March 29 | UCI Health | 7:00 AM

AMPLIFY SURGICAL

4th Annual Endoscopic Spine Symposium
featuring dualPortal &dualX technologies

Pearls and Pitfalls to Overcome Learning Curves for dual Portal Lumbar Fusion

(Dual portal fusion 101)

Spinal Surgery Division

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Disclosure: Consultants

Abbott

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ABOVE THE STANDARD
MANTIZ

CGBIO CELL & GROWTH FACTOR BIOTECHNOLOGY

Medtronic

Contents

1. Introduction
2. Learning curve of Dual Portal fusion
3. Pearls and Pitfalls to Overcome Learning Curves for fusion

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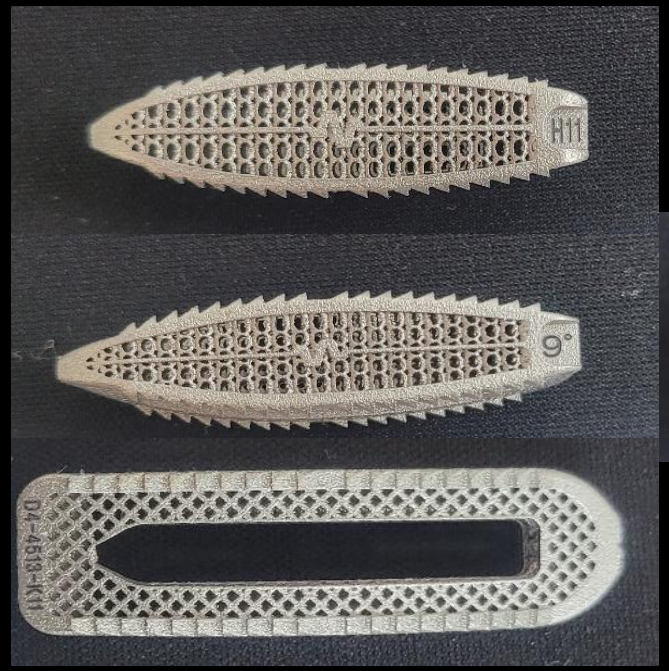
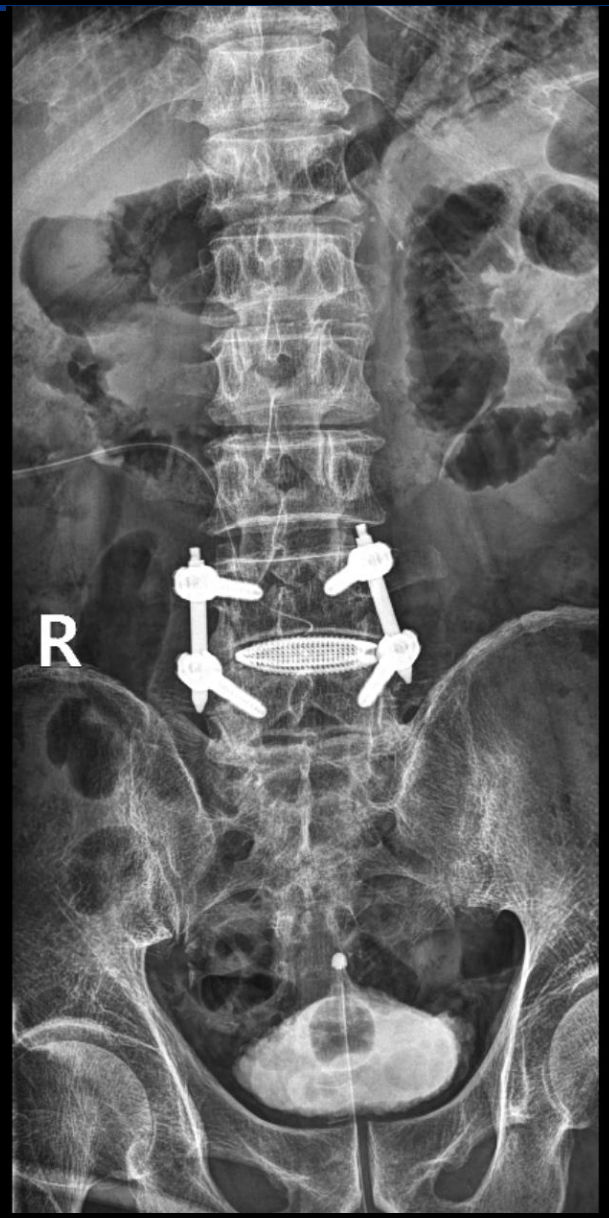
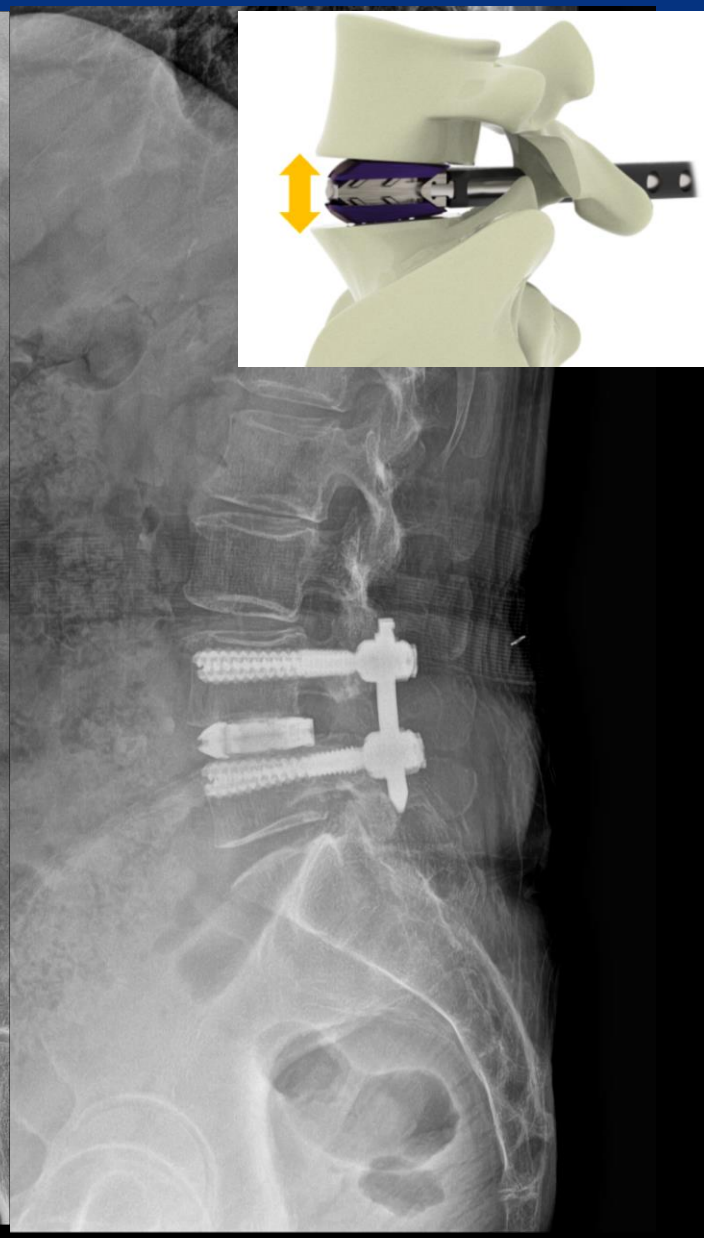
Dual portal fusion with large cage





Dual portal fusion with expendable cage



Evidence of dual portal fusion

Percutaneous biportal endoscopic TLIF with an ERAS pathway may have **good aspects in reducing bleeding and postoperative pain**. Endoscopic fusion surgery along with the ERAS concept may help to accelerate recovery after surgery. (Neurosurgical focus 2019)

BE-TLIF yieldeds **lesser early postoperative back pain** than did MI-TLIF, it may **allow ea rly ambulation and a shorter hospitalization period**. BE-TLIF may be a viable alternati ve to MI-TLIF in patients with degenerative or isthmic spondylolisthesis with superior c linical results in the early postoperative period. (Clinical spine surgery 2021)

This study showed that ULIF and PLIF were both effective surgical techniques for lumbar interbody fusion. However, ULIF caused less bleeding, reduced inflammatory reaction, **less tissue damage and faster postoperative recovery** compared with PLIF. (The spine journal 2023)

How is the Learning curve for the dual portal Fusion?

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Eligibility Criteria

Inclusion Criteria

- ✓Lumbar spondylolisthesis (meyerding grade I or II),
- ✓Who failed to be controlled with conservative treatment for more than 3months
- ✓Patients undergoing 1 level UBE interbody fusion using large cage(>40, 45mm)

Exclusion Criteria

- ✓More than 2 surgical levels, patient history of previous lumbar surgery, patient who had spinal infection, or tumor.

Study period

- ✓Retrospectively from 2023 through 2024

Baseline demographics

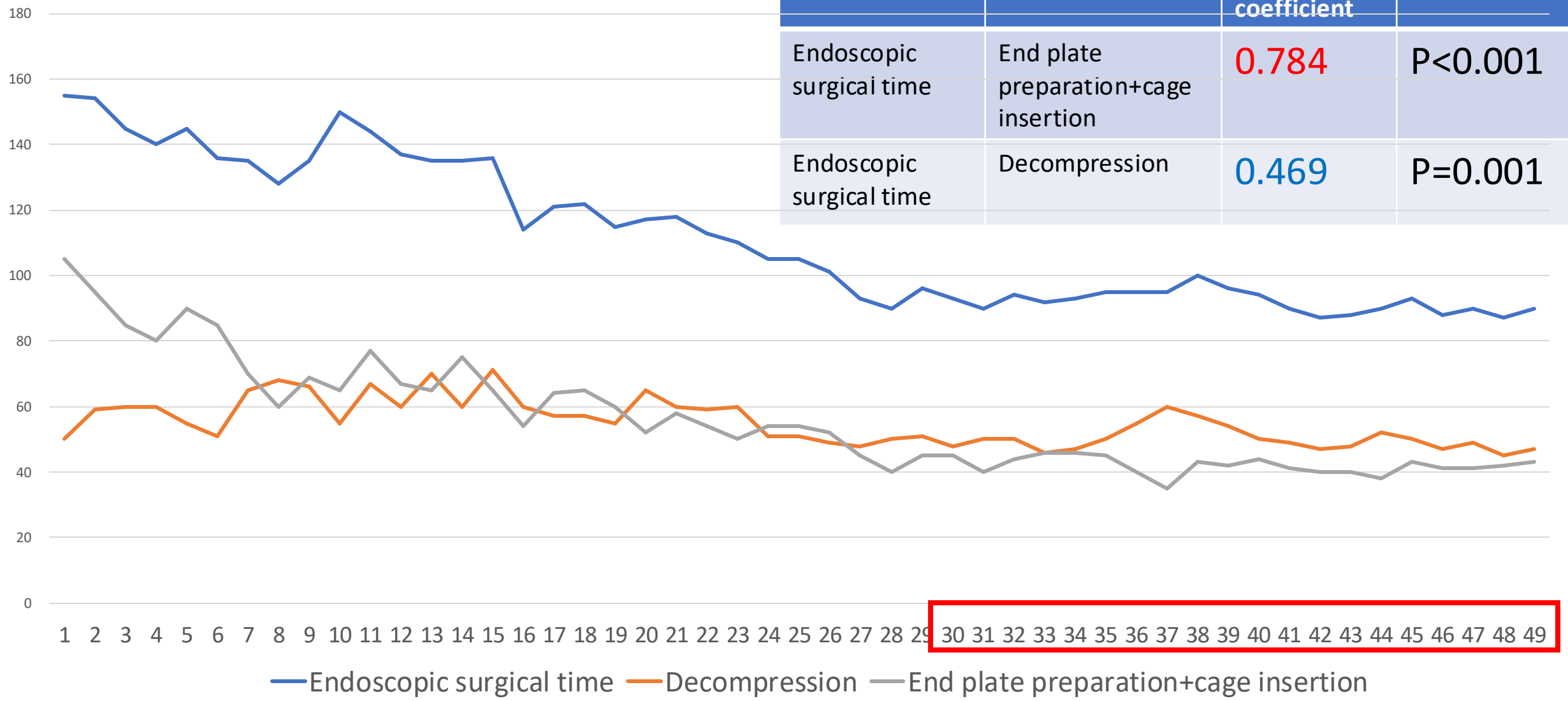
Table 1. Patients' demographic data		
Variables		Value(%)
No. of patient		69
Age (yr)		70.1 ± 7.1
Sex	Male : Female	26 (54.2): 22 (45.8)
Height (cm)		160.3 ± 9.0
Weight (kg)		63.7 ± 11.1
BMI		24.4 ± 3.3
BMD		-0.98± 1.6
Surgical segment		
	L3-4	21
	L4-5	45
	L5-S1	3
Diagnosis	Isthmic spondylolisthesis	4
	Deg. Spondylolisthesis	65 (

Clinical outcomes

Variables	Preoperative	Postoperative	P-value
VAS_Back	6.43±2.01	3.41±1.73	0.005
VAS _LEG	7.13±2.37	2.95±2.24	0.004
ODI	26.64±8.63	17.48±9.67	0.005

