How to Address Glenoid Bone Loss in Chronic Shoulder Instability

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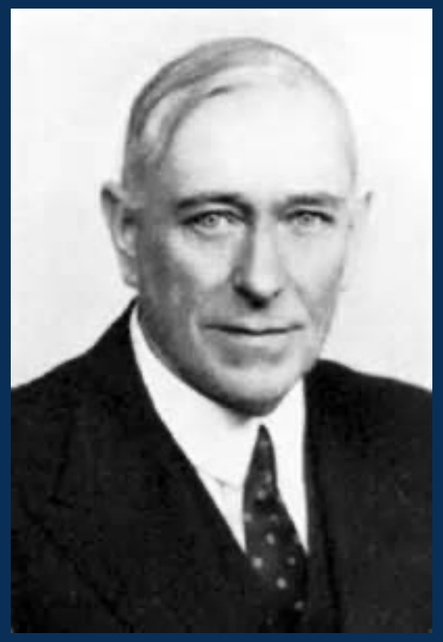
Disclosures

- Exactech, Inc – Consultant, Research Support
- Arthrex, Inc – Consultant
- AAOS Committee member
- ASES Committee member

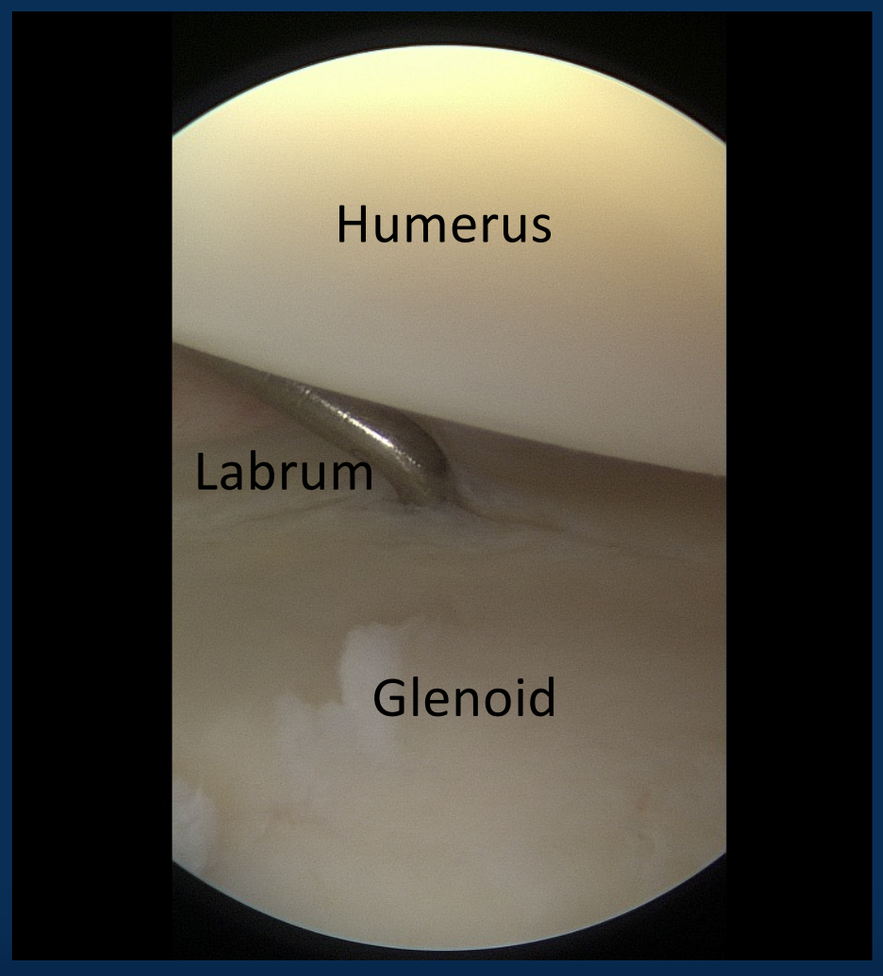
Outline

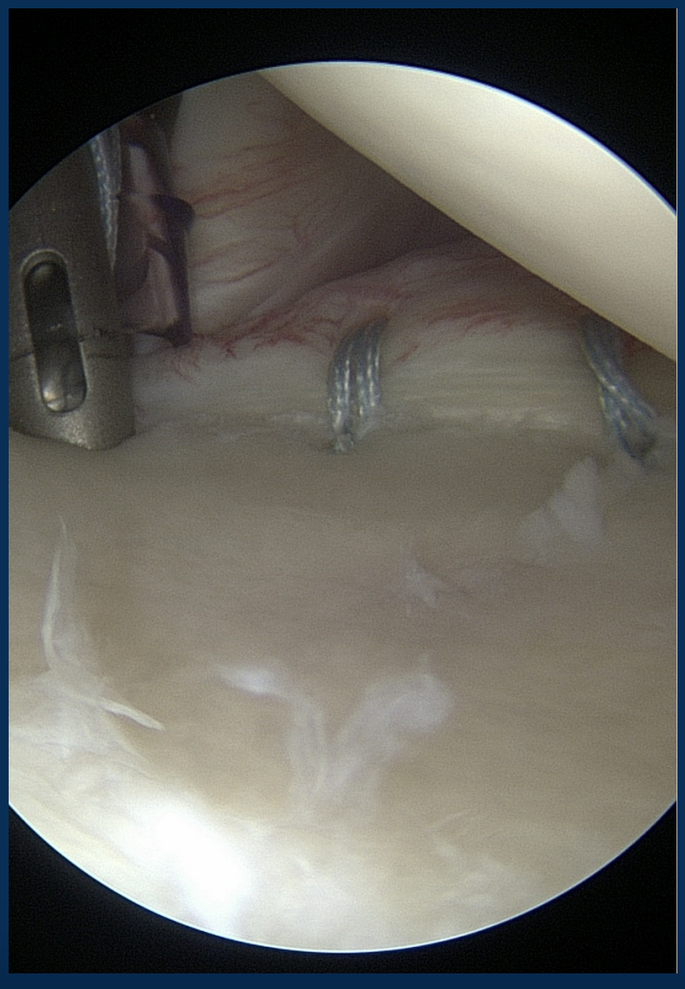
- Define Bankart
- Diagnosis
- Treatment

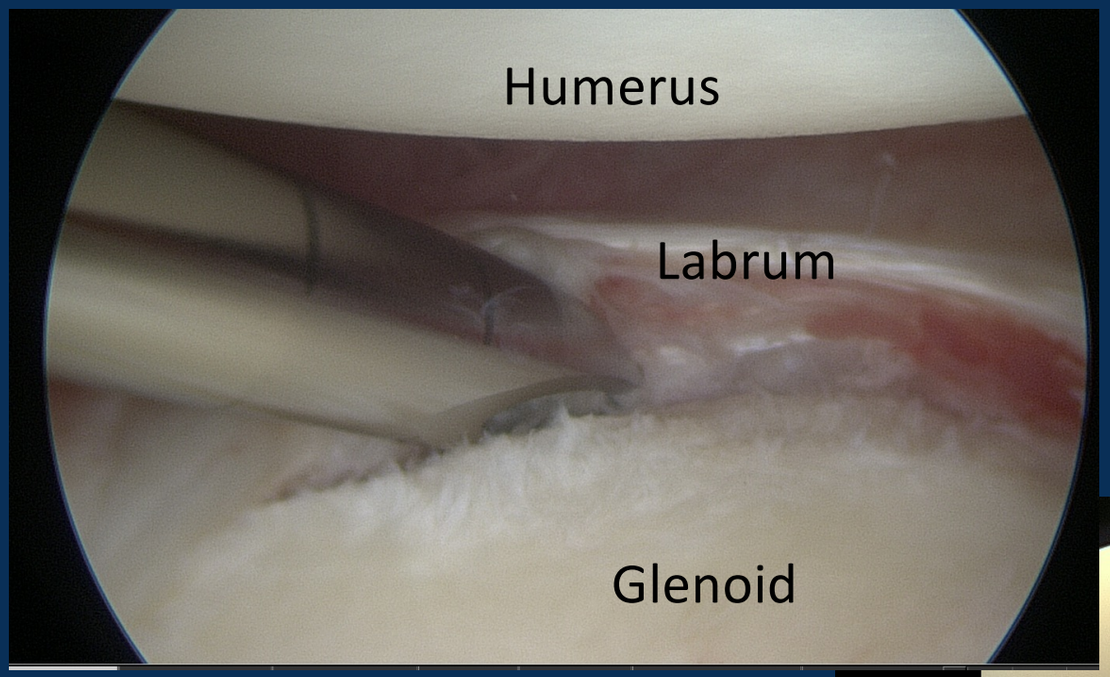
What is a Bankart lesion?

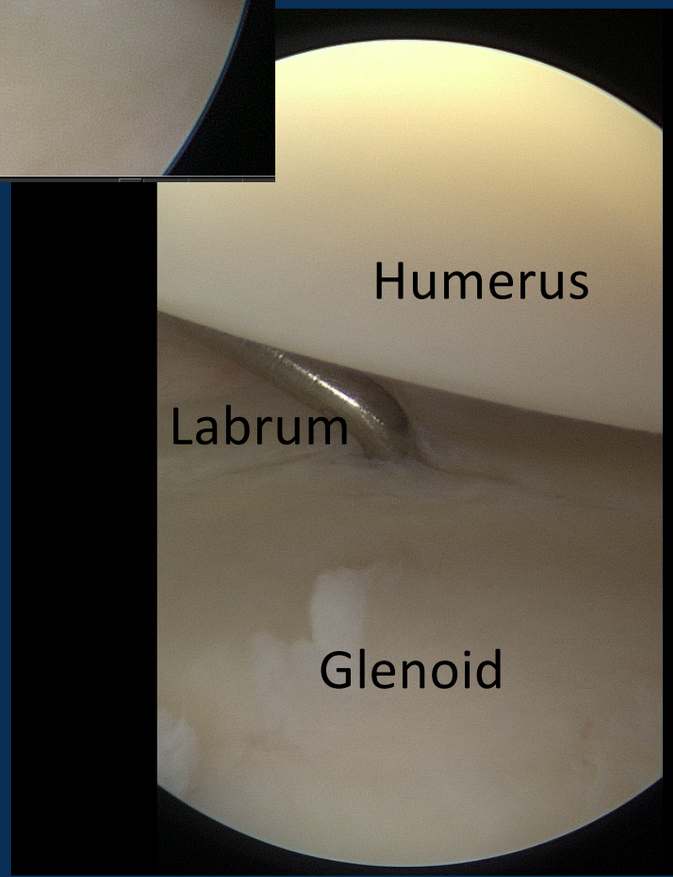


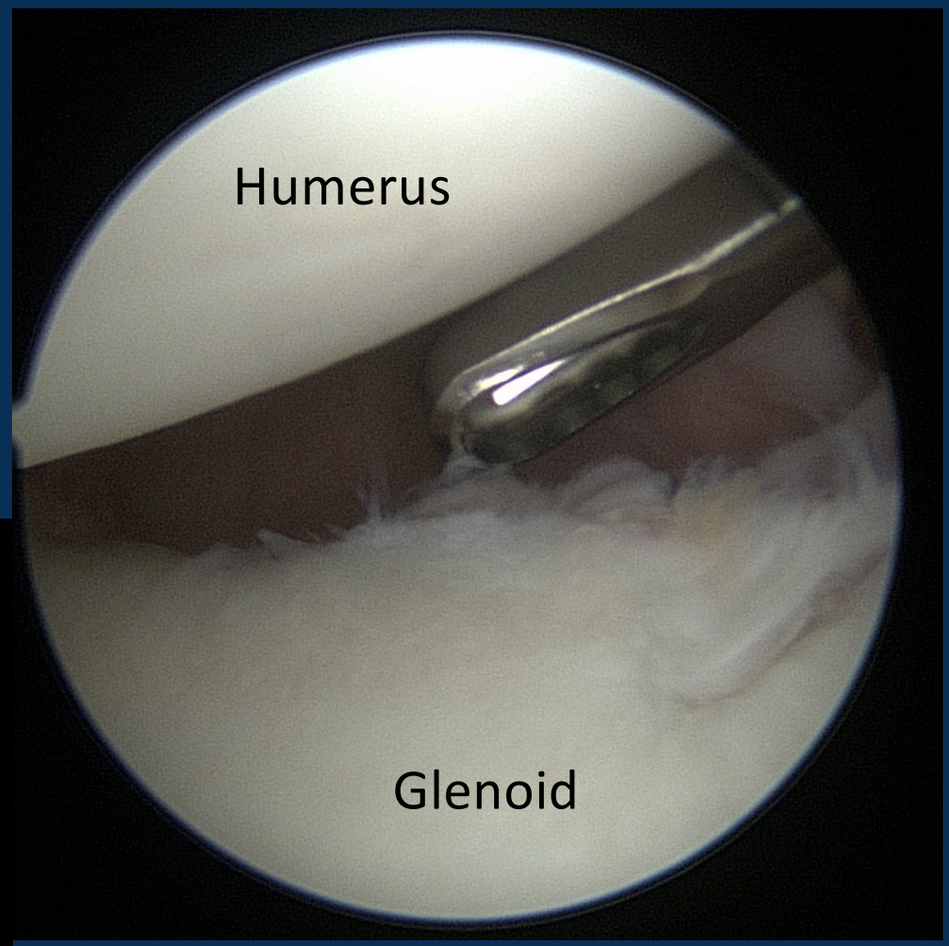
- Anterior labral tear associated with an anterior glenohumeral dislocation
- Named after Arthur Bankart, English Orthopaedic Surgeon (1879-1951)
- The subsequent repair is also termed a “Bankart” (typically performed arthroscopically)











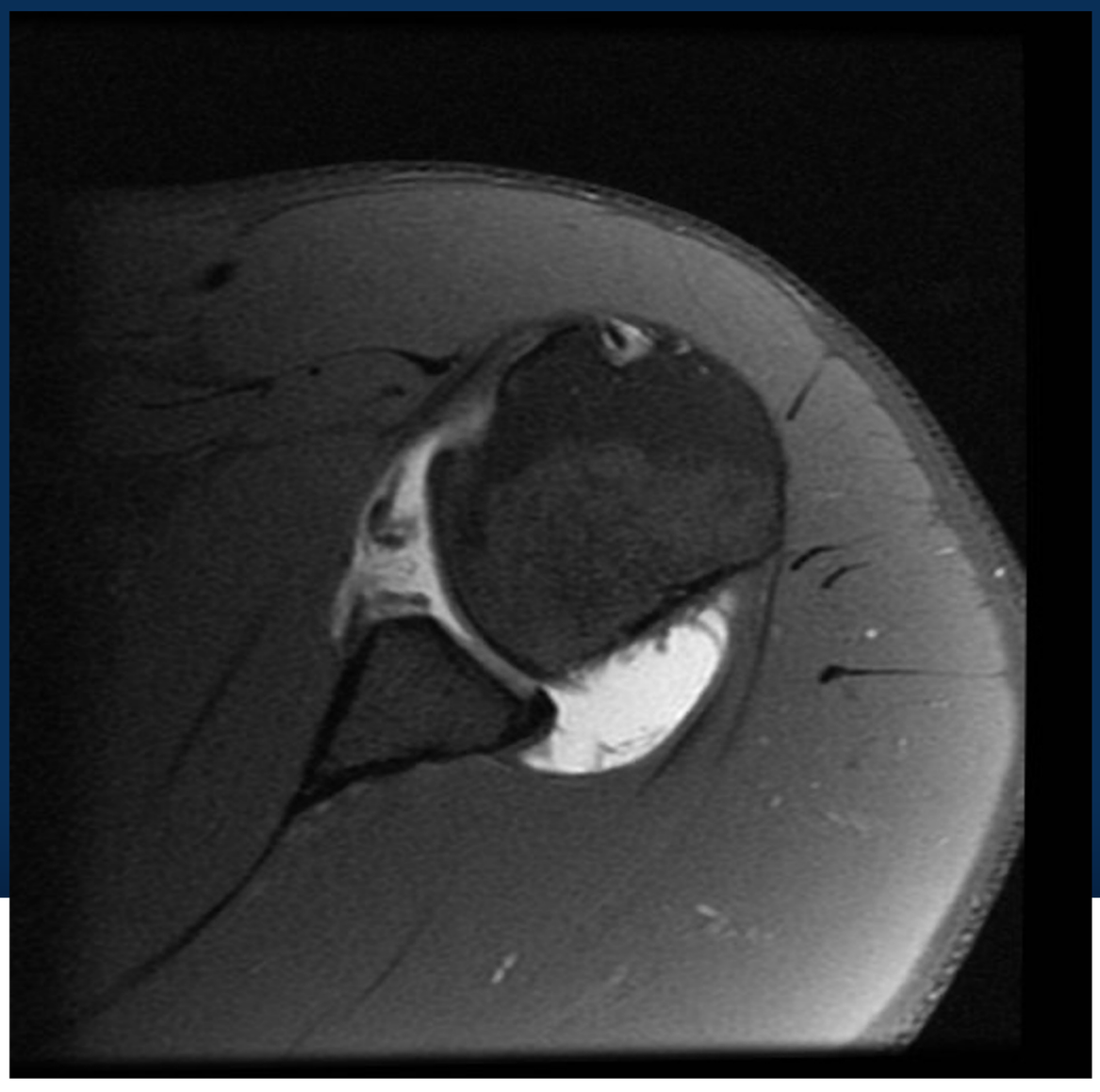
Severity of labral tears and quality/quantity of labral tissue varies

Imaging Evaluation

Hard to appreciate glenoid bone loss on this image

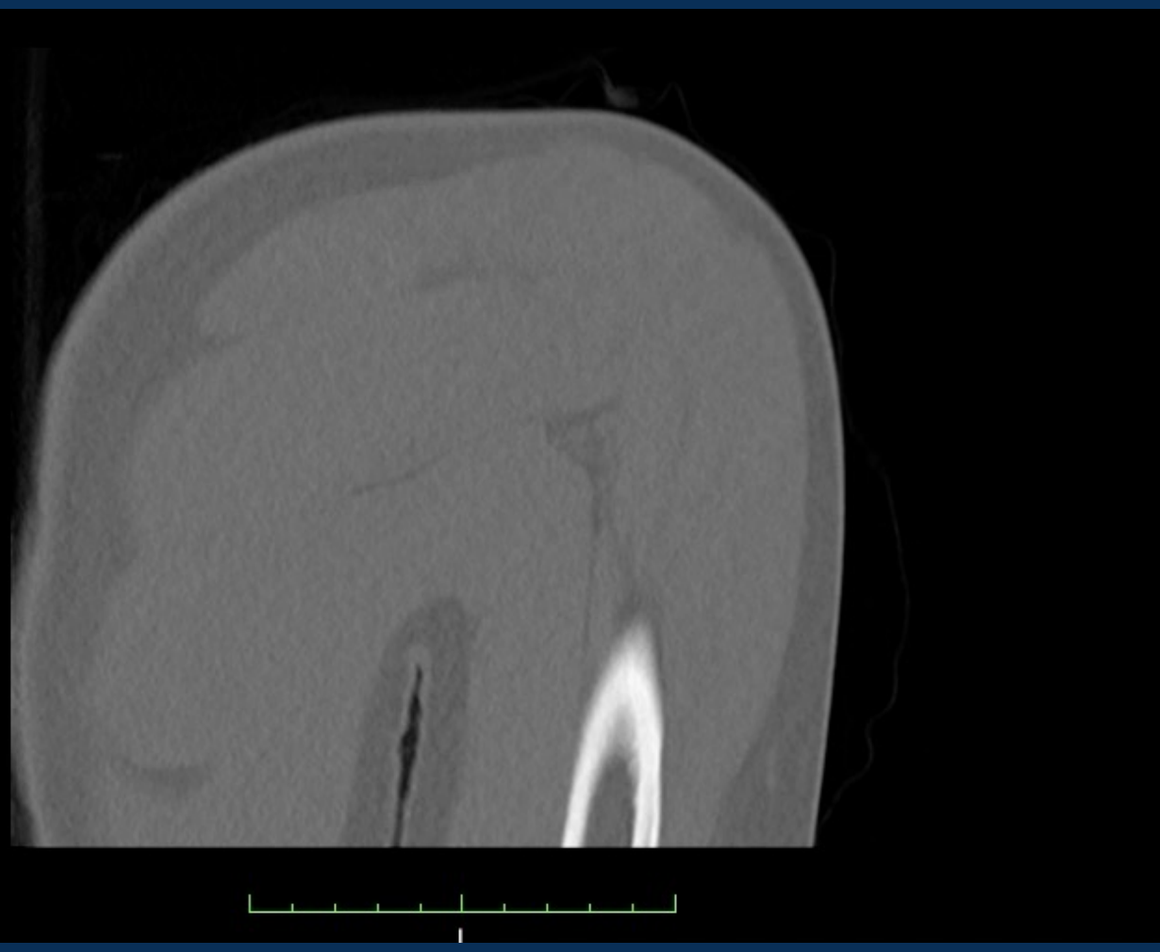
Subtle loss of sclerotic margin of anterior glenoid

