

# PIL SUN CHOI

- ❖ FOUNDING PRESIDENT OF BRAZILIAN ASSOCIATION FOR THE DEVELOPMENT OF MISS (BRAMISS/ABCMIC) - 2004
- ❖ FOUNDING PRESIDENT OF BRAZILIAN ASSOCIATION OF MISS (SBC-MISS/CCMI) - 2006/08
- ❖ COORDINATOR OF MISS GROUP OF ORTHOPEDIC INSTITUTE OF MEDICINE SCHOOL OF SÃO PAULO UNIVERSITY (2011-13)
- ❖ PRESIDENT OF III WCMISST (BRAZIL) 2012
- ❖ PRESIDENT OF INTERAMERICAN SOCIETY OF MISS (SICCMi) - 2016-17



# DISCLOSURE - NONE

## COMMITTED:

- PROVIDE THE BEST SPINE CARE TO OUR PATIENTS
- THE DEVELOPMENT OF SPINE SURGERY (MINIMALLY INVASIVE SPINE SURGERY & TECHNIQUES)

PIL SUN CHOI



# HISTORY OF SPINE ENDOSCOPY IN BRAZIL

PIL SUN CHOI

# HISTORY OF ENDOSCOPY

## ✓ **PHILIP BOZZINI, 1806**

BLADDER ENDOSCOPY: JOSEPH  
ACADEMY OF MEDICAL SURGERY –  
AUSTRIA

## ✓ **MAX NILTZE, 1877**

CYSTOSCOPE: CANDLELIGHT



# HISTORY OF ARTHROSCOPY

## KENJI TAKAGI, 1918

- ✓ (TOKYO UNIVERSITY)
- ✓ CYSTOSCOPE:  
CADAVER KNEE
- ✓ FIRST USE IN PATIENT:  
1931

## MASAKI WATANABE, 1950

- ✓ FIRST ARTHROSCOPE



LAMP AT THE TIP

# HISTORY OF ARTHROSCOPY/ENDOSCOPY

- ✓ **DISBELIEF**
- ✓ **SKEPTICISM**
- ✓ **FEAR**



**"GREAT SURGEONS, GREAT INCISIONS"**



# HISTORY OF ARTHROSCOPY IN BRAZYL



1980-1990



1990 - 2000

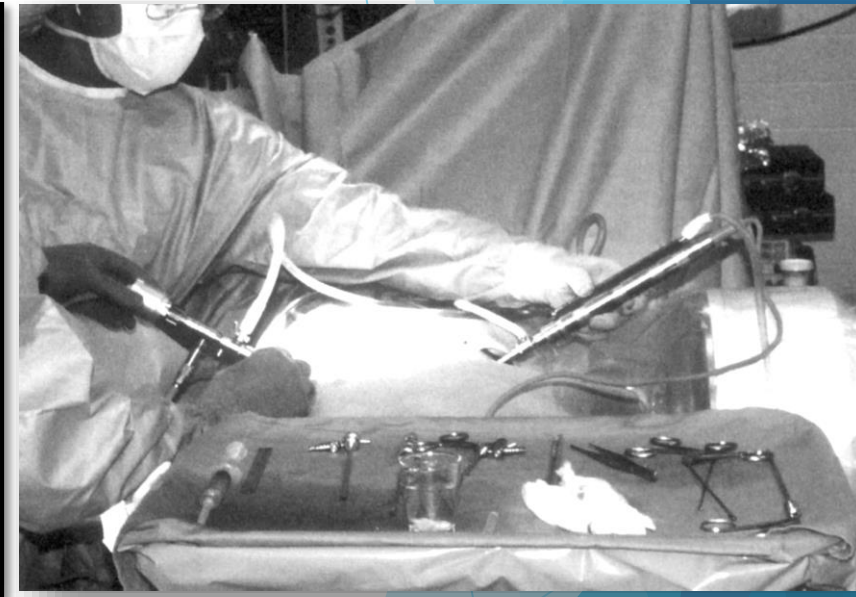
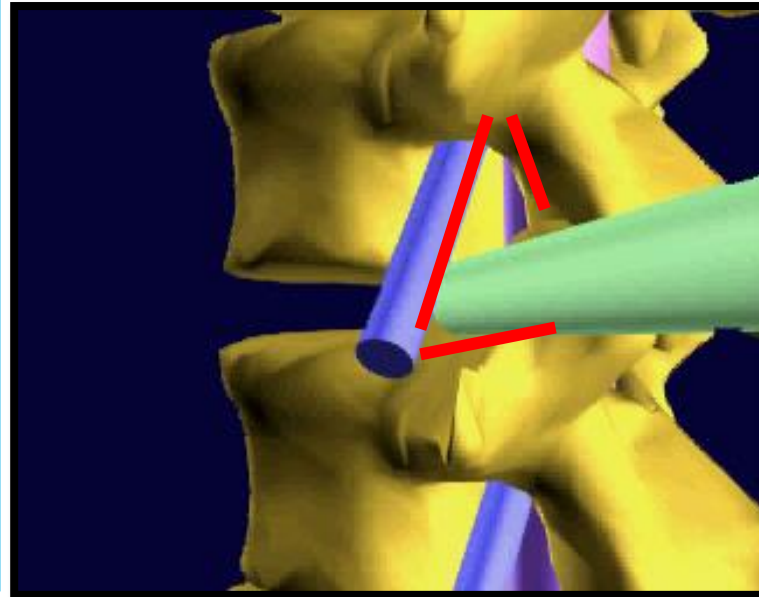
# TRANSFORAMINAL LUMBAR PERCUTANEOUS DISCECTOMY: HISTORICAL EVOLUTION

