

LUNCH PRESENTATION

DUAL PORTAL ENDOSCOPIC DECOMPRESSION FOR BERTOLOTTI'S SYNDROME, FAR OUT SYNDROME



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- 2021 – 2023 Clinical associate professor in Spinal Neurosurgery, [Severance Hospital, Seoul, Korea](#).
- Korean minimal invasive spinal surgery society (**KOMISS**) executive director.
- Korean spinal endoscopic surgery society (**KOESS**) academic secretary.
- **Busan-Ulsan spinal endoscopy research society** general affairs director.
- The **world UBE** research society executive director.
- **Amplify Dual portal endoscopic surgery symposium, UCLA, CA, USA 2023 Faculty**
- *Master's Degree of Yonsei University*



I've been to California twice

1. **Stanford** medicine
visiting fellow(2015.11)



2. Amplify symposium at
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3 Textbooks as 1st author

Unilateral Biportal Endoscopic Spine Surgery

Basic and Advanced Technique

Far-out Syndrome Decompression Using Unilateral Biportal Endoscopy

11

Nam Lee, Sang Hyuk Park, and Jin Woo An

11.1 Introduction

Far-out syndrome (FOS) is one type of lumbosacral transitional vertebrae (LSTV). LSTV is a various anatomical variant of lumbosacral junctional area. There are four types of LSTV [1, 2]. Among them, type 2 shows the pseudo-articulation between L5 transverse process and sacral ala, and in addition, the foraminal height is decreased than normal structure. Therefore, FOS is defined as the compression of L5 nerve root in the far-out area by the pseudo-articulation of the L5 transverse process and the sacral ala (Fig. 11.1). The gold standard treatment of FOS is a conventional microscopic decompression surgery or lumbar fusion surgery [3–6]. However, due to the development of endoscopic surgery system, we can treat this lesion sufficiently using unilateral biportal endoscopy (UBE)

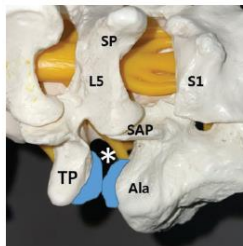


Fig. 11.1 This figure shows the fundamental concept of an extra-foraminal lesion. The blue overlaid areas indicate the pseudo-articulation of the hypertrophied transverse process and sacral ala. The exiting L5 nerve root is compressed in the narrow area (*)

Advanced Techniques of Endoscopic Lumbar Spine Surgery

Hyeun Sung Kim
Michael Mayer

Biportal Endoscopic Approach (Biportal Endoscopic Lumbar Discectomy)

Nam Lee, Dong Hwa Heo, and Choon Keun Park

Introduction of Approach

Microdiscectomy is the gold standard surgical treatment for lumbar disc herniation refractory to conservative managements. Recently, various endoscopic approaches have been attempted for lumbar disc herniation. Among them, the technique of biportal endoscopic lumbar discectomy was based on microscopic surgery, and similar to microdiscectomy. Therefore, surgical anatomy and orientation of biportal endoscopic lumbar discectomy may be familiar to spine surgeon.

Biportal endoscopic surgery used two channels. First portal is endoscopic portal and the other is working portal [1–3]. General spine surgical instruments as well as endoscopic specialized instruments can be used through working portal (Fig. 1). Relative shorter learning curve is

another advantage of biportal endoscopic lumbar surgery.

Indication and Contraindication

Indication of biportal endoscopic surgery is very similar with conventional lumbar microsurgery. All types of herniated lumbar disc (HLD) including protrusion, extrusion, sequestration type, and central, paracentral, bilateral disc herniation are indication of this procedure. In addition, recurrent lumbar disc herniation, calcified disc herniation, and cauda equina syndrome are also included in indication of this approach [1]. Foraminal and extraforaminal type HLD can be treated by paraspinous approach using biportal endoscopic surgery.

Core Techniques of Minimally Invasive Spine Surgery

Yong Ahn
Jin-Kyu Park

Unilateral Biportal Endoscopic Surgery (UBE) for Cervical and Thoracic Spine

Nam Lee

1 Introduction

Microscopic spinal decompression for degenerative cervical and thoracic disease is the gold standard surgical treatment. Especially, posterior keyhole foraminotomy for cervical foraminal stenosis or herniated cervical disc has shown successful outcomes [1]. Posterior microscopic discectomy for thoracic disc herniation also has shown favorable outcomes [2, 3]. Recently, due to the development of endoscopic spinal surgery system, we can resolve these lesions with unilateral biportal endoscopy (UBE) technique. Park et al. reported that endoscopic cervical foraminotomy using UBE surgery may be an alternative procedure for degenerative cervical foraminal disc protrusion [4]. This technique is similar to the conventional posterior surgical approach but has the advantages of less postoperative pain and faster recovery after surgery [5]. The purpose of this chapter is to describe the details of this UBE technique.

2 Indications

The indication of UBE surgery for degenerative cervical and thoracic lesion is very similar to conventional posterior decompression surgery using microscope. Indications for this technique include herniated cervical/thoracic disc (paramedian or foraminal or extra-foraminal type), foraminal stenosis of cervical spine, and ossification of ligamentum flavum (OLF) of thoracic spine. However, central herniated cervical/thoracic disc, cervical spondylotic myelopathy (CSM), and intrathecal disc herniation are contraindicated in this technique.

3 Special UBE Instruments

A zero-degree endoscope is mainly used in UBE surgery. Radiofrequency (Arthrocare®) probe is most commonly used to control intraoperative bleeding. The arthroscopic drill system with irri-

Bertolotti's syndrome (Far out syndrome)

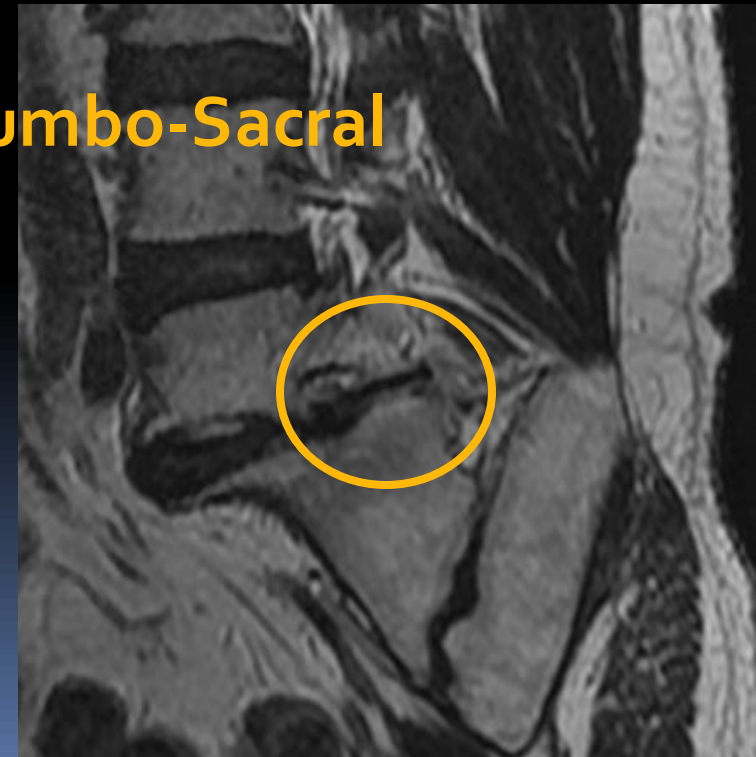
- Compression and entrapment of L5 root in the 'extra-foraminal' area between hypertrophied L5 transverse process & sacral ala

Wiltse LL, et al. The far-out syndrome. Spine 1984;9:31-41.

- One of the manifestations of **Lumbo-Sacral Transitional Vertebrae (LSTV)**

- **LSTV** is classified into **4 types**

Jancuska JM, Bertolotti's syndrome. Int J Spine Surg 2015;9:42.



#LSTV 4 types

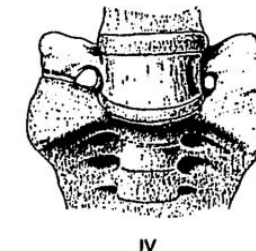
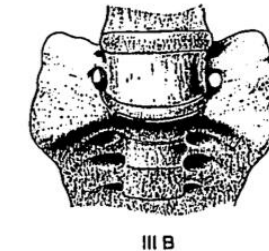
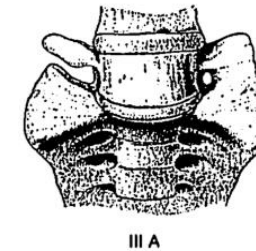
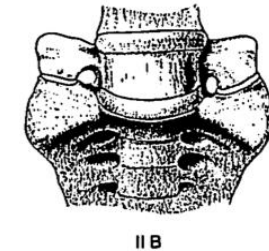
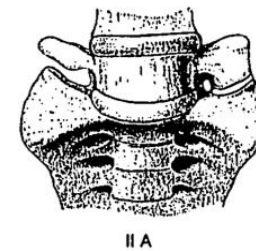
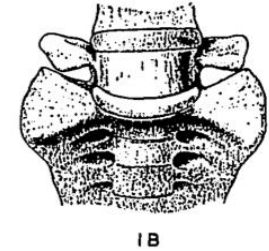
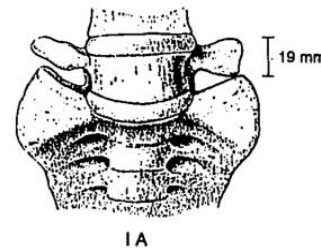
- Type I: Dysplastic TP, measuring at least 19mm