Blunting of anterior glenoid and no definable labrum as well as Hill Sachs lesion, but difficult to define amount of bone loss

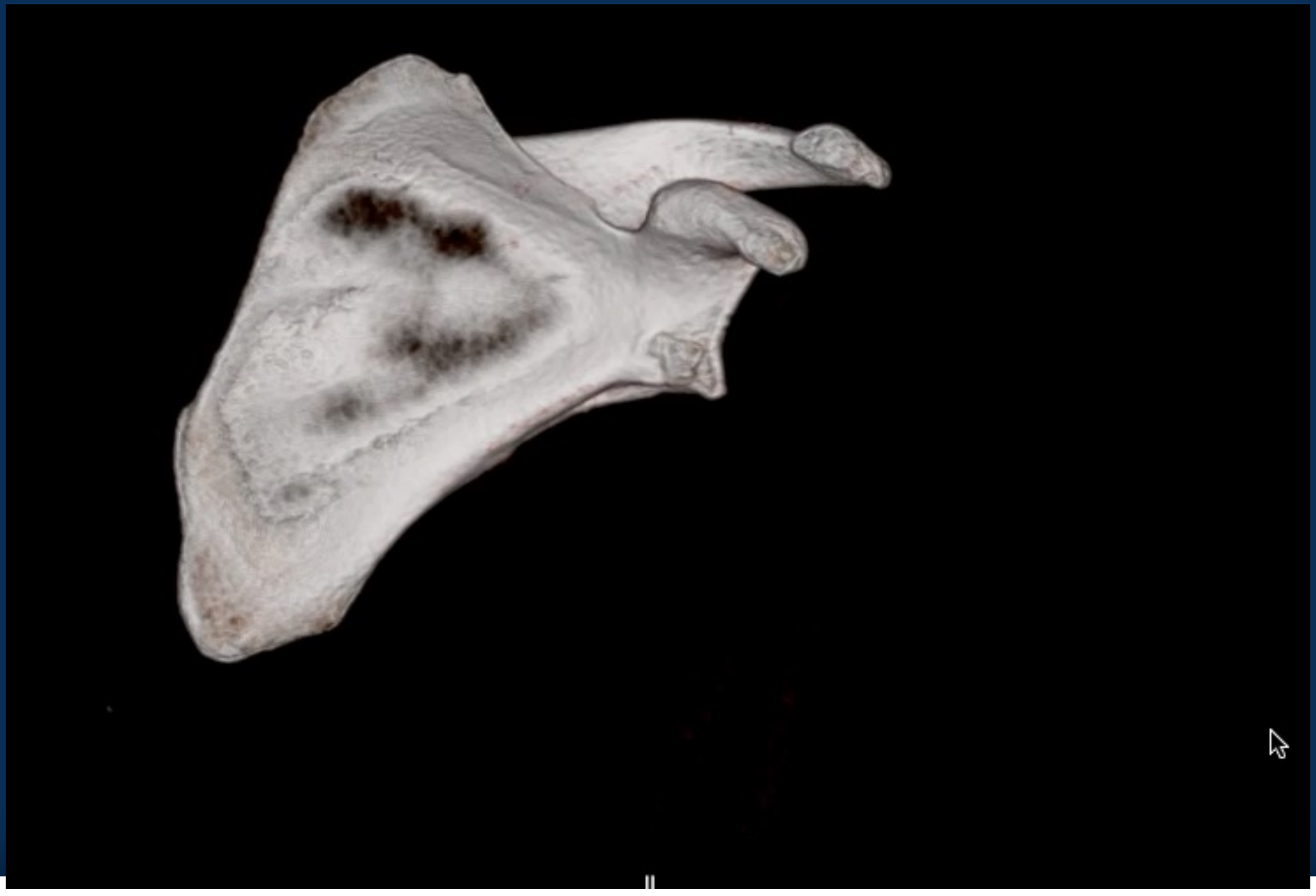


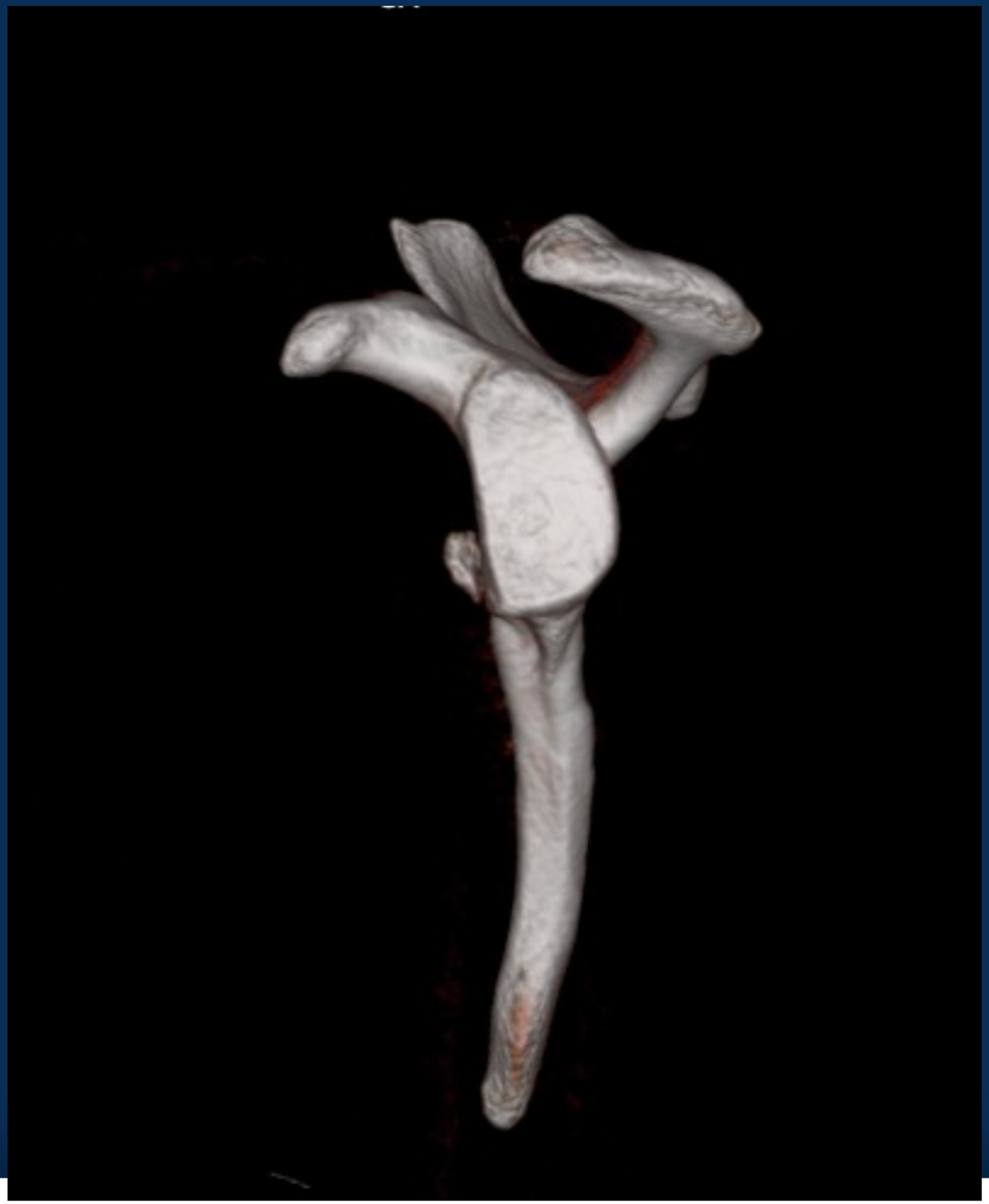
What's Next?

we need another imaging study…

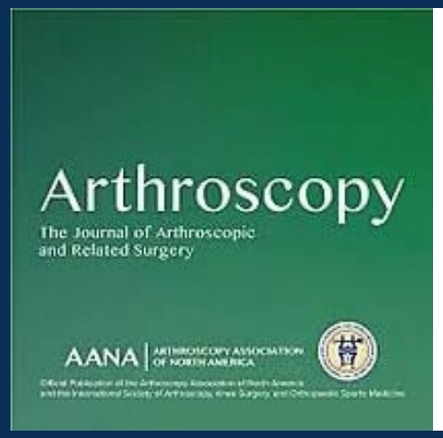


Still difficult to tell bone loss…



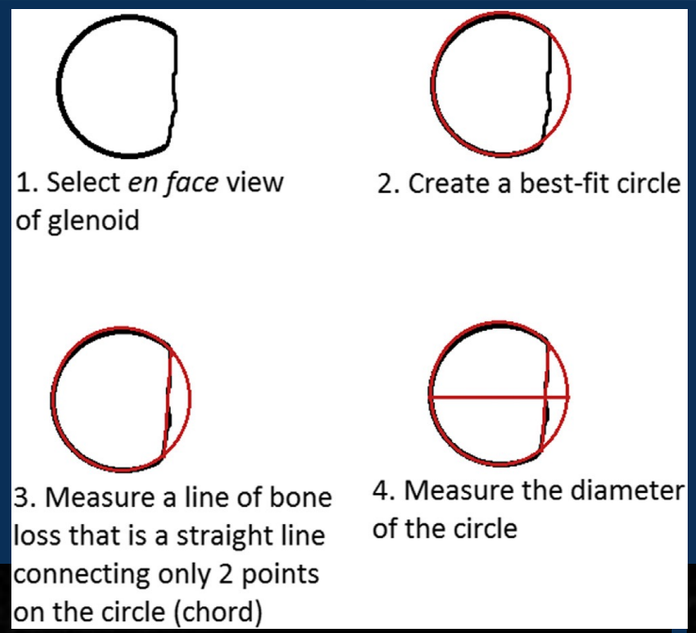


Is this normal?



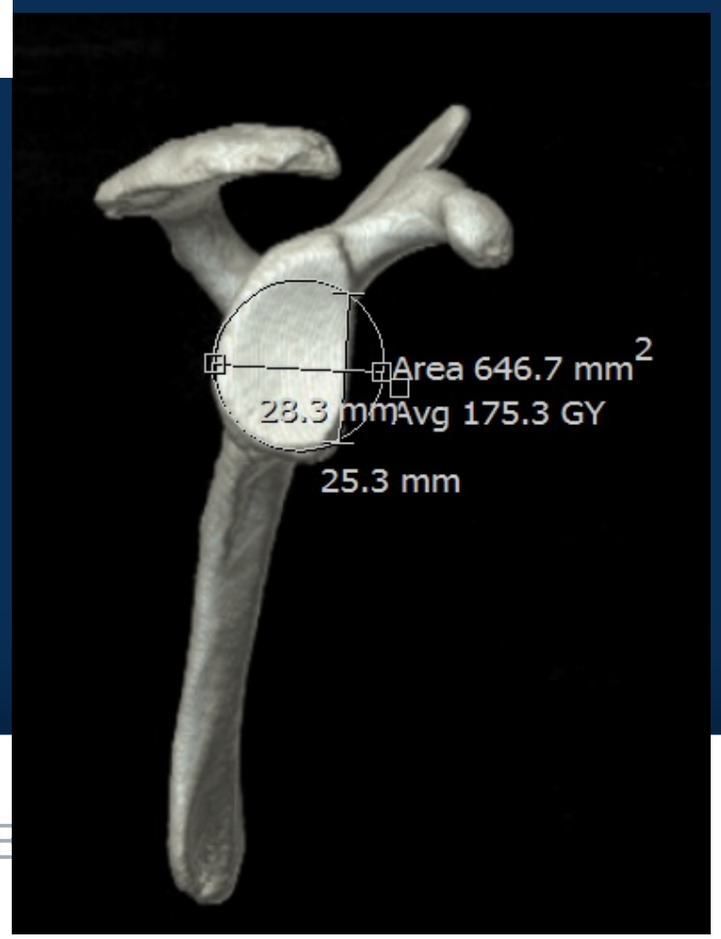
Accuracy and Reliability of a Simple Calculation for Measuring Glenoid Bone Loss on 3-Dimensional Computed Tomography Scans

Stephen A. Parada, M.D., Josef K. Eichinger, M.D., Guillaume D. Dumont, M.D., Carrie A. Parada, B.S., P.E., Alyssa R. Greenhouse, B.A., Matthew T. Provencher, M.D., Laurence D. Higgins, M.D., and Jon J. P. Warner, M.D.

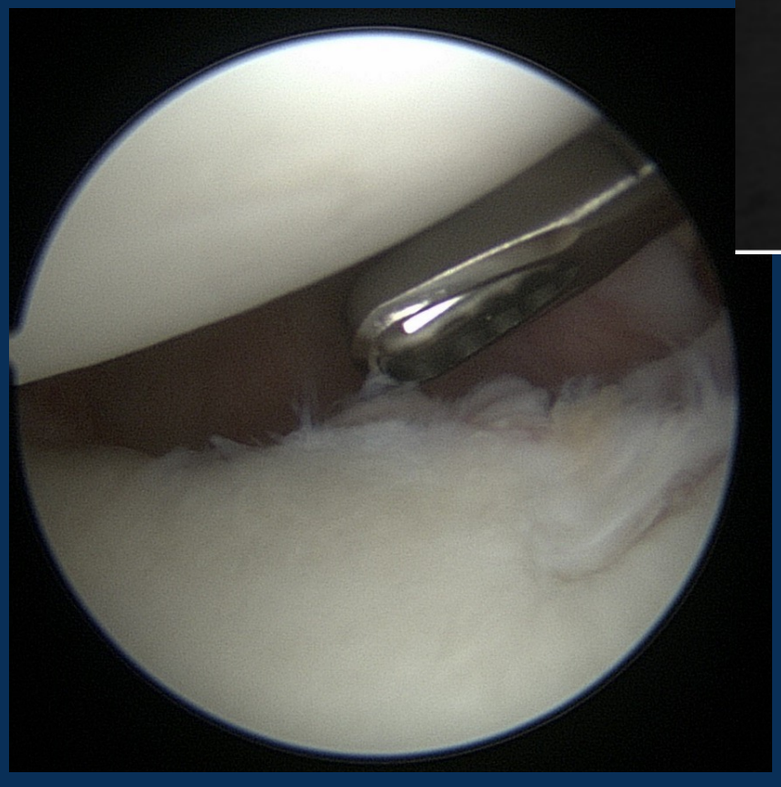


How do we know how much of the glenoid is missing?

MATH! *(make it so easy that even an Orthopaedic surgeon can find the answer)*



	Diameter=	28.3	
	Radius =	14.15	
	Chord Length =	25.3	
	Area of circle =	629.0175	
	Area of segment =	141.2765	
	Central angle (radians)		2.212357
x/2r	0.89399293		
	Sin C (rads)	0.801163	
Bone Loss	22%		



NEED MORE BONE!

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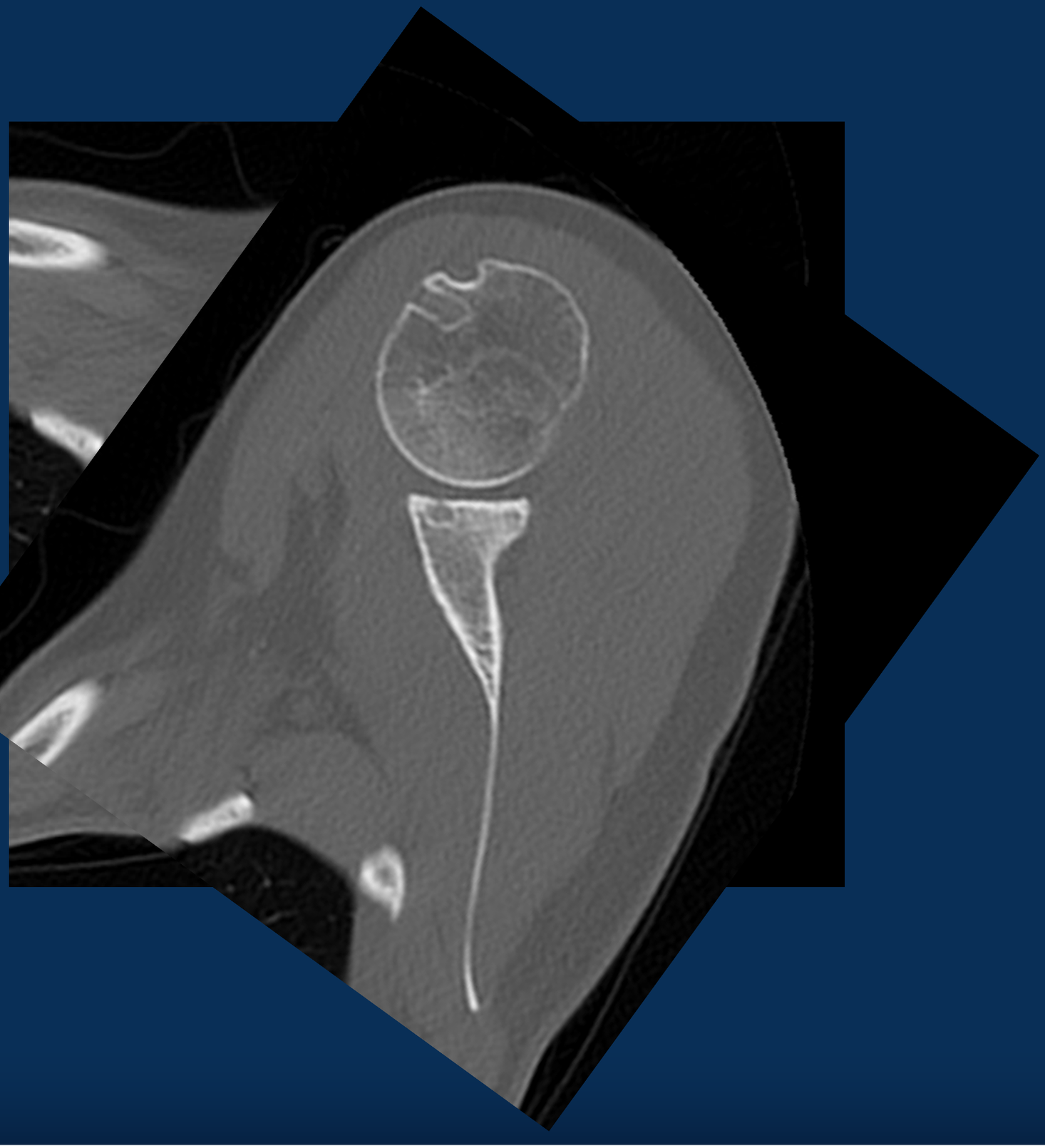