Learning curve of LUIF

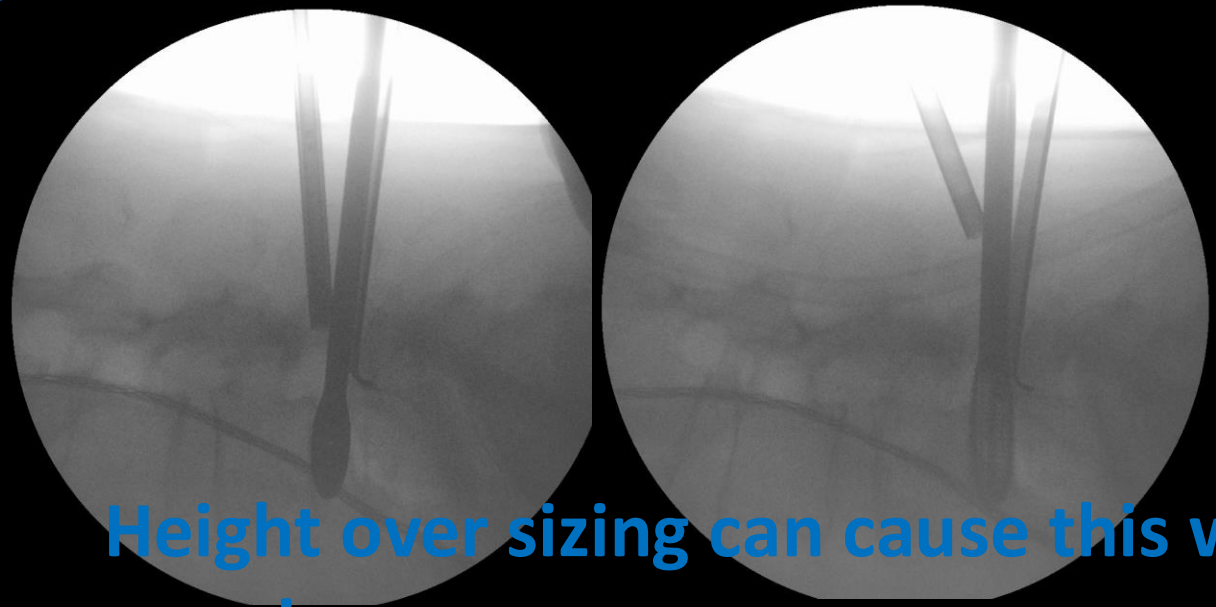
		Correlation coefficient	P-Value
Endoscopic surgical time	End plate preparation+cage insertion	0.784	P<0.001
Endoscopic surgical time	Decompression	0.469	P=0.001

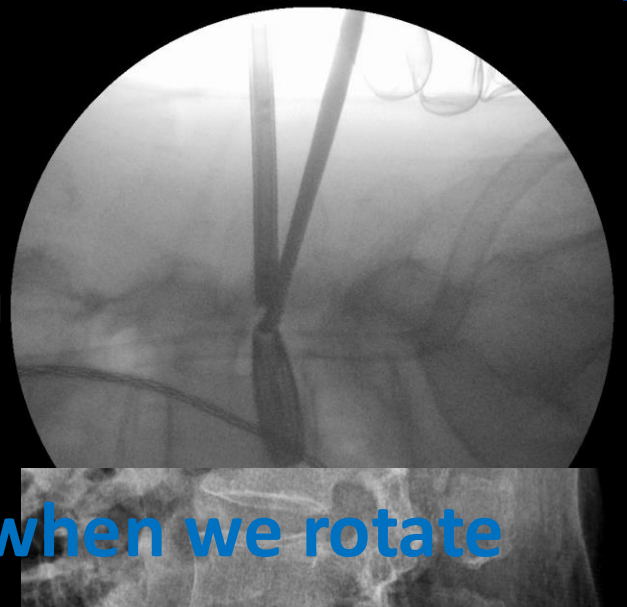


Complications

	N=69
Overall complication rate	9(13.0%)
Traversing root injury	1
dura tear	2
Hematoma	1
Mechanical complication	Screw pullout 1 Cage subsidence 1
Rotation related complication	Cage infiltration 1 Cage migration 1
Others	Bone chip retropulsion
Revision surgery(<6mo)	3

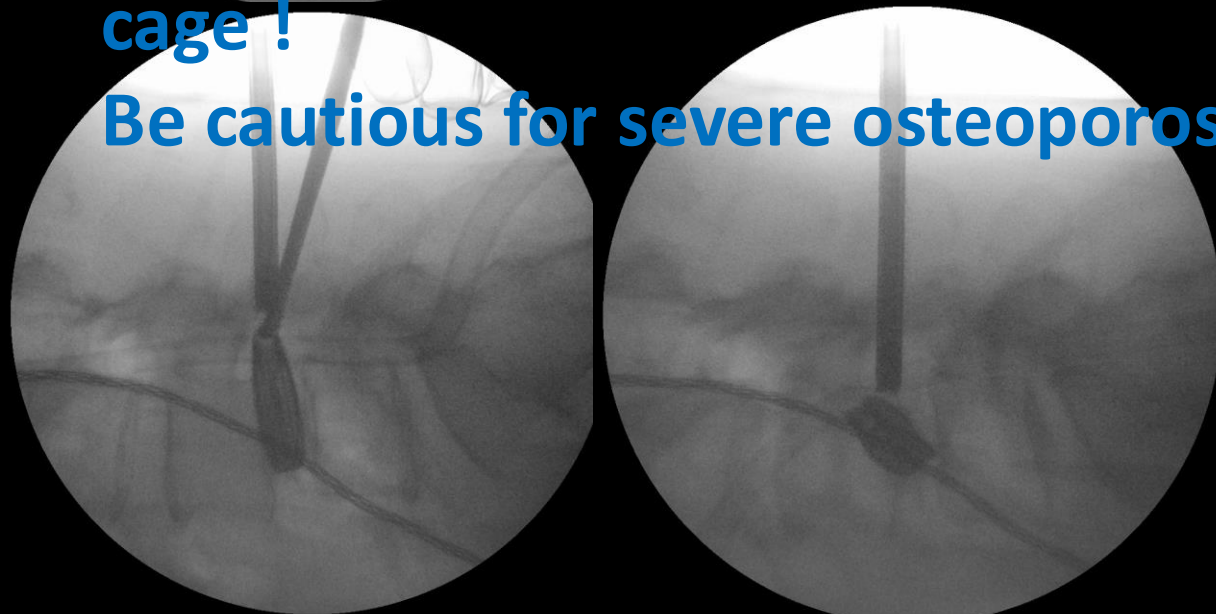
Cage infiltration case

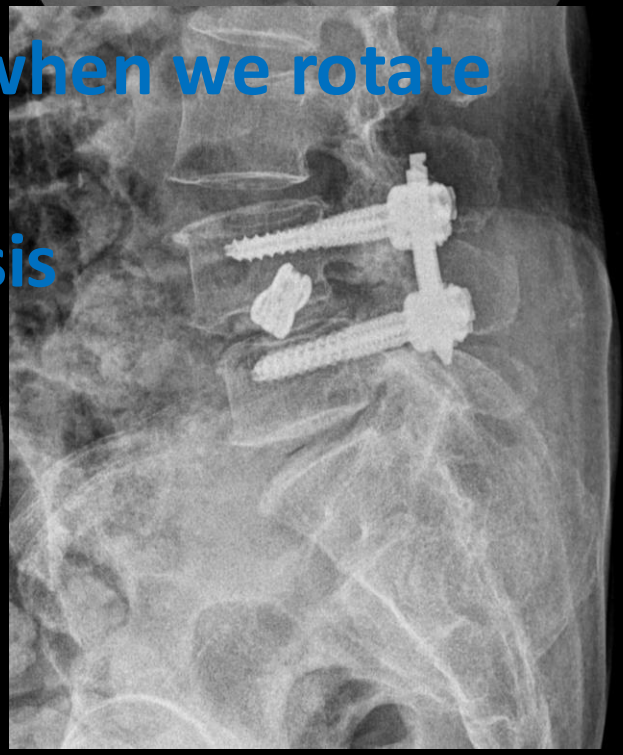




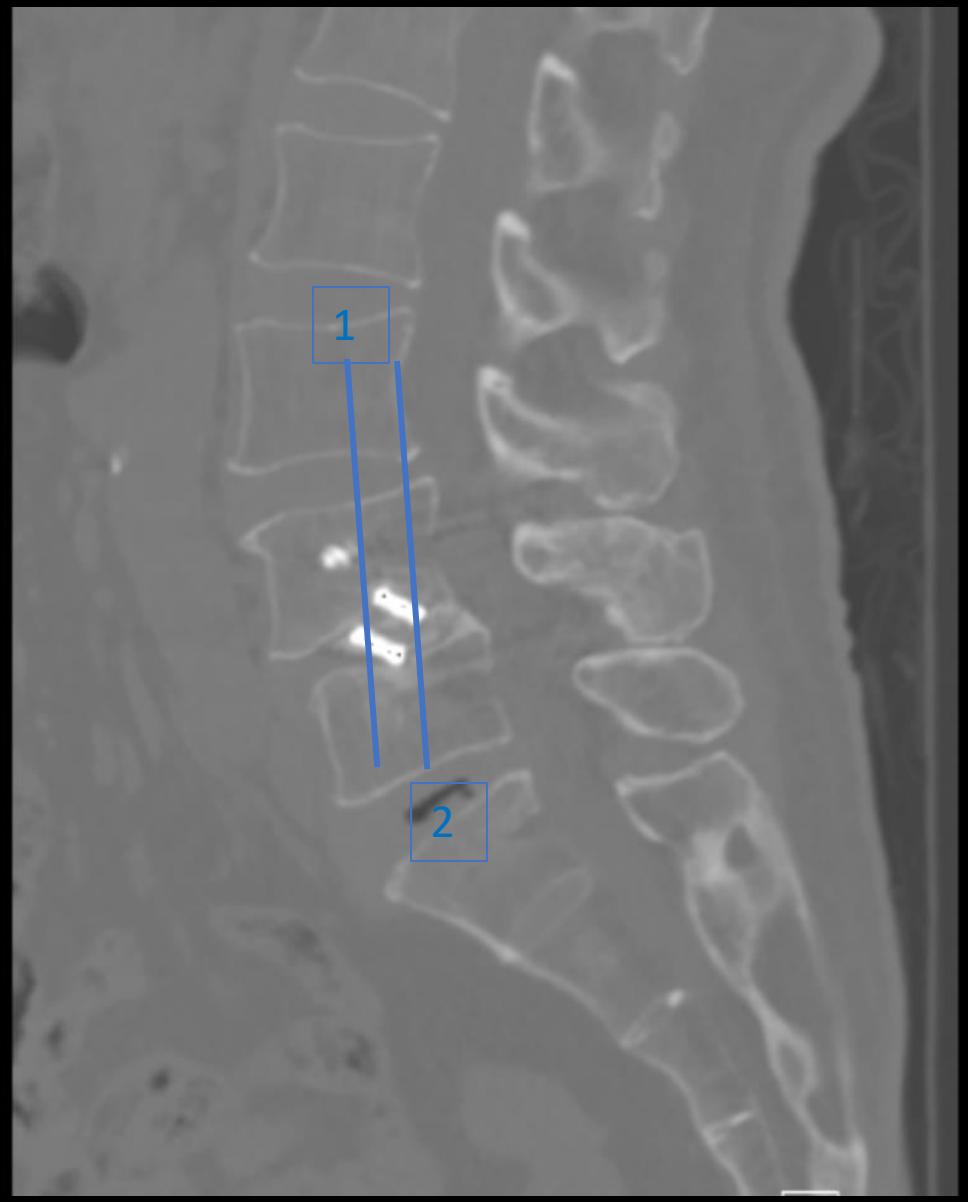
Height over sizing can cause this when we rotate cage !

