



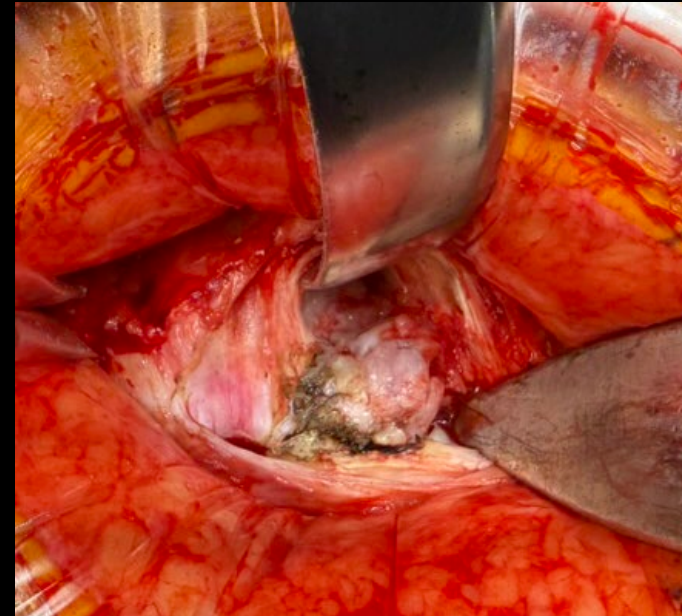
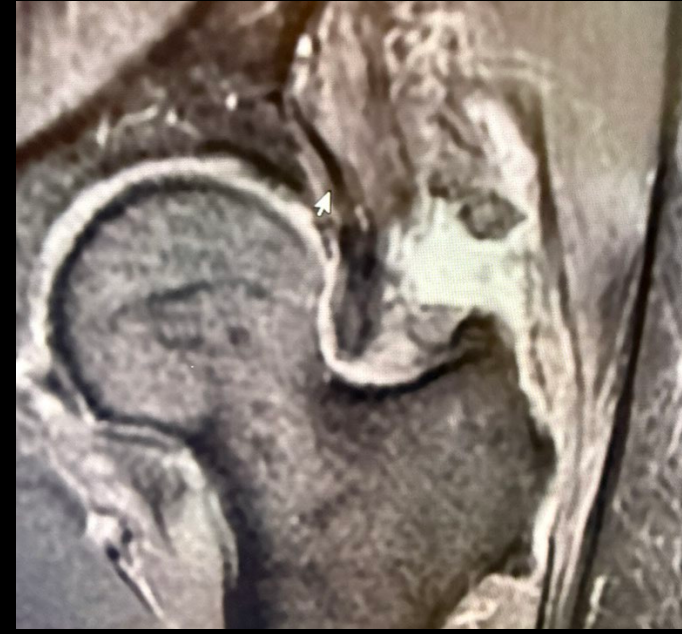
University of California
San Francisco

HIP ABDUCTOR TENDON REPAIR Surgical Update

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Professor of Orthopaedic Surgery

University of California San Francisco



Conflicts

- **Stefano Alec Bini, MD, FAAOS**
 - JOURNALS
 - Journal of Bone and Joint Surgery Associate Editor AI
 - Arthroplasty Today, Associate Editor AI
 - Journal of Arthroplasty: Editorial or governing board
 - Elsevier: Publishing royalties, financial or material support
 - SOCIETIES
 - Personalize Arthroplasty Society: Board or committee member
-
- START UPS
 - CaptureProof.com: Stock or stock options
 - Cloudmedx.com: Stock or stock options
 - Gait Science: Stock or stock options
 - InSilicoTrials.com: Stock or stock options
 - Siramedical.com: Stock or stock options
 - Archetype.ai: stock or stock options
 - INDUSTRY
 - Zimmer Biomet: consulting
 - Stryker Royalties
 - **Con Med research funding**
- 

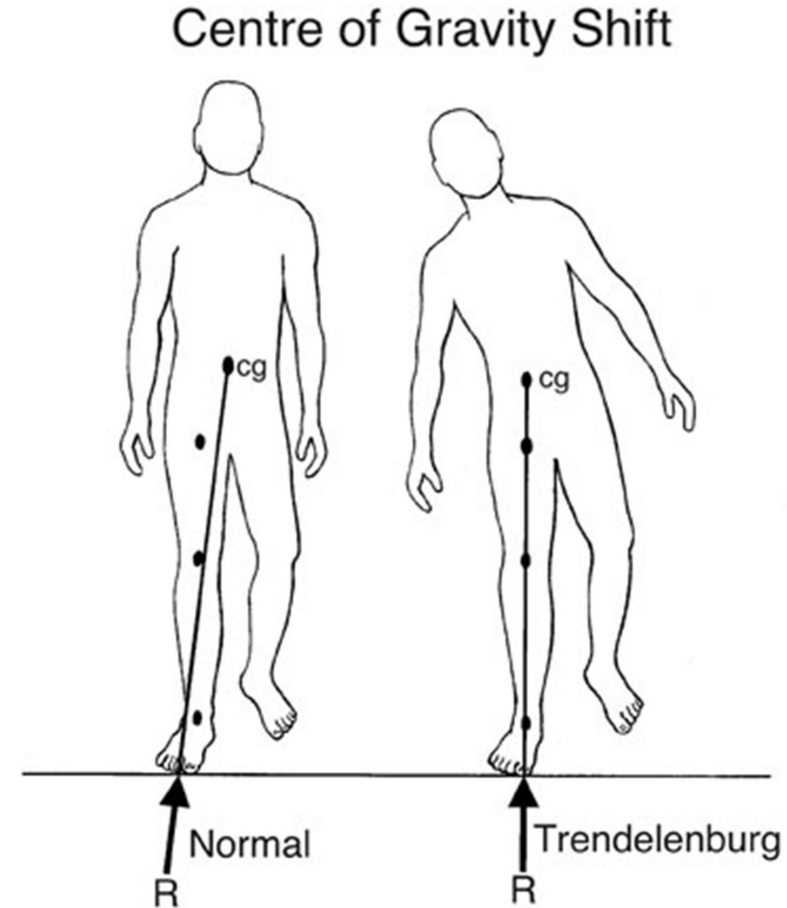
Goals of this talk

- Increase **awareness** of the high prevalence of Gmed and Gmin tears in patients with hip osteoarthritis
- Give you enough information to consider **treating** tears when you see them or refer the patient.



Biomechanics of the Abductors / Loads

- 4-5 times body weight
- **8 times BW when stumbling**
- Much higher forces than the shoulder
 - Impacts recovery and surgical techniques



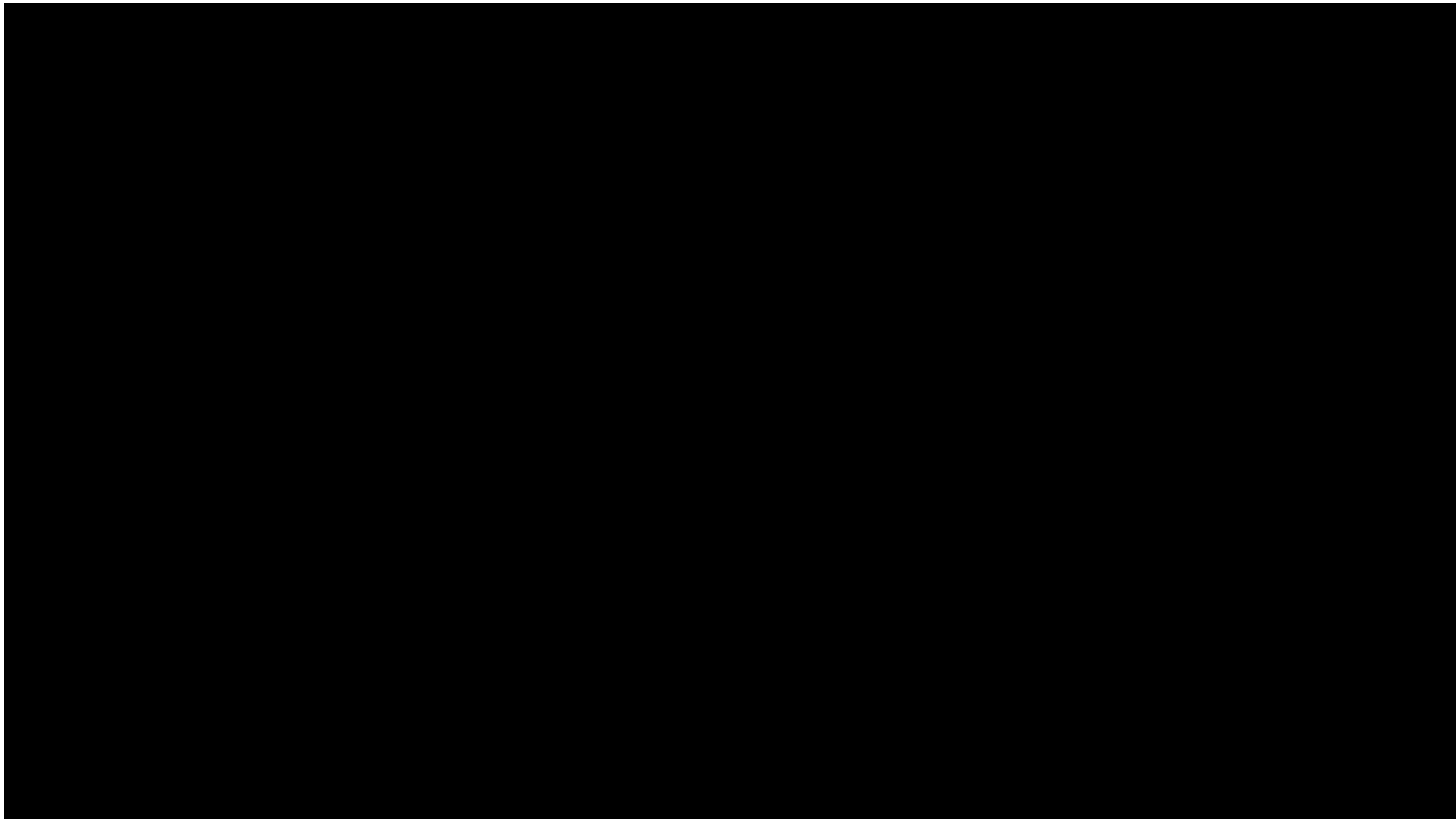
DIAGNOSIS

- History

- Pain / “Bursitis”
 - Lateral hip pain
 - Sleep disturbance
 - Pain with stair climbing, walking
- Multiple injections
- PT for IT band stretching
- Hip Surgery
 - lateral approach

