

The 5<sup>th</sup>  
**ISMISS**  
The 15<sup>th</sup> combined with  
**MISS Summit Forum**

minimally invasive spine surgery

## Program & Abstracts

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Web discussion 2023.3.11(Sat) 4:00PM-6:00PM(JST)

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On demand broadcasting 2023.3.11(Sat)-3.31(Fri)

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Congress Secretariat of MISS Summit Forum



**Aichi Spine Hospital**

31-1, Kamiike, Goromaru, Inuyama-shi, Aichi, 484-0066, Japan

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<http://missummit.com>



# Congress Outline

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## **Congress Name**

The 5th ISMISS combined with The 15th MISS Summit Forum

## **Dates**

2023.3.11(Sat) 4:00PM-6:00PM(JST) Web discussion

2023.3.11(Sat)-3.31(Fri) On demand broadcasting

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Kai-Uwe Lewandrowski

Akira Dezawa

## **President**

Koichi Sairyo

## **Chairman**

Fujio Ito

## **Co-Chairman**

Zenya Ito

## **Secretariat**

Aichi Spine Hospital

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Masataka Sakane, Tatsushi Inoue, Nobuyuki Simokawa, Shoichi Kokubun

Seiji Yamaya, Masatsune Yamagata, Hidetomi Terai, Daisuke Sakai, Ken Ishii

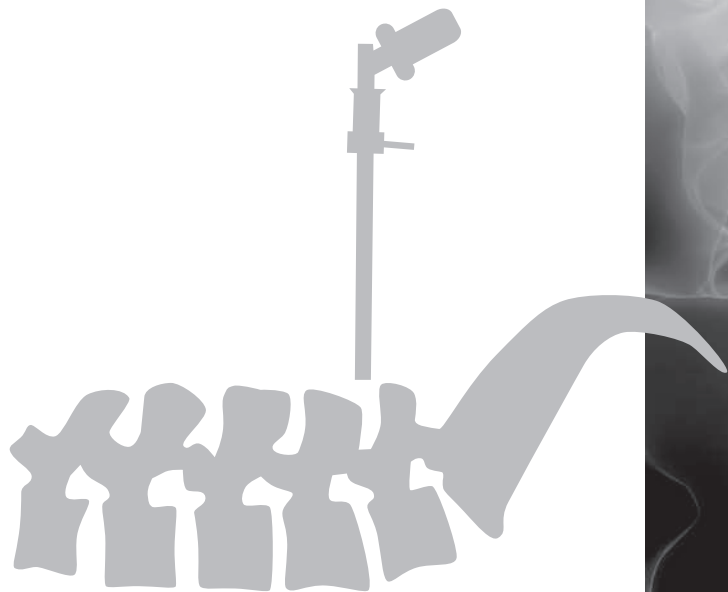
Kuniyoshi Tsuchiya, Yoshinori Kyoh, Hisashi Iwata, Kei Miyamoto, Hiroshi Yamada

Izumi Koyanagi, Sumito Shimizu, Hiroshi Ozawa, Yukihiro Matsuyama

Kanji Sasaki, Yukoh Ohara, Motohide Shibayama, Shu Nakamura, Kenzo Simizu

Yuichi Kondo, Yasushi Miura [JPN]

# Program



## **PROGRAM 1 - Web discussion – 2023.3.11.(Sat) 4:00PM–6:00PM(JST)**

■ session1 **DECOMPRESSION** 4:00PM-5:00PM(JST) Moderator : **Zenya Ito, Motohide Shibayama**

- D-1  
**PEL** 4:00-4:10  
**Full-endoscopic monoportal decompression for lumbar canal stenosis**  
Kuniyoshi Tsuchiya (Japan)
- D-2  
**PSLD** 4:10-4:20  
**Optimal Treatment Strategies of decompression with PSLD for Lumbar Stenosis without Fusion**  
Han Ga Wi Nam (Korea)
- D-3  
**UBE** 4:20-4:30  
**Lumbar central stenosis and foraminal stenosis by unilateral biportal endoscopy**  
Park Man Kyu (Korea)
- D-4  
**Comparison of MEL, UBE, PSLD, PEL** 4:30-4:40  
**Comparison of unilateral laminectomy for bilateral decompression by four surgical methods**  
Zenya Ito (Japan)
- Discussion** 4:40-5:00

■ session 2 **FUSION** 5:00PM-6:00PM(JST) Moderator : **Koichi Sairyo, Yukoh Ohara**

- F-1  
**LLIF VR/AR** 5:00-5:10  
**Devices of LLIF technique - Finger electrode, Single-position PPS, VR/AR -**  
Wataru Narita (Japan)
- F-2  
**PSLD-LIF** 5:10-5:20  
**Full endoscopic TLIF**  
Kangtaek Lim (Korea)
- F-3  
**UBE-LIF** 5:20-5:30  
**ULIF(UBE lumbar interbody fusion) and ADS(adult degenerative scoliosis)**  
Son Sang Kyu (Korea)
- F-4  
**KLIF** 5:30-5:40  
**Full—endoscopic trans-Kambin Lumbar interbody fusion (fullendo KLIF) for spondylolisthesis.**  
Koichi Sairyo (Japan)
- Discussion** 5:40-6:00



## PROGRAM 2 – On demand broadcasting – 2023.3.11.(Sat)-3.31(Fri)

### ■ Honorary President's Lecture

HL-1  
**FUTURE OF SPINAL ENDOSCOPY**  
Kai-Uwe Lewandrowski (USA)

### ■ President's Lecture

PL-1  
**Non-specific low back pain: how to treat the condition by MISS**  
Koichi Sairyo (Japan)

### ■ Chairman's Lecture

CL-1  
**Anterior Approach in MIS / Endoscopic Cervical Surgery (vs ACDF)**  
Zenya Ito (Japan)

### ■ Full video Lecture

PE D-1  
**My own history of 6 spinal surgeries**  
Fujio Ito (Japan)

MEL D-1  
**Endoscope-assisted minimally invasive surgical decompression for lumbar spinal canal stenosis with degenerative spondylolisthesis**  
Koshi Nambu (Japan)

MEL F-1  
**Safe and less invasive lumbar interbody fusion technique under microendoscope (MED): micro-endoscopy-assisted extraforaminal lumbar interbody fusion (mELIF)**  
Motohide Shibayama (Japan)

UBE F-1  
**Unilateral biportal endoscopic spine surgery (UBE) changes oblique lateral lumbar interbody fusion (OLIF) from anterolateral to posterolateral invasion and evolves minimally invasive fixation from muscle preserving to bone preserving**  
Kanji Sasaki (Japan)

UBE F-2  
**Biportal endoscopic lumbar interbody fusion with large cage**  
JU EUN KIM (Korea)

SELD D-1  
**Step by Step trans- SACRAL EPIDURISCOPIC LASER DECOMPRESSION SURGERY (SELD)**  
Elmer Jose Arevalo Meceda (Philippine)

PSLD D-1  
**A Beginner's Guide to perform the PSLD : Practical Advice and Tips**  
Han Ga Wi Nam (Korea)

## ■ Special Lecture

SL-1

### **Posterior Endoscopic Cervical Approach "single working channel scope" Step by Step**

Alfonso García (Mexico)

SL-2

### **Cervical disc arthroplasty – Clinical outcome and MRI findings of 46 patients with a mean follow-up of 11 years.**

Benedikt W. Burkhardt (Switzerland)

SL-3

### **The microendoscopic resection of migrated lumbar disc herniation via a intralaminar approach using the EasyGO-spine system.**

Benedikt W. Burkhardt (Switzerland)

SL-4

### **Epiduroscopic Laser Ablation of Sinuvertebral Nerve for Discogenic Back Pain**

Byapak Paudel (Spain)

SL-5

### **Recent trend and new trial of endoscopic spine surgery**

Chien-Min Chen (Taiwan)

SL-6

### **Opioid-free and awake percutaneous/endoscopic TLIF surgery using a large footprint interbody cage**

Christian Morgenstern (Spain)

SL-7

### **Clinical development of Tie2 positive nucleus pulposus progenitor cell product for low back pain**

Daisuke Sakai (Japan)

SL-8

### **Transcorporeal endoscopic discectomy for cervical disc herniation: A technical consideration.**

Gun Keorochana (Thailand)

SL-9

### **Correction of Adolescent Idiopathic Scoliosis using Convex Rod Rotation Maneuver**

Hidetomi Terai (Japan)

SL-10

### **Effects and limitations of the full-endoscopic lumbar discectomy transforaminal approach for a reoperation of lumbar disc herniation.: Focusing on complete resection of the herniated disc.**

Hiroki Yoshimatsu (Japan)

SL-11

### **IPSILATERAL BIPORTAL ENDOSCOPIC INCLINED TECHNIQUE FOR LATERAL RECESS AND FORAMINAL LUMBAR DISC PATHOLOGY AT L4-L5 AND L5-S1**

Javier Quillo-Olvera (Mexico)

SL-12

### **Endoscopic Extreme TLIF(eXTLIF) with OLIF Cage; Preliminary Technical Report**

Jin Hwa Eum (Korea)

SL-13

### **L5-S1 foraminal and lateral recess stenosis: The inherent factors to be considered upon the choice between the Full Endoscopic Transforaminal vs Interlaminar decompression.**

Jun Ho Lee (Korea)

SL-14

**Posterior Full-Endoscopic Cervical hemilaminectomy and Decompression for Cervical Adjacent Stenosis with Myeloradiculopathy: A Case Report and Technique Review.**

Keng-Chang Liu (Taiwan)

SL-15

**Full-endoscopic Contralateral Decompression of Foramen from Inside of the Canal (CDFIC)**

Kuniyoshi Tsuchiya (Japan)

SL-16

**EVOLUTION OF ENDOSCOPIC SPINE SURGERY TECHNIQUE**

Michael Schubert (Germany)

SL-17

**SURFACE MATTERS: NANOTECHNOLOGY IN ORTHOPAEDICS AND SPINE**

Muhammad Tariq Sohail (Pakistan)

SL-18

**Surgical technique for cervical pedicle screw insertion using O-Arm navigation plus mini screws**

Nobuyuki Shimokawa (Japan)

SL-19

**Instrument Design Based on Body Ergonomics in Endoscopic Spine Surgery**

**“Do we need to re-think our tools?”**

Rafael Cruz Bundoc (Philippine)

SL-20

**Full-endoscopic KLIF for lumbar spondylolisthesis and local scoliosis**

Seiji Yamaya (Japan)

SL-21

**Myogelosis: Static electricity plays a leading role in the production of pain regarded as non-specific.**

Shoichi Kokubun (Japan)

SL-22

**Bone wax technique for full-endoscopic lumbar laminotomy**

Tatsushi Inoue (Japan)

SL-23

**Decision Making of The Treatment of Spinal Stenosis in Elder: UBE versus Transforaminal Decompression or Combined Procedures**

Tolgay Satana (Turkey)

SL-24

**Percutaneous endoscopic transforaminal lumbar interbody fusion: a novel technique- sentinel pinning with lateral retractor for protection of exiting root**

Yi-Hung Huang (Taiwan)

SL-25

**Strategies against the posterior bowel deviation in lateral lumbar interbody fusion and Current ELLIF Techniques**

Yoshinori Kyoh (Japan)

SL-26

**Condoliase chemonucleolysis for lumbar disk herniation: Optimal indication and long term follow-up**

Yukihiro Matsuyama (Japan)

SL-27

**Full endoscopic management of thoracic spine pathologies**

Hyeun Sung Kim (Korea)

SL-28

**The Challenge of Endoscopic Lumbar Interbody Fusion for Adult Spinal Deformity. Incomplete Surgery or Not**

Hyeun Sung Kim (Korea)

SL-29

**Developing paradigm for surgical treatment of Osteoporotic Vertebral compression fractures.**

Arvind Bhawe (India)

SL-30

**Staged Endoscopic Approach For Elderly Scoliotic Patient**

Abdullah Merter (Turkey)

SL-31

**Novel trans-kambin approach to up-migrated Lumbar Disc Herniations in the hidden zone of Macnab with the use of hook and Flexi graspers from below the exiting root and axilla**

Malcolm Pestonji (India)

SL-32

**Biportal Endoscopic Spine Surgery (UBE): Pitfalls and Early Learning Curve**

Cigdem Mumcu (Turkey)

SL-33

**From anatomy of the spine to regenerative therapy applications: recent advances and translational research**

Ayhan Cömert (Turkey)

SL-34

**Clinical & Radiological Outcomes of Transforaminal Lumbar Interbody Fusion Using Biportal Endoscopic Technique & Double Cages**

Jwo-Luen Pao (Taiwan)

SL-35

**A PROMISING POST OPERATIVE PREDICTION OF DECOMPRESSION OF STENOSIS IN WITH INCOMPATIBLE CLINIC AND RADIOLOGIC IMAGES**

Tarik YAZAR (Turkey)



## ■ Lectures

L-1

### **Bess Decompression in Recurrent Pain Post Interspinosus Device Insertion**

Abdul Kadir Hadar (Indonesia)

L-2

### **Efficacy and safety of bilateral percutaneous Vertebroplasty using titanium intravertebral body implant for traumatic compression vertebral fractures**

Ali Hammed (Syria)

L-3

### **Full-endoscopic trans Kambin's triangle lumbar interbody fusion (Full-endo KLIF) using the PETLIF® system for degenerative lumbar spinal disease is less invasive in terms of bleeding compared to MIS-TLIF.**

Atsushi Kojima (Japan)

L-4

### **Posterior Full-endoscopic Cervical Decompression in Treatment of Cervical Stenosis Following Anterior Cervical Discectomy and Fusion. Cases Reports and Surgical Technique**

Ching-Hsiao Yu (Taiwan)

L-5

### **LUMBAR SOLITARY PLASMACYTOMA APPROACHED BY TRANS OPERATIVE VERTEBROPLASTY THROUGH FULL ENDOSCOPY IN ASSOCIATION WITH STEREOTAXY RADIOTHERAPY**

MÁRCIO ROBERTTI RAMALHO DA CUNHA (Brazil)

L-6

### **Percutaneous stenoscopic cervical decompression (PSCD) for treatment of multiple cervical nerve root compression in patients with chronic neck and periscapular pain**

Matee Phakawech (Thailand)

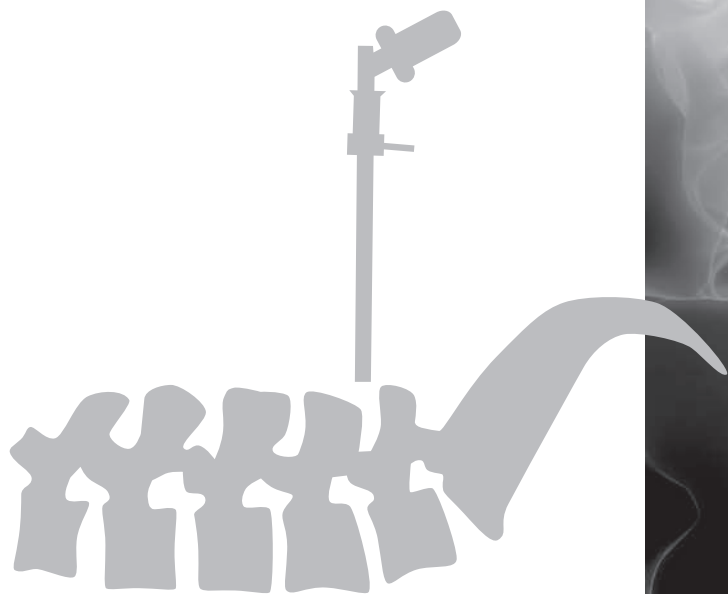
L-7

### **The UBE surgery with OLIF procedure in one single position**

Nantawat Uttamo (Thailand)



# Abstracts



# Web discussion

2023.3.11.(Sat) 4:00PM-6:00PM(JST)

session 1 **DECOMPRESSION**

4:00PM-5:00PM(JST)

session 2 **FUSION**

5:00PM-6:00PM(JST)



## PEL

### Full-endoscopic monoportal decompression for lumbar canal stenosis

Kuniyoshi Tsuchiya

Japan

Purpose of this presentation : This presentation is to describe basic technique of full-endoscopic monoportal decompression for lumbar canal stenosis. Tips for smooth surgical procedure are also discussed. During the procedure, positioning is one of the important keys and multiple bony landmarks should be identified and should be connected for this purpose. In order to obtain clear field, adequate hemostasis and cleavage of soft tissue debris are mandatory. Single portal full-endoscopic decompression can also serve to decompress opposite side foramen, thanks to its small diameter. Thus canal stenosis even accompanied with unilateral foraminal stenosis can be treated with less bone resection with monoportal decompression shown in this presentation. In order to attain satisfactory and stable results, objective endpoints should be defined and confirmed during the procedure, as well as a precise preoperative planning. Full endoscopic decompression for lumbar canal stenosis is extremely useful in its versatility.

## Education and Professional Work

### TRAINING:

1993-1994: Postdoctoral fellow, Stanford University

2003-2004: Visiting fellow: Spine Deformity Service

Department of Orthopaedics, Washington University School of Medicine, St Louis, MO

### LICENSES/CERTIFICATION

2010- : Board certified surgeon of Microendoscopic Spine Surgery

2016- : Board certified surgeon of Full Endoscopic Spine Surgery

### Activities:

2012-: Delegate: Japanese Spinal Instrumentation Society

2018-: Delegate: AO spine Japan

2019-: Editorial Committee: guideline for lumbar canal stenosis

### Current interests:

Minimally invasive spine surgery



## PSLD

### Optimal Treatment Strategies of decompression with PSLD for Lumbar Stenosis without Fusion

Han Ga Wi Nam

Korea

Lumbar spinal stenosis with foraminal stenosis (LSFS) is caused by gradual degenerative changes of the lumbar spine. These include hypertrophy of facet joints and ligamentum flavum, disk herniation, collapse of the intervertebral space, and osteophyte formation. LSFS can result in pain in the lower back, leg, as well as intermittent claudication that can seriously affect the daily life of patients. In early surgical practice, only the decompression of neural structures was performed. Further developments, such as spinal instrumentation using pedicle screws to fix the unstable spine, have been shown to improve surgical outcomes and inhibit progression of listhesis and scoliosis. Surgical treatment is better than conservative treatment if patients are selected carefully. With the prolonged life expectancy and increased number of older people, lumbar spinal stenosis has become the most common indication for spinal surgery among older people. Full endoscopic spinal surgery (FESS) has several advantages: minimally invasive, less surgical trauma, can be undertaken without general anesthesia, rapid postoperative recovery and, theoretically, non-degeneration of adjacent spinal segments. In recent years, with the development of surgical methods and instruments, FESS has been used for lumbar disc herniation and but also for spinal stenosis treatment. Therefore, in this presentation, I will show you optimal treatment of decompression with PSLD for lumbar stenosis without fusion surgery.

## Education and Professional Work

Feb. 2008	M.D. College of Medicine, Kangwon National University, Korea
Mar. 2009 - Feb. 2010	Internship, Hangang Sacred Heart Hospital, Seoul, Korea
Mar. 2010 - Dec. 2012	Residency in Department of Neurosurgery, Hangang Sacred Heart Hospital, Seoul, Korea
Jan. 2013 - Feb. 2014	Residency in Department of Neurosurgery, Dongtan Sacred Heart Hospital, Hwaseong, Gyeonggi., Korea
Apr. 2014 - Mar. 2015	Army Surgeon, 1st Armored Brigade
Apr. 2015 - Apr. 2017	Army Surgeon , Korea Military Academy Hopsital
May. 2017 - Feb. 2018	Fellow in Department of Neurological Surgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea
Mar. 2018 - Mar. 2020	Section Chief, Department of Neurosurgery, Good Doctor Teunteun Hospital, Anyang, Korea
Mar. 2020 - Jan. 2021	Section Chief, Department of Neurosurgery, The Leon Wiltse Memorial Hospital, Anyang, Korea
Jan. 2021- present	Section Chief, Department of Neurosurgery, Sooncheon Chuck Hospital, Sooncheon, Korea



## UBE

### Lumbar central stenosis and foraminal stenosis by unilateral biportal endoscopy

Park Man Kyu

Korea

Traditionally, microscopic surgery is the gold standard surgical treatment for lumbar spine disease, including lumbar spinal stenosis (LSS), lumbar disc herniation (LDH), lumbar foraminal and extraforaminal stenosis. However, the conventional posterior approach has disadvantages. For example, it is associated with a risk of postoperative back pain or instability and paraspinal muscle atrophy due to muscle dissection or retraction. Furthermore, excessive manipulation of the dorsal root ganglion can cause postoperative leg pain or dysesthesia, and the deep location of the foraminal lesions makes the surgery technically challenging and more invasive.

Recently, unilateral biportal endoscopy (UBE) has been widely used in decompression surgery for degenerative lumbar pathology. Several studies have shown that UBE has favorable clinical and radiological outcomes and advantage. Lately, due to advancements in endoscopic spine surgery, the unilateral biportal endoscopic (UBE) technique has been applied in the cervical, thoracic and lumbar spine.

The main advantages of UBE are the availability of a familiar and magnified surgical view and the independent movement of an endoscope and other instruments during surgery. These can help achieve complete neural decompression and improve neurological outcomes while preventing complications correlated with the conventional posterior approach. UBE is a less invasive procedure. Thus, it is associated with a lower level of postoperative back pain and volume of blood loss and a shorter length of hospitalization by preserving the facet joint and paraspinal musculoligamentous structures.

To perform lumbar decompression safely and effectively via UBE, some surgical techniques must be considered at each surgical stage. This presentation assesses the surgical techniques of the posterior approach and the strategies for preventing complications in patients with lumbar pathology

## Education and Professional Work

### Qualifications:

Graduated medical school at Kyungpook National University, Daegu, South Korea

Completed internship and residency at Kyungpook National University Hospital, Daegu, South Korea

Completed spine fellowship at Kyungpook National University Hospital, Daegu, South Korea

### Working Experience:

(Present) UBE consultant spine surgeon, Good Moonhwa Hospital, Busan, South Korea

Director of research center, Parkweonwook Hospital, Busan, South Korea

UBE consultant spine surgeon, Parkweonwook hospital, Busan, South Korea

Clinical instruction, Kyungpook National University Hospital, Daegu, South Korea (2017-2018)

### Awards:

Annual KOSESS conference Best paper award (2019)

The 37th Annual Korean Neurosurgical Society Academic award (2019)

2019 KOMISS advanced spinal endoscopic course symposium Academic award (2019)



## Comparison of MEL,UBE,PSLD,PEL Comparison of unilateral laminectomy for bilateral decompression by four surgical methods

Zenya Ito

Japan

**Introduction:** The unilateral laminectomy for bilateral decompression (ULBD) method for lumbar spinal stenosis has been performed in the order of Microendoscopic laminectomy (MEL), Percutaneous Endoscopic Laminectomy (PFEL), Percutaneous Stenoscopic Lumbar Decompression (PSLD), and Unilateral Biportal Endoscopic Laminectomy (UBEL). This time, I would like to compare the advantages and disadvantages of four ULBD methods and find useful points for spinal surgery including ULBD in the future.

**Methods:** ULBD by four surgeries shares the same basic operation step by step. After skin incision, clearance of soft tissue, partial resection of the inferior edge of the cranial lamina and liberation of the ligamentum flavum, next them of the caudal lamina, partial resection them from the contralateral and ipsilateral laminae are performed. 139 cases of MEL, 85 PFEL, 91 PSLD and 42 UBEL were operated on. The operation time, VAS (back & buttock pain, lower leg pain & numbness at preoperative, 1 month later, 3m, 6m and 1 year later), ODI, Macnab's criteria, postoperative bleeding, postoperative hematoma, and dura mater damages were compared. Fatty degeneration of multifidus muscle by Goutallier classification, bone resection area in 3-dimensional computed tomography (3DCT), and advanced side cut angle at L3/4 were analyzed.

**Results:** The operation time was shorter in the order of MEL, UBEL, PSLD and PFEL, and there was a significant difference between them. Compared with preoperatively, VAS, ODI, EQ-5D and Macnab's criteria were significantly improved at each measurement time by all four surgical methods. However, there was no significant difference between them. There were no significant difference in muscle damage between three endoscopic laminectomies, but MEL had significantly more muscle damage than the others. Endoscopic laminectomies had significantly larger advanced side cut angles than MEL. Moreover, UBEL resulted in significantly more outward cuts than the other two endoscopic laminectomies, which was ideal. The bone resection area in 3-dimensional computed tomography (3DCT) was measured at L3/4 for each case (the DICOM viewer). UBEL produced significantly smaller areas than MEL.

**Conclusions:** The advantages of MEL is short operation time and allows for manipulation with both hands. Numerous types of tools are available, and also provide a wide field of view when suture of dural injury is needed. However, due to the prolonged retraction of muscle with the outer sheath, the postoperative fatty changes in the multifidus muscle is somewhat increased. Postoperative bleeding is also slightly higher and the area of bone resection is larger. PFEL, PSLD, and UBEL are performed under continuous water irrigation, these methods provide clean fine views in high magnification, and allow for fine hemostasis. Therefore, the amount of postoperative blood loss and the risk of hematoma removal are low. These are also suitable for super obese patients due to the increased working lengths of the endoscopes and instruments. The greatest advantages of UBEL are its free selection of available tools, no restriction on the outer sheath, and its efficient osteotomy on the approach side to form a trumpet bell-like shape. In any of the methods, the surgeon should avoid mistakes as much as possible, become skillful, and switch to a different method with a wider field of view in the case of a problem.

### Education and Professional Work

#### HOSPITAL APPOINTMENTS:

1998/Apr-2003/Mar Nagoya 1st red cross Hospital  
 2003/Apr -2004/Sep National center for Geriatrics and Gerontology  
 2004/Sep -2005/Mar Atsumi Hospital  
 2005/Apr -2008/Mar Student in the Postgraduate Course of Nagoya University School of Medicine 2008/Apr -2009/Jul Medical staff in Nagoya University Hospital  
 2009/Aug-2010/Sep International clinical fellowship of Emory Spine Center  
 2010/Oct-2011/Mar Toyohashi municipal Hospital  
 2011/Apr-2016/Mar Assistant professor in Nagoya University Hospital  
 2016/Apr-2017/Mar Aichi Spine Institute vice president  
 2017/Apr -Present Aichi Spine Hospital Chair

#### MEMBERSHIPS:

- Japanese Orthopedic Association
- Japanese Spine Research Society
- Japanese spinal Instrumentation society
- The Japanese society of oriental medicine
- PASMIS board member
- AO Spine delegates

#### HONORS & AWARDS:

- 2006 Foundation of Orthopedic Department in Nagoya University (5000\$ sponsored by this Foundation)
- 2007 Grants-in-Aid from the Ministry of Education (20000\$ sponsored by this Foundation)
- 2008 Nagoya Spine Group Awards of publications (2000\$ sponsored by this Association)
- 2008 APOA spine travelling fellowship Awards (selected as the only member from Japan.)
- 2008 Instrumentation Conference Oral Presentation Awards (5000\$ sponsored by this Association)
- 2009 The Uehara Memorial Foundation Awards (40000\$ sponsored by this Foundation)
- 2009 Grants-in-Aid from the Orthopedics association Foundation Awards (10000\$ sponsored by this Foundation)
- 2009 Best Report Awards of Orthopedic department in Nagoya University (1500\$ sponsored by this Department)
- 2011 ISTA(International society for technology in Arthroplasty) best report award (1500\$ sponsored by this Association)
- 2011 Nagoya Spine Group Awards of publications (1000\$ sponsored by this Association)
- 2012 Grants-in-Aid from the Ministry of Education (33000\$ sponsored by this Foundation)
- 2012 JSSR spine travelling fellowship
- 2015 Grants-in-Aid from the Ministry of Education (40000\$ sponsored by this Foundation)
- 2018 JSSR Best report award





## LLIF VR/AR

Devices of LLIF technique - Finger electrode, Single-position PPS, VR/AR -

**Wataru Narita**

Director, Spine Surgery Center, Kameoka City Hospital

As a minimally invasive fixation technique for lumbar spondylolisthesis and degenerative scoliosis, a combination of lateral interbody fusion (LLIF) in the supine position and posterior fusion using percutaneous pedicle screws (PPS) is used. In this presentation, I will describe the author's innovations.