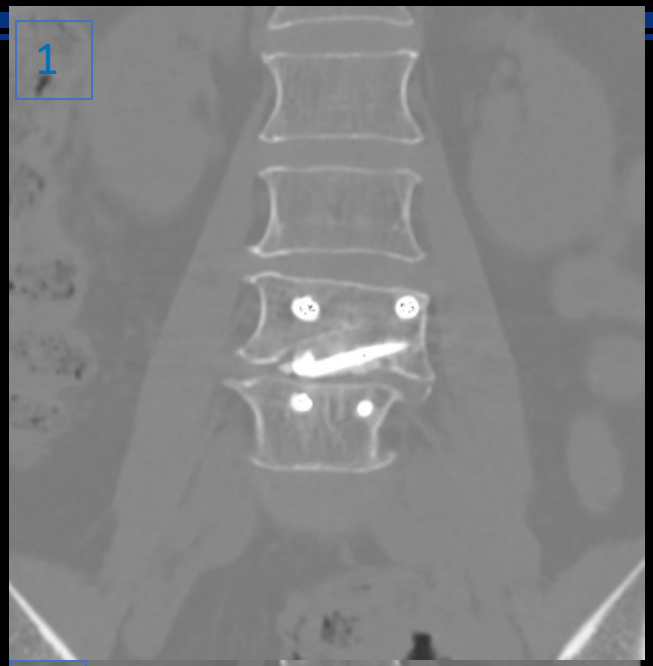
Be cautious for severe osteoporosis



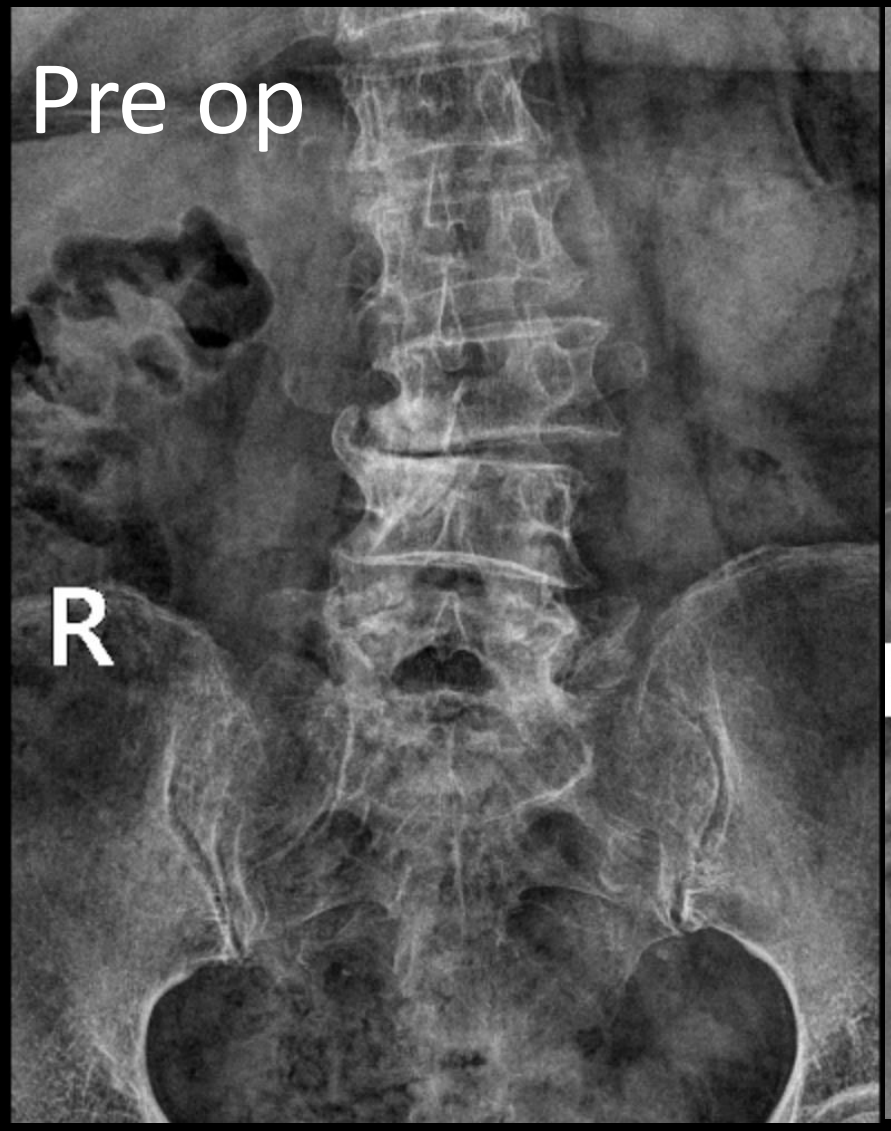


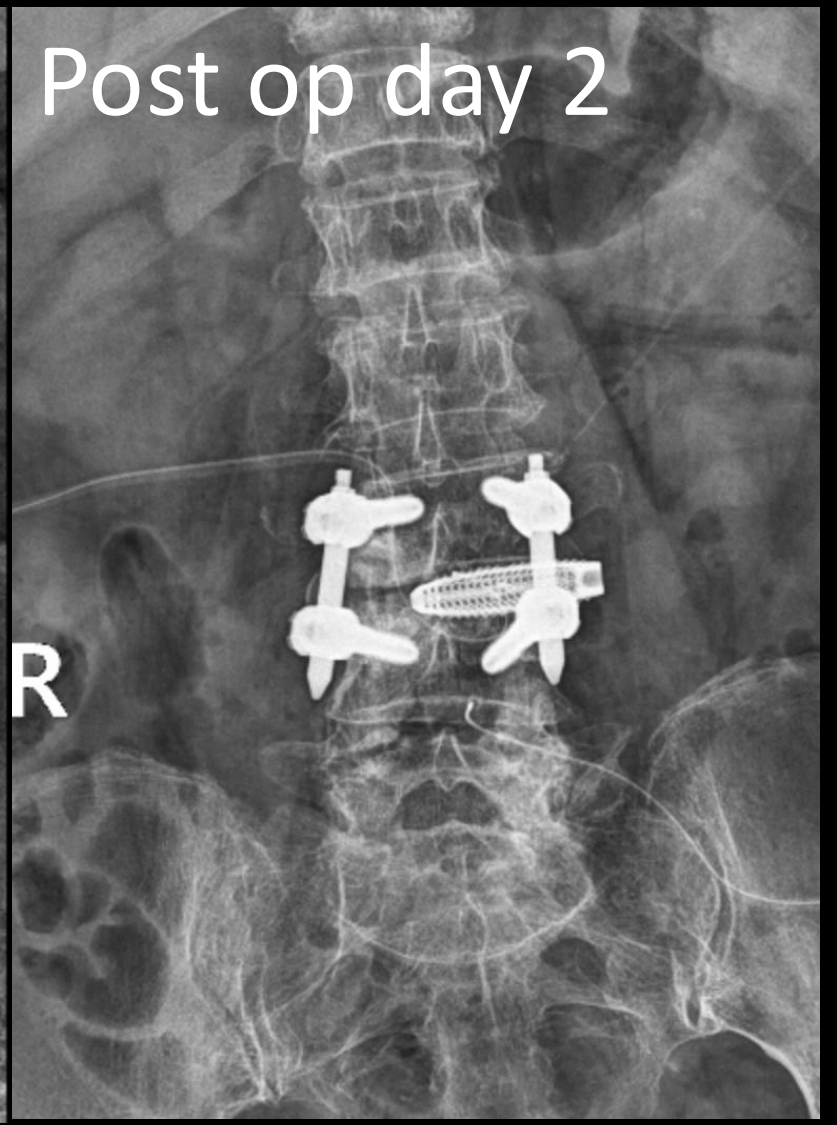
Cage infiltration case 6mo. CT

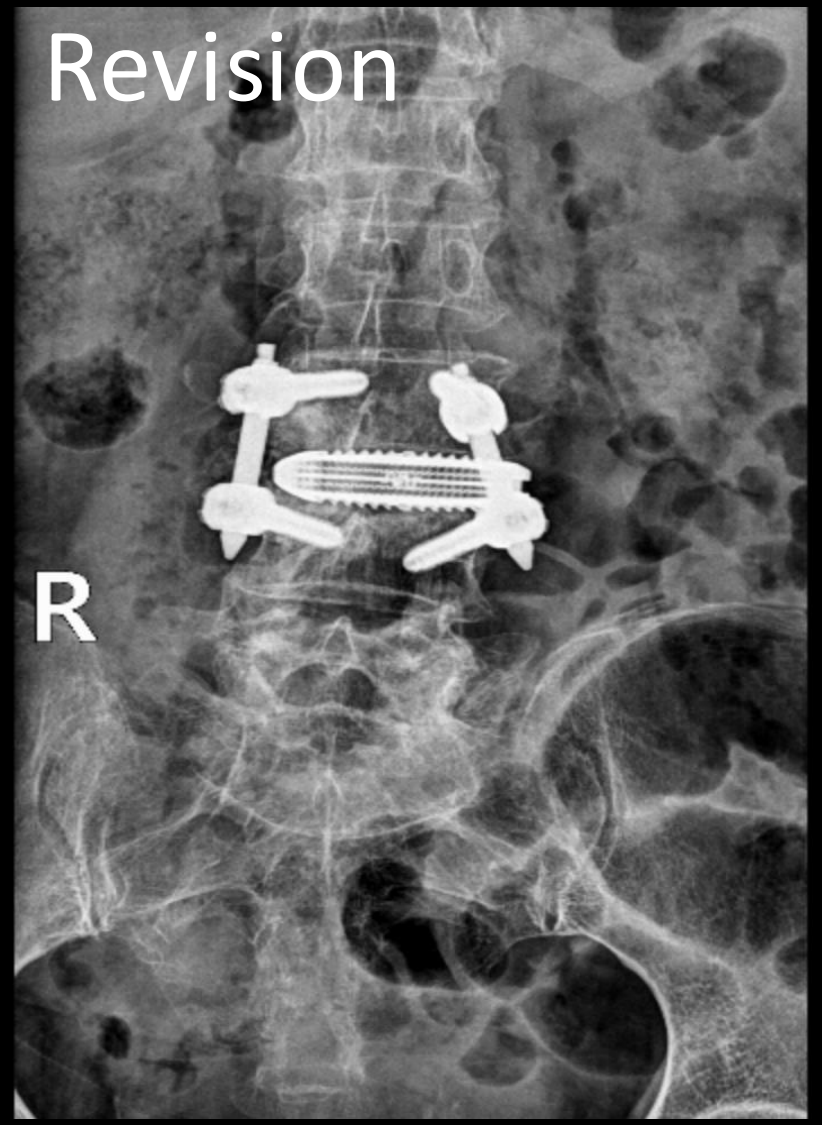




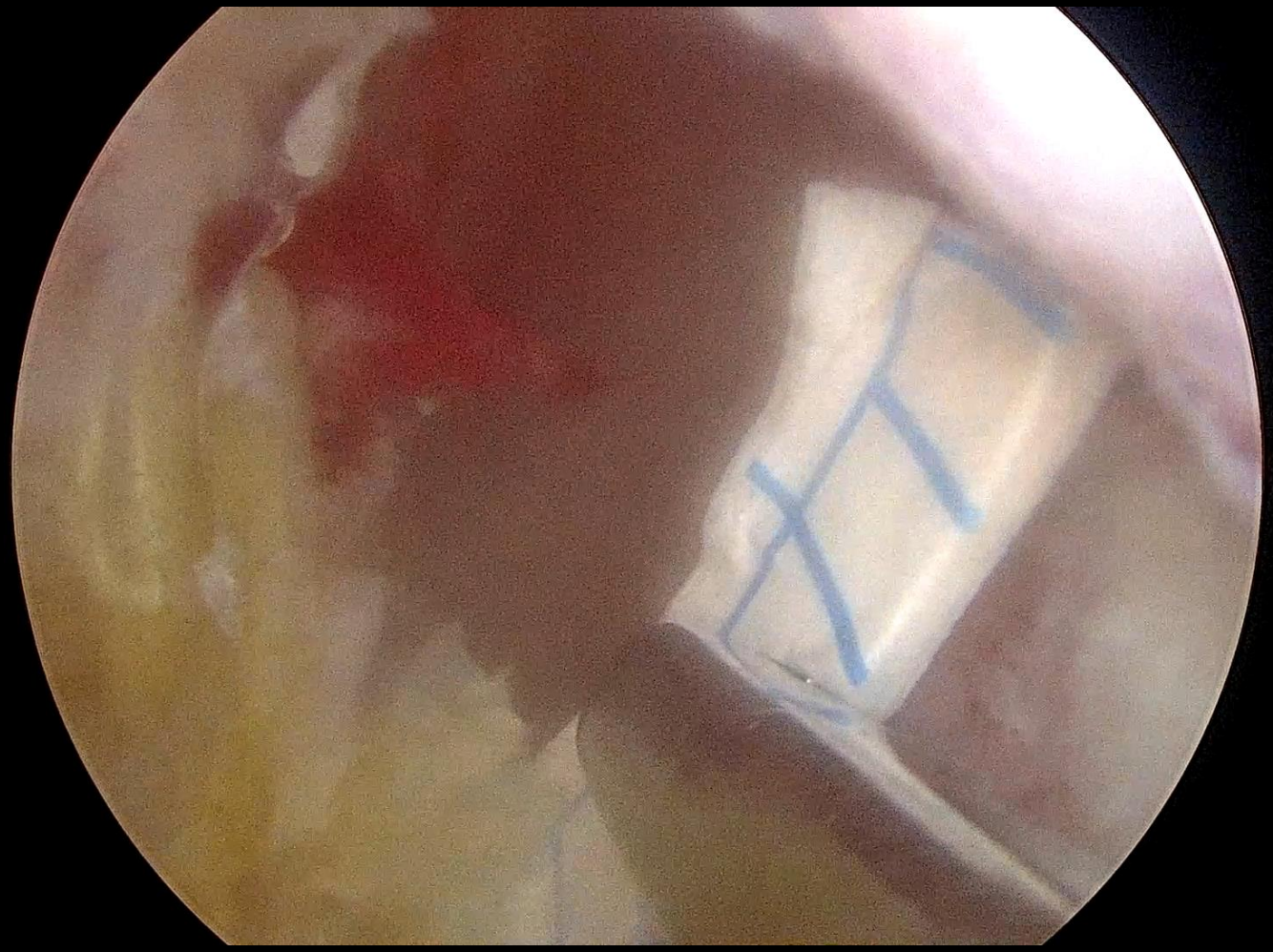
Cage migration case







Dura tear case



Pearls and Pitfalls to overcome the learning curve?

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First, master lumbar laminectomy

JMISST
Journal of Minimally Invasive Spine Surgery and Technique

Original Article
J Minim Invasive Spine Surg Tech [Epub ahead of print]
eISSN: 2508-2043
https://doi.org/10.21182/jmisst.2024.01522

Learning Curve Analysis: Impact of Ligamentum Flavum Removal Methods on Unilateral Biportal Endoscopic Laminectomy for Lumbar Spinal Stenosis

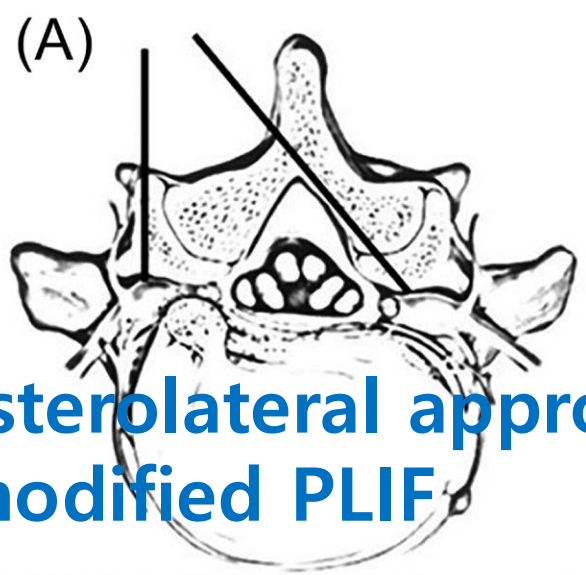
Woo Hyeong Joe[1], Sae min Kwon[1], Chang-Young Lee[1], Chang-Hyun Kim[1], Min-Yong Kwon[1], Jae Hyun Kim[1], In soo Kim[1], Young San Ko[2]

Conclusion: Although UBE surgery has a short learning curve, a considerable number of cases (26 and 29, respectively) were needed to achieve competency in terms of operative time and intraoperative dural tear occurrence. We highlight the caudal-to-cranial direction of ligamentum flavum dissection and removal as a way to decrease the number of dural tears and shorten the operative time.

