LL, Spino-pelvic parameters, Clinical outcome

S(Ⅷ)-1

Apllication of posterior atlantoaxial fixation surgery in the treatment of upper cervical spine diseases in special situations

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Background : Posterior atlantoaxial fixation surgery is an effective treatment for many upper cervical spine diseases such as atlantoaxial instability, atlantoaxial dislocation and upper cervical spine trauma. According to the current opinions, it cannot be applied in some special situations such as atlas occipitalization, atlas ponticulus posticus, small pedicles and C1 posterior arch osteotomy. However, according to our clinical experience, those special situations are not always contraindications of this technique.

Purpose : To evaluate the possibility of posterior atlantoaxail fixation surgery in special situations such as atlas occipitalization, atlas ponticulus posticus, small pedicles and C1 posterior arch osteotomy and introduce our experience.

Study design : Retrospective study and personal experience.

Material and methods : Eleven patients of atlantoaxial dislocation in presence of occipitalized atlas, twelve patients with atlantoaxial instability and with a ponticulus posticus at C1, fifteen patients of atlantoaxial instability with a small C1 pedicle and nine patients of atlantoaxial dislocation in whom C1 posterior arch osteotomy was needed were treated by posterior atlantoaxial fixation surgery in our department.

Results : All patients showed clinical improvement. No serious intraoperative or postoperative complications were observed. No hardware failure or neurologic function deterioration were observed during follow-up.

Conclusions : Special situations such as atlas occipitalization, atlas ponticulus posticus, small pedicles and C1 posterior arch osteotomy are not absolute contraindications of posterior atlantoaxial fixation surgery. With appropriate preoperative evaluation and some surgery skills, posterior atlantoaxial fixation surgery can be applied effectively as treatment of upper cervical spine diseases even in those situations.

S(Ⅷ)-2

Complication and its prevention of upper cervical instrumentation

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Department of Neurosurgery, Tsukazaki Hospital, Himeji, Japan

Introduction : Recently the surgery of upper cervical region is well available all over the world and its surgical technique is mandatory for spinal surgeons. The purpose of this paper is to present our principle of posterior cervical fixation surgery at the craniocervical junction (CCJ) and to present the complication and its prevention.

Material and Methods : Between 2002 and 2015, consecutive 74 cases underwent posterior (occipito-) cervical fixation 46 were male and 28 were female; their age ranged from 25 to 92 years old, mean 66.0. With regard to the range of fixation, we decide it depending on each case. We used make a great effort to fix a short range of vertebrae, such as C1-C2,O-C2 and used to make the cranial fixation end at C1 level as far as possible, except for the cases with O-C1 instability or C1 vertebra with destructive bony component such as rheumatoid arthritis. In the case of O-C2 fixation, adequate block-shaped bone grafting with absorptive plate fixated to the occipital bone, and occipital condyle screw or C1 lateral mass screw was added to conventional O-C2 fixation as far as possible to prevent nonunion. With regard to the fixed angle in the sagittal plane, O-C2 angle, C1-C2 angle and subaxial curvature, and T1 slope are taken into consideration during operation to prevent postoperative dysphagia.

Results : No neurovascular complication including permanent dysphagia associated with surgery occurred. Almost all patients (73cases/74cases:98.6%) obtained bony fusion including one case who suffered from occipitalgia with occipital bone erosion due to protruded rod end of C1-C2 fixation.

Discussion and Conclusion : Gold standard techniques are much useful and feasible. However we may be meet the accident such as bone fracture during anchor insertion procedure, so we should get not only various techniques instead of intended procedure but also biomechanical knowledge for the purpose of getting the good outcome of each patient with long follow-up period.

S(Ⅷ)-3

Reduction of severe basilar invagination and atlantoaxial dislocation from a posterior only approach – The DCER principle

P Sarat Chandra

Professor, Dept of Neurosurgery, AIIMS, New Delhi

The author describes a novel technique called Distraction, Compression, extension and reduction (DCER) to reduce severe basilar invagination and atlanto axial dislocation (N= 125)1-3. In this technique, following distraction of the O-C1 and C2 joint by use of a PEEK/ titanium spacer, compressive forces is applied between the C2 and OC1 area so as to perform extension at the OC1 and C2 joint. This leads to a situation where the spacer acts like a pivot and reduces effectively the "irreducible AAD". In addition, the author also for the first time described new indices to measure the joint abnormalities i.e. cranio-cervical tilt, sagittal and coronal inclination. By measuring these parameters both in normative and patients with CVJ anomalies, the authors were able to define objective values which correlated with the severity of CVJ anomaly4. In addition, more recently they have described 2 new modifications: joint re-modeling and extra-articular distraction to reduce BI and AAD with vertically oriented joints5. The author will describe his revolutionary new technique in detail along with the clinical/radiological outcome

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with sagittal joint inclination, coronal joint inclination, and craniocervical tilt: a description of new indices for the craniovertebral junction. Neurosurgery. Feb 2015;76(2):E235-239.

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S(Ⅷ)-4

Significance of intraoperative neuromonitoring for the CVJ surgery

Jae-Taek Hong

Catholic University

Free Paper SessionI V Trauma, Vascular Lesion and Infection

Yong-Jun Cho (Hallym University)
Sang-Gu Lee (Gachon University)

2016_S0014	The Korean Spinal Neurosurgery Society ; Are we reimbursed properly for spinal neurosurgical practices under the Korean Resource Based Relative Value Scale (K-RBRVS) service? **Woo-Keun Kwon, Youn-Kwan Park, Joo Han Kim, Hong Joo Moon (Korea University)**
2016_S0022	Extended DREZ-lesion for alleviating pain following brachial plexus avulsion injury **Makoto Taniguchi (Tokyo Metropolitan Neurological Hospital, Japan)**
2016_S0059	Medical issues in Japan concerning spinal and peripheral nerve disease. ~~Why are they not diagnosed correctly? **Noji Masato (Kanagawa prefectual Ashigarakami Hospital, Japan)**
2016_S0075	Early vertebroplasty associated with a lower risk of mortality and respiratory failure in aged patients with painful vertebral compression fractures: a population-based propensity score matched cohort study in Taiwan **Jiann-Her Lin, Li-Nien Chien, Wan-Ling Tsai, Yi-Chen Hsieh, Yung-Hsiao Chiang (Taipei Medical University Hospital, Taiwan)**
2016_S0109	The management and problems of spine and spinal injury in acute stage **Shinsuke Suzuki (Sendai Medical Center, Japan)**
2016_S0093	The radiologic and clinical results of multilevel Anterior Cervical Discectomy and Fusion (ACDF) using standalone synthetic interbody cages **You-Sub Kim, Jung-Kil Lee (Chonnam National University)**
	Percutaneous vertebroplasty in treatment of agressive vertebral hemangiomas **Sukhrob Saliev (MoH of Uzbekistan)**
2016_S0030	Sagittal imbalance in patients with lumbar spinal stenosis and outcome after simple decompression surgery **Chi Heon Kim, Chun Kee Chung, Yun Hee Choi (Seoul National University)**
2016_S0103	Prevalence of Parkinson's disease with osteoporosis or osteoporotic vertebral fracture in national inpatient sample of Korea: focusing on differences in socioeconomic status **Sung Bae Park, Chun Kee Chung (Seoul National University)**
2016_S0188	Spontaneous Spinal Canal Remodeling after Postural Pillow Reduction and Lordotic, Posterior Column Compressive Percutaneous Transpedicular Screwing in Thoracolumbar Burst Fractures **Byapak Paudel, Hyeun-Sung Kim, Jee Soo Jang, Il-Tae Jang, Jeong-Hoon Choi, Sung Kyun Chung, Jung Sup Lee, Jeong Hoon Kim, Seong Hoon Oh (Nanoori Hospital)**

Free Paper SessionI VI Minimal Invasive Spine Surgery

Geun-Sung Song (Pusan National University)
Dae-Hyun Kim (Daegu Catholic University)

	Evalution Results Of Endoscopic Discectomy Of L5-S1 Disc Herniation Via An Interlaminar Approach **Nguyen Ngoc Ba, Nguyen Huu Lam, Hoang Ngoc Bao, Le Quang Huy, Nguyen Ngoc Bach (Danang Hospital, Vietnam)**
2016_S0024	Long-term minimum clinically important difference in Health Related Quality of Life Scores after instrumented lumbar interbody fusion for low-grade isthmic spondylolisthesis. **Ju Wan Seuk, Jun Seok Bae (Woodidul Hospital)**
2016_S0031	Comparison of cervical sagittal alignment and kinematics after posterior full-endoscopic cervical foraminotmy and discectomy according to preoperative cervical alignment **Chi Heon Kim, Chun Kee Chung, Samuel Won (Seoul National University)**
2016_S0054	Preliminary Results of Minimally Invasive Posterior Lumbar interbody Fusion in Mongolia **Temuujin Murun, Nurbyek Baban, Saruul Enkhbayar, Hee seok Yang (Grandmed Hospital, Mongolia)**
2016_S0102	Early experience with contralateral keyhole endoscopic surgery (CKES) for lumbar spinal stenosis and lumbar disc herniation: surgical technique and preliminary results **Cheulwoong Park, Jaeha Hwang, Junghoon Park, Gyuchan Lee, Inchang Hwang, Woomin Park, Cheulwoong Park (Daejeon Woori Hospital)**
2016_S0135	Multifidus muscle changes after posterior lumbar interbody fusion with intraoperative CT and fulltime navigation systems. **Yu Yamamoto, Masahito hara, Yasuhiro nakajima, Daisuke umebayashi, Nobuhisa fukaya (Inazawa Municipal Hospital, Japan)**
2016_S0141	Endoscopic Lumbar Interbody Fusion by New Endoscopic Technique, Unilateral Biportal Endoscopy (UBE) **Sang-Kyu Son (Busan Gang-Dong Hospital)**
2016_S0172	Endoscopic foraminal decompression: myth? or trustworthy? **Chul-Woo Lee, Kang-Jun Yoon (St.Peter's Hospital)**
2016_S0143	The clinical outcome of posterior lumbar interbody fusion (PLIF) with percutaneous pedicle screw fixation (PPS) between lumbar and lumbosacral spine **Sang Don Kim (Bucheon St.Mary Hospital)**
2016_S0131	Is it Possible the Percutaneous Endoscopic Lumbar Discectomy for All Types of Lumbar Disc Herniations?: Evolution of Rigid Percutaneous Endoscopic Lumbar Discectomy **Keun Lee, Hyeun Sung Kim, Byapak Paudel, Kwang Lae Lee, Seong Hoon Oh, Il Tae Jang (Nanoori Hospital)**

Flash Presentation Session III

Ho-Yeol Zhang (N.H.I.S Ilsan Hospital)
Se-Hoon Kim (Korea University)
Seung-Myung Lee (Chosun University)

2016_S0068	Muscle-preserving laminoplasty for lumbar spine **Ryohei Miyazaki (Yokohama city University hospital, Japan)**
2016_S0082	Relationship between posterior back muscle degeneration at adjacent segment and spinal curvature change following Lumbar Fusion **Farid Yudoyono, Yi Seong, Shin Dong ah, Ha Yoon, Kim Keung Nyun, Yoon Do Heum (Padjadjaran University, Indonesia)**
2016_S0121	Comparison of self-perceived spine mobility after long level lumbar fusion with iliac screw : Effect on the Asian sedentary lifestyle **Dong Hyun Chun (Yonsei University)**
2016_S0067	Contralateral approach for the treatment of lumbar spinal stenosis in combination with foraminal disc herniations **Sang Hyung Jun, Se Young Pyo, Ho Soo Kim, Yong Tae Jung (Inje University)**
2016_S0161	Characteristic Features on Gait in Patients with Lumbar Disc Hernia In comparison to 3D Motion Gait Analysis Data from Normal Volunteers **Takahiro IIZUKA, Kohei Naito (Nishinokyo Hospital, Japan)**
2016_S0040	One option for the treatment of failed back surgery syndrome **Kyong Song Kim (Chiba Hokuso Hospital, Japan)**
2016_S0165	Sacroplasty for sacral insufficiency fracture **Kyung-Chul Choi (The Leon Wiltse memorial Hospital)**
2016_S0178	Feasibility of E-PASS and POSSUM system for Postoperative Risk Assessment in Patients with Spinal Disease **Do Young Kim, Seong Yi, Dong Hyun Chun, Keung Nyun Kim, Yoon Ha, Dong Ah Shin, Do Heum Yoon, Sun Kyu Choi, Chang Oh Kim (Yonsei University)**
2016_S0095	Lumbar spine fusion surgery with Cortical bone trajectory (CBT) technique is really more excellent Technique than traditional Technique? **Sang Hoon Lee, Ho yeol Zhang (N.H.I.S Ilsan Hospital)**
2016_S0027	BESS (Biportal Endoscopic Spinal Surgery) for spinal stenosis expanding guideline of endoscopic spine sugery **Chang-Myong Choi (Welcom Daejeon Hospital)**