<Finger Navigation Module>

The Finger Navigation Module is a device connected to a neuromonitoring system. It has electrodes on the surface of the finger abdomen of a silicone rubber component that is attached to the finger apex. When lumbar lateral fusion is performed on patients whose psoas muscles are anterior to the lumbar spine and the lumbar plexus is close to the entry path, this device can be used for pathetically dissecting the soft tissue with the use of nerve monitoring.

<Single Position PPS>

LLIF is a useful technique when it is possible to safely insert a single position PPS in the supine position. We perform PPS in the lateral recumbent position for posterior fixation of the thoracolumbar vertebrae. After fixation, it is important to tilt the operating table to keep the intervertebral space perpendicular to the floor while maintaining a working space, and draping is used to keep the surgical field clean during frontal fluoroscopy with the C-arm.

<VR/AR>

HoloLens (Microsoft) was used as a virtual reality (VR) intraoperative support device. Screw trajectories were programmed and input into the HMD by the primary surgeon before surgery, and superimposed on the surgical field. Although it was possible to perform surgery while projecting the patient's individual anatomy and the insertion trajectory of screws and cages onto the surgical field, it was difficult to achieve the same precision in positioning as in spinal navigation.

In this session, surgical techniques will be introduced mainly by video clips.

## Education and Professional Work

Jichi Medical University (B.S., 2003) Kyoto Prefectural University of Medicine, M.D.

Director of Spine Surgery Center, Kameoka City Hospital

Born in Kyoto in 1977, graduated from Jichi Medical University in 2003, and received his Doctor of Medicine from Kyoto Prefectural University of Medicine in 2017. While engaged in medical care in remote areas, he has been developing new surgical techniques and instruments by applying IT technology, including obtaining patents on surgical instruments and developing smartphone applications. 2017, he started spine treatment using virtual reality (VR) for the first time in Japan. 2018 October, he established the Spine He is planning to be the president of the MIST Society in 2026.

### Qualifications

Board Certified Orthopedic Surgeon, Japanese Orthopedic Association

Board Certification in Spine and Spinal Cord Surgery by the Japanese Orthopaedic Association

Board Certified Spine Surgeon, Japanese Society for Spine Surgery

Board Certified Clinical Physician, Japanese Society of Rehabilitation Medicine

**Position:** Public Relations Committee Member of the Japanese Society for Spine Surgery

Public Relations Committee Member, Japanese Society for Spine Surgery and Spinal Cord Disease

Director, Councilor, Public Relations Committee Member, and Chairperson of the Medical Instrumentation Committee of the Minimally Invasive Spine Treatment Society (MIST)

Sponsor, Kansai MIST Study Group

Sponsor of the Japan CAOS Study Group

Faculty member, Society for Minimally Invasive Spine Surgery -Asia Pacific (SMISS-AP)

Public Relations Committee Member, Japan Society for Instrumentation Research

Public Relations Committee member and special secretary of the Tohoku Spine Endoscopy Study Group

### work experience

2003 Resident, Kyoto Prefectural University of Medicine

2005 Member of Orthopedic Surgery Department, Nantan Public Hospital

2007 Medical Director, Kyotango Kumihama Hospital

2009 Medical staff, Kyoto Prefectural Yosanoumi Hospital

2013 Deputy Director, Spine and Spinal Cord Disease Center, Nantan Public Hospital

2015 Chief, Spine and Spinal Cord Surgery Center, Midorigaoka Hospital

2018 Director, Spine Surgery Center, Kameoka City Hospital





**PSLD-LIF**  
**Full endoscopic TLIF**

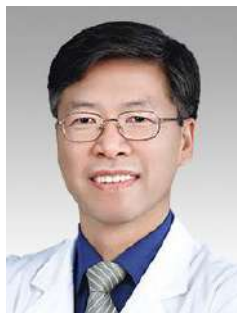
**Kangtaek Lim**

Korea

For the surgical treatment of lumbar spondylolisthesis, transforaminal lumbar interbody fusion (TLIF) using microscopy has been used widely as the standard procedure. Advances in endoscopic surgical methods have led to the application of spinal endoscopy to fusion surgery. One of the advantages of endoscopy for TLIF is that provide better visualization of the operative field because it uses water irrigation during operation. And it can preserve posterior ligament complex that maintain stability of spine, postoperatively. In endoscopic surgery, the fusion bed area ratio can be made more space than microscopic surgery, because the endoscopic systems can go into the disc space and remove a lot of the disc. The endoscopic procedure has much better results on reduction because bilateral facetectomy is possible, and complete reduction is also advantageous in terms of fusion rate because it can widen the cage and endplate contact area. The mean VAS scores for back and leg pain after endoscopic TLIF were significantly improved compared with before the operation during the follow-up period, the average length of hospital stay was  $2 \pm 3$  days. Radiological outcomes were evaluated using plain radiography and magnetic resonance imaging, computed tomography scan to evaluate disc height, segmental lumbar lordosis, and fusion rate. The bone fusion rate was 100% at 6 months after the operation, and there was no segmental instability. Endoscopic TLIF is a minimally invasive, effective surgical option for the management of lumbar spondylolisthesis, and appears to be a safe and feasible alternative to conventional TLIF for lumbar spondylolisthesis.

**Education and Professional Work**

Seoul Segyero Hospital  
Department of Neurosurgery.  
Director of KOMISS(Korea Minimally Invasive Spine Surgery).  
Consultant Physician of Maxmorespine, Germany.  
Member of AO spine, NASS, CNS.  
Review Board of Asian spine Journal.  
5th president of KOSESS.



## UBE-LIF

### ULIF(UBE lumbar interbody fusion) and ADS(adult degenerative scoliosis)

Son Sang Kyu

Korea

All kinds of endoscopy require a working space. For example, a preexisting knee joint cavity is a working space in knee arthroscopy. Unfortunately, there is no working space in posterior spine. It is a key issue of minimally invasive posterior approach how to make a working space without damage of Multifidus muscles. In UBE, small potential space (interfascicular between two small muscles of Multifidus and small space, filling with fat tissue, above lamina can be converted into atraumatic working space. This atraumatic and widened space is called as 'Son space' which is used as working portal and tract. My surgical goals of ULIF(UBE lumbar interbody fusion) are complete neural decompression, solid fusion, good lordosis(global balance) and minimal invasiveness. The definition of ULIF is as follows : 1. Posterior(interfascicular) approach, 2. Bone resection like half PLIF(total lt. IAP, partial SAP and ULBD), 3. Cage passing through interfascicular route, 4. Traversing root retracted with specialized tool, 5. Direct decompression, interbody fusion with cage, and percutaneous screw fixation. You know that the wide contact surface between harvest bone and clear bleeding bony plate are strongly correlated with higher fusion rate. Actually the interbody cage may act as spacer, not as fusion material. The mean LL(lumbar lordosis) and PI(pelvic incidence) in northeast Asian are different from in Caucasian. The mean LL/PI may be 50.10/46.50 in northeast Asian. I suggest the surgical disc angle of each lumbar level to get good lumbar lordosis and global balance. It is as follows: L2/3 ~15.0, L3/4 ~10.0, L4/5 ~12.0 on L4/5, 8.0 ~10.0 on L3/4, 6.0 ~8.0 on L2/3, 4.0 ~6.0 on L1/2.

ADS( adult degenerative scoliosis) is extremely severe degenerative condition. It is different from adult idiopathic scoliosis which is a continuation of adolescent idiopathic scoliosis. ADS is mainly lumbar scoliosis with fractional curve that is uneven foundation. In my opinion, the key points to correct ADS are as follows: 1. How to correct the fractional curve 2. How to make PILL match 3. Which is a proximal level There are two methods how to correct the fractional curve. The first is two big cages inserted into collapsed side and the second is a resection of pseudo fusion between transverse process of L5 and sacral ala before cage insertion. I like to use two transverse lying cages into disc space to make increased disc angle and PILL match. Anterior cage is higher and smaller PLIF cage, and posterior cage is lower and longer TLIF cage. 1mm height difference of two cages is 5.90 of disc angle, 2mm is 10.60, 3mm is 15.10. Sometimes, my preoperative surgical design of ADS is a combination of ULIF and Smith is a combination of ULIF and Smith--Peterson osteotomy (Peterson osteotomy(SPO) for bigger lumbar lordosis. SPO) for bigger lumbar lordosis. Commonly L2~S1 is performed for correction of ADS. L2~S1 is performed for correction of ADS. In severe case, T10~S1 may be suitable. In conclusion, In severe case, T10~S1 may be suitable. In conclusion, my surgical goal is a healthy spine and normal spine. ULIF can be done for stable and balanced my surgical goal is a healthy spine and normal spine. ULIF can be done for stable and balanced spine even single level fusion or adult degenerative scoliosis.

## Education and Professional Work

### Education

1989-1995 Kyungbuk National Medical School  
 Internship and residency  
 1995-1996 Kyungbuk National University Hospital (Internship)  
 1996-1998 Military service  
 1999-2003 Kyungbuk National University Hospital (Residency)  
 2004-2008 Kyungbuk National University Hospital (clinical assistant professor)  
 2009-2010 Gumi hospital chief of spine center  
 2011-2017 Gumi Gandong hospital spine center  
 2018 -2021 Park Won wook orthopedic , chief of spine center  
 2022 - Present Good Munhwa hospital, General director, Spine Center

### License

Neuro Surgeon, Korean National Board of Neurosurgery

### Membership

The Korean Neurosurgical Society  
 The Korean Spinal Neurosurgery Society  
 International Society for Minimal Intervention in Spinal Surgery (ISMIS)  
 Korean Society for the Advancement of Spine Surgery (KOSASS)  
 Korean Musculoskeletal Laser & Radiofrequency Society  
 International High-Tech Spine Society (HTSS)  
 Korean Minimally Invasive Spine Surgery Research Society (KOMISS)  
 Korean Society of Endoscopic Spine Surgery (KOSESS)

### Main Career & Activities

The First President of UBE Research Society (2017-2018)  
 The First President of Spine Endoscopy Research Society (2019-2020)  
 (Present) Director for International Exchange, KOMISS  
 (Present) Director for International Public Relations, KOSESS  
 (Present) Honorary chairman of Turkish, Indian and Chinese UBE Society  
 (Present) UBE Global Master, UBE development/training since 2003  
 (Present) General Director, International UBE Academy, Good Munhwa Hospital  
 (Present) Global Reference doctor for EndoSpineMax, UBE Solution Provider  
 (Present) Chairperson, International Society of Unilateral Biptoral Endoscopy (ISUBE)



## KLIF

**Full—endoscopic trans-Kambin Lumbar interbody fusion (fullendo KLIF) for spondylolisthesis.**

**Koichi Sairyo**

Japan

Transforaminal full-endoscopic (fullendo) lumbar surgery was first introduced as a method for performing discectomy. More recently, it has been used for decompression of lumbar spinal canal stenosis. The fullendo technique can also be performed for lumbar interbody fusion (LIF) through Kambin's triangle. Similar techniques have been used to insert a cage using fullendo surgery and are described variously in the literature as percutaneous endoscopic LIF, percutaneous endoscopic transforaminal LIF, full-endoscopic LIF, and full-endoscopic transforaminal LIF. Given that a cage is inserted through Kambin's triangle, we have proposed that this method be known as fullendo trans-Kambin's triangle lumbar interbody fusion (fullendo-KLIF). We have recently created a fullendo-KLIF surgical system. So far, I have conducted the fullendo-KLIF for 50 patients, mainly spondylolisthesis. The mean % slip before surgery was 13.8% and it improved to 3.4% after the surgery. As the complication, 4 cases complained exiting nerve irritation (8.0%) which was naturally improved within 3 months. However, no major complication such as major vessels, ureter and colon injury. Furthermore, we did not encounter hematoma and infection. In this symposium, we wish to introduce our surgical procedure, report the initial clinical results, and review of literature.

## Education and Professional Work

Professor and Chairman, Department of Orthopedics, Tokushima University, Tokushima, Japan.

1988: MD degree, Tokushima University School of Medicine

1994: PhD degree, Tokushima University Graduate School of Medical Sciences

1995-1997: Post Dr. follow, University of Iowa, Iowa, USA

1998: Assistant Professor, Tokushima University Hospital

1999: Associate Professor, Tokushima University School of Medicine

2003-2005: Post Dr. follow, University of Toledo, Ohio, USA

2010: Associate Professor, Teikyo University Mizonokuchi Hospital

2013- present: Professor and Chairman, Tokushima University

### International Society

International Society for Study of the Lumbar Spine: **ISSLS** (active member)

International Society for the advancement of the spine surgery: **ISASS** (member)

International Society of Endoscopic Spine Surgery: **ISESS** (Board member candidate)

International Intradiscal Therapy Society: **IITS** (Congress President 2021)

International Society for Minimal Intervention in Spinal Surgery: **ISMISS** (Asia representative)

Asian Congress Minimally Invasive Spine Surgery :**ACMISS** (Board member, Japan representative)

Pacific Asian Society for Minimally Invasive Spine Surgery: **PASMISS** (Board member)

World Congress Minimally Invasive Spine Surgery :**WCMISS** (Congress President 2021)

### Japanese Society

Japanese Orthopaedic Association **JOA** (Board member)

Japanese Society for Spine Surgery and Related Research: **JSSR** (Board member)

Japanese Orthopaedic Society for Sports Medicine: **JOSSM**

(Society vice chairman since 2019, CONGRESS PRESIDENT 2018)

Japanese Society of the Minimally Invasive Spine Surgery: **JASMISS**

(Society chairman since 2020, CONGRESS PRESIDENT 2019)

Japanese Society of the full-endoscopic trans-Kambin lumbar Interbody Fusion: **JEKLIF**

(Society Chairman since 2020, CONGRESS PRESIDENT 2020&2022)

# **Honorary President's Lecture**



## FUTURE OF SPINAL ENDOSCOPY

**Kai-Uwe Lewandrowski**

Center For Advanced Spine Care of Southern Arizona Surgical Institute of Tucson Deputy Editor of the International Journal of Spine Care

The future of spinal endoscopy will be driven by technology advances. Newer endoscopes are being developed that provide higher-resolution imaging, greater flexibility, and improved maneuverability, allowing surgeons to access and treat even more complex spinal conditions with greater accuracy and precision. In addition, the use of robotics in spinal endoscopy is rapidly advancing. Robotic systems can provide even greater precision and control during surgery, allowing surgeons to perform delicate procedures with greater safety and efficiency. There are several future developments in spinal endoscopy that are currently being explored:

**Augmented reality:** Augmented reality technology is being developed to help guide spinal endoscopy procedures. Surgeons can use a headset or smart glasses to overlay 3D images of the patient's spine onto their real-time view, giving them a better understanding of the anatomy and helping them navigate more precisely.

**Smart instruments:** Smart instruments with embedded sensors and tracking technology can provide surgeons with real-time feedback on the instrument's position, orientation, and force applied during surgery. This can help improve accuracy and reduce the risk of complications.

**Nanorobots:** Researchers are developing tiny robots that can be guided into the spinal canal to perform delicate procedures, such as repairing damaged nerves or removing tumors. These nanorobots are controlled remotely by the surgeon and can navigate through tight spaces with greater precision than human hands.

**Artificial intelligence:** AI algorithms can be used to analyze patient data and help guide surgical decisions. Machine learning models can help predict surgical outcomes based on patient characteristics, allowing surgeons to customize their approach and improve patient outcomes.

**Advanced imaging:** Advanced imaging technologies such as cone-beam CT scans and MRI can provide higher-resolution images of the spinal anatomy, allowing for more precise surgical planning and better outcomes.

These future developments in spinal endoscopy hold great promise for improving patient outcomes, reducing surgical complications, and expanding the range of conditions that can be treated with this minimally invasive technique.

## Education and Professional Work

" He currently is in private practice at the Center For Advanced Spinal Care of Southern Arizona in Tucson and the Surgical Institute of Tucson.

" He is a Clinical Assistant Professor at the University of Arizona in Tucson, and visiting Professor at the Universidade de Estado do Rio de Janeiro, Gaffree Gingle.

" He has authored over 68 papers, over 40 book chapters, 10 posters presentations and edited 13 text books. He

holds 6 patents. He has had numerous national and international speaking engagements.

" In his practice in Tucson, he focuses on minimally invasive spinal surgery to improve clinical outcomes while minimizing the impact of spinal surgery. He is an expert on outpatient endoscopic spinal surgery procedures and

has published a best-selling text book on it which has been translated in other languages as well.

" In his spare time, Dr. Lewandrowski loves to travel, he speaks 7 languages, and has multiple hobbies including piano, cooking, sailing, and bee keeping.

# **President's Lecture**



## Non-specific low back pain: how to treat the condition by MISS

**Koichi Sairyo**

Professor and Chairman, Department of Orthopedics, Tokushima University, Tokushima, Japan

Chronic low back pain (LBP) is divided into 2 categories: specific and non-specific LBP. The specific LBP is further divided into 2 sub-group such as with having red-flags and leg symptoms. The specific LBP is presented only 15% among all chronic LBP. Remaining 85% is non-specific LBP. Thus, non-specific LBP is defined to be only LBP without leg symptoms and red-flags. There are several pathologies to be reported as the pain generators. This time, I wish to explain the pain generator of non-specific LBP and minimally invasive solution.

- 1) Discogenic low back pain: On T2 weighted MRI, high signal intensity zone was proposed for the specific sign of the pain generator. Furthermore, CT following discography indicates the toxic annular tear for pain mechanism. Full-endoscopic thermal annuloplasty would be the best minimally invasive solution which can avoid the spinal fusion.
- 2) Type 1 Modic change: In 1988, Professor Modic reported 3 types in the endplate change of the lumbar spine according to the signal on T1 and T2 MRI. Type change refers inflammation; thus, it can be contributed to LBP. Intradiscal injection was proposed for the minimally invasive treatment. Recently, full-endoscopic disc cleaning surgery is reported to be the other minimally invasive alternatives.
- 3) Facet pain: There are 2 types of pathology for causing facet pain: i.e., facet arthritis and facet bone marrow lesion. Facet arthritis can be treated by facet block with steroid. On the other hand, bone marrow change is also called as posterior Modic type 1. Shock wave therapy is recently proposed as the minimally invasive treatment. In case, facet hypertrophy caused foraminal stenosis, that would be the best indication of the full-endoscopic decompression.
- 4) Others: sacroiliac joint pain, muscular pain and so on.

## Education and Professional Work

Professor and Chairman, Department of Orthopedics, Tokushima University, Tokushima, Japan.

1988: MD degree, Tokushima University School of Medicine

1994: PhD degree, Tokushima University Graduate School of Medical Sciences

1995-1997: Post Dr. follow, University of Iowa, Iowa, USA

1998: Assistant Professor, Tokushima University Hospital

1999: Associate Professor, Tokushima University School of Medicine

2003-2005: Post Dr. follow, University of Toledo, Ohio, USA

2010: Associate Professor, Teikyo University Mizonokuchi Hospital

2013- present: Professor and Chairman, Tokushima University

### International Society

International Society for Study of the Lumbar Spine: **ISSLS** (active member)

International Society for the advancement of the spine surgery: **ISASS** (member)

International Society of Endoscopic Spine Surgery: **ISESS** (Board member candidate)

International Intradiscal Therapy Society: **IITS** (Congress President 2021)

International Society for Minimal Intervention in Spinal Surgery: **ISMISS** (Asia representative)

Asian Congress Minimally Invasive Spine Surgery :**ACMISST** (Board member, Japan representative)

Pacific Asian Society for Minimally Invasive Spine Surgery: **PASMISS** (Board member)

World Congress Minimally Invasive Spine Surgery :**WCMISSST** (Congress President 2021)

### Japanese Society

Japanese Orthopaedic Association **JOA** (Board member)

Japanese Society for Spine Surgery and Related Research: **JSSR** (Board member)

Japanese Orthopaedic Society for Sports Medicine: **JOSSM**

(Society vice chairman since 2019, CONGRESS PRESIDENT 2018)

Japanese Society of the Minimally Invasive Spine Surgery: **JASMISS**

(Society chairman since 2020, CONGRESS PRESIDENT 2019)

Japanese Society of the full-endoscopic trans-Kambin lumbar Interbody Fusion: **JEKLIF**

(Society Chairman since 2020, CONGRESS PRESIDENT 2020&2022)

# **Chairman's Lecture**





## Anterior Approach in MIS / Endoscopic Cervical Surgery (vs ACDF)

Zenya Ito

Aichi Spine Hospital

**1. Background:** Several treatments for cervical disc herniation (CDH) exists, usually in Japan anterior cervical decompression and fusion (ACDF) is common. However, pseudarthrosis, loss of ROM and adjacent segment disease is seen. Anterior or posterior approach in MIS/Endoscopic Cervical Surgery develop nowadays, so patient's quality of life keeps growing. The indication of anterior approach is for center and intracanal herniation and posterior for intraforamen without instability. We report our experience of anterior procedure.

**2. Materials and Methods:** We operated 448 cases of CDH for herniation including 175 anterior (165 transdiscal, 10 transvertebral) and 273 posterior approach in MIS.

Also, we operated 129 ACDF for CDH with instability or local kyphosis.

Anterior-approach: Cannula inserted between esophagus and carotid artery, then into disc space. Prolapsed nucleus removed by forceps. When there is osteophyte or migrated herniation, we select percutaneous trans-vertebral decompression method using a small diamond-burr.

ACDF: The conventional microsurgical ACDF was performed with the known standardised technique using a microscope. A polyetheretherketone (PEEK) cage was used as the intervertebral implant; there was no additional ventral plating. The exam items were VAS, Macnab score and complication. Statistical analysis was using student t-test and repeated measure anova.

**3. Results:** Anterior-approach in MIS: Initial operation results satisfactory (excellent, good) in 86% of patients, and unsatisfactory in 14%. The seven poor cases were insufficient osteophyte removal, recurrence, transient C7 palsy, aggravated myelopathy and residual numbness. Anterior-posterior dural shrinkage averaged 42.1% preoperatively, recovering to 75.8% post-operation, then increased to 86.5% after one year using anterior approach. Disc height decreased on average by 12.6% one year later, without significant new symptoms.

VAS score decreases from 7 to 2.4 within 1 month. ( $p < 0.05$ )

However, after three months, patients who had returned to work or were able to work was better than ACDF. (85%: MIS vs 60%: ACDF) ( $p < 0.05$ )

ACDF: Initial operation results satisfactory (excellent, good) in 83% of patients, and unsatisfactory in 17%. Transient difficulty swallowing occurred in 5 cases and there were two surface haematomas in the ACDF group. One was a vegetable-like state.

VAS score decreases from 8 to 2.3 within 1 month. ( $p < 0.05$ )

**4. Conclusion:** MIS is a sufficient and safe alternative to conventional procedures when the indication criteria are fulfilled. At the same time, it offers the advantages of a minimally invasive intervention.

## Education and Professional Work

### HOSPITAL APPOINTMENTS:

1998/Apr-2003/Mar	Nagoya 1st red cross Hospital
2003/Apr -2004/Sep	National center for Geriatrics and Gerontology
2004/Sep -2005/Mar	Atsumi Hospital
2005/Apr -2008/Mar	Student in the Postgraduate Course of Nagoya University School of Medicine 2008/Apr -2009/Jul Medical staff in Nagoya University Hospital
2009/Aug-2010/Sep	International clinical fellowship of Emory Spine Center
2010/Oct-2011/Mar	Toyohashi municipal Hospital
2011/Apr-2016/Mar	Assistant professor in Nagoya University Hospital
2016/Apr-2017/Mar	Aichi Spine Institute vice president
2017/Apr -Present	Aichi Spine Hospital Chair

### MEMBERSHIPS:

- Japanese Orthopedic Association
- Japanese Spine Research Society
- Japanese spinal Instrumentation society
- The Japanese society of oriental medicine
- PASMIS board member
- AO Spine delegates

### HONORS & AWARDS:

- 2006 Foundation of Orthopedic Department in Nagoya University (5000\$ sponsored by this Foundation)
- 2007 Grants-in-Aid from the Ministry of Education (20000\$ sponsored by this Foundation)
- 2008 Nagoya Spine Group Awards of publications (2000\$ sponsored by this Association)
- 2008 APOA spine travelling fellowship Awards (selected as the only member from Japan.)
- 2008 Instrumentation Conference Oral Presentation Awards (5000\$ sponsored by this Association)
- 2009 The Uehara Memorial Foundation Awards (40000\$ sponsored by this Foundation)
- 2009 Grants-in-Aid from the Orthopedics association Foundation Awards (10000\$ sponsored by this Foundation)
- 2009 Best Report Awards of Orthopedic department in Nagoya University (1500\$ sponsored by this Department)
- 2011 ISTA(International society for technology in Arthroplasty) best report award (1500\$ sponsored by this Association)
- 2011 Nagoya Spine Group Awards of publications (1000\$ sponsored by this Association)
- 2012 Grants-in-Aid from the Ministry of Education (33000\$ sponsored by this Foundation)
- 2012 JSSR spine travelling fellowship
- 2015 Grants-in-Aid from the Ministry of Education (40000\$ sponsored by this Foundation)
- 2018 JSSR Best report award

# **Full video Lecture**



## My own history of 6 spinal surgeries

### Fujio Ito

President of Aichi Spine Hospital Secretary General of MISS Summit Forum

I would report on my own history of 5 spine surgeries and another scheduled surgery. The 1st time was percutaneous nucleotomy (PN) method for L1/2 LDH 30 years ago at age 47. As a result, instability appeared, and interbody fusion surgery was performed one month later with a 45 cm incision. 30 years later, from the summer of last year, problems occurred at the upper and lower levels of the fused L1/2. At the end of December 2022, Percutaneous full endoscopic laminotomy (PEL) method was performed for L3/4 spinal canal stenosis (cauda equina symptoms). I was doing well for 2 weeks, but spinal cord damage (epiconus syndrome) appeared upside of the fusion level, and on January 16th 2023, cross contralateral interlaminar laminotomy at Th12/L1 was performed. The Th12/L1 facet is vertical to the frontal plane and very narrow. If unilateral laminectomy for bilateral decompression is performed, the ipsilateral facet may disappear. The method of decompressing the contralateral side from both sides can preserve both joints and is minimally invasive. On the same day, the fifth surgery was also performed for Th11/12 using the PEL method. Epiconus syndrome (muscle weakness of L4, L5 and S1 anterior horn cell damages, and hyperactive bladder symptom from S2 spinal cord damage) was completely disappeared. However, there is radiating pain in the right lower back and buttock due to forward flexion of the thoracic spine, I am scheduled for the 6th surgery by PEL method for L1/2 ligamentum flavum resection on April 24th.