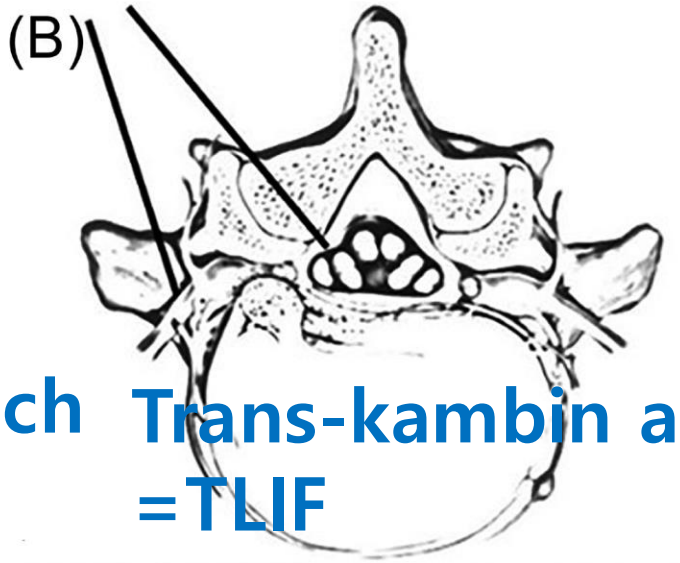
Master basic drills of dual portal surgery!

1. Docking
2. Bone work
3. LF removal

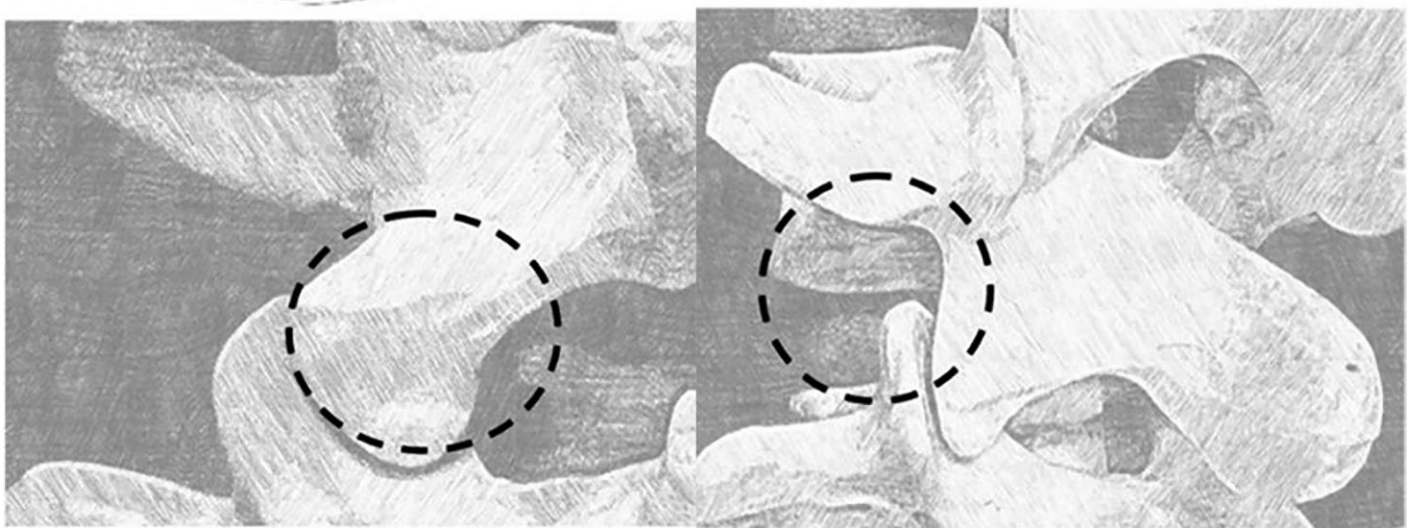
Two corridors



Posterolateral approach
=modified PLIF

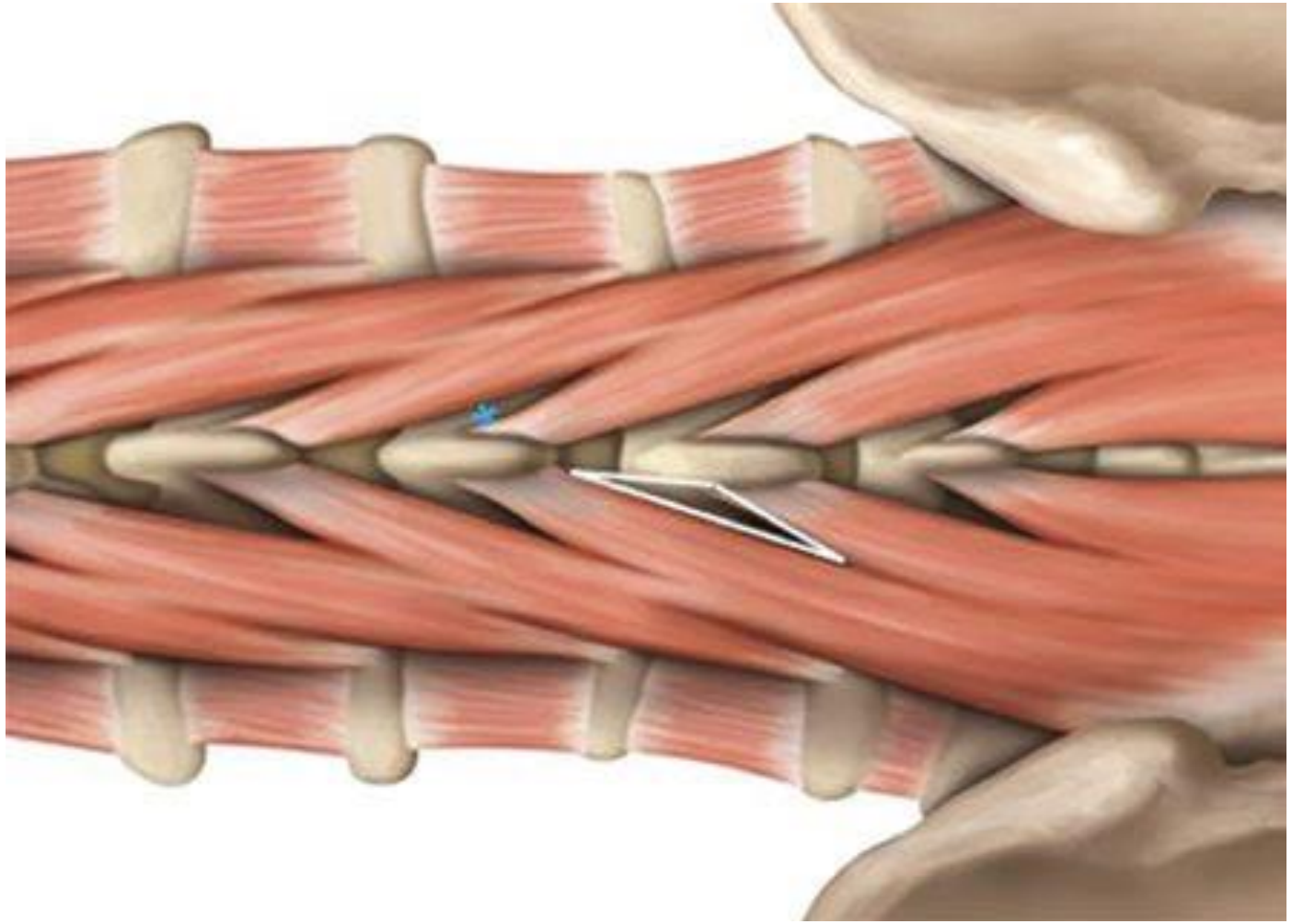


Trans-kambin approach
=TLIF



Spine Surg. 2021 Dec;15(suppl 3):S84-S92

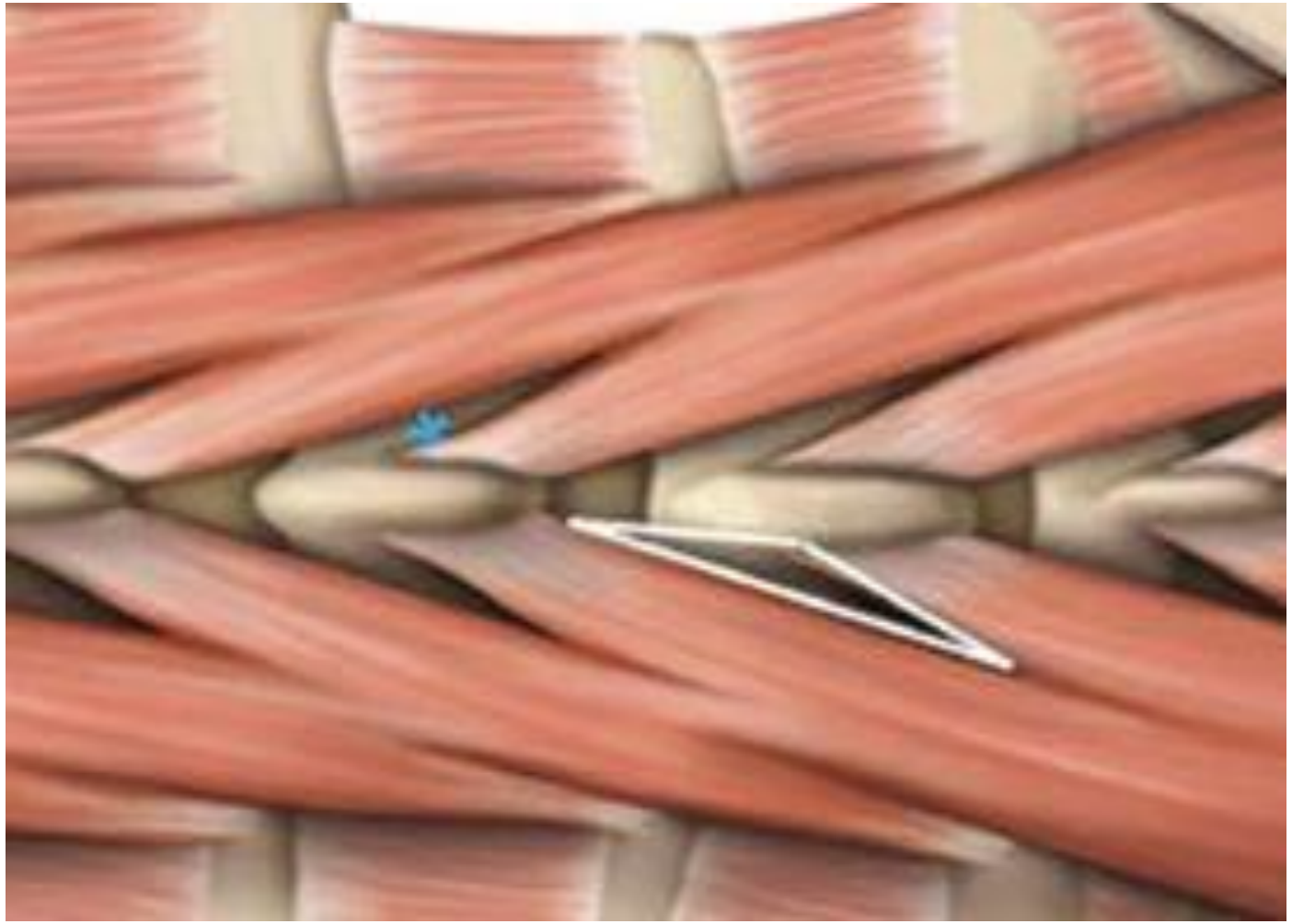
Docking is always the key



Use potential interfascial space of multifidus m.

Unilateral Biportal Endoscopic Spine Surgery

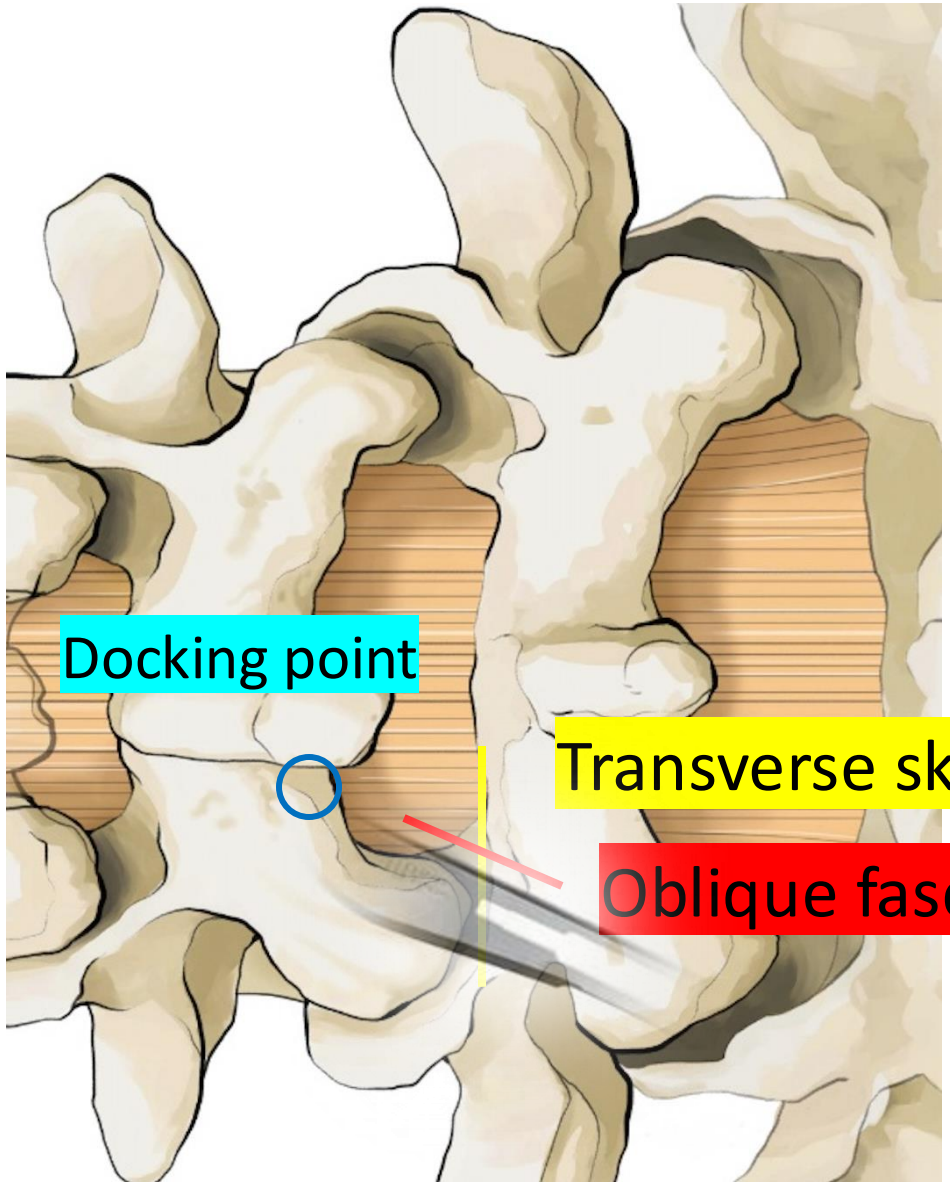
Docking is always the key



Use potential interfascial space of multifidus m.

