



Our experience in ACD & F for single level disc disease

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Cervical degenerative disc disease

- Encompass a number of symptoms that result from a damaged disc

Clinical presentation:

(Depends on the neural elements involved in this process)

- Neck pain
- Radiculopathy
- Myelopathy
- Radiculomyelopathy

Progress in diagnostic imaging, neurosurgery techniques and spinal instrumentation has changed and improved the management of CDD

Historical background

- **1955 Robinson & Smith:** Described their operative technique used a horseshoe shaped bone graft
- **1958 Cloward:** Reported his technique interbody fusion with cylindrical bone graft
- **1960 Bailey and Badgley:** Presented interbody fusion without decompression of spinal canal
- **1960 Bohler:** Applied anterior cervical plate and screw to treat instability of the spine
- **1975 Hankinson & Willson :** Improved the procedure with the use of operative microscope
- Variety plate and screw systems are now available for ACDFP

Non - surgical treatment

- Drug therapy
- Physical therapy
- Traction
- Nerve root block

Indication for surgery

- Symptoms that have not improved with physical therapy and medication / intolerable neck and nerve pain /
- Significant weakness in hand or arm
- Arm pain worse than neck pain
- Spinal cord compression leading Myelopathy
- Diagnostic test (MRI) show herniated disc

Correlation between radiological and clinical findings

Surgical treatment options for CDD

Surgical techniques

- **Posterior cervical foraminotomy**

Removed the compression and disk that primary lies ventral is difficult without manipulating or injuring spinal cord

- **Anterior cervical discectomy**

- Anterior approach is more convenient than posterior because the disc can be reached without disturbing the spinal cord and nerves.

- **Arthroplasty - Artificial disc**

(designed to preserve motion in the neck)

- **Surgical management of CDD is still controversial**