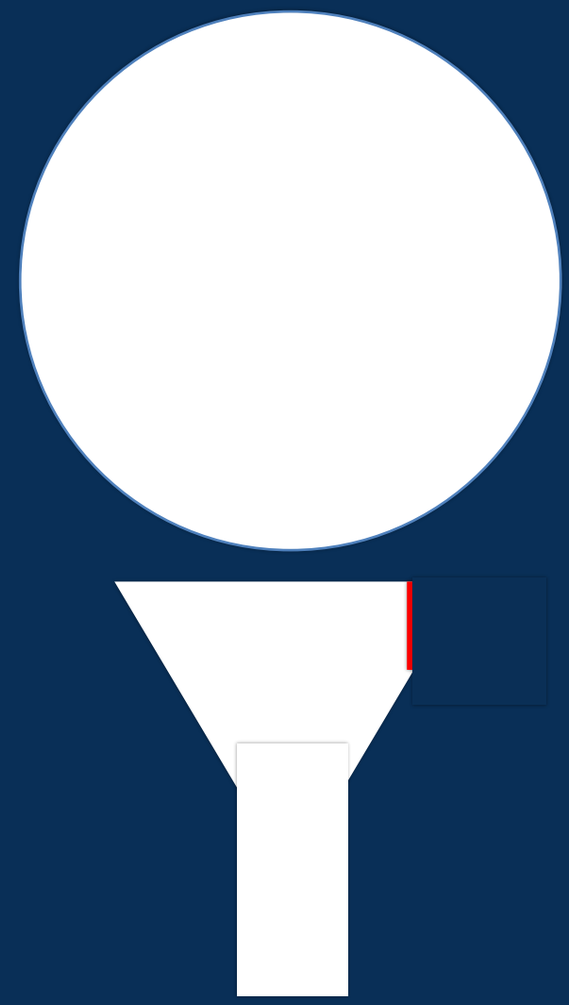

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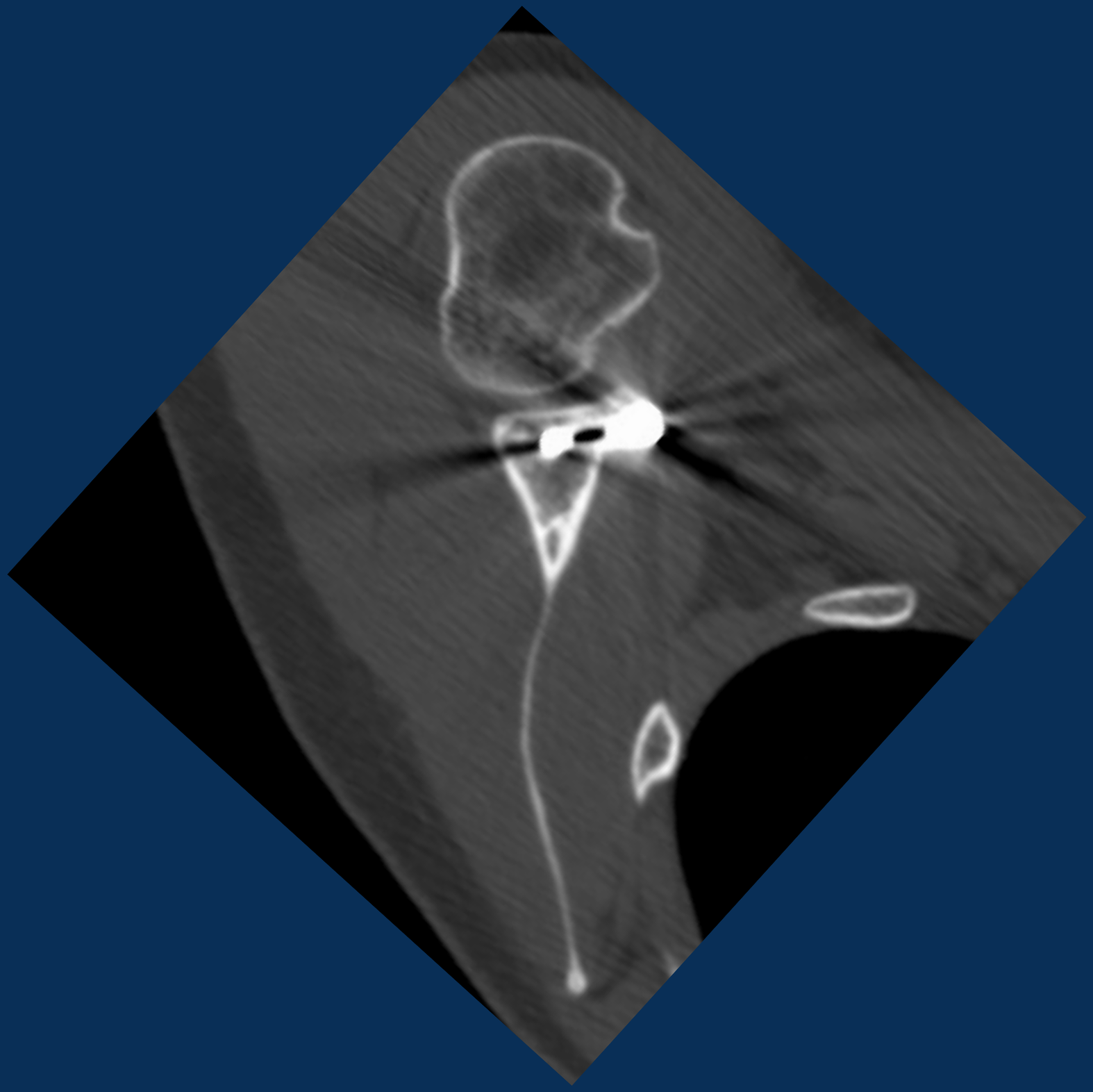

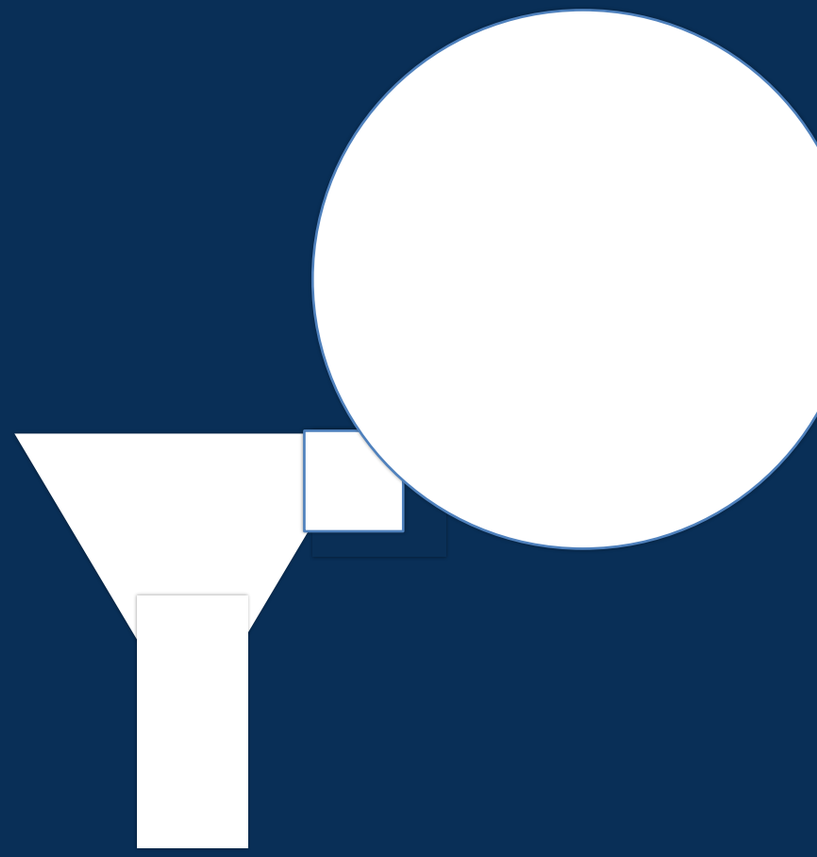

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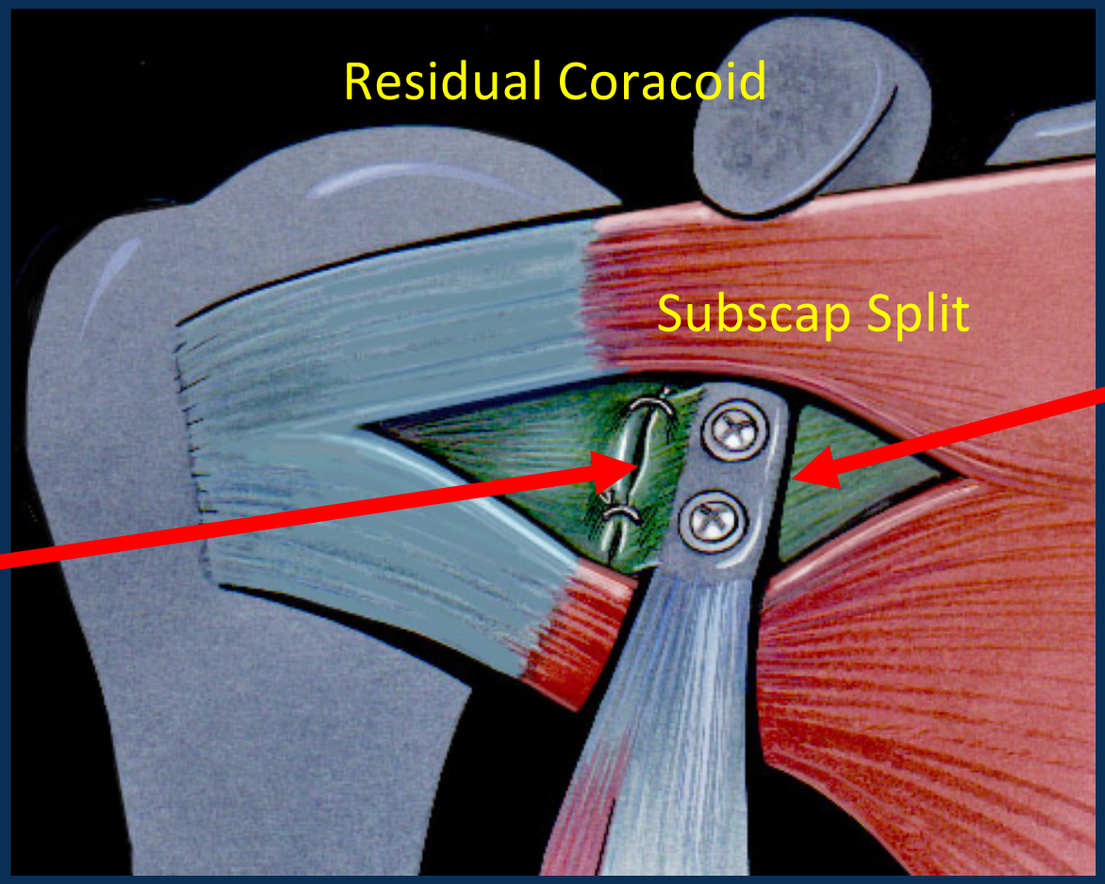
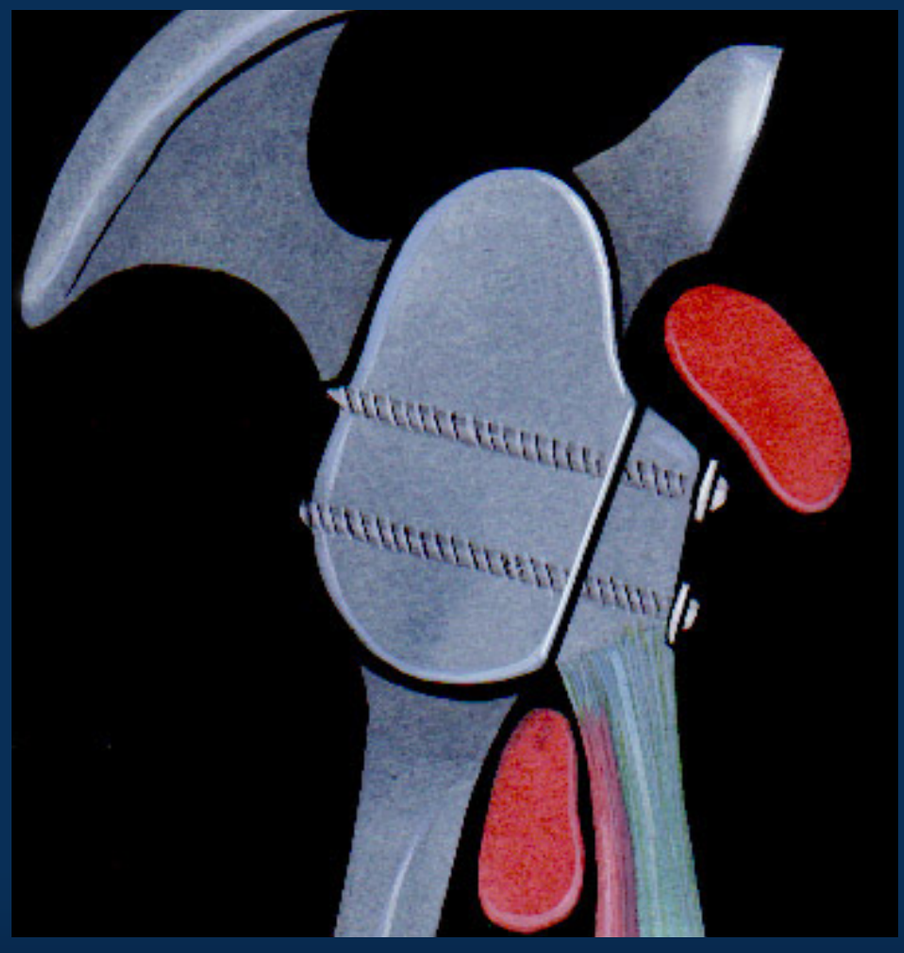
Need spare parts:

- Something close
- Same incision
- Something with a blood supply

Coraco-acromial ligament used to reconstruct anterior capsule



Transfer Coracoid to face of glenoid



Dr Gilles Walch – Lyon, France

Takes a botched surgery by Dr Latarjet and refines it into the most effective stability surgery that exists today. Keeps it named after Latarjet because he's just that much of a gentleman.

Latarjet Surgery

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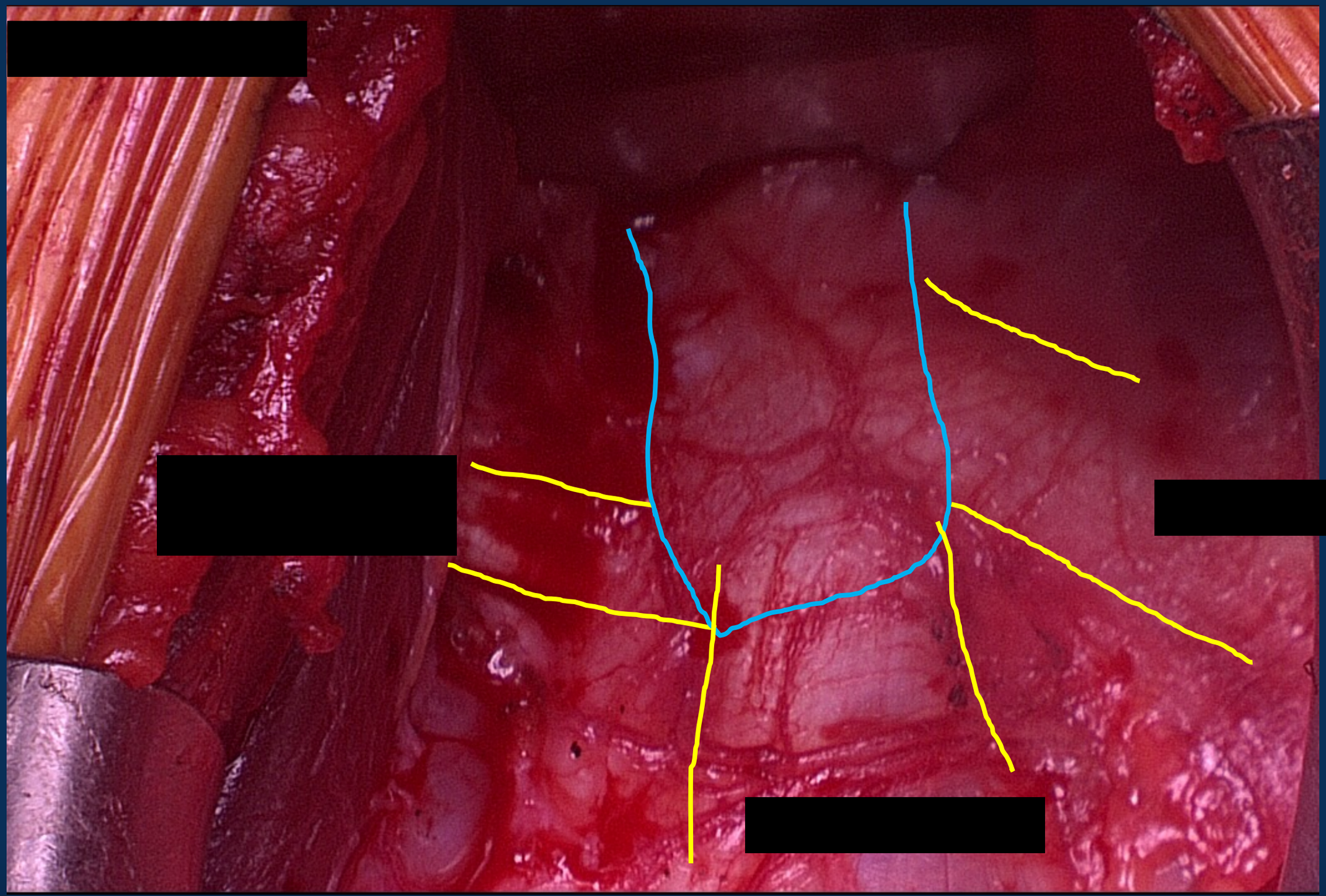
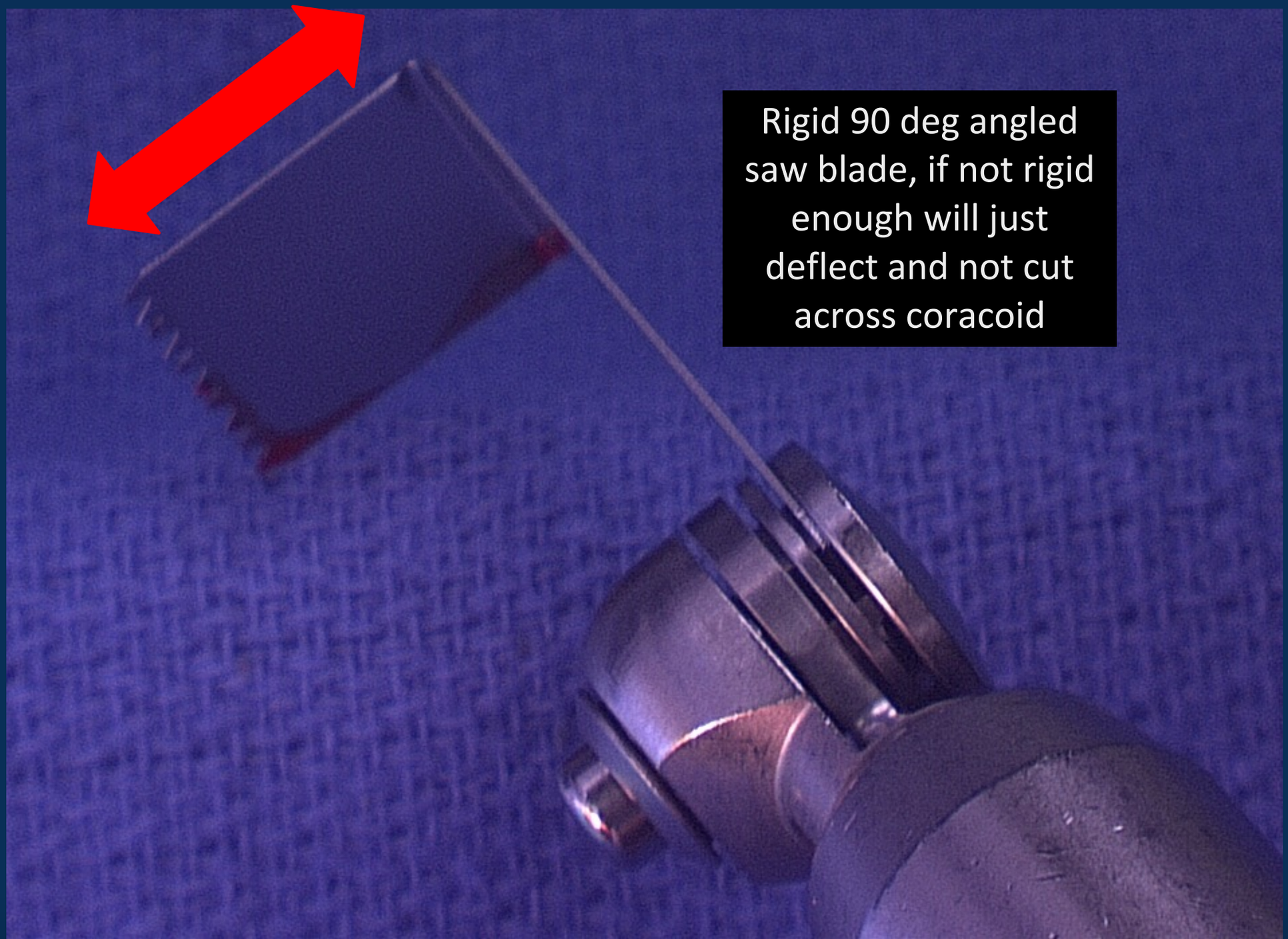
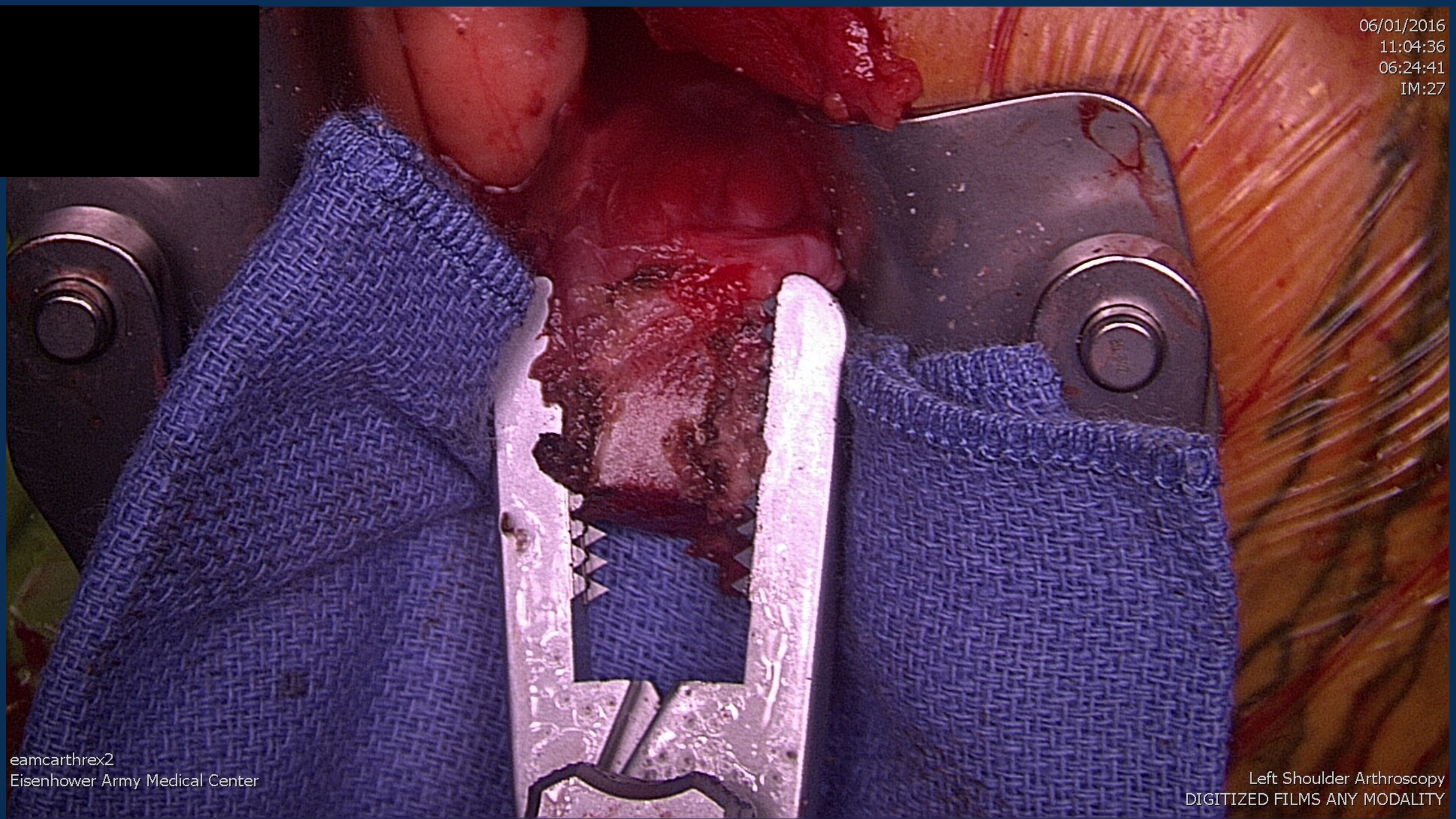
Vertical “instability” incision is key