Type II: **Incomplete** lumbarization/sacralization with an enlarged TP & Ala

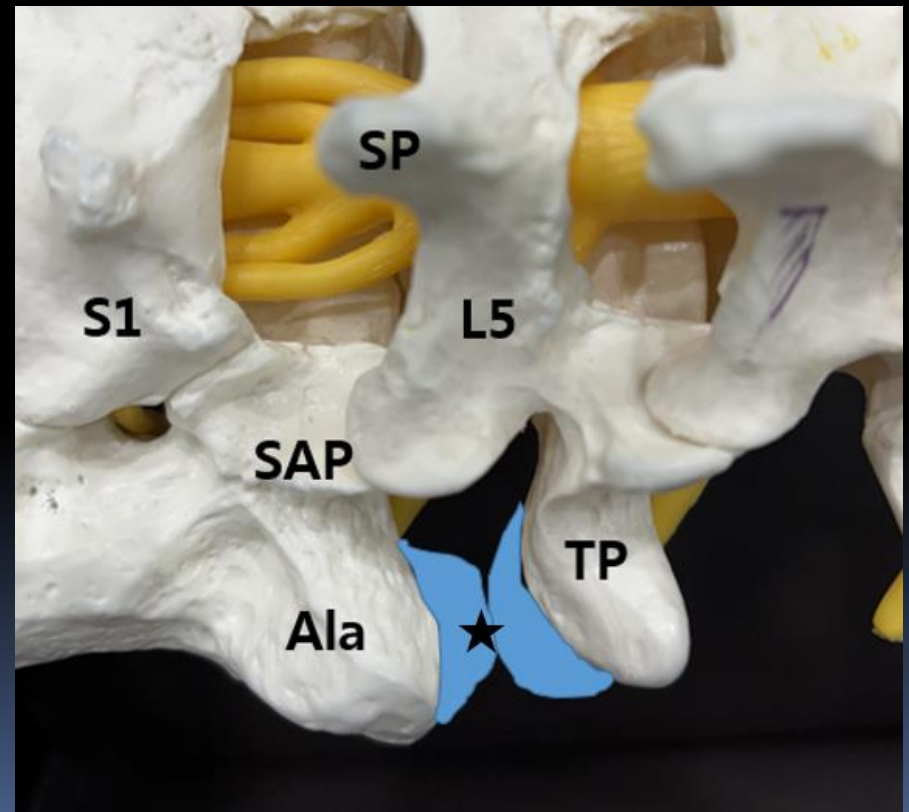
Pseudo-arthrosis

- Type III: Lumbarization/sacralization with **complete osseous fusion** of the TP to the sacrum.
- Type IV: Unilateral type II transition with a type III on the contralateral side

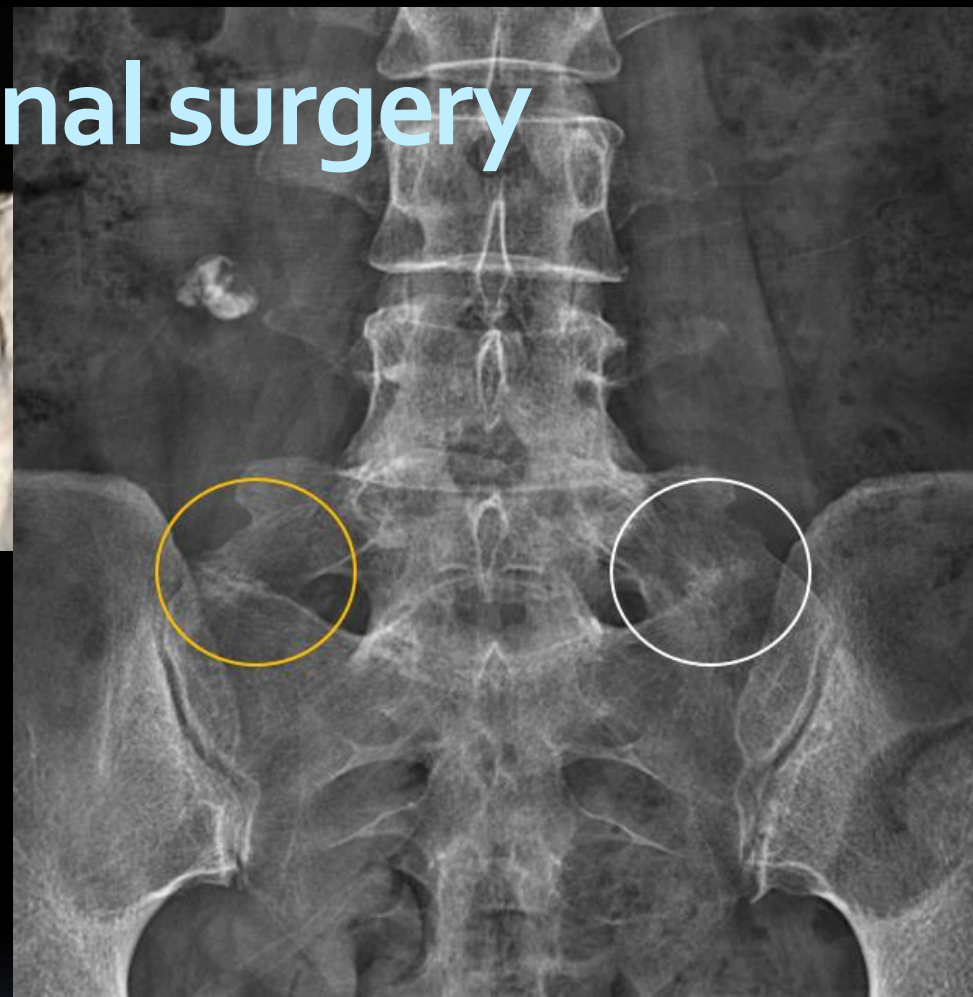
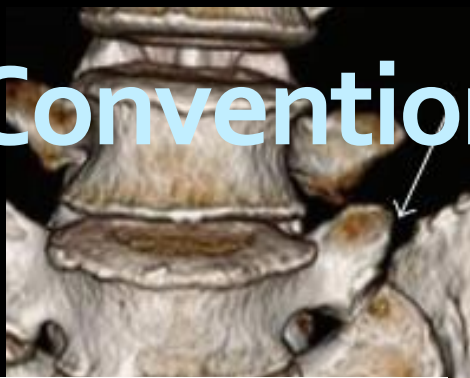


Goal of surgery is to remove the “pseudo-articulation”

- It is located between the L5 transverse process and the sacral ala



Conventional surgery



Minimally invasive tubular resection of the anomalous transverse process in patients with Bertolotti's syndrome

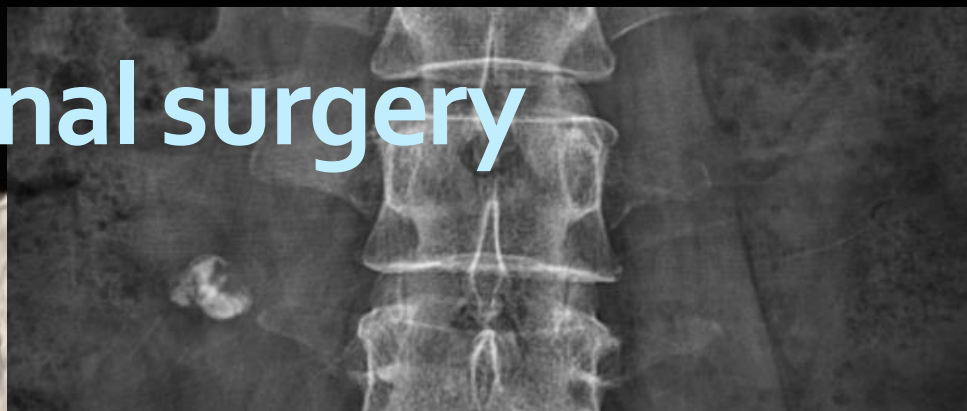
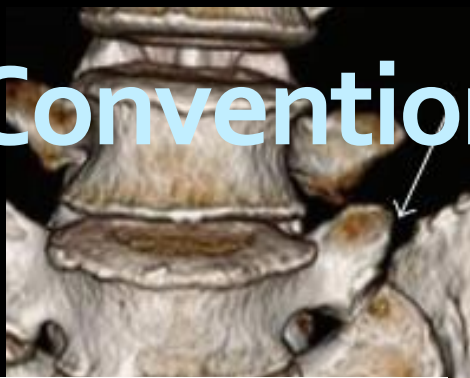
Presented at the 2013 Joint Spine Section Meeting

Yumeng Li B.S.^{1,2,3}, Daniel Lubelski B.A.^{1,2,3}, Kalil G. Abdullah M....

[View More](#) +

Management of patients with Bertolotti's syndrome should be carefully considered. Adequate interventions may be required to elucidate the pain source. In cases of insufficient pain relief, surgical treatment such as resection of the transverse process or spinal fusion should be considered. The present case is a successful example of minimally invasive resection of the transverse process.