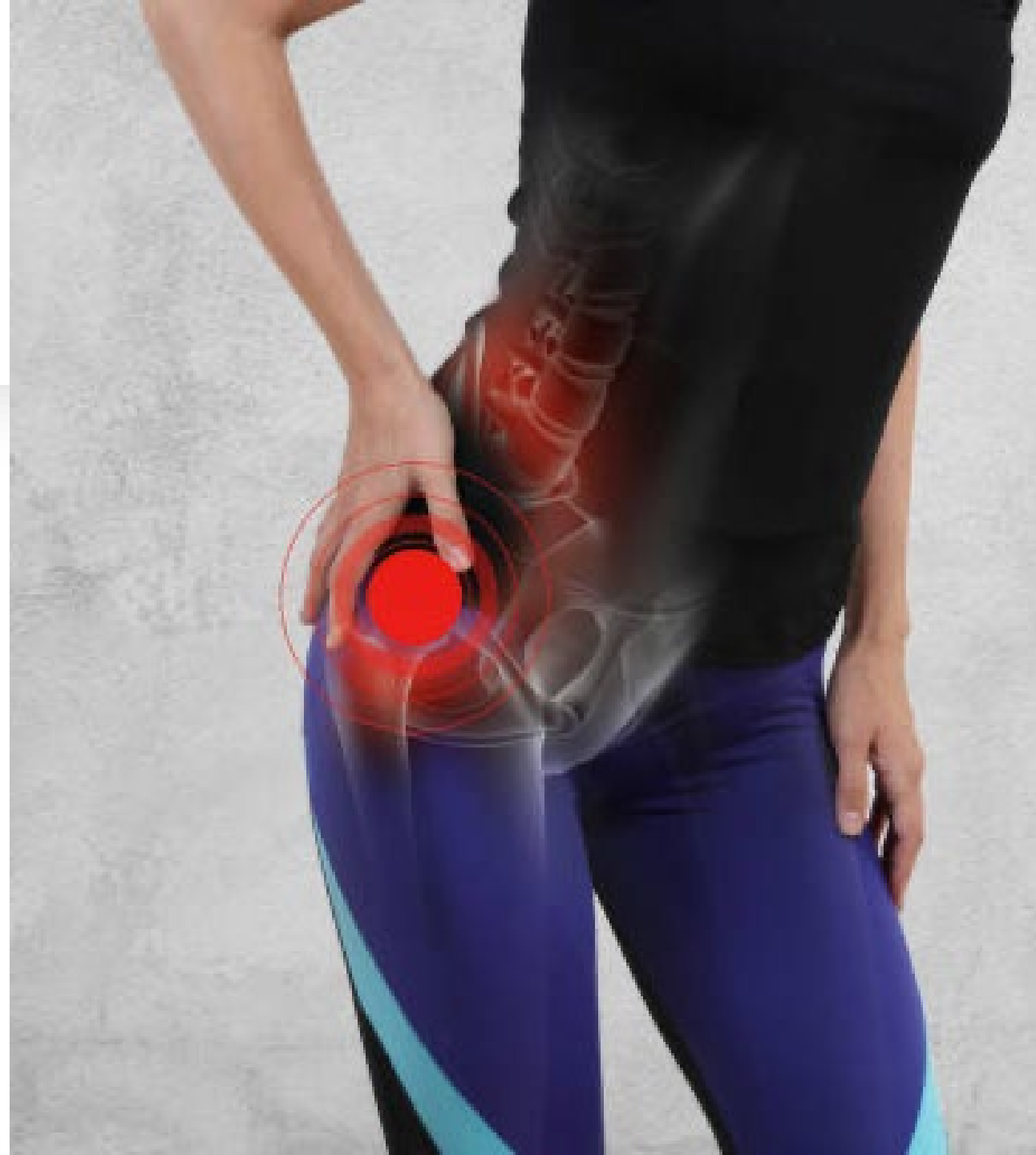
- Physical Exam

- Middle aged females
- Tender over GT/lateral hip
- Trandelenburg
 - Side to side waddle
- Use of a cane, walker



Greater Trochanteric Pain Syndrome

- Sunil Kumar et al, ESSKA 2021
- Female predominance (>70%)
 - Wider pelvis
 - Smaller Trochanteric footprint
 - 30% increase abductor moment arm
- 20% of THA patients
 - Source of lateral hip pain
 - Often pain not from the spine



Work up

- **Imaging**

- XR

- Flattening of GT,
Calcifications
 - May have hip arthritis
 - May have spine arthritis

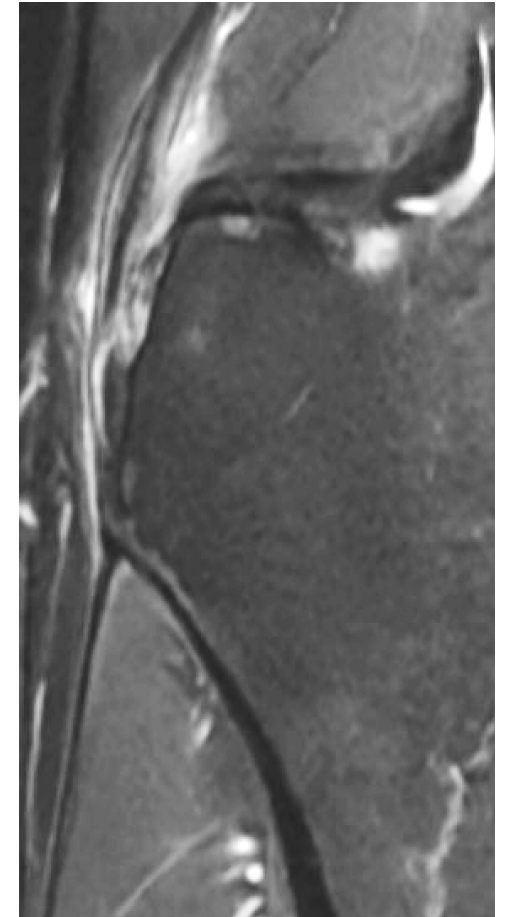
- U/S

- Detachment
 - Gmed only

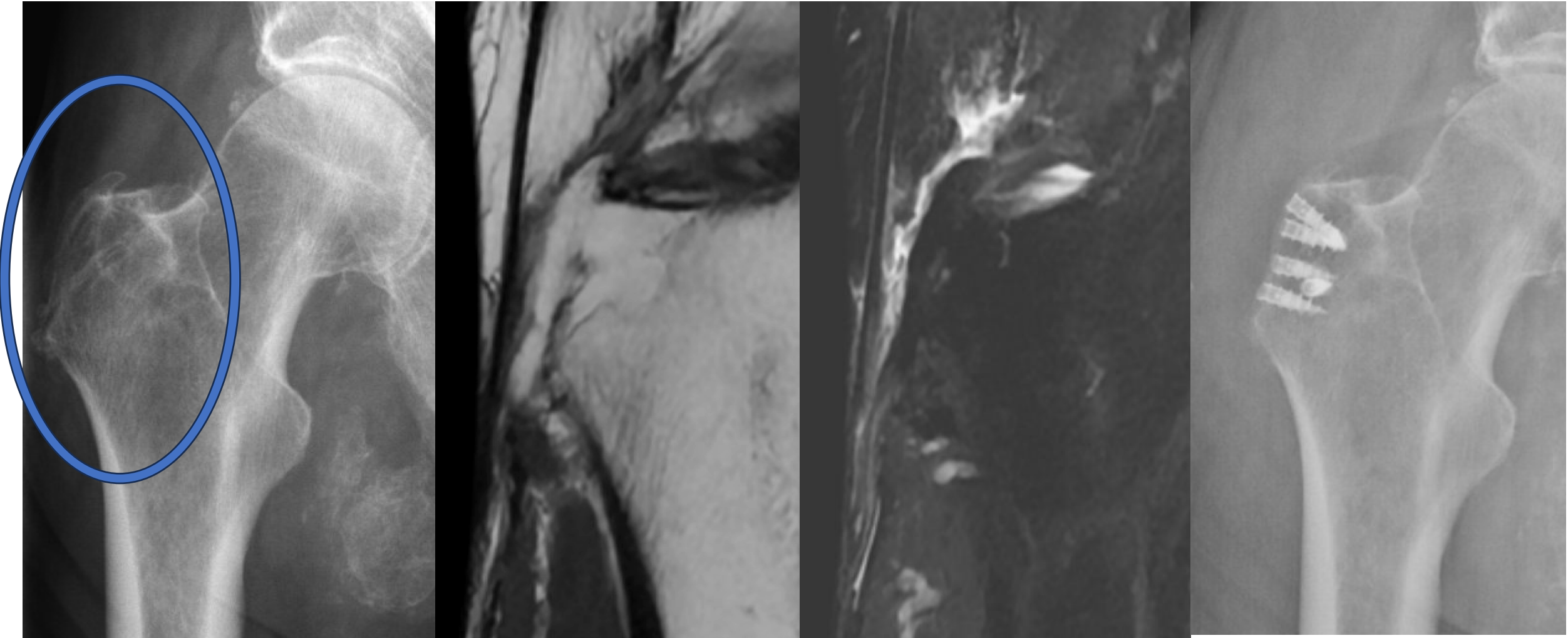
- MRI

- Quality of tear
 - Medius and/or Minimus
 - Fluid Collections (MOM)
 - **fatty degeneration of muscle**

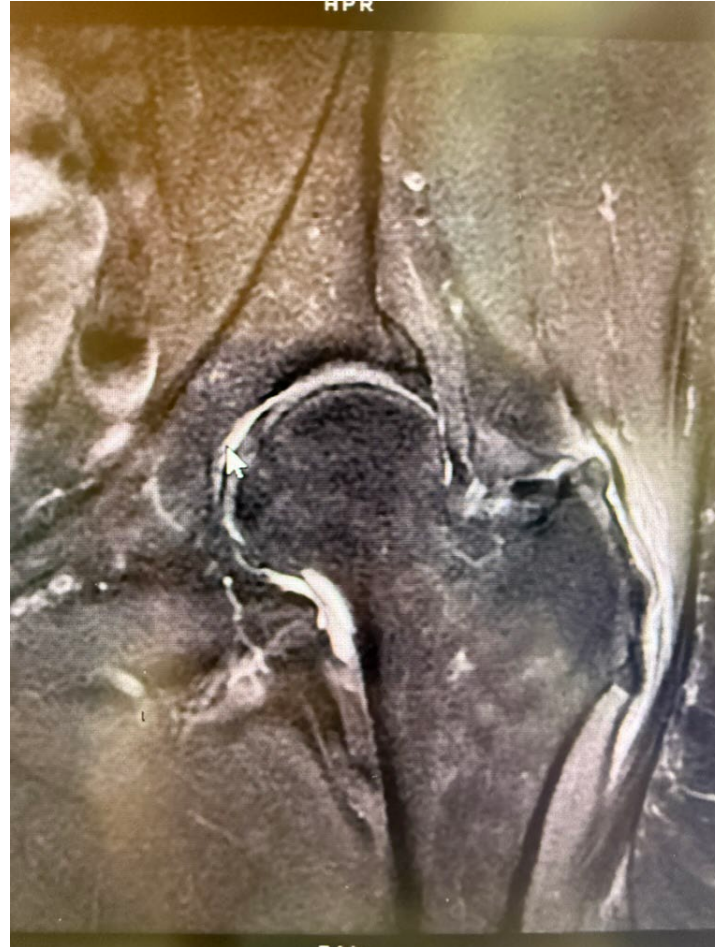
XR Imaging: flattened and osteophytic GT