- CHEMONUCLEOLYSIS ( Smith & Brown, 1967):chemical
- MECHANICAL NUCLEOTOMY (Hijikata,1975): mechanical
- AUTOMATIC DISCECTOMY(Onik et al.,1985): aspirated
- LASER DISCECTOMY (Asher & Choi,1986): thermic
- **ENDOSCOPIC MICRODISCECTOMY (Kambin,1992): mechanical**
- **VIDEOENDOSCOPIC MICRODISCECTOMY (2000): mechanical**
- NUCLEOPLASTY™ (2001): thermic
- DEKOMPRESSOR™ (2005): aspirated
- NUCLEOTOME™ (2005): aspirated
- DISC-FX SYSTEM™ (2008): thermic
- SPINEJET™ (2009): aspirated
- DIODE LASER (2010): thermic
- OTHERS



# TRIANGULAR SAFE ZONE (KAMBIN'S SAFE ZONE)

TRIANGULAR **ENTRY** SPACE  
IN THE FORAMEN  
THROUGH WHICH THE  
WORKING CANNULA CAN  
BE SAFELY INTRODUCED  
IN POSTEROLATERAL  
PERCUTANEOUS  
PROCEDURES



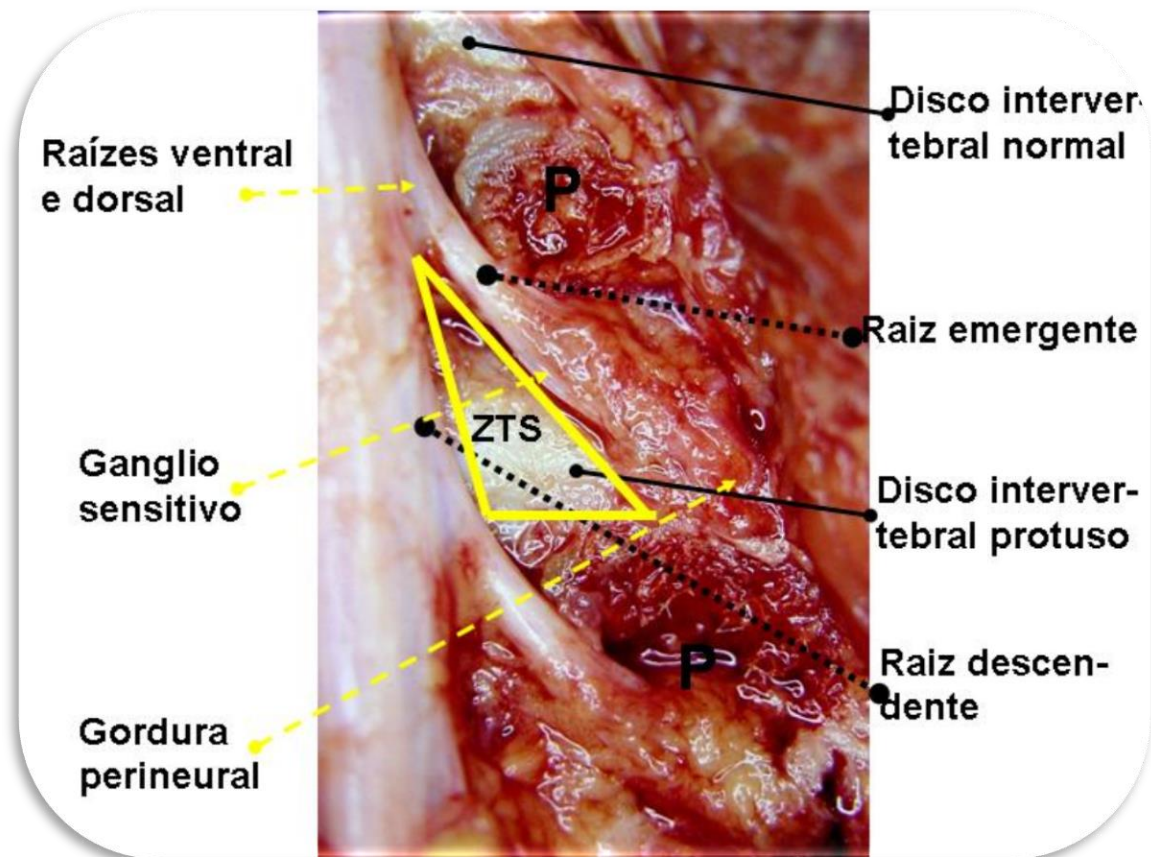
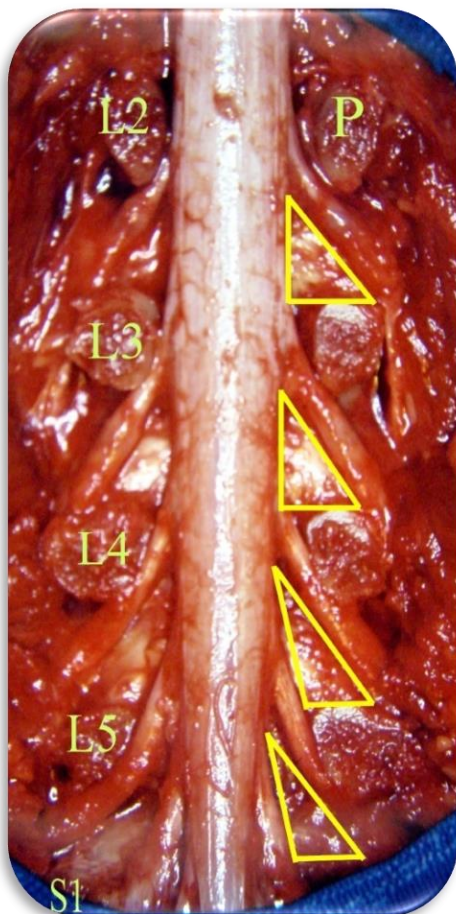
KAMBIN e BRAGER, Clin Orthop, 1987

**FORAMINAL PORTAL**

**PARVIZ KAMBIN (1990)**

TRIANGULAR PROCEDURE ZONE

# TRIANGULAR SAFE ZONE



Choi, P. S., Estudo anatômico da zona triangular de segurança aplicado aos procedimentos percutâneos pósteros-laterais lombares. Thesis, Orthopedic Institute – University of São Paulo, 2000

Revista COLUNA; V. 2, N. 1, Abril 2003  
<http://www.coluna.com.br/revistacoluna/>

CHOI, P. S. et al. Fundamental anatomic aspect of the lumbar foraminal zone Applied to the transforaminal procedures. In: ARVIND BHAVE, Modern Techniques in spine surgery, P.1-3, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, 2015

2000

# SBC/CCMI



FOUNDATION: 2004

FOUNDING PRESIDENT: PIL SUN CHOI

FIRST NATIONAL ANNUAL SYMPOSIUM: **SIMINCO - 2004**

VENUE: HOSPITAL ROBERTO A. SODRÉ (AACD) - SÃO PAULO



FOUNDATION: 2005

FOUNDING PRESIDENT: PIL SUN CHOI (2006/2008)

FIRST NATIONAL BIENNIAL CONGRESS (**COMINCO - 2008**)

VENUE: GRAMADO (RS)