## Education and Professional Work

Chairman of 1st ISMISS combined with 10th MISS Summit Forum in 2017  
Chairman of 2nd ISESS (International Society of Endoscopic Spine Surgery)  
and 2nd ISMISS (International Society of Minimal Intervention in Spine Surgery)  
combined with 11th MISS Summit Forum in 2018  
Chairman of 4th ISMISS combined with 14th MISS Summit Forum in 2021  
Secretary-general of the Japan Spine Dock Society  
President of MISS Summit Forum at Aichi Spine Hospital (Annual meeting)

### MEMBERSHIPS

The Japanese Orthopaedic Association  
Japanese Society for the Study of Endoscopic & Minimally Invasive Spine Surgery  
Japanese Society of Lumbar Spine Disorders  
Honorary board member of PASMIS  
Board member of ACMISST  
CEO of MISS Summit Forum



## Endoscope-assisted minimally invasive surgical decompression for lumbar spinal canal stenosis with degenerative spondylolisthesis

**Koshi Nambu**

Saiseikai Takaoka Hospital,

The fundamental procedure of endoscope-assisted minimally invasive surgical decompression for lumbar spinal canal stenosis is tubular surgery with assistance of endoscopic technique to offer bilateral decompression of the canal and lateral recess via a unilateral approach. This technique involves a small incision and significantly less disruption of the facet joints and posterior support structures, allows fine visualization, and obtains neurological results that are equivalent to open techniques. After making an approximately 16-mm para-midline skin incision, serial dilators are inserted to target the relevant interlaminar space and to dilate the lumbar muscle sequentially, and a tubular retractor, in which an endoscope is finally installed, is placed. The inferior edge of the lamina and the base of the spinous process are identified and drilled. A tubular retractor is put into the drilled space of the spinous process to be centralized and tilted for contralateral decompression of the canal and lateral recess. After contralateral decompression, a tubular retractor is tilted ipsilaterally for decompression of the residual canal and lateral recess. In patients with lumbar degenerative spondylolisthesis, the decompression needs to be enlarged until satisfactory decompression of bilateral nerve roots of two levels (for example, L4 and L5 nerve roots for decompression at the L4-5 level) and the dura mater was achieved. The modality of spinal canal stenosis in lumbar degenerative spondylolisthesis consists of degenerative spondylosis (thickened ligamentum flavum, osteoarthritis of the facet joints, and osteophytes) in the area from the disc level to the inferior border of the lower pedicle, and shearing due to slipping in the area from the disc level to the inferior border of the upper pedicle. Due to the feature of this enlarged decompression that appropriate decompression can be performed while conserving the facet joint and posterior lumbar tissue, this procedure is the solution for these two aspects of spinal canal stenosis and preparation for re-stenosis that may occur as a result of future slippage progression.

### Education and Professional Work

#### EDUCATIONAL HISTORY

1988: Graduated from Takaoka High School (Toyama)  
1995: M.D. Toyama Medical and Pharmaceutical University School of Medicine  
2004: Ph.D. Kanazawa University School of Medicine

#### MAJOR RESEARCH INTERESTS

1. Full-endoscopic spine surgery,
2. Minimally invasive spinal surgery

#### WORKING EXPERIENCE

1995-1996: Resident doctor, Department of Orthopaedic Surgery, Kanazawa University.  
1996-1997: Orthopaedic doctor, Department of Orthopaedic Surgery, Kouseiren Takaoka Hospital, Toyama.  
1997-1999: Orthopaedic doctor, Department of Orthopaedics Surgery, Saiseikai Fukui Hospital, Fukui.  
1999-2000: Orthopaedic doctor, Department of Orthopaedics Surgery, Suzu General Hospital, Ishikawa.  
2000-2002: Orthopaedic doctor, Department of Orthopaedics Surgery, Kanazawa University.  
2002-2007: Orthopaedic doctor, Department of Orthopaedics Surgery, Kanazawa Municipal Hospital, Ishikawa.  
2007- : Orthopaedic doctor, Department of Orthopaedic Surgery, Saiseikai Takaoka Hospital, Toyama.  
2009- : Medical director, Department of Orthopaedic Surgery, Saiseikai Takaoka Hospital, Toyama.  
Performed operations as surgeon in orthopedics. e.g: spinal disorder and injury, full-endoscopic spine surgery, minimally invasive spinal surgery with the assistance of endoscopic technique

#### LICENCE & CERTIFICATION

1995: Japanese Medical License Registration  
2002: Orthopaedic Surgery Specialist approved by Japanese Orthopaedic Association  
2004: Authorization for Spine Specialist approved by Japanese Orthopaedic Association  
2007: Board-certified Spine Surgeon approved by the Board of the Japanese Society for Spine Surgery and Related Research  
2008: Authorization for Endoscopic Surgical Spinal Skill Approved by the Japanese Orthopaedic Association (posterior approach)  
2022: Authorization for Endoscopic Surgical Spinal Skill Approved by the Japanese Orthopaedic Association (full-endoscopic spinal surgery)



**Safe and less invasive lumbar interbody fusion technique under microendoscope (MED): micro-endoscopy-assisted extraforaminal lumbar interbody fusion (mELIF)**

**Motohide Shibayama, Guanghua Li**

Aichi Spine Hospital

**Objective:** Lumbar interbody fusion is a standard technique for degenerative lumbar disorders. Minimally invasive technique, extraforaminal lumbar interbody fusion (ELIF) was introduced. Approaching from posterolateral the posterior muscles and the spinal canal was not invaded. In spite of theoretical advantage, ELIF was technically demanding and has not been popularized. We developed a micro-endoscopy-assisted extraforaminal lumbar interbody fusion (mELIF), a technique designed as safe and less invasive interbody fusion.

We have experienced over 100 cases as single level arthrodesis. Good results were obtained and no major complication was observed. Another advantage is mELIF can be applied for L5/S1 disorder. In this poster we introduce surgical technique.

**Surgical procedure**

A 61-year old female case with L4/5 degenerative spondylolisthesis. General anesthesia. Prone position

- 1) First four guide wires are inserted into pedicles under fluoroscopy for safety.
- 2) From a posterolateral approach, as for lateral disc herniation surgery, a 16- or 18-mm diameter tubular retractor was placed at the lateral aspect of the facet joint.
- 3) The facet joint was partially excised, and the disc space was cleaned under micro-endoscopic (MED) visual assistance.
- 4) A cage and local bone graft were inserted into the disc space under MED and C-arm.
- 5) Bilateral percutaneous screw-rod constructs were inserted and fixed.

**Education and Professional Work**

**Current position**

Vice director  
Aichi Spine Hospital

**Education**

1989 Graduated from Nagoya City University, School of Medicine

Research experience

1994-1997 Dept. of Neurobiology and Anatomy Medical college of Pennsylvania (Drexel University), Philadelphia, USA

**Occupation**

1989 Orthopedic surgery. Nagoya City University

1991 Orthopedic surgery. Ogaki Municipal hospital

1994 Neurobiology and Anatomy

Medical College of Pennsylvania (Drexel University), Philadelphia, USA 1997 Orthopedic surgery.

Nagoya City University

1999 Orthopedic surgery. Toyokawa City Hospital

2009 Aichi Spine Institute

**Interest**

Minimally invasive spinal surgery, Spinal Infection



## Unilateral biportal endoscopic spine surgery (UBE) changes oblique lateral lumbar interbody fusion (OLIF) from anterolateral to posterolateral invasion and evolves minimally invasive fixation from muscle preserving to bone preserving

**Kanji Sasaki**

Seirei Hamamatsu general Hospital

UBE does not use a retractor on the portal, which facilitates insertion of a large cage from portal. OLIF uses a large cage inserted anterolaterally, which allows for stable disc height lifting and correction of scoliosis and kyphosis, thus allowing for indirect decompression. In addition, OLIF is usually a "bone preserving" procedure that does not require a bone resection for cage insertion. The same procedure can be completed posteriorly by inserting a large cage, which is a little more difficult when the cage is inserted from within the retractor or from the extraforaminal. It is also difficult to insert a large cage while protecting the dura mater and nerve roots by penetrating the dural canal from posterior with an endoscope. To solve the aforementioned problems, we are performing extraforaminal interbody fusion (ELIF), in which a cage is inserted while enlarging Kambin's triangle using a UBE. This procedure is bone and muscle preserving compared to conventional posterior surgery. This presentation will show its practice and technical notes with the help of a video.

UBE-ELIF is usually performed using only a percutaneous pedicle screw (PPS) incision. The superior articular process is partially resected from the dorsal aspect of the facet joint, and the intervertebral body is entered. There is no need to see the nerve root or dura mater during this operation, and intradiscal manipulation is performed from a secure enlarged Kambin's triangle behind the superior articular process. Therefore, myotomy is relatively minimally invasive, with myotomy only in a small space over the facet joint and osteotomy only at the superior border of the superior articular process. In addition, because of the small number of operations, the procedure does not take a long time even if performed endoscopically. In addition, the medially enlarged intervertebral foramen is away from the nerve root, allowing space for insertion of a large cage.

These conditions allow a large cage to be inserted posteriorly for bone preserving. This procedure changes the meaning of oblique lateral in OLIF from anterior to posterior and eliminates the need for surgery in the lateral position.

### Education and Professional Work

#### Education:

Literature Kyoto Univ. dept. of literature Apr. 1993- Mar 1996

Medical School Kagawa Medical University School of Medicine Apr. 1996 - Mar. 2002. M.D. qualified on March, 2002.

#### Residency:

Dept. of Orthopedic Surgery, Kagawa Univ. School of Med. and Affiliated Hospitals May. 2002 ~ Mar. 2004

Kobe Rosai Hosp. Sep 2005- Mar 2007

Niigata Spine Surgery center Sep 2009- Aug. 2012

#### Postgraduate:

Graduate School, Kagawa Univ. Apr. 2007 ~ Mar. 2011

Ph.D. (No.525), qualified on Mar.24, 2011

Research fellow

Washington Univ. of St. Louis Fellow Sep. 2013- Nov.2013

#### Special subjects:

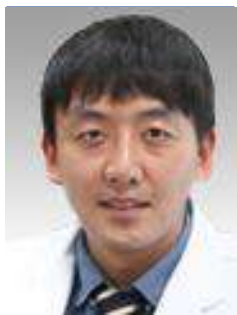
1)Clinical: All spine diseases covering spinal neural elements and bone and joints, from pediatric through adult, from cervical though sacrum, including spinal cord tumors (extra- or intra-medullary tumors), spine tumor (primary or metastatic), all degenerative diseases, osteoporotic spine, idiopathic, congenital or paralytic scoliosis, etc.

2)Basic: Cell and molecular biomechanics and cell signaling of cancer and tumors especially with biomarkers of cancer and tumors on orthopedic pathology

#### Academic activities:

- ① Japanese Orthopaedic Association, member
- ② Japanese Spine Research Society, member
- ③ Japanese Association of Spine Instrumentation, member
- ④ Japanese Society for UBE and BESS, representative director





## Biportal endoscopic lumbar interbody fusion with large cage

**JU EUN KIM**

Himnaera hospital

**Background context:** Numerous papers regarding minimally invasive spinal surgery using biportal endoscopic technique have been published. Furthermore, few technical reports and small case series of biportal endoscopic transforaminal interbody fusion (BE-TLIF) have been recently reported. However, as with open surgery, complications such as delayed union or subsidence occurred. Therefore, we assumed larger cages would result in less complication.

**Purpose:** Our aim was to introduce the surgical technique of BE-TLIF using larger cages that were originally designed for oblique lumbar interbody fusion (OLIF) and investigate the clinical outcome and technical feasibility of which.  
Study design: A retrospective study.

**Method:** Between January 2021 and January 2022, 36 patients who underwent single-level BE-TLIF for degenerative or isthmic spondylolisthesis that were followed up for at least a year were enrolled. For cage selection, Polyetheretherketone (PEEK) cages that were designed for OLIF were used. Visual Analog Scale (VAS) of back and leg and Oswestry Disability Index (ODI) were collected perioperatively, and modified Macnab criteria were collected at the final follow-up. The length of hospital stay, time to ambulation, and fusion rate, perioperative complications were collected.

**Result:** ODI scores improved from  $65.4 \pm 5.4$  preoperatively to  $15.3 \pm 6.1$  at the final follow-up ( $p < 0.001$ ). VAS scores of the leg decreased from  $7.7 \pm 1.5$  to  $1.7 \pm 1.5$  at the final follow-up ( $p < 0.001$ ). Per the modified Macnab criteria, 94% of the patients improved to good/excellent. The fusion rate over one-year follow-up was 94.2%, and no patient showed subsidence or other postoperative complication.

**Conclusion:** BE-TLIF using a larger cage can be safely performed with decreased risk of subsidence. A cage with a larger footprint is assumed to be advantageous in BE-TLIF, especially in the lower lumbar region.

**Keyword:** Transforaminal interbody fusion, endoscopy, spinal stenosis, degenerative spinal disease

## Education and Professional Work

### PRESENT POSITION

Chief Director Himnaera Hospital, Busan, South Korea 2019 - present

### EMPLOYMENT:

Chief of Department, Department of Orthopedic surgery 2015-2018

Clinical Instructor, Department of Orthopedic Surgery, Kyungpook National University Hospital, Daegu, South Korea 2014 - 2015

Physician in Army (rank: captain grade), Daegu Military Hospital, Daegu, South Korea United Nations Mission in South Sudan 2011 - 2014

### POSTDOCTORAL TRAINING

Spine Service Fellowship Department of Orthopedic Surgery Kyungpook National University Hospital, Daegu, South Korea – supervised by Prof. Min Woo-Kie 2014-2015

Orthopaedic Surgery Residentsip Department of Orthopedic Surgery Kyungpook National University Hospital, Daegu, South Korea 2007-2011

General Internship Kyungpook National University Hospital, Daegu, South Korea 2006-2007

### MEDICAL LICENSURE / CERTIFICATION

Licensure; Republic of Korea, No. 90743 2006

Certification: Korean Board of Orthopaedic Surgery, No. 5391 2011

### EDUCATION

M.S., Kyungpook National University, College of Medicine, Daegu, South Korea 2009

M.D., Kyungpook National University, College of Medicine, Daegu, South Korea 2006

PreMedic School, Kyungpook National University, College of Medicine, Daegu, South Korea 2001

### PROFESSIONAL SOCIETIES AND ACTIVITIES

Korean Medical Association 2006

Korean Orthopaedic Association 2011

Daegu-Kyungpook Orthopaedic Society 2011

AOSpine member 2015

Daegu-Kyungpook Spine Society 2015

Korean Society of Spinal Surgery 2016

Korean Worker's Corporation & Welfare Service Consultant 2016

National Pension Service Consultant 2016

Korean Society of Spinal Surgery Minimal Invasive surgery Committee Member 2017

Korean Society of Spinal cord research Committee Member 2017

Korean Society of Spinal cord research Committee Member 2017

APSS member 2018

NASS member 2018

### HONORS AND AWARDS

2017~2020 Marquis Who's who in the world



## Step by Step trans- SACRAL EPIDURISCOPIIC LASER DECOMPRESSION SURGERY (SELD)

**Elmer Jose Arevalo Meceda**

Chairman, Bicol Brain and Spine Care Center

SELD surgery utilizes the trans-sacral approach through the sacral hiatus. aims to decompress nerve root, perform fragmentectomy or ablate sensitized sinuvertebral nerves growing into annular tears to manage pain generators located in the lumbar ventral epidural space (VES). It employs a 0.9 mm ultra-high definition fiber endoscope, a 1.0 mm straight firing 550um Ho:YAG laser and a 1.2 mm flexible micro-forceps. these are all applied to the lumbar ventral epidural space through a 30 cm long 3.0 to 3.3 mm diameter steerable catheter.

This procedure is performed primarily to treat symptomatic acute lumbar disc herniation, either extruded or sequestered. This indication has since expanded to include management of chronic discogenic back or leg pain from annular tear syndrome and it can be used to perform adhesiolysis in postoperative syndrome or failed back surgery syndrome. If available diagnostic imaging cannot ascertain the cause of chronic back and leg pain, direct epiduroscopic visualization may give away the reason. It has the benefits of a minimally invasive procedure and is done under local anesthesia with conscious sedation.

Stages of SELD includes four stages. Stage 1 is the Approach to the sacral canal using a trocar and docking it at the level of Mid S3-S4 and passing the steerable catheter through it to reach the level of L5-S1 under C-Arm guidance where an Epidurogram is done to confirm that the catheter is in the potential VES. Safety of introducing the trocar directly through the sacral hiatus and the sacrococcygeal ligament and docking at the S4- S3 level was ascertained safe through a morphologic study of MRI T1 sequence showing that 99% of thecal sac ends at the S1 and S2 level. In the same study, it was noted that 90% of the study population has a dorsally oriented or neutral thecal end which is favorable for entry of the catheter into the VES. Stage 2 is the beginning of epiduroscopy to identify the level of interest, a concordant pain may be elicited from the patient upon reaching the painful level of herniation or tear. Subsequent mechanical adhesiolysis may be done at this stage. Stage 3 is the vaporization of the herniated disc fragment under the PLL and doing morcellation with a 1mm forceps. Stage 4 is determining the endpoint by doing epidurogram and asking for patient feedback of improvement of symptoms.

### Education and Professional Work

**Short Description:** Dr. Meceda is a Neurosurgeon, a Minimally Invasive Spine Surgeon, A Pioneer Endoscopic Spine Surgeon in the Philippines, Assistant Professor of Neurosciences, UERMMMC, College of Medicine Chairman of the Bicol Brain and Spine Care Center and a Visiting Neurosurgery Consultant of the St. Luke's Medical Center- Global City, Institute of Neurosciences, and Capitol Medical Center, Department of Surgery

**Present Positions:**

Chairman, Bicol Brain and Spine Care Center (April 2021 to present )  
Head, Section of Neurosurgery, Bicol Medical Center (  
Assistant Professor, UERMMMC, College of Medicine, Department of Clinical Neurosciences  
Consultant Neurosurgeon, MIS-Spine  
Endoscopic Spine Surgery Specialist  
Academy of Filipino Neurosurgeons Inc, Treasurer, January 2021- January 2022  
Academy of Filipino Neurosurgeons Inc., Board Member, January 2020 to present  
Philippine Spine Society, Member, MISS Research Group 2017 to present  
Board Member, Asian Congress of Minimally Invasive Spine Surgery, 2019 to present  
Philippine Representative to Asian Congress of MISS, 2018  
Board Member, ASEAN Minimally Invasive Spine Surgery and Techniques Congress, 2016 to present  
Philippine Representative to ASEANMISST, 2016  
Scientific Committee Chairman, 5th ASEAN Minimally Invasive Spine Surgery and Techniques 2019  
Board Member, 12th – 14th MISS Summit Forum 2019 to present, Aichi, Japan  
Executive Presidium, International Society of Endoscopic Spine Surgery (ISESS), 2017 to present  
International Faculty and Investigator, trans-Sacral/ trans-Foraminal Epiduroscopic Surgery  
tSELD Study Group, Good Doctor Teun Teun Hospital/AICHI Spine Hospital (December 2015 to present)





## A Beginner's Guide to perform the PSLD : Practical Advice and Tips

**Han Ga Wi Nam**

Department of Neurosurgery, Soonchon Chuck Hospital, Soonchon, South Korea

Degenerative changes in spine structures, including discs, ligamentum flavum, and facet, lead to spinal stenosis. Spinal stenosis is a common indication for spinal surgery in patients >65 years old. Many spine surgeons, who were familiar with conventional endoscopic transforaminal discectomy, have bestowed a consideration that a spine surgeon could do endoscopic spine surgery (ESS) in the other spine pathologies, but discectomy for once. As a result, the spine surgeons designed a larger diameter and shorter length of endoscopy, compared to the conventional one, along with the development of surgical tools such as rongeurs, forceps, dissectors, and high-speed drills enough to remove ligamentous and bony tissues and bony fragments with the aid of industries. In this presentation, a new technique is displayed, which decompresses 2–3 levels of the stenosis concomitantly via uniportal access through one skin incision in the lumbar spine (jumping technique). I tried to do my best to understand how to handle this endoscopic system in central stenosis by demonstrating the figures of each surgical step and removal of the main pathology followed as well as presenting the overview of this surgical technique. We determined the feasibility of PSLD for lumbar stenosis at single and multiple levels by image analysis to observe postoperative widening of the vertebral canal in the stenotic area.

### Education and Professional Work

Feb. 2008 M.D. College of Medicine, Kangwon National University, Korea  
Mar. 2009 - Feb. 2010 Internship, Hangan Sacred Heart Hospital, Seoul, Korea  
Mar. 2010 - Dec. 2012 Residency in Department of Neurosurgery, Hangan Sacred Heart Hospital, Seoul, Korea  
Jan. 2013 - Feb. 2014 Residency in Department of Neurosurgery, Dongtan Sacred Heart Hospital, Hwaseong, Gyeonggi, Korea  
Apr. 2014 - Mar. 2015 Army Surgeon, 1st Armored Brigade  
Apr. 2015 - Apr. 2017 Army Surgeon, Korea Military Academy Hospital  
May. 2017 - Feb. 2018 Fellow in Department of Neurological Surgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea  
Mar. 2018 - Mar. 2020 Section Chief, Department of Neurosurgery, Good Doctor Teunteun Hospital, Anyang, Korea  
Mar. 2020 - Jan. 2021 Section Chief, Department of Neurosurgery, The Leon Wiltse Memorial Hospital, Anyang, Korea  
Jan. 2021- present Section Chief, Department of Neurosurgery, Sooncheon Chuck Hospital, Sooncheon, Korea

# Special Lecture



## Posterior Endoscopic Cervical Approach "single working channel scope" Step by Step

**Alfonso García**

Hospital Angeles Tijuana, Mexico

Full endoscopic cervical foraminotomy was first described in 2008, since then technology and instruments development have improved substantially to make endoscopic procedures safer and relatively easier for surgeons to adopt.

Case series published from several authors have established that this approach is safe, causing fewer complications with minimal tissue disruption and short hospital stays.

In the present lecture I describe a step by step approach on how to do a "percutaneous endoscopic cervical disectomy" and extend the approach to make a "cervical endoscopic unilateral laminotomy for bilateral decompression", I conclude with two case video demonstrations and my current experience with this procedure.

## Education and Professional Work

### Education

2015 Pohang Wooridul Spine Hospital, South Korea. Fellowship training. Minimally Invasive & Endoscopic Spine Surgery

2010 Hospital San Juan de Dios, Barcelona España. Medical Rotation.

2006 2008 University of Phoenix, MBA

1997 2001 Instituto Mexicano del Seguro Social, Mexico City "Hospital de Traumatología y Ortopedia Dr. Victorio de la Fuente Narvaez. Postgraduate Orthopedic Surgery

1991 1996 Facultad de Medicina, Universidad Autónoma de Baja California. General Physician

### Experience

2001-02 Fundación para los Niños de las Californias Continuing Medical Education Coordinator.

2001-10 Fundación para los Niños de las Californias Pediatric Orthopedic Surgeon.

2006-14 Universidad Autónoma de Baja California Anatomy Professor / Orthopedics Professor

2007-14 Fundación Wesitos, A. C. Founder and President

2006-08 Raquis Clínica de Columna Co-owner / Senior Surgeon / General Manager

2010-11 Colegio de Ortopedia y Traumatología de Tijuana Vice-President

2012-12 Colegio de Ortopedia y Traumatología de Tijuana President

2010-14 Florence Health System, Hospital Medical Director

2016-Present Espalda Saludable Founder / CEO / President / Spine Surgeon

2016-21 Tijuana College of Orthopedic Surgeons Academic Coordinator

2017-Present National and International Faculty / Endoscopic Spine Surgery JOIMAX® / ESPINEA -University of Karlsruhe, Germany

### Certifications

2001 -Present Mexican Board Certified in Orthopedics No. 4/1500/13

2014 -2015 Fellowship Training International Spine Surgery Training Center. Wooridul Spine Hospital, Pohang, South Korea.

2015 Special Training in Unilateral Biportal Endoscopic Spine Surgery. International Spine Surgery Training Center. Wooridul Spine Hospital, Pohang, South Korea. Certified by "International UBE Spine Surgery Society"

2017 Active Member "North American Spine Society" ID 420499

2017 NASS Member ID 420499

2017 JOIMAX® Faculty

2019 AOSpine plus member ID 100024980

2020 Elsevier Editorial Reviewer.

2021 AMCICO (Mexican Spine Surgeons Association) Member

2021 Faculty, ESPINEA Universidad de Karlsruhe, Royal College of Surgeons of Edinburgh (Título en trámite)



## Cervical disc arthroplasty – Clinical outcome and MRI findings of 46 patients with a mean follow-up of 11 years.

**Benedikt W. Burkhardt**

Consultant Wirbelsäulenzentrum / Spine Center – WSC Hirslanden Klinik Zürich, Switzerland

### Abstract

Cervical disc arthroplasty (CDA) is an established procedure, but studies with data on long-term clinical outcome, reoperation for symptomatic adjacent segment degeneration (sASD), and degenerative changes based on MRI findings are rare. Thus, a file review was performed and patients with complete documentation of neurological status at preoperative, postoperative, 12 month, 3-4 years follow-up including surgical reports for reoperation with a minimum follow-up of 9 years were included. Final follow-up assessment included a physical examination, assessment of pain levels, Odoms criteria, Neck disability index (NDI). The degeneration of each cervical segment (SDI) at preoperative and at final follow-up was assessed using an MRI. Forty-six out of 68 included patients participated, the mean follow-up was 11 (range 9-15) years, at which 71.7% of patients were free of arm pain, 52.2% of patients were free of neck pain, 63% of patients had no sensory dysfunction, and full motor strength was noted in 95.6% of patients. The clinical success rate was 76.1%, the mean NDI was 12%. Overall repeated procedure rate was 17%, the reoperation rate for sASD was 9%, and removal of CDA was performed in 4%. MRI showed progressive degeneration but no significant changes of SDI from preoperative to final follow-up.

**Keywords:** Adjacent Segment Degeneration, Cervical Disc Arthroplasty, Long-term follow-up, MRI, Repeated procedure, Clinical outcome

## Education and Professional Work

### Education

04/2004 – 05/2011 Medical school - Johannes Gutenberg Universität Mainz, Germany

### Professional Experience

Since 01/2021 Consultant Wirbelsäulenzentrum / Spine Center – WSC Hirslanden Klinik Zürich, Switzerland PD Dr. med. Benedikt Burkhardt, PD Dr. med. Hansjörg Leu

07/2018 – 12/2020 Consultant Department of Neurosurgery Universitätsklinikum des Saarlandes, Germany Chairman: Univ.-Prof. Dr. med. Joachim Oertel

10/2018 – 12/2018 Zentrum für Wirbelsäulenchirurgie, Orthopädie und Traumatologie SRH-Klinikum Karlsbad-Langensteinbach, Germany Prof. Dr. med. Tobias Pitzen, Dr. med. Gregor Ostrowski, PD Dr. med. Michael Ruf

06/2016 – 09/2016 Department of Neurological Surgery – Section of Spine Neurosurgery Rush University Medical Center, Chicago, USA Professor Richard G. Fessler, MD, PhD

03/2012 – 06/2018 Residency Neurosurgery Department of Neurosurgery Universitätsklinikum des Saarlandes, Germany Chairman: Univ.-Prof. Dr. med. Joachim Oertel

### Honors

04/2018 Best oral presentation – World Spine 8, Porto, Portugal

06/2018 Depuy Synthes Spine Grant – DGNC, Münster, Germany

### Membership

09/2018 International Society of Minimal Intervention in Spinal Surgery (ISMISS) National representative Switzerland

11/2019 International Federation of Neuroendoscopy (IFNE)

12/2017 Deutsche Wirbelsäulengesellschaft (DWG)

05/2018 Deutsche Gesellschaft für Neurochirurgie (DGNC)

07/2018 Saarländische Chirurgenvereinigung

09/2021 Schweizer Gesellschaft für Neurochirurgie (SGNC)

09/2021 Schweizer Gesellschaft für Spinale Chirurgie (SGS)



## The microendoscopic resection of migrated lumbar disc herniation via an intralaminar approach using the EasyGO-spine system.