XR imaging: 80% detachment, GMed retraction, complex repair



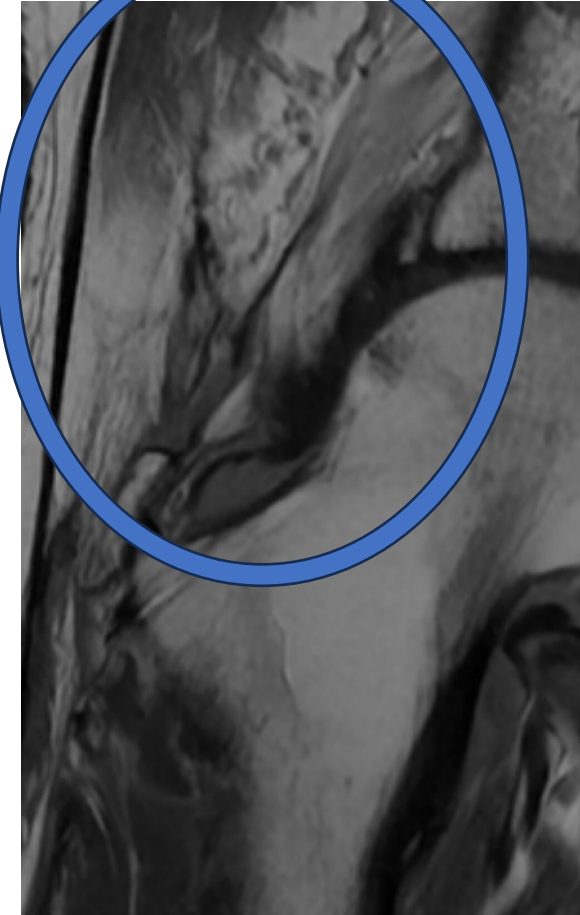
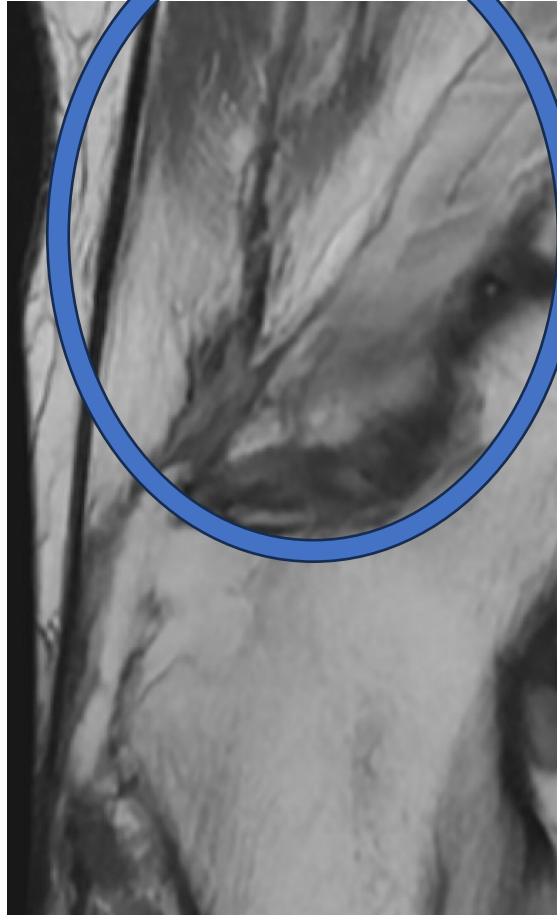
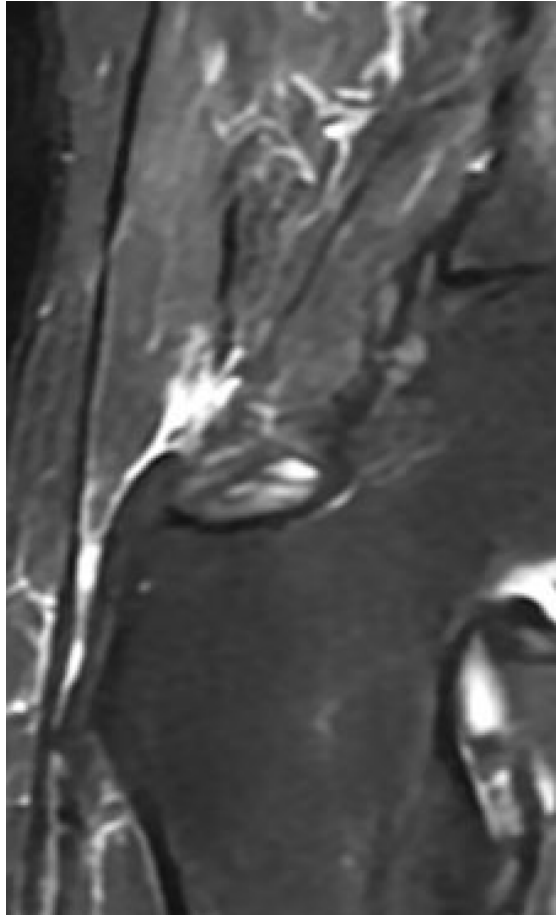
MRI: best for Gluteus Medius Pathology



- **GMED Pathology**

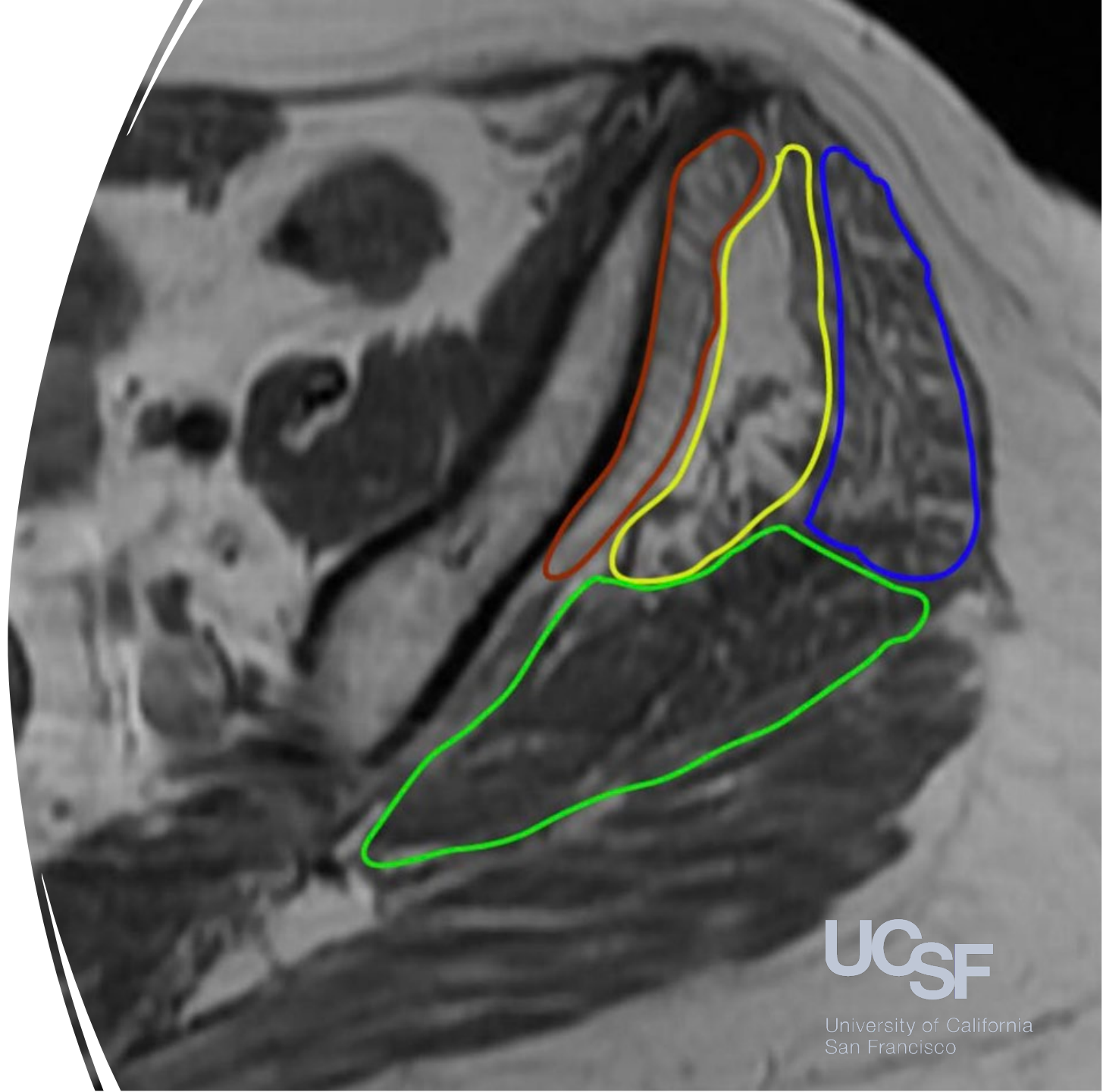
- Tendinosis/Bursitis
- Subsurface Tears
 - Delamination tears
- Partial Tears
- Complete Tears
- Fatty degeneration
- Associated Pathology
 - OA
 - Labral tears