CONGRESS CHAIRMAN: ERNANI ABREU



# SIMINCO

## SIMINCO - INTERNATIONAL SYMPOSIUM OF MINIMALLY INVASIVE SPINE SURGERY

- ✓ SHOWCASE OF NEW MINIMALLY INVASIVE SPINE SURGERIES AND TECHNIQUES
- ✓ MAIN FEATURE: LIVE SURGICAL DEMONSTRATIONS AND BROADCAST TO THE AUDITORIUM



Jean Destandau 2004



Anthony  
Yeung



Stephan Joubert 2006



Sang Ho Lee 2007



Gun Choi 2009



Thomaz Hoogland 2010



Hyeun Sung Kim 2012



Jeffrey Wang 2016



Sang Kyu Son 2018

# COMINCO -GLOBAL LEADERS

## COMINCO - BRAZILIAN CONGRESS OF MINIMALLY INVASIVE SPINE SURGERY

MAIN CHARACTERISTIC - INTEGRATION OF THE MAIN NATIONAL SPINE ENTITIES: BRAZILIAN PAIN SOCIETY (SBED), BRAZILIAN ORTHOPEDICS SOCIETY (SBOT) AND BRAZILIAN NEUROSURGERY SOCIETY (SBN); AND INTERNATIONAL MISS ENTITIES (IIITS, IMLAS, ISMISS, SICCM, SMISS) ALONG SIDE HIGH SCIENTIFIC LEVEL

2008



A. YEUNG

SANG HO LEE

MARIO BROCK

2010



H. LEU

J. DESTANDAU

R. FESSLER

2012



GILLES DUBOIS

JOHN CHIU

KEVIN FOLEY

2014



T. HOOGLAND

PIL SUN CHOI

JOSÉ SORIANO

2016



HYEUN SUNG KIM

LUIZ PIMENTA

JORGE RAMIREZ

Renowned surgeons who, somehow, whether by teaching, researching, assisting or promoting surgeries and minimally invasive spine techniques, have encouraged the development of the specialty worldwide



# FELLOWSHIP- CCMI/SBC-MISS

## **GERMANY (2009-2014)**

Service of Prof. Dr. Uwe Vieweg

Location: Leopoldina Krankenhaus, Schweinfurt

Duration: 6 months

Scholarship: AESCULAP

## **SOUTH KOREA (2008-2013)**

Service of Prof. Dr. Sang Ho Lee

Location: Wooridul Spine Hospital (WSH) in Seoul, South Korea ([www.wooridul.com](http://www.wooridul.com))