2016_S0036	Quantitative assessment of CSF movement with time-spatial labeling inversion pulse MR imaging in patients with Chiari malformation type I **Tatsuya Ohtonari, Nobuharu Nishihara, Taisei Ota, Akio Tanaka (Ota Memorial Hospital, Japan)**
2016_S0136	The importance of shoulder joint evaluation before cervical spinal surgery **Yasukazu Hijikata (Shinkomonji Hospital, Japan)**
2016_S0066	Clinical and radiological features of hybrid surgery in multilevel cervical degenerative disc disease: over a 5-year follow-up **Hee-Seok Yang (The Joeun Hospital)**
2016_S0076	Early predictor of solid bone fusion in anterior cervical discectomy and fusion 3 months postoperatively **Won Heo, Chun Kee Chung, Chi Heon Kim (Seoul National University)**
2016_S0077	Posterior instrumentation of upper cervical spine **Nobuyuki Shimokawa (Tsukazaki Hospital, Japan)**
2016_S0087	Anterior and posterior approach for cervical ossification of posterior longitudinal ligament **Takahiro Hayashi (Yokohama City University)**
2016_S0096	Upper Cervical Subluxation and Cervicomedullary Junction Compression in Patients With Rheumatoid Arthritis **Gun-Ill Lee, Koang Hum Bak, Jaewoo Chung (Hanyang University)**
2016_S0181	Risk factor analysis and decision making of surgical strategy for V3 segment anomaly: Significance of preoperative CT angiography for Posterior C1 instrumentation **Jae Yoel Kwon (Catholic University)**
2016_S0186	Risk factors related to post-operative dysphagia after anterior cervical decompression and fusion: a focused analysis of anesthetic consideration **Jong Hyeok Park, Sun Ho Lee (Sungkyunkwan University)**
2016_S0222	Significance ofMultimodal intraoperative monitoring (MIOM) change for thepatients with Craniovertebral junction pathology **Jung Jae Lee (Catholic University)**

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Poster

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E-Poster Presentation

Kyung-Tae Kim (Kyungpook National University)

Wan-Ling Tsai	2016_S0020	The relationship between NURICK grade and the entropy of gait in patients with cervical spondylotic myelopathy
Yasufumi Ohtake	2016_S0026	Long-term and short term results of micosurgical anterior cervical foraminotomy for cervical radiculopathy
Farid Yudoyono	2016_S0037	Intraparenchymal Cervicomedullary Abcess
Byapak Paudel	2016_S0038	Percutaneous Endoscopic Ligamentum Flavum Splitting Interlaminar Approach for Dorsally Migrated Huge Lumbar HNP: A novel technique for saving important segmental structures
	2016_S0039	Percutaneous Full Endoscopic Resection for Bertolotti's syndrome: Technical Note
Taigo Kawaoka	2016_S0046	A case of L5 / S far-out stenosis treated by percutaneous endoscope
	2016_S0047	Posterolateral percutaneous endoscopic partial pediculotomy for the high grade migrated upper lumbar disc herniation
Shagayrat Shatursunov		Results of anterior decomprssion and interbody stabilization with cages in cervical spinal canal degenerative stenosis.
Nobuhiko Nakajima	2016_S0070	Investigation of overactive bladder (OAB) in the patients with cervical degenerative disorders
Inagaki Hiroshi	2016_S0079	A case with kyphosis transformation which forced us to perform a laminectomy and a vertebra fixation from the rear of the body after frontal surgery using KUSABI-fixation technique
Fabianto Santoso	2016_S0110	Spinal Surgery Cases in Cipto Mangungkusumo National Hospital (CMNH), Jakarta from 2010 until 2015
Yong Jun Jin	2016_S0155	Intraradicular and dorsal epidural enhancement in lumbar spinal stenosis patients on gadolinium-enhanced MRI with fat suppression - diagnosis of mono- or polyradiculopathy
Takahiro Miyahara	2016_S0166	A surgical case of skull base metastasis from renal cell carcinoma whose onset of craniovertebral junction instability
Hee Yul Kim	2016_S0189	Analysis of Sagittal balance and Lower back pain of PLIF for Lumbar spondylolisthesis

Poster

2016_S0003	Effects of adenosine monophosphate-activated kinase in the ventral horn of rabbit spinal cord after transient ischemia **Seung-Myung MOON, Ms., jinney hwang BSC.** Department of Neurosurgery, Dongtan Sacred Heart Hospital, College of Medicine, Hallym University
2016_S0005	Investigation of the improvement in overactive bladder following decompression surgery for lumbar degenerative disease **Mizuki Watanabe MD., Junya Hanakita MD., PhD., Toshiyuki Takahashi MD., PhD.** Fujieda Heisei Memorial Hospital, Spinal Disorders Center
2016_S0007	Percutaneous Endoscopic Thoracic Discectomy : Myelopathy due to Thoracic soft disc herniation **Jihwan Park MD., Taeho Kim FRCS., MD.** Mimimal invasive
2016_S0009	Impact of C1 laminectomy without fusion on upper cervical instability **Tae Seok Jeong MD., Sang Gu Lee MD., PhD. Woo Kyung Kim MD., PhD., Seong Son MD., PhD.** Gachon Gil Medical Center
2016_S0020	The relationship between NURICK grade and the entropy of gait in patients with cervical spondylotic myelopathy **Wan-Ling Tsai BSC., RN., Jiann-Her Lin MD. Yung-Hsiao Chiang MD., PhD., Cheng-Kuei Chang MD., PhD.,Chao-Cheng Wu PhD.,Mr. Jin-Wei Yang BSC.** Taipei Medical University
2016_S0026	Long-term and short term results of micosurgical anterior cervical foraminotomy for cervical radiculopathy **Yasufumi Ohtake MD., Jyunya Hanakita MD., PhD.** Fujieda Heisei Memorial Hospital
2016_S0029	Outcome that focuses on lumbar peripheral disease for the failed back surgery syndrome **Juntaro Matsumoto MD., PhD., Toyohiko Isu PhD., Kyongsong Kim PhD.** Department of Neurosurgery, Kushiro Rosai Hospital
2016_S0033	The surgical procedures for treatment of cranially migrated lumbar disc herniation. -Middle term results- **Masanori aoki** Department of neurosurgery
2016_S0037	Intraparenchymal Cervicomedullary Abcess **Farid Yudoyono MD., Yi Seong PhD., Lee Nam MD., Shin Dong ah PhD., Ha Yoon PhD., Kim Keung Nyun PhD., Yoon Do Heum PhD.** Department of Neurosurgery, Spine and Spinal Cord Institute, Yonsei University College of Medicine, Seoul, Korea

2016_S0038	Percutaneous Endoscopic Ligamentum Flavum Splitting Interlaminar Approach for Dorsally Migrated Huge Lumbar HNP: A novel technique for saving important segmental structures **Byapak Paudel MD., Hyeun Sung Kim MD., PhD., Ji so Jang MD., PhD., Jung Hoon Choi MD., Sung Kyun Jeong MD., Jung Sub Lee MD., Jung Hoon Kim MD., Seong Hoon Oh MD., PhD., Il Tae Jang MD., PhD** Nanoori Suwon Hospital
2016_S0039	Percutaneous Full Endoscopic Resection for Bertolotti's syndrome: Technical Note **Byapak Paudel MD., Hyeun Sung Kim MD., PhD., Ji So Jang MD., PhD., Jung Hoon Choi MD., Sung Kyun Jeong MD., PhD., Jung Sub Lee MD., Jung Hoon Kim MD., Seong Hoon Oh MD., PhD., Il Tae Jang MD., PhD.** Nanoori Suwon Hospital
2016_S0046	A case of L5 / S far-out stenosis treated by percutaneous endoscope **Taigo Kawaoka** Omaezaki municipal hospital, Spine Center
2016_S0047	Posterolateral percutaneous endoscopic partial pediculotomy for the high grade migrated upper lumbar disc herniation **Taigo Kawaoka** Omaezaki municipal hospital, Spine Center
2016_S0051	Anterior cervical discectomy and fusion using cylindrical titanium cages with hydroxyapatite and hydroxyapatite and β-tricalcium phosphate: early radiological assessment of bony fusion. **Masanori aoki PhD., Manabu Sasaki PhD.** Department of neurosurgery
2016_S0053	Intra-Dura Mater Hemorrhage of the Cervical Spine **Yasuomi Nonaka** HEIWA Hospiral department spinal surgery
2016_S0058	A case of reconstructive surgery of lumbar isthmic spondylolisthesis using Cross Trajectory Technique **Yukoh Ohara MD., Junichi Mizuno MD., PhD.** Shin-yurigaoka general hospital
2016_S0070	Investigation of overactive bladder (OAB) in the patients with cervical degenerative disorders **Nobuhiko Nakajima MD., Junya Hanakita** Fujieda Heisei Memorial Hospital
2016_S0074	Advantages and disadvantages of multi-axis intraoperative angiography unit for percutaneous pedicle screw placement in the lumbar spine **Hiroto Kageyama MD.[1], Yukoh Ohara MD., PhD.[2], Tomoko Iida MD.[1], Shinichi Yoshimura MD., PhD.[1]** [1]Department of neurosurgery, Hyogo College of Medicine, Surgical Department of Spine, [2]Spinal Cord and Peripheral Nerve, Shin-Yurigaoka General Hospital[2]

2016_S0079	A case with kyphosis transformation which forced us to perform a laminectomy and a vertebra fixation from the rear of the body after frontal surgery using KUSABI-fixation technique **Inagaki Hiroshi MD., Endo Satoshi MD., Noji Masato MD.** The Dep. of Neurosurgery
2016_S0080	Structural preservation percutaneous endoscopic lumbar interlaminar discectomy for L5-S1 herniated nucleus pulposus **Jung Sup Lee MD., Hyeun-Sung Kim MD., PhD., Jee-Soo Jang MD., PhD. Il-Tae Jang MD., PhD.** Neurosurgery
2016_S0081	Transforaminal Percutaneous Endoscopic Lumbar Discectomy for Recurrent disc herniation after Conventional Open Discectomy **Jung Sup Lee MD., Hyeun-Sung Kim MD., PhD., Jee-Soo Jang MD., PhD. Il-Tae Jang MD., PhD.** Neurosurgery
2016_S0084	An analysis of surgical and clinical outcomes of 1 level cervical ADR **Sungho Kim MD., Jinhak Park MD., Jaeeun Kwon MD., Changjoo Lee MD., Sunyoung Park MD., PhD., Eulsoo Jung MD., PhD., Yongchul Chi MD., PhD.** Bogang Hospital
2016_S0097	Double crush syndrome of the vertebral artery loop and foraminal stenosis causing monoparesis. **Young Joon Rho** Department of Neurosurgery
2016_S0098	Natural history and treatment of sequestrated lumbar disc herniation **Young Joon Rho** Department of Neurosurgery
2016_S0110	Spinal Surgery Cases in Cipto Mangungkusumo National Hospital (CMNH), Jakarta from 2010 until 2015 **Fabianto Santoso BSC., Fakhri Muhammad BSC., Mohammad Saekhu MD., MBBS., Samsul Ashari MD., MBBS.** Junior Doctor, Faculty of Medicine Universitas Indonesia, Jakarta, Indonesia
2016_S0118	The surgical treatment of symptomatic Tarlov cysts: report of 6 cases. **Yasuyoshi Miyao MD., PhD., Manabu Sasaki MD., PhD., Masanori Aoki MD., PhD.** Dept of Neurosurgery, Suita Municipal Hospital
2016_S0119	The outcome of bilateral decompression through unilateral laminotomy for aged patients **Kazuyoshi Tamura MD., PhD., Manabu Sasaki MD., PhD., Masashi Umegaki MD., PhD.** Department of Neurosurgery, Iseikai Hospital
2016_S0122	Impingement of spinous process and multifidus after open door laminoplasty.-Pitfall of minimum invasive laminoplasty- **Takaki Yoshimizu MD., Kanji Sasaki MD., PhD.** Seirei Hamamatsu general hospital spine centre