Fatty Degeneration seen on T1



Fatty Degeneration and Atrophy

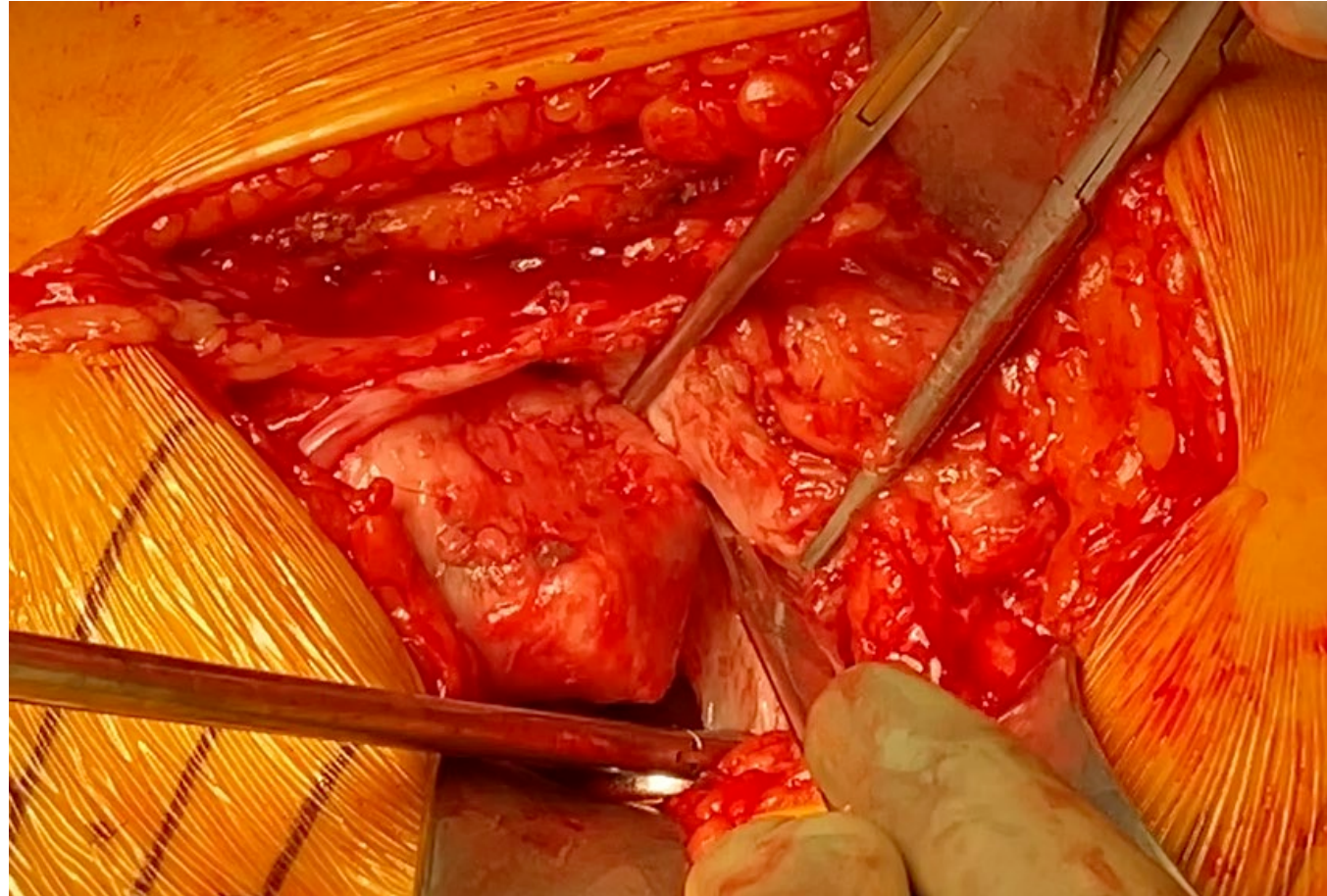
- An axial T1 Sequence of an MRI illustrating the Gmin and 3 parts of the Gmed included in the **assessment of Fatty Degeneration**
 - Thunaut (Arthroscopy 2018)
- **Muscle atrophy** was present if >25% reduction in cross sectional area compared to contralateral side on Coronal mid trochanter view
 - Cvitanit et al AJR 2004



Non-Surgical Treatment G Medius

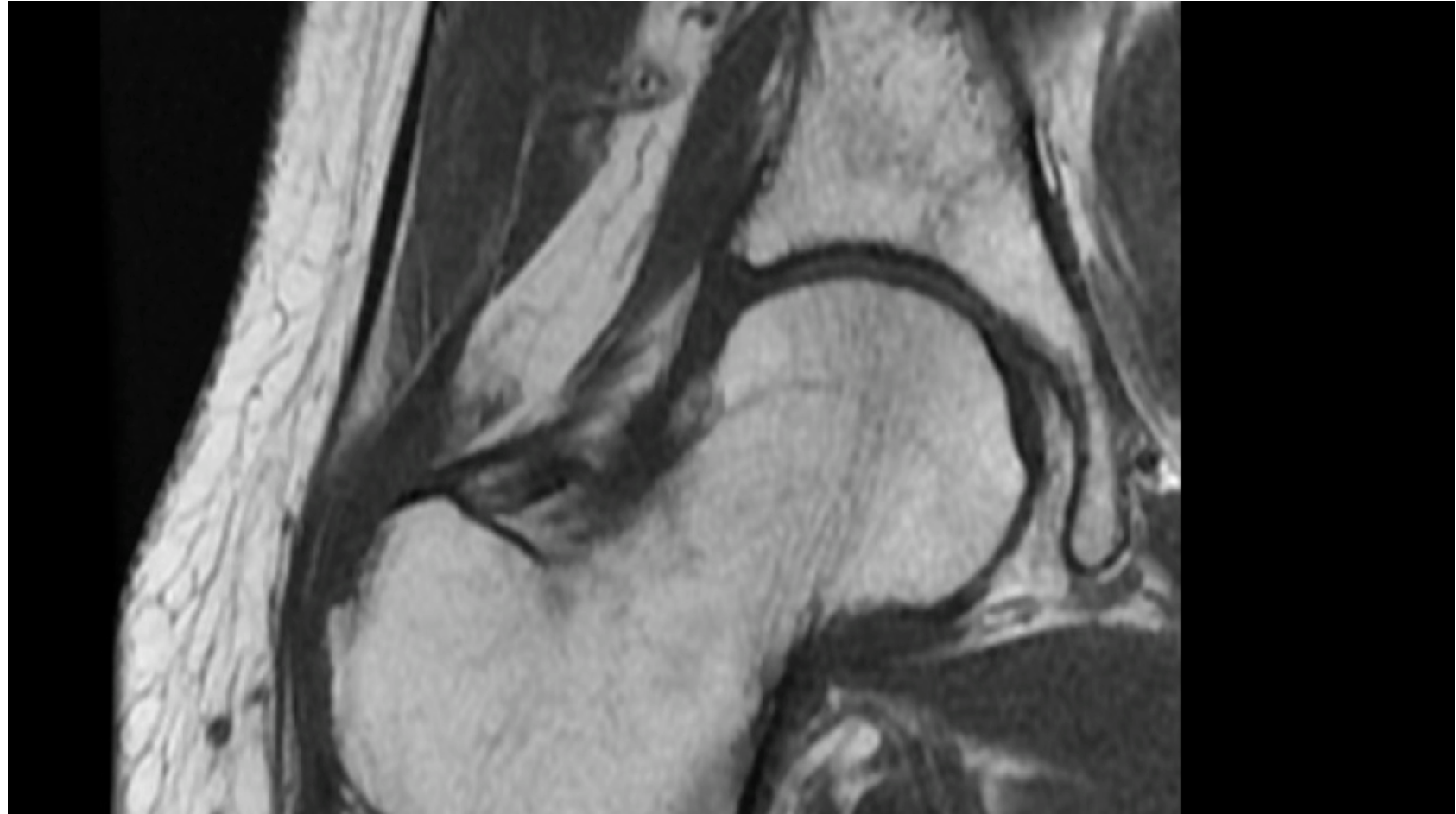
- Natural history is unclear
- Tendonitis > Subsurface Tear > Partial Tear > Complete Tear > Fatty Degeneration
 - Seems reasonable
 - Not all tears are symptomatic
- Physical Therapy
- Steroids
- PRP