Duration: 01 year

Scholarship: WSH

## **UNITED STATES (2014-2018)**

NASS President: Jeffrey Wang

Location: several U.S. universities

Duration: 3 months

Scholarship: NASS



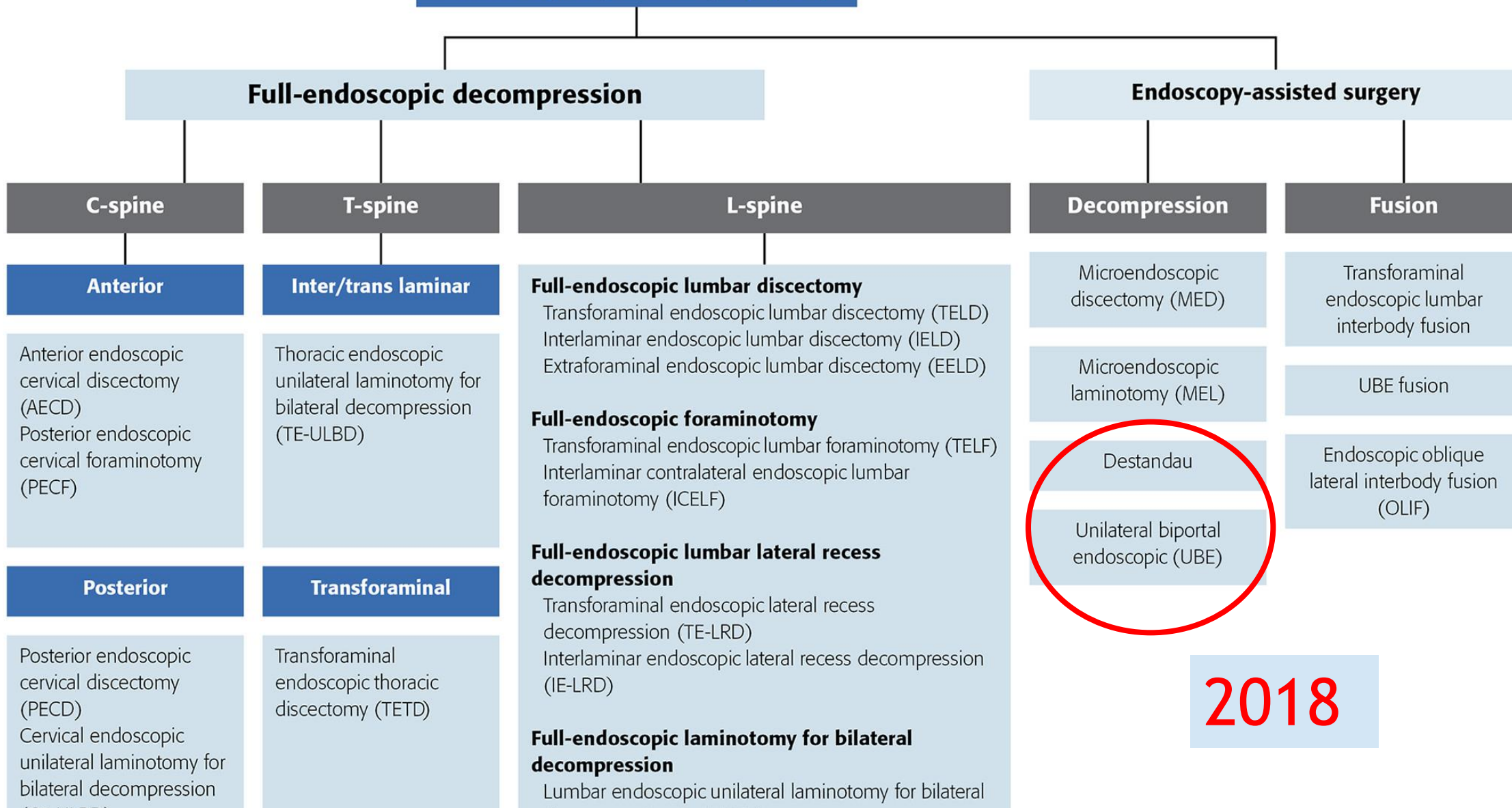
2010-



2012



# Endoscopic spine surgery (ESS)

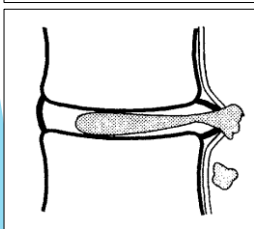
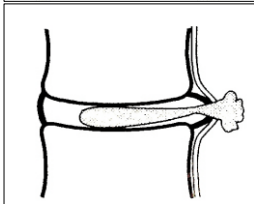
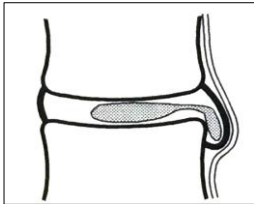
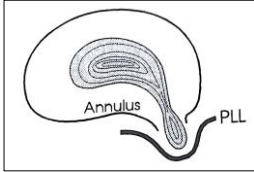


2018

# ENDOSCOPIC SPINE SURGERY (FULL ENDOSCOPY)

## TRANSFORAMINAL

CONTAINED DISC  
EXTRUSION



NON CONTAINED



Lee SH et al. ,Mt Sinai J Med ( 2006)

**LIMITATIONS: LARGE CENTRAL DISC HERNIATION  
AND CENTRAL AND SUBARTICULAR CANAL  
STENOSIS**

✓ LUMBAR  
✓ TORACIC

# FULL ENDOSCOPIC DISCECTOMY/DECOMPRESSION (TRANSFORAMINAL)

- CHALLENGING TECHNIQUE
- SURGEON MUST BE SKILLFUL
- **NOT SO EASILY REPRODUCIBLE**
- SOME TECHNICAL LIMITATIONS
- USUALLY MORE EXPENSIVE THAN MICRODISCECTOMY

GIBSON JNA ET AL., EURO SPINE J MED (2017)

RANDOMIZED CONTROLLED TRIAL TED X MICRODISCECTOMY.