2016_S0132	Morphological trends of cervical alignment and the correlation between range of motion (ROM) on cervical spine x-ray and pre-operative outcomes in 298 patients underwent cervical spinal surgeries **Il-Tae Jang MD., PhD., Jung Sik Bae MD., Ho Kim MD., Sol Lee MD., Yunsu Yang MD., Jae Eun Park MD., Woung Lee MD., Do Kwan Kim MD.** Nanoori Hospital
2016_S0133	Extremely old age is a contraindication to pedicle screwing surgery in the thoracolumbar fractures? **Kuen Lee MD., HyeunSung Kim MD., PhD., Kuen Lee MD., KwangLae Lee MD., PhD., SungHun Oh MD., PhD., JinUk Kim MD., IlTae Jang MD., PhD.** Nanoori Hospital
2016_S0134	Surgical Results of Anterior Screw Fixation for Odontoid Fracture **Shigeharu Fukao MD., Minoru Kidooka MD., Takahiro Isozumi MD., Hidehiko Lee MD., Sayaka Ito MD.** Kyoto Okamoto Memorial Hospital
2016_S0137	Anterior-posterior combined corrective fusion for severe cervical kyphosis with myelopathy: report of two cases **Masao Umegaki MD., PhD., Manabu Sasaki MD., PhD., Kazuyoshi Tamara MD., PhD.,** Department of the neurosurgery and spine surgery, Iseikai Hospital, Osaka, Japan
2016_S0138	Case report of a cervico-thoracic OPLL with ankylosing spondylitis who needed three surgeries because of complicated process **Masao Umegaki MD., PhD., Manabu Sasaki MD., PhD., Kazuyoshi Tamara MD., PhD.** Department of the neurosurgery and spine surgery, Iseikai Hospital, Osaka, Japan
2016_S0146	Severe fracture-dislocation of the cervical spine with ankylosing spondylitis: case report **jinho seo** The korean spinal neurosurgery society
2016_S0155	Intraradicular and dorsal epidural enhancement in lumbar spinal stenosis patients on gadolinium-enhanced MRI with fat suppression - diagnosis of mono- or poly-radiculopathy **Yong Jun Jin** Department of Neurosurgery, Seoul Paik Hospital
2016_S0166	A surgical case of skull base metastasis from renal cell carcinoma whose onset of craniovertebral junction instability **Takahiro Miyahara MD., Shouta Terachi MD., Rokudai Sakamoto MD., Gousuke Hattori MD., PhD., Kiyohiko Sakata MD., PhD., Masaru Hirohata MD., PhD., Yasuo Sugita MD., PhD., Motohiro Morioka MD., PhD.** Kurume University
2016_S0167	The Results of Cervical Nucleoplasty in Patients with Cervical Disc Disorder: A Retrospective Clinical Study of 42 Patients **YoungHa Woo** Bumin Hospital Busan

2016_S0168	Facet Joint Preserving, Unilateral Approach, Bilateral Splitting Ligamentum Flavectomy (UBSF) for Degenerative Lumbar Spinal Stenosis **Mun Soo Kang MD., Jung Sik Bae MD., Hyeun Sung Kim MD., PhD., Ki Joon Kim MD., PhD., Il-Tae Jang MD., PhD.** Nanoori Hospital
2016_S0176	Retroperitoneal hematoma after Transforaminal selective epidural block: A case report **Wooram Shin** The Korean Neurosurgical Society
2016_S0189	Analysis of Sagittal balance and Lower back pain of PLIF for Lumbar spondylolisthesis **Hee Yul Kim, Chang Il Ju PhD., Seung Myung Lee PhD., Seok Won Kim PhD.** Chosun University Hospital
2016_S0191	Cervical myelopathy caused by bilateral laminar cleft of the axis: A case report and review of the literature **Bong Ju Moon MD., Jung-Kil Lee MD., PhD.** Department of Neurosurgery, Chonnam National University Hospital
2016_S0192	Destiny of Fractured Cervical Allospacer cage made by Allobone in ACDF ; Fracture rate, Fusion rate, and Revision surgery rate **Jeong Hyuk Ju MD., Sung Uk Kuh MD., PhD.** Department of Neurosurgery, Gangnam Severance Hospital, Spine and Spinal Cord institute, Yonsei University College of Medicine
2016_S0194	Langerhans cell histiocytosis in the adult lumbar spine **Sang-Deok Kim** Neurosurgery
2016_S0195	Primary Langerhans cell histiocytosis (LCH) in adult cervical spine **Sang-Deok Kim** Neurosurgery
2016_S0202	A case of spinal dissemination from cerebellar hemangioblastoma **Satoshi Yamaguchi PhD., Satoshi Yamaguchi PhD., Masaaki Takeda PhD., Kaoru Kurisu PhD.** Department of Neurosurgery, Hiroshima University Graduate School of Biomedical and Health Sciences
2016_S0206	Sixteen years follow-up results of aneurysmal bone cyst in 8 years old pediatric patients with observation : detailed clinicoradiological natural course. **HanJoo Lee MD., Kyung Hyun KIm PhD., Sung Uk Kuh PhD., Dong Kyu Chin PhD., Keun Su Kim PhD., Yong Eun Cho PhD.** Yonsei University Gangnam Severance Hospital

2016_S0214	Two cases of lower thoracic spinal cord cavernous angioma causing progressive paraplegia and review of the literature **Sang Hoon Yoon MD., Jeong-Sik Ham MD., Byung-Kyu Cho PhD.** The Armed Forces Capital Hospital
2016_S0215	Monostotic fibrous dysplasia of the lumbar spine: A case report **Sang Hoon Yoon MD., Jeong-Sik Ham MD., Byung-Kyu Cho MD., PhD.** The Armed Forces Capital Hospital
2016_S0216	Comparative study to evaluate the clinical efficacy and results of using a bioactive glass ceramic and a PEEK cage those were used for PLIF surgery : A preliminary report **Sang Hoon Yoon MD., Jeong-Sik Ham MD.** The Armed Forces Capital Hospital
2016_S0217	Surgical results and prognostic factors of thoracic myelopathy caused by ossification of the ligamentum flavum **Kwan Ho Park MD., PhD., Hyunsuk Oh MD., Tae Wan Kim MD.** VHS Medical Center
2016_S0218	Automated Percutaneous Lumbar Disc Decompression Using the Dekompressor: A preliminary study **Sang Hoon Yoon MD., Jeong-Sik Ham MD., Byung-Kyu Cho MD.** The Armed Forces Capital Hospital
2016_S0219	The safety and efficacy of a novel unltrasonic bone scalpel in extensive posterior cervical foraminotomy: Our preliminary experience **Jeong-Sik Ham MD., Sang Hoon Yoon MD., Byung-Kyu Cho MD.** The Armed Forces Capital Hospital
2016_S0220	Acute spinal cord infarction at conus medullaris mimicking cauda equina syndrome by known lumbar disc herniation **Jeong-Sik Ham MD., Sang Hoon Yoon MD., Byung-Kyu Cho MD.** The Armed Forces Capital Hospital
2016_S0221	Clinical failure after cervical total disc arthroplasty causing symptomatic adjacent segment degeneration and spontaneous arthrodesis at the level of arthroplasty: A case report **Jeong-Sik Ham MD., Sang Hoon Yoon MD.** The Armed Forces Capital Hospital
	Results of anterior decomprssion and interbody stabilization with cages in cervical spinal canal degenerative stenosis **Shagayrat Shatursunov** MoH of Uzbekistan

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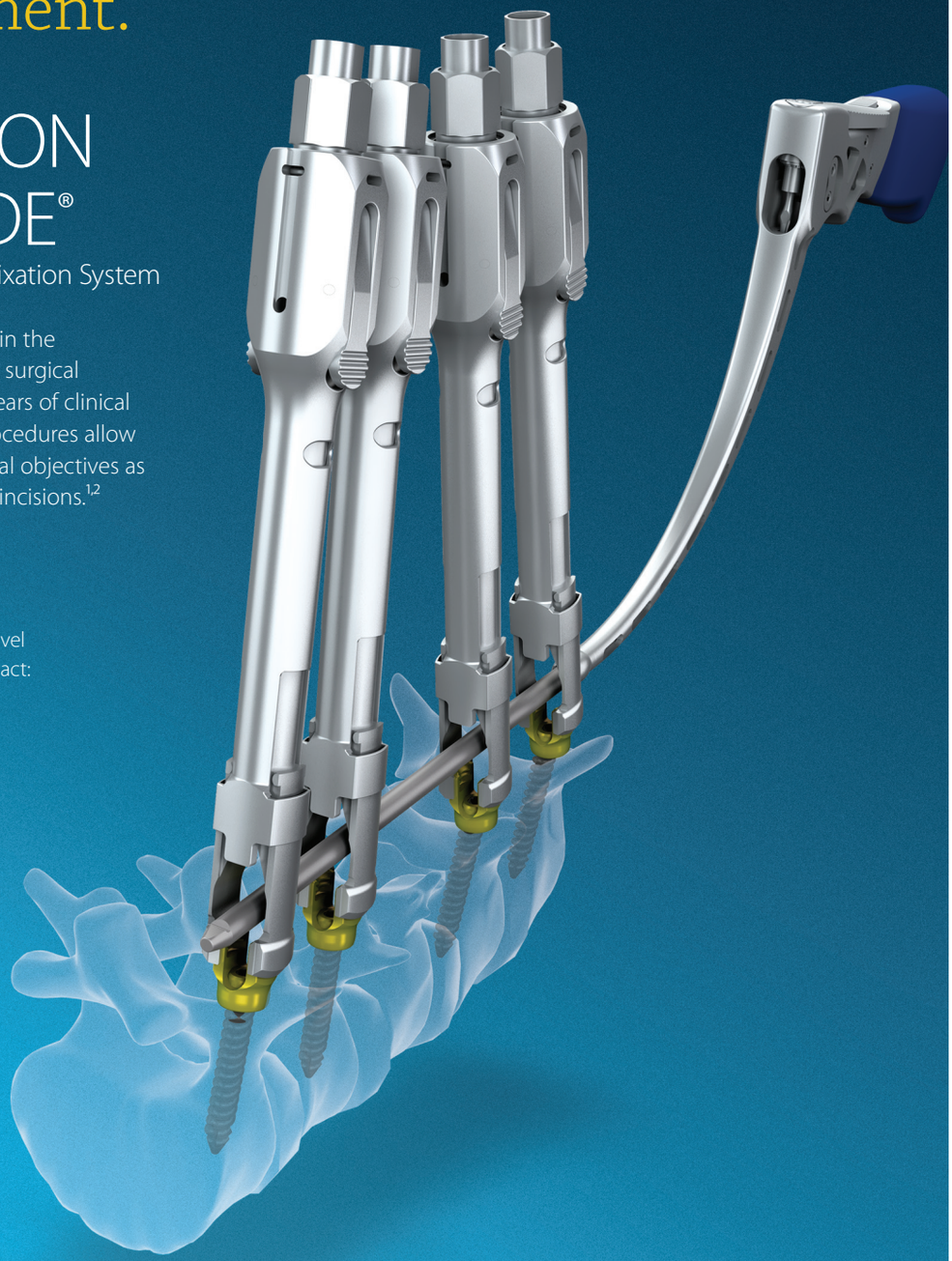