Open Surgical Treatments



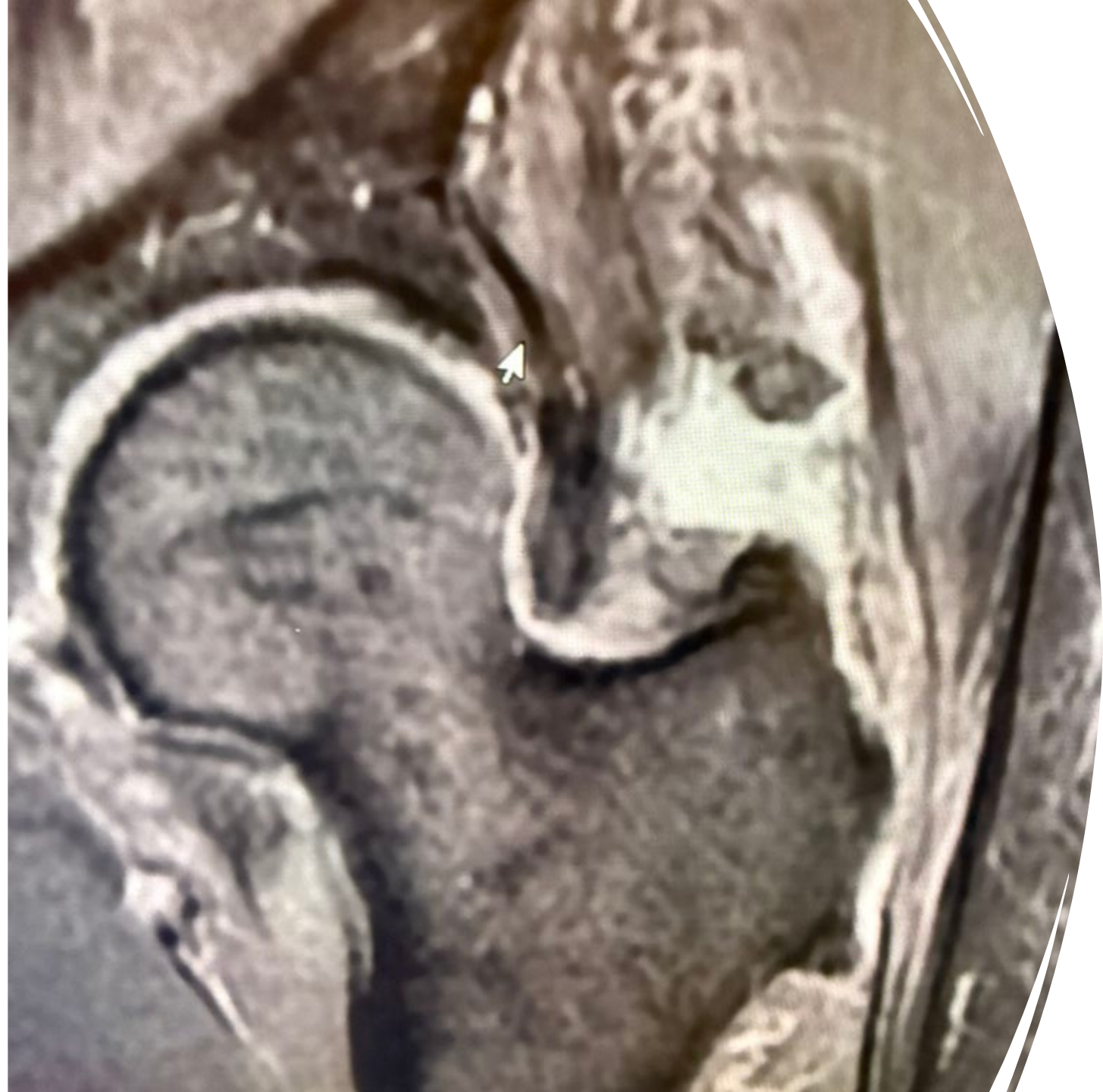
Subsurface Tears: surgical repair

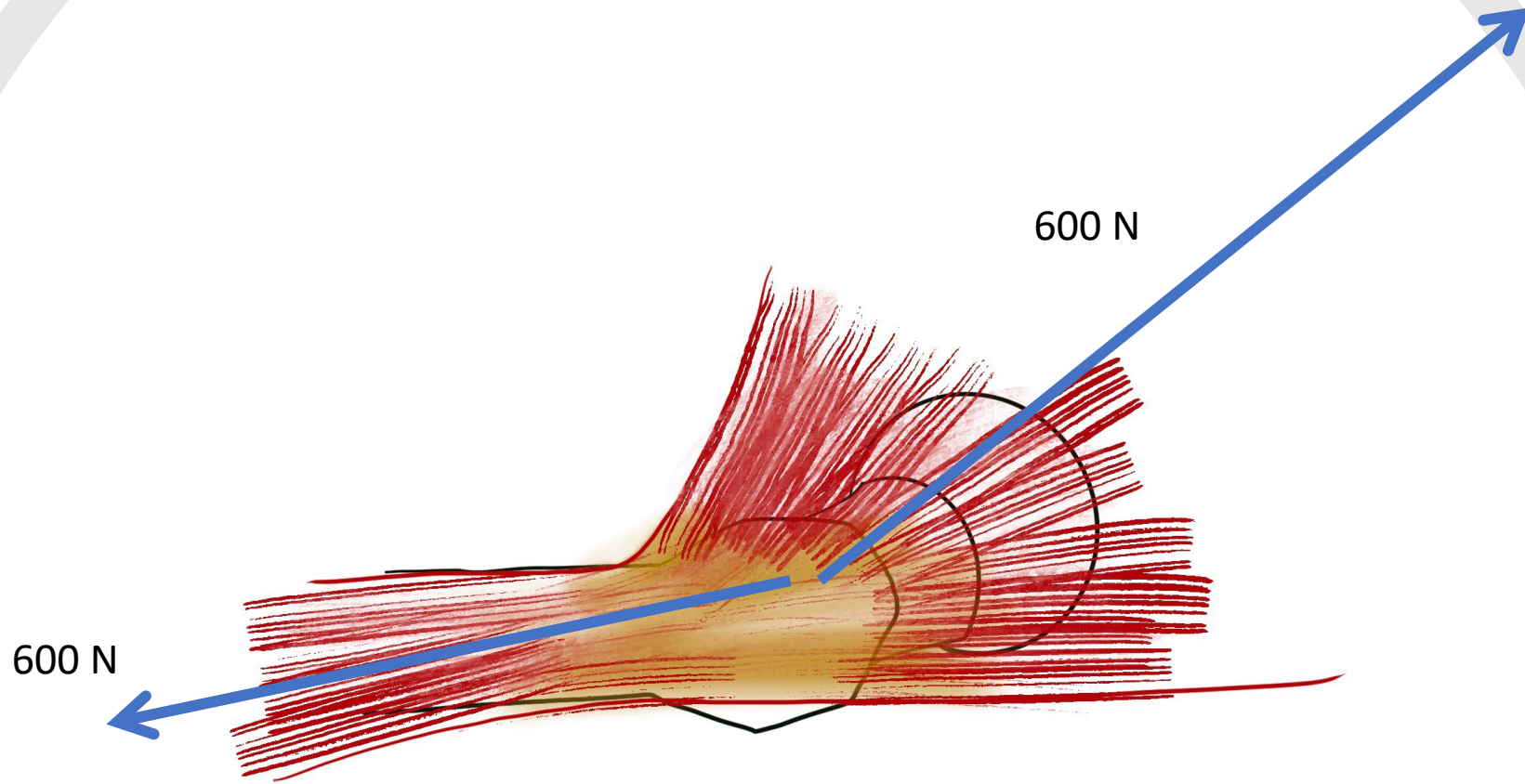
- Endoscopic repair of partial thickness undersurface tears of the abductor tendon – Hardigan Arthroscopy 2018
 - 14 patients
 - Improved proms
 - Vas improved 5 points
 - Gait improved in 12/14