Conventional surgery



JNS JOURNAL OF NEUROSURGERY
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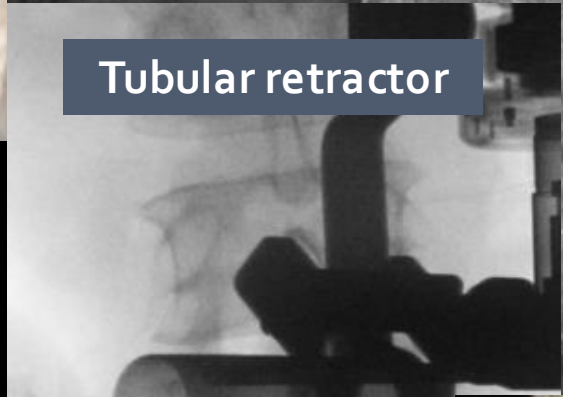
Home COVID-19

Minimally invasive tubular resection of the anomalous transverse process in patients with Bertolotti's syndrome

Presented at the 2013 Joint Spine Section Meeting

Yumeng Li B.S.^{1,2,3}, Daniel Lubelski B.A.^{1,2,3}, Kalil G. Abdullah M.... [View More +](#)

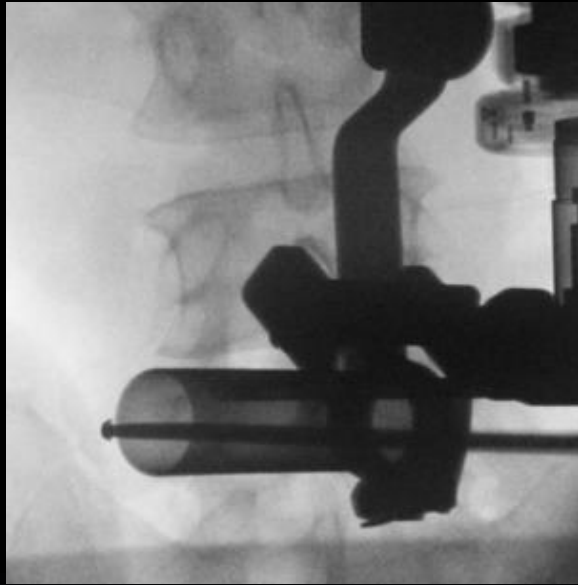
Tubular retractor



Management of patients with Bertolotti's syndrome should be carefully considered. Adequate interventions may be required to elucidate the pain source. In cases of insufficient pain relief, surgical treatment such as **resection of the transverse process** or **spinal fusion** should be considered. The present case is a successful example of minimally invasive resection of the transverse process.



Conventional → Novel technique



The goal is to perform this surgery with a **dual portal**

Bertolotti's surgery sequence

Position /Portal making (incision)

Identify land mark (SAP lateral surface)

Removal of bony structure and foramen ligament

Resection of pseudo-articulation

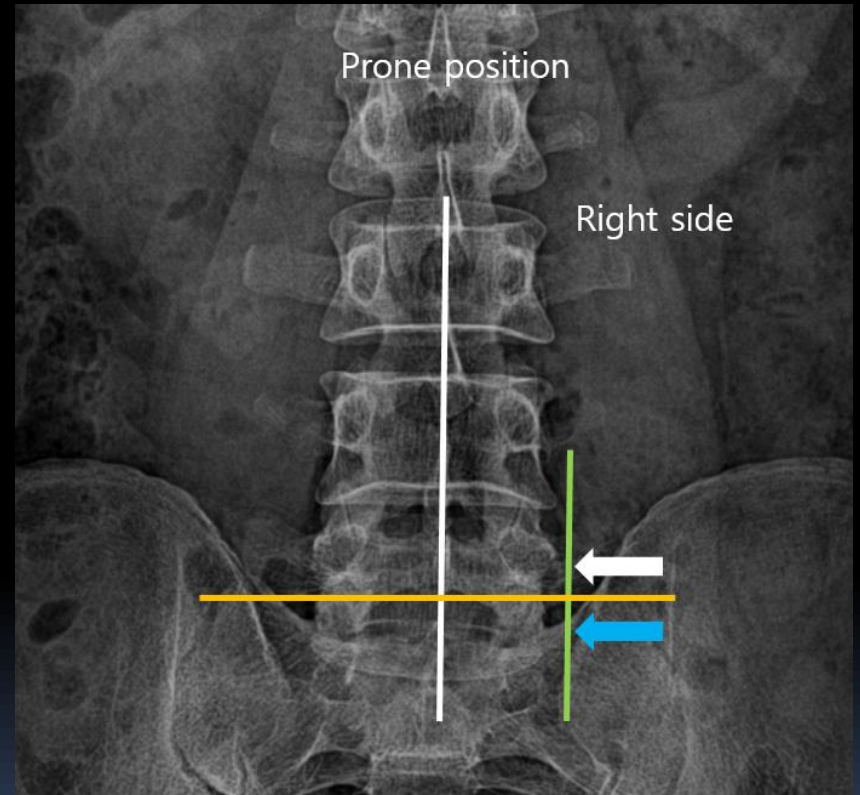
Identify distal part of L5 nerve root

Drain insertion/ Finish



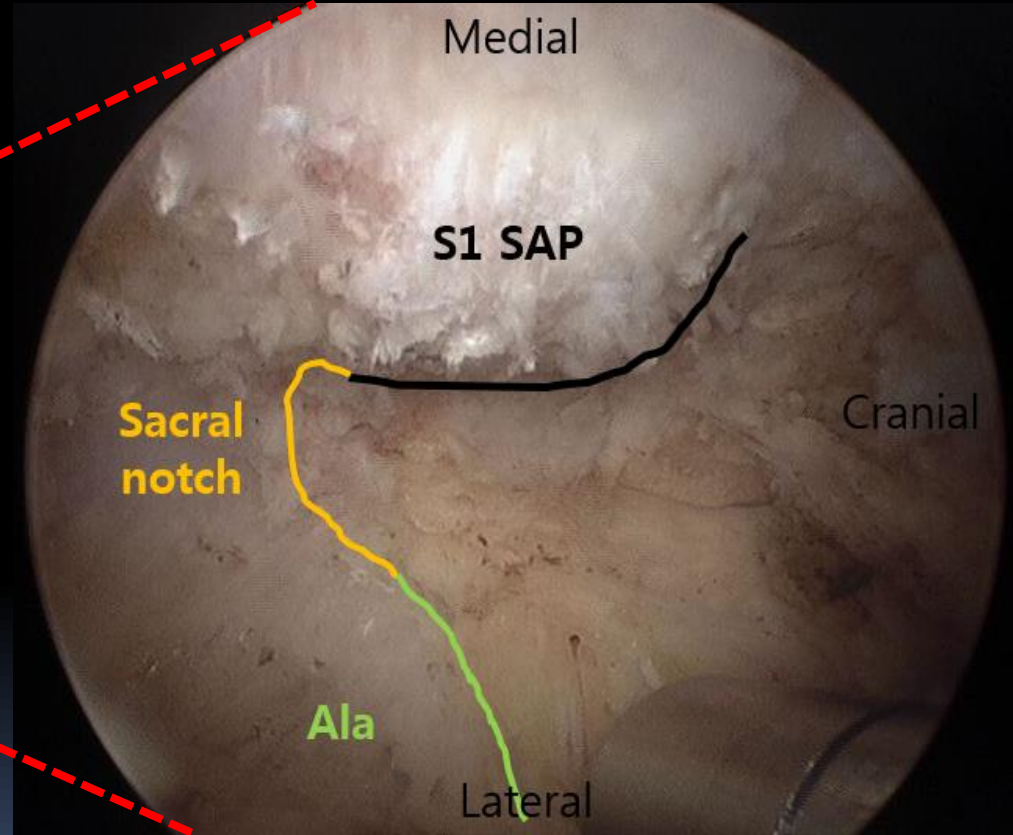
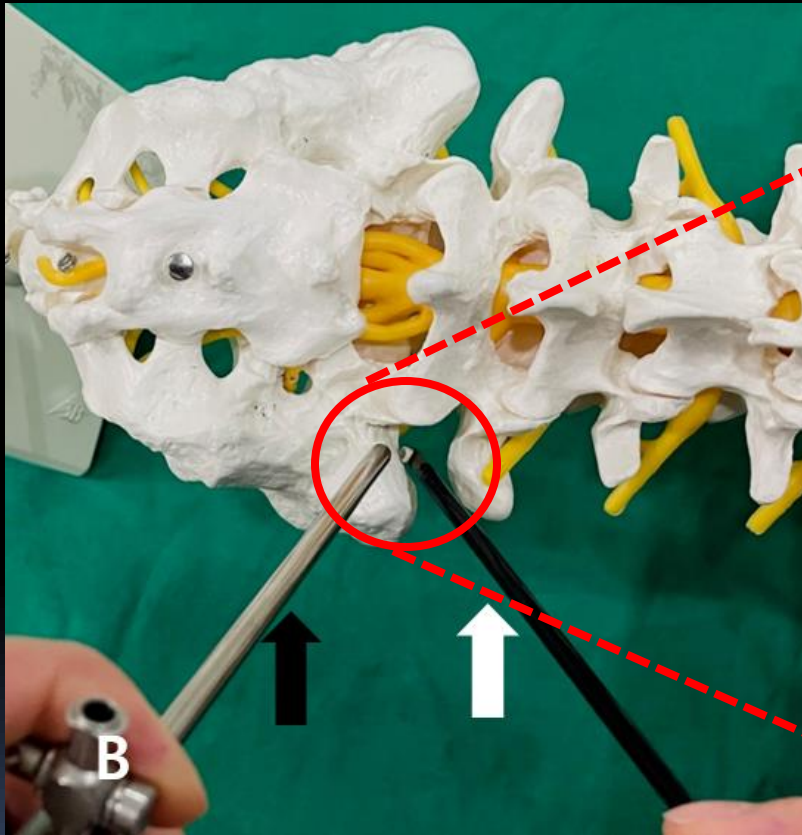
Position - prone