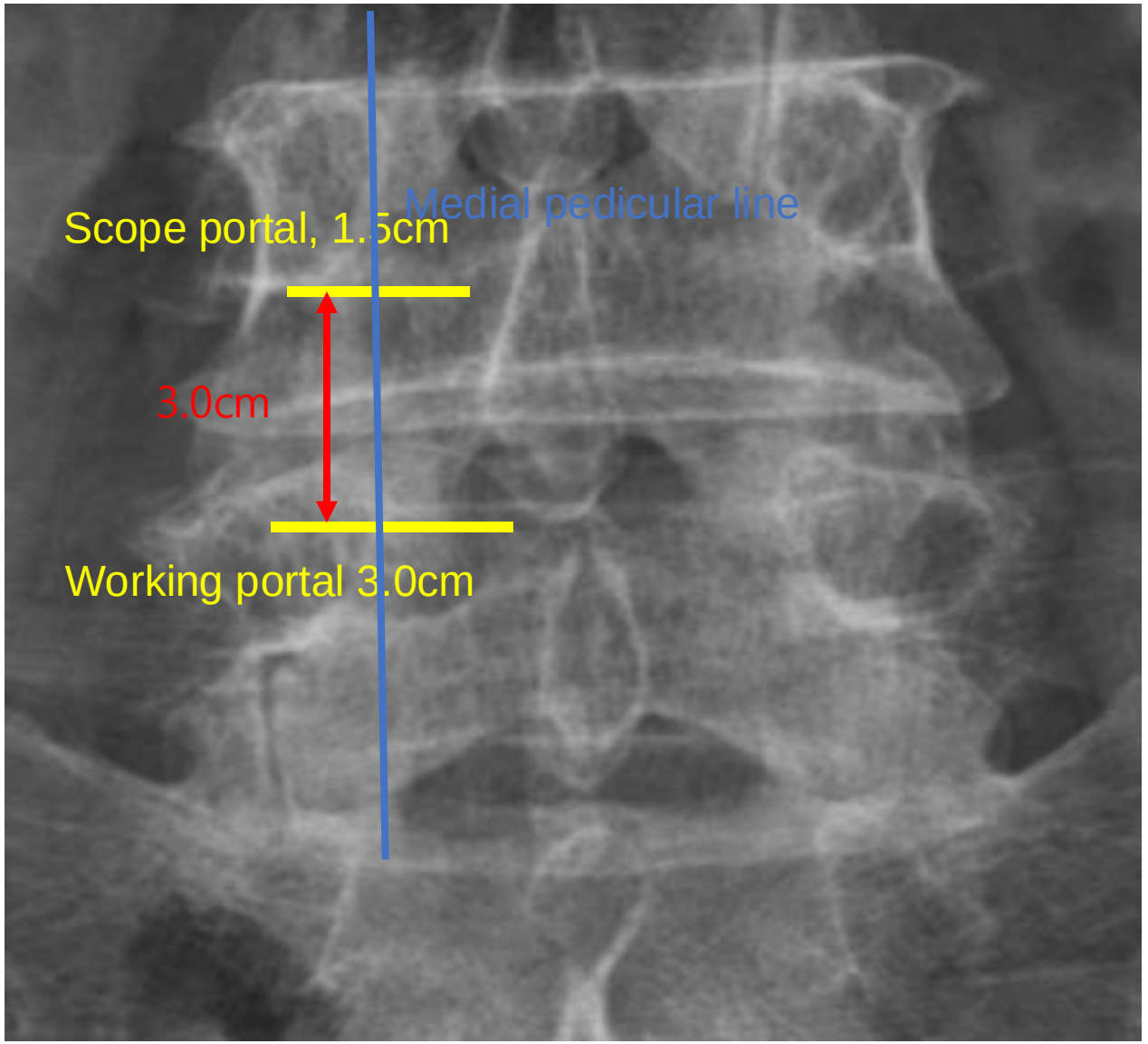
Unilateral Biportal Endoscopic Spine Surgery

Docking is always the key



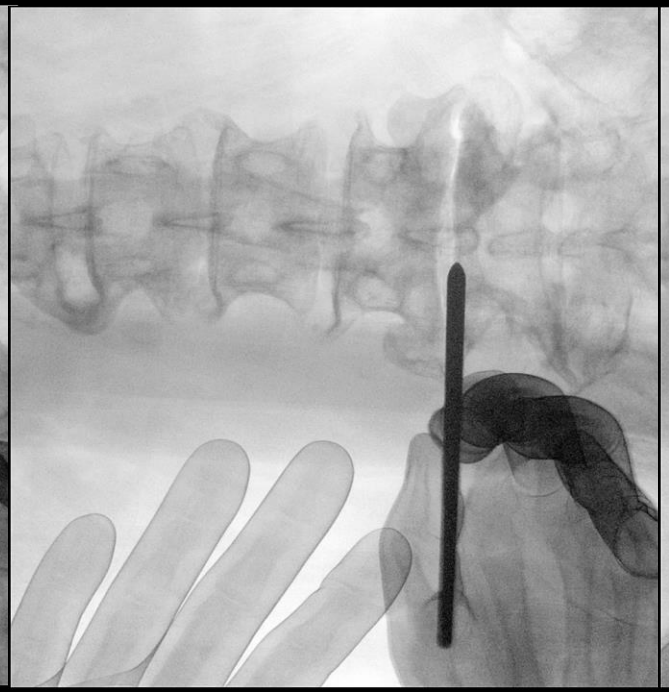
Unilateral Biportal Endoscopic Spine Surgery