- **There is no consensus of the best surgical approach for this entity**

Surgical techniques

anterior cervical approach

- **ACD**
 - Simple procedure, low cost, absence of complications related to autograft
 - Post operative loss of lordosis, abnormal curving of spine and cervical kyphosis
- **ACDF** interbody distraction

ACDFP

- Prevention of disc space collapse
- Minimize the risk of graft extrusion
- Improves fusion rate
- Increases the stability
- Shorter surgical time

Bone graft

- **Autograft**

Bone cells from the iliac crest, which has bone - growing cells and proteins

Disadvantage: pain in hipbone and complications after surgery

- **Allograft bon**

graft from cadavers , without bone - growing cells.

- **Bone graft substitute : CAGES**

- Man made; plastic, ceramic, titanium, (packed with bone tissue taken during spine surgery)

- **PEEK - polyetheretherketone , Cage Medtronic**

- avoid the complication related to bone graft from donor



- **66 patients, (35F, 31M)**
 - **Preoperative symptoms**
 - **Pain – Preoperative neck pain 1-10 / 42**
 - **Radiculopathy 66**
 - **Weakness 40**
 - **Numbness 30**
 - **Myelopathy 9**
 - **Level C4-5: - 19, C5-6: - 36 , C6-7: - 11.**

Avanto 87255
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HFS
+LPH STUDY 1
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2 IMA 7 / 13

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SL 3.0/0.3 BW 191.0
FoV 220*220 M/NORM/DIS2D
269*384s
Sag>Tra(-1.8) A2/SAT1
W 1290 C:HE4;NE1,2;SP1
C 531 *tseR2d1rr18 / 150

Radiologija RISTOVSKA, SNEZANA
Avanto 87255



Radiologija RISTOVSKA
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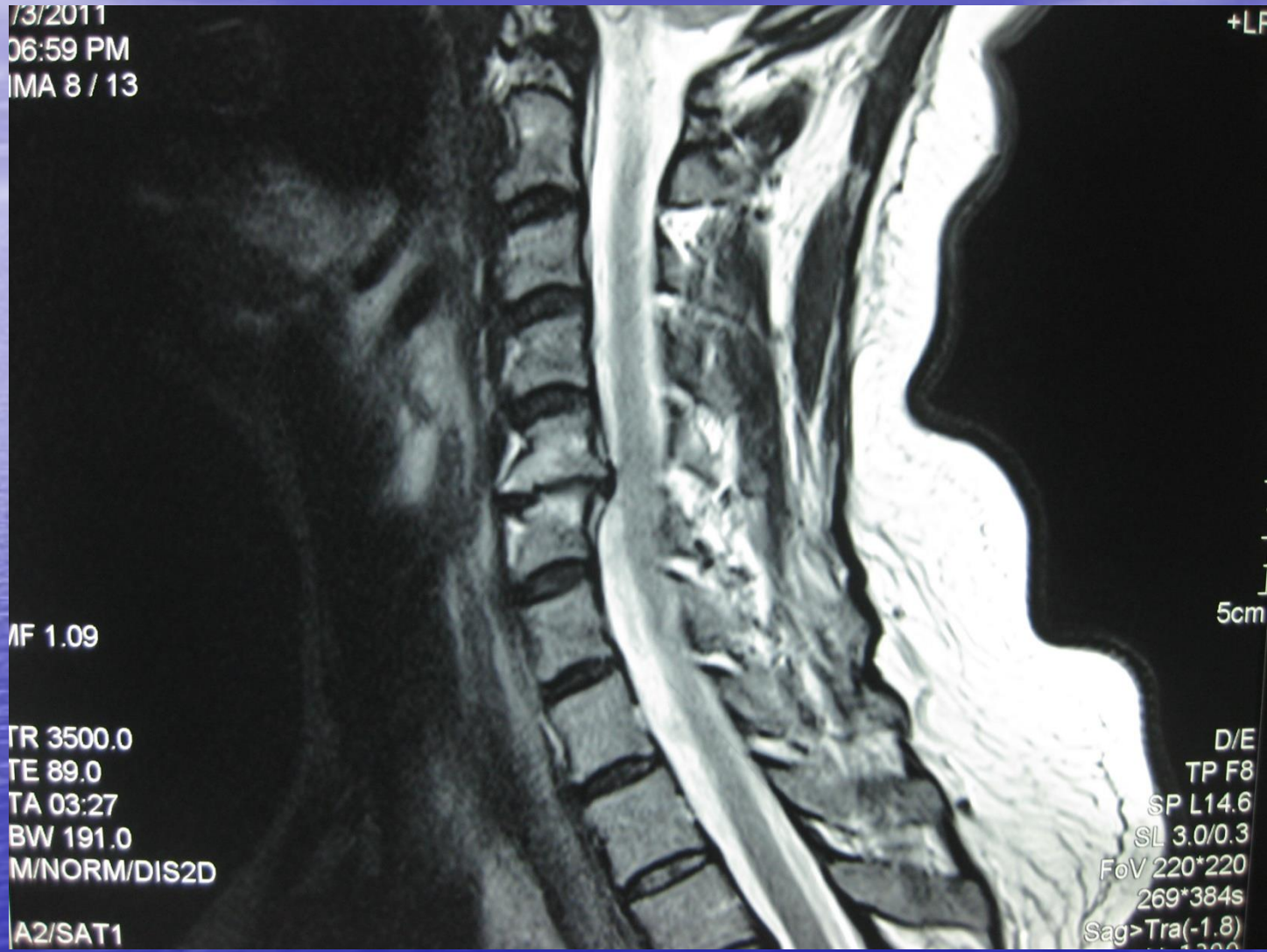
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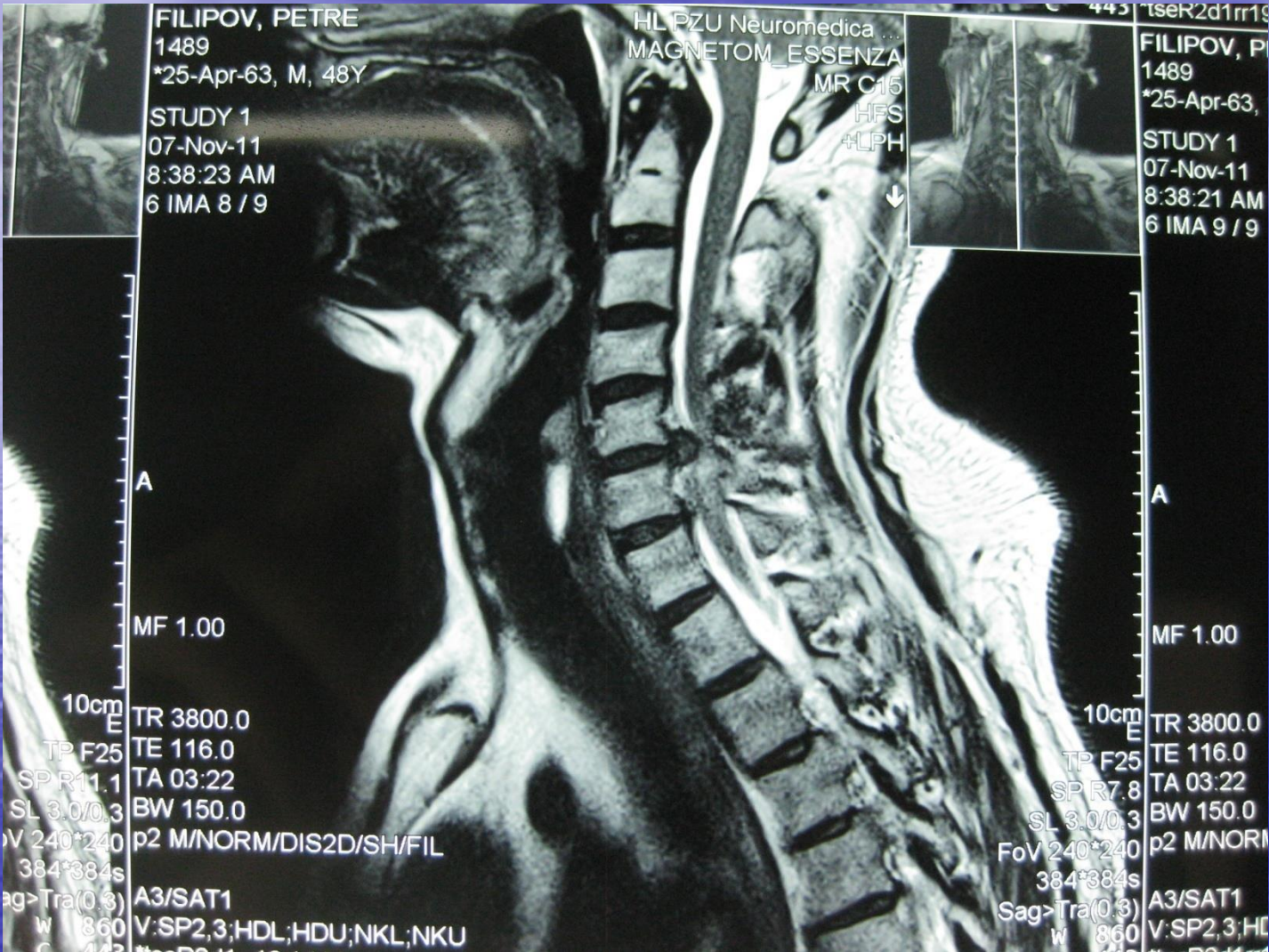
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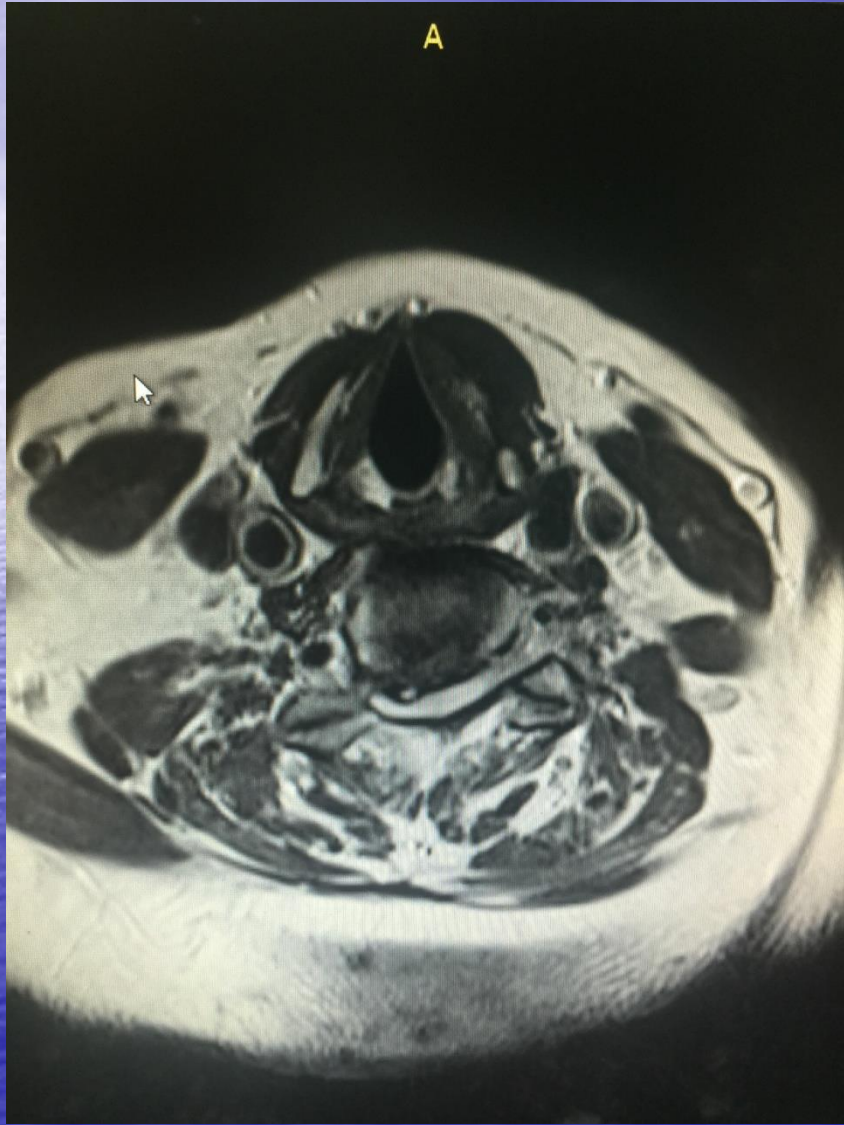
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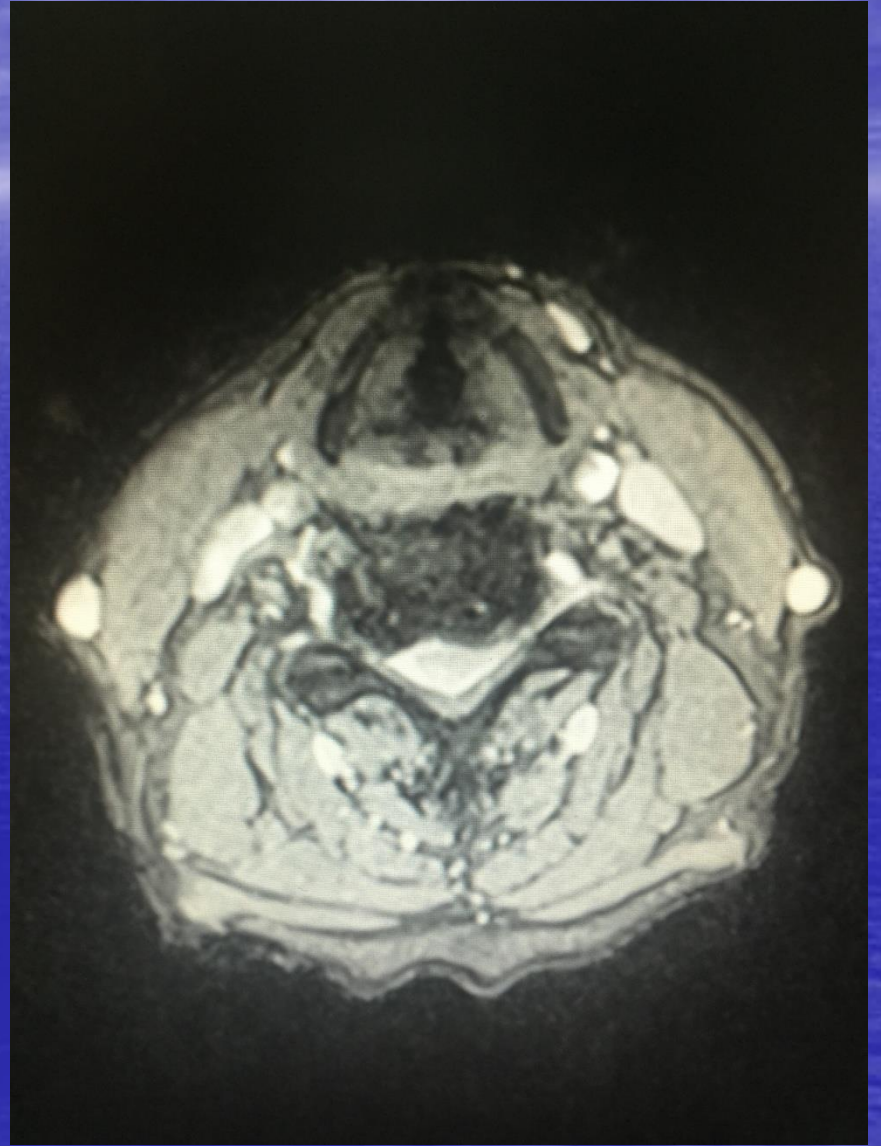
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ATLANTIS™