A GREATER REVISION RATE AFTER TED WAS OFFSET BY A MORE RAPID RECOVERY

## PUBMED

LAST 36 YEARS: 1014 PUBLICATIONS

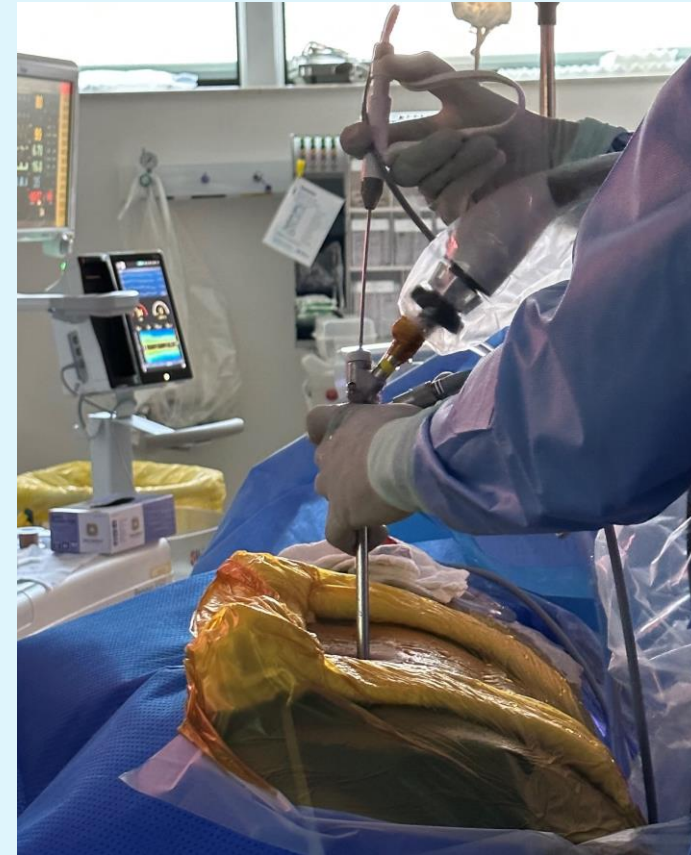
2018/2019: 100 PUBLICATIONS (85 ASIAN)

CHINA: 57 (67%)/OTHERS (SOUTH KOREA, JAPAN, INDIA, ITALY, BRAZIL, ETC.)



# ENDOSCOPIC SPINE SURGERY (FULL ENDOSCOPY)

## INTERLAMINAR



- ✓ LUMBAR
- ✓ CERVICAL
- ✓ TORACIC

**COMPLETES THE LIMITATIONS OF  
TRANSFORAMINAL ACCESS**

# FULL ENDOSCOPY DECOMPRESSION/DISCECTOMY (INTERLAMINAR)

- ✓ TECHNICALLY EASIER THAN TRANSFORAMINAL TECHNIQUE
- ✓ SHORTER LEARNING CURVE IF COMPARED TO TRANSFORAMINAL TECHNIQUE
- ✓ TECHNOLOGICAL DEVELOPMENT (INSTRUMENTAL, ENDOSCOPE, TV MONITOR, DRILL, RADIO FREQUENCY, ETC.)
- ✓ COMPLETE THE TRANSFORAMINAL TECHNIQUE
- ✓ LESS INVASIVE OPTION THAN DESTANDAU, METRIX & MICROSCOPIC TECHNIC
- ✓ MORE EXPENSIVE THAN MICROSCOPIC TECHNIC

Cost analysis comparison between conventional microsurgical decompression and full-endoscopic interlaminar decompression for lumbar spinal stenosis surgery  
Prudence Wing Hang Cheung<sup>1</sup>, Carlos King Ho Wong<sup>2,3</sup>, Sin Ting Lau<sup>1</sup>, Jason Pui Yin Cheung<sup>1,4</sup>  
*J Spine Surg* 2020;6(4):721-728

Contraindications and Complications of Full Endoscopic Lumbar Decompression for Lumbar Spinal Stenosis: A Systematic Review  
Chang-Il Ju, Pius Kim, Sang-Woo Ha, Seok-Won Kim, Seung-Myung Lee; *World Neurosurg.* (2022) 168:398-410.