Medial tip of coracoid to axillary crease



- Available depth of cut is depth of blade – will have to finish with osteotome if large male





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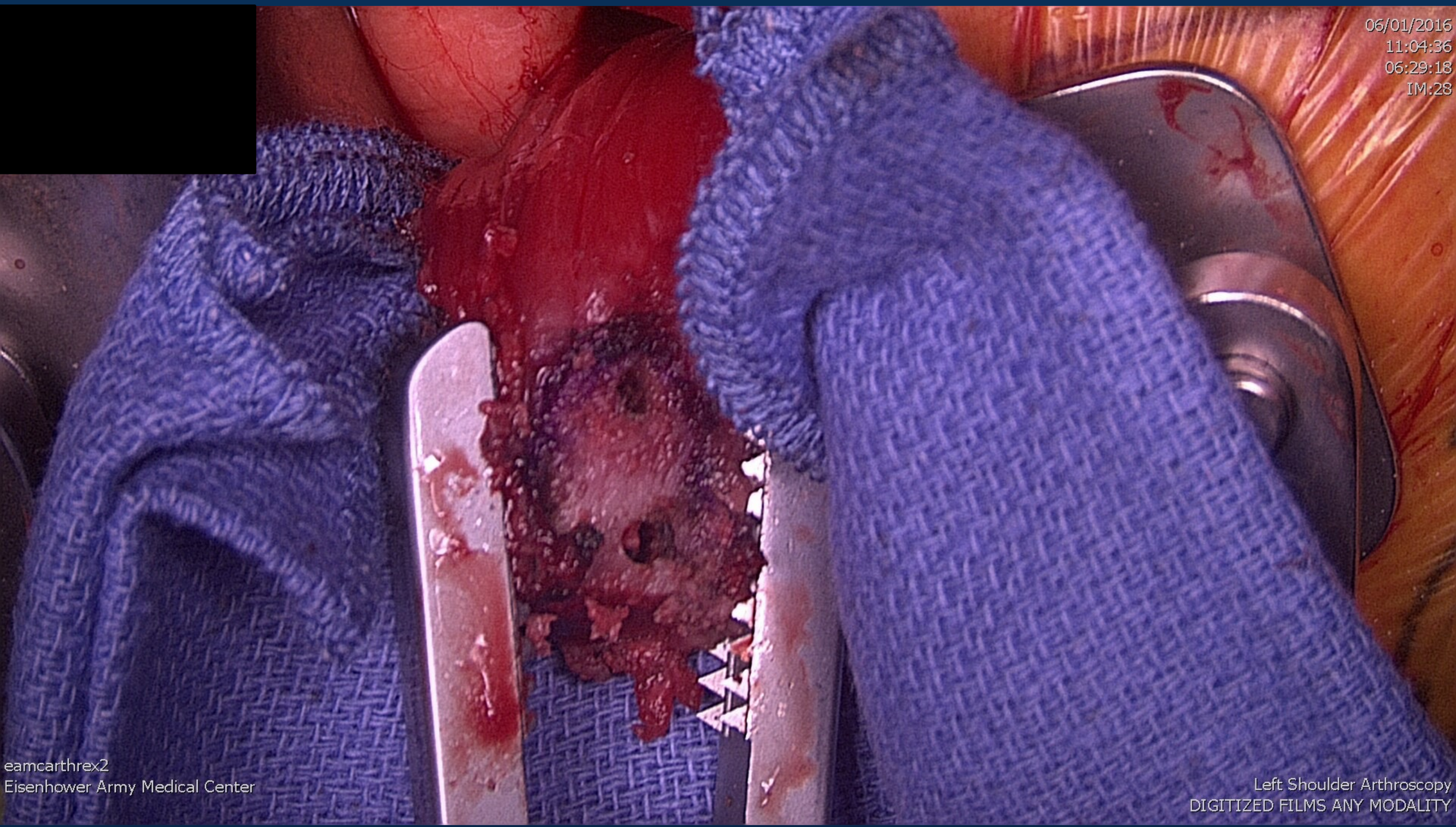
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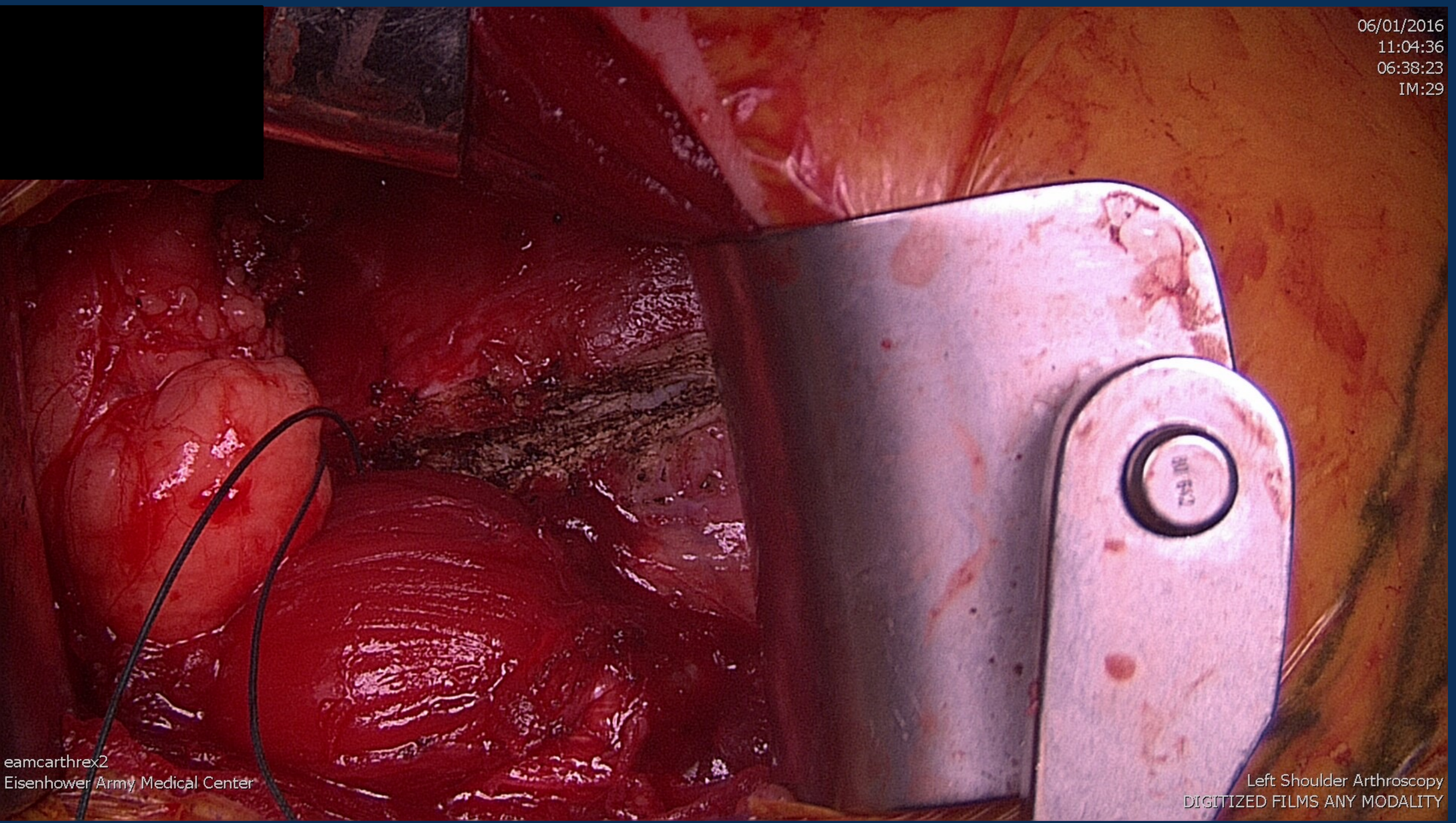
Eisenhower Army Medical Center
Left Shoulder Arthroscopy
DIGITIZED FILMS ANY MODALITY



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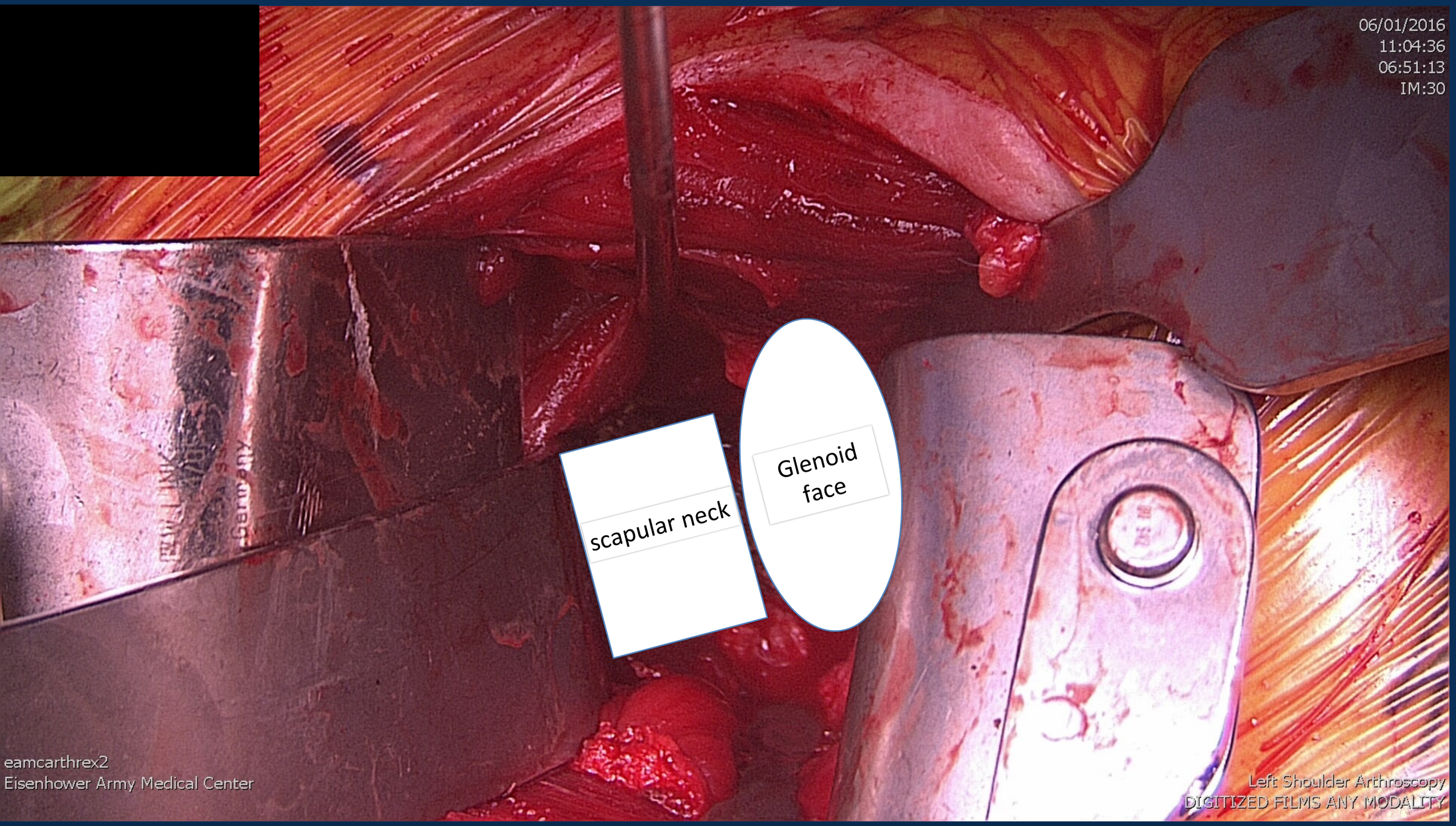