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* ADL : Activities of Daily Living
Source : 1. 重信 恵一, Osteoporosis Jpn 2014 22:117
2. Nakamura T et al., J Clin Endocrinol Metab. 2012;97(9):3097-3106.
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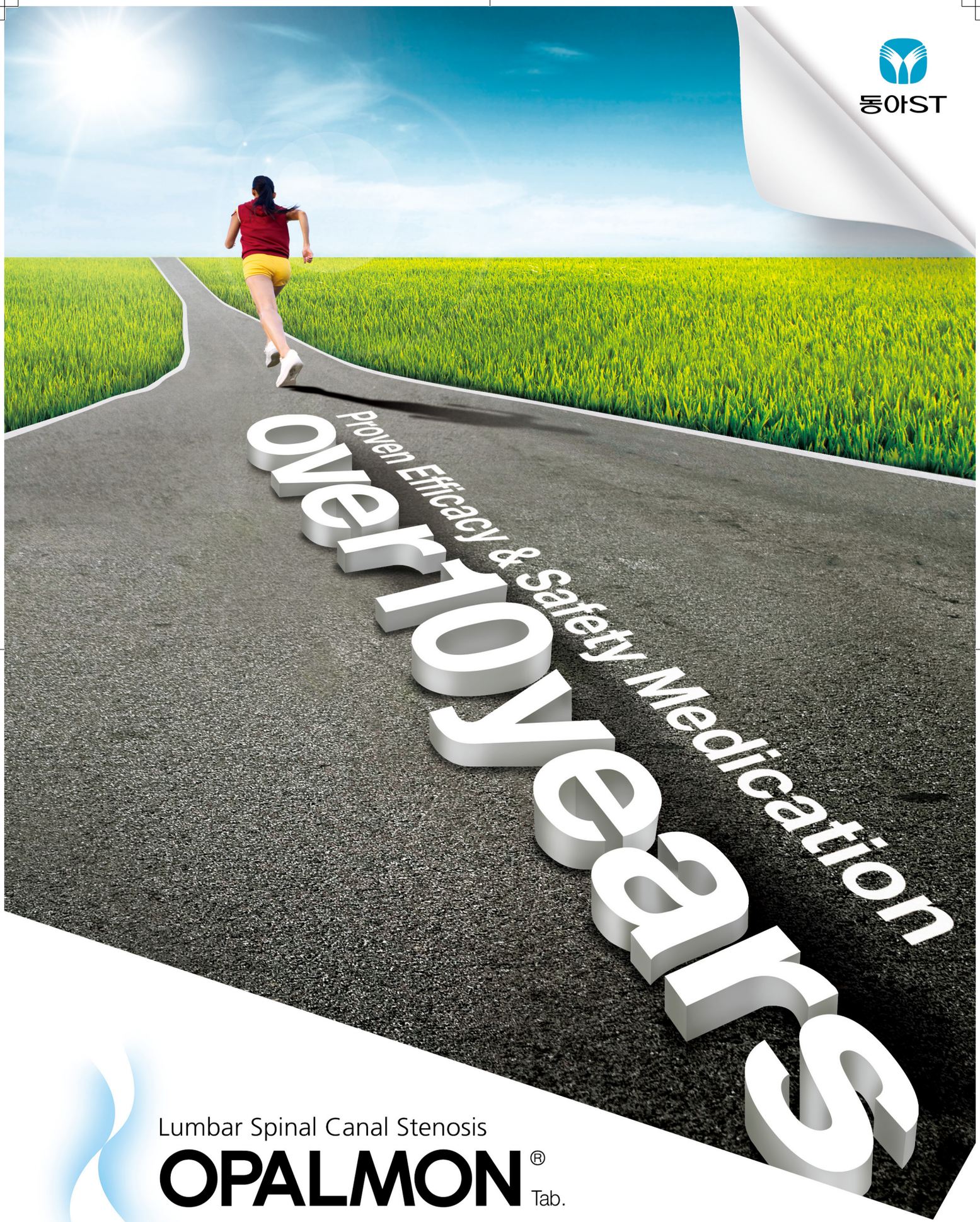

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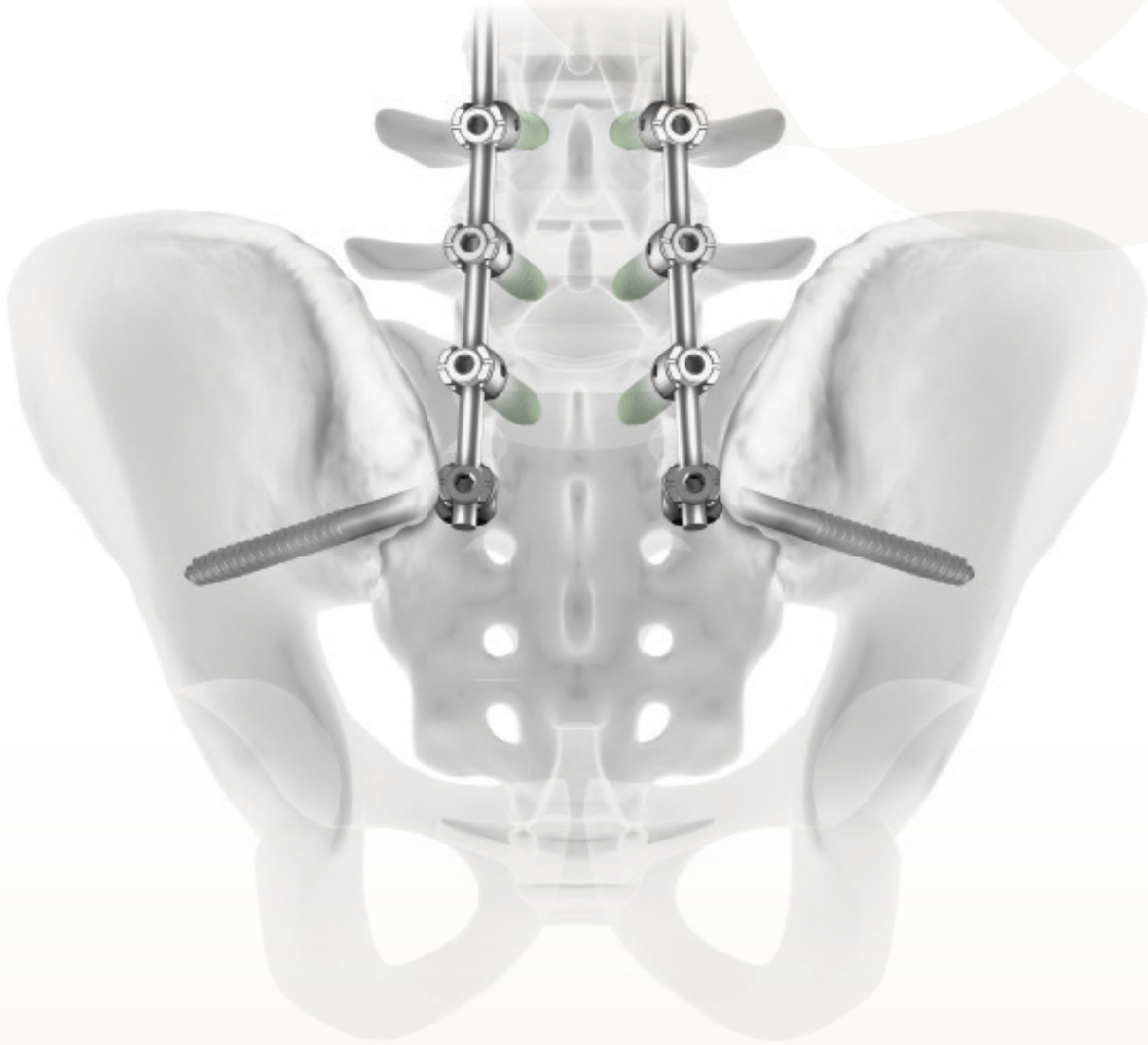

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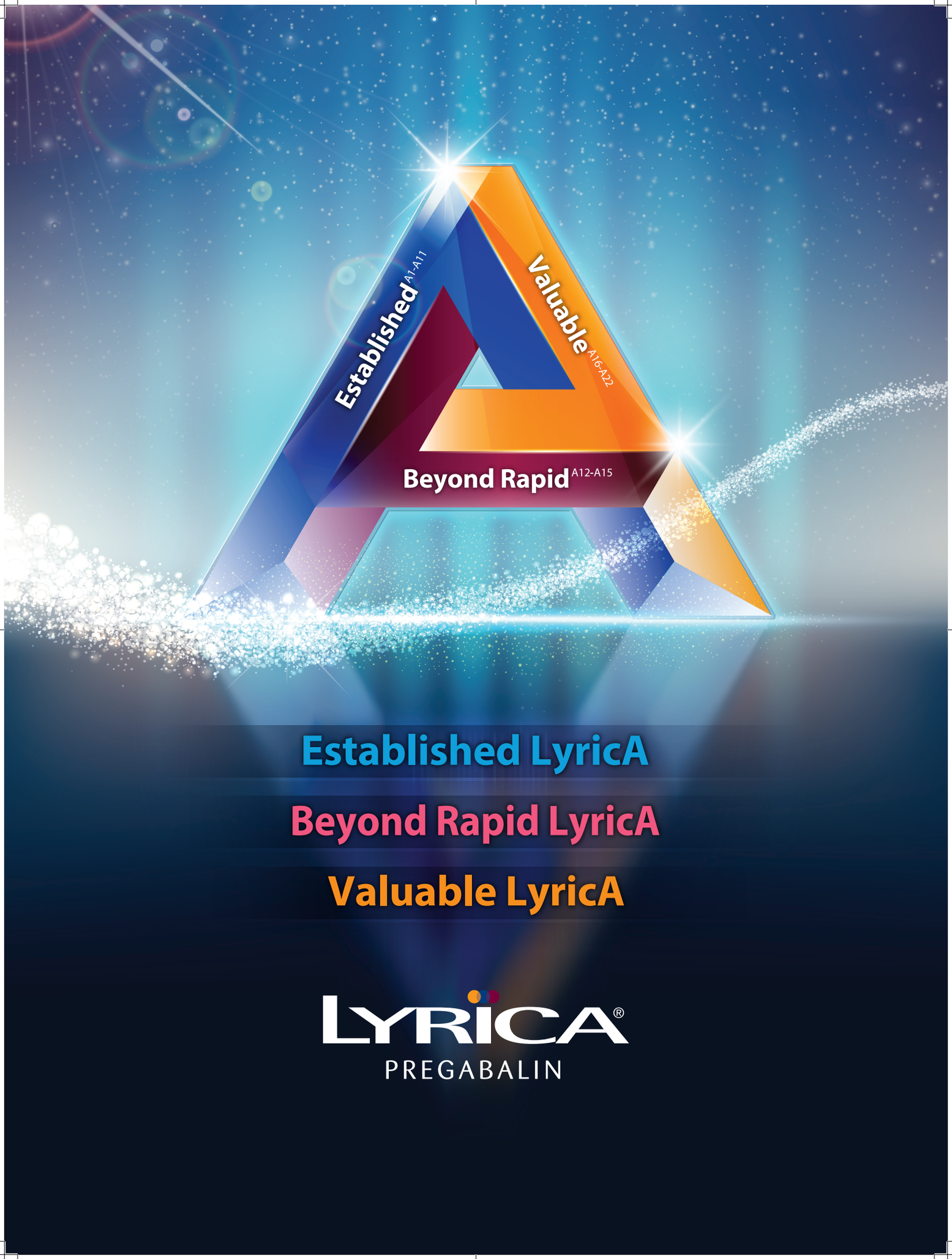
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†. Study design A second 2-year extension of the 3-year multicenter outpatient core study. In a 3-year randomized, double-blind core study, women(55-85 years) were randomized to receive daily oral bazedoxifene 20 or 40 mg, raloxifene 60 mg, or placebo. During extension I (years 4-5), the raloxifene 60 mg arm was discontinued and women receiving bazedoxifene 40 mg transitioned to bazedoxifene 20 mg. In extension II (years 6-7; n=1,530), all bazedoxifene -treated women continued bazedoxifene 20 mg. Main outcome measures included year 7 endpoints: incidences of new vertebral and nonvertebral fractures, bone mineral density changes, and safety assessments. **‡. Study design** 3-year, randomized, double-blind, placebo- and active-controlled study, healthy postmenopausal women with osteoporosis (55–85 years) were treated with bazedoxifene 20 or 40 mg/d, raloxifene 60 mg/d, or placebo. The primary endpoint was incidence of new vertebral fractures after 36 months; secondary endpoints included nonvertebral fractures, bone mineral density (BMD), and bone turnover markers. **††. Study design** A total of 4,216 postmenopausal women with osteoporosis were enrolled in this 2-year extension of a 3-year, randomized, double-blind, placebo-controlled, phase 3 trial. Five-year findings are reported for bazedoxifene 20 and 40/20 mg and placebo. Endpoints included incidence of new vertebral fractures (primary) and non-vertebral fractures, and changes in bone mineral density (BMD) and bone turnover markers.