anterior cervical plate system

HEYPO
IMPLANT INSTRUMENT CASE
876-500

CONSIGNMENT

SOFAMOR
DANEK
THE SPECIAL

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PLATE BENDER
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PLATE HOLDER
876-401

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SPSATLAA-1701

13mm DRILL BIT
876-403

876-415 41500

FIXED ANGLE
DRILL GUIDE
876-412

876-410 42000

PLATE HOLDING
PIN DRIVER
876-404

DEPTH GAGE

DEPTH GAGE
876-406

ADJUSTABLE ANGLE
DRILL GUIDE
876-415

4.0x13mm TAP
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4.5x13mm TAP
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4.0 X 13mm TAP

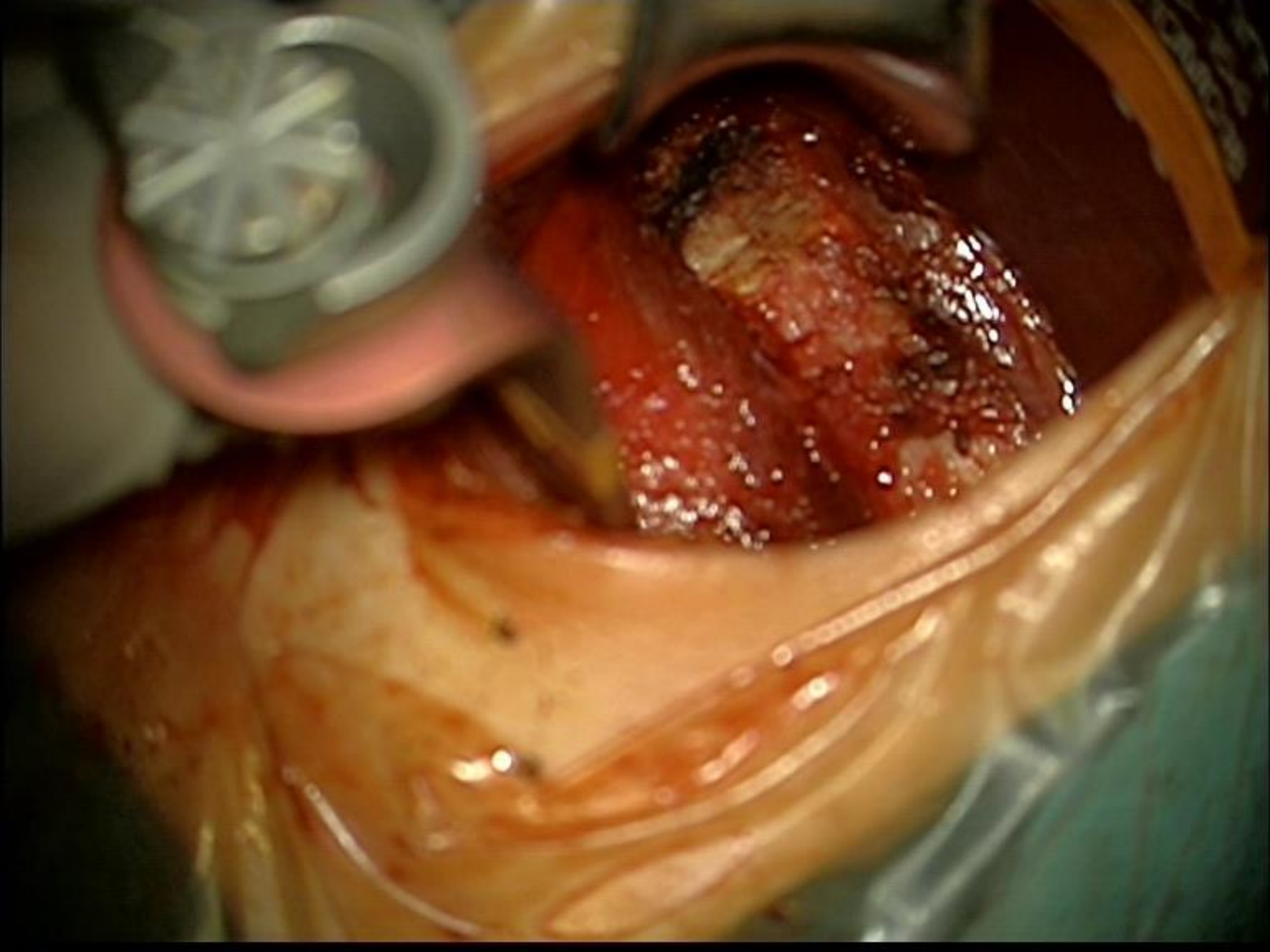
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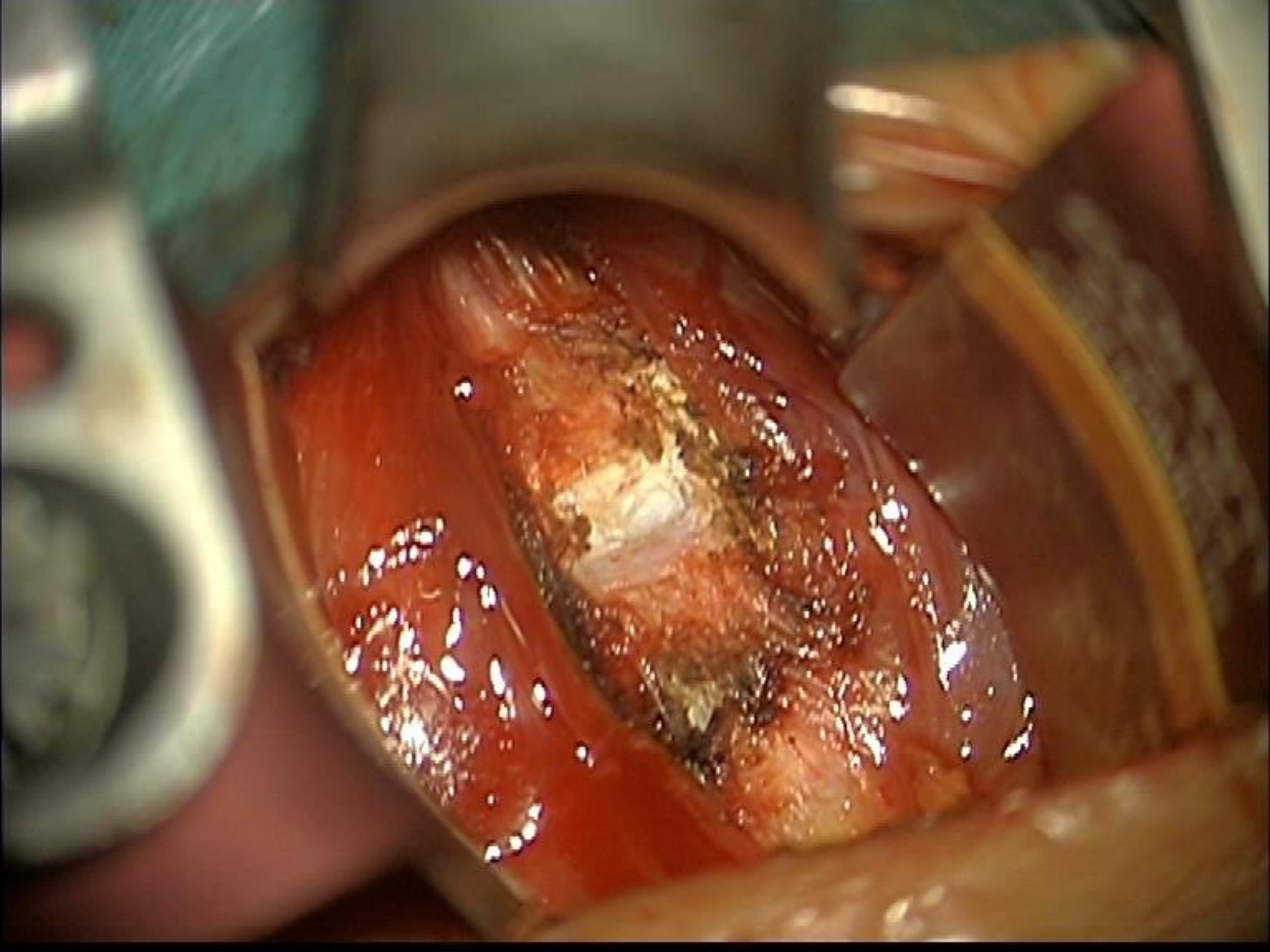
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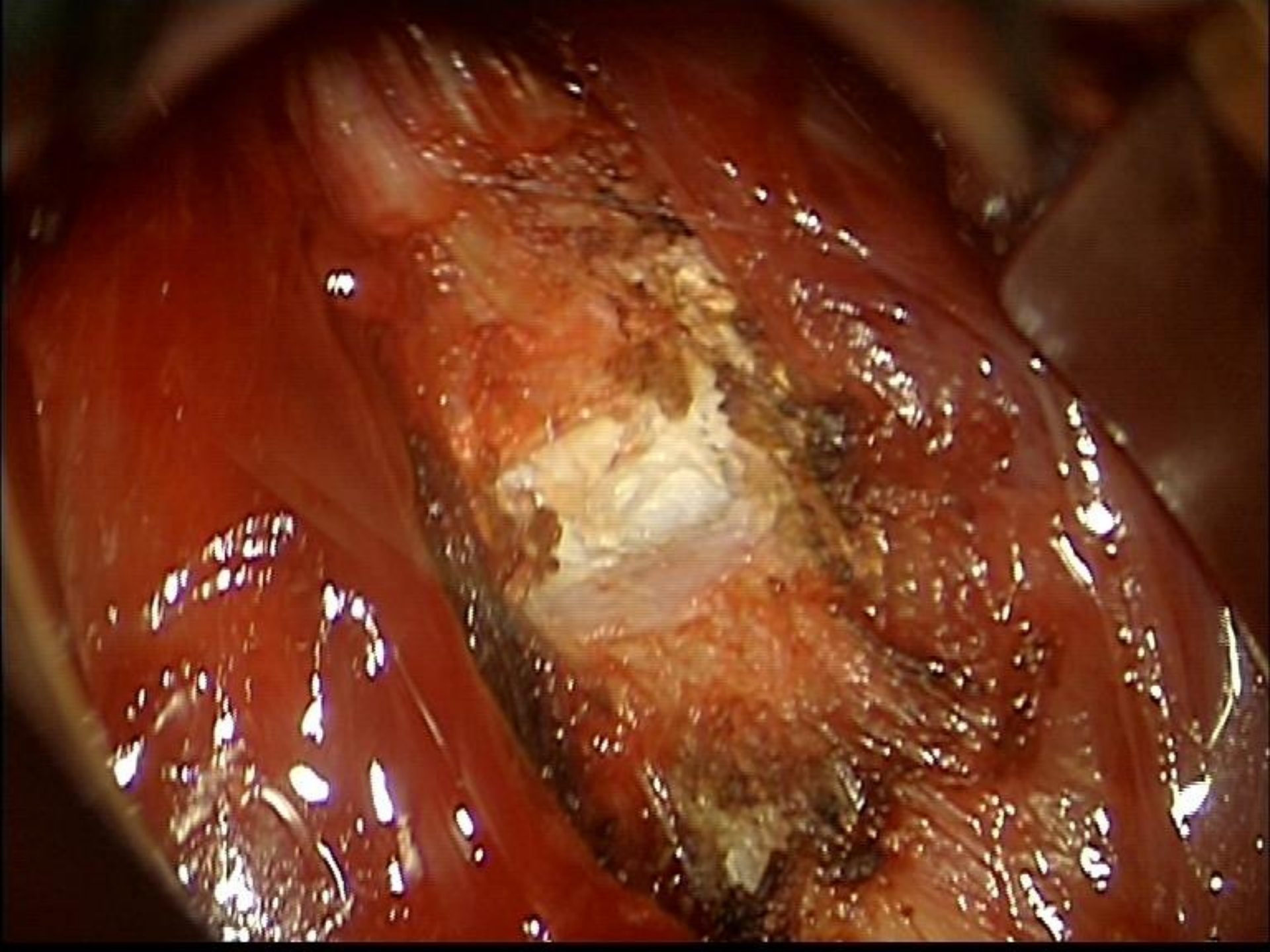
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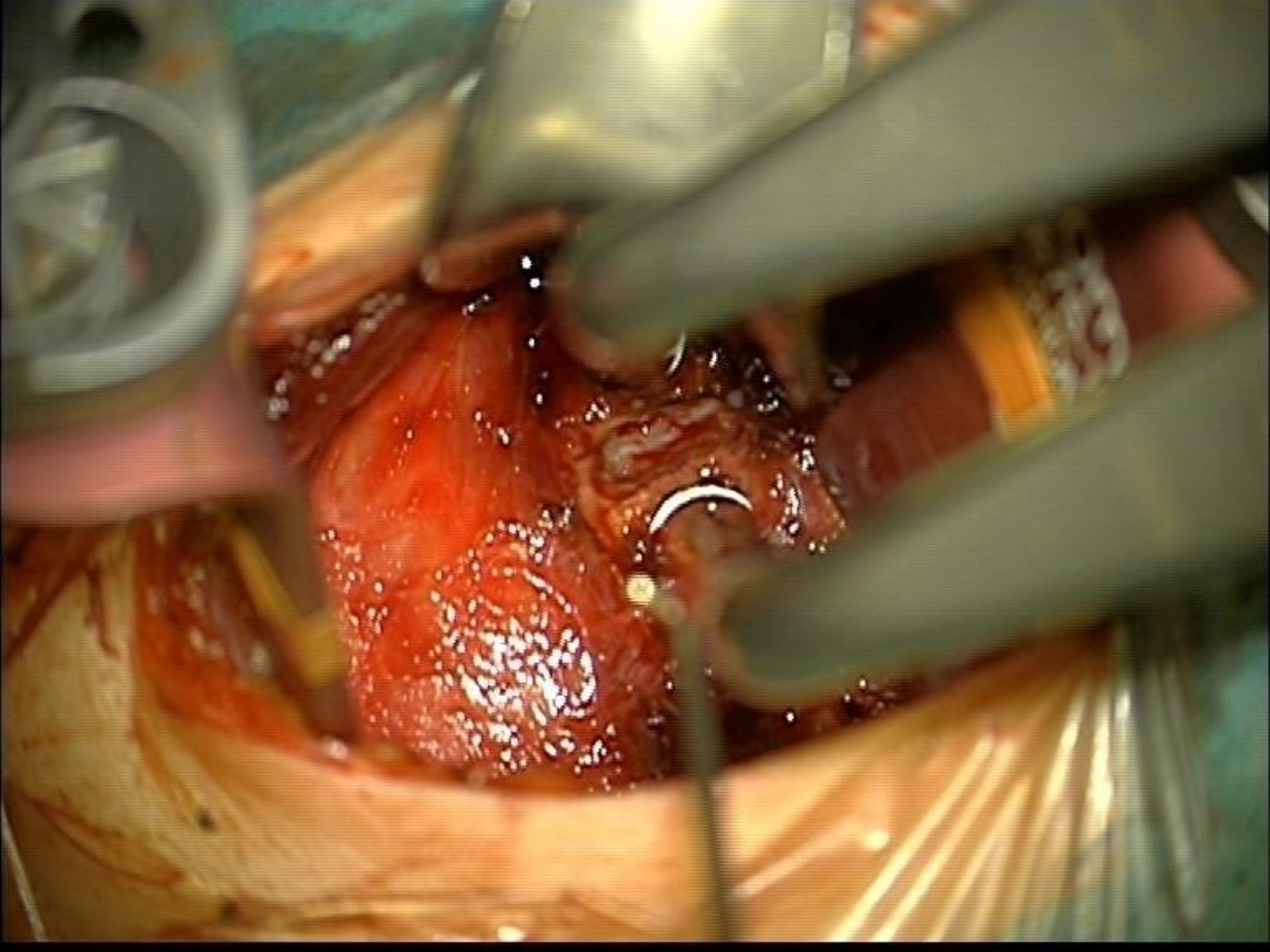
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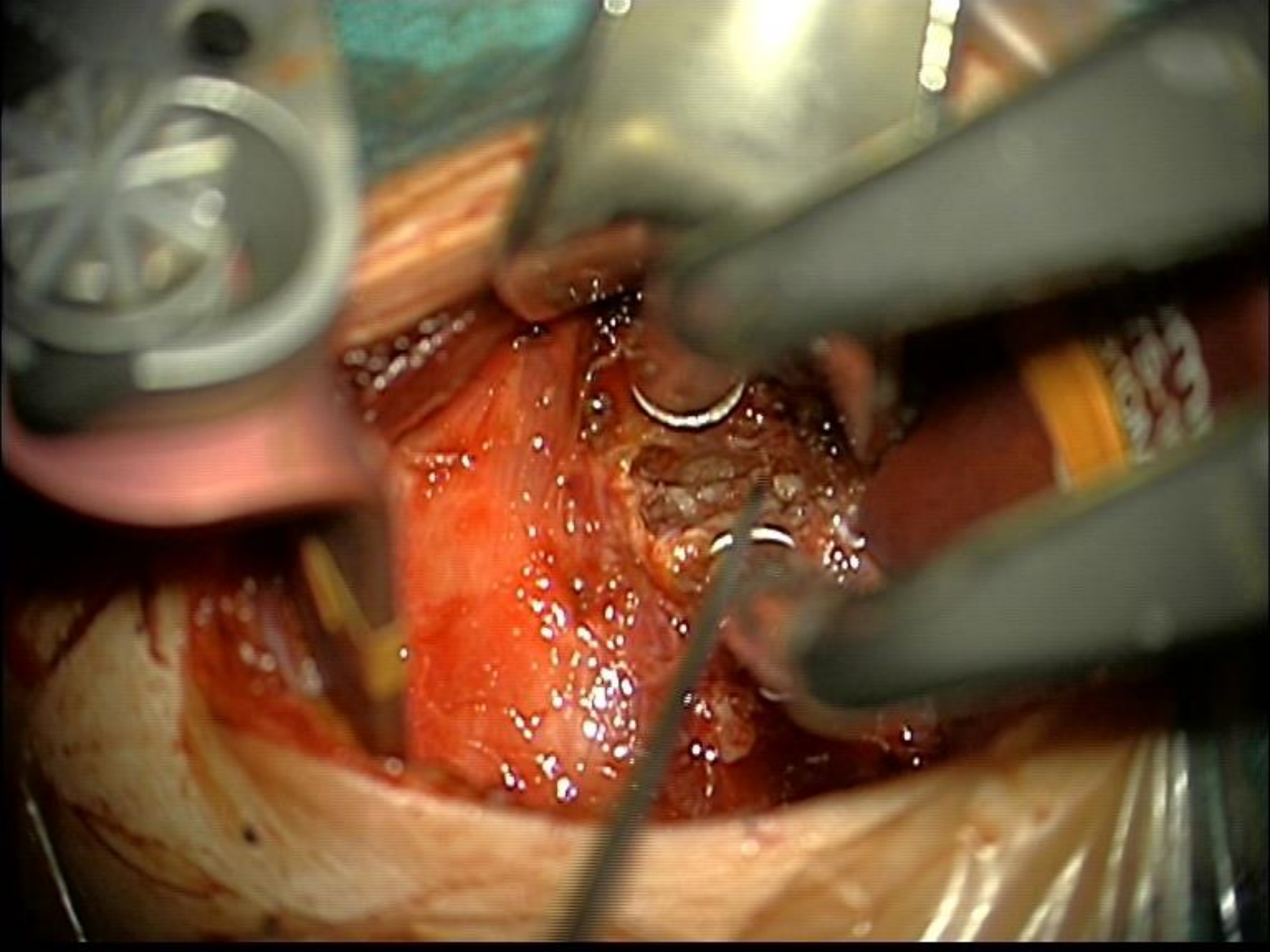