**Benedikt W. Burkhardt**

Consultant Wirbelsäulenzentrum / Spine Center – WSC Hirslanden Klinik Zürich, Switzerland

**Background:** Almost every surgical approach carries the risk of causing some degree of spinal instability, especially in cases of excessive resection of the lamina and facet joint. Up to 10% of lumbar disc herniation (LDH) migrates into the so-called "hidden zone." The intralaminar approach (ILA) has the intention to minimize osseous destruction by preserving the edges of the lamina. In this study the endoscopic ILA was performed for the treatment of cranially and caudally migrated LDH.

**Methods:** A consecutive series of 31 patients who underwent endoscopic ILA for 26 caudally and 5 cranially migrated LDH were identified from a prospectively database. Endoscopic video recording was assessed to identify the osseous diameter of ILA. A final follow-up evaluation was performed including a personal examination and a standardized questionnaire. The evaluation included the Oswestry Disability Index (ODI) and functional outcome according to modified MacNab criteria. In addition, particular reference was given to back pain, leg pain, and repeat procedures.

**Results:** Twenty-nine patients attended (93.5%) for final follow-up examination at a mean of 37.0 months (range, 5-57 months). No leg pain was noted in 95.0%, no back pain in 85.0%, full motor strength in 95.0%, and no sensory deficit in 95.0% of patients. Clinical success was reported by 95.0% of patients and the mean ODI was 9% in patients with TLA. In 10 patients a minor enlargement of ILA to conventional laminotomy has been noted on the endoscopic video recording (32.3%). By comparison of clinical outcome and repeat procedure rate in patients with ILA with patients with enlargement to laminotomy, no significant differences were identified except for higher ODI (i.e., 16%) in patients with enlargement of ILA. The rate of recurrent LDH was 5%. Overall reoperation rate with the first year was 10%.

**Conclusions:** Endoscopic ILA is a safe technique for the treatment of cranially and caudally migrated lumbar disc herniations. Careful procedural planning is recommended to protect soft tissue and osseous structures and to achieve excellent clinical outcome.

## Education and Professional Work

### Education

04/2004 – 05/2011 Medical school - Johannes Gutenberg Universität Mainz, Germany

### Professional Experience

Since 01/2021 Consultant Wirbelsäulenzentrum / Spine Center – WSC Hirslanden Klinik Zürich, Switzerland PD Dr. med. Benedikt Burkhardt, PD Dr. med. Hansjörg Leu

07/2018 – 12/2020 Consultant Department of Neurosurgery Universitätsklinikum des Saarlandes, Germany Chairman: Univ.-Prof. Dr. med. Joachim Oertel

10/2018 – 12/2018 Zentrum für Wirbelsäulen Chirurgie, Orthopädie und Traumatologie SRH-Klinikum Karlsbad-Langensteinbach, Germany Prof. Dr. med. Tobias Pitzen, Dr. med. Gregor Ostrowski, PD Dr. med. Michael Ruf

06/2016 – 09/2016 Department of Neurological Surgery – Section of Spine Neurosurgery Rush University Medical Center, Chicago, USA Professor Richard G. Fessler, MD, PhD

03/2012 – 06/2018 Residency Neurosurgery Department of Neurosurgery Universitätsklinikum des Saarlandes, Germany Chairman: Univ.-Prof. Dr. med. Joachim Oertel

### Honors

04/2018 Best oral presentation – World Spine 8, Porto, Portugal

06/2018 Depuy Synthes Spine Grant – DGNC, Münster, Germany

### Membership

09/2018 International Society of Minimal Intervention in Spinal Surgery (ISMISS) National representative Switzerland

11/2019 International Federation of Neuroendoscopy (IFNE)

12/2017 Deutsche Wirbelsäulengesellschaft (DWG)

05/2018 Deutsche Gesellschaft für Neurochirurgie (DGNC)

07/2018 Saarländische Chirurgenvereinigung

09/2021 Schweizer Gesellschaft für Neurochirurgie (SGNC)

09/2021 Schweizer Gesellschaft für Spinale Chirurgie (SGS)



## Epiduroscopic Laser Ablation of Sinuvertebral Nerve for Discogenic Back Pain

**Byapak Paudel**

Assistant Director Spine Services, Grande International Hospital

### Education and Professional Work

#### **Qualification, Post**

MD, MS (Ortho), Fellowship Minimally Invasive Endoscopic Spine Surgery  
 Consultant Orthopedic and Spine Surgeon  
 Assistant Director Spine Services, Grande International Hospital

#### **One and only**

Fellowship trained Endoscopic Spine surgeon in Nepal Association of Spine Surgeons of Nepal (ASSN)  
 Vice President 2022-2024  
 General Secretary 2020-2022  
 Treasurer 2018-2020  
 Joint Secretary 2012-2018

#### **Founder**

Orthopaedic Associations Executive Committee member Asia Pacific Trauma Society (APTS) 2018-2020  
 National delegate (Nepal) representing NOA to Asia Pacific Orthopaedic Association (APOA) 2016-2018  
 General Secretary Nepal Orthopedic Association (NOA) 2014-2016

#### **Editorial Board**

International Journal of Recent Surgical and Medical Sciences (IJRSMS)  
 Grande Int. Hospital Medical Journal (GMJ)  
 Med Phoenix- An official Journal of National Medical College (JNMC)  
 And Many More...

#### **Member**

IRC (Institutional Review Committee) Grande Int. Hospital- Approved by NHRC  
 Spine Trauma Registry-Nepal (STR-NP) Subcommittee of Nepal Health Research Council (NHRC)

#### **Speaker, Moderator and Panelist**

Navi Endoscopic Spinal Surgery International Web Symposium (NEIWS)

#### **Mentor**

Fellowship in Spinal Reconstructive Surgery (FSRS) - Grande Int. Hospital

#### **Award**

First Quarter 2019 Best Reviewer, Neurospine  
 NEIWS presentation award 2021, Nanoori Research  
 And Many More...





## Recent trend and new trial of endoscopic spine surgery

**Chien-Min Chen**

Department of Neurosurgery, Changhua Christian Hospital, Taiwan

Endoscopic spine surgery (ESS) has evolved as a safe, effective, and efficient alternative for minimally invasive spine surgery (MISS). The innovation of full-endoscopic systems makes definitive decompression surgery through different approaches feasible. The approach can be determined according to the location and characteristics of the target lesion or the surgeon's preference. During the past two decades, ESS has expanded its indications from lumbar to cervical spines. Except for decompression, endoscopy-assisted fusion surgery is also developing. However, ESS is still evolving and has a steep learning curve. The revolution of technologies and ESS techniques will enable surgeons to treat various spinal diseases more practically. In recent years, the application of the computer-assisted navigation system and augmented reality have reformed imaging quality and interpretation. The endoscopic rhizotomy techniques have opened a new way for MISS of chronic low back pain. This review will introduce the current indications of ESS and discuss its potential future expansion.

## Education and Professional Work

### Present Position:

1. Director of Neurosurgery, Changhua Christian Hospital, Changhua
2. Director of minimally invasive spine center, Changhua Christian Hospital
3. Associate Professor

### Board Certification:

Board of Surgery, Taiwan Surgical Association.  
 Board of Surgery, Taiwan Surgical Association.  
 Board of Neurosurgery, Taiwan Neurosurgical Society.  
 Board of Taiwan Surgical intensive care  
 Board of Taiwan neurological intensive care

### Professional Affiliations: (Medical Organizations or Societies).

Member, Taiwan Surgical Association.  
 Member, Taiwan Neurosurgical Society.  
 Member, Taiwan Society of Critical Care Medicine.  
 Member, Taiwan Society of pediatric neurosurgery  
 Member, Taiwan Neurospinal Society  
 Board member, Taiwan Society of skull base  
 Supervisor, Taiwan Society of Minimally Invasive Spine Surgery.  
 Executive presidium, International Society of Endoscopic Spine Surgery  
 Board member, World Congress on Minimally Invasive Spine Surgery and Techniques Association (WCMISSST association)  
 2nd President of Taiwan Society of Endoscopic Spine Surgery (TSESS)

Neurospine (SCI) guest editor

Diagnostics (SCI) guest editor

### Professional specialty:

Full endoscopic discectomy  
 Minimally invasive spine surgery  
 Total navigation in spine surgery  
 Endoscopic removal of ICH  
 Ventricular endoscopic surgery  
 Neuro Oncology  
 Vascular Neurosurgery  
 Endoscopic transnasal pituitary surgery  
 Skull base surgery  
 Neurotraumatology



## Opioid-free and awake percutaneous/endoscopic TLIF surgery using a large footprint interbody cage

Christian Morgenstern\*, Rudolf Morgenstern

\*Morgenstern Institute of Spine, Spain

**Background Context:** Despite a significant rise in prescription opioid-drugs related overdose deaths in the last decade and the U.S. Department of Health declaring the opioid epidemic a national emergency in 2017, median opioid prescription duration remains the longest for spine surgery with 12.6 days, demanding for alternatives to opioid medication in spine surgery related analgesia. Thoraco-Lumbar Interfascial Plane (TLIP) block is an ultrasound-guided interfascial block that has shown promising results in reducing opioid consumption in non-instrumented spine surgery procedures.

**Purpose:** Aim of this study was to evaluate the efficacy in reducing post-operative pain and opioid analgesia of a novel inter-disciplinary strategy combining pre-operative Thoraco-Lumbar Interfascial Plane (TLIP) block and instrumented percutaneous/endoscopic TLIF surgery with a large footprint interbody cage. Secondary aims were to determine the time to first postoperative ambulation and hospital length of stay. Study

**Design/Setting:** This is a prospective study with a retrospective control cohort, Patient Sample: 42 patients that underwent elective single-level percutaneous/endoscopic TLIF surgery between 2015 and 2021. A TLIP Group with 17 patients prospectively underwent TLIP block before surgery and Non-TLIP (control) Group with 25 patients obtained standard opioid analgesia. Both groups received the same post-operative analgesia with morphine as patient-controlled rescue medication.

**Outcome Measures:** Visual Analogic Scale (VAS) and Oswestry Disability Index (ODI) scores were evaluated. Statistical evaluation was performed with Student's T test.

**Methods:** For the TLIP group, ultrasound-guided bilateral TLIP was performed in prone position with bupivacaine 0.25% and dexamethasone 8mg (20ml each side) by the anesthesia team. All patients were operated on under general anesthesia (protocol: propofol 2.0-3.0 mcg/ml (TCI) following BIS, ketamine 0.15 mg/Kg/h, rocuronium 0.4 mg/Kg). Percutaneous TLIF was performed by inserting an expandable interbody implant using the facet-sparing, trans-Kambin approach with an endoscopic cannula and complemented with a percutaneous posterior fixation consisting of transpedicular screws and rods. Postoperative analgesia included NSAIDs and Acetaminophen. Intravenous morphine was administered with a PCA pump consisting of a bolus of 20mcg/Kg with interval lock-out of 15 minutes and a maximum of 3 bolus per hour. The use of the PCA pump was monitored.

**Results:** In contrast to the Non-TLIP group, the TLIP group's post-operative, mean VAS back scores as well as mean ODI significantly decreased from 6.6 to 3.3 ( $P < 0.01$ ) and 32.8 to 23.6 ( $P < 0.01$ ) at hospital discharge. No differences were found between both groups at one month. The overall mean follow-up was  $29 \pm 18$  [3-78] months. Non-TLIP Group patients were administered a median post-operative 24-hour morphine dose equivalent (MDE) of 23 [range, 8-31] mgr, while TLIP Group patients did not require opioid analgesia ( $P < 0.01$ ). TLIP Group patients started post-operative ambulation at a median of 4.1 [range, 2.5-26] hours with a median hospital length of stay of 24 [range, 20-48] hours ( $P = 0.112$ ).

**Conclusions:** TLIP block significantly improves patient outcome at hospital discharge after percutaneous/endoscopic TLIF surgery using a large footprint interbody cage without post-operative administration of opioids. A prospective study is recommended to confirm our preliminary results.

### Education and Professional Work

- Consultant Spine Surgeon at **Morgenstern Institute of Spine, Barcelona**
- **Head of Spine surgery** at Hospital Nostra Senyora de Meritxell (Andorra)
- **Teaching instructor (international faculty)** in international workshops for anterior and lateral approaches (Spineart), and endoscopic spine surgery (AO Spine, Maxmore Spine, etc.)

#### Training

- **Board certified orthopedic surgeon** (German Board, Berlin)
- Residency at **Charité Universitätsmedizin Berlin**, Germany
- **Fellowship** trained MIS and endoscopic spine surgeon

#### Education

- Doctor medicinae (Dr. med.), Germany
- Medical Doctor, University of Barcelona
- PhD in Biomedical engineering, UPC-BarcelonaTECH
- Diplom-Ingenieur, Karlsruhe Institute of Technology
- Thesis at the Massachusetts Institute of Technology (MIT), USA

#### Publications / Societies

- More than 100 abstracts and papers in international peer-reviewed journals and international conferences (NASS, Eurospine, AO Spine GSC, ISMISS, etc.)
- Reviewer for more than 10 international journals
- Member of **NASS, Eurospine, AO Spine, ISASS, IEEE**
- **National representative** (Spain) for **ISMISS**





## Clinical development of Tie2 positive nucleus pulposus progenitor cell product for low back pain

**Daisuke Sakai**

Tokai University School of Medicine

Low back pain affects various individuals, from the working population to the locomotive syndrome of the elderly, and its social and economic impact is unignorable. In particular, the intervertebral disc, which is closely related to low back pain, is a tissue that changes significantly with aging and degeneration, and degeneration of the intervertebral disc leads to the development of herniated disc and various spinal degenerative diseases. Stem/progenitor cells have been isolated from various musculoskeletal tissues. Recently, cells with MSC-like properties have been isolated from degenerate human intervertebral discs, providing support for the presence of mesenchymal progenitors.

We have isolated progenitor cells from human and mouse nucleus pulposus (NP) of the intervertebral discs that are different to adhesive MSCs, able to form spheres similar to neural progenitors. These cells have self-renewal and multipotential characteristics consistent with progenitor cells. These progenitors express Tie2 as a marker that progress toward Tie2+/GD2+ cells, with the subsequent expression of CD24 and CD44 as markers for nucleus pulposus (NP) cells in culture and self-renewal property is then lost. Therefore, cells that express Tie2 may be a novel source of donor NP cells in cell therapy for degenerative disc disease.

In order to develop a cell therapeutic agent derived from Tie2 positive NP cells, we isolated NP cells from young donors who had undergone herniotomy for lumbar disc herniation. Minced NP tissue was macroscopically isolated and tissue was brought into whole tissue organ culture for 2 weeks. Thereafter, tissue was then enzymatically digested and cells were expanded in 2D culture for 2 weeks. Tie2 positivity was checked after harvest and counted. Tie2 positivity, proteoglycan and type II collagen positivity after expansion culture was measured by flow-cytometry.

Tie2 positive NP cells may provide superior outcomes in cell therapy for degenerative disc disease and low back pain compared to other cell products.

## Education and Professional Work

### Society membership:

- International Society for the Study of Lumbar Spine (Active Member)
- Orthopaedic Research Society (Active member)
- North American Spine Society (Corresponding member)
- Asia Pacific Orthopaedic Association (Lifetime member, National Delegate Japan)
- Asia Pacific Spine Society (Lifetime member)
- Japanese Orthopaedic Association
- Japan Spine Research Society
- Japanese Scoliosis Society
- Japanese Society for Transplantation and Tissue Engineering in Musculoskeletal System
- The Japanese Society for Regenerative Medicine
- The Japanese Society for Cartilage Metabolism

### Society Appointments

- Japanese Orthopaedic Association
- 2011-2014, 2017- International Affairs Committee member, 2015-2016 Advisor, 2018~ Chairman
- 2016-2019 Low Back Pain Guideline Committee member
- 2018- present Lumbar Disc Hernia Guideline Committee member
- Japanese Society for Spine Surgery and Related Research
- 2016-present, International Affairs Committee member
- Japanese Scoliosis Research Society
- 2017-present, International Affairs Committee Society

### Journal Editorial Appointments

- Journal of Orthopaedic Research – Spine 2017- present, Co-Editor-in-Chief
- Journal of Orthopaedic Surgery, Official Journal of APOA 2011- present, Basic Science Section Editor
- Journal of Orthopaedic Research 2011- present, Editorial Board
- Journal of Orthopaedic Science 2010- present, Editorial Board
- Scientific Reports 2019- present Editorial Board

### Awards

- 2003 Research Encouragement Award International Society for the Study of Lumbar Spine (Japan Branch)
- 2003 Young Researcher Award The Naito Foundation
- 2004 Research Encouragement Award The Kanagawa Foundation for Intractable Disease
- 2006 North American Spine Society Best Research Paper Award
- 2013 Research Recognition Award, The Japanese Orthopaedic Association



## **Transcorporeal endoscopic discectomy for cervical disc herniation: A technical consideration.**

**Gun Keorochana**

Ramathibodi hospital, Mahidol university, Bangkok, Thailand

In recent years, the application of spinal endoscopy has become more prevalent. Percutaneous endoscopic cervical discectomy (PECD) is mainly divided into the anterior transdiscal approach and the posterior foraminotomy approach. Although the anterior transdiscal approach can provide direct decompression for central or paramedian cervical disc herniation, the iatrogenic disc damage may result in decreased intervertebral space when compared to posterior foraminotomy access. Anterior transcorporeal approach under endoscopy could enable an individual and adjustable trajectory within the vertebral body under different conditions of disc herniation preserving the motion of adjacent segment, especially in a migrated or sequestered lesion. The precise surgical technique of this procedure is need for good clinical outcome and less complications. The topic describes the concept, indications, contraindications and step by step of transcorporeal anterior endoscopic discectomy and how to apply proper endoscope, instruments, tools and equipments.

## **Education and Professional Work**

### **PROFESSIONAL EXPERIENCE**

2006-present Assistant Professor Spine Unit, Department of Orthopaedics, Faculty of Medicine, Ramathibodi Hospital Mahidol University Bangkok, Thailand

### **AWARDS, HONORS**

APOA Spine Traveling Fellowship 2005 to Hong Kong, Sendai and Taipei

### **MEMBERSHIPS**

The Royal College of Orthopaedic Surgeons of Thailand (RCOST)

Asia Pacific Orthopaedic Association (APOA)

AO Spine International

North American Spine Society (NASS)

Association of Southeast Asian Nations of Minimally Invasive Spine Surgery and Techniques (ASEANMISST)

World Congress of Minimally Invasive Spine Surgery and Techniques (WCMISST) Association

Society of Lateral access surgery (SOLAS)



## Correction of Adolescent Idiopathic Scoliosis using Convex Rod Rotation Maneuver

**Hidetomi Terai**

Associate professor, Dept. of Orthopaedic Surgery, Osaka Metropolitan University Graduate School of Medicine

It has been avoided to manipulate thoracic scoliosis from convex side because it had been believed that convex side manipulation must deteriorate the vertebral rotation and worsen rib hump. Convex manipulation was first described by Chang et. al (Taiwan) in 2003. He used cantilever bending technique in convex side to correct the curvature. Then, Vallespir et al. and his Spanish colleagues released the clinical outcome of "Coplanar method" in 2008. We have developed the new technique using pure-titanium rod for convex side with rod rotation maneuver since 2008 (We named it: Convex rod rotation maneuver: CRRM) and we have reported its clinical data since 2015. (Terai H. et al., Scoliosis 2015 and Takahashi S. et al., SSRR 2020) Advantages of this method are easiness and safety during pedicle screw insertion due to larger size of pedicle in convex side than concave side. Other advantage is the longer distance between each pedicle screw in convex side than those in concave side. Due to the longer distance, scoliotic spine can be manipulated with less load in accordance with the principles of leverage. We have utilized uniplanar screws and direct vertebral rotation technique to solve the problem of worsening vertebral rotation. More than 150 patients of adolescent idiopathic scoliosis underwent CS-RRM since 2008 in our institution. Average correction rate of Lenke type 1 and type 2 scoliosis were 75.6% and 64.7% respectively.

Detailed surgical techniques and key points of CRRM will be discussed using surgical video in this presentation.

## Education and Professional Work

### BOARD CERTIFICATION

- 2004 Orthopaedic Surgery Specialist #116235, The Japanese Orthopaedic Association (JOA)
- 2005 Specialist of Spine and spinal cord disorder #3473, The Japanese Orthopaedic Association (JOA)
- 2007 Spine surgery certified doctor #11102, The Japanese Society for Spine Surgery and Related Research (JSSR)
- 2009-2015 Endoscopic Spine Surgery Specialist #1064, The Japanese Orthopaedic Association (JOA)

### PRESENT POSITION OR ACADEMIC RANK

2015- Present Associate Professor of Orthopaedic Surgery Osaka City University Graduate School of medicine

### PREVIOUS PROFESSIONAL POSITIONS AND APPOINTMENTS

#### Clinical:

- 2002-2005 Instructor of Orthopaedic Surgery, Osaka City University Graduate School of medicine
- 2005- 2015 Lecturer of Orthopaedic Surgery, Osaka City University Graduate School of medicine
- 2015- present Associate Professor of Orthopaedic Surgery, Osaka City University Graduate School of medicine

#### Academic Research:

1999-2001 Research fellow in Surgery (Tissue engineering Lab.), Massachusetts General Hospital, Harvard medical School, USA

#### Medical Support in Afghanistan:

2012 (Jan-Mar) Teaching and clinical staff in Wazir Akbar Khan Hospital, Kabul Medical University (International Medical Corps)

### TEACHING ACTIVITIES- HOSPITAL OR OFFICE-BASED

#### Medical School:

- 2002-2005 Instructor of Orthopaedic Surgery, Osaka City University Graduate School of medicine
- 2005- 2015 Lecturer of Orthopaedic Surgery, Osaka City University Graduate School of medicine
- 2015- Present Associate Professor of Orthopaedic Surgery Osaka City University Graduate School of medicine

### HONORS AND AWARDS

- 1999 Research award from Nakatomi Health and Wellness Organization
- 2007 Research award from Chiyoda Health and Wellness Organization
- 2009 Research award from Japan Foundation for aging and health
- 2019 Best presentation award in 26th meeting of JPSTSS (Japan Society for the Surgical Technique for Spine and Spinal Nerves)

### MAJOR CLINICAL AND RESEARCH INTERESTS

Spine surgery (Scoliosis, Pediatric, Degenerative, Minimally invasive), Regenerative medicine, Bone graft substitute

### MEMBERSHIP IN PROFESSIONAL SOCIETIES

- The Japanese orthopedic association (JOA)
- The Japanese society for spine surgery and related research (JSSR)
- Pacific and Asian Society of Minimally Invasive Spine Surgery (PASMIS)
- AO Spine
- North American Spine Society (NASS)
- Japanese Research Meeting for Mucopolysaccharidosis
- Japanese Spinal Instrumentation Society
- Japanese Scoliosis Society

### BOARD MEMBER in

JSSR, JSIS, PASMIS, AO Spine, MISS summit forum Japanese Research Meeting for Mucopolysaccharidosis



## Effects and limitations of the full-endoscopic lumbar discectomy transforaminal approach for a reoperation of lumbar disc herniation.: Focusing on complete resection of the herniated disc.

**Hiroki Yoshimatsu**

Fukuoka Kinen Hospital, Fukuoka, Japan

**【Background】** Surgery for a reoperation of lumbar disc herniation (LDH) poses problems associated with scar formation and adhesions following the initial operation. The superiority of the full-endoscopic lumbar discectomy transforaminal approach (FELDTF) has been reported in resecting recurrent herniated discs while avoiding adhesion scars following posterior approach surgery. However, the limitations associated with FELDTF in reoperation cases of LDH are still unclear, and measures to minimize such incidents remain insufficient.

**【Purpose】** We evaluated the clinical results of FELDTF in patients undergoing reoperations for LDH to examine the efficacy and limitations of this procedure.

**【Materials and Methods】** The subjects included 246 reoperation patients with LDH who underwent FELDTF. The presence or absence of complete resection of the herniated disc was evaluated by lumbar MRI performed early in the following surgery. And, we investigated these results using VAS scores for leg pain, postoperative recurrence, modified Macnab criteria and postoperative complications.

**【Results】** Complete resection of the herniated disc was observed in 76% of the subjects, with incomplete resection observed in 24%. Reoperation due to incomplete resection was required in 13 cases. Postoperative recurrence was observed in 19% of the subjects. Such recurrence occurred on average after 3 months, with 33 cases requiring reoperation.

According to the surgical approach, the percentage of incomplete resection and that of reoperation due to incomplete resection tended to be higher in the group undergoing the posterior approach.

**【Discussion】** Reoperation for LDH is associated with some risks including postoperative complications and insufficient decompression, which are considered to be one of the causes of such incidents. Thus far, we have reported that identifying the appropriate surgical indications and careful preoperative planning are necessary when selecting

## Education and Professional Work

1996 M.D., Kurume University School of Medicine  
 2001 Ph.D.(Doctorate of Medical Science), Kurume University, Department of Orthopaedic Surgery  
 2001 Medical Staff of Orthopaedic Surgery in Kurume University  
 2006 Manager of Spine of Orthopaedic Surgery in St. Mary's Hospital  
 2011 Vice-Head of Medical Office of Orthopaedic Surgery in Kurume University  
 2013 Head of Medical Office of Orthopaedic Surgery in Kurume University  
 2015 Chief physician of Spine and Spinal Cord Center in Omigawa General Hospital  
 2017 Spine fellow in Pohang Wooridul Hospital, Korea  
 2017 Chief of Spine Surgery Division in Aichi Spine Hospital  
 2023 Director of Spine and Spinal Cord Surgery in Fukuoka Kinen Hospital



## **IPSILATERAL BIPORTAL ENDOSCOPIC INCLINED TECHNIQUE FOR LATERAL RECESS AND FORAMINAL LUMBAR DISC PATHOLOGY AT L4-L5 AND L5-S1**

**Javier Quillo-Olvera**

Hospital H+ Querétaro

Lateral recess and foraminal lumbar disc herniations can cause traversing or exiting nerve root compression. Therefore, when conservative treatment is not enough, surgery may be suggested. Currently, minimally invasive techniques are available to address this pathology, including tubular microsurgery and various endoscopic methods such as unilateral biportal endoscopy (UBE). At high lumbar levels where the lamina is usually narrow and wide, the contralateral sublaminar UBE approach is often effective in reaching lateral disc pathology and avoiding facet joint injury compared to a direct ipsilateral approach. However, at levels with a longer lamina, such as L4-L5 and L5-S1, the contralateral trajectory may be unnecessary if we consider that the interlaminar space is more expansive. For these cases, instead of planning a direct ipsilateral approach in which medial removal of the facet joint is required to reach the lateral recess and foramen, trying with a longer contralateral route that crosses under the base of the spinous process may take time. Therefore, the authors have opted for a different way to perform the sublaminar approach for high foraminal pathology or to use the ipsilateral interlaminar space if lateral recess disc pathology occurs. This route is called ipsilateral inclined. Through this new method, we have noted a reduction of bone remodeling of the facet joint that hinders the subarticular and foraminal area. In this technique, the surgeon uses the space between the spinous process and the ipsilateral lamina to angle the approach following an inclined (medial to lateral) trajectory to address the subarticular and foraminal area, avoiding approaching the lateral recess and the foramen directly in a perpendicular fashion, which results in less injury to the facet joint and a great visualization of neural structures and pathology. In addition to the well-known UBE-related advantages, the surgeon can introduce the endoscope and the surgical tool through independent working channels to have more freedom of movement with both hands during a water-based endoscopic procedure. This presentation aims to introduce the technical feasibility of the ipsilateral biportal endoscopic inclined technique for lateral recess and foraminal lumbar disc pathology at L4-L5 and L5-S1.