# FULL ENDOSCOPIC DISCECTOMY/DECOMPRESSION (TRANSFORAMINAL)

BEFORE



L5 RIGHT SCIATICA PAIN

AFTER



EXTRUDED DISC HERNIATION L4-5 & SPONDYLOLISTHESIS L5-S1 GRADE 1 - LITIC TYPE

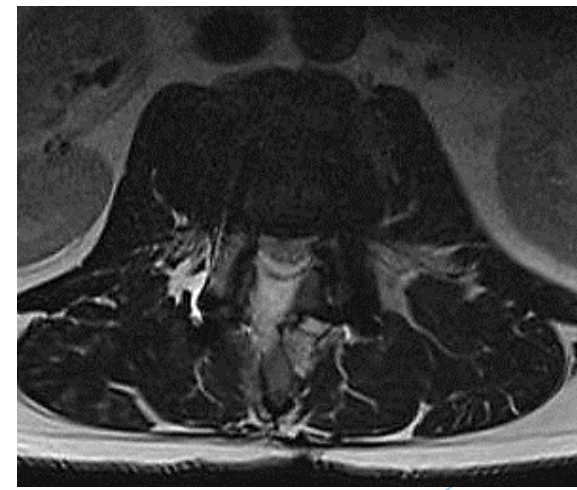


# FULL ENDOSCOPY DECOMPRESSION/DISCECTOMY (INTERLAMINAR)

BEFORE



AFTER



LUMBAR SPINE STENOSIS - JUNCTIONAL SYNDROME L2-3 (2 WEEKS)

# DEGENERATIVE DISEASE OF SPINE (HERNIA & STENOSIS)



DEGENERATIVE DISEASE OF  
CERVICAL SPINE (CANAL  
STENOSIS)



DEGENERATIVE DISEASE OF SPINE  
(EXTRUDED DISC HERNIATION)



DEGENERATIVE DISEASE OF  
LUMBAR SPINE (CANAL STENOSIS)

W. RAUSCHNING

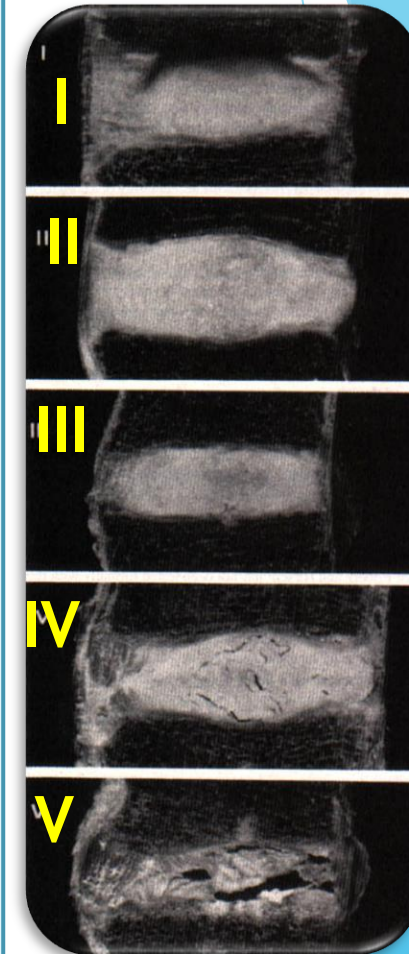
# DEGENERATIVE CASCADE OF SPINE (KIRKALDY WILLIS)

✓ **NORMAL DISC**

✓ **FASE 1 - DISFUNCTION**

✓ **FASE 2 - INSTABILITY**

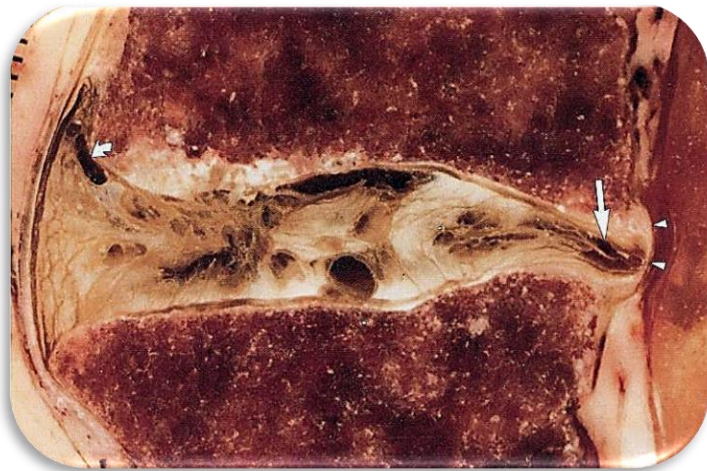
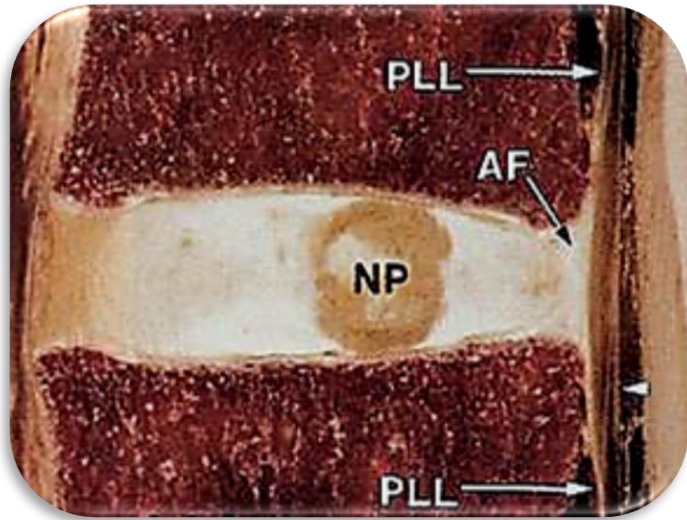
✓ **FASE 3 - RE-STABILITY**