Incision for dual portal fusion

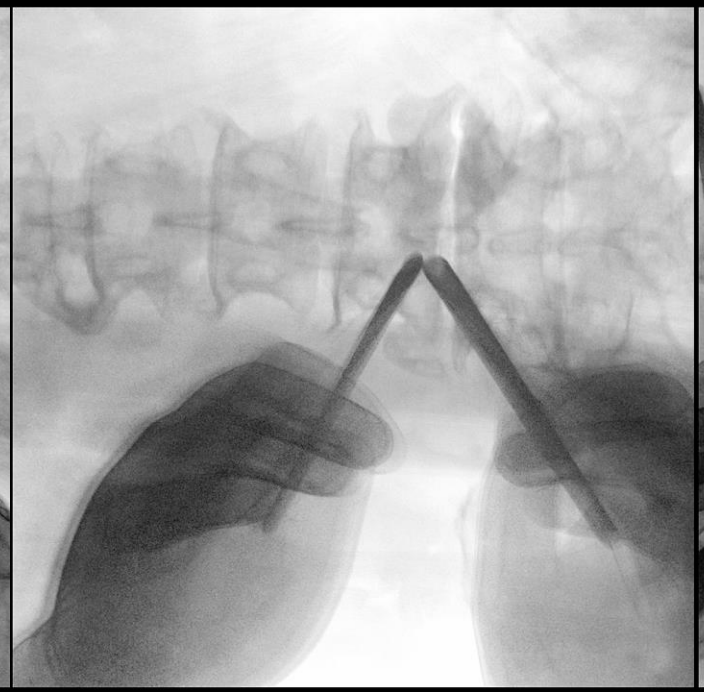


How to dock properly

Skin incision

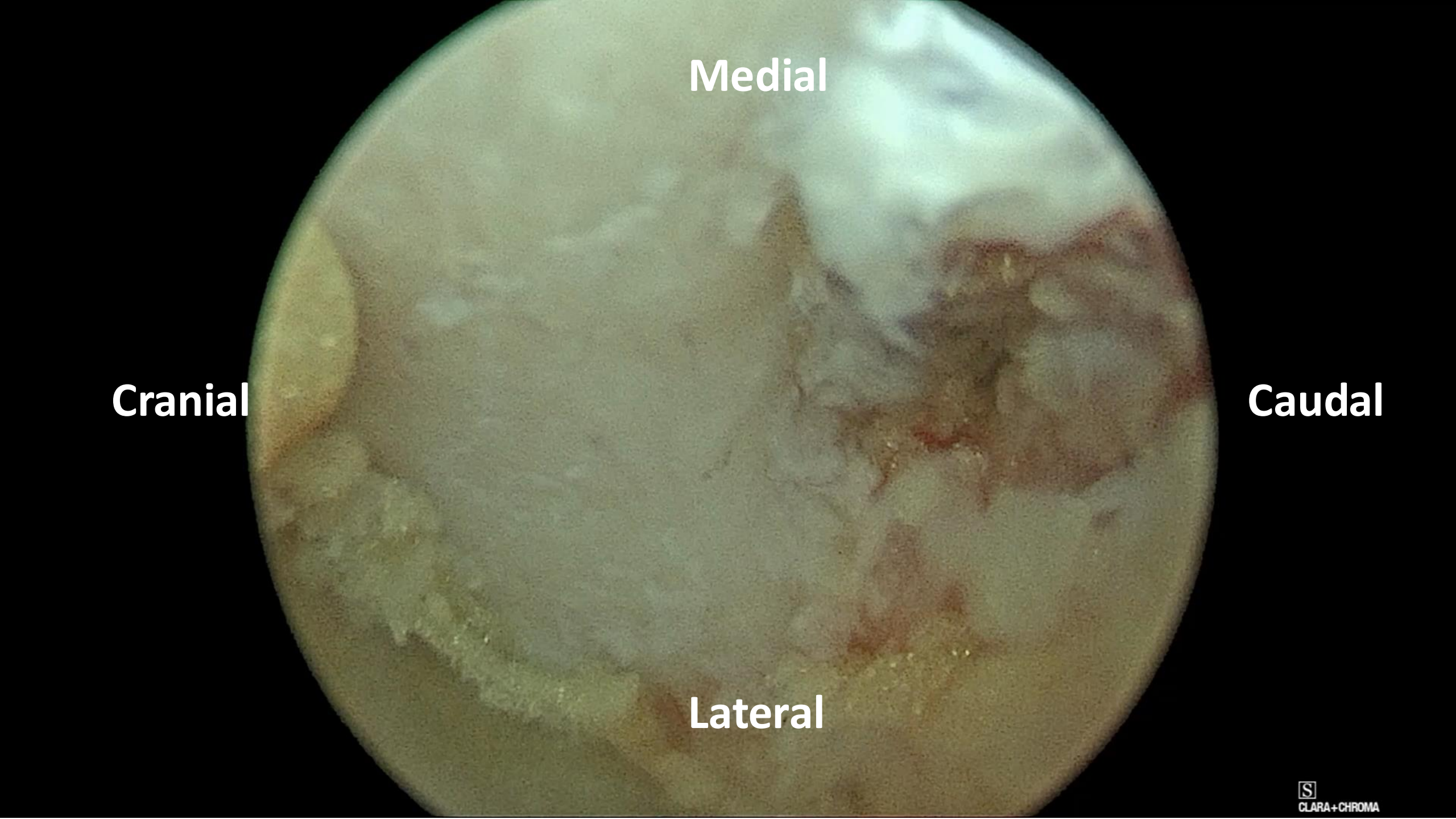


Stripping off Muscle



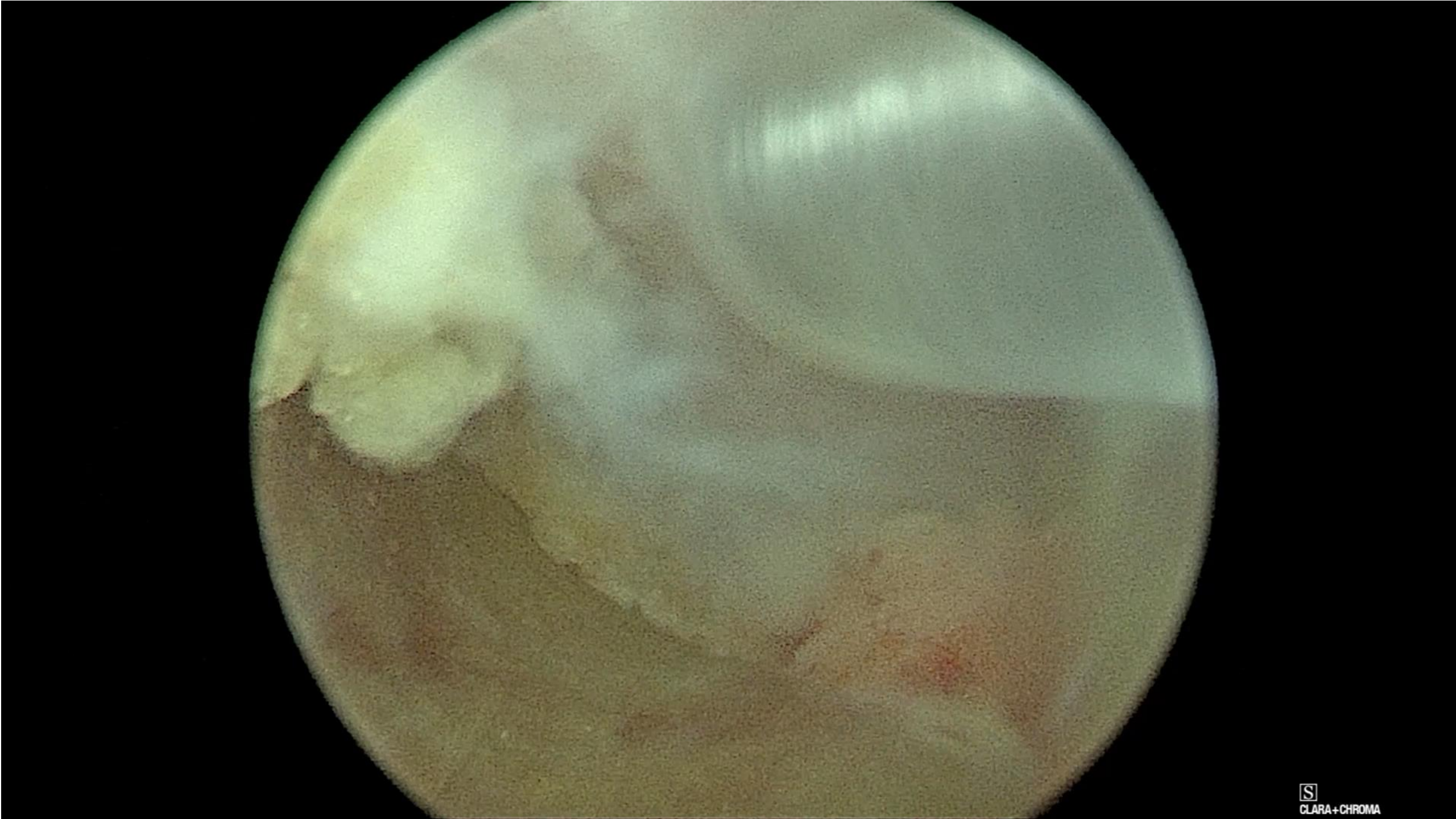
Triangulation

Level check


Medial
Cranial
Caudal
Lateral
CLARA+CHROMA

Laminectomy

1. Start bone work ASAP
2. Burr or shaver doesn't matter
3. Meticulous bone bleeding control
4. Yellow ligament(YL) will serve as protective barrier if it is properly detached from lamina
5. Drill out to expose attachment site of LF
6. Harvest as much bone as possible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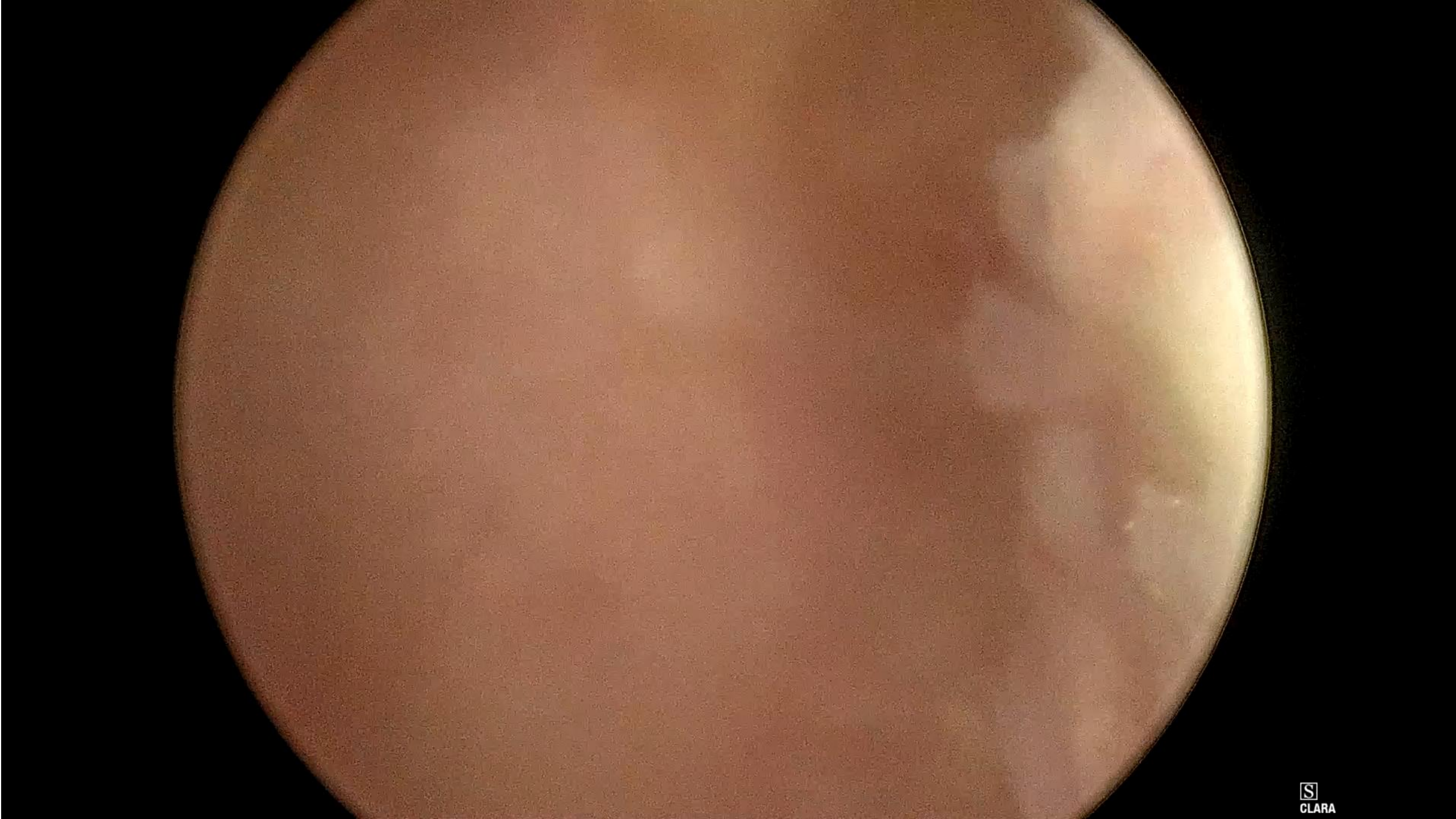
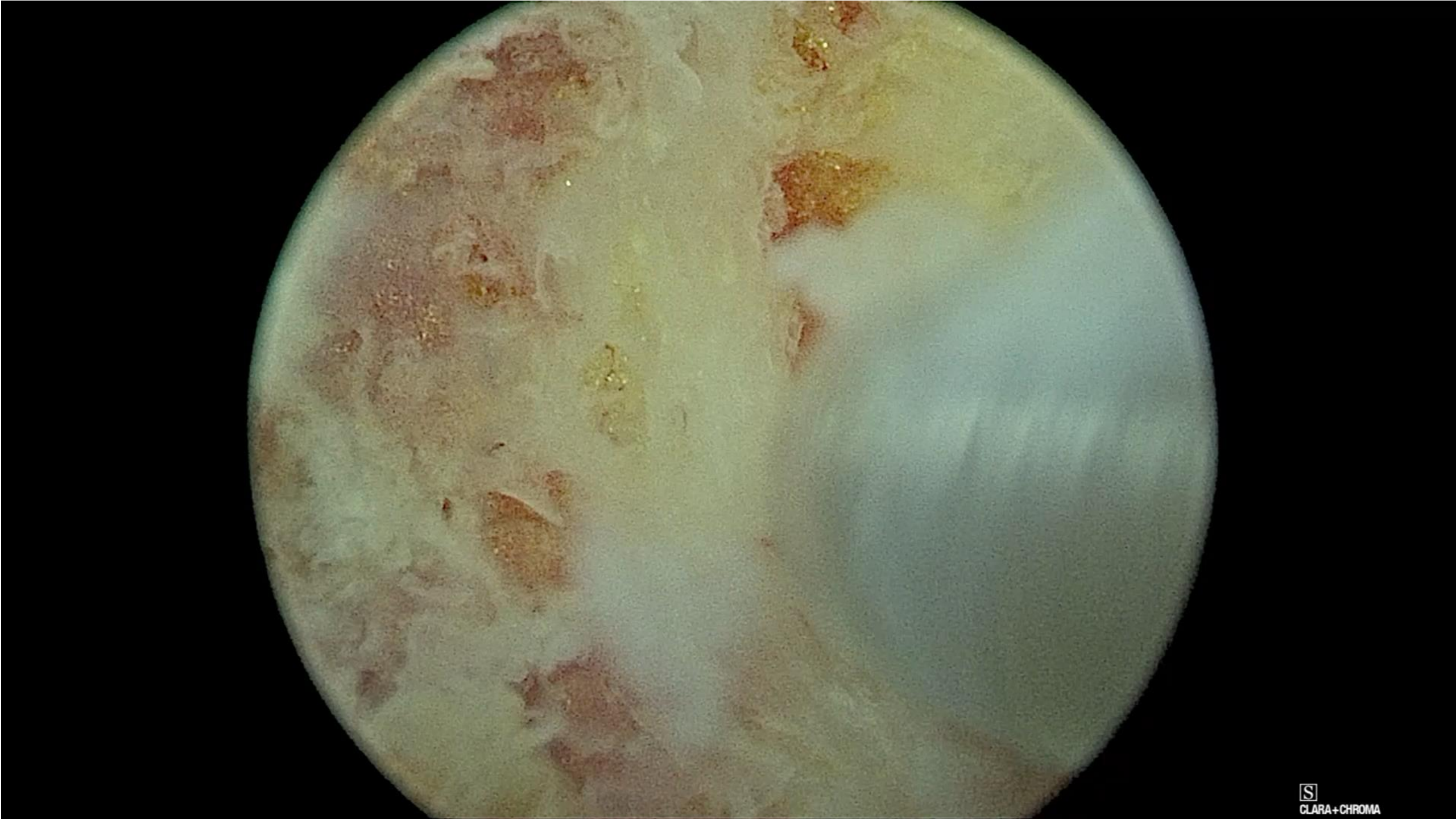
CLARA+CHROMA