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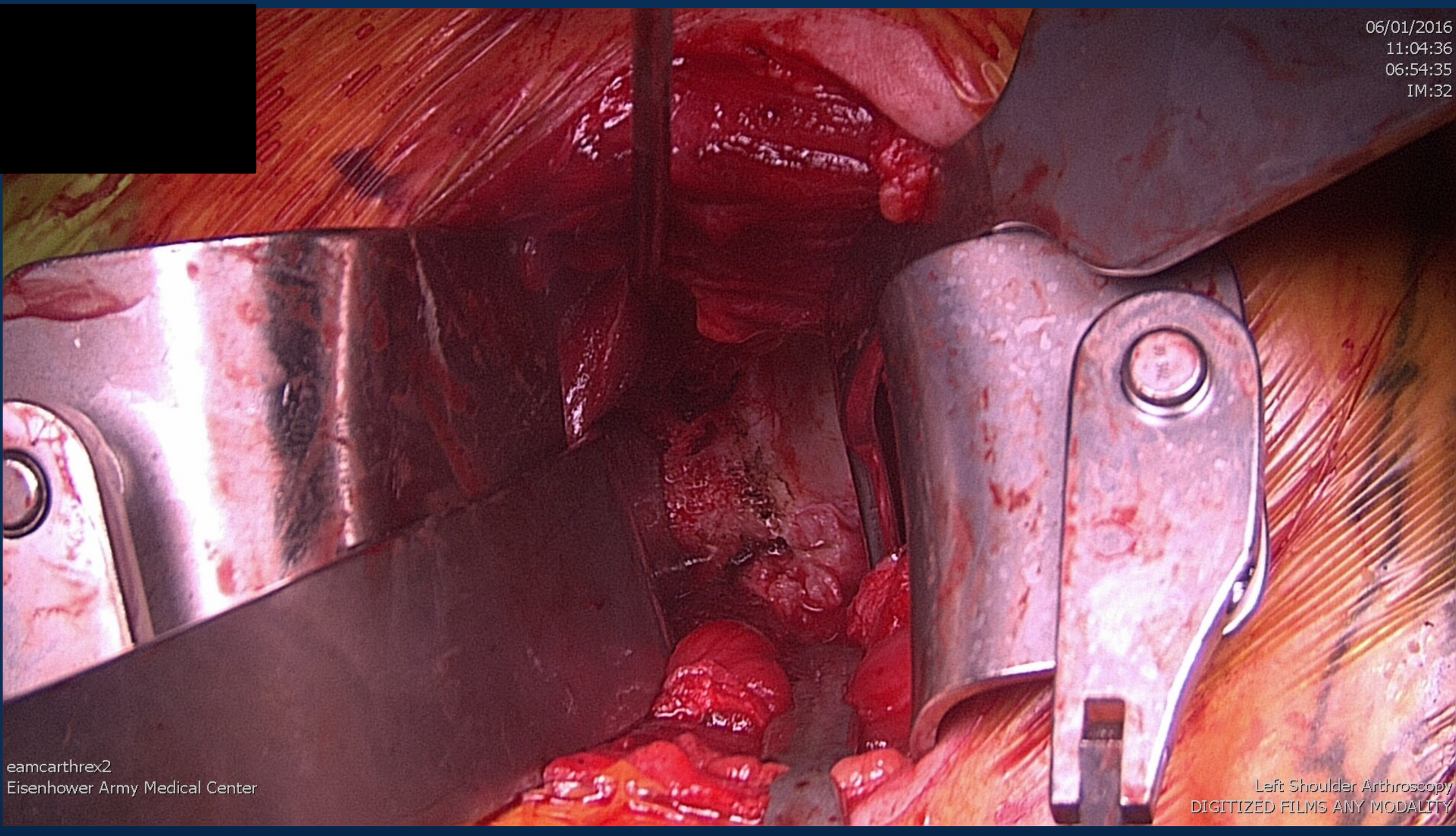
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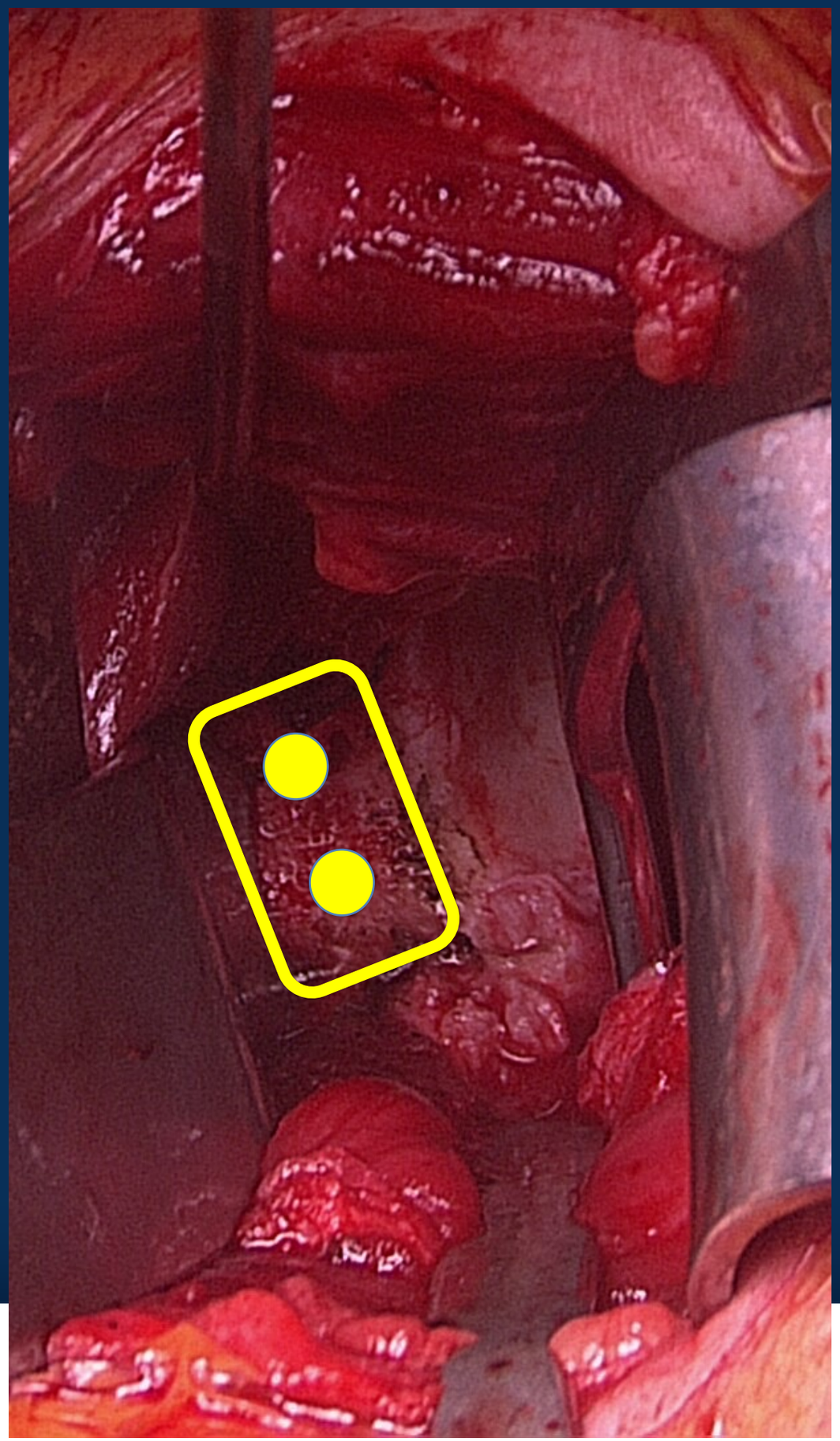
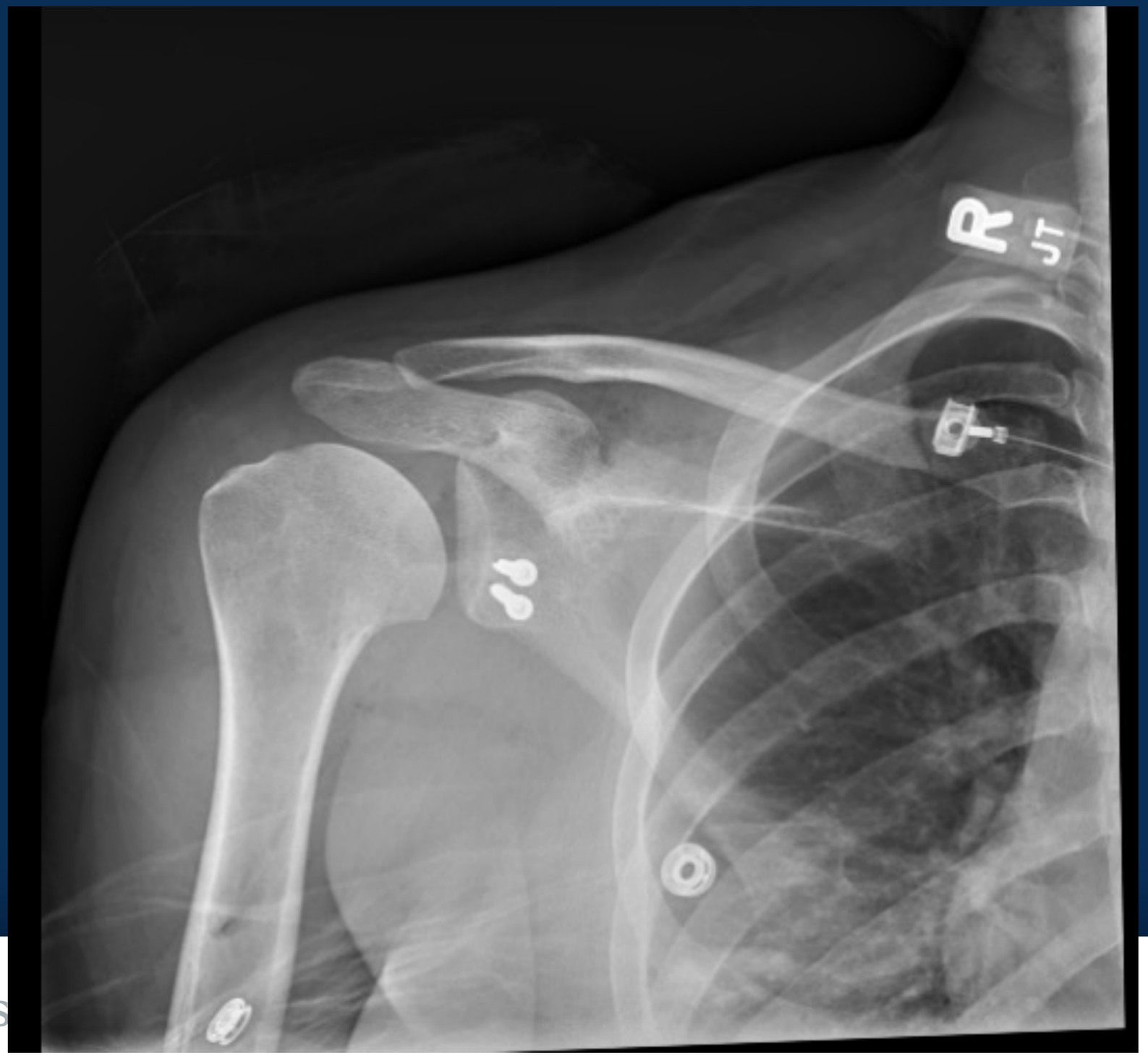


Immediate Post-op



4 mos CT

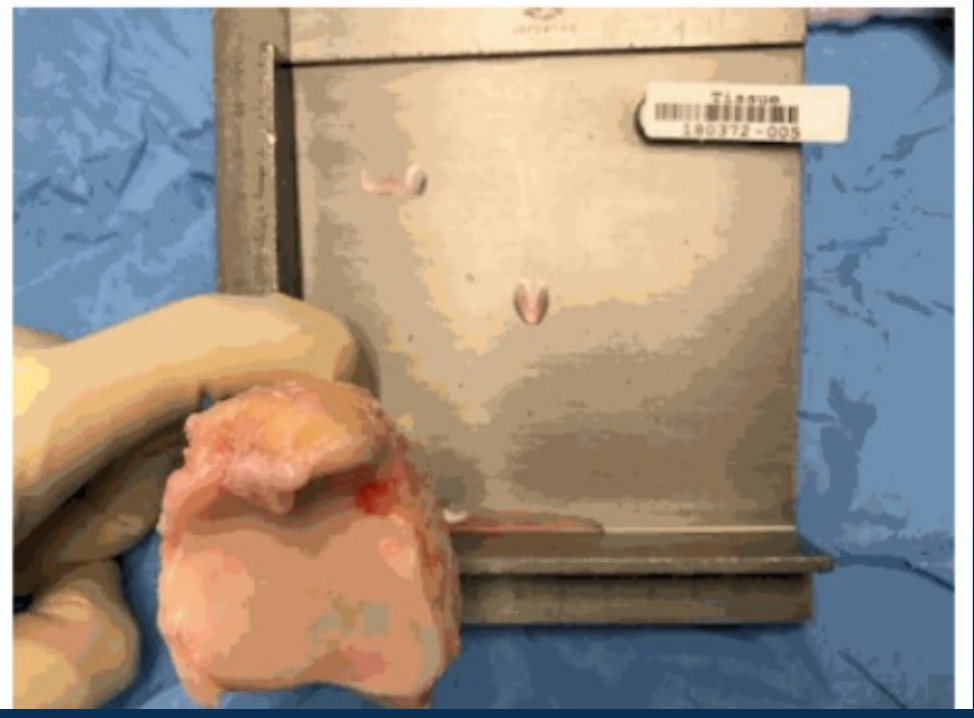

1
W 255 : L 127

But what if the coracoid isn't big enough to make up for the defect, or if they've already had a Latarjet and failed?

Enter the Distal Tibia Allograft (DTA)

**Almost everything we know about DTA can be attributed to Matt Provencher*

Donor #: [redacted] Graft #: **005** Gender: **M** Age: **30** Processed Date: **01/18/2018** Orientation: **Left**



I use non-laterality, non-sized, non-gender matched FRESH *(never frozen)* allograft distal tibia

Selecting a Graft

- We have looked at ***many*** distal tibias on MRI
  - 85% of distal tibias have a straight (or nearly straight) lateral border of the tibia to allow retention of cortex for graft

Variations in the Anatomic Morphology of the Lateral Distal Tibia

Surgical Implications for Distal Tibial Allograft Glenoid Reconstruction

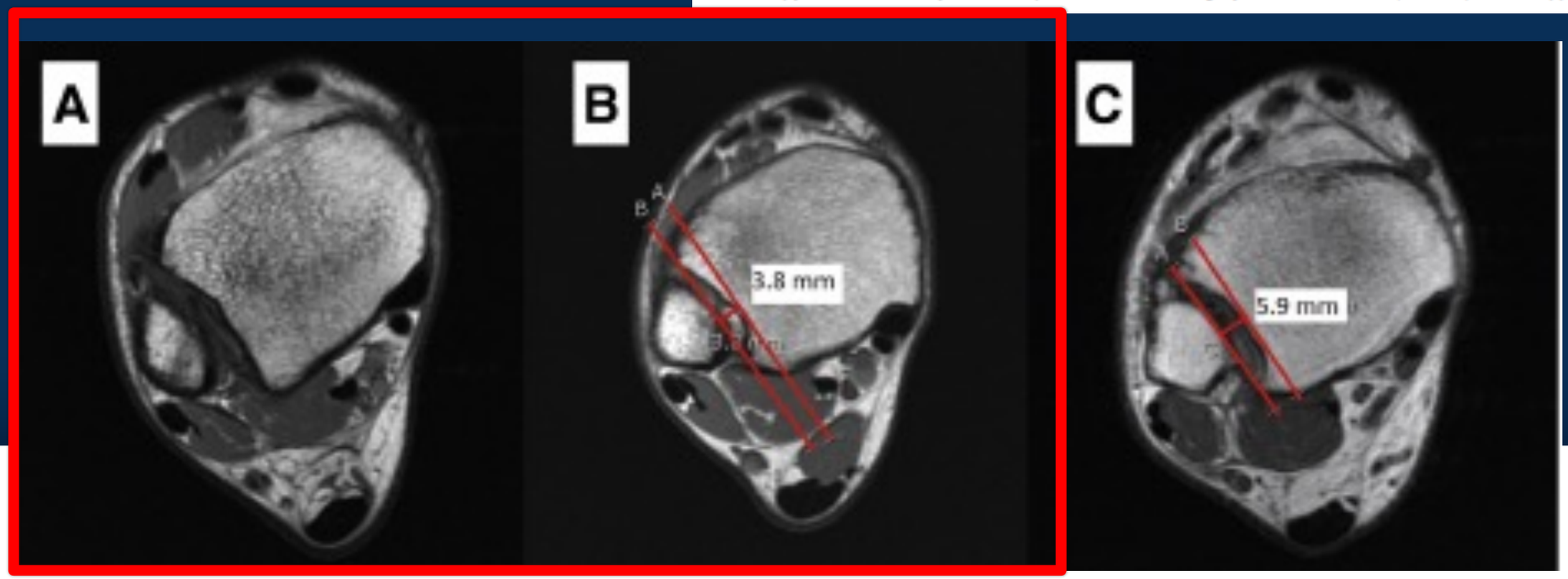
Stephen A. Parada,*† MD, K. Aaron Shaw,‡ DO, Colleen Moreland,‡ DO, Douglas R. Adams,§ MD, Mickey S. Chabak,‡ MD, and Matthew T. Provencher,‖ MD
Investigation performed at Eisenhower Army Medical Center, Orthopaedic Surgery, Fort Gordon, Georgia, USA

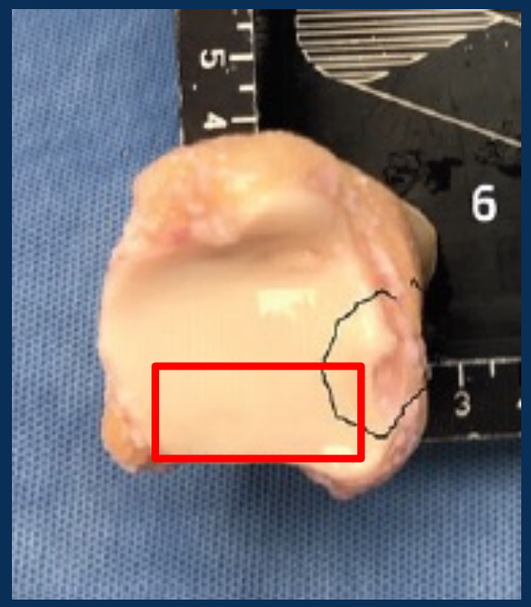
AJSM Vol. 46, No. 12, 2018

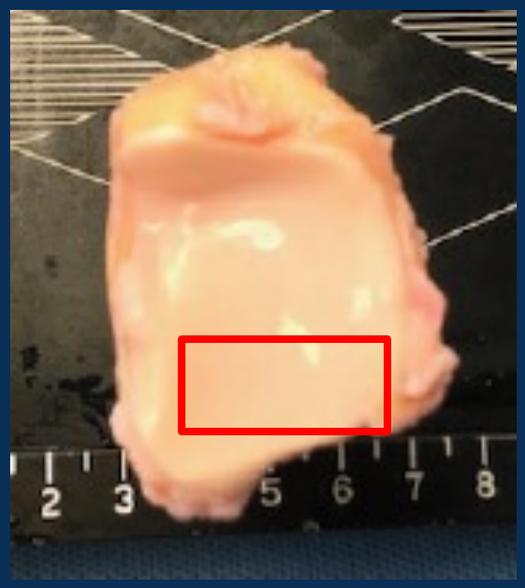
Demographics and Distal Tibial Dimensions of Suitable Distal Tibial Allografts for Glenoid Reconstruction

Stephen A. Parada, M.D., Matthew S. Griffith, M.D., K. Aaron Shaw, D.O., Brian R. Waterman, M.D., Josef K. Eichinger, M.D., Xinning Li, M.D., and Matthew T. Provencher, M.D.

Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 35, No 10 (October), 2019: pp 2788-2794