References 1. Palacios S, Silverman SL, de Villiers TJ, et al. A 7-year randomized, placebo-controlled trial assessing the long-term efficacy and safety of bazedoxifene in postmenopausal women with osteoporosis: effects on bone density and fracture. Menopause. 2015 Aug;22(8):806-13. **2.** Silverman SL, Christiansen C, Genant HK et al. Efficacy of bazedoxifene in reducing new vertebral fracture risk in postmenopausal women with osteoporosis: results from a 3-year, randomized, placebo-, and active- controlled clinical trial. J Bone Miner Res. 2008 Dec;23(12):1923-34. **3.** Silverman SL, ChinesAA, KendlerDL, et al. Sustained efficacy and safety of bazedoxifene in preventing fractures in postmenopausal women with osteoporosis: results of a 5-year, randomized, placebo-controlled study. OsteoporosInt 2012;23:351-363. **4.** Palacios S, de Villiers TJ, Nardonede C, et al. Assessment of the safety of long-term bazedoxifene treatment on thereproductive tract in postmenopausal women with osteoporosis: Results of a 7-year, randomized, placebo-controlled, phase 3 study. Maturitas. 2013;76(1):81-87. **5.** 비비안트정 제품설명서.[개정년월일 2015.04.15]

Summary of Prescribing Information [COMPOSITION] 1 tablet (414 mg) contains: Bazedoxifene acetate (equivalent to bazedoxifene 20.0 mg). (in-house)22.6 mg **[APPEARANCE]** White to off-white, capsule-shaped film-coated tablet. **[INDICATIONS]** Treatment and prevention of post-menopausal osteoporosis in women. A significant reduction in the incidence of vertebral fracture has been demonstrated, but efficacy on non-vertebral fracture has not been established. **[DOSAGE AND ADMINISTRATION]** One tablet once daily, at any time of day, with or without food. Supplemental calcium and/or vitamin D should be added to the diet if daily intake is inadequate. **[PRECAUTIONS FOR USE]** Warnings Use of this drug is not recommended in women at an increased risk for venous thromboembolic events. In addition, women taking this drug should be advised to move about periodically during prolonged travel. This drug is only for use in post-menopausal women. There is no evidence of endometrial proliferation. Any uterine bleeding during therapy is unexpected and should be fully investigated. The safety of this drug in patients with breast cancer has not been studied. **Contraindications** Hypersensitivity to the active substance or to any of the excipients. Active or past history of venous thromboembolic events, including deep vein thrombosis, pulmonary embolism, and retinal vein thrombosis. Pregnant women and women of child-bearing potential. Lactating women. Unexplained uterine bleeding. Patients with signs or symptoms of endometrial cancer, This drug contains lactose. Patients with rare hereditary problems of galactose intolerance, the Lapp lactase deficiency or glucose-galactose malabsorption should not take this medicinal product. **Administrations with Caution** Patients with hypertriglyceridemia. Patients with severe renal impairment. Patients with hepatic impairment. **Adverse Reactions** The most common adverse reaction that led to discontinuation of treatment was vasodilatation (hot flushes) There have been post-marketing reports of ocular events other than retinal vein thrombosis. These reports include visual acuity reduced, blurred vision, photopsia, visual field defect, visual impairment, dry eye, eyelid edema, blepharospasm, eye pain, and eye swelling. Before prescribing please consult the local full prescribing information **Latest approved date:** 15 Apr 2015

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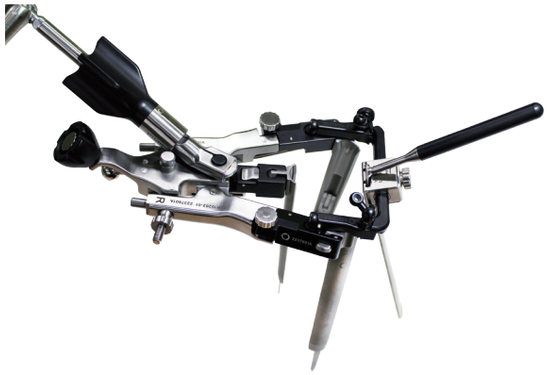

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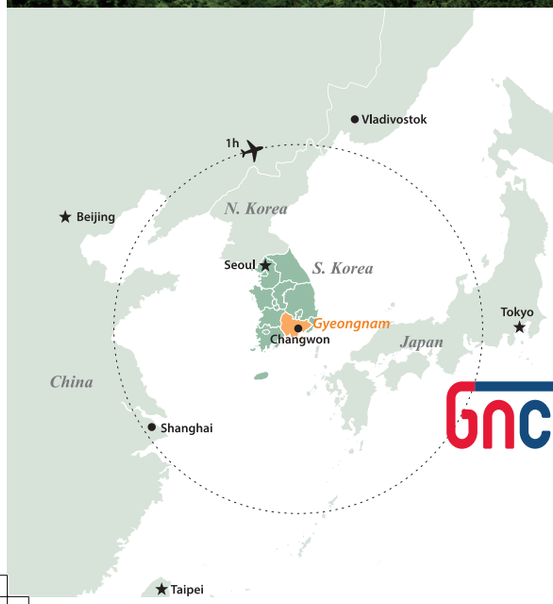

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References
1. Narayan S, Tucker MD, Shander A. An economic model to assess Floseal hemostatic matrix versus Gelfoam with bovine thrombin to reduce perioperative blood loss during cardiovascular procedures. Proceedings of the 6th Annual SABM Meeting; 2007 Sept 7-9: Hollywood, Calif. **2.** Richter F, Schnorr D, Deger S, et al. Improvement of hemostasis in open and laparoscopically performed partial nephrectomy using a gelatin matrix-thrombin tissue sealant (Floseal). Urology. 2003;61:73-77 **3.** Gill IS, Ramani AP, Spaliviero M, et al. Improved hemostasis during laparoscopic partial nephrectomy using gelatin matrix thrombin sealant. Urology. 2005;65:463-466. **4.** Ng C, Chern B, Siow A. Retrospective study of the success rates and complications associated with total laparoscopic hysterectomy. Obstetrics Gyeaecol. 2007;33(4):51-18 **5.** Bedi AD. , et al. Use of Hemostatic Matrix for Hemostasis of the Carvernous Sinus During Endoscopic Endonasal Pituitary and Suprasellar Tumor Surgery. Skull base 2011;21:189~92

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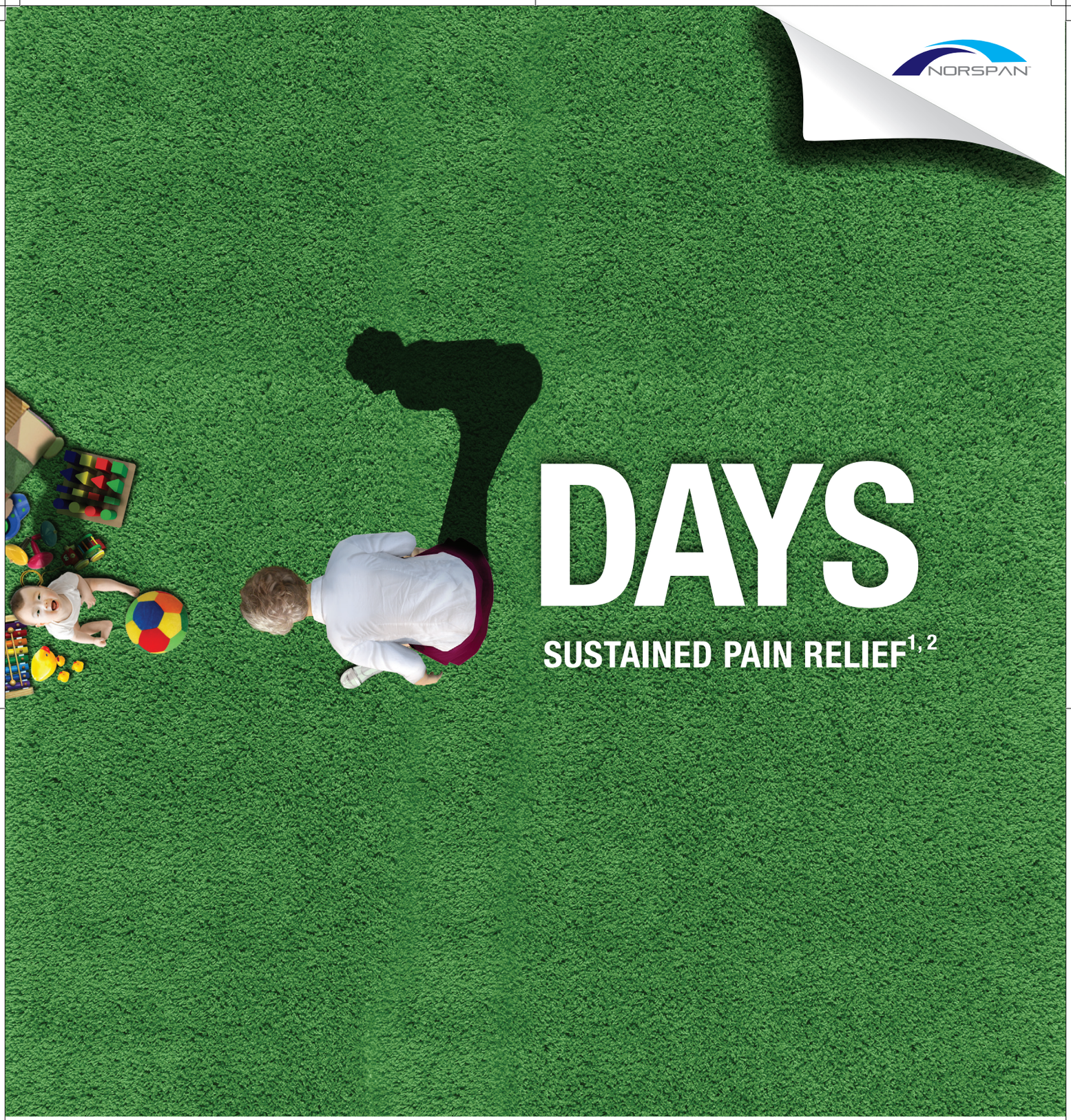

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향정신성 | 전문의약품

■ **원료약품 및 분량 :** 이 약 1 매 중 · 5㎍/h : 부프레노르핀(EP) 5.0mg · 10㎍/h: 부프레노르핀(EP) 10.0mg · 20㎍/h: 부프레노르핀(EP) 20.0mg ■ **성상 :** · 5㎍/h : 모서리가 둥근 베이지색의 정사각형 패취 · 10㎍/h: 모서리가 둥근 베이지색의 직사각형 패취 · 20㎍/h: 모서리가 둥근 베이지색의 정사각형 패취 ■ **효능 · 효과 :** 비마약성진통제에 반응하지 않는 중등도 및 중증의 만성 통증완화. 이 약은 급성 통증의 치료에는 적절하지 않다. ■ **용법 · 용량 :** · 이 약은 7일마다 부착하여야 한다. · 성인 및 노인 : 5mg을 초기용량으로 사용하여야 하며, 환자의 현재 전반적 상태 및 의학적 상황뿐 아니라, 내성을 포함한 환자의 마약성 진통제 사용력에도 고려되어야 한다. · 증량 : 이 약의 투여시작 및 용량조절 기간 동안 환자는 이 약으로 진통효과를 얻을 때까지 필요한 경우 단시간형 추가진통제를 권장 상용량으로 사용할 수 있다. 주어진 용량은 항정상태에 도달할 때까지 3일 동안 증량하지 않아야 한다. 이후 추가적인 통증완화에 대한 필요성 및 이 약에 대한 환자의 진통반응에 따라 용량을 조정할 수 있다. · 마약성 진통제 또는 고정비율 마약성 진통제/비마약성 진통제 복합제로부터의 전환 : 이 약은 저용량의 마약성 진통제경구용 모르핀 동등량으로 환산시 1일 90 mg 이하) 및 복합진통제를 복용하고 있던 환자에서 대체치료제로 사용되었다. 이러한 환자는 가능한 최저용량(5 mg 패취)으로 시작하여야 하며 증량기간 동안 필요한 경우 단시간형 추가진통제를 권장 상용량으로 사용할 수 있다. · 신장애 : 신장애환자에서 이 약의 특별한 용량조절은 필요하지 않다. · 간장애 : 경증 및 중등도의 간장애 환자에서 이 약의 특별한 용량조절은 필요하지 않다. 중증의 간장애 환자에서 이 약의 치료 중 부프레노르핀이 축적될 수 있다. 이러한 환자에서 대체치료를 고려하여야 하며, 이 약은 주의하여 투여하여야 한다. · 치료의 중단 : 이 약을 제거한 후 혈장 부프레노르핀 농도는 점차 감소하고 진통효과는 일정시간동안 지속된다. 이 약의 치료 후 다른 마약성 진통제를 복용할 경우 이를 고려하여야 한다. 일반적으로 이 약을 제거한 후 24 시간 이내 마약성 진통제를 연속하여 투여하지 않아야 한다. ■ **사용상의 주의사항 :** 1. 경고 1) 이 약은 마약류 중독 치료에 사용되지 않아야 한다. 2) 이 약은 수술 직후 또는 좁은 치료역이나 진통제 필요량이 빠르게 변하는 것이 특징적인 상황에서 진통제로 사용해서는 안된다. 2. 투여금기 1) 부프레노르핀이나 다른 부형제에 알려진 과민반응이 있는 환자 2) 중증 호흡기능 장애 환자 또는 호흡억제상태 3) MAO 저해제를 복용하고 있거나 지난 2주 이내에 복용한 적이 있는 환자 4) 임부 및 임신 가능성이 있는 부인 3. 이상반응 1) 매우 흔한 이상반응(빈도 1/10 이상) : 어지러움, 두통, 기면, 변비, 구역, 구토, 가려움, 홍반, 적용부위의 반응(홍반, 부종, 가려움, 발진) 2) 흔한 이상반응(빈도 1/100 이상, 1/10미만): 식욕부진, 혼란, 우울, 불면증, 신경과민, 불안, 떨림, 호흡곤란, 복통, 설사, 소화불량, 목마름증, 발진, 땀이 남, 피진, 무기력(근육약화, 권태감, 피로 포함), 통증, 말초부종 ■ **제조원 :** LTS Lohmann Therapie–Systeme AG, 독일 ■ **판매원 :** 한국먼디파마(유), 서울특별시 중구 한강대로 416 서울스퀘어 3층 (02-568-5689) ※ 보다 자세한 사항은 제품설명서를 참고하여 주시기 바랍니다.