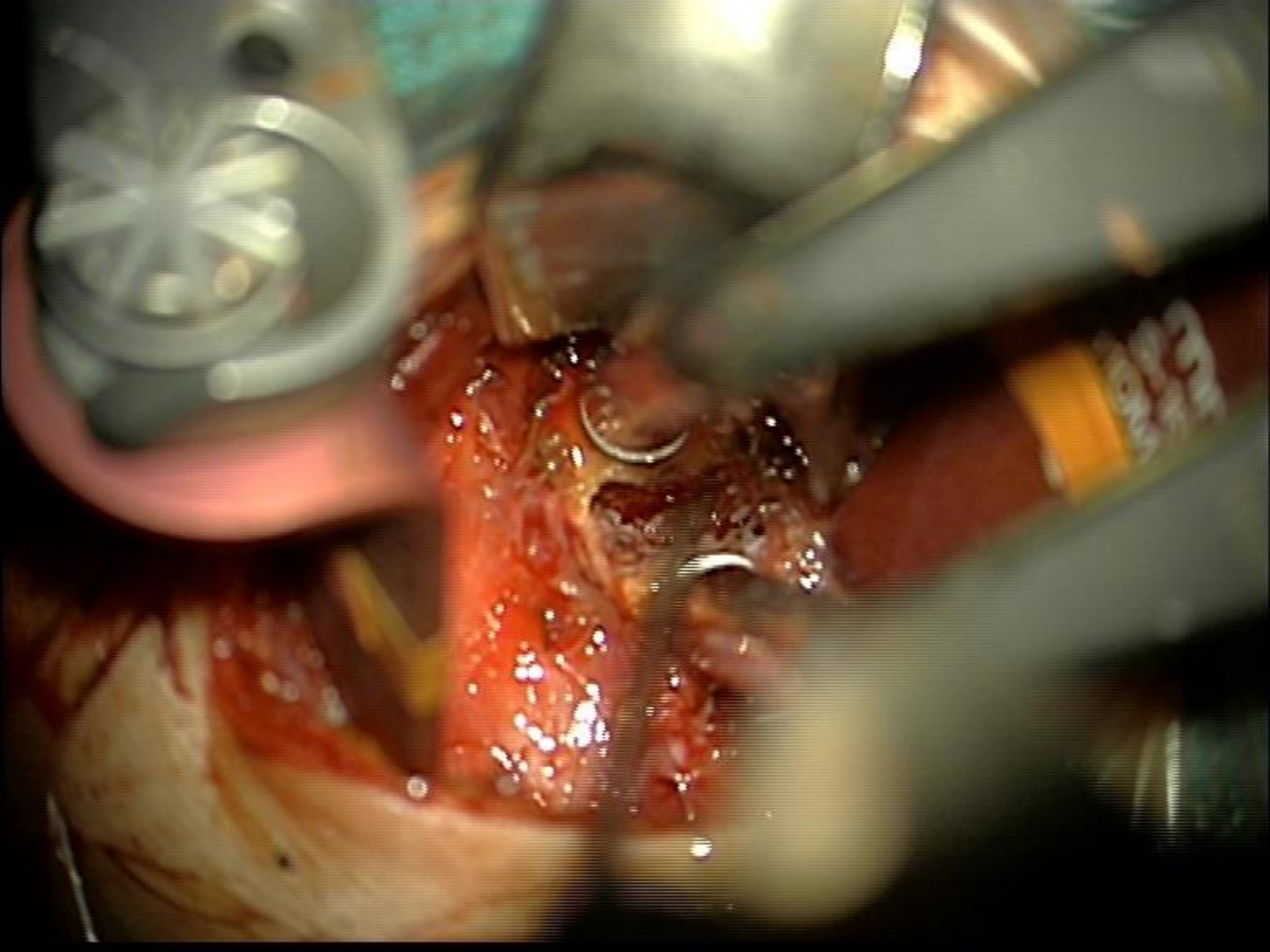


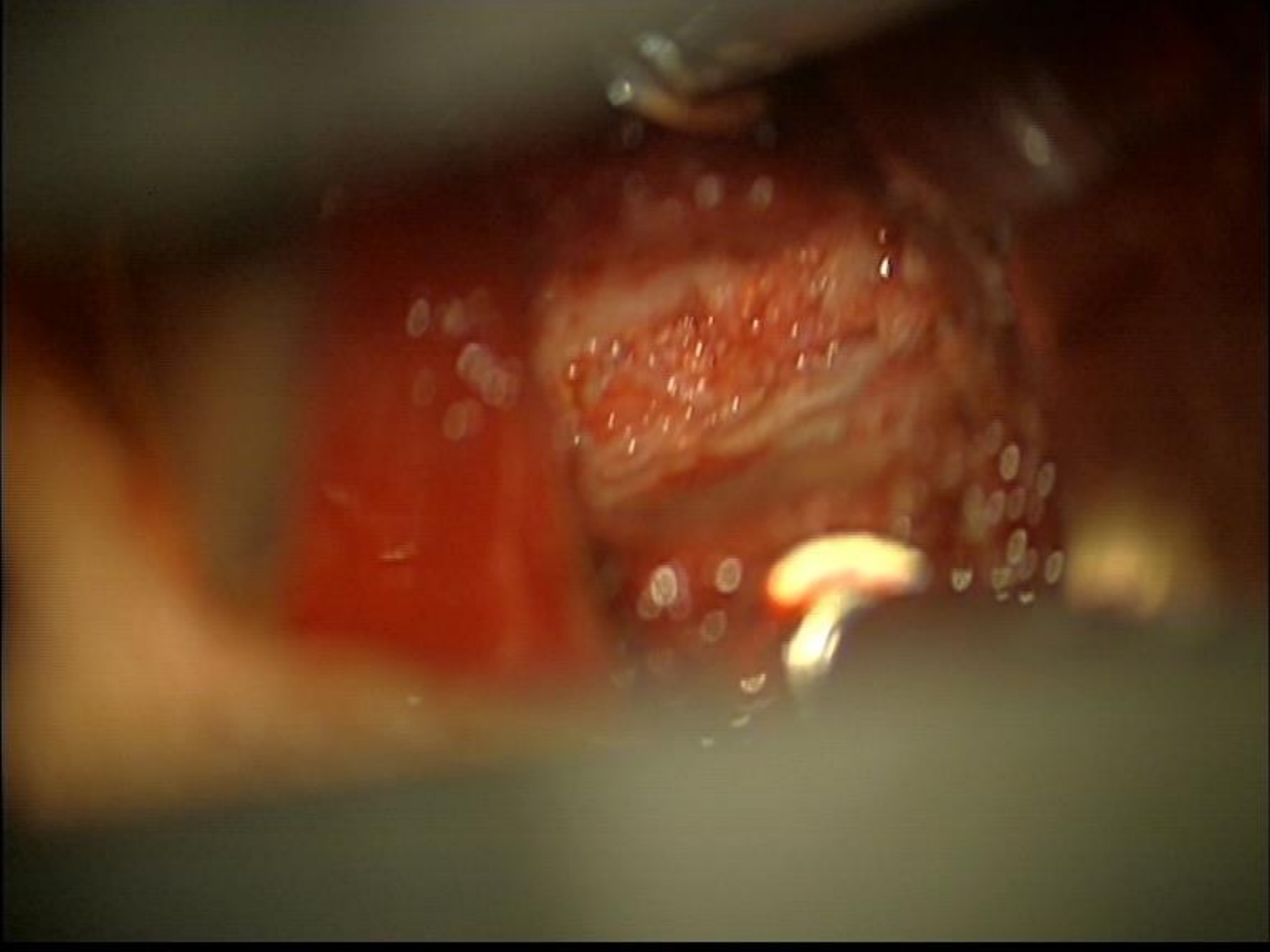


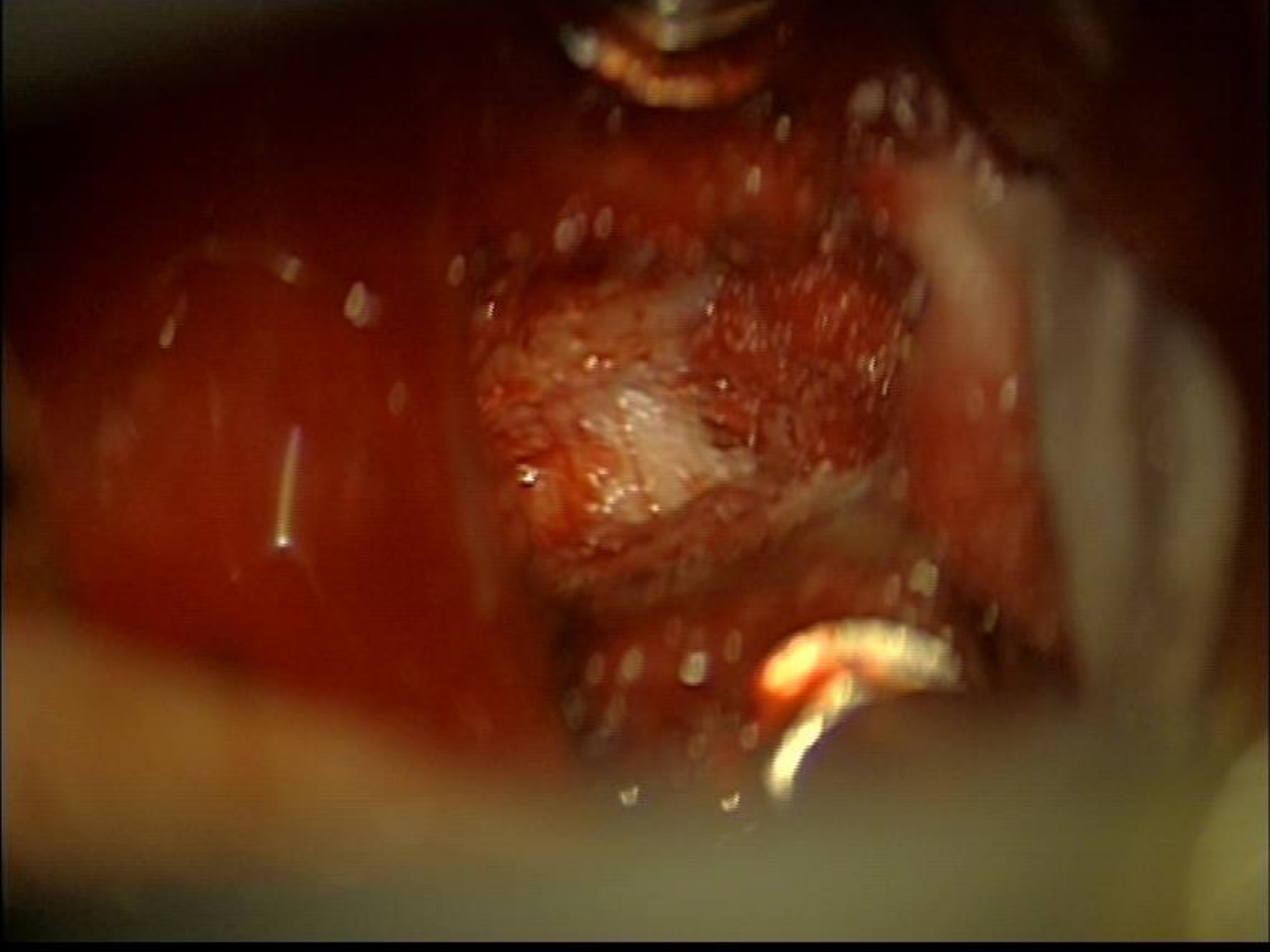




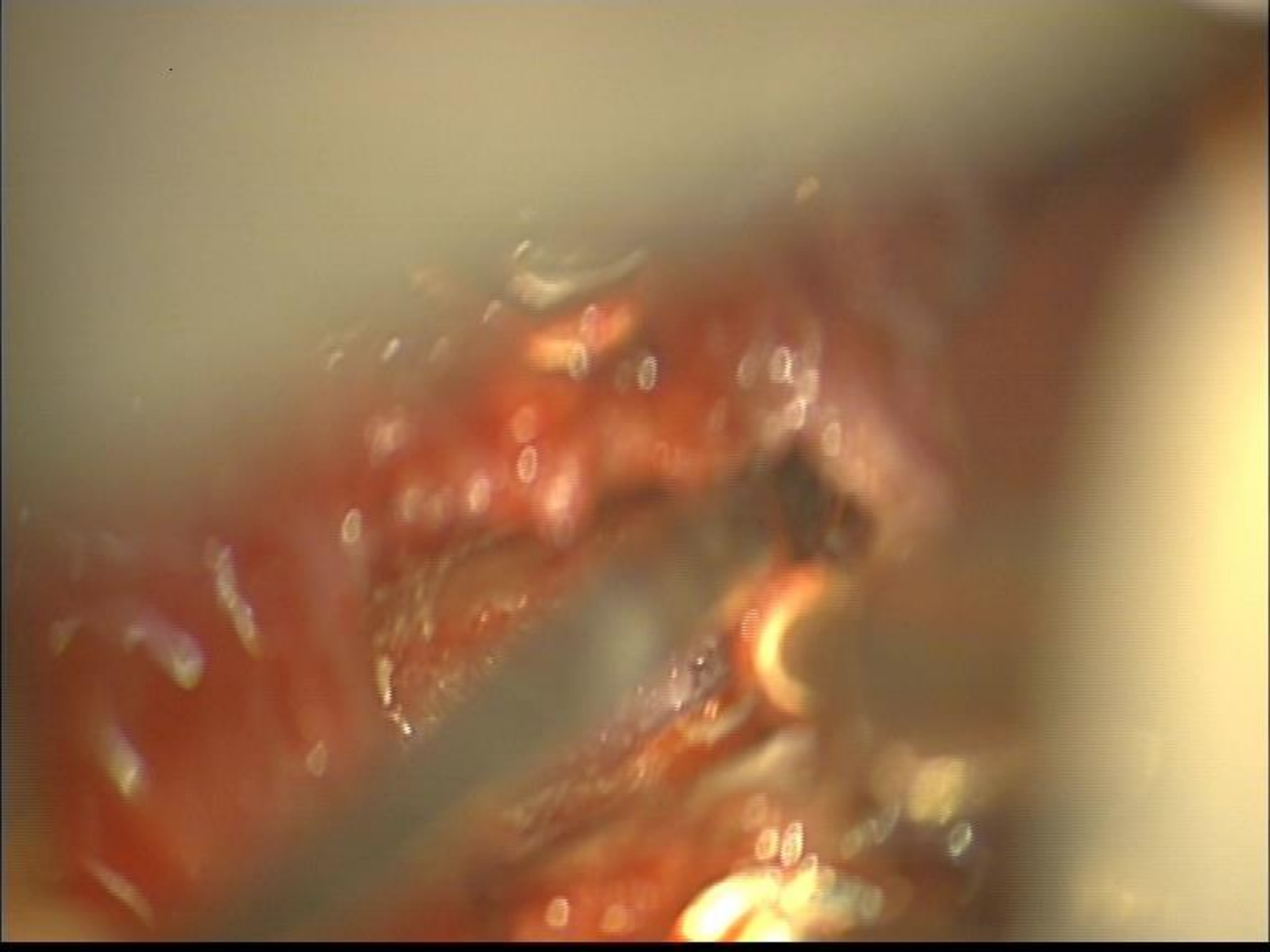






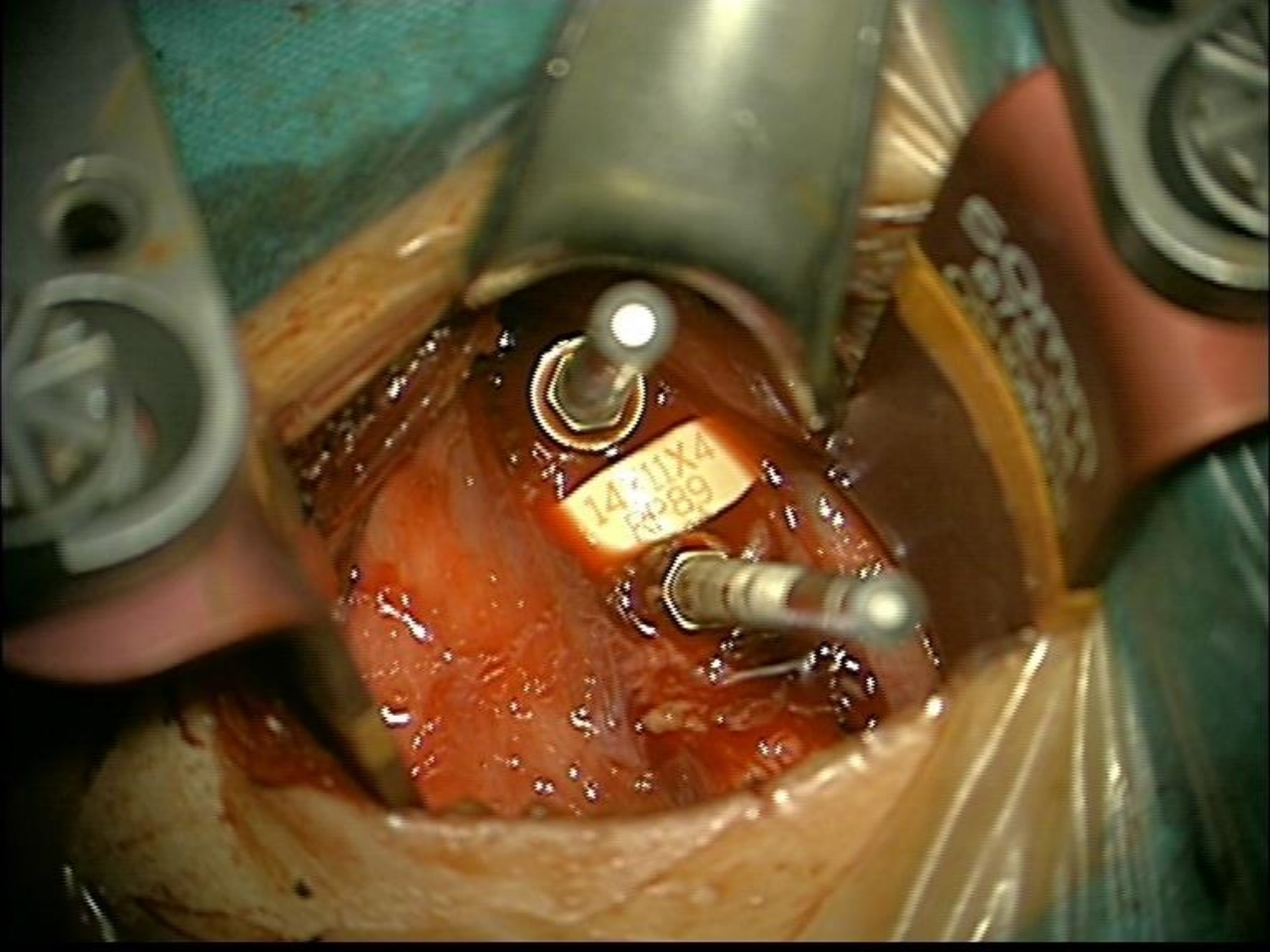




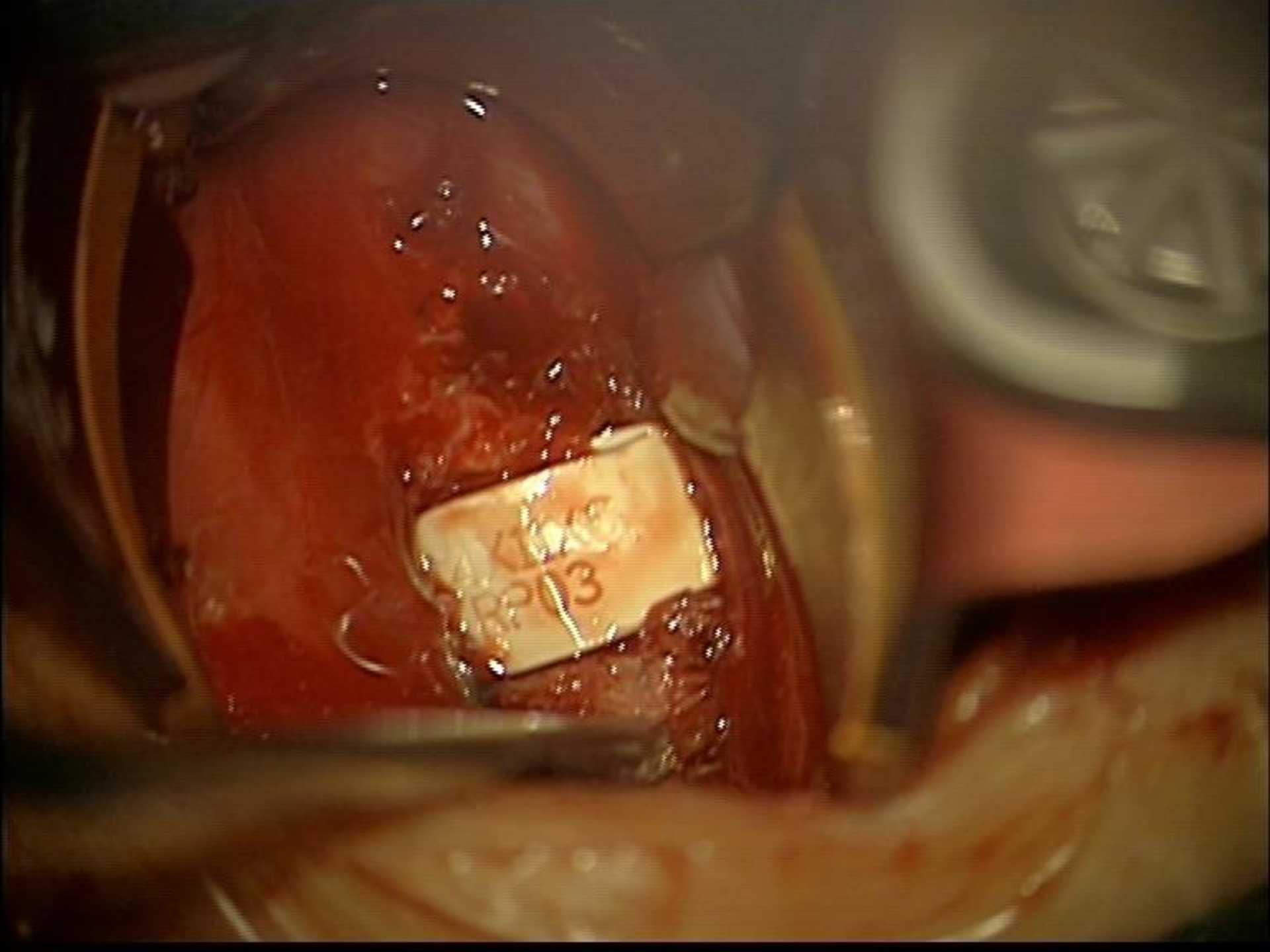


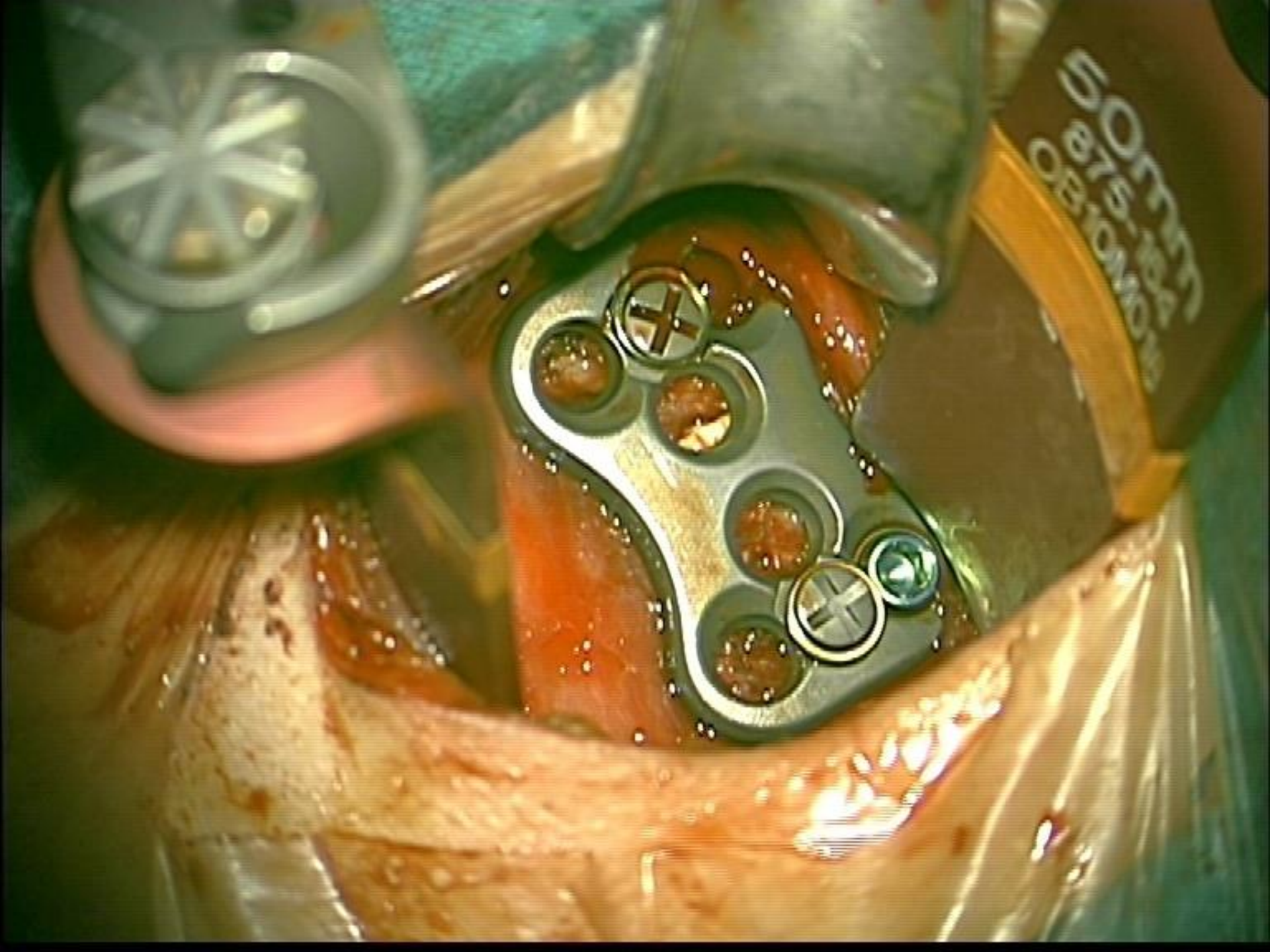






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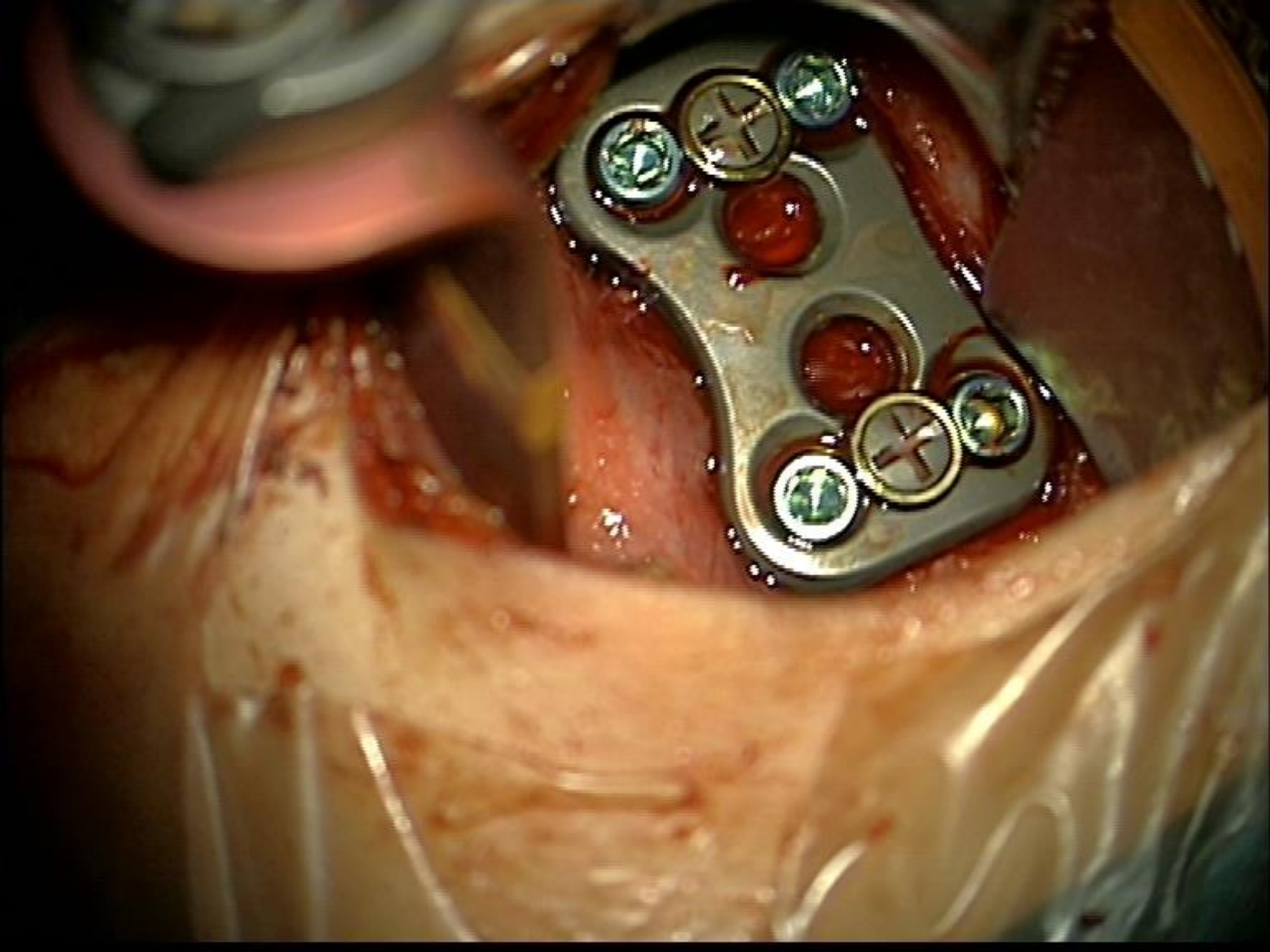




Figure 10-10: Lateral X-ray of the thoracic spine showing a fracture of the T12 vertebra with a compression fracture and a large bony fragment displaced posteriorly.













Results

- Outcome
 - Improve and relieve radicular pain
 - Neck disability index
 - Fusion rate
 - Poor
 - Average
 - Good
 - Excellent

Neck Disability Index

This questionnaire has been designed to give us information as to how your neck pain has affected your ability to manage in everyday life. Please answer every section and mark in each section only the one box that applies to you. We realise you may consider that two or more statements in any one section relate to you, but please just mark the box that most closely describes your problem.

Section 1: Pain Intensity

- I have no pain at the moment
- The pain is very mild at the moment
- The pain is moderate at the moment
- The pain is fairly severe at the moment
- The pain is very severe at the moment
- The pain is the worst imaginable at the moment

Section 2: Personal Care (Washing, Dressing, etc.)

- I can look after myself normally without causing extra pain
- I can look after myself normally but it causes extra pain
- It is painful to look after myself and I am slow and careful
- I need some help but can manage most of my personal care
- I need help every day in most aspects of self care