Portal making (incision)



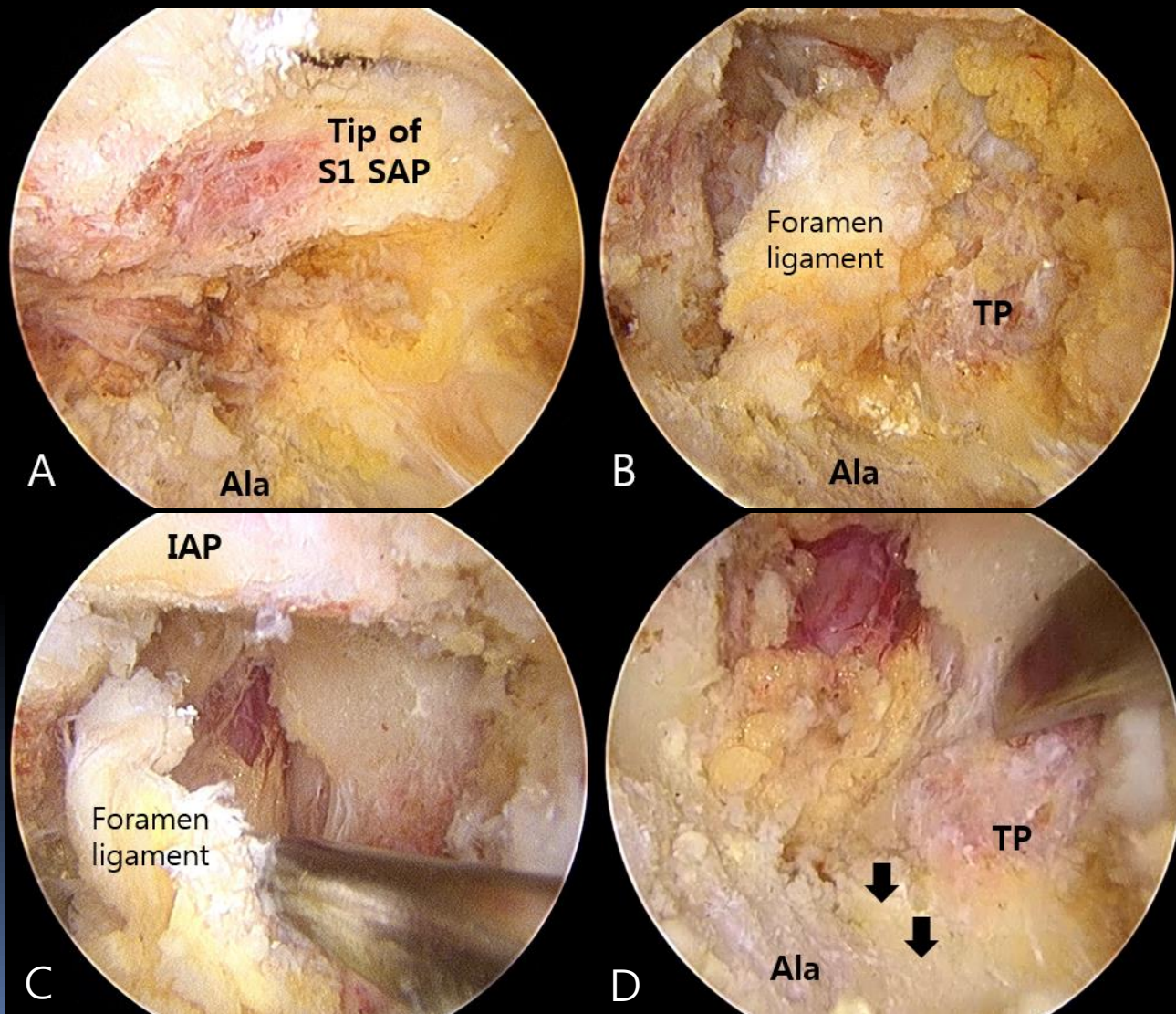
White arrow : Instrument portal
Blue arrow : Scope portal

Identify the land mark (SAP lateral surface)

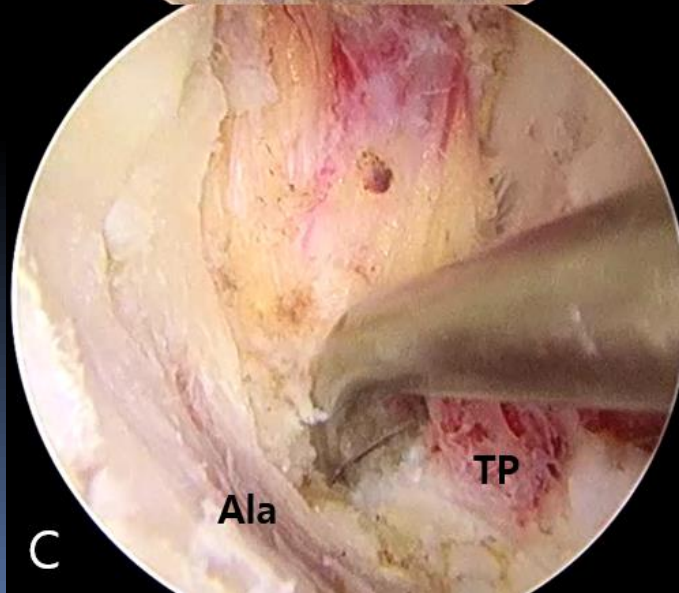
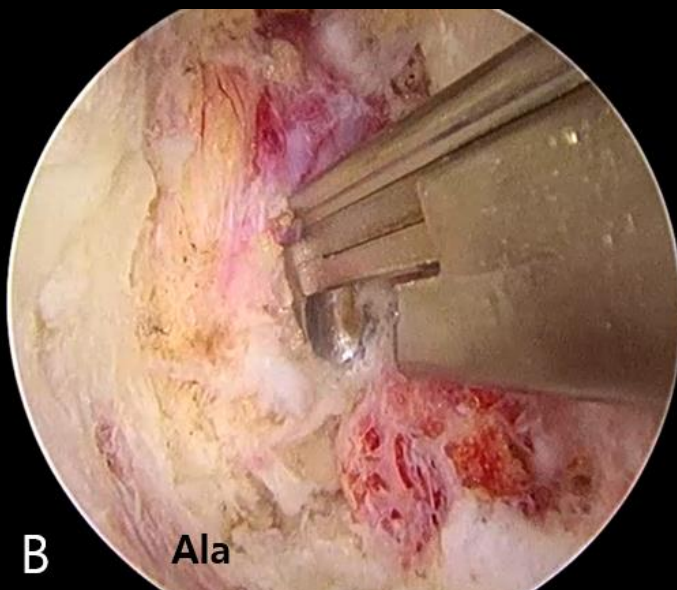
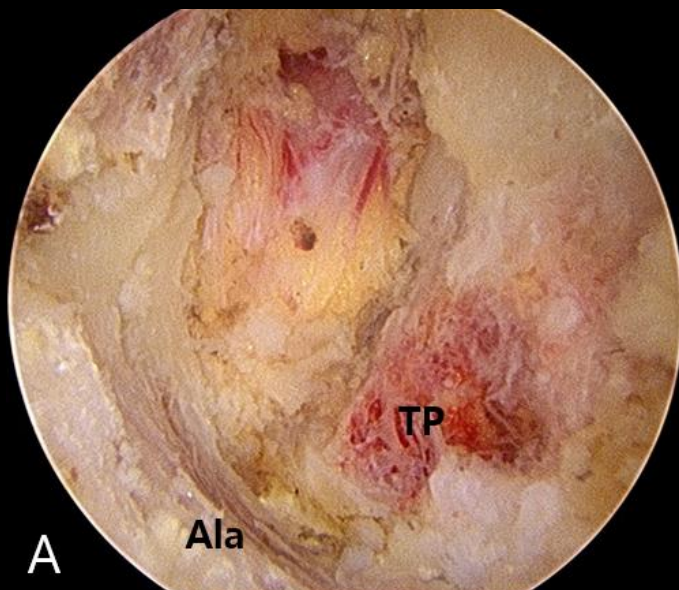