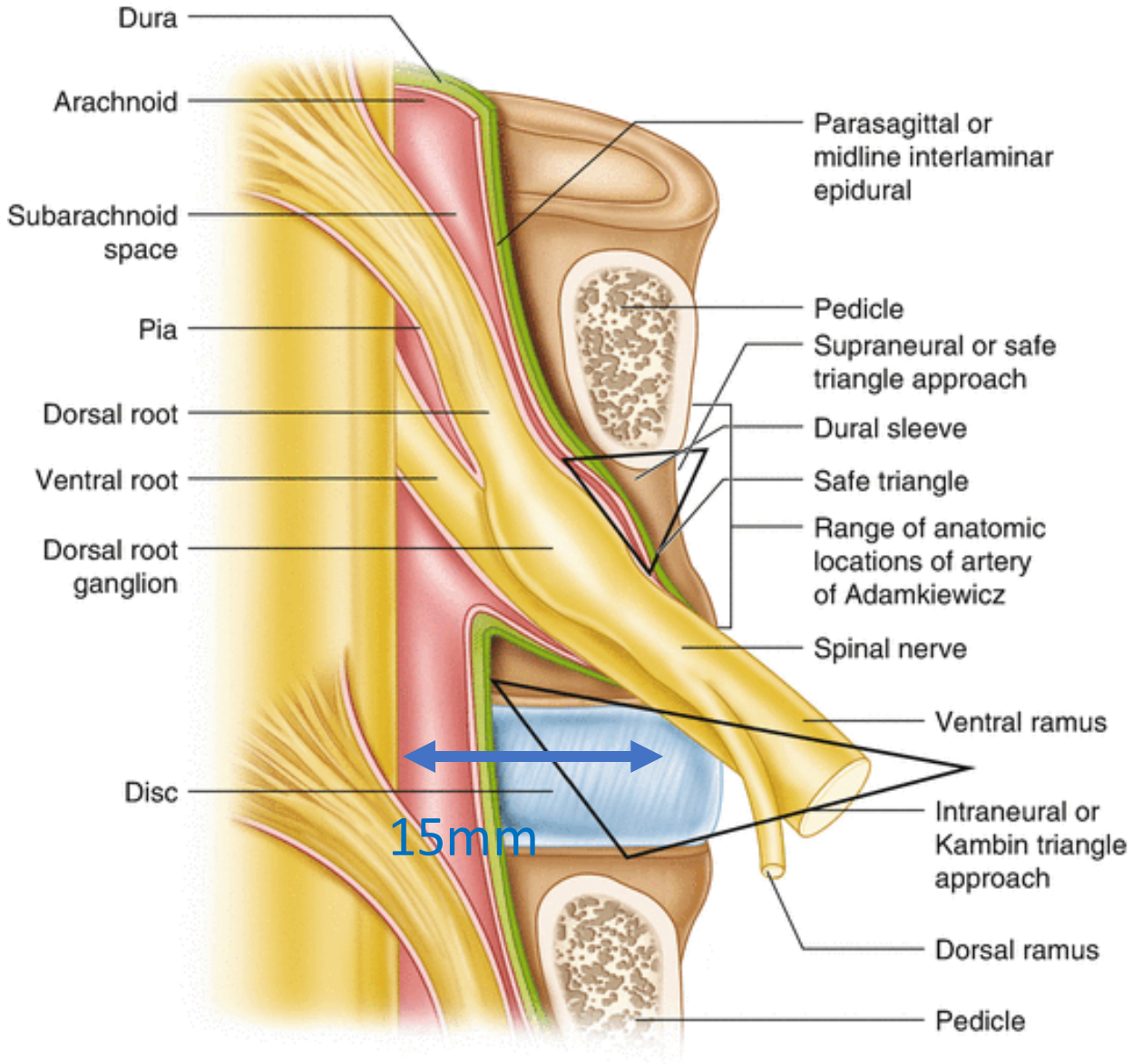

CLARA

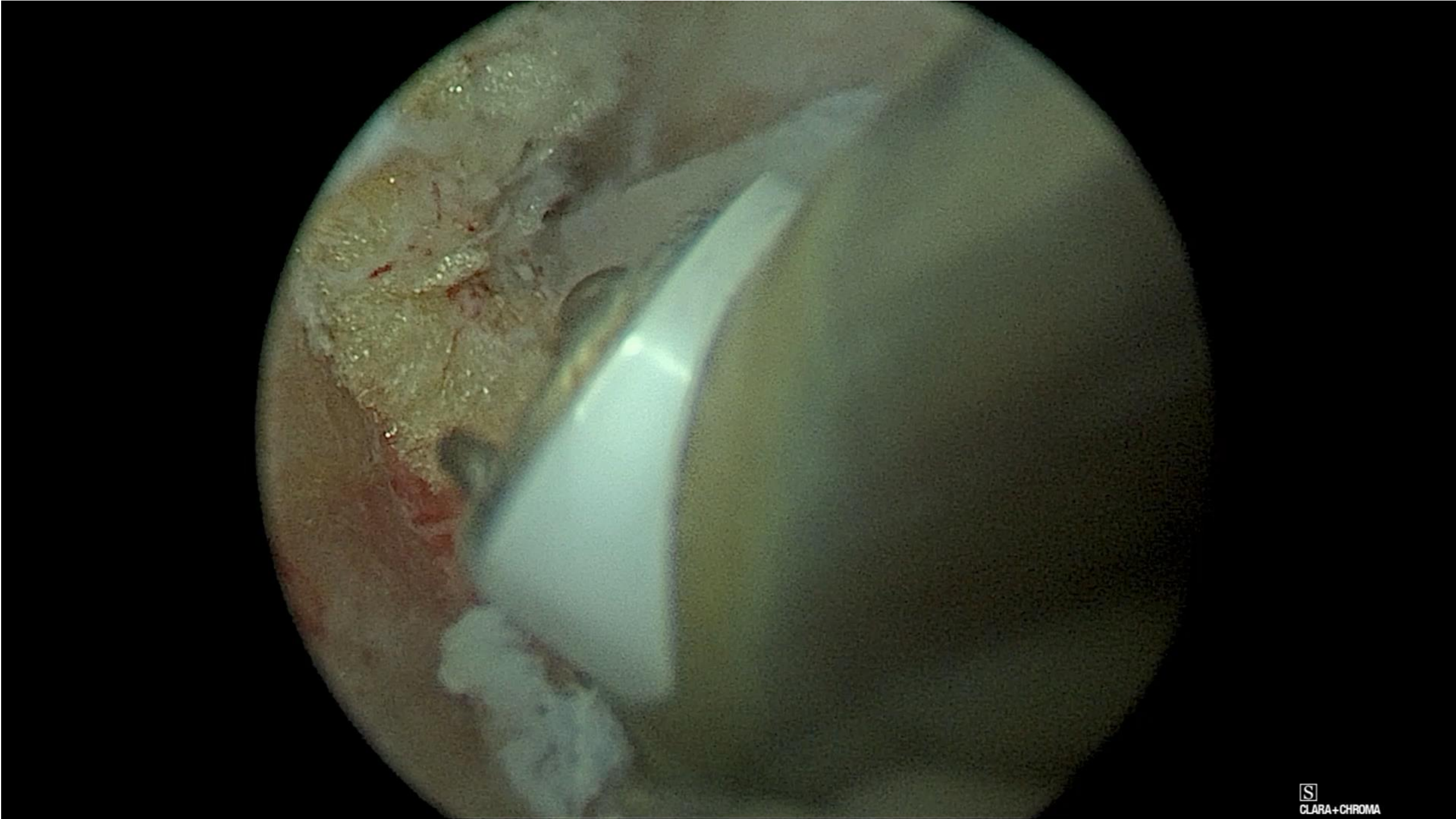

S
CLARA+CHROMA

Ipsilateral facetectomy

1. Doesn't have to remove whole facet
2. Soft tissue dissection should be preceded
3. However, enough ipsilateral facet resection should be considered depending on cage size (at least more than 10~15 mm from thecal sac to lateral window)
4. Not always necessary to expose whole exiting root, if decompression it not needed. However, its better to expose foraminal portion

Kambin's triangle

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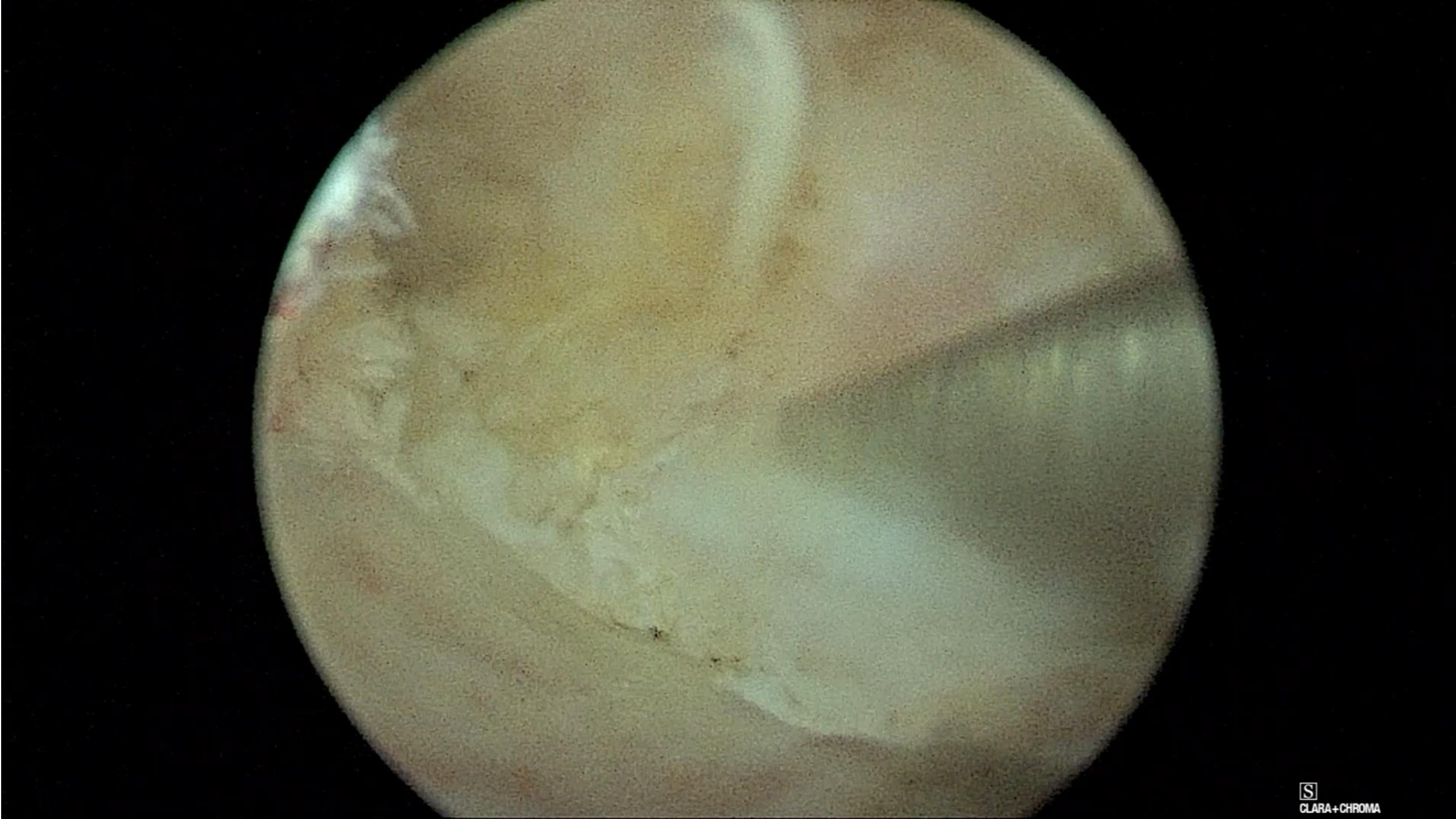
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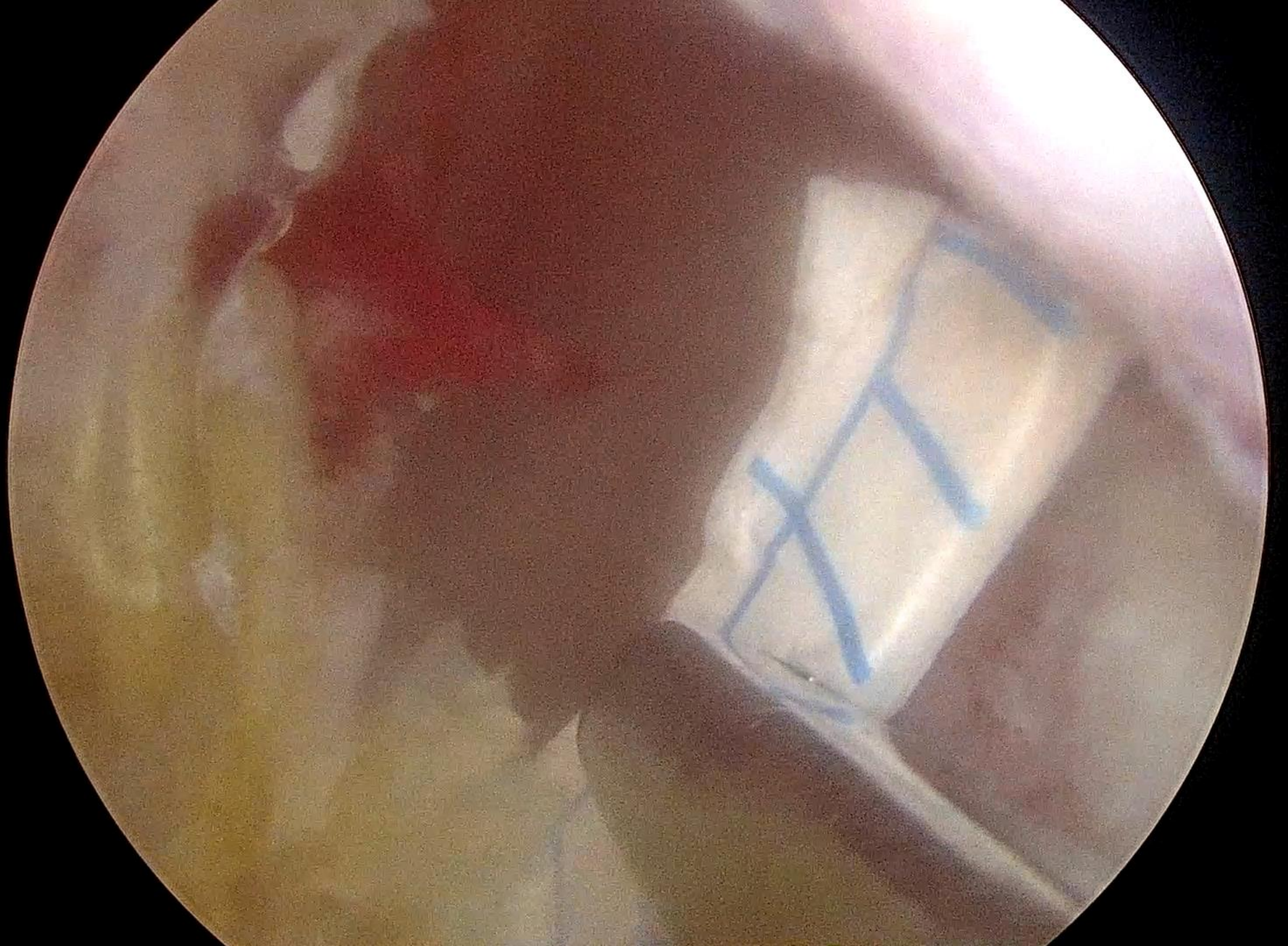
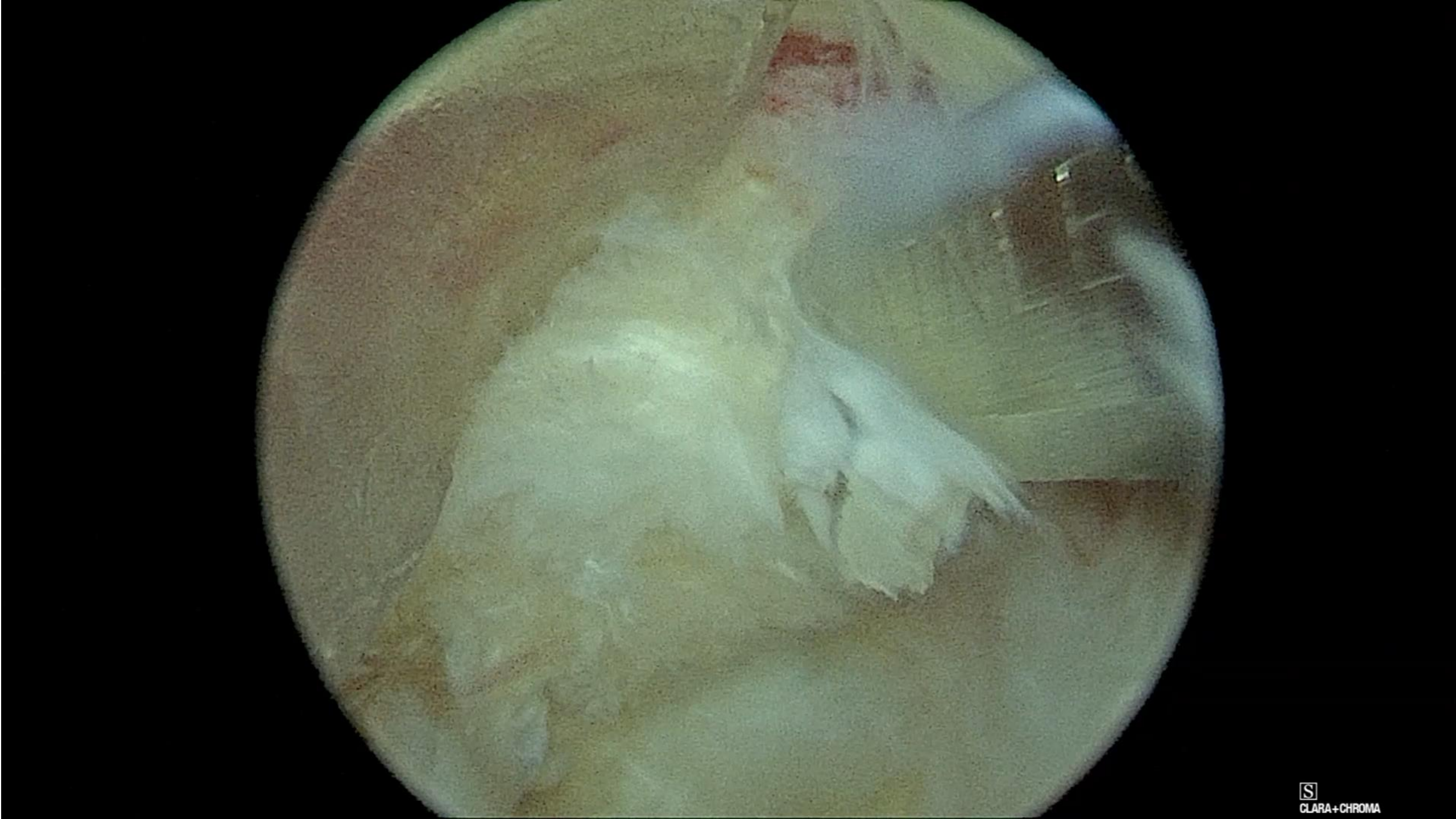
CLARA+CHROMA