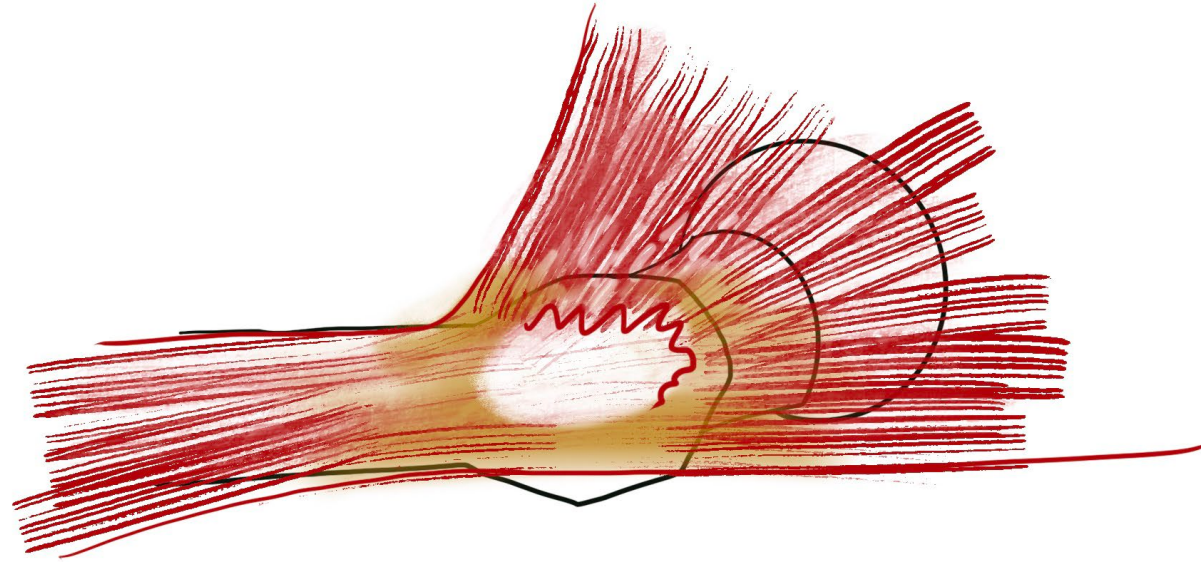
Managing larger tears

- Open repair
- Suture anchors
- Augments

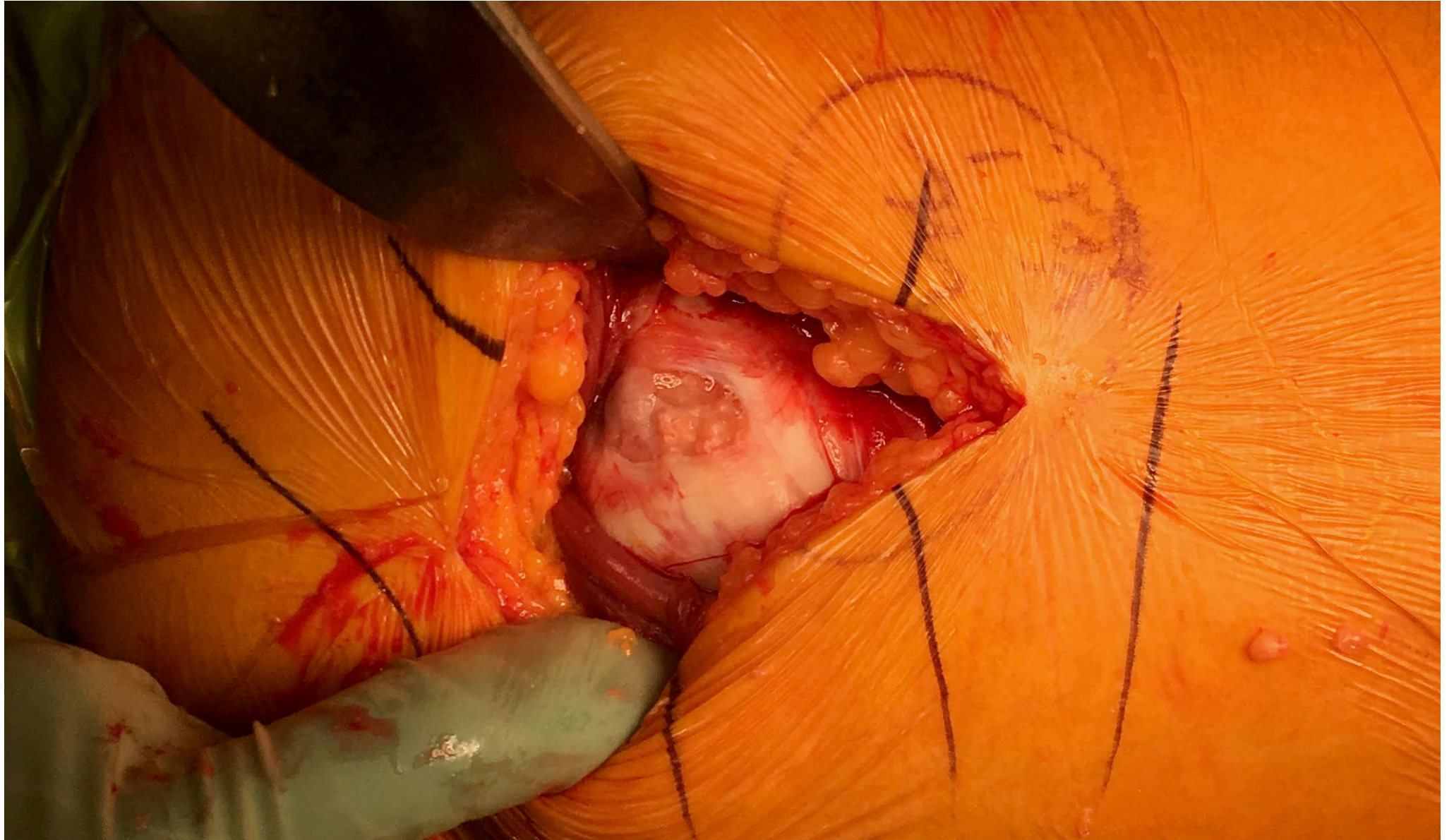


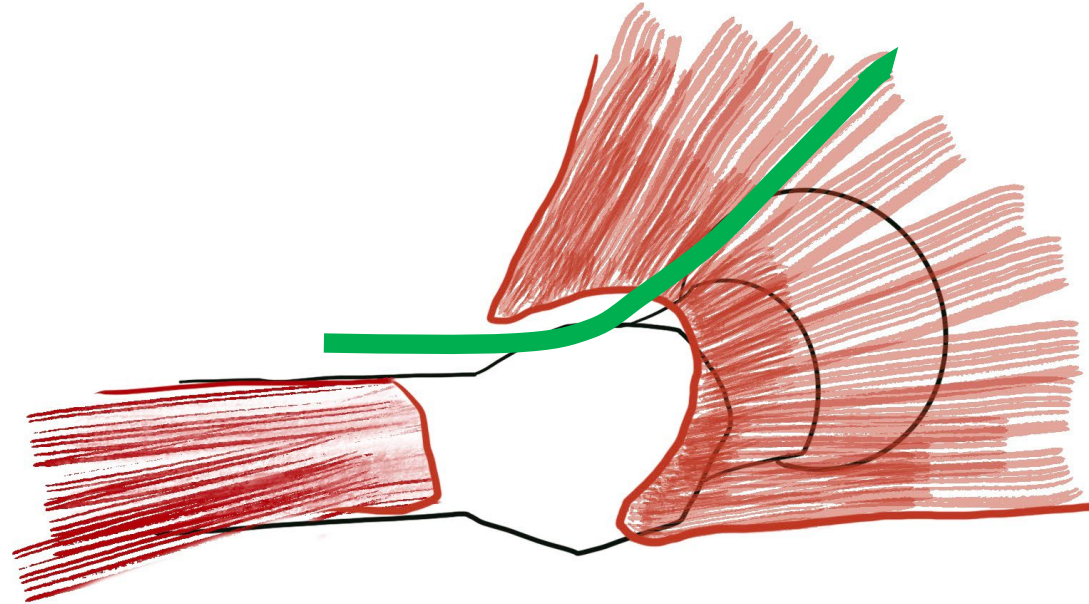


0-20%



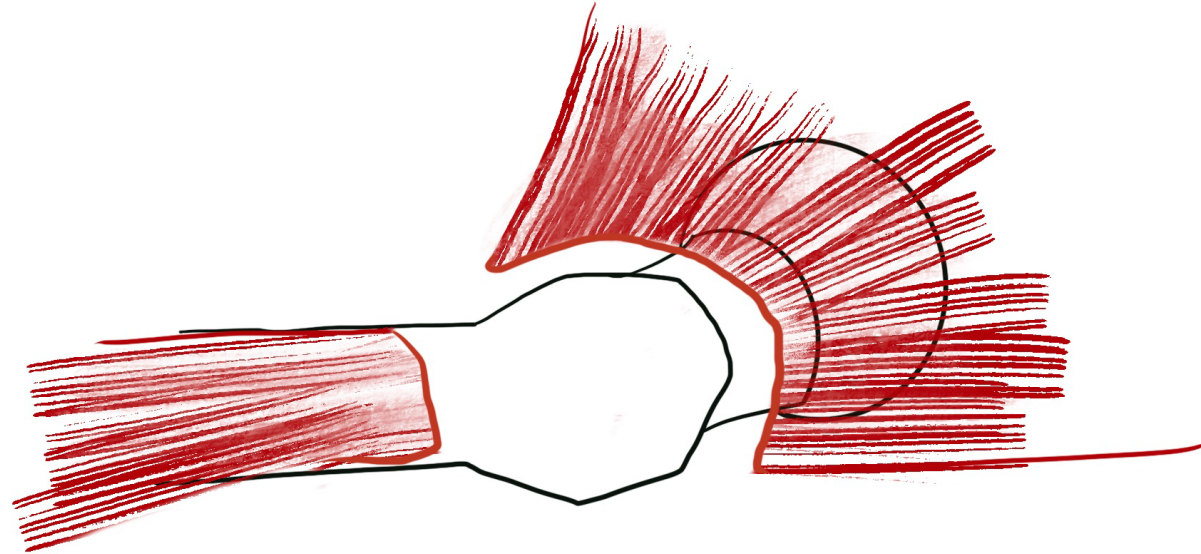
Central Tears, Degenerative



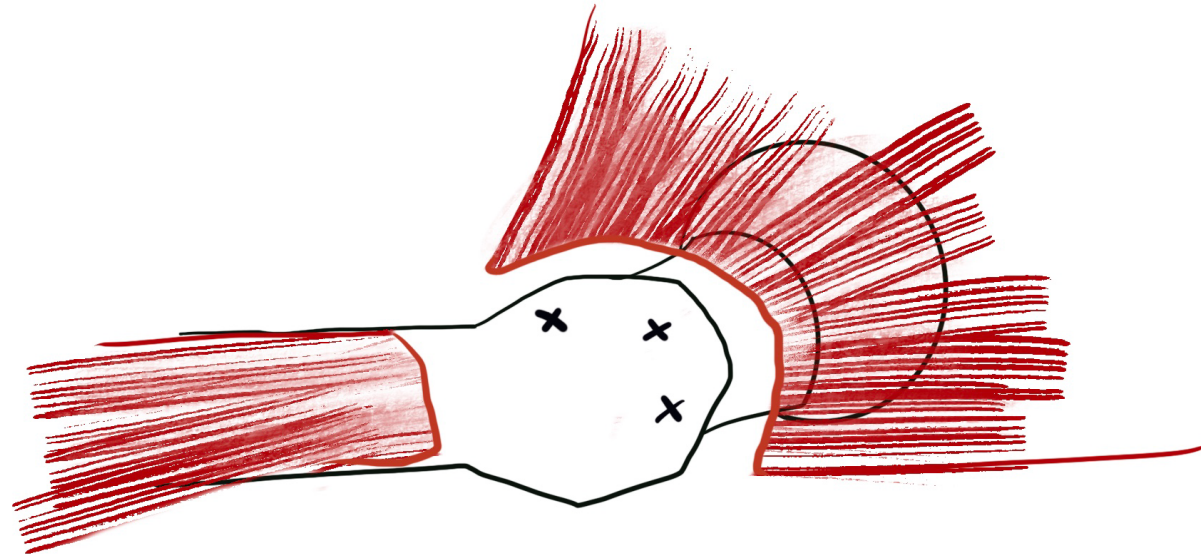