mundipharma

Mundipharma Korea Ltd.
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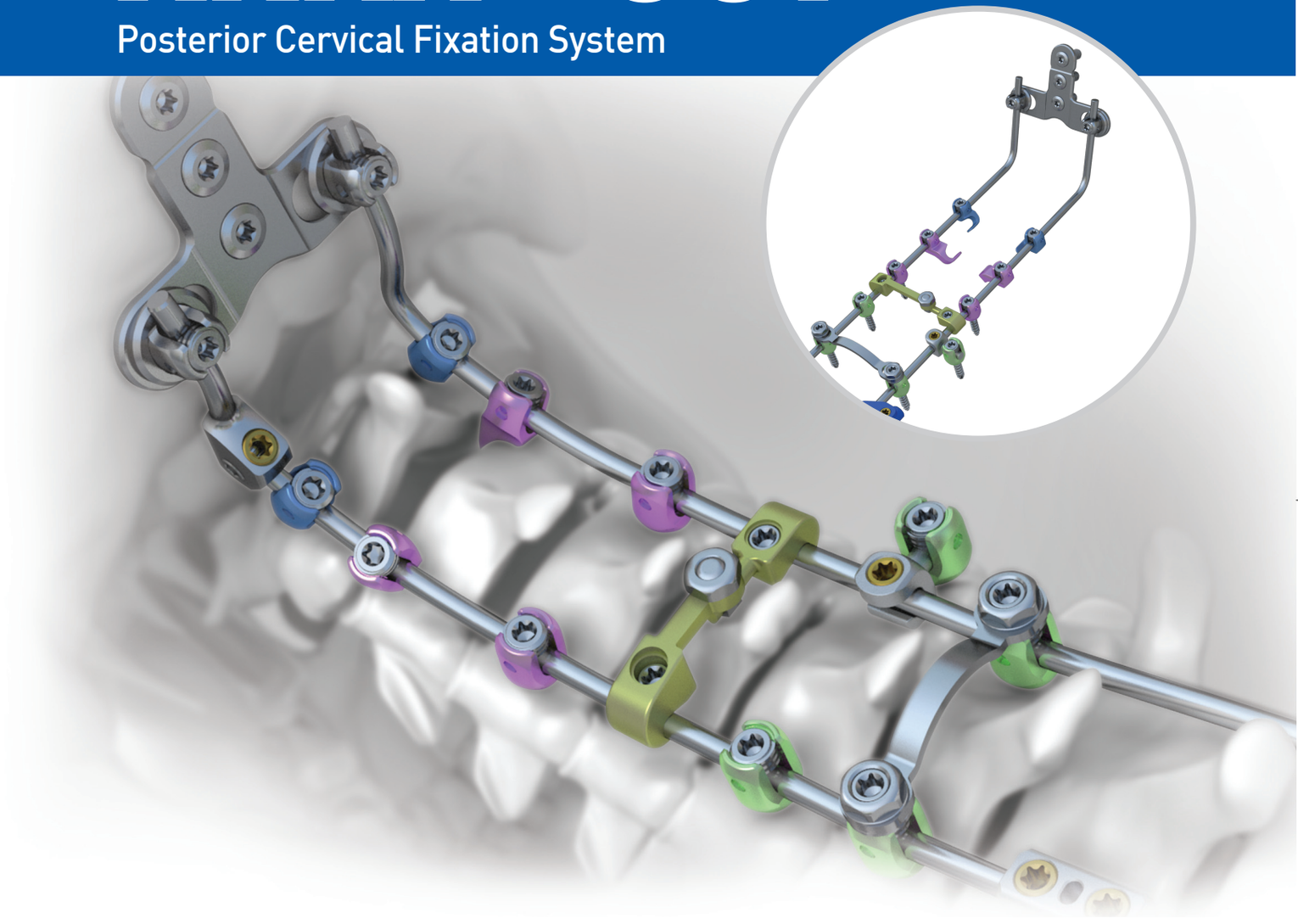
서울스퀘어 3층 (100-714)
Tel. 02)568-5689

KR-NOR-0953-V1-0115

Cleared by **FDA, MFDS**

ANAX™ OCT

Posterior Cervical Fixation System



The ANAX™ OCT Spinal System is an internal fixation device for spinal surgery comprising pedicle screws, connectors, rods, housings, plates, cortical screws and transverse link assemblies.

Various forms and sizes of these implants are available, so that adaptations can be made to take into account the pathology and individual patient.

U&I Corporation
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Tel : +82-31-852-0102 **E-mail** : darren.ko@youic.com

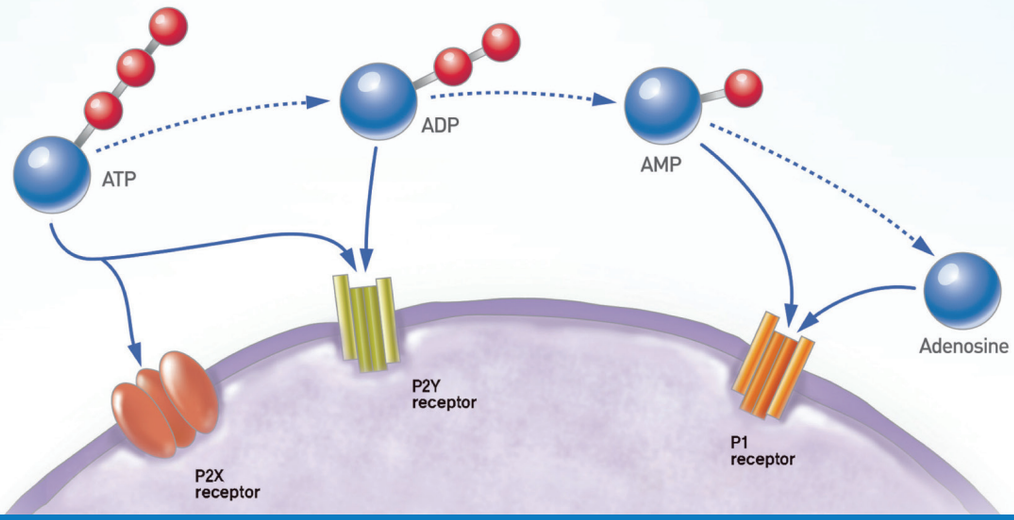
아데노피 주

Adenosine Triphosphate 20mg/Amp.

ATP Action
+
Metabolites Action
+
ATP Energy

→ **Adeno-P Effect**

아데노피 주는
P1, P2 receptor에 작용하여
간기능을 개선합니다.



아데노피 주 (Adeno-P Inj.)

[원료약품의 분량]
1 앰플(2ml) 중,
- 주성분 : 아데노신트리포스페이트 이나트륨, 삼수화물(별규) 21.96mg
  [아데노신트리포스페이트 이나트륨(무수물)으로서 ..... 20mg]
- 안정제 : 엘-아르기닌(U.S.P) 10mg
- 첨가제 : 벤질알코올, 염화나트륨, 주사용수

[성상]
무색 투명한 액이 든 무색 투명한 앰플

[효능 및 효과]
다음의 질환에 수반하는 여러증상의 개선:
근무력증, 심부전, 만성간염에 있어서의 간 기능 개선,
두부외상 후유증, 조절성 안정피로

[용법 · 용량]
아데노신트리포스페이트 이 나트륨으로서 보통 성인 1 회 5~20mg을 1 일 1~2회 피하, 근육 또는 정맥주사한다.
정맥주사인 경우 포도당 주사액 10~20ml에 혼합한 후 3~5분에 걸쳐 천천히 주사한다. 연령, 증상에 따라 적절히 증감한다.

[사용상의 주의사항]

1. 경고
앰플주사제는 용기 절단시 유리파편이 혼입되어 이상반응을 초래할 수 있으므로 사용시 유리파편 혼입이 최소화될 수 있도록 신중하게 절단 사용하되 특히 소아, 고령자에 사용시에는 각별히 주의한다.

2. 다음 환자에는 투여하지 말 것
1) 뇌출혈 직후의 환자(뇌혈관 확장에 의해 재출혈의 가능성이 있다.)
2) 심근경색 및 그 병력이 있는 환자

3. 이상반응
1) 쇽 : 드물게 흉부불쾌감, 구역, 안면홍조, 기침, 딸꾹질, 발열 등의 증상이 나타날 수 있으므로 이러한 증상이 나타날 경우에는 투여를 중지한다.
2) 순환기계 : 가슴이 답답함, 일과성 심계항진, 부정맥 등이 나타날 수 있다.
3) 소화기계 : 구역, 구토, 식욕부진, 위통, 변비 등이 나타날 수 있다.
4) 호흡기계 : 기침 발작이 나타날 수 있다.
5) 중추신경계 : 두통이 나타날 수 있다.

4. 상호작용
디피리다몰은 이 약의 분해산물인 아데노신의 혈중농도를 상승시켜, 이 약의 심혈관에 대한 작용을 증강시킨다는 보고가 있으므로 병용투여시 주의한다.

5. 임부에 대한 투여
임신 중의 투여에 대한 안전성이 확립되어 있지 않으므로 임부 또는 임신하고 있을 가능성이 있는 여성에는 투여하지 않는 것이 바람직하다.

6. 소아에 대한 투여
소아에 대한 안전성은 확립되어 있지 않다.

7. 고령자에 대한 투여
일반적으로 고령자는 생리기능이 저하되어 있으므로 감량 하는 등 주의하여 투여한다.

8. 적용상의 주의
정맥 내에 신속히 주사하면 일시적인 흉부불쾌감, 구역, 두통, 안면홍조, 기침, 딸꾹질, 발열, 기관지경련 등을 일으키는 경우가 있으므로 주사의 속도는 가능한 한 느리게 한다.

[포장단위] 1앰플(2ml)×10, 50앰플/박스

[저장방법] 냉암소 보관, 밀봉용기

※ 구입시 사용기간이 경과되었거나 변질, 변패, 오염 또는 손상된 의약품은 약국개설자 및 의약품 판매업자에 한하여 구입처를 통해서 교환해 드립니다.