White arrow : Instrument (RF)
Black arrow : Scope

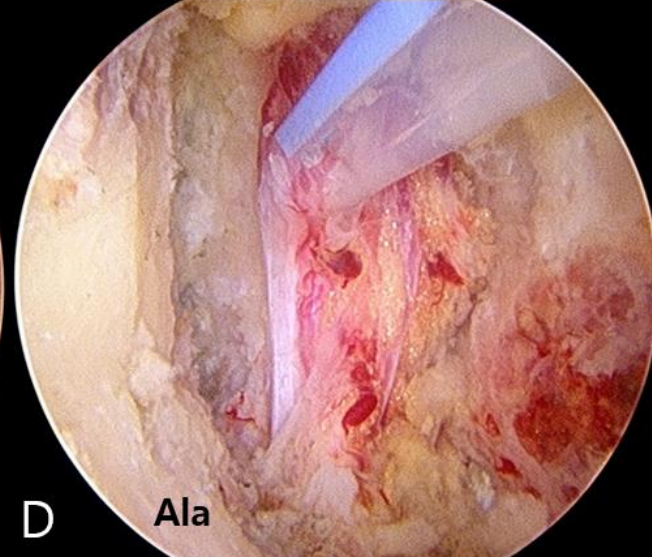
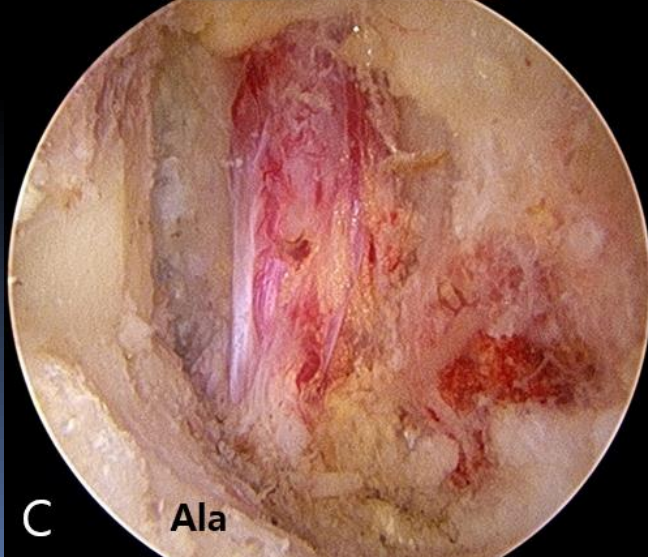
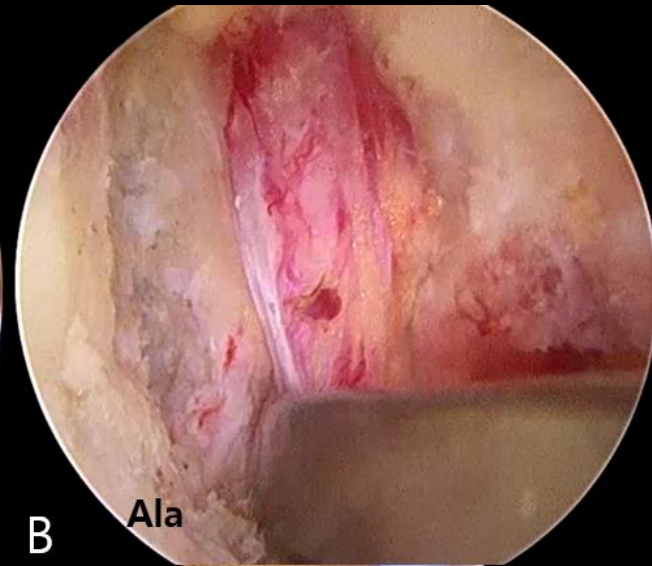
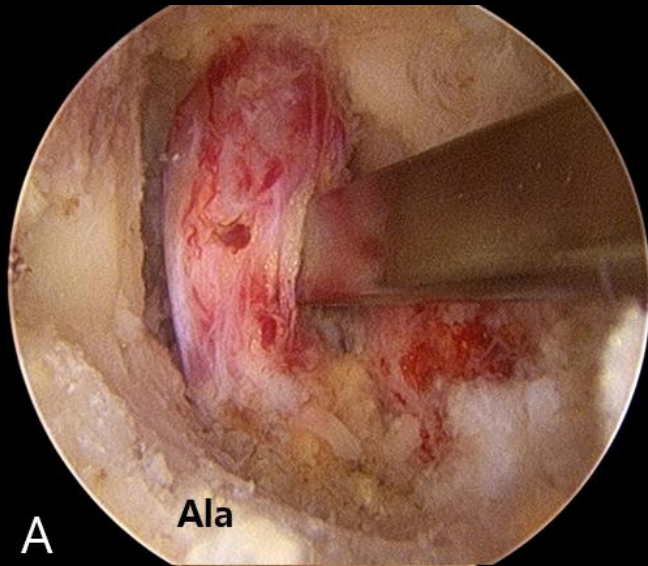
Removal of bony structure And foramen ligament



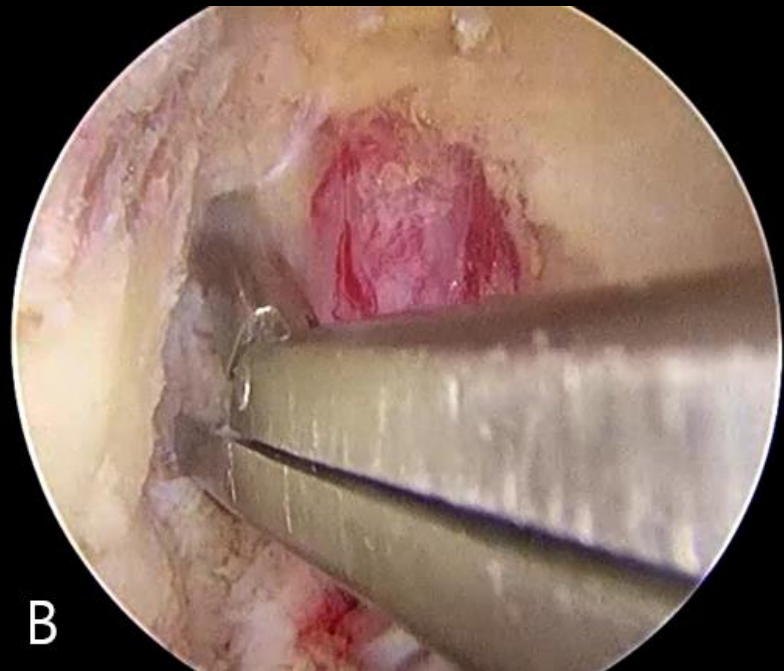
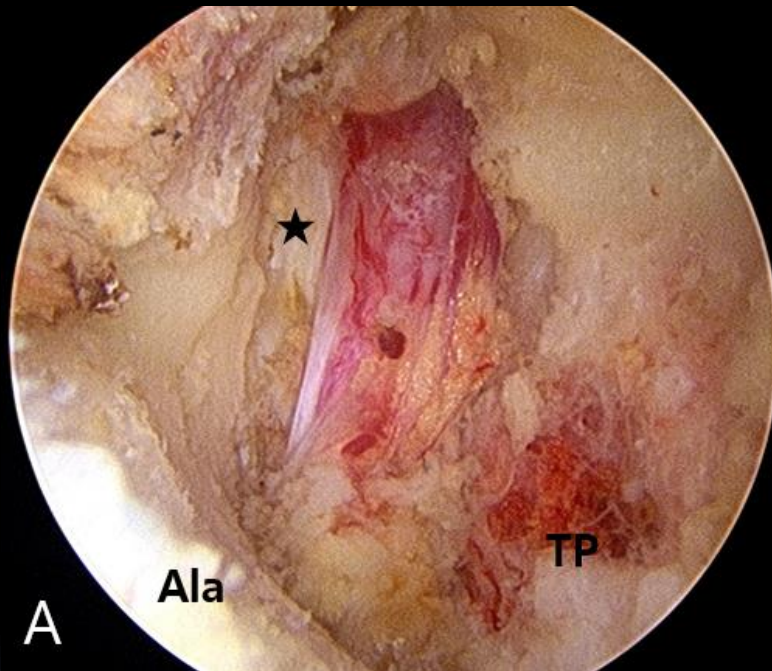
Resection of pseudo-articulation