- I do not get dressed, I wash with difficulty and stay in bed

Section 3: Lifting

- I can lift heavy weights without extra pain
- I can lift heavy weights but it gives extra pain
- Pain prevents me lifting heavy weights off the floor, but I can manage if they are conveniently placed, for example on a table
- Pain prevents me from lifting heavy weights but I can manage light to medium weights if they are conveniently positioned
- I can only lift very light weights

Office Use Only

Name _____

Date _____

- I cannot lift or carry anything

Section 4: Reading

- I can read as much as I want to with no pain in my neck
- I can read as much as I want to with slight pain in my neck
- I can read as much as I want to with moderate pain in my neck
- I can't read as much as I want because of moderate pain in my neck
- I can hardly read at all because of severe pain in my neck
- I cannot read at all

Section 5: Headaches

- I have no headaches at all
- I have slight headaches, which come infrequently
- I have moderate headaches, which come infrequently
- I have moderate headaches, which come frequently
- I have severe headaches, which come frequently
- I have headaches almost all the time

Section 6: Concentration

- I can concentrate fully when I want to with no difficulty
- I can concentrate fully when I want to with slight difficulty
- I have a fair degree of difficulty in concentrating when I want to
- I have a lot of difficulty in concentrating when I want to
- I have a great deal of difficulty in concentrating when I want to
- I cannot concentrate at all

Section 7: Work

- I can do as much work as I want to
- I can only do my usual work, but no more
- I can do most of my usual work, but no more
- I cannot do my usual work
- I can hardly do any work at all
- I can't do any work at all