제조원: Kobayashi Kako Co., Ltd. 일본

수입원: 제이텍 바이오젠

판매원: 중헌메디텍
서울특별시 서초구 사평대로 64 덕명빌딩 B동 6층
TEL: (02)3667-8101 FAX: (02)3667-8104

판매사
중헌메디텍

제조사
小林化工株式会社

뉴신타® 서방정 50, 100, 150, 200, 250 mg

NUCYNTA® ER tablets

타펜타돌염산염

마 약
전문의약품

【조성】

뉴신타서방정 50mg : 이 약 1정 중 주성분 타펜타돌염산염(별규) ······ 58.24mg (타펜타돌로써 50mg)
뉴신타서방정 100mg : 이 약 1정 중 주성분 타펜타돌염산염(별규) ······ 16.48mg (타펜타돌로써 100mg)
뉴신타서방정 150mg : 이 약 1정 중 주성분 타펜타돌염산염(별규) ······ 174.72mg (타펜타돌로써 150mg)
뉴신타서방정 200mg : 이 약 1정 중 주성분 타펜타돌염산염(별규) ······ 232.96mg (타펜타돌로써 200mg)
뉴신타서방정 250mg : 이 약 1정 중 주성분 타펜타돌염산염(별규) ······ 291.20mg (타펜타돌로써 250mg)

【성상】

뉴신타서방정 50mg : 흰색의 장방형 서방정
뉴신타서방정 100mg : 연한 노란색의 장방형 서방정
뉴신타서방정 150mg : 청록색의 장방형 서방정
뉴신타서방정 200mg : 파란색의 장방형 서방정
뉴신타서방정 250mg : 진한 파란색의 장방형 서방정

【효능효과】

장시간 지속적인 마약성 진통제 치료를 필요로 하는 중증 만성 통증의 완화

【용법용량】

이 약은 마약성 진통제를 이용한 만성통증 관리에 대한 지식이 풍부한 전문의가 처방한다.
중추신경계에 작용하는 다른 많은 진통제와 마찬가지로, 치료할 통증의 중증도, 이전 치료 경험 및 환자 모니터링 가능성을 고려하여, 용법용량은 환자별로 조절되어야 한다.
이 약은 씹거나 부수지 말고 그대로 복용하여야 한다. 만일 씹거나 부수어 복용하면 약물이 신속하게 용출되어 잠재적으로 독성을 일으킬 수도 있는 양이 흡수될 수 있다. 이 약은 한번에 1정씩 삼켜야 한다. 입에 넣은 즉시 충분한 물과 함께 완전히 삼키도록 해야 한다.
이 약은 1일 2회, 약 12시간 간격으로 복용하며, 식사와 무관하게 투여할 수 있다.

1. 치료시작
1) 현재 아편양 진통제를 복용하지 않고 있는 환자:
이 약을 1일 2회, 1회 50mg으로 치료를 시작한다.
2) 현재 아편양 진통제를 복용하고 있는 환자
아편양 진통제에서 이 약으로 변경하여 초기 용량을 설정하는 경우, 이전 약물의 특성, 효력 및 평균 1일 용량을 고려해야 하며, 이 약을 투여하기 전에 다른 서방형/장기지속형 마약성 진통제를 모두 중단한다.

2. 적정 및 유지
치료를 시작한 후 처방의의 면밀한 감독 하에 적절한 진통효과를 나타내고 부작용을 최소화하는 수준에서 용량을 개별적으로 적정해야 한다.
임상시험 경험에 따르면, 1일 2회 투여를 유지하면서 3일 간격으로 50mg 씩 증량하는 방법이 적절한 적정방법으로 나타났다.
이 약은 500mg을 초과하는 1일 용량에 대해 연구된 바 없으므로 권장되지 않는다.

3. 치료 중단
이 약의 치료를 갑작스럽게 중단하면 금단증상이 발생할 수 있다. 더 이상 이 약의 치료가 필요하지 않는 환자의 경우, 금단증상을 방지하기 위해 점진적으로 용량을 감량하는 것이 권장된다.

4. 신장애 환자
경증 또는 중등도 신장애 환자에서 용량 조절이 필요하지는 않다. 이 약은 중증 신장애 환자에 대해 유효성 대조임상시험이 수행되지 않았으므로 이러한 환자에서는 사용이 권장되지 않는다.

5. 간장애 환자
경증 간장애 환자에서 용량 조절이 필요하지는 않다.
이 약은 중등증 간장애 환자에게 주의하여 투여해야 한다. 이러한 환자의 치료는 이 약 50mg 으로 시작해야 하며, 24시간마다 1회 투여보다 더 자주 투여해서는 안된다. 이후 치료는 허용가능한 내약성 범위에서 투여간격을 단축 또는 연장하여 진통효과가 유지되도록 해야 한다.
이 약은 중증 간장애 환자에 대해 연구된 바 없으므로 이러한 환자에서는 사용이 권장되지 않는다.

6. 노인환자(65세 이상)
일반적으로 신기능과 간기능이 정상인 노인 환자를 위한 권장 용량은 신기능 및 간기능이 정상인 젊은 성인 환자의 경우와 동일하다. 노인 환자는 신기능과 간 기능이 저하될 가능성이 더 높기 때문에, 권장사항에 따라 용량 선정 시 주의해야 한다.

7. 소아환자 (18세 미만)
소아환자의 경우 안전성 및 유효성이 입증되지 않았으므로, 18세 미만의 환자에서는 사용이 권장되지 않는다.

【사용상의 주의사항】

1. 경고
1) 남용가능성: 다른 μ-아편양 수용체 작용제 활성이 있는 약물과 마찬가지로, 이 약은 남용 가능성이 있다. 오용, 남용 또는 전용(diversion) 위험 증가에 대한 우려가 있는 경우에는 이 약을 처방 또는 조제할 때 이를 고려해야 하며, μ-아편양 수용체 작용제 활성이 있는 약물로 치료받는 모든 환자들은 남용 및 중독 징후에 대해 면밀하게 모니터링되어야 한다.
2) 호흡억제: 고용량 또는 μ-아편양 수용체 작용제에 민감한 환자들에서 이 약은 용량 관련 호흡억제를 유발할 수 있다.('5. 일반적 주의' 항 참조)
3) 신생아 아편양 금단증후군: 임신중 이 약을 장기사용한 경우 신생아에게 금단 증후군이 발생할 수있다('7. 임부 및 수유부에 대한 투여' 항 참조).

2. 다음 환자에는 투여하지 말 것
1) 이 약 또는 이 약의 구성성분에 과민증이 있는 환자
2) mu-아편양 수용체 효현제 활성이 있는 약물이 금기인 경우: 중증의 호흡 억제 환자, 급성 또는 중증 기관지천식 환자, 고탄산혈증(hypercapnia)환자
3) 마비성 장폐색증이 있거나 의심되는 환자
4) 알코올, 수면제, 중추작용성 진통제 또는 향정신성의약품에 대한 급성 중독 환자
5) MAO 억제제를 투여받고 있거나 최근 14일 이내 이를 복용했던 환자

3. 다음 환자에는 신중히 투여할 것
1) 신장애 환자(중증의 신장애 환자에 대한 투여경험은 없다).
2) 간장애 환자(중증의 간장애 환자에 대한 투여경험은 없다):
3) 저혈압 환자
4) 급성 췌장염을 포함한 담도질환 환자
5) 호흡저하 환자
6) 두부손상, 뇌종양 환자 등 두개내압 상승 가능성이 있는 환자
7) 발작장애가 있는 환자
8) 임부 및 수유부

4. 이상반응
1) 위약 대조군 시험에서 이 약으로 치료받은 환자의 약 60%가 이상약물반응을 경험했다. 중증도는 주로 경증 및 중등증이었다. 가장 빈번한 이상약물반응은 위장관계와 중추신경계(구역, 어지러움, 변비, 두통 및 졸음) 증상이었다.
만성 통증을 대상으로 한 제2/3상 임상시험에서 이 약으로 치료받은 환자의 약 15%가 이상약물반응으로 시험을 중단했으며, 공개라벨 치료 중 중단한 환자는 약 18%였다.
2) 아래 표1은 임상시험 및 시판 후 경험에서 확인된 이 약과 관련된 이상반응 목록으로 범주와 빈도로 기재되어 있다. 매우 흔하게(≥1/10), 흔하게(≥1/100, <1/10), 흔하지 않게(≥1/1,000, <1/100), 드물게(≥1/10,000, <1/1,000), 매우 드물게(<1/10,000), 알 수 없음(이용가능한 자료로 추정할 수 없음)으로 정의된다.

표1. 이상약물반응

기관계	빈도			
	매우 흔하게 (≥1/10)	흔하게 (≥1/100 ~ <1/10)	흔하지 않게 (≥1/1,000, <1/100)	드물게 (≥1/10,000, <1/1,000)
면역계장애			약물과민성*	
대사 및 영양장애		식욕감소	체중감소	
정신장애		수면장애, 불안, 기분 저하, 신경과민, 안절부절	비정상적 꿈, 인지장애, 방향감각상실, 초조, 혼돈상태, 황홀감, 공황발작	약물의존성, 이상 사고
신경계장애	어지러움, 두통, 졸음	불수의적 근육수축, 진전, 주의력 장애	감각이상, 감각저하, 평형장애, 진정, 실신, 기억력 장애, 정신 장애, 의식수준 저하, 말더듬증	협동이상, 실신직전 상태, 경련
눈장애			시력장애	
심장장애			심박수 증가, 심박수 감소, 두근거림	
혈관장애		홍조	혈압감소	
호흡기, 흉부 및 종격장애		호흡곤란		호흡억제
위장관장애	구역, 변비	구토, 설사, 소화불량	복부 불쾌감	위배출장애
피부 및 피하조직 장애		가려움, 다한증, 발진	두드러기	
신장 및 비뇨기계장애			배뇨지체, 빈뇨증	
생식기계 및 유방장애			성기능장애	
전신장애 및 투여부위 상태		피로, 점막 건조, 무력증, 체온변화느낌, 부종	약물 금단증후군, 과민성, 비정상적 느낌	술에 취한 느낌, 이완감

* 시판후 이상 반응으로 드물게 혈관부종, 아나필락시스, 아나필락시스 쇽이 보고되었다.

3) 이 약으로 실시한 임상시험에서 최대 1년 동안 약물에 노출된 환자들에게서 갑작스럽게 투약을 중단했을 때 금단증상에 대한 증거는 거의 보이지 않았다. 발생한 금단증상은 전반적으로 경증으로 분류되었으나, 의사들은 이를 모니터해야 하며 금단증상이 발생하는 경우 그 증상에 따라 환자를 치료해야 한다.
4) 이 약의 시판 후 조사에서 자살 관념이 보고된 바 있다. 자살관념과 타펜타돌 약물 노출 사이의 인과관계는 임상시험 및 시판 후 조사에서 보고된 자료를 근거로 확립되지 않았다.

5. 일반적주의
1) 호흡억제: 고용량 또는 μ-아편양 수용체 작용제에 민감한 환자들에서 이 약은 용량 관련 호흡억제를 유발할 수 있다.
가) 호흡기능 장애가 있는 환자(만성 폐쇄성 폐질환이나 폐질환 환자, 저산소혈증, 호흡기능 저하 증상이 있는 환자 등)에서는 신중하게 투여해야 한다. 이러한 환자들의 경우, 비 μ-아편양 수용체에 작용하는 진통제로의 대체를 고려해야 하며, 이 약은 최저 유효 용량에서 면밀한 의학적 감독하에서만 사용해야 한다. 호흡억제가 발생하면, μ-아편양 수용체 작용제로 유발된 호흡억제의 경우에서와 같이 치료해야 한다. (7. 과량투여시 처치 참조)
나) 아편양 수용체 작용제로 인한 호흡저하 작용은 이산화탄소 저류와 이차적인 뇌척수액 압력의 증가를 포함하며, 이러한 작용은 두부손상, 두개강내 병소, 또는 다른 원인으로 인한 두개강 내압 상승으로 인해 현저히 악화될 수 있다. 또한, 이 약으로 인한 동공의 변화(동공수축)는 두 개강내 병소의 존재, 크기 또는 진행상태를 모호하게 할 수 있다. 임상의는 이 약을 처방하는 환자의 정신상태(Mental Status)의 변화를 평가할 때 이상약물반응에 대한 주의를 기울여야 한다. 다른 μ-아편양 수용체 작용제와 마찬가지로, 이 약은 두개내압 상승, 의식 장애 또는 혼수 등과 같이 이산화탄소 축적의 두개내 영향에 특히 감수성을 가질 수 있는 환자들에게 사용해서는 안 된다.
2) 저혈압: 다른 마약성 진통제들과 마찬가지로 이 약물은 혈관운동상태를 악화시킬 수 있는 페노치아진 또는 전신마취제 등의 CNS 저해제와 함께 투여한 후 또는 혈압유지를 위한 각 개인의 능력이 혈액량 고갈에 의해 악화되었을 경우에 중증의 저혈압을 유발할 수 있다. 또한, 다른 마약성 진통제와 마찬가지로 약물로 인한 혈관확장효과가 심박출 및 혈압을 더 낮출 수 있기 때문에, 순환기계 쇽이 있는 환자에게는 주의하여 사용한다.
3) 발작장애: 이 약은 발작장애가 있는 환자를 대상으로 체계적으로 평가되지 않았다 (이러한 환자들은 임상시험에서 제외되었다). 그러나, 다른 μ-아편양 수용체 작용을 갖는 진통제와 같이, 발작장애 과거력이 있거나 환자에게 발작의 위험을 줄 수 있는 모든 상태의 환자에서 이 약은 신중하게 처방해야 한다.
4) 담도질환 환자: μ-아편양 수용체 효현제 활성이 있는 약물은 오디(Oddi) 괄약근 연축을 초래할 수 있으므로, 급성 췌장염을 포함한 담도질환 환자의 경우 신중하게 사용해야 한다.
5) 운전이나 기계조작에 미치는 영향: μ-아편양 수용체 작용을 갖는 다른 약물과 마찬가지로, 이 약은 중추신경계에 영향을 주어 운전이나 기계 조작에 영향을 줄 수 있다. 이는 치료를 시작할 때와 용량이 변경될 때 뿐만 아니라 알코올이나 진정제와 관련된 경우에도 고려되어야 한다. 운전 또는 기계 조작에 영향을 줄 수 있다는 사실을 환자에게 알려주어야 한다.