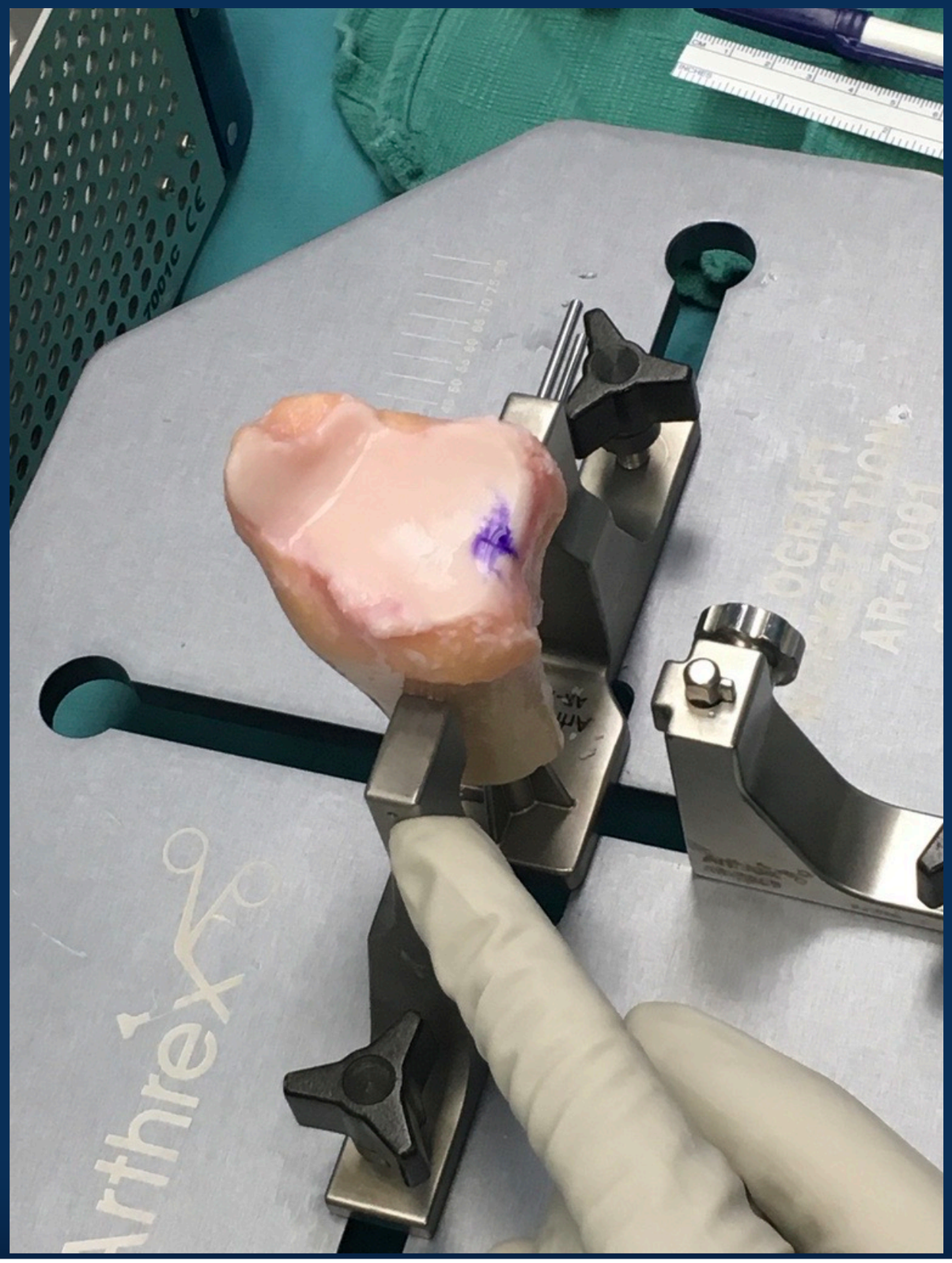


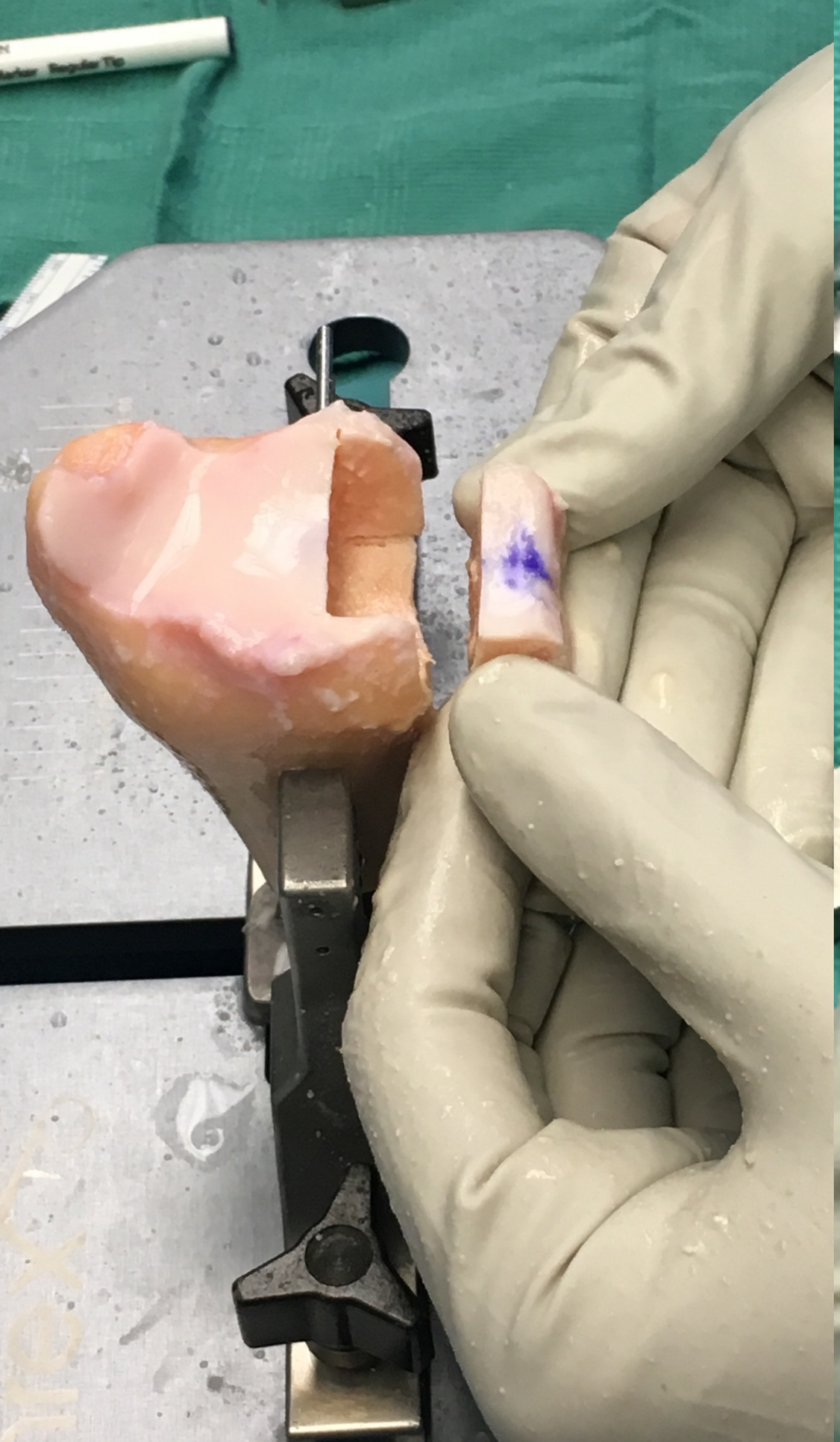


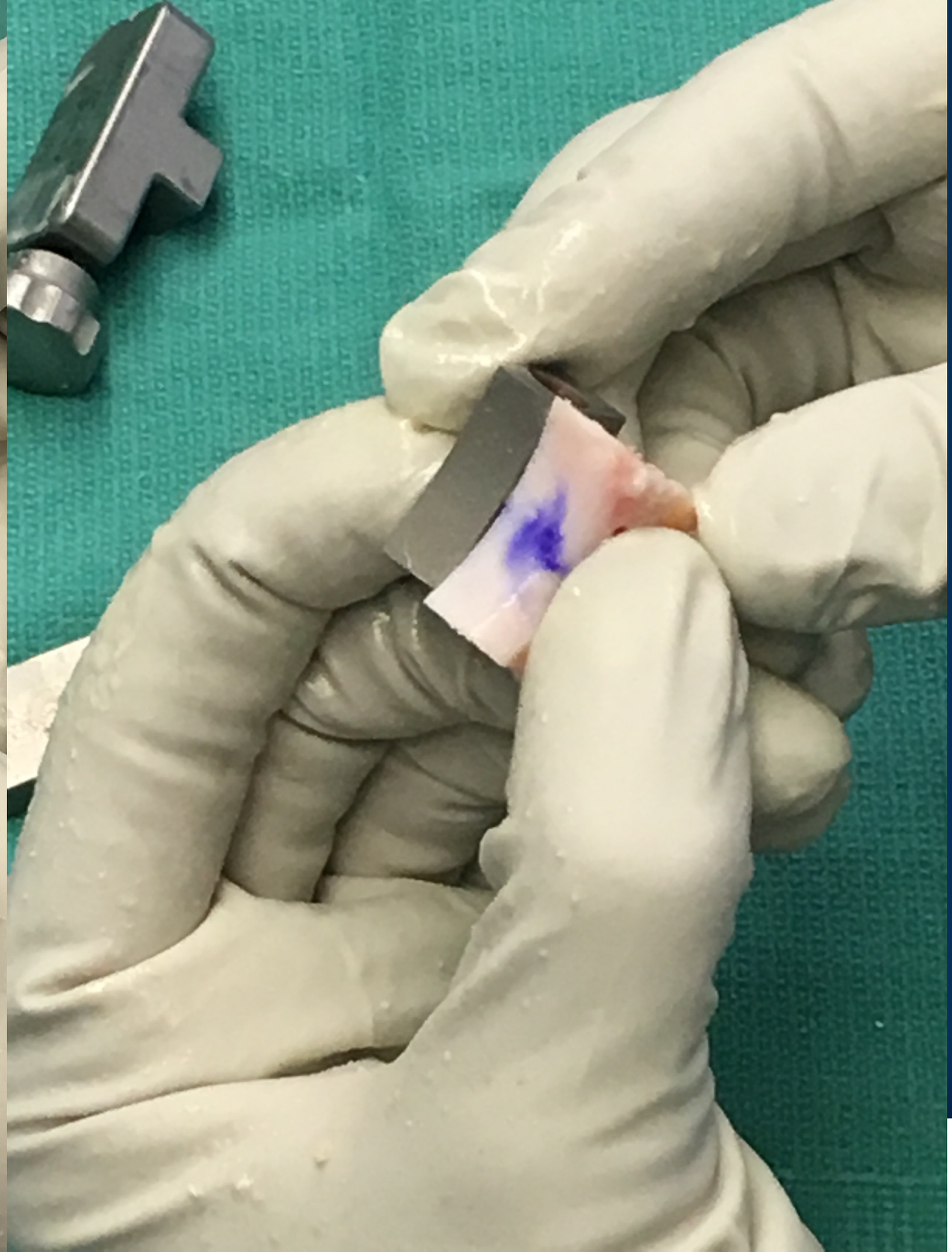


Graft Preparation

- Starts ***before*** patient is in OR
- Preoperative templating gives size of graft
- Separate back table set up
- I'm usually finishing up graft by time patient rolls in room

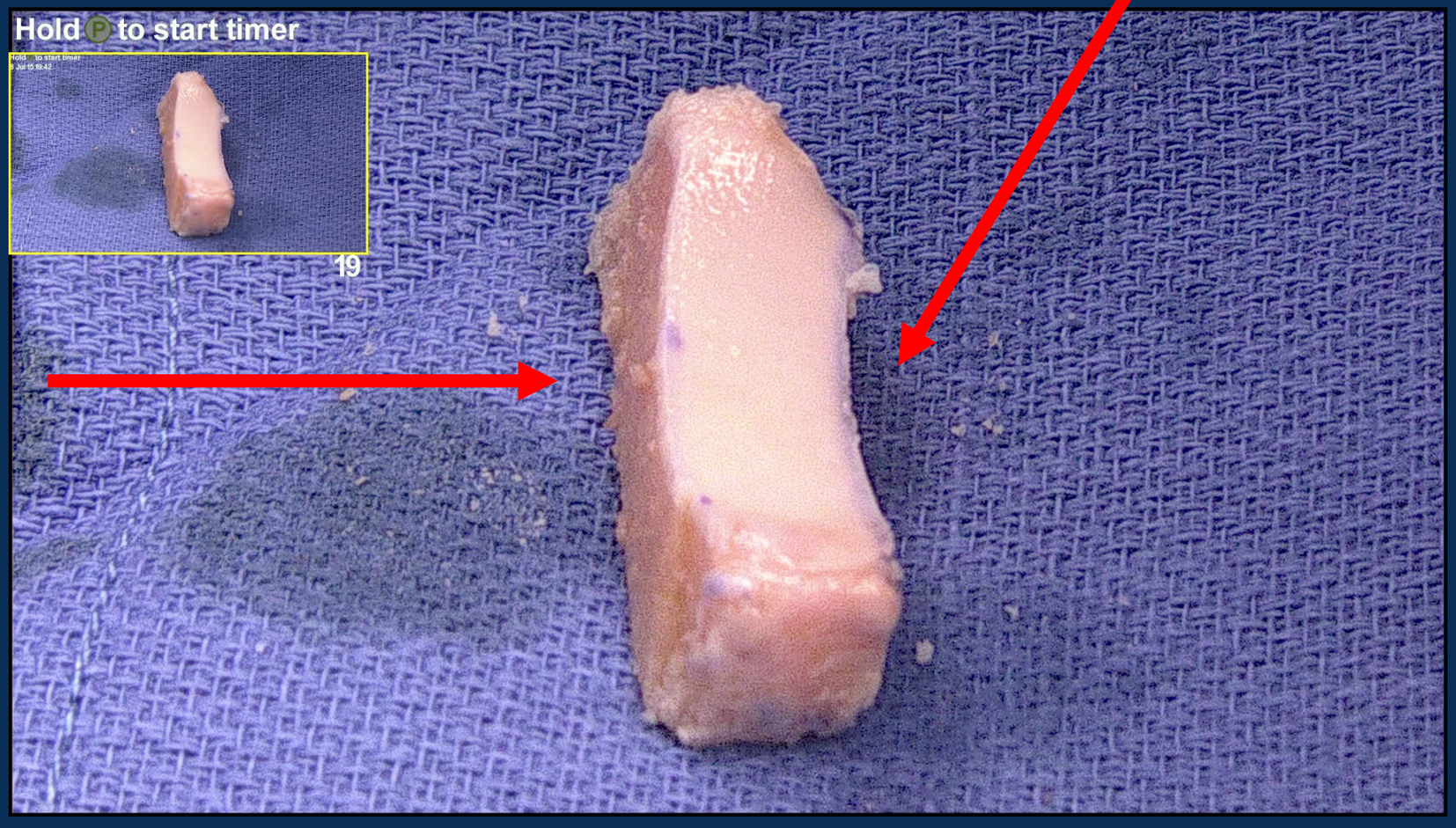






Cortical side for screw fixation

Cancellous side goes up against glenoid neck

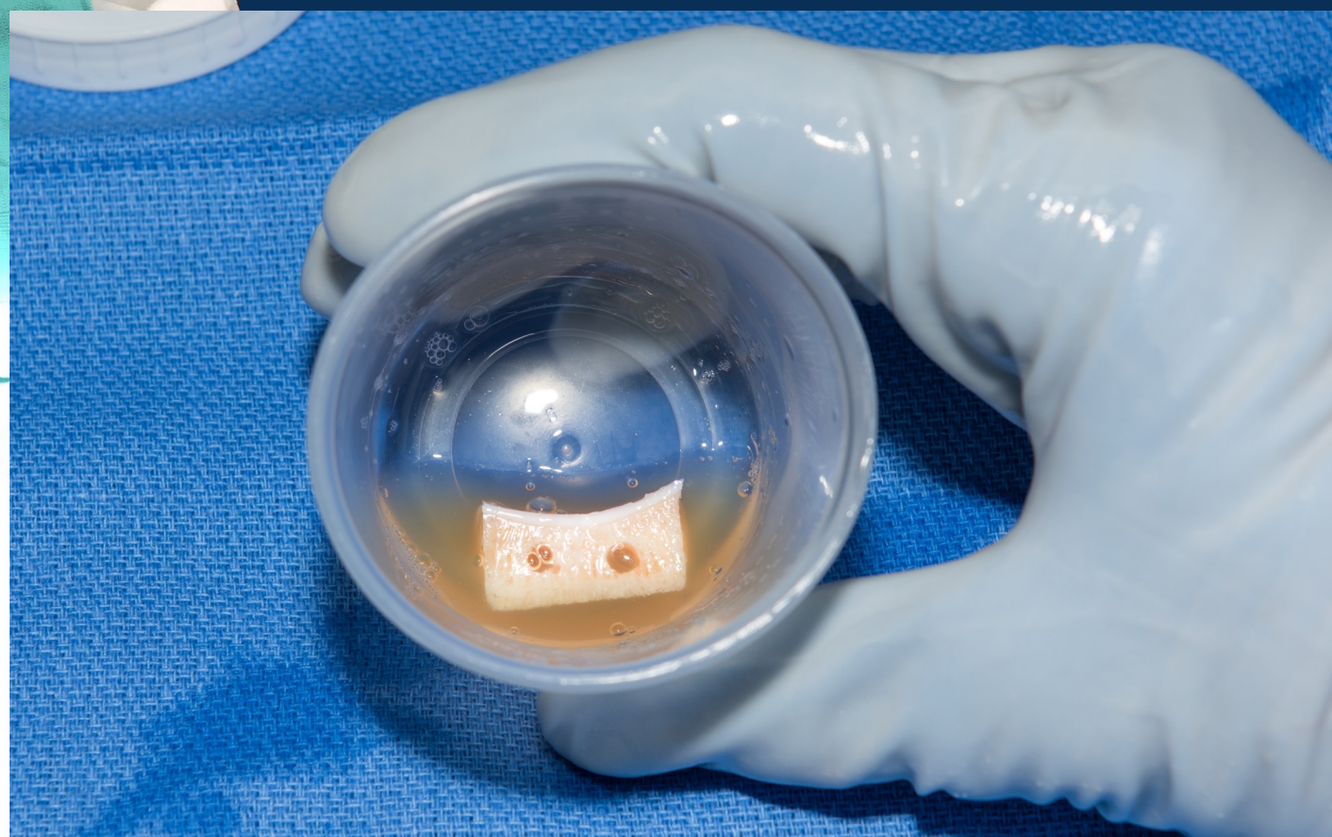


Pulse lavage is key to remove marrow elements and hopefully decrease any type of allogenic response

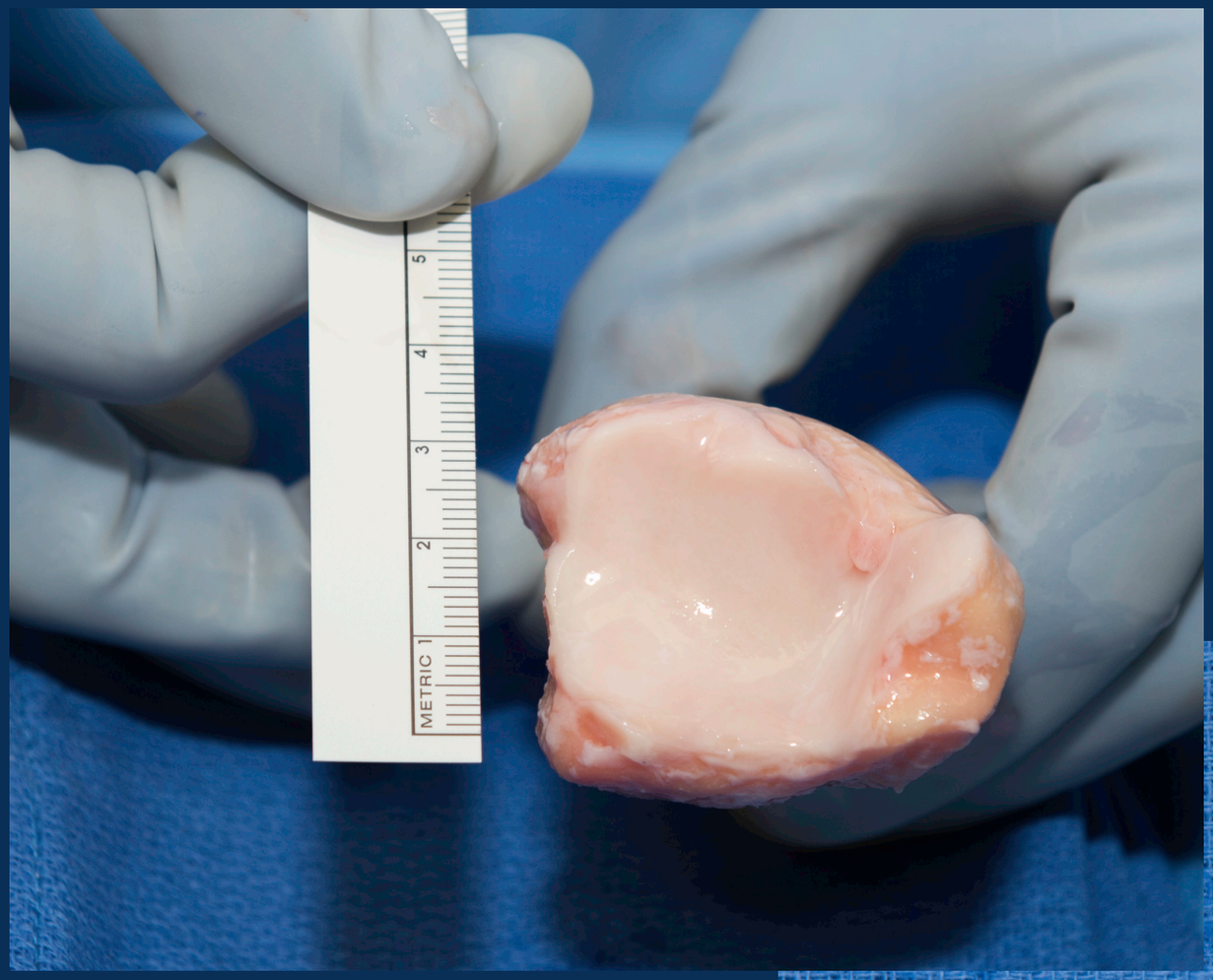
- I use some type of biology to make this graft more likely to incorporate