### **Education and Professional Work**

#### **EDUCATION**

- 2017 – 2018 Endoscopic Spinal Surgery Leon Wiltse Memorial Hospital, Suwon, South Korea.
- 2017 – 2018 Minimally Invasive Spine Surgery The Catholic University of Korea, St. Mary's Hospital, Neurosurgery department, Spine Clinic, College of Medicine, Seoul, South Korea.
- 2015 – 2016 Spine Surgery ABC Medical Center, Mexico. The American British Cowdray Hospital, Mexico City.
- 2008 – 2014 Neurosurgery University of Guadalajara
- 2001 – 2008 MD degree Del Valle de México University

#### **BOARD CERTIFICATION IN MEXICO**

- 2014 – 2019 Mexican Council of Neurological Surgery Approved.

#### **SOCIETIES**

- 2018 – until today AOSpine member and faculty
- 2020 – until today Mexican Society of Spine Surgeons (AMCICO)

#### **ACADEMY**

- 2018 – until today International Faculty of Endoscopic Spine Surgery from Joimax Inc.





## Endoscopic Extreme TLIF(eXTLIF) with OLIF Cage; Preliminary Technical Report

**Jin Hwa Eum\*, Dong Hwa Hoe**

\*Ain Al khaleej Hospital ,UAE

This report describes a novel endoscopic fusion technique performed with unilateral biportal endoscopy (UBE) that is known as extreme transforaminal lumbar interbody fusion (eXTLIF) and is performed with OLIF cages.

We also present the short-term results of this procedure.

Previous studies reported that minimally invasive transforaminal lumbar interbody fusion (MIS-TLIF) could achieve acceptable rates of fusion; therefore, it is often used for treating various degenerative lumbar diseases. Moreover, MIS-TLIF can be performed with a unilateral approach; hence, it is commonly performed with the UBE technique. The biportal endoscopic TLIF procedure is usually performed with a single spacer in the interbody space. It is important to insert the maximum amount of graft material into the preparation site via an autologous bone marrow transplant or any other suitable substance with spacer insertion. Because MIS-TLIF with UBE is performed in water, it might provide an inadequate environment for excellent fusion. Therefore, a modified method was used to increase the surface contact area and insert the maximum amount of bone material

with a larger spacer. However, the use of a large spacer necessitates a larger spacer orifice. For this purpose, eXTLIF was performed, which inserts the spacer more laterally compared with the current TLIF position. We report the surgical method and short-term results, which have been satisfactory thus far.

## Education and Professional Work

### Professional Objective

To contribute my innovative spinal surgical approach in partnership with a doctor, medical team, or hospital in the world.

### Education & Professional Credentials

Medical Doctor, Kyeungbuk National Medical School, Daegu, South Korea, 1982 - 1986.

Professional License, Korean National Board of Neurological Surgery, 1991.

### Leadership, Membership, Presentations

Presenter, "Translaminar Endoscopic Discectomy"

The 4th Biennial Korea-Japan Conference on Spinal Surgery, 2003.

1st presentation about UBE surgery.

Exchange Visitor, Albert Einstein College of Medicine of Yeshiva University, New York, 1994 – 1995.

Member, International Chapter, NASS (North American Spine Society)

KOMISS (Korea Minimal Invasive Spine Surgery) 2021

KOESS (Korea Research Society of Endoscopic Spine Surgery) 2021

Chairman, Korea UBE, 2020, 2021

### Experience

Ain Al Khaleej Hospital, UAE 2021.2- present

Burjeel Royal Hospital, UAE 2021.5- 2021.12

Medrex hospital 2020-8- 2021.3

Seoul Barun Hospital 2019.7- 2020.7

Bumin hospital 2018- 2019.6

### Volunteer & Community Work

- Mentor for new medical doctors entering spinal residency

- Active in hospital volunteer programs



## **L5-S1 foraminal and lateral recess stenosis: The inherent factors to be considered upon the choice between the Full Endoscopic Transforaminal vs Interlaminar decompression.**

**Jun Ho Lee**

Professor Department of Neurosurgery, Spine Section Kyung Hee University Medical Centre

**Background:** The Transforaminal access to the spinal canal would be the prototype of the spinal endoscopy with the history more than a half century. However, sometimes this procedure would be fraught with diverse limitations from the anatomical hindrance or device parameter itself, especially during the access to the level of L5-S1.

**Method & Results:** A recent analysis from Prof Ju et al has asserted that the failure rate after the full endoscopic transforaminal decompression of L5-S1 might be closely related to the magnitude of working zone, approaching angle for the endoscopic instruments, anatomical morphology and height of the iliac crest, the size of the L5 transverse process size, and the concomitant existence of underlying bony spur or calcification. Alternating to the Interlaminar access would still request a thorough review on the size and shape of the interlaminar space itself, the narrowed dimensions inside the stenotic lateral recess, as well as thorough decompression of the ligamentum flavum lying underneath the superior articular process.

**Conclusion:** Either Transforaminal or Interlaminar endoscopic decompression at the level of L5-S1 would be challenging unless a proper location of the endoscopy or its working sheath and subsequent thorough decompression has been secured. A discreet knowledge on both the instrumental or anatomical factors prior to the surgical procedure would enhance the surgeons with the decreased failure rate after the endoscopic L5-S1 stenosis decompression.

## **Education and Professional Work**

### **EDUCATION**

March 1990 – February 1996: B.A. Seoul National University College of Medicine, Seoul, Korea

March 2000 – February 2002: Master course, Seoul National University, College of Medicine Graduate School, Seoul, Korea

March 2005 – February 2007: Doctoral course, Seoul National University, College of Medicine Graduate School, Seoul, Korea

### **POSTGRADUATE TRAINING**

March 1997 – February 1998: Internship, Seoul National University Hospital, Seoul, Korea

March 1998 – February 2002: Resident, Neurosurgery, Seoul National University Hospital, Seoul, Korea

May 2005 – April 2006: Clinical and Research Fellowship, Neurosurgery, Seoul National University Hospital, Seoul, Korea

### **HOSPITAL APPOINTMENT**

April 2002 – March 2003: Chief of Medical Affairs, Recruit Training Center, 55th Infantry Division, Yong In, Gyeong-Gi Do, Korea

April 2003 - April 2005: Director of Department of Neurosurgery, Armed Forces Seoul Hospital, Seoul, Korea

May 2006- February 2016: Chief Neurosurgeon, Wooridul Spine Hospital

March 2016 – August 2021: Associate Professor, Dept of Neurosurgery, Kyung Hee University Medical Centre

September 2021 – currently: Professor, Dept of Neurosurgery, Kyung Hee University Medical Centre

### **ACADEMIC INTERESTS**

Minimally invasive spine surgery

Endoscopic cervical spine surgery

Image-guided spine surgery

### **MEMBERSHIP**

International member, Tier I, Member's Feedback Committee, North American Spine Society

Member & International Faculty, AOSpine Davos course, Asia-Pacific & North America

Member & Executer, Walter E Dandy Neurosurgical Society

Member, Korean Neurosurgical Society

Member, Korean Spine Neurosurgical Society

### **RECENT PUBLICATIONS (International Journals (SCI and SCIE))**

Lee JH, Lee DC, Lee JH. Does Paramedian Approach Preferentially Secure Optimal Drug Delivery Onto Ventral Epidural Space and Subsequent Superior Clinical Efficacy Over a Dorsal Midline Approach During Cervical Interlaminar Epidural Injection? Pain Physician. 2021 Sep; 24(6): E839-E847.

Choi MK, Kim SB, Lee JH. A Concomitant Occurrence of the Atlantoaxial Subluxation with Rare Vertebral Formation and Segmentation Defects. J Korean Neurosurg Soc. 2021 Sep; 64(5):837-842.

Lee ET, Lee SA, Soh Y, Yoo MC, Lee JH, Chon J. Association of Lumbar Paraspinal Muscle Morphometry with Degenerative Spondylolisthesis. Int J Environ Res Public Health. 2021 Apr





## Posterior Full-Endoscopic Cervical hemilaminectomy and Decompression for Cervical Adjacent Stenosis with Myeloradiculopathy: A Case Report and Technique Review

**Keng-Chang Liu**

Buddhist Dalin Tzu Chi Hospital, Chiayi, Taiwan

### OBJECTIVE:

Cervical adjacent spinal stenosis with myelopathy after anterior interbody fusion and posterior fixation is relatively rare. Surgical treatment is the preferred option. Open revision procedures will have following problems: large trauma, scar adhesion, intraoperative bleeding, and fixation failure. By using of full endoscopic decompression, we successfully treat a patient with upper cervical spinal stenosis complicated with myeloradiculopathy.

### METHODS:

A 55-year-old man underwent C3-7 anterior cervical discectomy and fusion, and C3-7 posterior decompression and lateral mass screw fixation for 2 years. Adjacent C2-3 spinal stenosis with myeloradiculopathy developed one year later. He presented with weakness of bilateral upper and lower extremity and loss of proprioception. He underwent posterior full-endoscopic cervical laminectomy and decompression and got good outcomes.

### RESULTS:

The procedure involved right C2-3 hemilaminectomy and bilateral decompression. Complete decompression of bilateral C3 nerve root and spinal cord could be achieved uneventfully. The patient was discharged on postoperative day one. The patient's neurologic function including muscle power improved dramatically, pain was obviously reduced, and quality of life improved significantly. He started to walk without support 3 weeks later.

### CONCLUSIONS:

Full endoscopic unilateral portal and bilateral decompression is an effective method for treating cervical adjacent stenosis associated with myelopathy. It has the advantages of smaller trauma, less bleeding, shorter postoperative hospital stays, and faster recovery.

## Education and Professional Work

### Current Position :

Director, Division of Spine Surgery, Department of Orthopedics, Dalin Tzu Chi General Hospital, Buddhist Tzu Chi Medical Foundation, Taiwan

### Educational Background :

Department of Medicine, National Cheng Kung University, Tainan, Taiwan

Department of Orthopedic Surgery, National Cheng Kung University, Taiwan

### Current Title:

1. Director, Division of Spine Surgery, Department of Orthopedics, Buddhist Dalin Tzu Chi General Hospital, Taiwan
2. Associated Professor, School of Medicine, Tzu chi University, Taiwan

### Work Performance :

1. Member of Taiwan orthopedic association
2. Member of Taiwan Spine Society
3. Member of Taiwan Society of Minimally Invasive Spine Surgery
4. Board member of Pacific Asian Society of Minimally Invasive Spine Surgery (PASMIS) (Representative of Taiwan)
5. Board member of International Society of Endoscopic Spine Surgery (ISESS) (Representative of Taiwan)
6. Board member of Taiwan society of endoscopic spine surgery (TSESS)



## Full-endoscopic Contralateral Decompression of Foramen from Inside of the Canal (CDFIC)

**Kuniyoshi Tsuchiya**

Department of Orthopaedics, JCHO Kyushu hospital

Full-endoscopic spine surgery (FESS) has made great shift of paradigm in the field. Complete decompression of the spinal canal can be achieved with a skin incision less than 10mm length. However, foraminal stenosis still remains as one of the challenging pathologies.

Preservation of supportive structures such as facet and successful decompression of the affected nerve are controversial issues.

In many cases, foraminal decompression has been treated from extraforaminal approach, otherwise fusion surgery is considered. Full-endoscopic surgery has given innovative solution on treating this pathology.

Nevertheless, problem still remains in the case of co-existence of pathologies inside and outside of the canal. Contralateral decompression from interlaminar space gives a solution from the different aspect.

Indication of the procedure: L4/5 central or lateral recess stenosis combined or with the potential risk of foraminal stenosis.

Surgeons should be aware that the shape of the foramen seen from inside of the canal is fairly various, which makes it difficult to tell how deep you are in the foramen. Degenerative change or spondylolisthesis will greatly affect their shape. Even in those cases, excessive bone resection which may cause fracture of the pars on the contralateral side should be avoided.

Surgeons should be familiar with those variable anatomy for the safe and complete decompression of the affected nerve at foraminal lesion, in addition to sufficient hemostasis skill to maintain clear vision and these are the keys to perform this new maneuver successful.

Nerve damage should be carefully avoided, because the scope and the cannula approach to the pathology over the dural sack.

Maximum three affected roots (L4/5 stenosis with any degree and single sided foraminal stenosis at the level) can be the most feasible indication of this method. L5/S1 level, however, which has much greater frequency of extraforaminal or far-out compression of the nerve, is currently out of indication of this method.

Most of proximally-migrated herniation, which had been treated with translaminar approach so far, can be ideal indication of this method.

Point of full-endoscopic decompression of foramen with monoportal contralateral approach from interlaminar space is presented.

## Education and Professional Work

### TRAINING:

1993-1994: Postdoctoral fellow, Stanford University

2003-2004: Visiting fellow: Spine Deformity Service

Department of Orthopaedics, Washington University School of Medicine, St Louis, MO

### LICENSES/CERTIFICATION

2010- : Board certified surgeon of Microendoscopic Spine Surgery

2016- : Board certified surgeon of Full Endoscopic Spine Surgery

### Activities:

2012-: Delegate: Japanese Spinal Instrumentation Society

2018-: Delegate: AO spine Japan

2019-: Editorial Committee: guideline for lumbar canal stenosis

### Current interests:

Minimally invasive spine surgery



## EVOLUTION OF ENDOSCOPIC SPINE SURGERY TECHNIQUE

**Michael Schubert**

Apex Spine, Germany

Microdiscectomy is still regarded as the gold-standard method for the treatment of herniated discs. Good clinical results, the almost universal applicability and the possibility of concomitant bony decompression are among the main reasons for this. Hence an endoscopic technique – although the advantages of the lower invasiveness are well accepted - should be comparable in these respects before the gold-standard can be challenged. The transforaminal endoscopic inside-out technique by YESS® never presented that optimal good post-operative outcome for endoscopic spine surgery compared to the golden standard open microscopic discectomy. Later the outside-in technique via a postero-lateral approach under widening of the foramen by dilators that has been established with the VERTEBRIS® system, by reamers with the TESSYS® technique and with only drills by maxMorespine® method and at least by CEPTOVATION® (combination of reamers and drills) might be suited best to meet this challenge: almost all kinds of herniations can be treated, a foraminoplasty can readily be done and the verification of nerve decompression is possible in all cases. Preliminary data from a randomized controlled trial comparing the endoscopic outside-in technique to microdiscectomy have been presented during the Britspine in 2010 (Molyneux et al.). They confirm at least clinical equivalence between the two techniques. For outside-in technique patients, however, the time of bed rest after surgery was significantly shorter – 16 versus 40 hours. A large multicenter randomized and controlled trial (TESCORT) is now being started to compare the endoscopic outside-in technique with limited microdiscectomy. Experience from patients in our own clinic show that very good outcomes and low complication rates can be obtained mainly with the new and most advanced CEPTOVATION® system. A high patient satisfaction and a low number of recurrences were observed. These favorable results were reached including almost all kinds of herniations – only the rare herniations with sequestrators posterior to the dura had to be excluded. This is the most important reason for considering this outside-in technique as a true alternative to the current gold-standard microdiscectomy. With the innovative CEPTOVATION® system, it is possible to operate endoscopically - inter laminar or transforaminal - on all types of intraspinal pathologies (except for tumors) in the area of the entire spine, i.e. cervical, thoracic (except Th1 - Th5 according to our own experience) and lumbar (also L5/S1 in particular).

## Education and Professional Work

### Education and Qualifications

1983 – 1984 Jurisprudence, Göttingen, Germany  
 1984 – 1991 Medical study, Göttingen and Recife, Brasil  
 1987 – 1988 Scholarship in Brasil for the doctoral thesis, Institute for tropical medicine Göttingen, Germany (Prof. Dr. Bommer)  
 1993 Degree of doctor: „Seroepidemiologic Investigation of the prevalence of antibodies against Toxoplasma gondii in Recife and Borrelia burgdorferi in Recife and Fortaleza, Brasil“  
 1994 License to practice medicine  
 1999 Medical specialist in Orthopaedics

### Employment History

1992 – 1993 Zürcher Hochgebirgsklinik, Intern Medicine (Davos, Swiss)  
 1994 – 1997 Residence at the German Spine Center, Orthopaedy and spine surgery Werner Wicker Klinik, Bad Wildungen, Germany  
 1997 – 2000 Auguste Viktoria Klinik, Orthopaedy Bad Oeynhausen, Germany Juni 2000 – Sep. 2000, head of department for spine surgery  
 2000 – 2002 head of department, Orthopaedy and Traumatology, EuroMed Clinic Fürth, Germany  
 2003 – 2008 Senior spinesurgeon Alphaklinik Department Spine surgery (Dr. Hoogland), Munich Germany  
 2008 Founder of the international Spine Center – apex spine , Munich Germany  
 2019 In 2019 his own endoscopic “all in one” spine system - Ceptovation®- was inaugurated and already sold world wide.

### Sciences

Since 1989 More than 14.000 spine surgery's  
 Since 1989 Around 10.000 endoscopic spine procedures  
 Since 1989 More than 300 oral presentations in the field of spine  
 Since 1989 Multiple publications and book chapters  
 Since 2003 International instructor and visiting professor  
 Since 2003 More than 400 trained spine surgeons  
 Since 1990 Member of multiple Spine organizations (NASS, ISASS, ISMISS; IITS; DWG, etc.)



## **SURFACE MATTERS: NANOTECHNOLOGY IN ORTHOPAEDICS AND SPINE**

**Muhammad Tariq Sohail**

Professor of Orthopaedics & Spine Surgery, Doctors Hospital & Medical Centre, Lahore – Pakistan

Implant surface geometry is important for biological response from surrounding tissue smooth surface to rough to nano-surface have variable response – from cellular and protein adsorption and bony integration, as one changes surface from macro to micro to nano. For stability at bone implant or bone on bone (fracture or graft healing). The surface is important consideration which is modified through osteo-immune cells – macrophages M1&M2 which help in bio-debridement then restore the bone biology and continuity. Nanotechnology in orthopedics is hot and emerging topic for research and development. Implants as Total Hip Replacement /Total Knee Replacement etc. are now increasingly by coated with nanomaterial as Titanium (Ti) and Hydroxyapatite (HA) which result in better bondage, integration with host bone thus increasing stability and longevity of implant, thus reducing long term complications of loosening etc. etc. Infections in orthopedics/spine surgery is sometime difficult to treat-nano loading of cells with antibiotics helps in delivery which is further helped by increased surface area through nano-engineering. Some phenomena help in oncological management at cellular level. Fracture management / healing is helped apart from input from immune response in which macrophage activity expose nano-surface at fracture site thus initiating a biological response which fill up the gap – by cellular and protein adsorption and expression of osteoblastic activity. Same nano-surface treatment in spinal cage (Polyether-ether-ketone cage) and spacer induce and bio-cellular activity which results in cellular attachment expression of various growth factors and provision robust-bond at bone implant interface thus eliminates any motion. In areas of bone/cartilage deficiency 3-D printed implants are now being developed utilizing various bio-inks and proteins helping in taking care of bone and cartilage defects and in trauma, infective bone loss, ortho-oncology and other situations by providing viable, implantable scaffolds which biologically active nano-surface. In summary nano technology is exciting new field in orthopedic and spine offering durable bioactive solutions which hitherto has been difficult to tackle.

### **Education and Professional Work**

Born in Lahore, on 3rd Nov 1951. Studied medicine from World famous King Edward Medical College, Lahore & qualified MBBS in 1975. After serving two years compulsory service in Army & house Job in Mayo Hospital, proceeded to UK for higher surgical training in 1979. Obtained fellowships from Royal College of Surgeons of Edinburgh & Glasgow in 1982 & Master of Surgery in Orthopedics in 1984. Further trained in Orthopedics & Spine Surgery in UK & in Germany under the tutelage of Late Prof. Klaus Zielke. Returned to Pakistan in 1986 & after various assignments rose to level of Professor in 1996 & served as Professor of Orthopedic Surgery in Post Graduate Medical Institute & Services Institute of Medical Sciences, Services Hospital, Lahore. After serving as a Professor of Orthopedics Surgery in Department of Orthopedic & Spine Surgery, King Edward Medical University & Mayo Hospital Lahore, retired on November 3rd 2011 and presently heading a Spine & Orthopedic surgery unit in private setup. Prof. Muhammad Tariq Sohail is specialized in Spine, Trauma & Joint Replacement Surgery. I am also known internationally for my innovative Spine work & Surgery for Hemophilic Patients. I am keen mind & had significant research in field of Spine Surgery & Bone Substitutes. I have attended both basic and advanced AO courses in trauma and Spine Surgery. And I am active member of AOSpine and I have to privileged to be editorial of the Global Spine Journal, Asian Spine Journal and I am reviewer for ISASS Journal. I am also on the editorial board of Journal of Orthopedic and Spine Trauma (from Iran). I have more than 100 publications to my credit & holds eight patents for Bone Substitutes, Spinal Fusion Cages & Vertebral body replacement devices. I have also contributed internationally in various books & Journals and have published more than 50 chapters in various reference books (from India, Italy, Venezuela, Argentina, Brazil & Pakistan) which are also translated in Persian and Spanish languages. I have been on the faculties of various Spine institutions and Associations, in Japan, Indonesia, Switzerland, China and other far eastern countries. I am regularly invited as guest speaker to various countries and have the privilege to be visiting lecturer in Oxford University in 2004. I am also co-authored /edited “The Spine Principles & Practice”, “Mayo Manual of Fracture Management” and orthopedic management of patients with hemophilia in developing countries. These contributions has brought laurels to the country & earned a lot of respect for Pakistan & its Medical Community. Professor Muhammad Tariq Sohail is also very active in Philanthropic and Charitable work in helping few NGO’s in various ways from providing medical assistance and help to fund raising. I am facilitated provision of modern & fully equipped 3 Orthopedics Operation Theatre in Services Hospital through donation & charities. These theatres are fully Functional & providing efficient service to the poor & needy in public sector. I was honored recently in UK, as one of 100 people of Pakistani origin who has, through their contribution has influenced and brought positive change in the respective field both in Pakistan and around the world. I am keenly interested in various sports & am active flyer (Private Pilot).



## Surgical technique for cervical pedicle screw insertion using O-Arm navigation plus mini screws

**Nobuyuki Shimokawa\*, Hidetoshi Sato, Takafumi Inoue**

\* Department of Neurosurgery, Tsukazaki Hospital, Hyogo, Japan

### Introduction

Posterior cervical fixation using cervical pedicle screw (CPS) is getting available for various disorders such as trauma and degenerative disease and so on. The purpose is to report our CPS insertion technique using O-Arm plus mini screws for the confirmation of accuracy of full-time navigation system particularly.

### Materials and Methods

Since 2002 more than two hundreds patients underwent posterior cervical fixation using CPS. After-that consecutive ninety-six patients (62 male 34 female: mean age 70.7y.o.25-93y.o.) underwent posterior cervical fixation using CPSs including upper thoracic spine using O-arm plus mini screw technique since January 2016. Pathology consisted of 62 cases of degenerative disease including OPLL, 31 cases of spinal injury and 3 cases of congenital anomaly. We made use of full time O-arm navigation system. We used a T-shaped reference frame to pinch the 2-3 spinous processes to firmly fix the frame and to prevent rotatory movement of the cervical spine in between. We put several mini screws in the operative field, after-that intraoperative CT was obtained with O-arm. We could confirm that there was no discrepancy between the actual point of the surgical field and same point on the navigation monitor intraoperatively. We firmly could insert CPSs with sufficient confidence of the accuracy of the navigation system. If there was a little discrepancy between the two, we made a fine adjustment or use C-arm together.

### Results

We inserted 682 CPSs and classified their accuracy with Neo's classification using postoperative CT scan, grade 0(678screws,99.4%), grade 1(4 screws,0.6%), grade2 and grade 3 (0 screw,0%). Four screws that had deviated from the pedicle with grade 1 were those placed at T1 level. The reason of this malposition is that the resolution of CT and C-arm worsens at the cervicothoracic junction rather than other cervical spine level. No neurovascular complications associated with surgery were encountered.

### Conclusions

Even if using a state-of-the-art navigation system, the accuracy of the navigation system cannot be complete due to various factors overlapping. The procedure using our mini screw is one of useful method to cover it.

## Education and Professional Work

### Academic Interests

- 2016-2021 Member of WFNS Spine committee
- 2016-at present Member of The Section on Disorders of the Spine and Peripheral Nerves (DSPN)
- 2016-at present Member of American Association of Neurological Surgeons (AANS)
- 2015-at present Member of Cervical Spine Research Society Asia Pacific Section (CSRS-AP) & CSRS-Japan
- 2015- at present Delegate of AO spine Japan
- 2015-at present Member of Board Trustee of the Neurospinal Society of Japan (NSJ)
- 2014 -at present Member of Congress of Neurosurgical Surgeons (CNS)
- 2013-2015 Inspector of Japanese Society of Spinal Surgery
- 2012-at present Review Board of Neurologia medico-chirurgica (official journal of the Japan Neurosurgical Society)
- 2012 at present Editorial Board of the Japan Society of Neurotraumatology
- 2012-at present Editorial Board of the Japan Society of Neurosurgical Emergency
- 2012 –at present Editorial Board of the Japan Medical Society of Spinal Cord Lesion
- 2010-at present Member of Board Trustee of the Japan Society for the Study of Surgical Technique for Spine and Spinal Nerves
- 2010 Board certification as Senior Member (Instructor) and Review Board SPINAL SURGERY (official journal of Japanese Society of Spinal Surgery) by Japanese Society of Spinal Surgery
- 2008 Board certification as Technical Specialist by the Japanese Society of Neuroendoscopy
- 2006 Board certification as Spinal Surgeon by the Japanese Society of Spinal Surgery
- 2005 Stroke Specialist certified by the Japan Stroke Society
- 1997 Board certification as Neurosurgeon by Japan Neurosurgical Society





## Instrument Design Based on Body Ergonomics in Endoscopic Spine Surgery "Do we need to re-think our tools?"

**Rafael Cruz Bundoc**

Univ. of the Philippines-Philippine General Hospital, Philippines

Numerous studies present a high prevalence of musculoskeletal disorders among surgeons who shift from open to endoscopic procedures in all surgical specialties. In spine surgery, it is a common consensus that it required a great deal of a surgeon's mental and physical capabilities to relearn MIS procedures. Latter commonly leads to physical fatigue and a good deal of musculoskeletal disorders. It is obvious that these physical conditions affect the precision of actions at task and that the preservation of a surgeons' technical skill is highly important for patient safety.