Identify distal L5 nerve root / Drain insertion

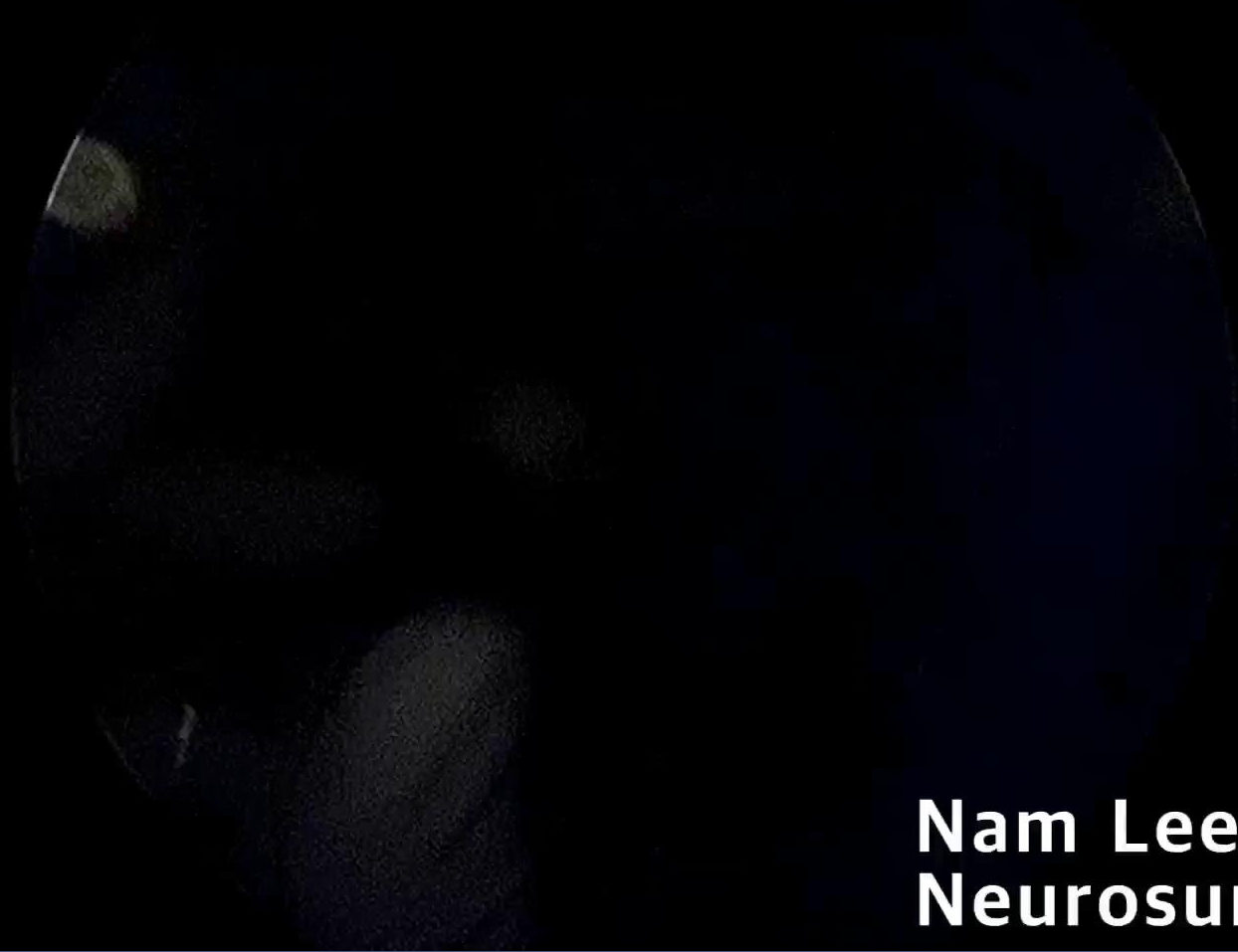


Option: you can add a discectomy



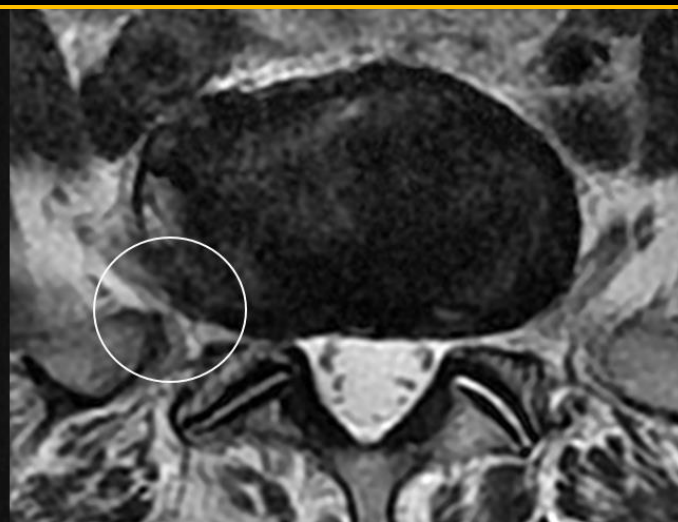
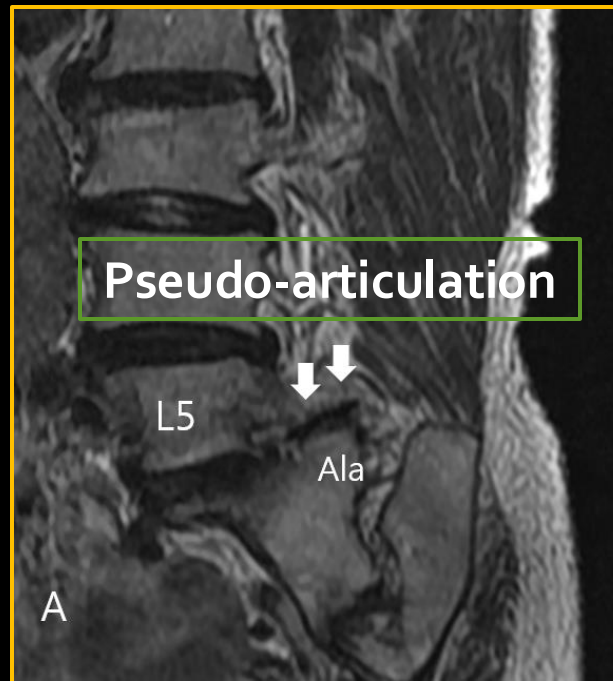
Operation video

 GOM Mix



Nam Lee, MD
Neurosurgery

Post-operative MRI images



Literature outcomes review

Neurospine 2019;16(1):130-137.
<https://doi.org/10.14245/ns.1938026.013>

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Original Article

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study as co-first authors.

Endoscopic Treatment of Extraforaminal Entrapment of L5 Nerve Root (Far Out Syndrome) by Unilateral Biportal Endoscopic Approach: Technical Report and Preliminary Clinical Results

Dong Hwa Heo*, Sagar Sharma*, Choon Keun Park

Department of Neurosurgery, Spine Center, The Leon Wiltse Memorial Hospital, Suwon, Korea

Table 1. Clinical parameters of patients

Characteristic	Value
Sex, male:female	4:10
Age (yr)	59.5 ± 7.2
Follow-up period (mo)	11.0 ± 5.0
Estimated blood loss (mL)	85.0 ± 29.5
Operation time (min)	72.8 ± 15.5
VAS of leg	
Preoperative	8.4 ± 1.1
Postoperative	2.8 ± 1.4
ODI	
Preoperative	60.2 ± 5.5
Postoperative	22.1 ± 3.4
MacNab criteria	
Excellent	3
Good	7
Fair	3
Poor	1
Complication	
Abdominal pain (perirenal fluid collection)	2 (1)

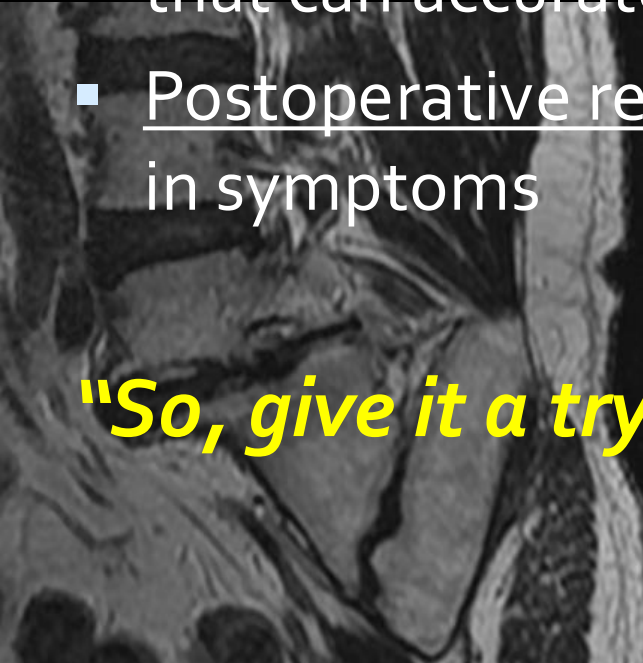
The mean leg VAS and the ODI were significantly improved after dual portal endoscopic surgery

Lecture summary

- **Bertolotti's syndrome** is caused by a pseudo-arthritis (transverse pro. and ala)
- The **goal** of this surgery is to remove it sufficiently
- **Dual portal surgery** is a minimally invasive surgery that can accurately reach the lesion and decompress it
- Postoperative results also show **notable improvement** in symptoms




"So, give it a try and I hope you get good results"




Thank you for attention!!