Section 8: Driving

- I can drive my car without any neck pain
- I can drive my car as long as I want with slight pain in my neck
- I can drive my car as long as I want with moderate pain in my neck
- I can't drive my car as long as I want because of moderate pain in my neck
- I can hardly drive at all because of severe pain in my neck
- I can't drive my car at all

Section 9: Sleeping

- I have no trouble sleeping
- My sleep is slightly disturbed (less than 1 hr sleepless)
- My sleep is mildly disturbed (1-2 hrs sleepless)
- My sleep is moderately disturbed (2-3 hrs sleepless)
- My sleep is greatly disturbed (3-5 hrs sleepless)
- My sleep is completely disturbed (5-7 hrs sleepless)

Section 10: Recreation

- I am able to engage in all my recreation activities with no neck pain at all
- I am able to engage in all my recreation activities, with some pain in my neck
- I am able to engage in most, but not all of my usual recreation activities because of pain in my neck
- I am able to engage in a few of my usual recreation activities because of pain in my neck
- I can hardly do any recreation activities because of pain in my neck
- I can't do any recreation activities at all

Score: /50 Transform to percentage score x 100 = %points

Scoring: For each section the total possible score is 5: if the first statement is marked the section score = 0, if the last statement is marked it = 5. If all ten sections are

completed the score is calculated as follows:

If one section is missed or not applicable the score is calculated:

Minimum Detectable Change (90% confidence): 5 points or 10 %points

Example:16 (total scored)

50 (total possible score) x 100 = 32%

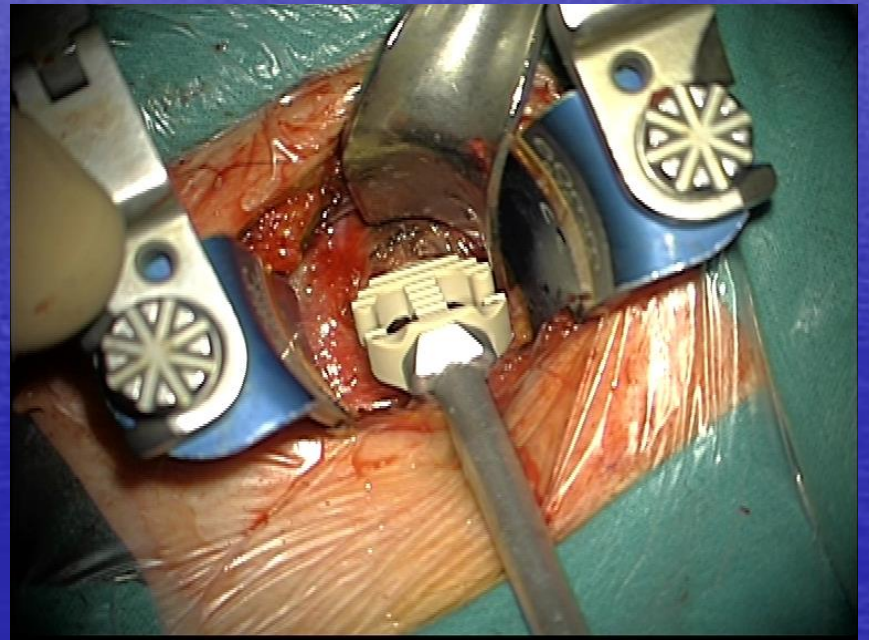
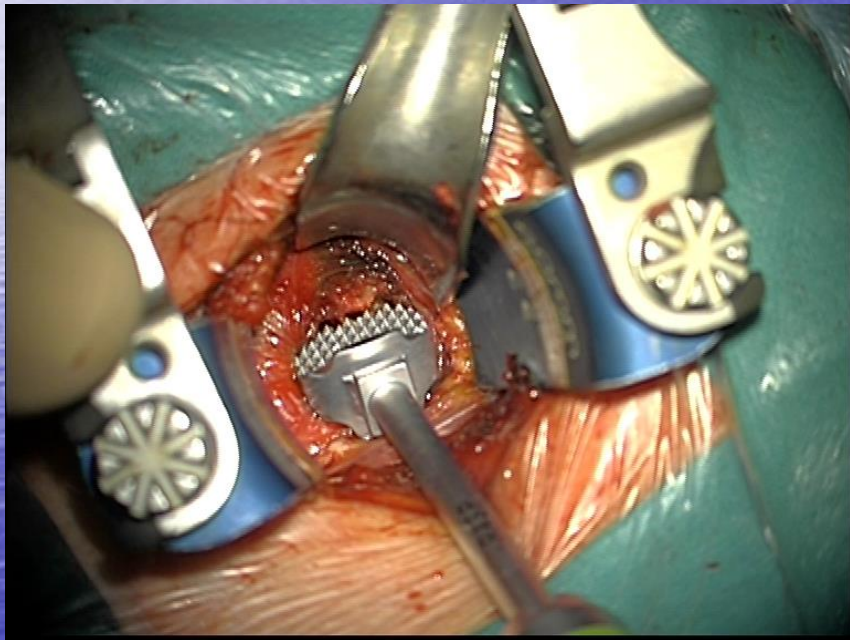
16 (total scored)