Endplate preparation (M/I for fusion)

1. Before annulotomy, epidural venous plexus should be coagulated to prevent bleeding
2. Most possible deep cup of annular incision should be made
3. Use Reamer to detach cartilage end plate
4. Use box curet to removal detached end plate


CLARA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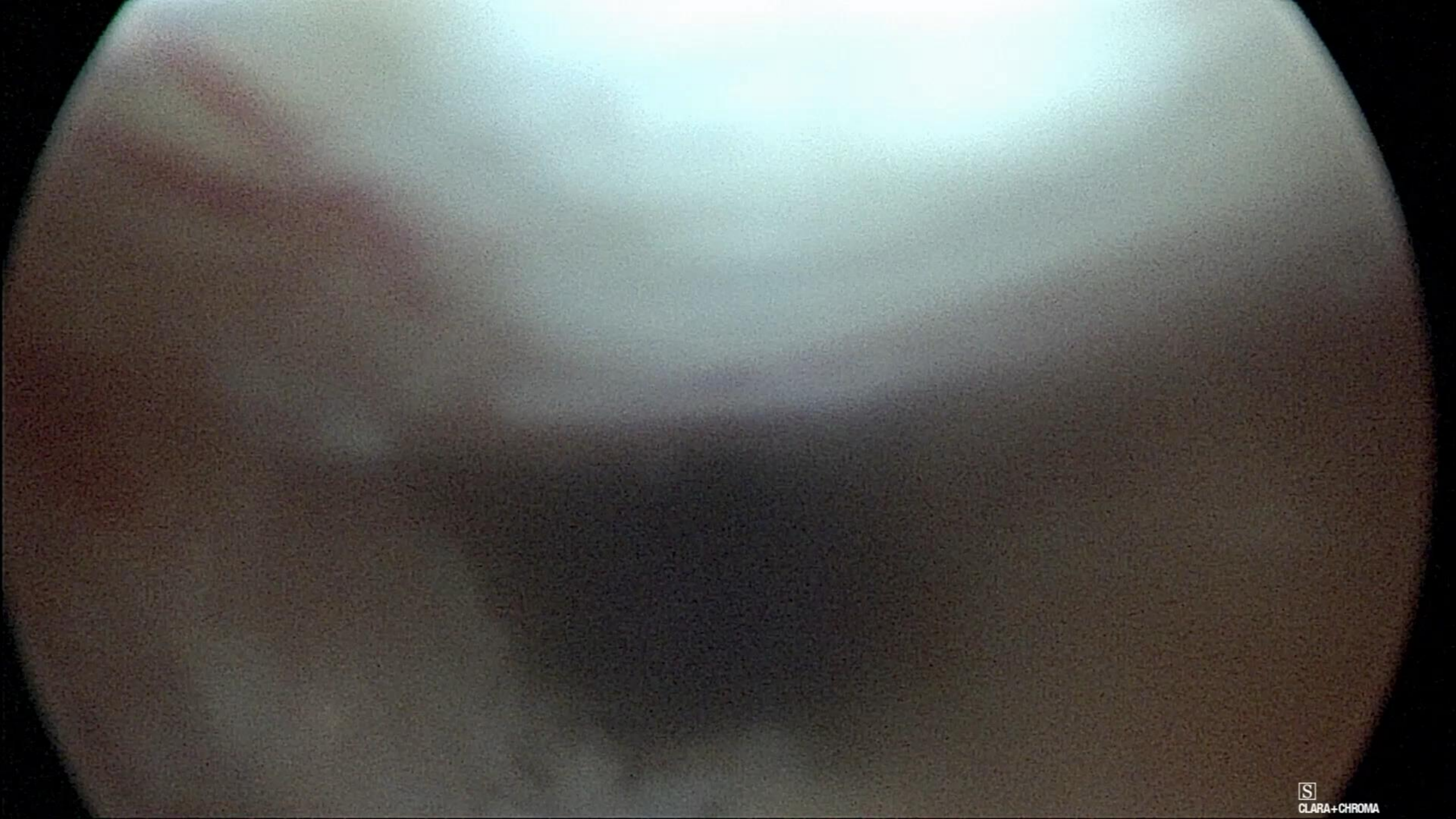
Cage insertion

1. Height oversizing is not good idea
2. Remember auto bone is where fusion achieved. Try to put as much as bone possible, if BMP can be used, put it inside of cage
3. Once 2/3 of cage inserted, impactor can be used for cage rotation
4. After whole length of cage insertion, cage can be expanded. Now you can put bone graft.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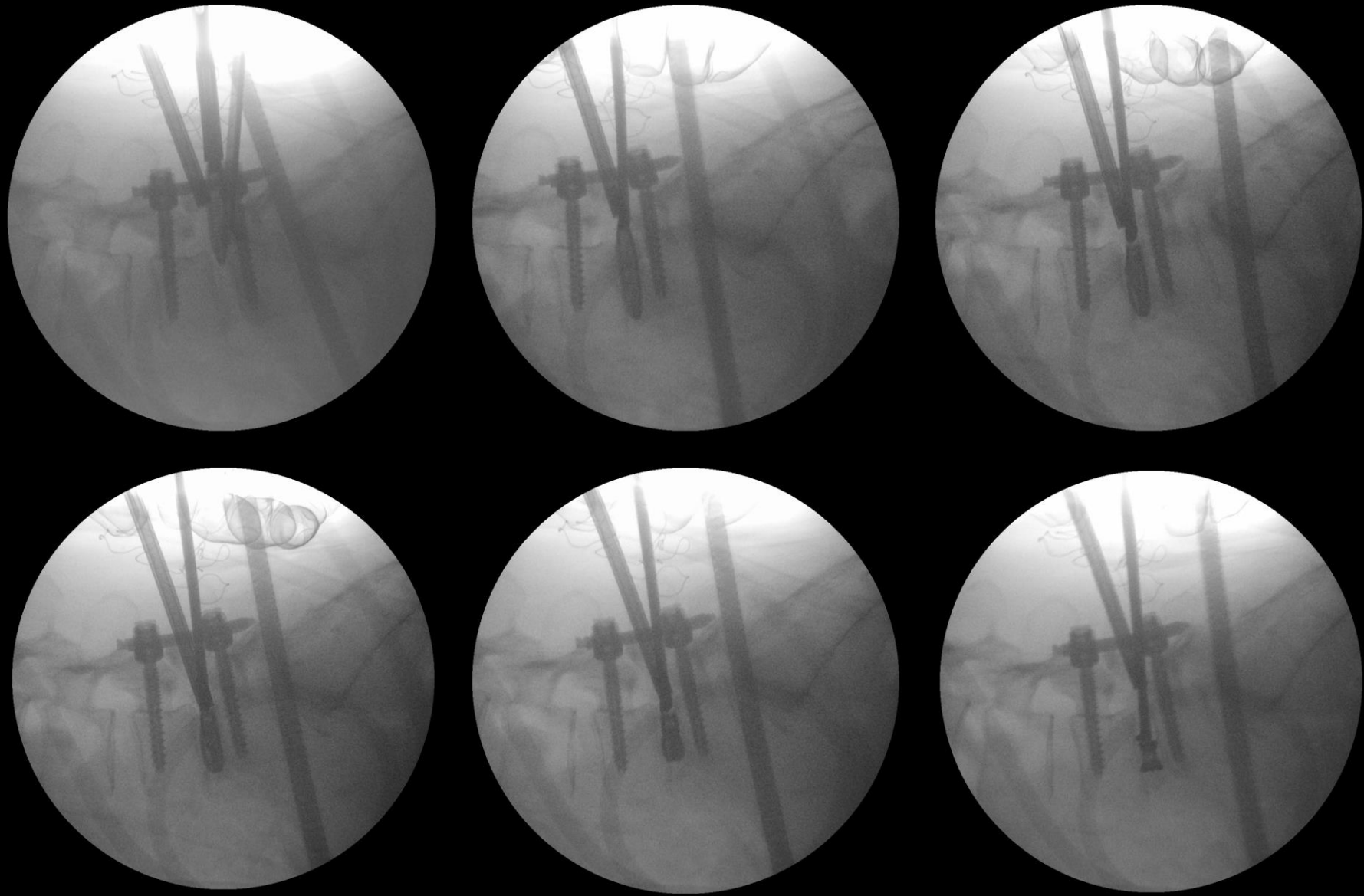
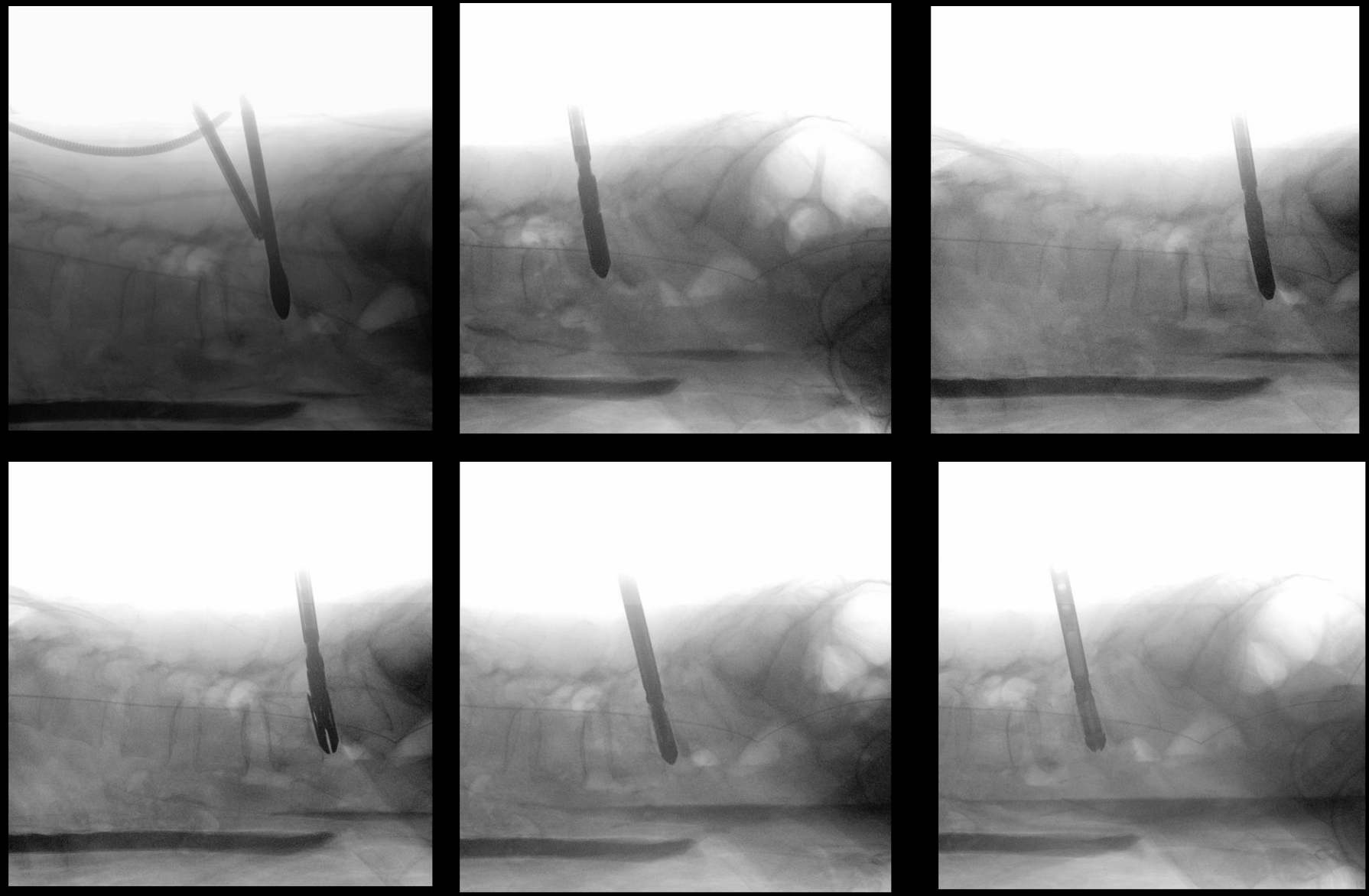
CLARA+CHROMA

Intraoperative C-arm image(large cage)



Intraoperative C-arm image(Expendable)



Closure

1. Meticulous bleeding control, especially bone bleeding with hemostatic agent or bone wax.
2. Better to use drain, with location not to irritate traversing root
3. Layer by layer closure(M fascia-> sub q -> Skin)

Conclusion

1. Dual portal fusion can be wonderful optio n for 1-2 level interbody fusion
2. End plate preparation is the most importa nt step for overcoming learning curve
3. If you can master basic drills first, dual po rtal fusion is not difficult at all.

bos

Expandable cage

LIVE surgery

Global Webinar

Pearls and pitfalls to overcome learning curve for UBE fusion

April 3rd, 2025 (Thursday)
New York 8PM, Paris 2AM, Hong Kong 8AM

Speaker.

Young San Ko, M.D., Ph.D.

- Assistant professor, Spine division, Department of Neurosurgery, Kyungpook National University Hospital
- Master of Science, Seoul National University College of Medicine : 2018 ~ 2020
- Clinical fellow, Department of Neurosurgery, Seoul National University Hospital : 2019 ~ 2021
- Board member of Korean research Society Endoscopic spine surgery
- Board member of Korean minimally invasive spine surgery society
- Secretary of the Academic Committee
- Committee member of Korean spinal neurosurgical society

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EXCENDER

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Thank you!

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