One wonders why the basic design of the instruments we commonly used for open spine surgery has not been significantly modified to conform to the of spine endoscopes we now utilize. An extensive search on Google Patents Advanced Search and a meticulous browse over all catalogues of spine endoscopy industry show that there is a wide room for us surgeons to suggest modifications based on how best we can handle our tools to perform spinal decompressions

This lecture will provide an objective rationale why our basic tools for decompression need to be modified based on muscle forces and body ergonomics utilizing quantifying measurement equipment. It will also present surgeons' subjective evaluation of the tool they use based on standardized questionnaires. It is our belief that modifying our equipment might be a viable solution as well in decreasing eye to body/hand coordination that can reduce the steep learning curve associated with endoscopic spine surgery.

### Education and Professional Work

Fellow, Philippine Orthopedic Association  
Diplomate, Philippine Board of Orthopedics  
Fellow Philippine College of Surgeons  
Professor Department of Anatomy College of Medicine University of the Philippines  
Consultant, Spine Service  
Dept. of Orthopedics, Univ. of the Philippines-Philippine General Hospital  
Head, Integrated Biomechanical Laboratory, Orthopedic Learning Center  
Visiting Physician, Manila Doctors' Hospital  
Member, Minimally Invasive Spine Surgery Study Group  
Local and foreign resource speaker on Spinal deformity, Minimally invasive spine surgeries and Biomechanics  
Class 1986, Univ. of the Philippines, College of Medicine  
Residency, Department of Orthopedics, UP-PGH  
Fellowship in Spine Surgery, Prince of Wales Hospital, Chinese University of HongKong, 1991  
Diploma in Biomechanics, Strachlyde University, Glasgow, Scotland, 1997  
Trueta Fellow, Cervical Spine Surgery, Nuffield Orthopaedic Centre, Oxford University, United Kingdom, 1998

#### Major Awards:

Philippine Talent Search for Young Scientist, Gold Award, given by the National Academy of Science and Technology, 1995  
TOYM (The Outstanding Young Men) Award in the Field of Medicine, 1997  
Joseph Trueta Fellowship Awards, given by the Nuffield Orthopaedic Center, Oxford University, United Kingdom, 1998  
Honorary Fellow of the Girdlestone Society, given by the Nuffield Orthopaedic Center, 1999  
TOYS (The Outstanding Young Scientist) Award given by National Academy of Science and Technology, 2000  
Outstanding Philippine Doctors Award given by the Philippine Jaycees in cooperation with Department of Health, World Health Organization and Philippine Medical Association, 2004  
Metrobank Outstanding Teacher for 2005 given by the Metrobank Foundation  
Eisenhower Fellow 2008 given by the Eisenhower Fellowship Foundation

**Areas of Expertise:** Cervical Spine Surgery  
Scoliosis and Spine Deformity Surgery  
Minimally Invasive Spine Surgery  
Design/ Innovation of Instruments  
Biomechanical Testing  
Anatomical Studies  
Prosthetic/Orthotic design  
3D Printing surgical applications



## Full-endoscopic KLIF for lumbar spondylolisthesis and local scoliosis

**Seiji Yamaya**

Center of Endoscopic Spine Surgery, Department of Orthopaedic Surgery, Sendai Nishitaga Hospital

### Background

Full-endoscopic trans-Kambin lumbar interbody fusion (KLIF) was reported in Japan in 2018. It consists of surgical procedures with posterior percutaneous pedicle screw fixation and full-endoscopic anterior interbody fusion using a tran-Kambin approach. It developed for treating degenerative lumbar spondylolisthesis. KLIF can perform indirect decompression like XLIF or OLIF. XLIF or OLIF had some reports about serious complications such as intestinal and major vascular injuries. Such complications are less likely to occur in KLIF due to difference approach. However, KLIF needs the peculiar attention to avoid exiting nerve root injury (ENRI) because the surgical technique based on transforaminal full-endoscopic spine surgery (TESS). I started to perform KLIF in 2018. I extended KLIF indications to lumbar spondylolisthesis with degeneration local scoliosis.

### Objectives

There were few reports about KLIF. We studied the clinical outcomes, complications and intervertebral fusion rates of initial 43 patients more than one year after KLIF.

### Methods

43 cases were performed KLIF by the same surgeon from November 2018 to 2022. The clinical outcomes (JOA score, JOABPEQ, Visual analog scale of low back pain and lower extremity pain) and complications were prospectively evaluated at 1, 3, 6 and 12 months postoperatively. The degree of slippage (% slip) was measured on an X-ray before and one year after surgery. The intervertebral fusion rate was evaluated using CT one year after surgery. 11 cases performed KLIF had degenerative lumbar spondylolisthesis with local degenerative scoliosis. The subsidence rates were compared concave and convex of insertion cage for local scoliosis cases.

### Results

All of clinical outcomes improved significantly from as early as 1 month postoperatively compared to preoperatively. There were no serious complications. A transient symptom of exiting nerve root occurred in one case, which improved after one month. The degree of slippage (% slip) improved significantly from 22% before surgery to 8% after surgery, and the interbody bone fusion rate was 93% at one year postoperatively. Three patients underwent reoperation due to nonunion or subduction of the cage. The five cases with insertion of cage on the concave side had no subsidence, whereas the two out of six cases with insertion of cage on the convex side had subsidence.

### Conclusions

KLIF was an excellent minimally invasive procedure with good clinical results, reduction, high interbody fusion rate (93%) and no serious complications. The insertion of cage on the concave side is more reliable than on the convex side to reduce local scoliosis.

## Education and Professional Work

**Education:** 2003, MD degree, Jichi Medical University.

2014, PhD degree, Department of Orthopaedic Surgery, Tohoku University.

**Board certification in Japan:** 2003 National Board of Medical Doctor. 2011 Approved Orthopaedic Surgeon by Japanese Orthopaedic Association

2015 Board-certified spine surgeon (approved by the board of the Japanese Society for the Spine Surgery and Related Research)

2016 Board-certified endoscopic spine surgeon MED (approved by Japanese Orthopaedic Association)

2021 Board-certified endoscopic spine surgeon FESS (approved by Japanese Orthopaedic Association)

### Professional and academic employment history

2003 Iwate Prefectural Cyuou Hospital

2010 Department of Orthopaedic Surgery, Tohoku University

2015 Clinical Spine Fellow (MED) of JSSR

Department of Orthopaedic Surgery, Wakayama Medical University

2017 Clinical Spine Fellow (FESS) of JSSR

Department of Orthopaedic Surgery, Tokushima University

2017 an assistant professor, Tohoku University

2018 Director of the Center of Endoscopic Spine Surgery, Orthopaedic Surgery, Sendai Nishitaga Hospital





**Myogelosis: Static electricity plays a leading role in the production of pain regarded as non-specific.**

**Shoichi Kokubun**

Professor Emeritus, Tohoku University, Sendai, Japan

Most musculoskeletal pain is protean in its presentation and is regarded as non-specific. The following truths have been discovered through clinical research at outpatient departments. Muscles in high tonicity at rest, i.e., myogelosis are felt hard in palpation and sensitize their inherent skin areas in addition to themselves. The human body has the muscle tone regulation system composed of the muscle-to-muscle reflex and the skin-to-muscle reflex. Static electricity works at the interface between the skin and a contacting substance and elicits inputs in the skin-to-muscle reflex as.. Polyester, linen, silicon and polyethylene, for example, are excitatory substances making muscles hard and acrylic fiber, acrylic resin, polyurethane, for example, are inhibitory substances making muscles soft. Cotton, wool, silk and nylon, for example, are neutral substances which do not activate the reflex. The leading role at the skin-substance interface is static electricity. Avoidance of excitatory substances over the skin and removal of static electricity by earthing should be fundamental self-treatments.

## Education and Professional Work

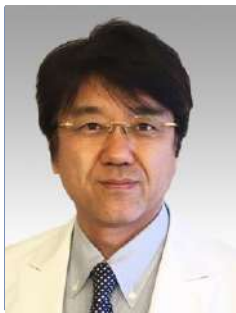
Dr. Kokubun is Director of the Research Center for Spine and Spinal Cord Disorders at the NHO Sendai Nishitaga Hospital in Sendai. He stayed at the University of Hong Kong in 1974 and at the University of Oxford in 1992. He was Professor and Chairman of the Department of Orthopaedic Surgery, Tohoku University School of Medicine in Sendai from 1995 to 2006.

His major research and clinical activities before retirement from the Tohoku University were neurology and surgery for cervical myelopathy and spine shortening osteotomy. He first in the world proposed neurological indices for level diagnostic of cervical myelopathy in 1984 and the cartilaginous endplate type of cervical disc herniation in 1996. He first in Japan excised a hemivertebra in 1977 and in the world shortened the spine for a tethered cord due to lipomyelomeningocele in 1995. On the other hand, for the last 16 years after the retirement, he has been concentrating on discovering secrets of pain from muscles as nonspecific pain.

Internationally, the 2nd Triennial Congress of the International Federation of Paediatric Orthopaedic Societies (IFPOS) was a great success under his presidency in Sendai in 2001. He was National Delegate to SICOT (1999-2005), Chief National Delegate to the Asia-Pacific Orthopaedic Association (APOA) (2001-2006), Chairman of the Spine Section, APOA (2005-2008) and President of APOA (2021-2022).

At home, as Congress President, he held the Annual Congress of the Japanese Orthopaedic Association in 2004 and the Annual Meeting of the Japanese Spine Research Society in 2005. In addition, he was President in charge of management of the Japanese Pediatric Orthopaedic Association from 2003 to 2009 and President of Japan Orthopaedics and Traumatology Research Foundation, Inc., Tokyo, Japan from 2007 to 2017.

Therefore, he was given the Award for the Development of the Japanese Orthopaedic Association in 2018. He has been making every effort to improve spinal surgery, in many Asian countries by visiting there for lectures and demonstration of surgeries or by accepting over 250 fellows to his university department and research center for their training. Because of his achievements, he has been granted an SC Fong Visiting Professorship of the University of Hong Kong in 1996, an honorary professorship of the Jilin University in Changchun, China in 1966, a Ho-Chi-Minh Medal of Ho-Chi-Minh City, Vietnam in 1999, an honorary membership of the Royal College of Orthopaedic Surgeons of Thailand in 2004, a VK Pillay Lectureship of the University of Singapore in 2006, and an AR Hodgson Memorial Lectureship of the University of Hong Kong in 2011.



## Bone wax technique for full-endoscopic lumbar laminotomy

**Tatsushi Inoue**

Fujita Health University Hospital, Japan

Hemostatic procedures in endoscopic spine surgery have not yet been established, especially in full-endoscopic spine surgery (FESS) performed under continuous irrigation, which has been a concern for surgeons. Chu et al. had previously reported a technique to convey bone wax during full-endoscopic cervical spine surgery via intracorporeal route by using ball tip of the drill in 2018. However, to the best of our knowledge, there has been no report by surgeons to adopt bone wax as a hemostatic material in full-endoscopic lumbar surgery to date, probably because of difficulty in handling bone wax under continuous irrigation and through a narrow and long working channel in endoscope. We have renewed the bone wax technique for hemostasis in FESS, improving its handling by introducing a nozzle applicator, without which the bone wax would stick to the working channel of the endoscope on the way to the bleeding target. This would result in significant loss of bone wax and repeated bone-wax contact would cause dirt build-up on the endoscope lens, which would then be pushed out from the wall of the working channel, thereby disturbing the laminectomy procedure and obfuscating the visual field. Technical details have been demonstrated in the attached (Inoue, T: Journal of Spine Surgery, 2022)

Key Words: bone wax; full-endoscopic spine surgery; hemostasis

## Education and Professional Work

### PRESENT APPOINTMENT:

Associate Professor  
Department of Neurosurgery and Department of Spine and Spinal Cord Surgery Fujita Health University

### EDUCATION:

Hiroshima University, School of Medicine Hiroshima  
1984-1990: M.D.  
Hiroshima University, Graduate School of Medicine (Neurosurgery) Hiroshima  
1993-1998: Ph.D. in Medicine  
Research fellow 1994-1995  
Department of Integrative Brain Science, Graduate School of Medicine, Kyoto University  
Clinical fellow 2001  
Carolina Neuroscience Institute NC, US

### ACADEMIC APPOINTMENTS:

1991-1992 Staff Neurosurgeon  
Department of Neurosurgery Kita-kyusyu General Hospital Kokura, Japan  
1998-2001 Assistant Professor Department of Neurosurgery Hiroshima University Hiroshima, Japan  
2002-2006 Assistant Professor  
Department of Neurological Surgery Aichi Medical University Aichi, Japan  
2007-2017 Assistant Professor  
Department of Neurological Surgery Fujita Health University Aichi, Japan  
2018-present Associate Professor  
Department of Neurosurgery and Department of Spine and Spinal Cord Surgery Fujita Health University Aichi, Japan

### MEMBERS IN PROFESSIONAL SOCIETIES:

Japan Neurosurgical Society  
Japan Congress of Neurological Surgeons  
The Japanese Society of Spine Surgery  
The Japanese Society of Skull Base Surgery  
Japanese Congress on Surgery for Cerebral Stroke  
The Japanese Society for Pediatric Neurosurgery  
Congress of Neurological Surgeons (US)  
American Association of Neurological Surgeons  
American Association of Neurological Surgeons Spine Section

### MAIN RESEARCH INTEREST:

Minimally Invasive Spinal Surgery  
Skull Base Surgery



## Decision Making of The Treatment of Spinal Stenosis in Elder: UBE versus Transforaminal Decompression or Combined Procedures

**Tolgay Satana**

Avrupa Safak Hospital Istanbul and International Hospital, Turkey

Unilateral biportal endoscopic (UBE) interventions are an effective procedure with a rapid learning curve than Transforaminal surgery in this subject, which can be easily performed by orthopedic surgeons who are especially skilled in arthroscopic surgery. UBE 30-degree arthroscopy allows us to use conventional Radiofrequency probes, strong motorized shaver and wide mouth aggressive hand tools as well as wide video quality. We expected that the using of expensive microscopes in interlaminar surgery will decrease in very near future. Although effective treatment of foraminal stenosis in UBE provides 360-degree vision, the effectiveness in intra-foraminal canal pathologies is not effective as well as Transforaminal Foraminoplasty. In this respect, despite foraminal problems, Transforaminal endoscopic foraminoplasty is an effective and superior method than UBE. We strongly recommend that severe spinal stenosis with foramina stenosis problems should be combined foraminoscopy instead of single UBE inter laminar decompression.

### Education and Professional Work

Graduated University of Ankara Faculty of Medicine 1991  
 Orthopedic Surgery Training completed in University of Gazi Ankara 1997  
 Military Service and war surgery experience 1 year 1998  
 Spinal Fellowship in University of Michigan 1999-2000  
 Specialised on Deformity spine surgery since 2000 and interested beside Arthroscopic surgery  
 Private practicing since 2003 well known spine surgeon and arthroscopist in Turkey  
 Executive Member of IMLAS since 2000  
 Secretary of IMLAS Istanbul 2005  
 Guest Editor in Turkish Journal of Joint Surgery  
 Active member of Bone and Joint Turkey Osteoporosis and Osteoarthritis congress responsible of Spine section for 9 years.  
 Member of Turkish Spine Society  
 Member of Turkish Orthopedic society  
 Board member of ISMISS and national representative of Turkey since 2005  
 Chairman of Turkish Chapter of ISLASS  
 WALA board member  
 Founder and President of Turkish MISS  
 Founder and Coordinator of ISMISS Turkey 2003-14  
 President of World Federation miss Congress in Istanbul and board member  
 Board member MissSummit since 2009  
 Tolgay Satana is doing private Practice in Istanbul  
 He has numerous lectures' articles, editor of books about MISS.



## Percutaneous endoscopic transforaminal lumbar interbody fusion: a novel technique- sentinel pinning with lateral retractor for protection of exiting root

**Yi-Hung Huang**

Chia Yi Christian Hospital

**Introduction.** The endoscopic spine surgery(ESS) is rapidly developed in recent three decades and ESS combined with TLIF(endo-TLIF) is the new trend due to the least traumatization. The safe zone of foramen (Kambin triangle) is so limited, therefore implanting a cage into disc space away from the exiting root or dura injury is a major challenge. We developed a novel technique “sentinel pinning with a retractor” to protect the exiting root as application of tunnel protector and to implant a traditional non-expandable cage per segment. The complete procedures were well described and effectiveness was surveyed.

**Methods.** We inserted contralateral percutaneous pedicle screws firstly, and also aspirated bone marrow from vertebral body through a Jamshidi needle for mixing with synthetic crystal bone substitute. Then we inserted the guide-pin to the SAP, performed foraminoplasty, discectomy and endplate preparing and inserted the sentinel pin docking at inferolateral border of the cranial vertebral body under the monitor of endoscope and fluoroscope. We performed interbody bone grafting with autogenous bone chips and the synthetic bone substitute mixing with bone marrow and implanted a fixed size cage through the safe quadrangular space created by sentinel pin and lateral retractor. We secured the screws and rods finally. We performed indirect decompression or left lateral recess decompression if the disc height could be restored over 11mm and adequate reduction of spondylolisthesis. The others including all Schzas D stenosis should be direct decompressed by ESS interlaminar ULBD.

**Results.** To Dec 2021, a total of 89 patients and 119 levels (mean age 63.4 y/o) were evaluated. The overall mean VAS score for back pain improved statically significantly, and mean ODI scores from 50.9 to 3.6 ( $P < 0.01$ ) postoperatively was significantly improved with a mean follow-up of 15 months There was no postoperative permanent exiting root injury, iatrogenic durotomy. Only one case suffered from cage dislodge and needed revision surgery.

Postoperative scores for endo-TLIF by this novel technique significantly improved and no disabled complications. The procedure could be considered as a safe and effective TLIF.

## Education and Professional Work

### Education:

MD: Private Chung Shan Medical University, 1994

MS: Institute of Manufacturing Engineering, national Cheng Kung University  
NCKU, 2009

### Visiting Clinical Fellow:

Dept. of Orthopaedic Surgery, Showa University, Tokyo, Japan, 2006

Center for Orthopeidcs and Traumatology of the St Elisabeth Group

Herner/Dusseldorf Germany 2014

Lugwig Maximilan University, Isar Klinikum Munich Germany 2015

### Medical Association member:

1. Taiwan society of endoscopic spine surgery (TSESS): founding president
2. PASMIS: board member
3. Faulty member of Society for Minimally Invasive Spine Surgery(SMISS)
4. Taiwan Mini-invasive Spine Surgery Association: board member



## Strategies against the posterior bowel deviation in lateral lumbar interbody fusion and Current ELLIF Techniques

**Yoshinori Kyoh**

Director of Kyoh Orthopaedics & Neurosurgery Clinic

**Introduction:** We have performed LLIF on 466 cases (766 intervertebral segments) with mostly favorable results. However, we have experienced two intestinal complications. The purpose of this presentation is to review the characteristics of these complication cases and to provide surgical treatment strategies for the future.

**Method:** 161 cases 233 segments (male 69cases, female 92 cases, 64.8y.o) were performed ELLIF(Endoscopic Lateral Lumbar Interbody Fusion). 305 cases 533 segments (male 129cases, female 176 cases, 69.9y.o) were performed OLIF. Among them, we examined BMI, preoperative CT characteristics, sex and affected intervertebral levels in patients with intestinal-related complications.

**Results:** One case of ileus after ELLIF showed retroperitoneal and intestinal impingement between the cage and endplate and required surgical release.

Another one case who presented with infection after ELLIF was diagnosed as having no intestinal injury at either radiology or surgery. However the organism of origin was an intestinal bacterium. The patient improved with conservative treatment. In addition, in one case of OLIF, the retroperitoneal impingement was detected intraoperatively between the cage and endplate, and the retroperitoneum was dissected intraoperatively.

In all three cases, preoperative CT showed a posterior deviation of the intestinal tract and all of the three occurred at L4/5 level. Besides, all three of them were female. Their BMI are 13.7, 20.4, 18.2.

**Summary:** Advancement in our understanding of basic intestinal tract location in retroperitoneal space improves surgical strategies for lateral lumbar interbody fusion. Thus,

1. Caution should be exercised with thin women. Asians are particularly alert, because of low BMI patients is more compared to those Europeans and American.

2. The location of the intestinal tract on preoperative CT must be carefully evaluated. Particular attention should be paid to L4/5.

In those cases, it is essential to pay close attention to the intestinal tract if lateral surgery is chosen, or it is safer to choose posterior surgery.

**Current ELLIF Techniques:** In the presentation, I will show the movie of ELLIF procedure via retroperitoneal space in prone position.

## Education and Professional Work

### EDUCATION/POST GRADUATE TRAINING

University: 1988-1994 Mie University, Faculty of Medicine

Residency: 1995-1997 Department of Orthopaedic Surgery, Osaka Rosai Hospital

### MEDICAL LICENSURE

Full Medical License (Japan) No.5810

### BOARD CERTIFICATION

The Japanese Orthopaedic Association

The Japanese Society for Spine Surgery and Related Research

### AWARD

Best Oral Presentation Award -3rd Place-

The 7th ACMISST & 18th KOMISS, 24-25 May, 2019, Seoul, Korea

### INTERNATIONAL FACULTY & INVITED LECTURE

The 5th Asia Pacific Cervical Spine Society Meeting, Bari, Indonesia, 23-26 November, 2011

The 2016 Midyear Course of the Minimally Invasive Spine Surgery and Techniques (MISST), Goa, India, 17-19 June, 2016

The Leon Wiltse Spine Symposium, Suwon, Korea, 14 July, 2018

The 2nd ISESS & The 2nd ISMISS Asia-Japan & The 11th MISS Summit Forum, Aichi, Japan, 31 August & 1 September, 2018

The 12th MISS Summit Forum, Aichi, Japan, 23-24 August, 2019

The 3rd ISMISS Asia-Japan & The 13th MISS Summit Forum, Aichi, Japan, 26-27 March, 2021

The 4th ISMISS Asia-Japan & The 14th MISS Summit Forum, Aichi, Japan, 25 March - 24 April, 2022





## Condoliase chemonucleolysis for lumbar disk herniation: Optimal indication and long term follow-up

**Yukihiro Matsuyama**

Department of Orthopaedic Surgery, Hamamatsu University School of Medicine, Hamamatsu, Shizuoka, Japan

Chemonucleolysis with chymopapain was widely used as a minimally invasive treatment for LDH before condoliase, but chymopapain was withdrawn from the market in many Western countries during the 1990s. Condoliase (chondroitin sulfate ABC endolyase) is an enzyme preparation used to degrade glycosaminoglycans in the nucleus pulposus of the intervertebral disc. In clinical trials, chemonucleolysis with condoliase was shown to be efficacious without causing clinically significant harm.

Although chemonucleolysis with condoliase is available in Japan and is considered to be a promising minimally invasive treatment for LDH, its long-term outcome has not been reported and its long-term clinical significance is still unknown. Therefore, to evaluate the surgical intervention rate and the outcomes more than a year of after condoliase therapy,

## Education and Professional Work

### EDUCATION

- 1987 Graduate from Hiroshima Univ. School of medicine
- 1991 Staff at Nagoya University, School of Medicine
- 1995 Fellow at Minnesota Spine Center in America
- 1996 Assistant professor at Nagoya University, School of Medicine Chief of spine service
- 2006 Associate professor at Nagoya University, School of Medicine
- 2009 Professor and Chairman Hamamatsu University School of Medicine
- 2014 Vice-Director for Risk Management Hamamatsu University Hospital
- 2016 Director of Hamamatsu University Hospital
- 2019 M.B. Lee visiting professor of Hong kong National University

### SOCIETIES

- 1: Member, Board of Directors of Japanese Orthopaedic Association (JOA) 1989  
Committee Member for Orthopaedic Board Examination, JOA, 2007-2009,
- 2: Past president of the Japanese Society for Spine Surgery and Related Research Society

### International member

- 1: Active Fellow and Member of SRS 2009
- 2: Member of CSRS 2010
- 3: Associate member of the AO Spine KnowledgeForum Deformity2016
- 4: Scoliosis-RISK-1 study team 2017
- 5: PEEDS study team 2017

### Award

- Scoliosis Research Society Russell S.hibbs Clinical Award 2013
- Scoliosis Research Society Whitecloud Award for Best Clinical Paper 2015
- Associate member of the AO Spine Knowledge Forum Deformity 2016
- Stealing member of the AO Spine Knowledge Forum Deformity 2019
- Scoliosis-RISK-1 study team 2017
- PEEDS study team 2017
- Scoliosis Research Society Russell A.Hibbs Best Clinical Research Paper Award 2021





## Full endoscopic management of thoracic spine pathologies

**Hyeun Sung Kim**

Gangnam Nanoori Hospital

Although thoracic spine pathologies do not occur commonly, surgical access is difficult and the risk of neurological damage is high, so it has not been easily accessible surgically. However, the development of spinal endoscopic surgery provides an easier approach to various degenerative diseases of the thoracic spine, and today I would like to talk about this.

## Education and Professional Work

### Position

An Editor-in Chief of JMISST  
 A Past President of KOSESS (Korean Research Society of Endoscopic Spine Surgery) (2020~2021)  
 A Director of Private Sector of Korean Spinal Neurosurgery Society (2022~)  
 A Director of Korean Neurosurgical Society (2022~)  
 A Faculty of KOMISS (Korean Minimally Invasive Spine Surgery Society) (2012~)  
 A Co-Founder of NASESS (NAVI Symposium of Endoscopic Spinal Surgery) (2016~)  
 A Faculty of World Spinal Column Society (2016~)  
 A Program Chairman of 2019 7th ACMISST (2019~)  
 A Chairman of the Nanoori Hospital Group Scientific Team (2016~)  
 A Deputy Editor of the Journal of Minimally Invasive Spine Surgery and Technique (JMISST) (2019~)  
 A Section Editor of the World Neurosurgery (2020~) / neurospine journal (2019~)  
 A Section Editor of the International Journal of Spine Surgery (2020~)  
 A Lead Guest Editor of Biomed Research International Special Issue (2018~)  
 Associate Editor of BMC Musculoskeletal Disorders  
 Academic Editor of Medicine  
 A Guest Editor of Brain Sciences  
 2018 Parviz Kambin Award Winner (2018)  
 Chair of 2019 NASS/Neurospine Endoscopic Spinal Surgery (ESS) Symposium and Cadaver Workshop

### Memberships & Professional Societies (More than 20 Society)

Korean Neurosurgical Society / Korean Neurosurgical Spine Society / KOMISS / KOSESS / Eurospine / NASS / ISASS / AANS / WCMISST / ACMISST / KASS / AO Spine / World Spinal Column Society / Others

### Major Career

2018 Parviz Kambin Award (Best Award of the Endoscopic Spine Surgery)  
 2019 NASS annual meeting: Endoscopic Spine Surgery Workshop and Symposium Director  
 2021 KOSESS (Korean Research Society of Endoscopic Spine Surgery) President  
 2022 An Editor-in-Chief of JMISST  
 Editor: World Neurosurgery / Neurospine / IJSS / BMC Musculoskeletal Disorders / Medicine



## The Challenge of Endoscopic Lumbar Interbody Fusion for Adult Spinal Deformity. Incomplete Surgery or Not

**Hyeun Sung Kim**

Gangnam Nanoori Hospital

Endoscopic spine surgery has made a lot of progress, and now even lumbar interbody fusion is being stably performed. However, with the increase in the elderly population, the number of Adult Spinal Deformity patients to be treated is also rapidly increasing, and efforts are being made steadily to solve this problem. Recently, the development of endoscopic spine surgery has provided a clue to solve adult spinal deformity, and today I would like to talk about its consideration and future development direction.