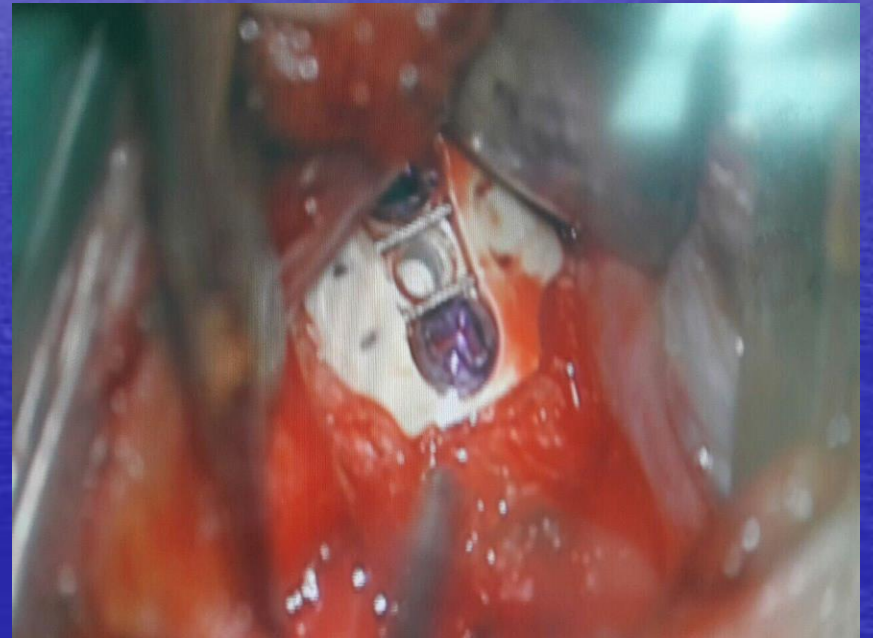
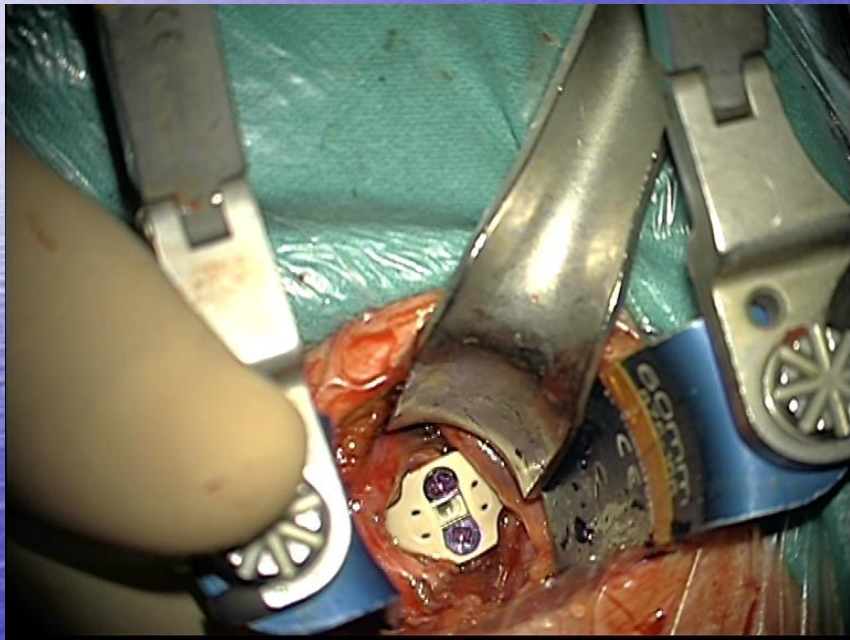
45 (total possible score) x 100 = 35.5%

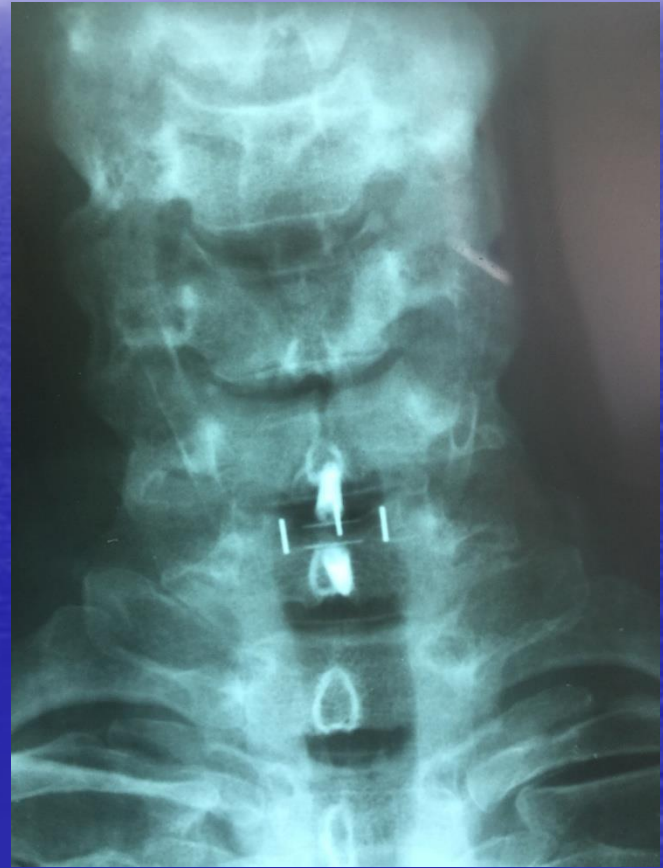
NDI developed by: Vernon, H. & Mior, S. (1991). The Neck Disability Index: A study of reliability and validity. Journal of Manipulative and Physiological Therapeutics. 14, 409-415

PEEK PREVAIL –Cervical Interbody Device

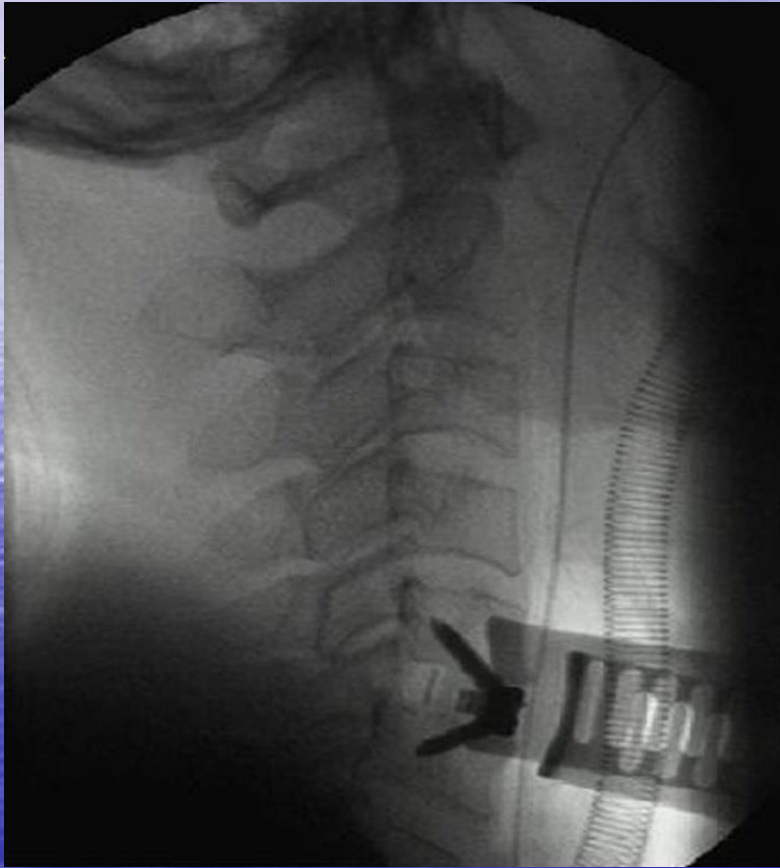












Complications

- Nerve damage or persistent pain
- Increased neurological deficit
- Dural laceration, CSF fistula
- Vascular injury
- Esophageal perforation
- Recurrent laryngeal nerve injury
- **Graft complications**
 - Bone graft migration and displacement
 - Graft collapse
 - Nonunion - vertebrae failing to fuse
 - Hardware fracture

- **Posterior cervical foraminotomy vs ACDFP**
 - ACDF 41% adjacent level degeneration (Henderson)
 - Foraminotomy 55% adjacent level degeneration (Scoville, Silvieri)

- **Arthroplasty vs ACDFP**

(Weak evidence arthroplasty showed that may be superior in treating neck and arm pain; Cepoiu M.)

2 years follow up : Effectiveness of ACDA is similar to ACDFP

- Loosening - More incidence of hardware failure
- Paravertebral ossification

- ACD vs ACDFP

- On the short term, ACD leads to satisfied outcome.
- Over longer term, patients report increasing complains (Tewarie, Bartels,Peul)
Incidence of kyphotic deformity is higher

Surgical management – controversial

- The trend is to treat degenerative cervical disc from anterior approach with subsequent fusion.
- Anterior cervical screw - plate systems have become an integral part of the surgical management after ACD

Conclusion

- **ACDFP**
 - Safe, effective, excellent results in SLDD with intractable pain w/wo neurologic deficit

THANK YOU