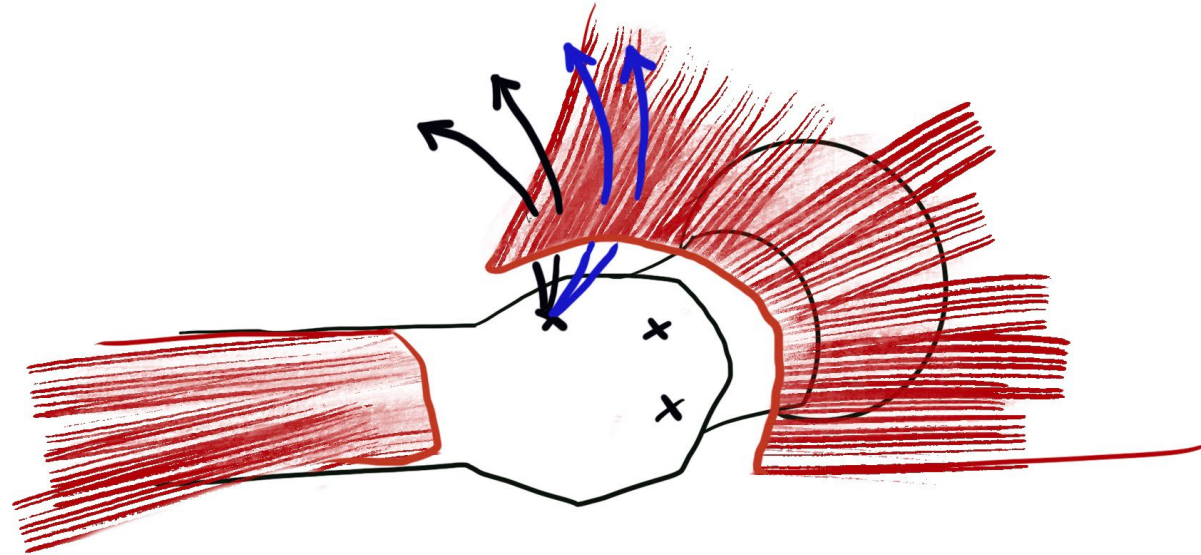
Iatrogenic from Anterolateral Approach

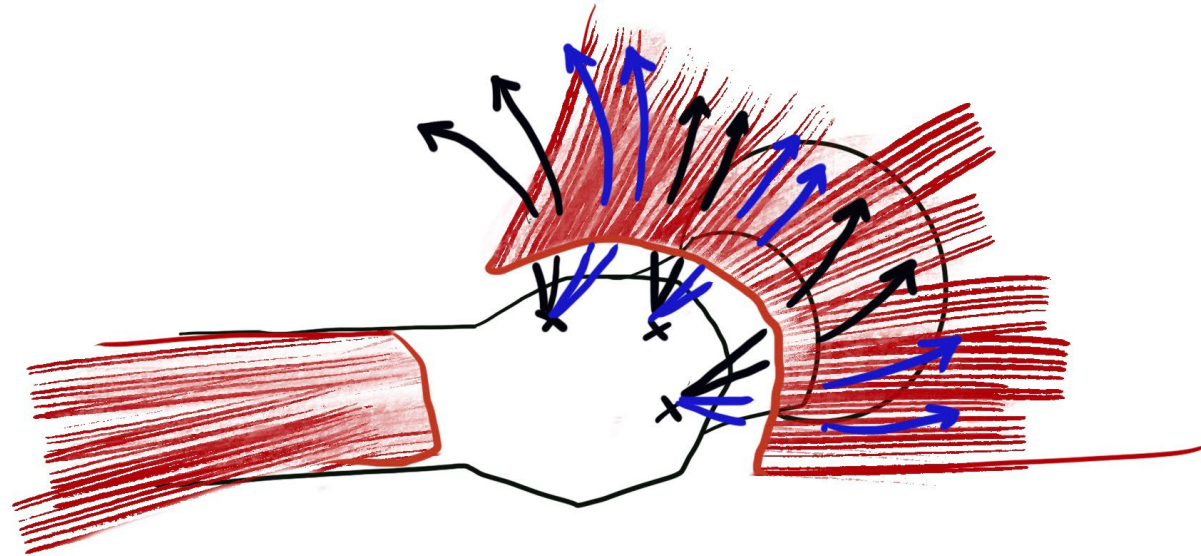
Partial vs Total Tears
20-100%

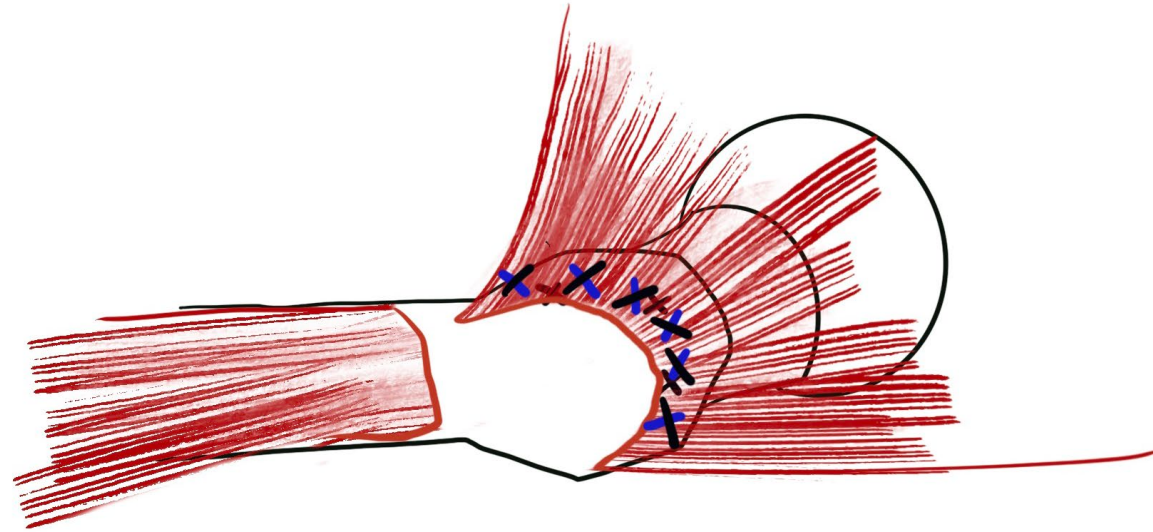


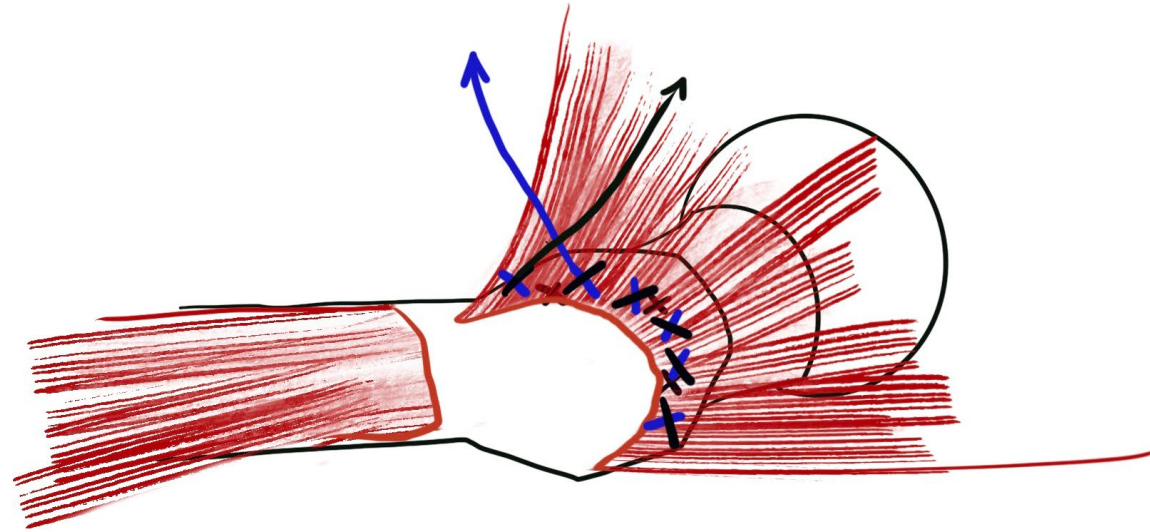
Chronic, degenerative

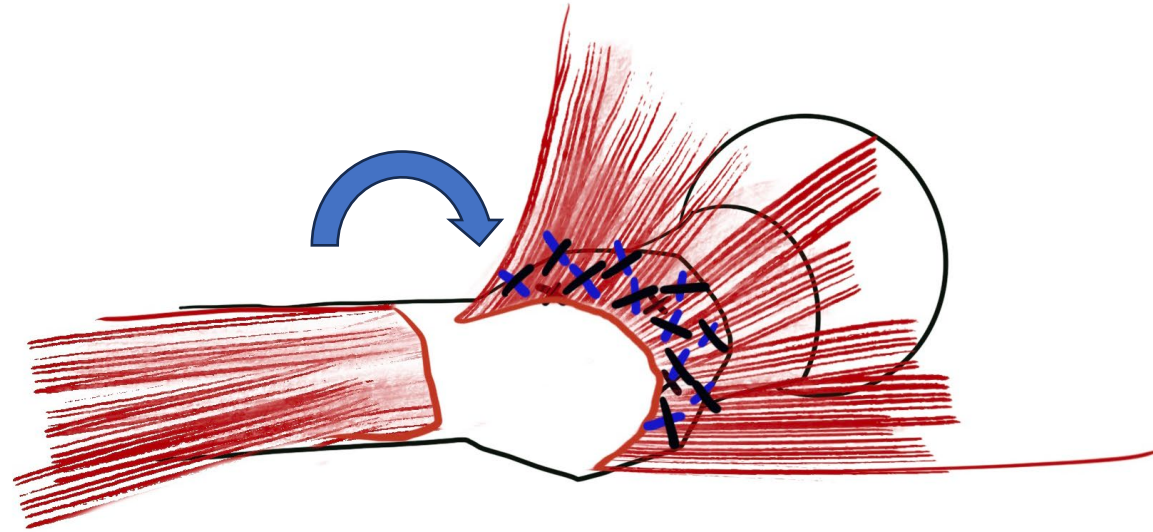