### Education and Professional Work

#### Position

An Editor-in Chief of JMISST  
 A Past President of KOSESS (Korean Research Society of Endoscopic Spine Surgery) (2020~2021)  
 A Director of Private Sector of Korean Spinal Neurosurgery Society (2022~)  
 A Director of Korean Neurosurgical Society (2022~)  
 A Faculty of KOMISS (Korean Minimally Invasive Spine Surgery Society) (2012~)  
 A Co-Founder of NASESS (NAVI Symposium of Endoscopic Spinal Surgery) (2016~)  
 A Faculty of World Spinal Column Society (2016~)  
 A Program Chairman of 2019 7th ACMISST (2019~)  
 A Chairman of the Nanoori Hospital Group Scientific Team (2016~)  
 A Deputy Editor of the Journal of Minimally Invasive Spine Surgery and Technique (JMISST) (2019~)  
 A Section Editor of the World Neurosurgery (2020~) / neurospine journal (2019~)  
 A Section Editor of the International Journal of Spine Surgery (2020~)  
 A Lead Guest Editor of Biomed Research International Special Issue (2018~)  
 Associate Editor of BMC Musculoskeletal Disorders  
 Academic Editor of Medicine  
 A Guest Editor of Brain Sciences  
 2018 Parviz Kambin Award Winner (2018)

Chair of 2019 NASS/Neurospine Endoscopic Spinal Surgery (ESS) Symposium and Cadaver Workshop

#### Memberships & Professional Societies (More than 20 Society)

Korean Neurosurgical Society / Korean Neurosurgical Spine Society / KOMISS / KOSESS / Eurospine / NASS / ISASS / AANS / WCMISST / ACMISST / KASS / AO Spine / World Spinal Column Society / Others

#### Major Career

2018 Parviz Kambin Award (Best Award of the Endoscopic Spine Surgery)  
 2019 NASS annual meeting: Endoscopic Spine Surgery Workshop and Symposium Director  
 2021 KOSESS (Korean Research Society of Endoscopic Spine Surgery) President  
 2022 An Editor-in-Chief of JMISST  
 Editor: World Neurosurgery / Neurospine / IJSS / BMC Musculoskeletal Disorders / Medicine



## Developing paradigm for surgical treatment of Osteoporotic Vertebral compression fractures.

**Arvind Bhave**

Deenanath Mangeshkar Hospital, Pune, India

Osteoporotic vertebral compression fractures are commonly treated by spine surgeons. Rising geriatric population with multiple medical problems pose challenge to the treating surgeons .

There is always dilemma about which fractures need surgical fixation, cement augmentation or combined procedures, as per patients presenting clinical signs & symptoms.

In this presentation ,multiple cases have been presented with possible guidelines from out group of more than 500 cases. The suggestions of the treatment modalities have been described with example.

### Education and Professional Work

#### AWARDS RECEIVED:

\*ONE OF THE TEN OUTSTANDING YOUNG PERSONALITIES OF PUNE. [TOYP].

\*INTERNATIONAL FELLOWSHIP-GOVT.OF ISRAEL-FOR INTERNATIONAL POSTGRADUATE TRAINING COURSE IN ORTHOPAEDIC[SPINE] SURGERY at TEL-AVIV UNIVERSITY ISRAEL.1998.

\*BOMBAY ORTHOPAEDIC\_WOCHARDT FELLOWSHIP FOR 1998-99- [BOS SPINE FELLOW].

\*BEST PAPER AWARD -at the Research Society Annual Conference of the B.J. MEDICAL COLLEGE, PUNE1999.

\*SELECTED FOR WORLD ORTHOPAEDIC CONCERN FELLOWSHIP FOR 2000.

\*SELECTED FROM ASIAN SPINE SURGEONS FOR JAPANESE SPINAL FELLOWSHIP -2001.

\*BEST PAPER AWARD at RESEARCH SOCIETY –BHARATI VIDYAPEETH DEEMED UNIVERSITY. - 2000

& 2002 [TWO TIMES].



## Staged Endoscopic Approach For Elderly Scoliotic Patient

**Abdullah Merter**

Associate Professor Ankara Medicine Faculty, Ibn-i Sina Hospital Orthopaedics and Traumatology Department

There has been a significant increase in the incidence of degenerative scoliosis with the prolongation of the expected human lifespan. Intensive spondylosis, multiple foraminal stenosis and lateral recess stenosis are frequently seen due to this disease, which occurs in the spine due to the degenerating disc, joint capsule and ligamentous structures losing their functions, and due to the severe reduction of the disc distance on the concave side of scoliosis.

Treatment of spinal diseases accompanied by degenerative scoliosis is challenging due to the increase in comorbid diseases with advanced age.

In this study, the algorithmic endoscopic approach to spinal stenosis cases accompanied by degenerative scoliosis is discussed.

Accordingly, endoscopic approaches can be tried in cases where the sagittal balance is not severely impaired and radiculopathic complaints are at the forefront. Algorithmically 1) In this disease with multiple foraminal and lateral recess stenosis, first of all, the patient's main complaint is to be determined with diagnostic transforaminal epidural injections, 2) secondly, endoscopic decompression of the existing central or lateral recess stenosis, 3) thirdly, in the presence of ongoing complaints, external foraminotomy is applied to the area determined by diagnostic injection, 4) Finally, if previous attempts have been unsuccessful, single/short segment endoscopic fusion is performed without disturbing the balance.

In our study, this algorithm was applied to 51 patients with degenerative scoliosis, and no patient required a long fusion or a negative situation due to existing comorbid diseases.

## Education and Professional Work

### EDUCATION

2018-2019 Spine fellowship researcher (Minimally Invasive Endoscopic Spine Surgery), Aichi Spine Hospital, Inuyama-shi, Aichi prefecture, JAPAN

2018 Clinical fellowship, Minimally Invasive Endoscopic Spine Surgery, ParkWeonWook Spine Hospital, Busan, SOUTH KOREA

2009-2015 Research assistant, Orthopaedics and Traumatology Department, Ankara University Medicine Faculty, Ankara, TURKEY

2003-2009 Undergraduate education, Selcuk University Meram Medicine Faculty, Konya, TURKEY

### WORK EXPERIENCE

2010-2015 Research assistant, Orthopaedics and Traumatology Department, Ankara University Medicine Faculty, Ankara, TURKEY

2015-2017 (Compulsory service) Orthopedic Surgeon, Orthopaedics and Traumatology Department, Kahramanmaraş Afsin State Hospital, Kahramanmaraş/TURKEY

2017-2021 Spine Surgeon, Spine Surgery Section, Orthopaedics and Traumatology Department, Ankara University Medicine Faculty, Ankara, TURKEY

2021-... Associate Professor, Spine Surgery Section, Orthopaedics and Traumatology Department, Ankara University Medicine Faculty, Ankara, TURKEY



## Novel trans-kambin approach to up-migrated Lumbar Disc Herniations in the hidden zone of Macnab with the use of hook and Flexi graspers from below the exiting root and axilla

**Malcolm Pestonji**

Golden Park Hospital

**Purpose:** Transforaminal Percutaneous endoscopic discectomy is the least invasive surgery for herniated fragment into the hidden zone of Macnab.

**Methods:** To study transforaminal endoscopic discectomy for superiorly migrated LDH. Here, we investigated the efficacy, advantages and safety of a full-endoscopic procedure for migrated LDH in the hidden zone of Macnab. Patients with clinical conditions with isolated causative factors such as prolapsed disc in the hidden zone of Macnab were selected for surgical intervention and all other patients with contributory condition to clinical symptoms were excluded. Under fluoroscopic guidance skin markings were done and a needle was inserted followed by chromo discography and epidurography. A nonstandard floating approach of transforaminal PED is done.

**Results:** We have operated on 12 cases with hidden-zone disc herniations. In all cases, the herniated fragment was successfully removed and Based on the modified Macnab criteria, 11 out of 12 patients were rated as excellent and one as a good outcome (despite revision surgery). All patients were evaluated with VAS score and ODI score.

This approach is a minimally invasive technique for managing hidden-zone fragments and gives satisfactory to excellent results with a significantly short rehabilitation period and insignificant blood loss. pars interarticularis and lamina are kept completely intact in the transforaminal approach.

## Education and Professional Work

### **Educational Qualification**

MBBS year 1983 to 1987 MRMC Gulbarga and TNMC Mumbai,

D-Ortho 1989 College of Physicians and Surgeons Mumbai,

MS Ortho 1997 to 1991 TNMC Medical College Mumbai, Lecturer of orthopaedics TNMC Mumbai 1991 to 1992,

Private Practise since 1993 January.

### **Current Attachments**

Orthopedic Endoscopic Spine Surgeon Golden Park Hospital Vasai.

Honorary Professor of Endoscopic Spine Surgery at Bareilly International University & Rohilkand Medical College Hospital,

Honorary Endoscopic Spine Surgeon Holy Spirit Hospital Mahakali Andheri (East) Mumbai.

Ex-Honorary Professor of Endoscopic Spine Surgery MGM University of Health Science, Navi Mumbai, Kamothe.

### **MY VISION**

Endoscopic spine surgery has evolved into a safe result oriented surgery the world over. Today due to changing patient demographics there is a higher incidence of canal stenosis in the spondylotic spine along with many other problems. Endoscopic spine surgery is the answer to all those problems.



## **Biportal Endoscopic Spine Surgery (UBE): Pitfalls and Early Learning Curve**

**Cigdem Mumcu**

Sultanbeyli State Hospital in Istanbul, Turkey

UBE is a relatively new technique which has benefits including excellent magnification and illumination just as conventional spinal endoscopy. In addition, a wider range of view by a freely moving endoscope and dynamic handling of various instruments permit in overcoming the limitation of surgical indication for uniportal technique. However, the learning curve of Biportal Endoscopic Spine Surgery is long. For the beginner, making working space, keeping fluent saline outflow, control of epidural bleeding and successful bony drilling may be challenging and may require more practice. Appropriate case selection, joining the training & cadaver courses are useful for shortening the learning curve. More attention is required for the beginner to use instruments carefully in this technique. Some complications could be expected in the early learning periods for this technique, so there needs to be known of various endoscopic circumstances and pitfalls. In this presentation, we aim to discuss them.

### **Education and Professional Work**

Cigdem Mumcu was born and raised in Sakarya, Turkey. She graduated from Cerrahpasa Medical Faculty of Istanbul University in 1999. She completed her residency training in Neurosurgery at Van 100. Year University in 2007.

Dr. Mumcu completed her fellowship in Advanced Spine Surgery and Interventional Pain Management at Umraniye Training and Research Hospital and Private American Hospital during 2010 and 2012 in Istanbul. Dr. Mumcu has special training in Unilateral Biportal Endoscopy (UBE) by Dr. Sang Kyu Son, Busan Park Weon Wook Hospital in Korea. UBE is the last endoscopic spine procedure that highly effective on all degenerative spine diseases. Along with many other minimal invasive spinal procedures, Dr Mumcu is trained in Sacral Epiduroscopic Laser Disc Decompression (SELD) by Dr Kang Taek Lim at Seoul Good Doctor TeunTeun Hospital in Korea, Endoscopic Spine Surgery by Dr Gun Choi at Pohang Wooridul Hospital in Korea, and Regenerative Medicine (platelet-rich-plasma and stem cell) and Endoscopic Spine Procedures by Dr Atif Malik at American Spine Center in USA.

She is a member of Turkish Society of Unilateral Biportal Endoscopy, Korean Society of UBE, International Society of UBE (ISUBE), Turkish Neurosurgery Society, Turkish Spinal and Peripheral Nerve Surgery Society, Turkish Spine Society (TOD), AOSpine, International High-Tech Spine Society (IHTSS). Dr Mumcu is married and has two daughters. She enjoys spending time with her family, travelling, and yoga. She currently works at Sultanbeyli State Hospital in Istanbul, Turkey.





## From anatomy of the spine to regenerative therapy applications: recent advances and translational research

**Ayhan Cömert**

Department of Anatomy Ankara University

Basic research is actively being conducted on the mechanisms of therapeutic approaches for patients with impaired function due to not only spinal cord injury but also degenerative diseases such as spinal canal stenosis is expected in the near future. Future perspectives are promising in spinal cord regeneration using hiPSCs (induction of other iPSC-derived cell types) for the treatment of spinal cord injury. Moreover, the application of regenerative therapy for the spinal cord could be broadened to degenerative disorders, such as spinal canal stenosis. Because of the establishment of human induced pluripotent stem cells (hiPSCs), hiPSC-based therapies for spinal cord injury SCI, such as neural stem/progenitor cell (NS/PC) transplantation, have emerged as promising therapeutic modalities. Using several animal models, hiPSC-NS/PC transplantation into subacute injured spinal cords has been repeatedly demonstrated to improve locomotor function. Chronic low back and neck pain is associated with intervertebral disc degeneration. Differentiation of notochord-like cells into chondrocyte-like cells is correlated with disc degeneration and aging. Disc's capacity for regenerating itself is exhausted over time. New idea is to direct and refine differentiation of adult and human-induced pluripotent stem cells into notochord-like and nucleus pulposus-like cells for use in novel cell-based therapies. Human-induced pluripotent stem cells (hiPSCs) have attracted much attention for their potential use in cell-based therapies. Additionally, treatment of degenerative disc disease with allogeneic mesenchymal stem cells, their long-term follow-up results were discussed. New studies are under discussion to valid alternatives for treatment of degenerative disc disease because was published that they can provide effective and durable pain relief together with objective improvements to disc degeneration. There are major limitations as difficulties to generalize the results to large populations, as well as the lack of detailed determination of the optimal dosage of cells. Anatomical protection neurovascular structures is important during transforaminal approaches. Here major vessels include the abdominal aorta, the inferior vena cava, and the common iliac arteries and veins, situated directly anterior to the lumbar spine. Injury to the great vessels and sympathetic and superior hypogastric plexus anterior to the intervertebral disc should be always kept in mind during disc surgery and instruments should not be inserted much into the disc space. However, serious complications may occur due to the proximity of the intervertebral disc to adjacent neurovascular structures. Anatomical investigations support that for instance cooled blood may enter the internal vertebral venous plexus from subcutaneous veins and that could very well serve both warming and cooling of the spinal cord. Additionally, injury to nerve roots and perforation into the anterior annulus fibrosis and anterior longitudinal ligament with major vascular injury is rare during surgical approaches. However, anatomical protection of epidural venous system during transforaminal approaches is an important advantage. The internal vertebral venous plexus was connected to segmental veins outside the vertebral column via intervertebral veins that run through the intervertebral foramen. It is known that, the veins from the erector spinae drained into intervertebral veins. Additionally, there are many clinical cases describing the symptomatic epidural venous engorgements and anatomic variations in the literature.

## Education and Professional Work

### PERSONAL DETAILS:

Address: Department of Anatomy Ankara University, School of Medicine

06100 Sıhhiye, Ankara, TURKEY

Profession: Professor of Anatomy

Nationalit: Turkish

Mail: comertayhan@yahoo.com ; comert@medicine.ankara.edu.tr

Cellular Phone: +90 535 8467218

### Awards

- ISMISS Turkey 2011 Innovative research award, ISMISS Turkey Congress, Antalya, Turkey ("Morphometry and Anatomy of the Lumbosacral Dorsal Root Entry Zones")
- Ankara University, School of Medicine, "Prof. Dr. Hikmet Yavuz" Best research award, 2008
- The American Society of Colon and Rectal Surgeons: The ASCRS Barton Hoexter, MD, Best Video Award: "Perineal anatomy for colorectal surgeons", 2016

### PROJECTS

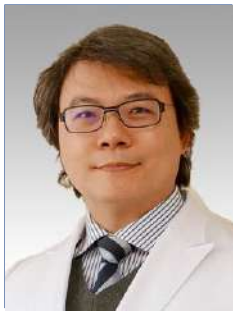
The Scientific and Technological Research Council of Turkey TÜBİTAK 104S402 SBAG SBAG-AYD-479

Yumuşak ve sert doku malzeme deney sistemine elektronik veri toplama biriminin eklenmesi 2005 /2006

Turkish Neurosurgical Society Türk Nöroşirürji Derneği Araştırma Projesi. Deneysel akut omurilik yaralanmasında (spine injury) granülosit koloni stimulan faktörün (GCSF) antiinflatuar etkisi 2007

Celal Bayar University Research Projects, Celal Bayar Üniversitesi Bilimsel Araştırma Projesi Tıp 2005- 47 Sıçan beyinde fokal iskeminin matriks metaloproteinaz ve ekstraselüler matriks proteinlerinin dağılımlarına etkisinin immunohistokimyasal yöntemle değerlendirilmesi 2005/2007

The Scientific and Technological Research Council of Turkey TÜBİTAK 108S075 İnsan dişsiz çene kemiklerinin mikromekaniksel özelliklerinin incelenmesi 2008/2011



## Clinical & Radiological Outcomes of Transforaminal Lumbar Interbody Fusion Using Biportal Endoscopic Technique & Double Cages

**Jwo-Luen Pao**

Chair of Department of Orthopedic Surgery Far Eastern Memorial Hospital, New Taipei, Taiwan

### **【Background】**

This study is aimed to report the surgical techniques, clinical, and radiological outcomes of the biportal endoscopic transforaminal lumbar interbody fusion (BETLIF) using two cages.

### **【Methods】**

This study included 90 patients who received 120 segments of BETLIF from July 2019 to May 2019. They were 17 males and 73 females with an average age of 64.8 (range 35 ~ 85). 1-segment fusion was done in 72 patients, 2-segment in 22 patients, and 3-segment in 2 patients. The diagnoses were spondylolisthesis in 85 patients and degenerative disc disease in 5 patients. Bilateral decompression was accomplished via the unilateral approach. One PEEK cage and one composite PEEK cage with outer Titanium plates along with laminectomy bone chips and demineralized bone matrix were impacted into the disc space. Clinical data including ODI, JOA scores, VAS score, and complications were retrieved from the chart records. Computed tomography (CT) of the lumbar spine was arranged 1 year post-operatively to evaluate the fusion status.

### **【Results】**

The average follow-up period was 15.5 months (range 12 ~ 31 months). The average hospital stay was 5.7 +/- 1.1 days (range 3 ~ 7 days). At final follow-up, the ODI was improved from 46.7 +/- 17.0 to 12.7 +/- 16.1. The JOA score was improved from 15.6 +/- 6.3 to 26.4 +/- 3.2. The VAS were improved from 5.2 +/- 3.1 to 1.7 +/- 2.1 for low back pain; and from 6.3 +/- 2.5 to 1.7 +/- 2.0 for leg pain. All these improvements were statistically significant with a p-value < 0.005. CT scan was available in 44 patients. Solid interbody fusion was achieved in 43 patients (fusion rate 97.7%). Mild cage subsidence (less than 2 mm) was noted in 9 patients (20.9%) and cyst formation around the endplate was noted in 6 patients (5.0%). Both cage subsidence and cyst formation were more frequently occurred on the pure PEEK cage than the composite cage. Complications included 1 dural tear (1.1%), 2 pedicle screw malposition (2.2%), and 2 epidural hematoma (2.2%). No patient required blood transfusion. Re-operation was required in 2 patients for evacuating the epidural hematoma and adjusting the pedicle screw.

### **【Conclusion】**

BETLIF with double cages is a safe, effective, and revolutionary minimally invasive technique for the spinal fusion with very high fusion rate and great functional improvement.

## Education and Professional Work

### Education & Training

1989 ~ 1996: M.D., Depart. of Medicine, College of Medicine, National Taiwan University

1998 ~ 2003: Residency, Orthopedic Depart., National Taiwan Univ. Hospital

2002 ~ 2003: Sports Medicine Fellowship of Prof. Ching-Chuan Jiang and Spine Fellowship Prof. Po-Quan Chen, Orthopedic Department, National Taiwan Univ. Hospital

2005: Fellowship for Minimally Invasive Spine Surgery, Professor Munehito Yoshida, Wakayama University Hospital, Wakayama, Japan

2015: 1st Traveling Fellowship to Japan, Grant from Taiwan Spine Society (TSS) & Japanese Society for Spine Surgery and Related Research (JSSR)

2022: The 19th National Innovation Award

### Employment

2021 ~ : Director, Department of Orthopedic Surgery, Far Eastern Memorial Hospital, New Taipei, Taiwan

2016 ~ : Clinical Assistant Professor, Depart. Orthop. Surg., Far Eastern Memorial Hospital

2015 ~ : Chief, Division of Orthopedic Spine Surgery, Department of Orthopedic Surgery, Far Eastern Memorial Hospital, New Taipei, Taiwan

2008 ~ : Lecturer, Ministry of Education, The Republic of China

2012~2015: Chief for Minimally Invasive Spine Surgery, Far Eastern Memorial Hospital, New Taipei, Taiwan

2003 ~ 2012: Attending Surgeon, Orthopedic Department, National Taiwan Univ. Hospital, Taipei, Taiwan

Board member of the Pan Asian Society for Minimally Invasive Spine Surgery (PASMISS)

President of the Taiwan Society for Minimally Invasive Spine Surgery (TSMISS)

President of the Taiwan Society for Endoscopic Spine Surgery 2022 (TSESS)

National and Regional Faculty of the AOSpine Foundation

Member of the Taiwan Spine Society

Member of the Taiwan Orthopedic Association

Member of North American Spine Society (NASS)

### Speciality

Minimally Invasive Spine Surgery, specialized in:

- Percutaneous unilateral biportal endoscopic spine surgery (UBE)
- Biportal endoscopic transforaminal lumbar interbody fusion (BETLIF)
- Minimally invasive transforaminal Lumbar Interbody Fusion (MIS-TLIF)
- Percutaneous vertebroplasty/ kyphoplasty (PVP/ PKP)
- Percutaneous endoscopic lumbar discectomy and decompression (PELD)
- Minimally invasive oblique lumbar interbody fusion (OLIF)
- Microendoscopic discectomy (MED) and decompressive laminotomy (MEL)



**A PROMISING POST OPERATIVE PREDICTION OF  
DECOMPRESSION OF STENOSIS IN WITH INCOMPATIBLE  
CLINIC AND RADIOLOGIC IMAGES**

**Tarık YAZAR , H. AYGÜN**

Department of Orthopaedics University of Ankara

## Education and Professional Work

Place of birth

Artvin, Turkey

Date of birth 26th of may 1951

Nationality Turkish

- In 1988, he graduated from Ankara University Faculty of Medicine, Department of Orthopedics and Traumatology. became an Associate Professor.
- In 1988, he received a patent number 28534 for the mechanical spinal system used in the treatment of spine, trauma and deformity diseases, whose research was carried out at the Vienna International Patent Institute, and this mechanical spinal system was produced in our country.
- He became a professor at Ankara University Faculty of Medicine in 2001

# Lecture



## **Bess Decompression in Recurrent Pain Post Interspinous Device Insertion**

**Abdul Kadir Hadar**

Hasan Sadikin General Hospital

We described a patient who still developed back pain and radicular pain after post-open decompression and interspinous device insertion. The patient first underwent an open decompression procedure and interspinous device by another surgeon because of herniated nucleus pulposus (HNP) in the L4-L5 region. The patient's back pain was temporarily relieved. However, after 6 months, the patient came again to Dr. Hasan Sadikin Central General Hospital with back pain recurred. The patient complains of persistent back pain that radiates to the left lower extremity. We planned to perform laminotomy decompression per endoscopy and interspinous device removal to the patient. But before the surgery, we perform a selective nerve root block (SNRB) as a diagnostic to confirm the pain-generating root level and the result was positive. We then perform the procedure and the back pain was alleviated immediately after the surgery. The patient also said that the radiating pain had also disappeared. We also evaluated the clinical outcomes with the Visual Analogue Scale (VAS) Spine Score and Oswestry Disability Index (ODI) score before and after the surgery. The pre-surgery score for VAS spine score and ODI were 25 and 38 which means moderate disability. After surgical treatment, the VAS and ODI score obtained were significantly improved to 70 and 15 which shows there has been an improvement in the patient's back pain.

## **Education and Professional Work**

### **Education & Training**

- Fellowship spine Juli 2019 – Juni 2020  
Department of Orthopaedics and Traumatology Cipto Mangunkusumo General Hospital Faculty of Medicine Universitas Indonesia Jakarta, Indonesia  
Degree conferred : Orthopaedic Spine Consultant
- Orthopaedic Residency September 2011 - August 2016  
Department of Orthopaedics and Traumatology Hasan Sadikin General Hospital Faculty of Medicine Universitas Padjadjaran Bandung, West Java, Indonesia  
Degree conferred : Specialist in Orthopaedic Surgery
- Compulsory Internship 2004 – 2006  
Saiful Anwar General Hospital Faculty of Medicine Universitas Brawijaya Malang, East Java, Indonesia  
Degree conferred : Dokter (Medical Doctor)
- Medical School 2000 – 2004  
Faculty of Medicine Universitas Brawijaya Malang, East Java, Indonesia  
Degree conferred : Sarjana Kedokteran (Bachelor degree in medicine)

### **Employment History**

- Teaching Staff / Orthopaedic Surgeon November 2016 – Present  
Department of Orthopaedics and Traumatology Spine Division Hasan Sadikin General Hospital Faculty of Medicine Universitas Padjadjaran Bandung, West Java, Indonesia
- General Practitioner November 2007 – April 2009  
Sidangoli Primary Health Center West Halmahera, North Maluku, Indonesia
- General Practitioner Mei 2009 – Mei 2011  
Bina Sehat Hospital Jember, Indonesia

### **Licensure and Certification**

- Orthopaedic spine consultant Agustus 2020 - present
- Specialist in Orthopaedics Registry and License Indonesian Medical Council November 2016 – present
- Certificate of Competency in Orthopaedic Surgery National Orthopaedic Board Examination Indonesian College of Orthopaedics August 2016 – present



## **Efficacy and safety of bilateral percutaneous Vertebroplasty using titanium intravertebral body implant for traumatic compression vertebral fractures**

**Ali Hammed**

Tishreen University Hospital

Vertebroplasty is a well-known method used for osteoporotic and neoplastic compression fractures, yet little evidence exists for its use in traumatic burst fractures.

Spine Jack® is a vertebroplasty system with an intracorporeal implant designed to restore the height of the vertebral body in osteoporotic vertebral fractures.