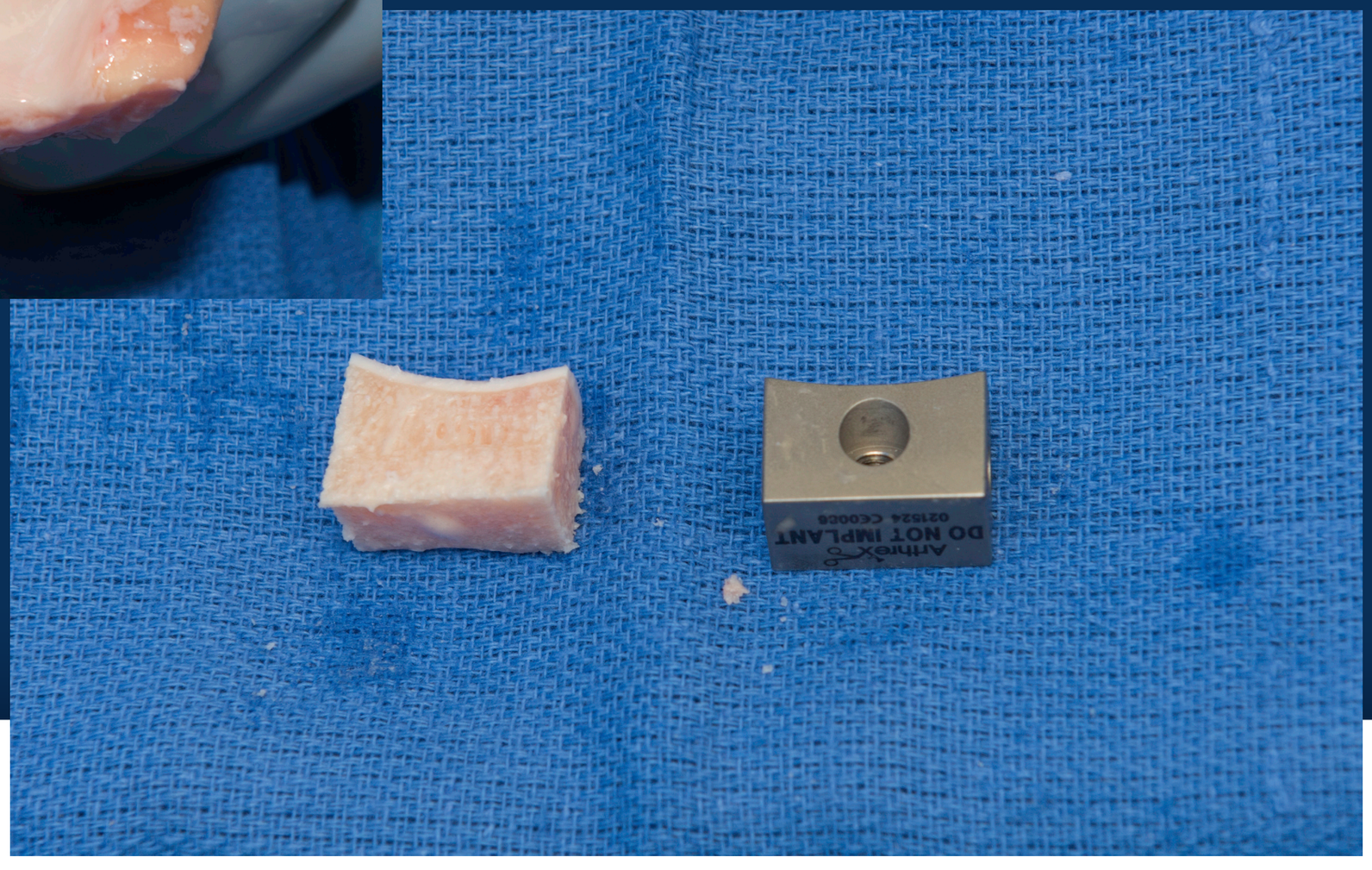
- I use PRP when insurance will allow

- Otherwise I use iliac crest aspirate while patient is still supine



- I use a bone marrow harvest needle and mallet, no scalpel and then put a 2 x 2 gauze and tegaderm for dressing
- Harvest before sitting patient up in beach chair – easier when supine





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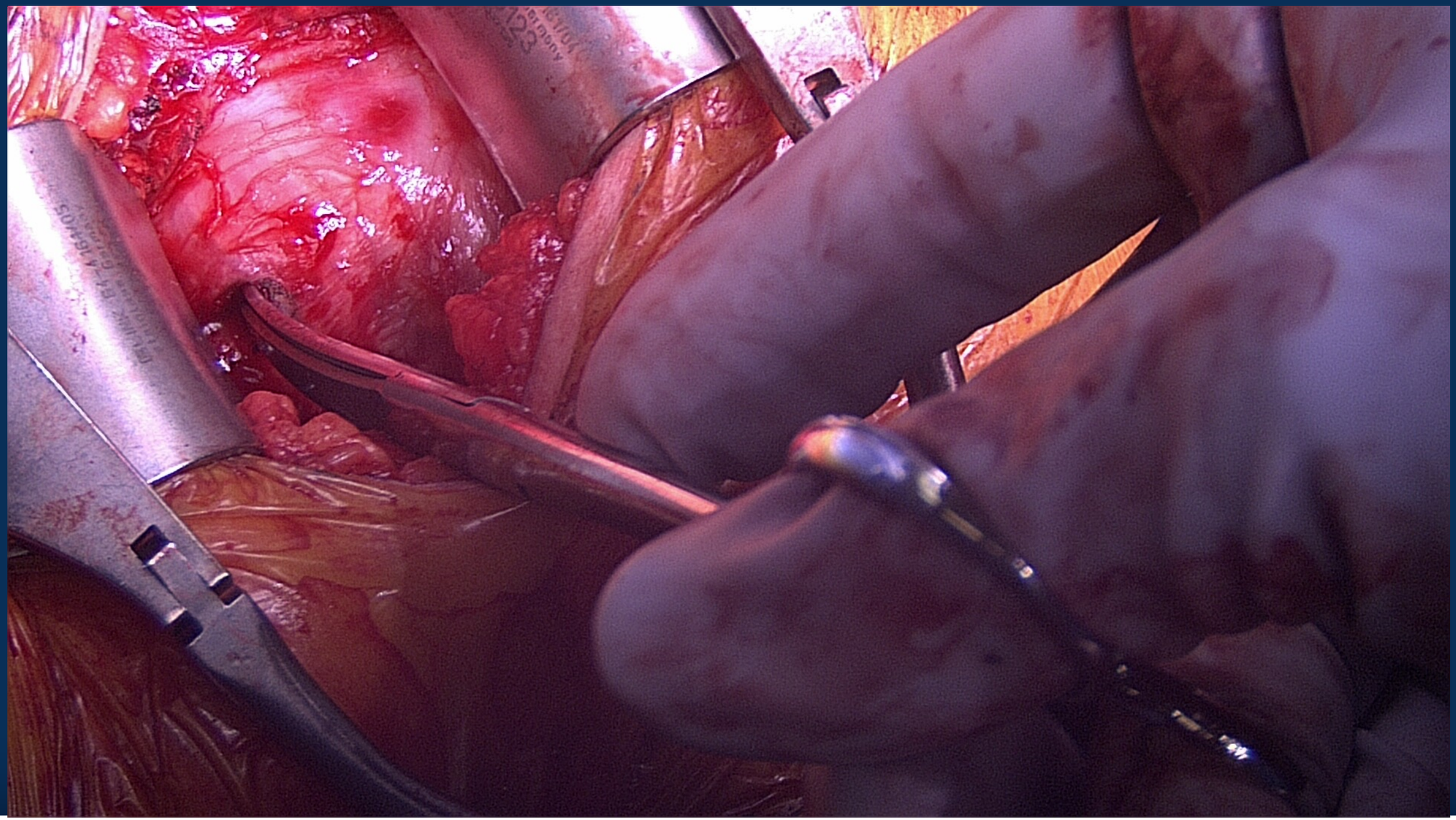

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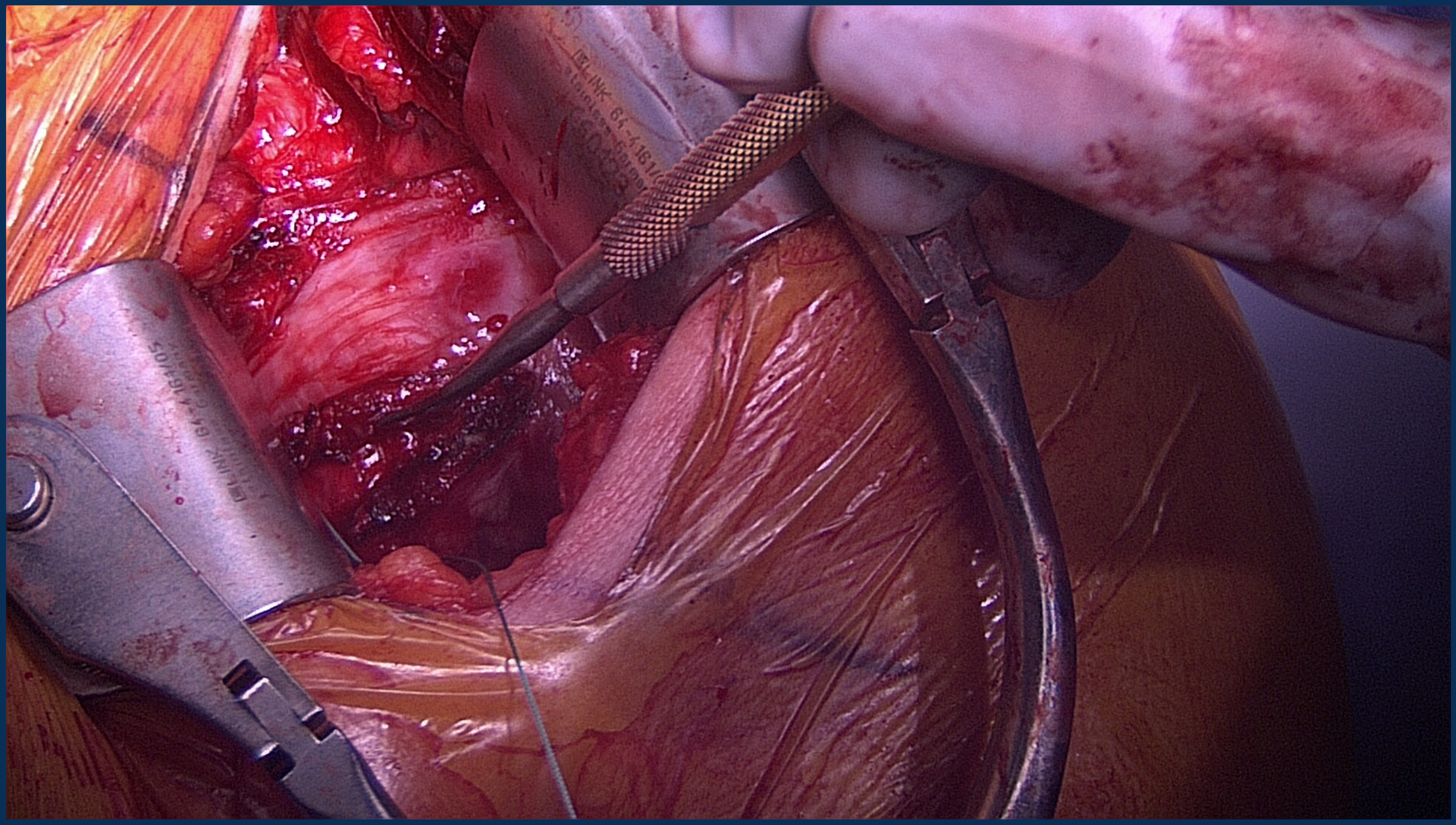

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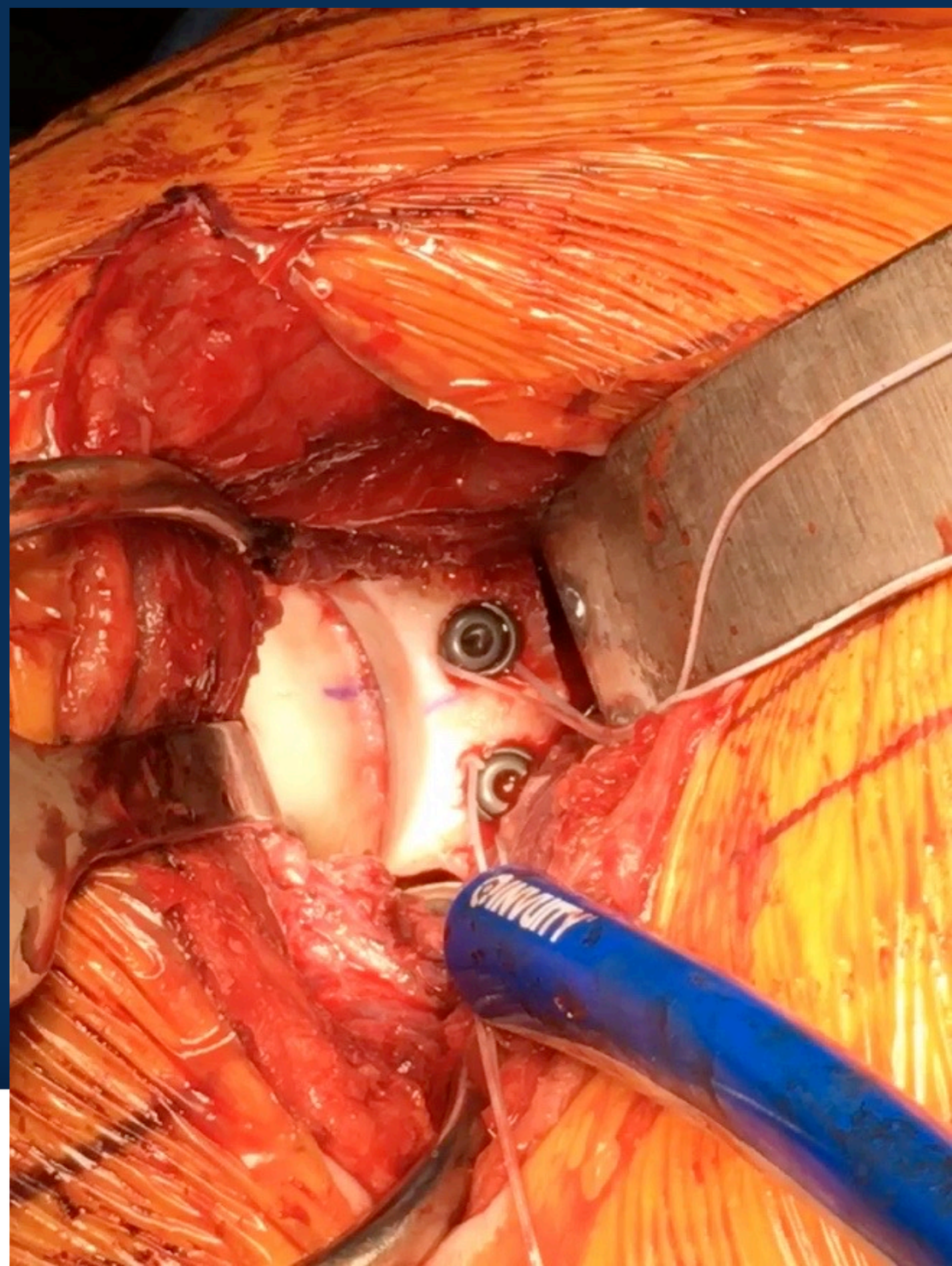
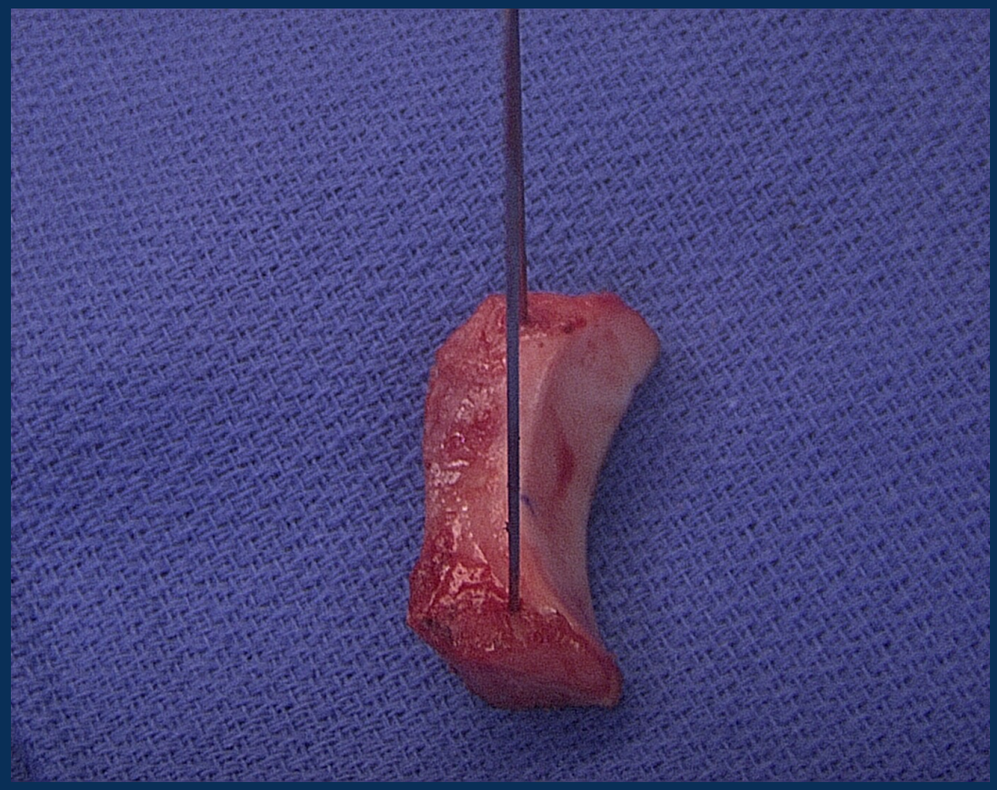
Create flat, bleeding bed of bone on glenoid neck prior to insertion of graft

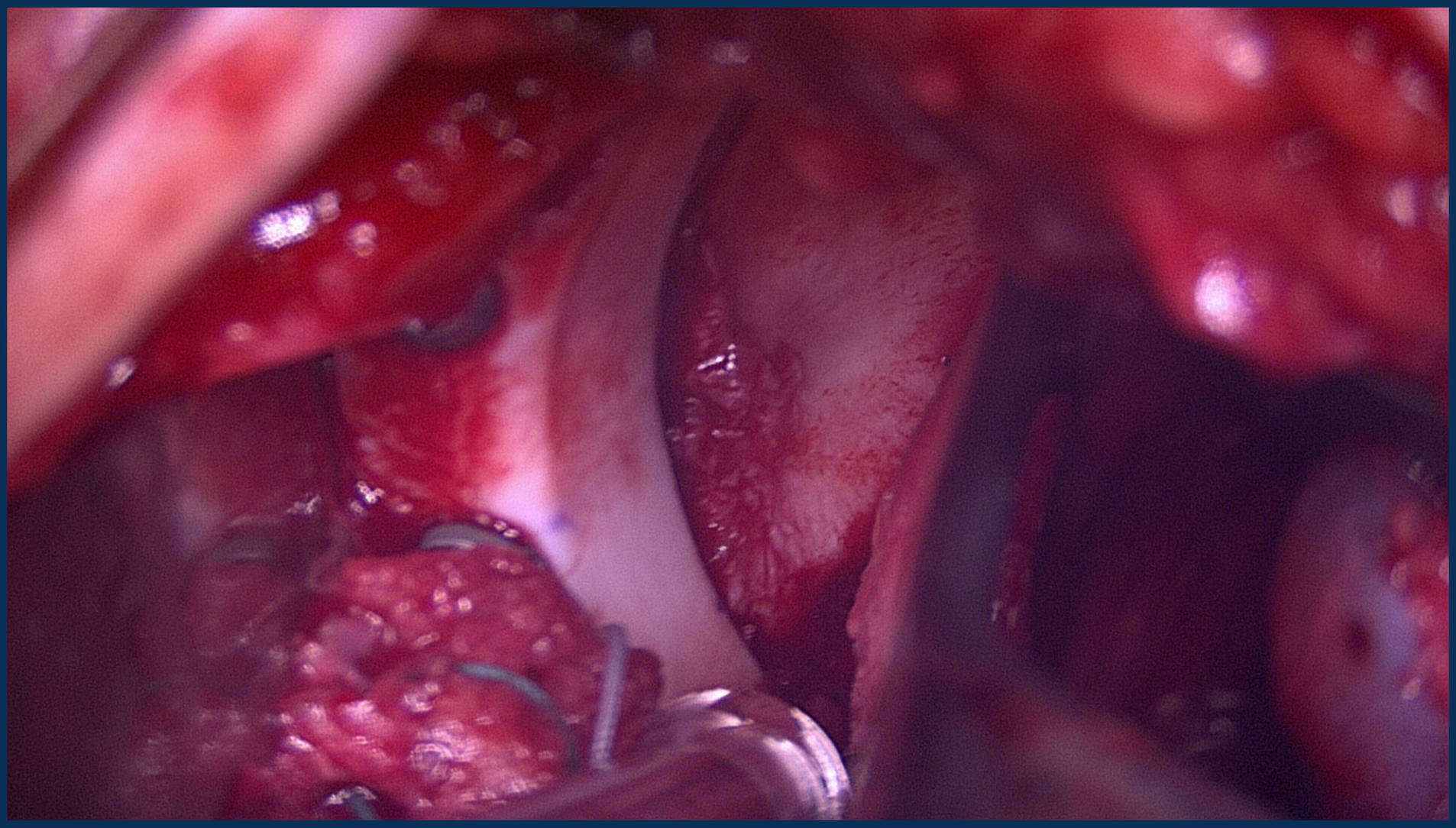
Can mark the presence of previous holes with marker on face of glenoid so you can avoid old holes with new screws