PFIRRMANN



## DEGENERATIVE DISEASE OF SPINE (MOTION SEGMENT)



W. RAUSCHNING

- ✓ BENIGN DISEASE
- ✓ NATURAL TENDENCY TO CURE
- ✓ USUALLY, ASYMPTOMATIC
- ✓ END RESULT: **AUTO FUSION**
- ✓ SMALL MINORITY EVOLVES TO SYMPTOMATIC CANAL STENOSIS, THAT WILL NEED SOME KIND OF **DECOMPRESSION**

# HISTORICAL EVOLUTION OF SURGICAL TREATMENT OF LUMBAR DISC HERNIA

EXPLORATORY LAMINECTOMY (Elsberg, 1916)

LIMITED LAMINECTOMY (Mixer & Barr, 1934)

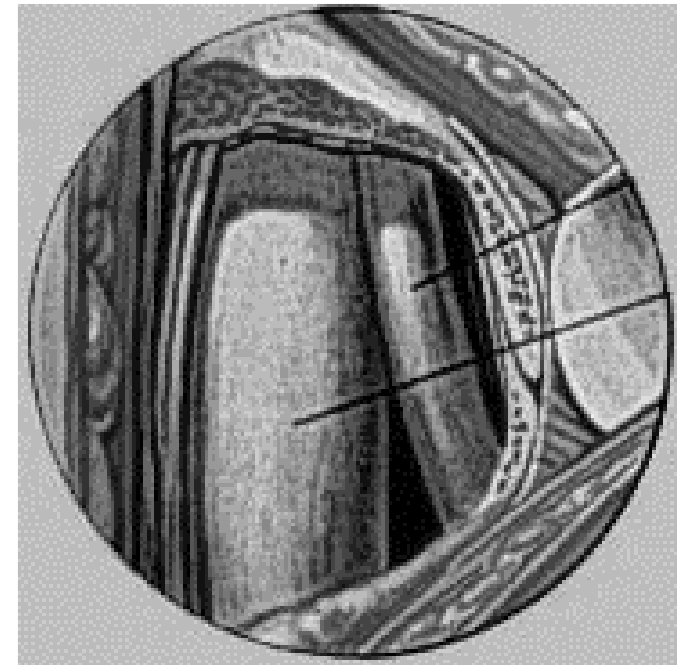
ANTERIOR ACCESS (Lane & Moore, 1948)

RETROPERITONIAL ANTERIOR ACCESS (Hult, 1951)

MICROSURGICAL (Yasargil, Carpar (1977), Williams (1978))

ENDOSCOPIC (Kambin, Destandau, Yeung, Hoogland, Ruetten, Gun Choi & Others, 1990/2020)

MIXTER & BARR, 1934



IPSILATERAL LIMITED LAMINECTOMY

# CHANGE IS INEVITABLE.

EVERYTHING AND EVERYONE WE KNOW IS A CONSTANT STATE OF FLUX



- ✓ PEOPLE
- ✓ TECHNOLOGY
- ✓ INFORMATION
- ✓ SPINE SURGERY

HAS CHANGED AND IT  
WILL CONTINUE TO  
CHANGE TOWARD TO  
**ENDOSCOPIC  
TECHNIQUES**

MAURÍLIO AMORIM

<http://www.maurilioamorim.com/2012/01/are-you-adapting-to-the-change-accelerators/>