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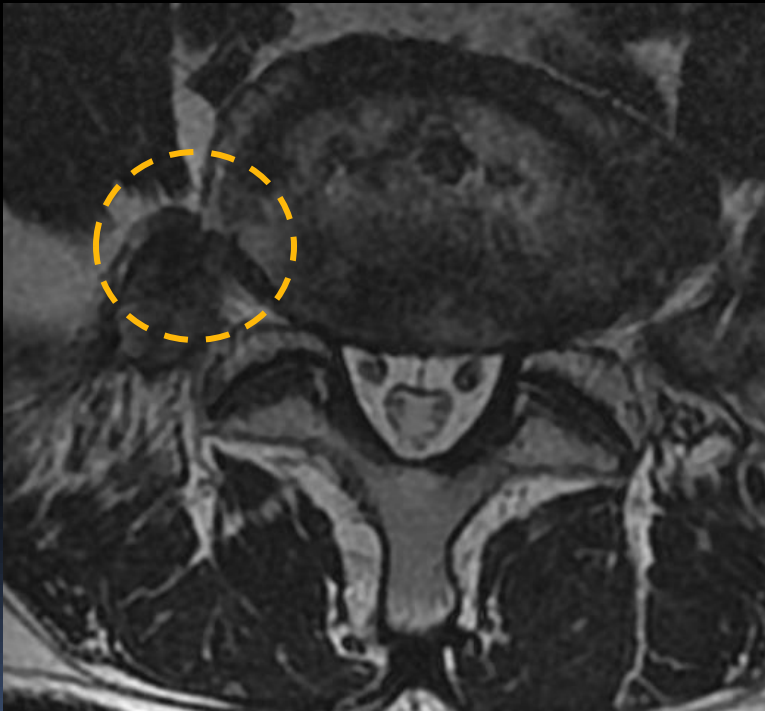
dualPortal  dualX

A novel **two-portal endoscopic** approach to the spine

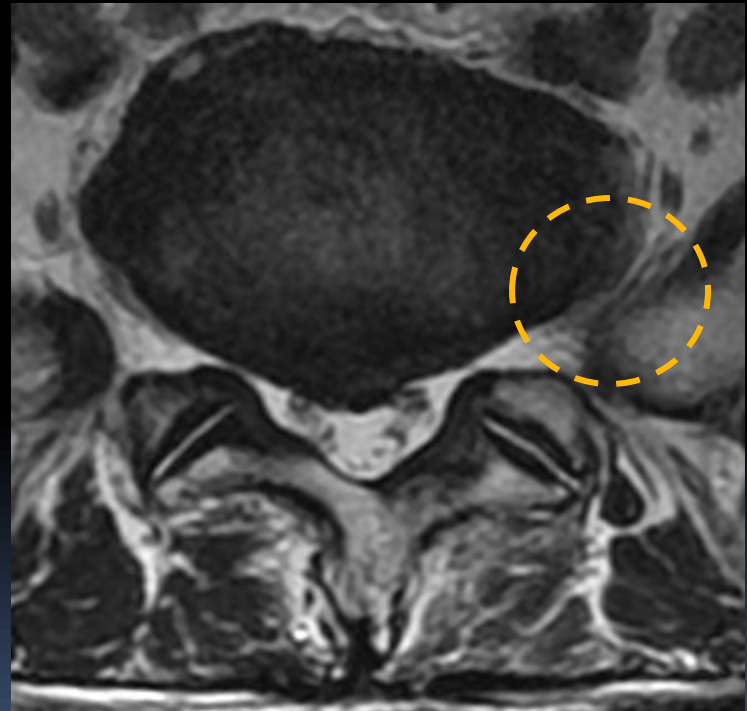


Another cases

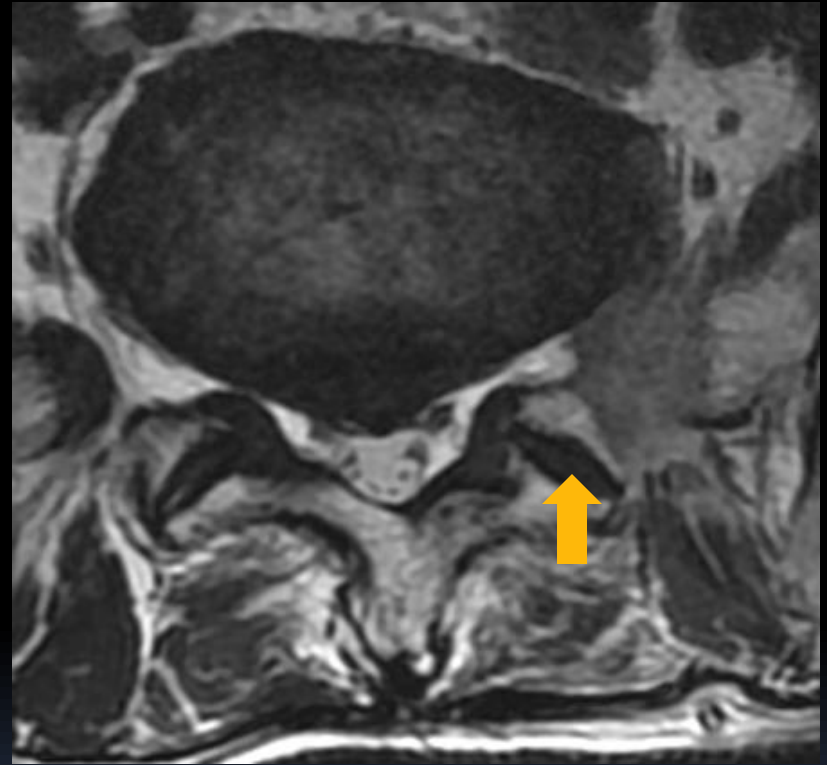
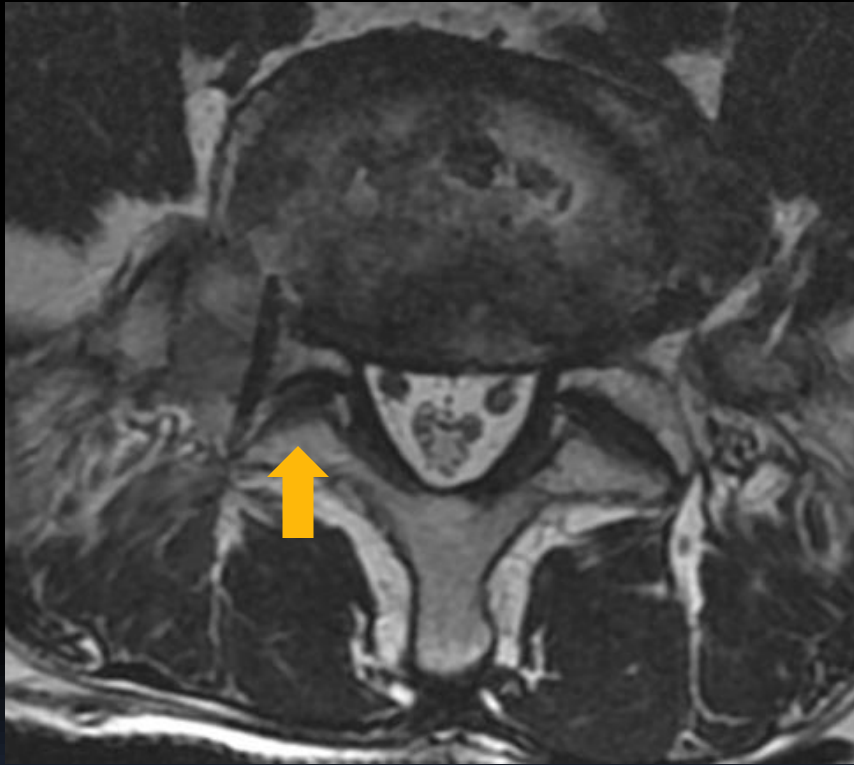
Rt side FOS