A 72-year-old man with axial back pain didn't respond to narcotics 3 weeks prior to presentation, with Oswestry score of 72% and a visual analogue scale (VAS) score of 9 points. Imaging studies showed vertebral fracture (AO –Type A3) at T12 vertebra secondary to Trauma. PV was performed with a Spine Jack intracorporeal implant device, the 5 mm diameter SpineJack was implanted using a percutaneous or minimally invasive posterior surgical approach using surgical tools supplied with the device. Post-operative course demonstrated improvement of pain, height, correction of the kyphotic angle and Oswestry score, without any neurological deficits.

### **Conclusion**

Percutaneous vertebroplasty with the Spine Jack® system is a safe and effective procedure to treat traumatic vertebral fractures.

Typical cementoplasty risks, such as extravasation into the spinal canal or venous system, or thermal effects during the polymerization of PMMA, are decreased or absent when using Spine Jack system.

## **Education and Professional Work**

### **RESEARCHER AND RESEARCH REVIEWER IN INTERNATIONAL JOURNALS.**

1. BMC Musculoskeletal Disorders.
2. Interdisciplinary Neurosurgery: Advanced Techniques and Case .Management.
3. World neurosurgery.
4. Medicine.
5. Frontiers in Neurology, section Neurotraum.
6. Journal of oncology.
7. Clinical Case Reports.

### **MEDICINE LECTURER**

Medical teacher at Tishreen University. Lattakia, syria

Medical teacher at Al-Andalus Private University. Tartous, Al-kadmous, syria

### **EDUCATION AND TRAINING**

01/03/2019 – CURRENT NEUROSURGERY RESIDENT – TISHREEN UNIVERSITY HOSPITAL

2012 – 2018 BSC IN MEDICINE WITH RATE (82%) Tishreen University, Lattakia (Syria)

09/05/2022 – 13/05/2022 United Kingdom QUEEN SQUARE NEUROSURGERY REVIEW COURSE Royal College of Surgeons (Eng)

### **NETWORKS AND MEMBERSHIPS**

05/05/2020 – CURRENT American Association of Neurological Surgeons-membership

11/06/2020 – CURRENT North American spine society Membership

01/06/2021 – CURRENT USA Spine intervention surgery

01/04/2021 – CURRENT Congress of Neurological Surgeons International Vista Resident

01/03/2021 – CURRENT UK European Association for Cancer Research

### **HONOURS AND AWARDS**

18/11/2021 Global Neurosurgical Update and Educational Symposium - Best E-Poster – David and Lya Neumann Foundation award





## Full-endoscopic trans Kambin's triangle lumbar interbody fusion (Full-endo KLIF) using the PETLIF® system for degenerative lumbar spinal disease is less invasive in terms of bleeding

**Atsushi Kojima**

Funabashi orthopaedic hospital, spine and spinal cord center

**Introduction.** Recently, good results of full-endoscopic trans Kambin's triangle Lumbar Interbody Fusion (full-endo KLIF) have been reported for the surgical treatment of degenerative lumbar spinal diseases. In this study, we report the perioperative clinical outcomes of full-endo KLIF using the PETLIF® system in comparison with MIS-TLIF.

**Materials and Methods.** The subjects were 11 patients (group K: 4 males and 7 females, mean age 63.0 years) undergoing L4/5 Full-endo KLIF for lumbar degenerative diseases (spondylolisthesis and disc disease) from January 2020 to September 2022.

The control group consisted of 11 cases of L4/5MIS-TLIF performed at the same time (group T: 6 males and 5 females, mean age 67.3 years). All surgeries were performed by the same surgeon. The following data were collected: pre- and postoperative back pain and leg pain NRS, anesthesia/operative time, intraoperative blood loss, pre- and postoperative hemoglobin level (Hgb) trend and rate of change, serum CRP level at 6 days after surgery, and length of hospital stay.

**Results.** NRS (back pain/leg pain) averaged 5.9/6.1 in group K and 5.0/7.1 in group T before surgery, 2.1/1.7 in group K and 2.5/2.6 in group T at discharge, and anesthesia/operative time (minutes) was 172/127 in group K and 175/131 in group T. There were no significant differences. Intraoperative blood loss was 72.7 g in group K and 122.7 g in group T, significantly lower in group K. Hgb (g/dl: day before → next day → 6 days later) was 14.0 → 12.6 → 13.0 in group K and 13.6 → 11.3 → 12.0 in group T. The rate of change (% decrease from preoperative level: next day → 6 days later) was 10.0% → 7.6% in group K and 16.1% → 11.0% in group T. There was no difference in the 6-day postoperative CRP level (mg/dl) in the K group (0.9) and in the T group (0.8), and the mean length of hospital stay in the K group (9.5) and in the T group (9.4).

**Discussion.** The results of this study suggest that despite anesthesia/operative time, postoperative CRP level and hospital stay being almost the same, intraoperative blood loss and postoperative Hgb reduction rate were significantly lower in group K, suggesting that group K has a similar or better perioperative course than group T.

**Conclusions.** The perioperative clinical results of full-endo KLIF are minimally invasive and comparable to or better than MIS-TLIF.

## Education and Professional Work

### EDUCATION:

1995-2001 B. A., St Marianna University, School of Medicine, Kanagawa, Japan

2003-2007 Ph. D, St. Marianna University, Graduate School of Medicine, Kanagawa, Japan Concentrations: Physiology

### CERTIFYING EXAMINATION

2001 National board of medicine, registration No. 421761

2008 Japanese board of Orthopaedic Surgery No. 118309 approved by Japanese Orthopaedic Association.

2009 Spinal-disease certified physician of The Japanese Orthopaedic Association No.4304

2013 Spinal surgery instructor No.11571 approved by The Japanese Society for Spine surgery and Related Research

2017 Certificate of Japan Osteoporosis Society No.17-NI-0857

### EXPERIENCE

2001-2003 Resident physician, St. Marianna University hospital, Kanagawa, Japan

2007-2008 Clinical fellow working under Professor, Department of Orthopaedic Surgery, St. Marianna University Yokohama city Seibu hospital, Kanagawa, Japan, Masuo Sasa ,M.D., Ph. D., Professor and Chairman.

2008~2012 Clinical fellow working under Professor, Department of Orthopaedic Surgery, St. Marianna University hospital, Kanagawa, Japan, Moroe Beppu, M.D., Ph. D., Professor and Chairman.

2012 May-August International observer ship under Professor, Children's Orthopaedic center, Children's hospital Los Angeles, California, USA. David L. Skaggs M.D, Professor, and Division director.

2013-2016 St.Joseph's Hospital, Yokosuka

2016-2021 Spine and Spinal Cord Center, Funabashi Orthopaedic Hospital,

2022 Deputy Director, Spine and Spinal Cord Center, Funabashi Orthopaedic Hospital

### TEACHING EXPERIENCE

2007-2017 Orthopaedic Surgery for medical students of St. Marianna University

2018~2022 Part-time lecturer of Department of Orthopaedic Surgery, St. Marianna University, School of Medicine

### MEMBERSHP OF ACADEMIC SOCIETIES

Japanese Orthopaedic Association

Japanese Scoliosis Society

Japanese Society for Spine Surgery and Related Research

Japan Osteoporosis Society

Society for Minimally Invasive Spinal Treatment (Councillor)

The Japanese Orthopaedic Society for Sports Medicine

The Kanto Society of Orthopedics and Traumatology

### AWARDS

English Presentation Award of 22nd JASMISS November 29, 2019 in Takamatsu, Japan. "All-in-one percutaneous pedicle screw system reduces screw insertion time in minimally invasive thoracolumbar spine surgery."



## Posterior Full-endoscopic Cervical Decompression in Treatment of Cervical Stenosis Following Anterior Cervical Discectomy and Fusion. Cases Reports and Surgical Technique

**Ching-Hsiao Yu**

Taoyuan General Hospital

### [Introduction]

Anterior cervical discectomy and fusion (ACDF) has been considered as a gold standard for most patients with cervical degenerative diseases. However, residual or recurrent radiculopathy or cord compression may occurred and surgical intervention is necessary. Repeat anterior surgery may be difficult in these conditions while posterior approach should be an alternative method. Compared to posterior microendoscopic (MED) foraminotomy or laminotomy, full-endoscopic cervical decompression becomes more popular because of its less invasiveness and efficiency. This study reports clinical outcome of patients who underwent posterior full-endoscopic cervical decompression in the treatment of residual or recurrent symptoms after previous ACDF surgery. Besides, our surgical technique will be introduced.

### [Materials and Method]

Since Jan. 2021 to Jan. 2022, 6 patients (3 males and 3 females) were included. The average age was 57.1 years old (42 to 72). Total 9 levels were operated and C5/6 and C6/7 were most common. All patients complained of radiculopathy and two of them sustained myelopathy. Full-endoscopic cervical decompression included foraminotomy using "V-point" approach and unilateral laminotomy bilateral decompression (ULBD) for treating central stenosis. In this series, we used 5.7mm working-channel stenoscope with 8.4mm outer-diameter (Techcord company, Korea). After operation, one 1/8 inch hemovac drain was placed. Neck-collar was used for 2 weeks after index procedure. The clinical outcome was evaluated by pain Visual Analogue Score (VAS), Neck Disability Index (NDI) and Oswestry Disability Index (ODI).

**[Results]** The operation time was averaged 42 mins for one-level foraminotomy and 60 mins for one-level ULBD. At 12 months follow-up period, the clinical outcome including VAS score, NDI, ODI of 6 patients were all improved. There was no major complications. No postoperative hematoma or infection was noted. One patient sustained persisted motor weakness and numbness and recovered after two months postoperatively.

### [Conclusion]

Posterior full-endoscopic cervical decompression is an effective and safe procedure for treating residual or recurrent radiculopathy after ACDF.

## Education and Professional Work

MEMBERSHIP (Dec. 2022 )

Director, Taiwan Society of Endoscopic Spine Surgery (TSESS)

Secretary General, Taiwan Society of Minimally Invasive Spine Surgery (TSMISS)

Taiwan Orthopaedic Association (TOA)

Taiwan Spine Society (TSS)

Taiwan Osteoporosis Association (TOA)

Asia Pacific Orthopaedic Association (APOA)



## LUMBAR SOLITARY PLASMACYTOMA APPROACHED BY TRANS OPERATIVE VERTEBROPLASTY THROUGH FULL ENDOSCOPY IN ASSOCIATION WITH STEREOTAXY RADIOTHERAPY

**MÁRCIO ROBERTTI RAMALHO DA CUNHA**

TRAUMA CENTER CLINIC

### INTRODUCTION

Solitary plasmacytoma (SP) is defined as a solitary mass of neoplastic plasma cells, represents only 5% of all plasma cell malignancies and is a heterogeneous condition . The clinical outcome of SP varies greatly; many patients are cured with the appropriate therapy, but 50-60% of patients with SP progresses to disseminated multiple myeloma (MM) years later.

### OBJECTIVES

- 1- Promote a safe decompression and a biopsy under direct vision through a skin incision smaller than 01 centimeter
- 2 - Avoid the post operative complications associated with tissue aggression of the open procedures .

### MATERIAL AND METHODS

The patient is a male ,77 years old with a spontaneous fracture of L1 Vertebra after a domestic maneuver to lift a 15 Kg water bottle .The patient had a historical background of adenocarcinoma of prostate, resected by open way six years earlier of L1 fracture .He has complained of severe lumbar back pain and a grade III muscle strength of the iliopsoas on the left leg associated with an inguinal dysesthesia The radiological exams demonstrated a fracture with lost of sixty percent of the vertebral body height and an important disruption of the posterior wall of the vertebra in association with others comorbidities,such as : Obesity, DM type II, SAH and Hypothyroidism . The patient was submitted to general anesthesia and positioned under a prone position . The entry point was performed in the Interlaminar window of L1 on the left side, followed by the docking of the working channel in the lamina . The interlaminar window was enlarged under the assistance of burrs promoting a good decompression of the lateral recess, followed by the opening of yellow ligament by punch scissors followed by the exposition of dural sac and L1 left nerve root . The vertebral body was biopsied under direct vision, in association with radio frequency ablation through the trigger flex device of the surrounded bone tissue of L1 .The vertebroplasty was performed through pedicle in association with fluoroscopy assistance . The patient had hospital discharge less than twelve hours after the procedure without lumbar pain and no brace support. He was forwarded to be submitted to a precocious stereotaxy radiotherapy .

### DISCUSSION

The full endoscopy is expanding its spectrum of indications in the treatment of spinal pathologies in recent years . We are still initiating the first steps, about this surgical modality to manage lumbar spinal fractures , bringing the benefits of this minimal invasive modality in the management of spinal fractures of neoplastic etiology. The great benefit is to perform under a minimal skin incision smaller than one centimeter obtaining an effective decompression of dural sac and nerves roots involved in the process of punctual vertebral fractures . The vertebroplasty provides reliable pain relief for patients with simple compression fractures without extensive cortical destruction or extension into the posterior elements and has gained a lot of adapters as a surgical option to treat stable fractures of the vertebral body as a single surgical modality.

The plasmacytoma usually is a radiosensitive disease and regresses in almost every case after local irradiation, being a potential curable pathology, through the use of radiotherapy .

### CONCLUSION

The usefulness of full endoscopy in the management of SBP is still a question to be answered in the next years , undoubtedly more cases will be necessary to cement this less invasive modality as a safe option to treat these lesions .Of course,it always will be necessary the association of vertebroplasty and stereotaxy radiotherapy to bring a successful treatment in the management of this pathology .

## Education and Professional Work

### MEMBERSHIP AFFILIATION

- 1) TITULAR MEMBER OF BRAZILIAN NEUROSURGERY SOCIETY (1994)
- 2) TITULAR MEMBER OF BRAZILIAN SPINE SOCIETY (2009)
- 3) Ao SPINE MEMBER
- 3) MEMBER OF LATINO AMERICAN STUDY GROUP OF NEUROENDOSCOPY / GLEN
- 4)CO FOUNDER MEMBER OF BRAZILIAN BRANCH OF I.S.E.S( INTERNATIONAL SOC. ENDOSCOPY OF SPINAL SURGERY )

### PROFESSIONAL QUALIFICATIONS:

- 1) CHAIRMAN OF NEUROSURGERY OF THE GENERAL HOSPITAL NATAL-RN / H.W.G ( 2014)
- 2) SENIOR STAFF OF THE SPINAL SURGERY AREA OF CLINIC TRAUMA CENTER /NATAL-RN (2007)
- 3) U.F.R.N, ASSISTANT PROFESSOR OF THE NEUROSURGERY DEPARTMENT ( 1996-1999 )
- 4) NEUROSURGEON OF THE GENERAL HOSPITAL NATAL-RN / H.WG ( 1994- 2018)



## Percutaneous stenoscopic cervical decompression (PSCD) for treatment of multiple cervical nerve root compression in patients with chronic neck and periscapular pain

**Matee Phakawech**

S Spine and Nerve Hospital

**Introduction:** Percutaneous stenoscopic cervical decompression (PSCD) is an endoscopic surgical procedure for decompression of cervical spinal foramens. A number of patients with chronic neck and scapular pain, who fail to conservative treatment, have multiple levels of cervical root compression. PSCD is an upcoming procedure for relieving pain in these patients.

**Objective:** This study aimed to compare surgical outcome of PSCD for multiple cervical nerve roots decompression (surgery  $\geq 3$  nerve root) and 1 or 2 nerve roots decompression groups.

**Methods:** This retrospective study collected 193 patients undergoing PSCD from November 2018 to April 2022. All PSCD operations were done by single orthopedic surgeon. The patients were categorized into 2 groups, including group A (PSCD for decompression  $\geq 3$  nerve roots,  $n = 28$ ) and group B (PSCD for decompression 1-2 nerve roots,  $n = 165$ ). All cases were complete at least 6 months of follow-up period. Surgical outcome was compared between 2 groups.

**Results:** The average overall improvement of symptom at 6 months was  $79.6 \pm 14.6\%$  and  $76 \pm 22.3\%$  in group A and B, respectively. Good to excellent outcome was found in 87% and 80% of group A and B, respectively.

The most common complication was transient paresthesia. C5 nerve root was vulnerable to develop dysfunction when compared with other nerve roots. There was no cervical cord injury in the present study.

**Conclusion:** PSCD is a safe and useful operation for relieving chronic neck and periscapular pain in patients with either single or multiple cervical nerve root compression.

## Education and Professional Work

### EDUCATION

2005-2011	Medical Doctor Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok
2013-2017	Orthopaedic Surgery Resident Department of Orthopaedics, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok
2016	Fellowship of lower limb surgery ATOS-Praxisklinik Heidelberg, Germany
2017	Fellowship of spine surgery, Tohoku Central Hospital Japan
2018	Fellowship of minimal invasive spine surgery, Aichi spine hospital, Japan
2017-2018	Fellowship of spine surgery Department of Orthopaedics, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok

### APPOINTMENT

2011-2012	Internship, Narathiwatrachanakarin hospital, Narathiwat
2012-2013	General practitioner, Nathawee hospital, Songkhla
2018-Present	Orthopedic spine surgeon at S-spine and nerve hospital.

### MEMBERSHIPS IN PROFESSIONAL SOCIETIES

Medical Council of Thailand  
Royal College of Orthopaedic Surgeons of Thailand (RCOST)  
Spine Surgery Thailand  
Minimal Invasive Spine Surgery Thailand

### Presentation as an invited speaker and Instructor

1. MISS summit forum 2021 Nagoya, Japan (PSCD in my practice)
2. KOESS 2022 Seoul, Korea (PSCD for multiple cervical nerve root decompression in chronic neck and shoulder pain)
3. Endospine UAE 2022 Dubai, UAE cadaveric workshop instructor.



## The UBE surgery with OLIF procedure in one single position

**Nantawat Uttamo**

Veterans General Hospital

Nowadays, Minimally invasive spinal surgery plays a great role in treating spinal diseases and there are many varieties of techniques. However, each method has its own advantages and limitations. Oblique lumbar interbody fusion (OLIF) surgery is considered one of the methods that can correct both sagittal and coronal imbalances as well as help expand the spinal canal by indirect decompression. But indirect decompression alone may not be enough to treat patients with facet hypertrophy or fusion or ligamentum flavum hypertrophy. Bi-portal endoscopic spinal surgery (UBE), however, is minimally invasive but potentially very powerful in decompressing. So, the combination between OLIF procedure and UBE surgery in single position may have a role in treating these problems.

## Education and Professional Work

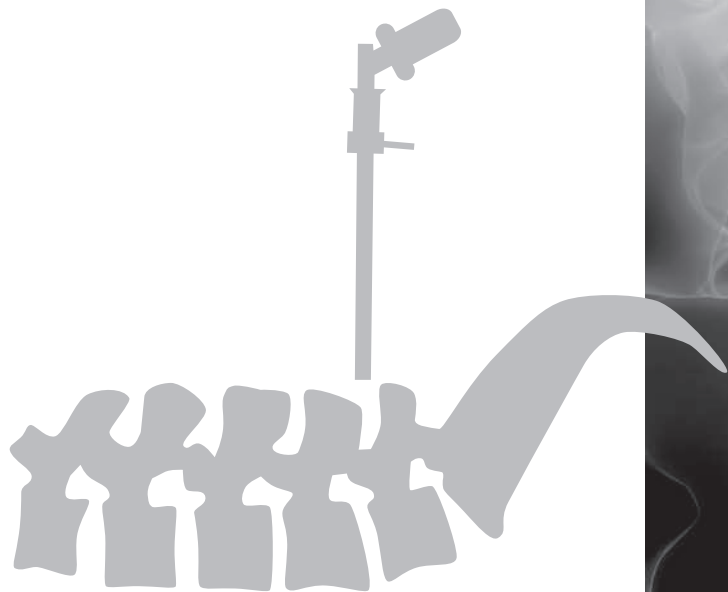
### COMMITTEE MEMBERSHIPS AND ACTIVITIES

- ThaiSMISST and ASEANMISST committee
- Secretary and cadaveric workshop co-chairman of 4th ASEANMISST in Collaboration with NASS and Cadaveric Workshop 2018, Chiang Mai, Thailand
- Secretary of 7th ASEANMISST meeting 2022, Chiang Mai, Thailand

### PROFESSIONAL MEMBERSHIPS AND SOCIETIES

- 2010 – present: Thai Medical Council
- 2012 – present: AO Trauma membership
- 2015 – present: Royal College of Orthopedic Surgeons of Thailand (RCOST)
- 2016 – present: Spine Society of Thailand (SST)
- 2016 – present: Thai Society of Minimally Invasive Spinal Surgery and Techniques (ThaiSMISST)
- 2017 – present: ASEAN Minimally Invasive Spinal Surgery and Techniques (ASEANMISST)
- 2017 – present: North American Spine Society (NASS)
- 2020 – present: AO Spine membership

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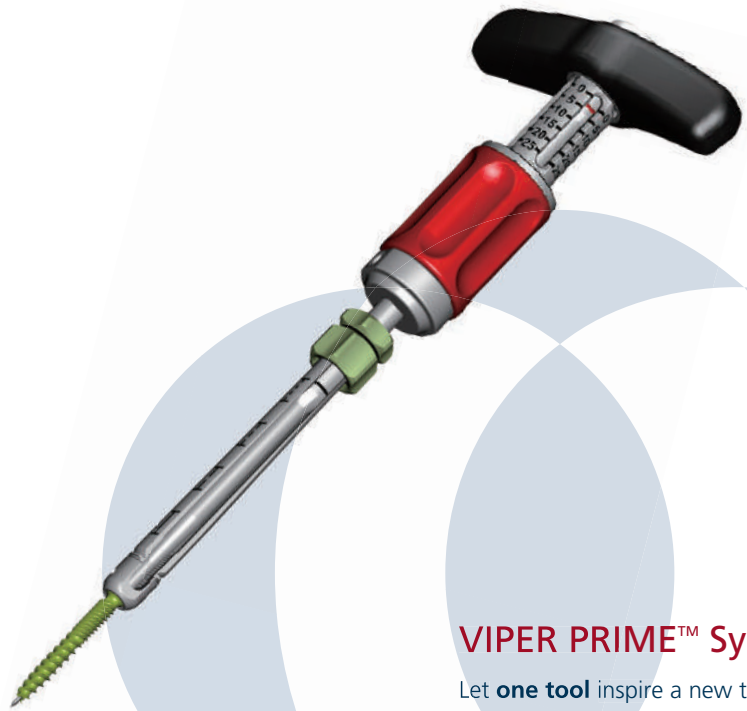
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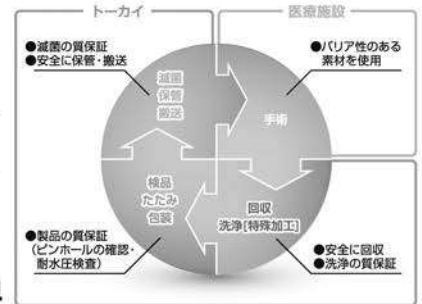
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**株式会社トーカイ (四国)**  
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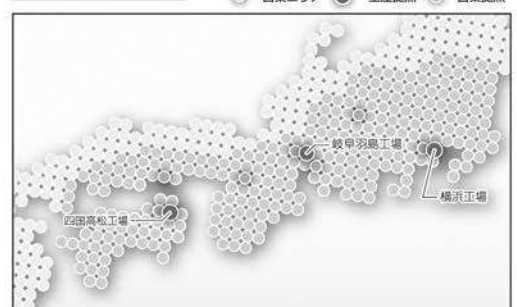
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 〒515-0045 三重県松阪市駅前田町203番地  
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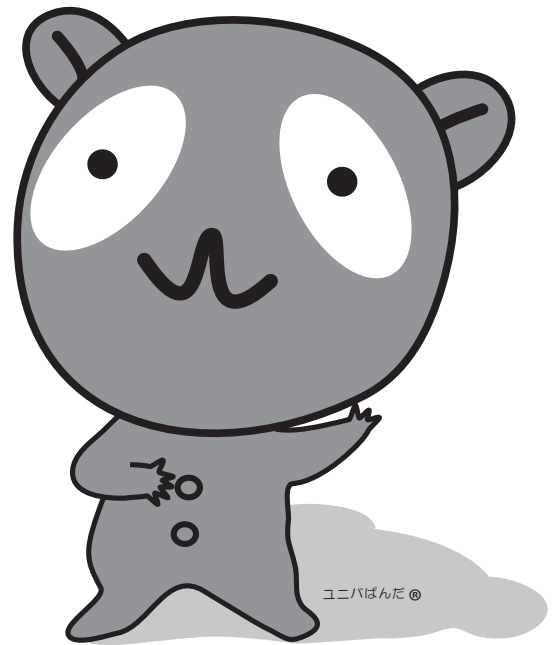
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# 慢性化しやすい痛み

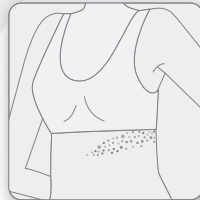
## 腰痛症



## 頸肩腕症候群



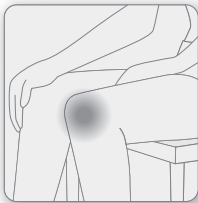
## 帯状疱疹後神経痛



## 肩関節周囲炎



## 変形性関節症



### 【効能・効果】

帯状疱疹後神経痛、腰痛症、頸肩腕症候群、肩関節周囲炎、変形性関節症

### 【用法・用量】

通常、成人には1日4錠を朝夕2回に分けて経口投与する。なお、年齢、症状により適宜増減する。

### 〈用法・用量に関連する使用上の注意〉

帯状疱疹後神経痛に対しては、4週間で効果の認められない場合は漫然と投薬を続けないよう注意すること。

### 【使用上の注意】

#### 1. 副作用

承認時までの調査では、1,706例中89例(5.22%)に、市販後の副作用頻度調査(再審査終了時点)では、18,140例中98例(0.54%)に副作用が認められている。以下の副作用は、上記の調査及び自発報告等で認められたものである。

#### (1) 重大な副作用

- 1) 肝機能障害、黄疸(いずれも頻度不明): AST(GOT)、ALT(GPT)、 $\gamma$ -GTPの上昇等を伴う肝機能障害、黄疸があらわれることがあるので、観察を十分に行い、異常が認められた場合には、投与を中止するなど適切な処置を行うこと。
- 2) 本薬の注射剤において、ショック、アナフィラキシーがあらわれたとの報告があるので、観察を十分に行い、異常が認められた場合には、直ちに投与を中止し、適切な処置を行うこと。

その他の使用上の注意などにつきましては、添付文書をご参照下さい。

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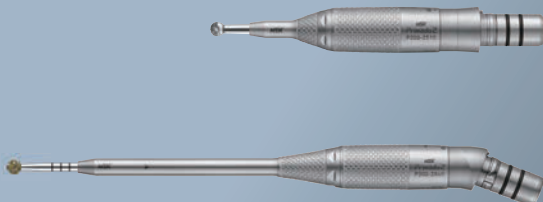
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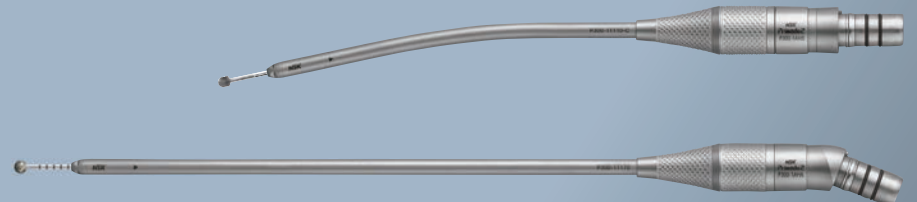


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