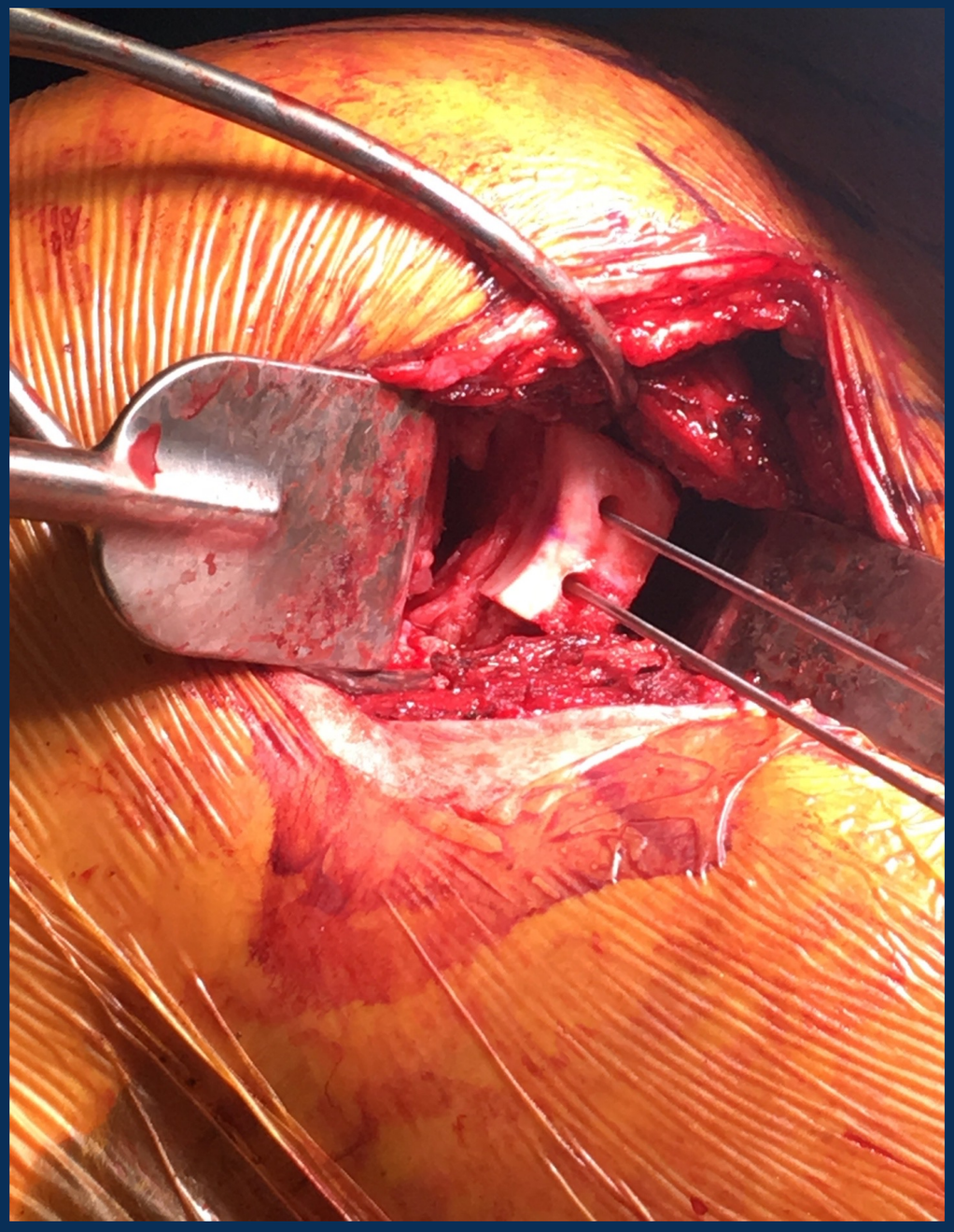
For cases of considerable bone loss, a larger graft (sup-inf height) can be used, typically graft is around 22 mm

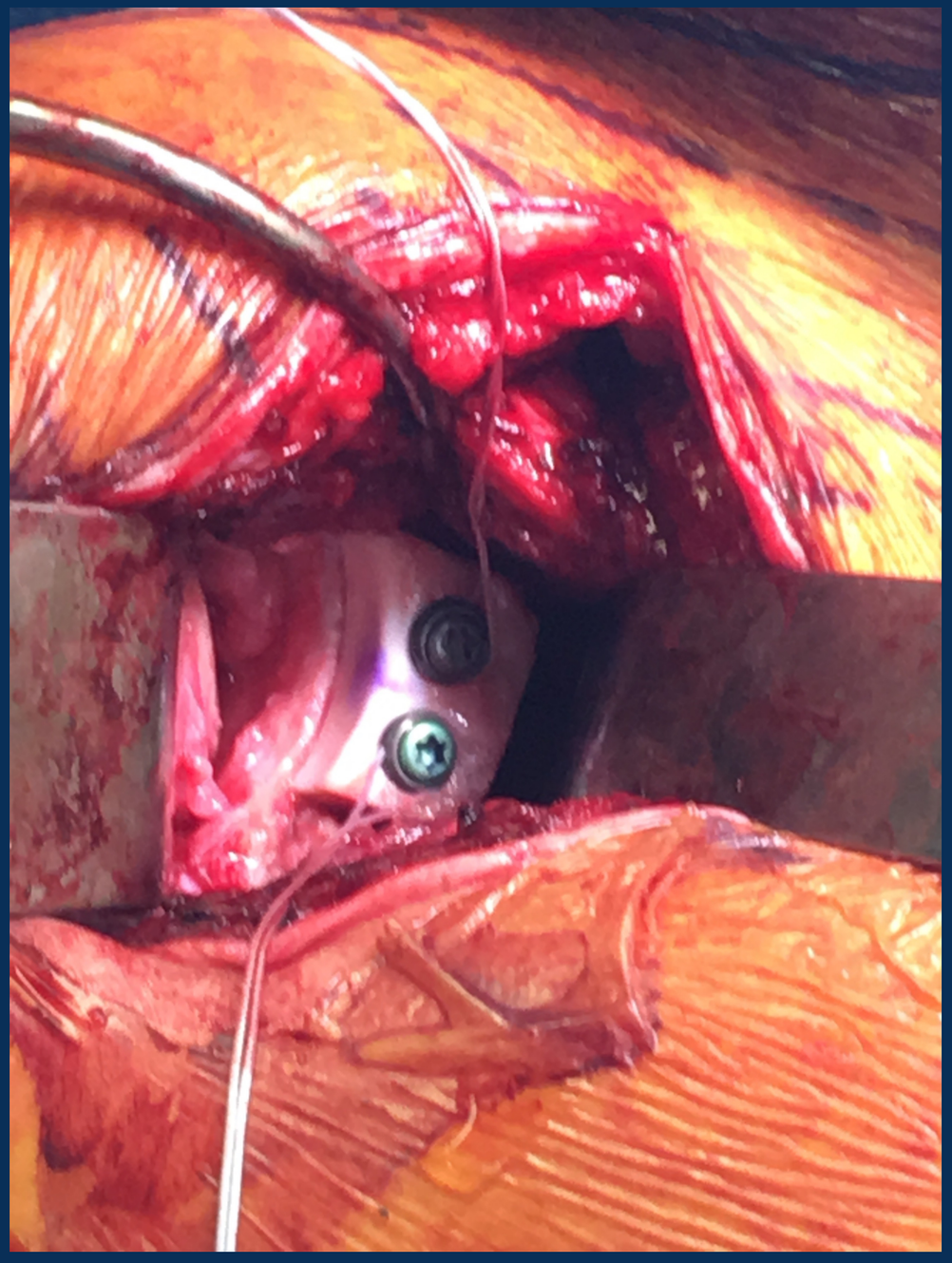
Larger grafts (3 cm) can be provisionally fixed with k-wires to align onto glenoid and then screws placed



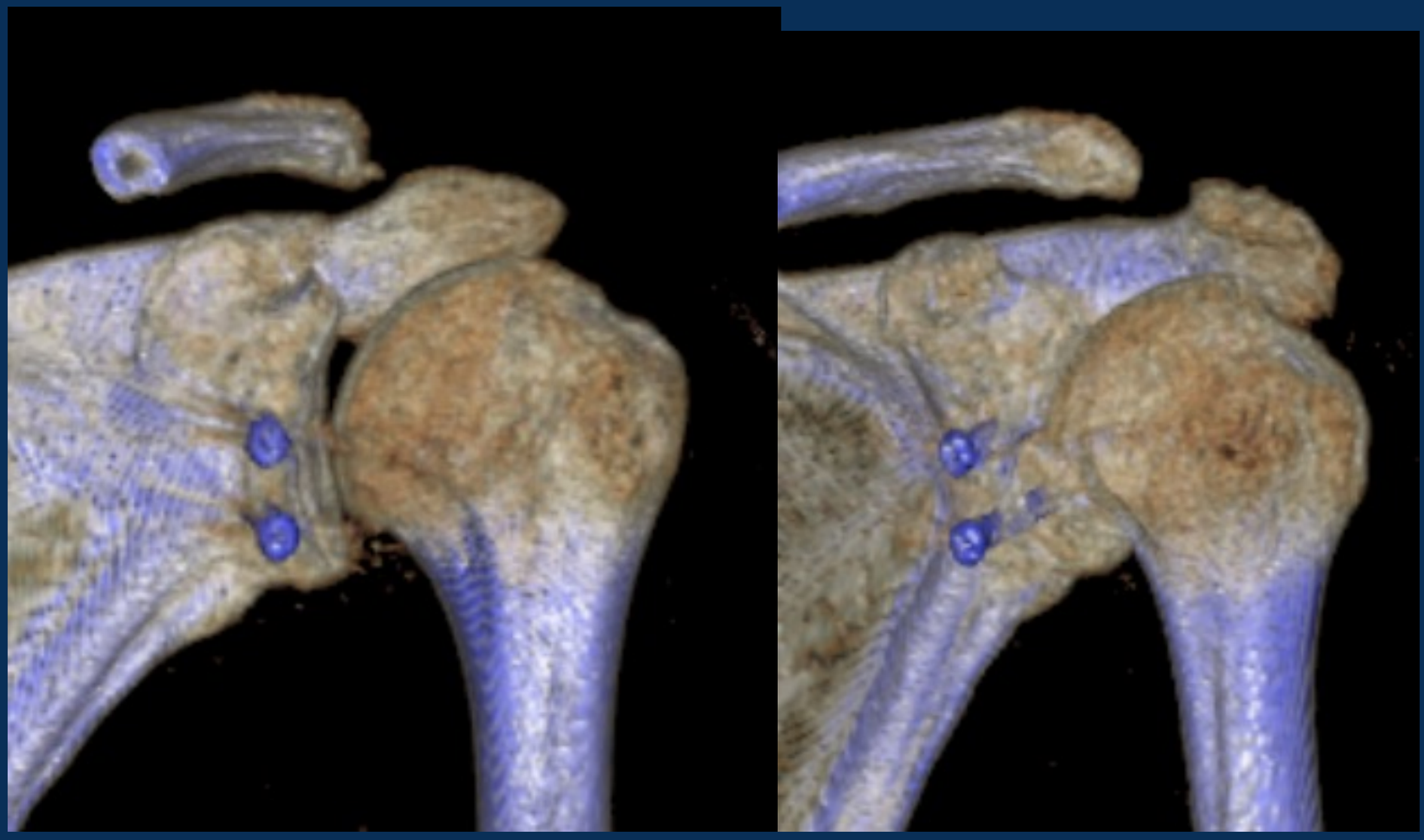


Goal of glenoid reconstruction is to replicate the contour in both the axial plane and the coronal plane





Can use a cannulated drill and then place solid screws and now I always use washers (with or without sutures for capsular repair)



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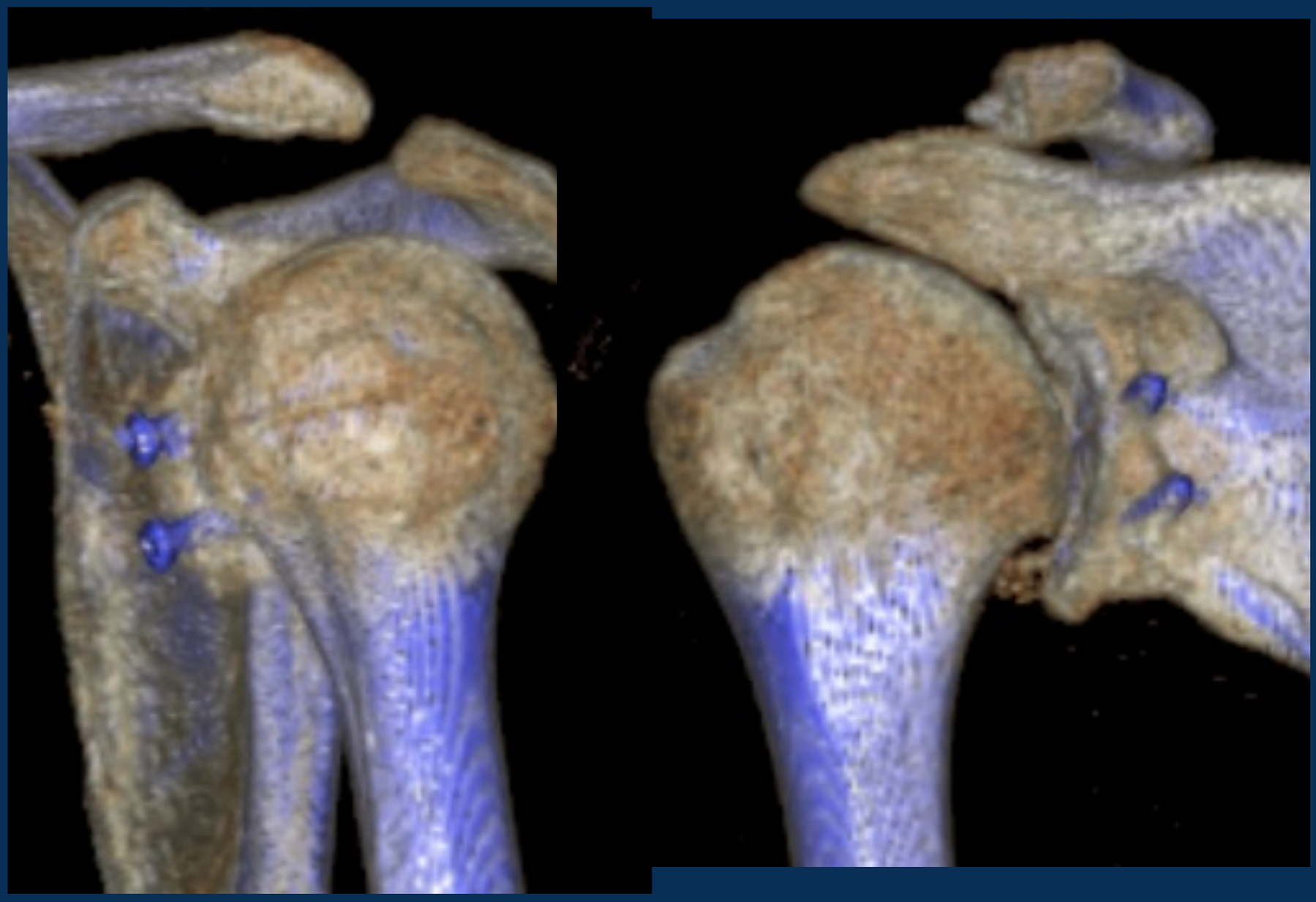

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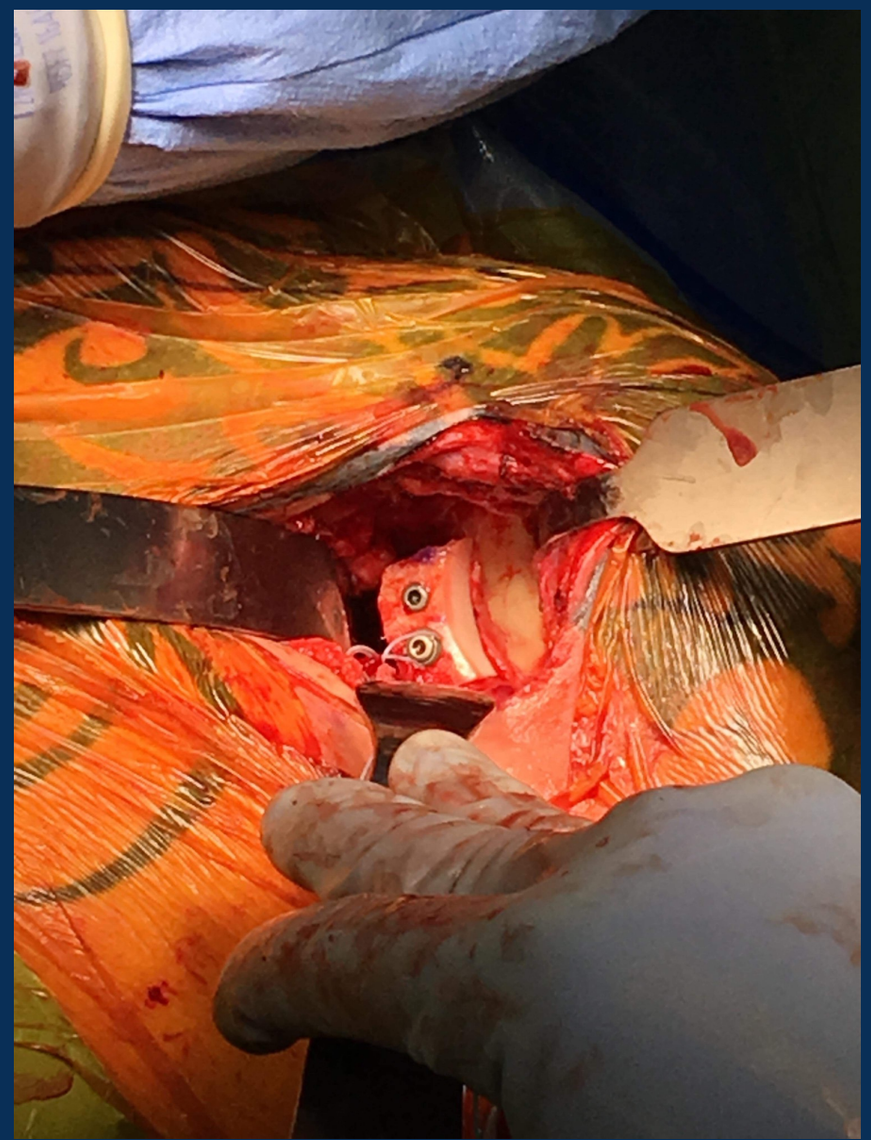
Summary

- Appropriate treatment of shoulder instability starts with recognition of glenoid bone loss
- Soft tissue procedures have a HIGH failure rate in the setting of glenoid bone loss
- Correcting the problem = restoring the glenoid bone
- Latarjet or DTA are both very demanding surgeries with known complication rates, however can lead to excellent results for our patients



Thank You

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