Lt side FOS

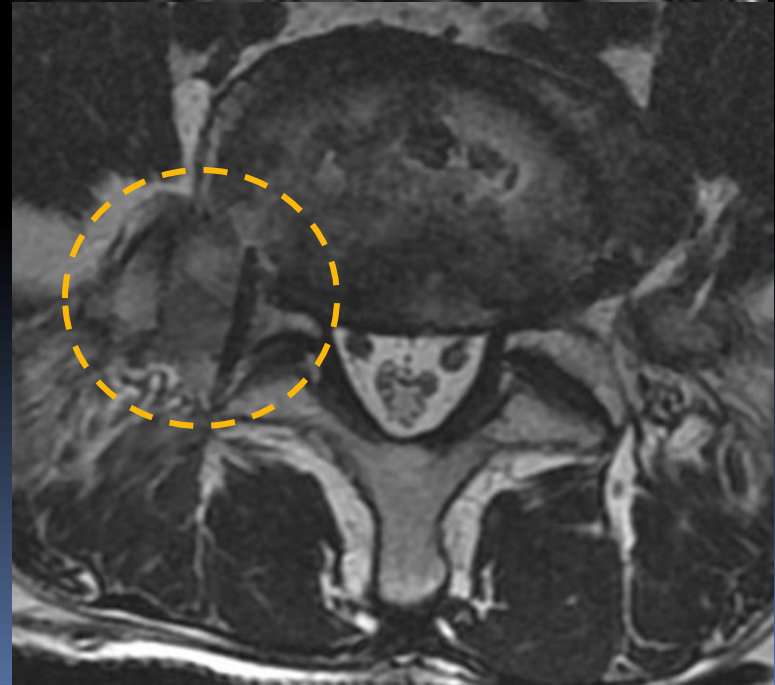
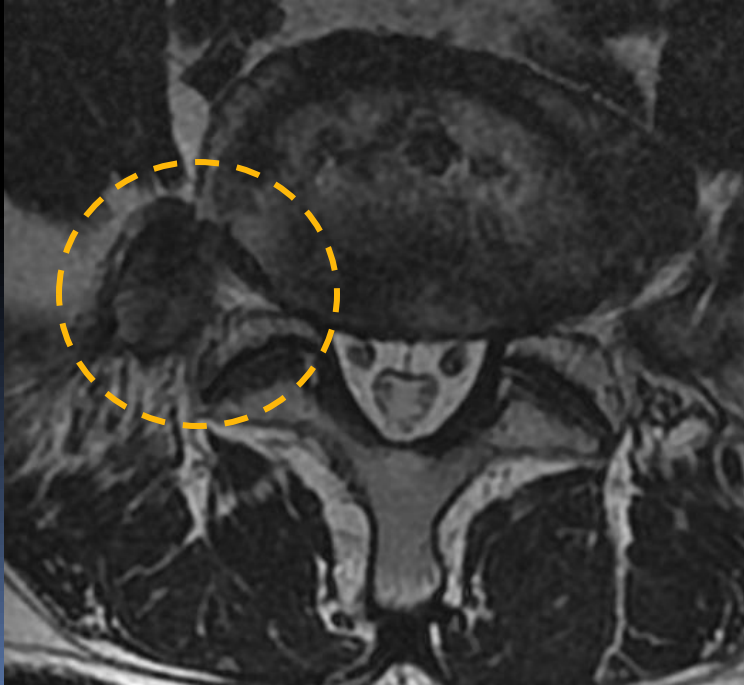
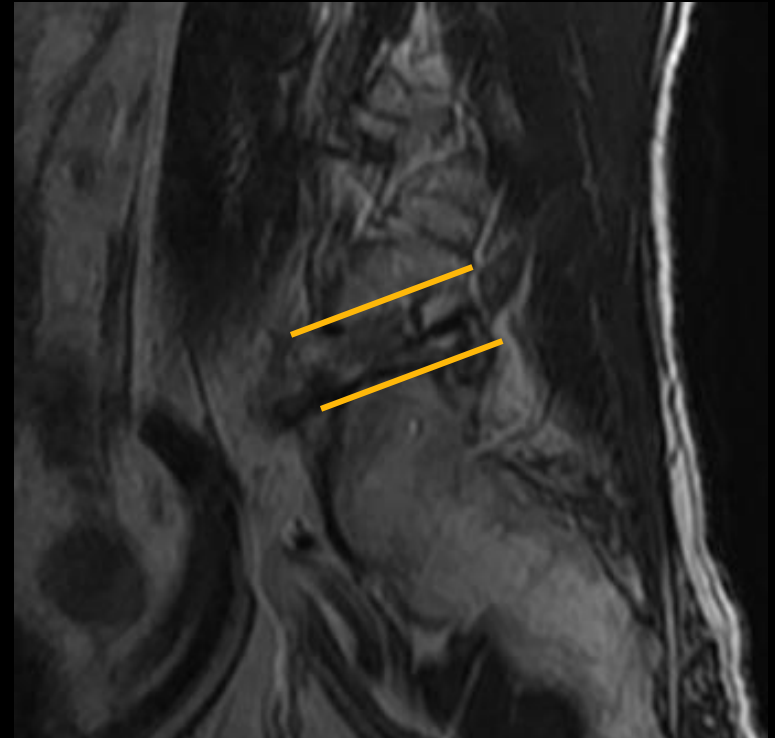
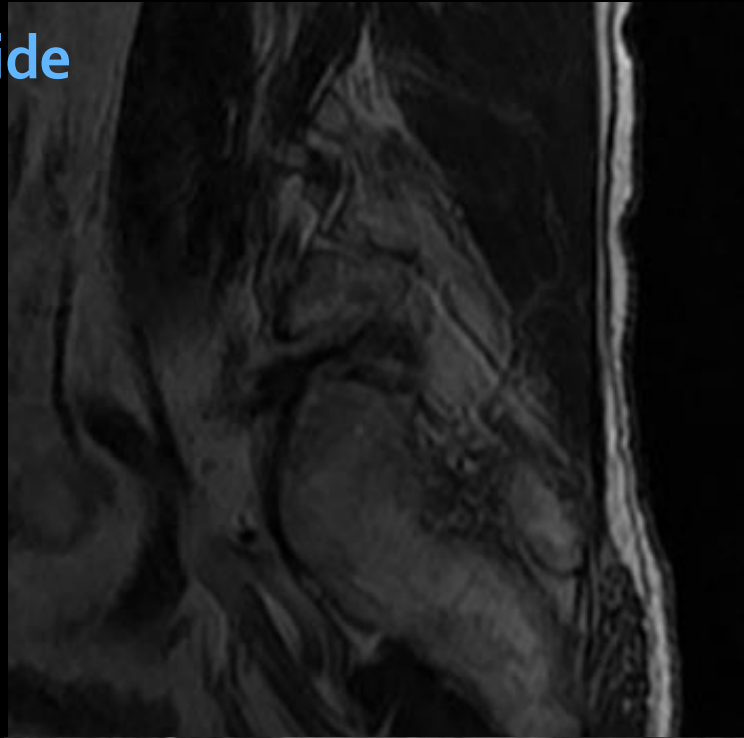


After FOS decompression



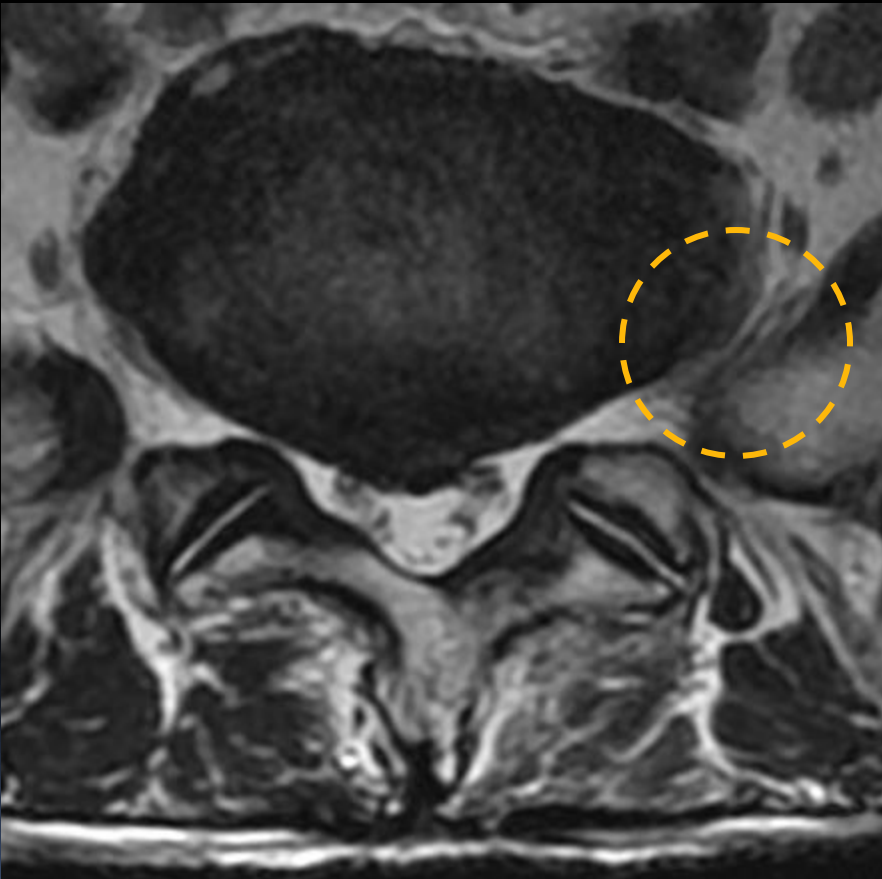
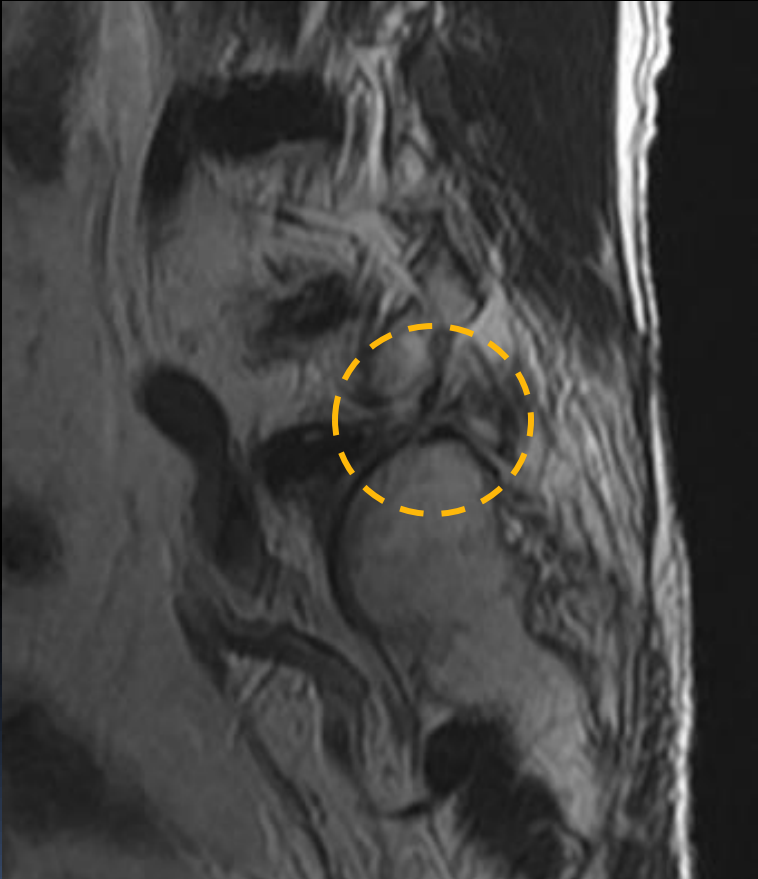
Preserve the facet joint as much as possible

Rt side



Lt side

Lt side case



Lt side