6. 상호작용
1) 다른 μ-아편양 수용체에 작용하는 진통제, 전신 마취제, 페노티아진계, 기타 신경안정제, 진정제, 수면제 또는 다른 중추신경계 억제약물(알코올 및 불법 약물 포함)과 이 약을 병용투여하는 환자들은 추가적인 중추신경계 억제를 보일 수 있다. 이 경우 상호작용의 영향으로 호흡억제, 저혈압, 심각한 진정 또는 혼수가 초래될 수 있다. 이러한 약물들을 병용요법으로 사용하려 하는 경우에는 두 제제 중 하나 또는 두 제제 모두의 용량 감량을 고려해야 한다.
2) 노르에피네프린 수치에 대한 잠재적 부가효과로 인해 심혈관계 부작용이 유발될 수 있으므로, 이 약은 MAO 억제제를 투여 중인 환자 또는 최근 14일 이내에 이를 복용했던 환자들에게는 금기이다.
3) 이 약을 선택적 세로토닌 재흡수억제제(SSRI)와 같은 세로토닌성 의약품과 병용투여하였을 때 일시적인 세로토닌 증후군 사례가 보고된 바 있다. 세로토닌 증후군의 징후 예로는 혼돈, 초조, 발열, 발한, 운동실조, 과다반사, 간대성근경련 및 설사가 있을 수 있다. 세로토닌성 의약품을 중단하면 보통 신속하게 개선된다. 치료는 증상의 속성과 중증도에 따라 달라진다.
4) 아편양 수용체 작용제나 길항제의 복합제(펜타조신, 날부핀 등) 또는 μ-아편양 부분 작용제와 이 약의 병용투여에 대한 임상자료는 없다. 이 경우 순수 μ-아편양 작용제와 마찬가지로 이 약의 μ-아편양 성분으로 인한 진통효과는 이론적으로 감소될 수 있다. 따라서, 이러한 약물과 이 약을 병용하는 경우 신중하게 투여해야 한다.
5) 이 약의 주요 배설경로는 UGT(주로 UGT1A6, UGT1A9, UGT2B7)에 의한 글루크로닌산과의 포합과정이므로, 이 효소에 대한 강한 유도제와 병용투여하는 경우 이 약의 전신노출이 증가할 수 있다.

7. 임부 및 수유부에 대한 투여
1) 임부: 임부에서의 사용에 대한 자료는 매우 제한적이다. 동물시험에서 최기형성은 나타나지 않았다. 그러나 과다한 약리작용(치료범위를 상회하는 용량에서 μ-아편양 관련 중추신경계 작용)을 초래하는 용량에서 발생 지연 및 배태자 독성이 관찰되었다. 출생 후 발달에 대한 영향은 모체 NOAEL인 40mg/kg/day에서 이미 관찰되었다.
이 약의 경우 임신 중에는 잠재적 유익성이 태아에 대한 잠재적 위험성을 상회하는 경우에만 사용해야 한다.
2) 출산: 사람에서 출산에 대한 이 약의 영향은 알려져있지 않다. 이 약은 출산 직전 및 출산 중 여성에게 사용은 권장되지 않는다. 타펜타돌의 μ-아편양 수용체 작용 활성으로 인해, 산모가 이 약을 복용했던 신생아의 경우 호흡억제를 모니터링해야 한다.
임신 중 이 약을 장기사용하는 경우 나타날 수 있는 신생아 금단증후군은 성인과 달리 생명을 위협할 수 있으므로 전문의에 의하여 적절히 관리되어야 하며, 투여 기간이 길어질 경우에는 환자에게 신생아 금단증후군의 가능성에 대해 설명하고 이에 대한 조치를 마련하여야 한다.
3) 수유부: 이 약이 사람 모유로 분비되는지에 대한 정보는 없다. 모체에 이 약을 투여했던 랫드시험에서 이 약이 유즙으로 분비되는 것으로 확인되었다. 따라서 수유 중인 아이에 대한 위험성은 배제할 수 없다. 수유부에서 이 약의 유익성을 고려하여, 수유를 중단하거나 투여를 중단한다.

8. 과량투여시의 처치
1) 증상
이 약의 과량투여 경험은 매우 제한적이다. 전임상 자료에서 μ-아편양 수용체 작용 활성을 갖는 다른 중추 작용성 진통제의 중독과 유사한 증상이 타펜타돌의 과량투여에서 예상되는 것으로 나타났다. 원칙적으로 임상상황에서 이러한 증상에는 특히 동공수축, 구토, 심혈관 허탈, 최대 혼수에 이르는 의식장애, 경련, 심하면 호흡정지에 이르는 호흡억제가 포함된다.
2) 처치
과량투여시의 처치는 μ-아편양 수용체 작용성 증상의 치료에 초점을 맞추어야 한다. 이 약의 과량투여가 의심되는 경우 일차적으로 환자의 기도 확보와 보조환기 또는 조절환기 실시에 주의를 기울여야 한다.
날록손과 같은 아편양 길항제가 아편양제제의 과량투여로 초래된 호흡억제에 대한 해독제이다. 과량 투여 후의 호흡억제는 아편양 길항제의 작용시간을 초과하여 지속될 수 있다. 아편양 길항제의 투여로 아편양 과량 투여 후 기도, 호흡, 순환의 지속적 모니터링을 대신할 수는 없다. 아편양 길항제에 대한 반응이 최적수준에 미달되거나 특성상 단기 작용성인 경우에만 의약품의 제조사 지침에 따라 추가적 길항제를 투여해야 한다.
흡수되지 않은 의약품의 제거를 위해 위장관 오염제거를 고려할 수 있다. 활성탄을 사용한 위장관 오염제거 또는 위세척을 섭취 2시간 이내에 고려할 수 있다. 위장관 오염제거를 시도하기 전, 기도 확보에 주의를 기울여야 한다.

【저장방법】 기밀용기, 실온(1~30℃) 보관

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울트라셋®이알 세미 서방정 울트라셋®이알 서방정

[조성] **울트라셋이알세미서방정** (트라마돌염산염 37.5 mg, 아세트아미노펜 325 mg) **울트라셋이알서방정** (트라마돌염산염 75 mg, 아세트아미노펜 650 mg) **[효능·효과]** 중등도-중증의 만성 통증 **[용법·용량]** 성인: 용량은 환자의 통증 정도 및 치료 반응에 따라 조절. 초회용량으로 울트라셋®이알세미서방정은 2정, 울트라셋®이알서방정은 1정 투여를 권장, 그 이후 투여 간격은 최소 12시간 이상으로 하되, 1일 울트라셋®이알세미서방정은 8정, 울트라셋®이알서방정은 4정을 초과하지 않도록 함. 이 약을 필요 이상 장기간 투여하지 않도록 하며, 질병의 특성 및 심한 정도로 인해 장기간 투여가 필요한 경우, 정기적인 모니터링을 실시하여 이 약의 지속투여 여부를 확인하도록 한다. 이 약의 투여 시 구역, 구토, 가려움증, 변비, 어지러움, 졸음 등이 나타날 수 있으므로 환자의 반응을 면밀히 관찰하고 적절히 조절한다. 노인의 경우 통상적인 성인 용량을 투여하도록 함. 단, 75세 이상의 노인에게 트라마돌을 경구 투여시 트라마돌의 소실반감기가 17% 증가하였으므로 최소 12시간 이상 간격으로 이 약을 투여하도록 함. 소아, 신장애 및 간장애 환자에 대한 이 약의 안전성 및 유효성은 확립되어 있지 않으므로, 투여를 권장하지 않음. **[사용상의 주의사항]** **〈경고〉** 1) 매일 세잔 이상 정기적으로 술을 마시는 사람이 이 약이나 다른 해열진통제를 복용해야 할 경우 반드시 의사 또는 약사와 상의해야 함 2) 아세트아미노펜을 복용한 환자에서 매우 드물게 급성 전신성 발진성 농포증(급성 전신성 발진성 고름물집증)(AGEP), 스티븐스존슨 증후군(SJS), 독성 표피 괴사용해(TEN)와 같은 중대한 피부반응이 보고됨. 이 약 투여 후 피부발진이나 다른 과민반응의 징후가 나타나면 즉시 복용을 중단하도록 함. 3) 트라마돌을 권장용량 범위 내에서 투여받은 환자에서 발작이 보고됨. 권장용량 이상 투여 시 발작의 위험은 증가되는 것으로 나타남. 트라마돌을 선택적 세로토닌 재흡수 억제제, 삼환계 항우울제 (TCAs) 및 다른 삼환계 및 다른 마약류 등의 약물과 병용시 발작의 위험은 증가됨. 트라마돌은 MAO (Monoamine Oxidase) 억제제, 신경이완제, 발작 역치를 낮출 수 있는 약물 등과 병용시 발작의 위험을 증가시킬 수 있음. 간질환자, 발작 병력자 또는 발작에 대한 위험인자 (머리 상해, 대사장애, 알코올 또는 약물 금단 환자, 중추신경계 감염)가 있는 환자에서 경련발생의 위험이 증가될 수 있음. 4) 트라마돌 투약 환자에서 드물게 치명적인 아나필락시양 반응이 보고됨 5) 과량의 트라마돌을 마취제 또는 알코올과 병용시 호흡억제가 나타날 수 있음. 6) 중추신경계 억제제를 복용한 환자에게 이 약을 투여시 중추신경계 및 호흡억제의 위험이 증가될 수 있음 7) 두개골내압이 증가된 환자나 머리상해 환자에서 이 약의 투여는 아편제제의 호흡억제 효과로 이산화탄소 저류와 2차적인 뇌척수액의 압력 증가로 인해 이러한 증상이 심각하게 나타날 수 있음 8) 트라마돌은 모르핀형(μ-opioid)의 정신적, 육체적 의존성을 유발할 수 있음 9) 간독성: 이 약에는 아세트아미노펜 및 트라마돌이 함유되어 있음. 아세트아미노펜은 때로 간이식 및 사망을 초래하는 급성 간부전과 관련이 있으며, 대부분의 간손상은 다른 아세트아미노 펜 제품과 함께 복용하여 일일 4,000 밀리그램을 초과하였을 때와 관련이 있으므로 사용시 주의, 특히 간장애 환자는 반드시 의사와 상의한 후 복용해야 함. **〈투여금기〉** 1) 이 약의 성분에 과민성이 있는 환자 2) 알코올, 수면제, 중추작용진통제, 아편제 또는 향정신성 약물 등 중추신경계 작용약물 중독 환자 3) 심한 호흡억제상태 환자 4) 두부손상, 뇌의 병변이 있는 경우로 의식혼탁의 위험이 있는 환자 5) MAO억제제를 투여받고 있는 환자 또는 최근 14일 이내에 투약한 경험이 있는 환자 6) 소화성궤양, 심한 혈액이상 환자 7) 심한 간장애, 심한 신장애, 심한 심기능부전 환자 8) 아스피린 천식또는 병력이 있는 환자 9) 약물로 조절되지 않는 간질 환자. **〈신중투여〉** 1) 모르핀 병용 또는 반복투여 환자 2) 아편제제, 마취제, 최면제, 페노치아진, 신경안정제, 진정제 등과 같은 중추신경계 억제제 복용 환자 3) 담도질환 환자 4) 간장애 환자 5) 신장애 환자 6) 음주 환자 7) 아편에 과민증 환자 8) 간질 환자 또는 발작 발생 가능성이 있는 환자 9) 속상태, 원인모를 이유로 인한 의식 변화상태 환자 **[전문의약품]** **[제조원]** (주)한국얀센

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