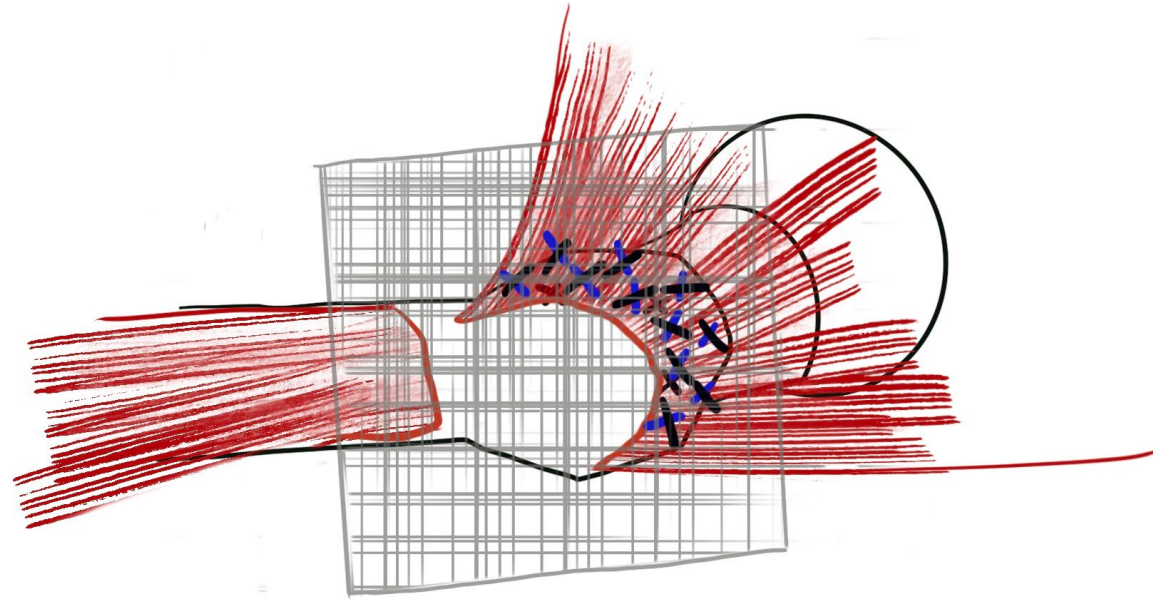


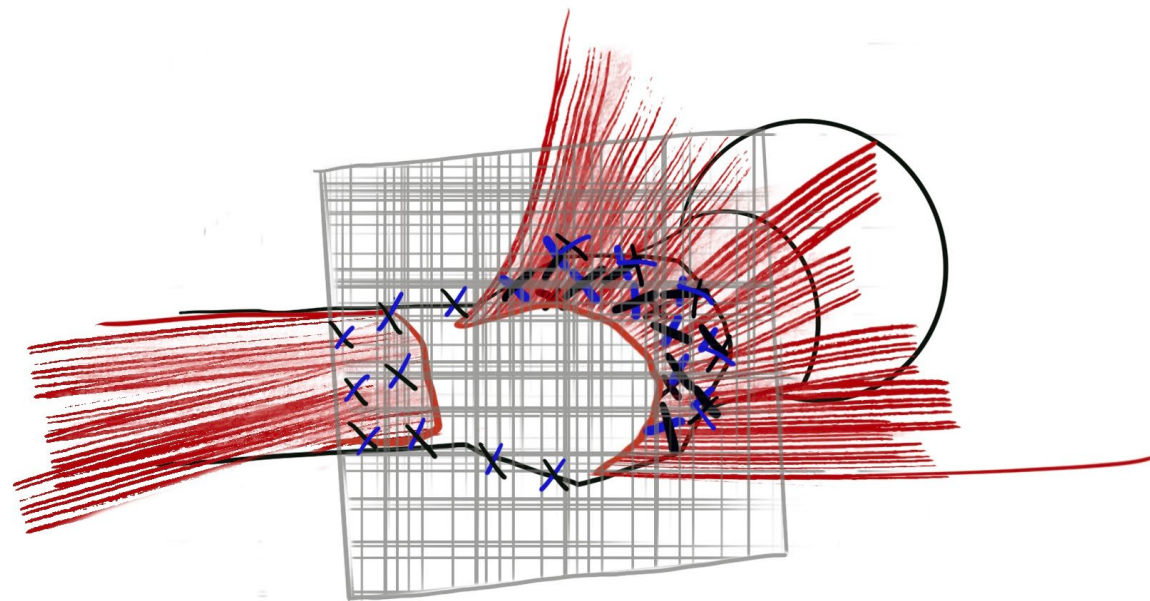


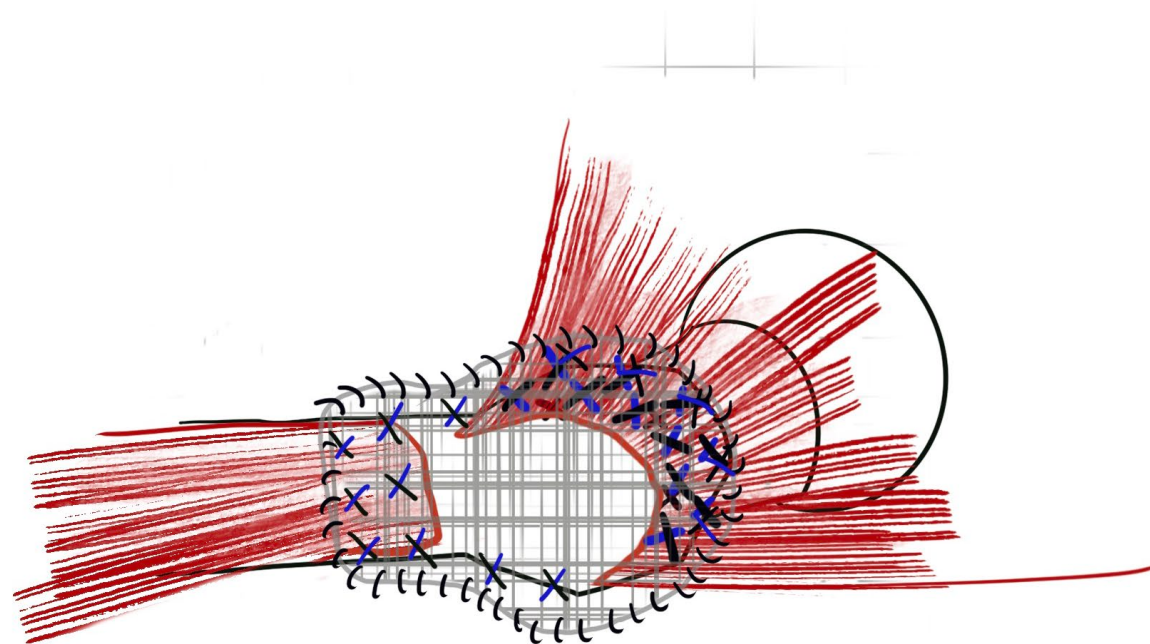


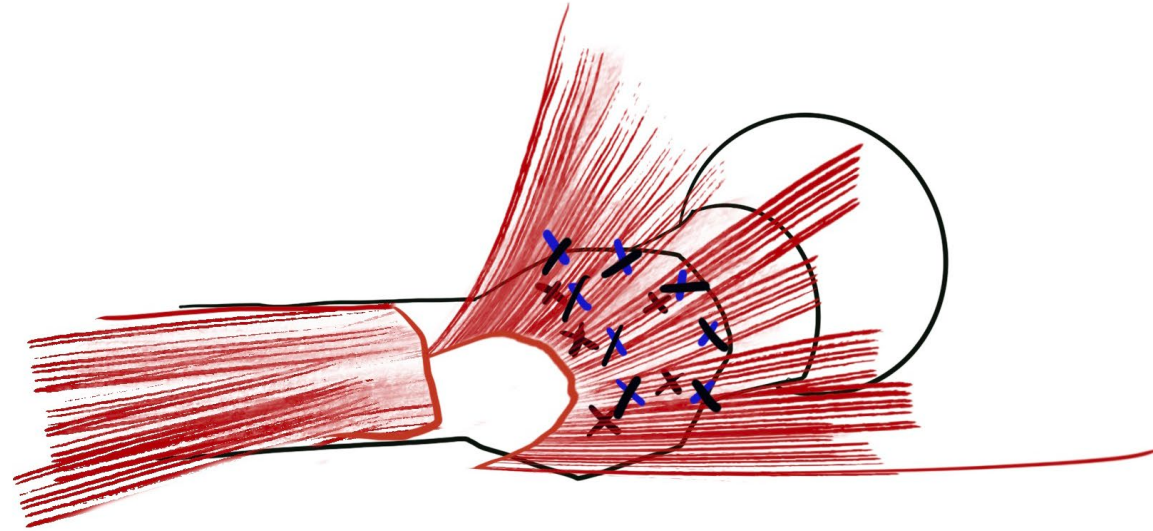


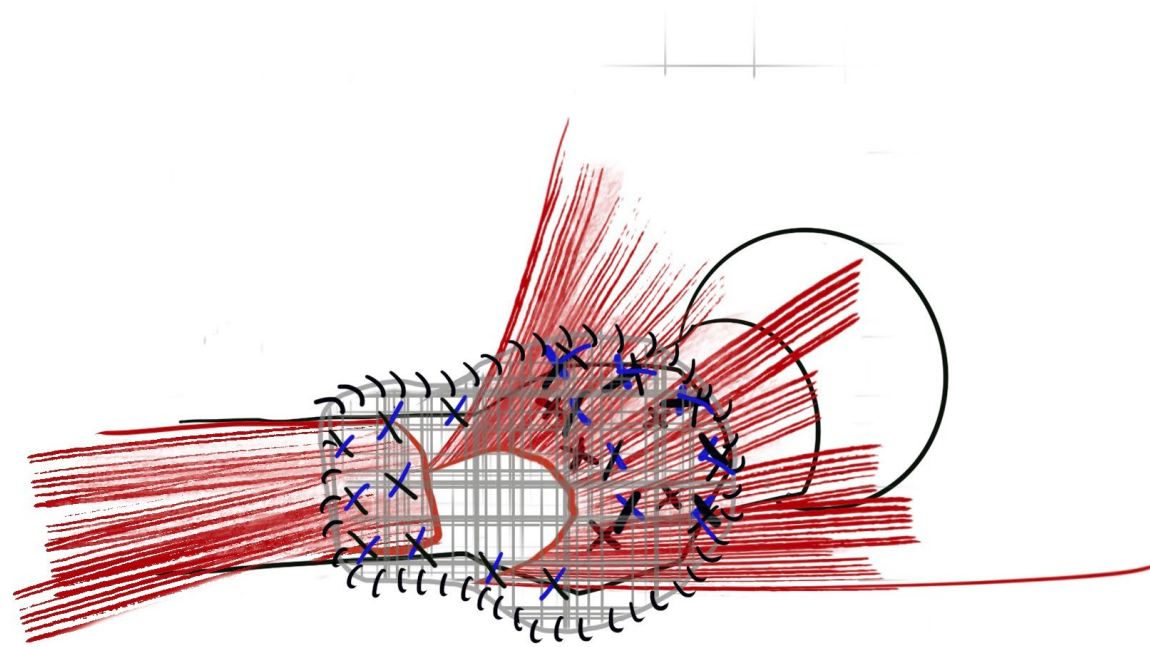


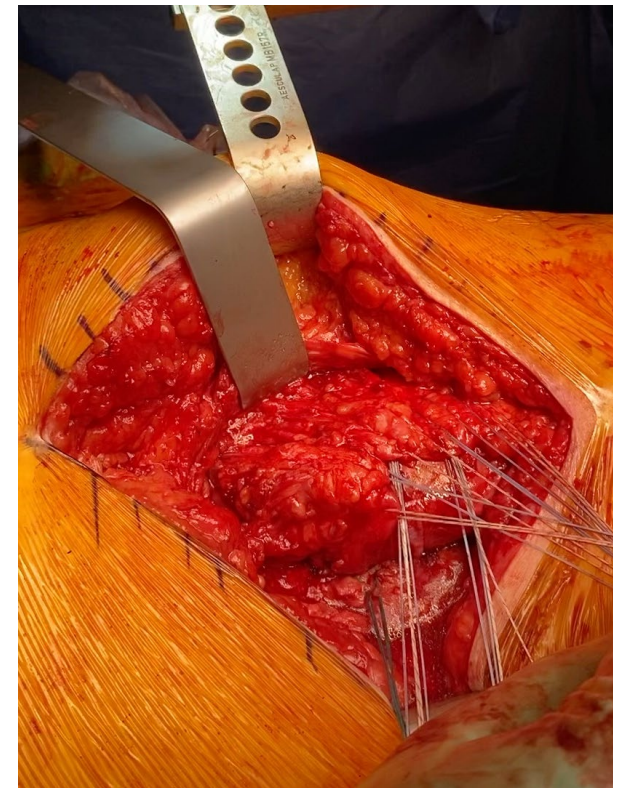
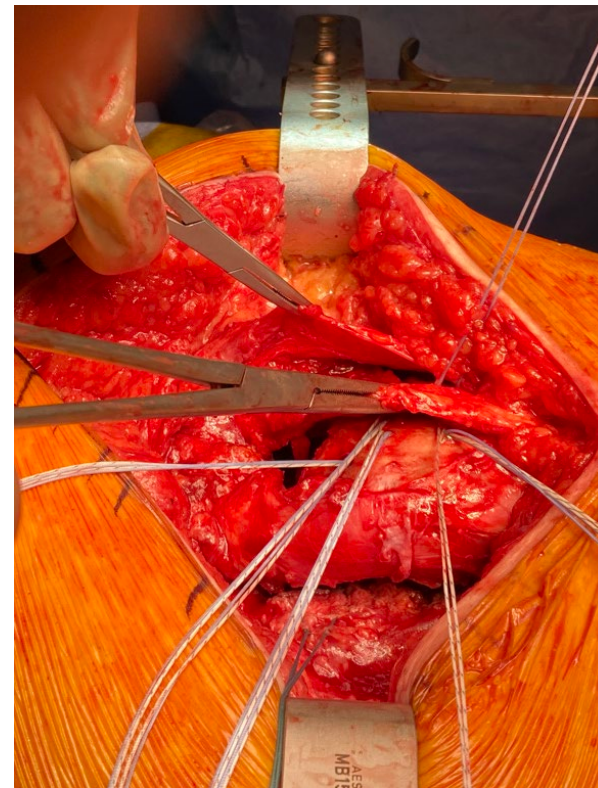
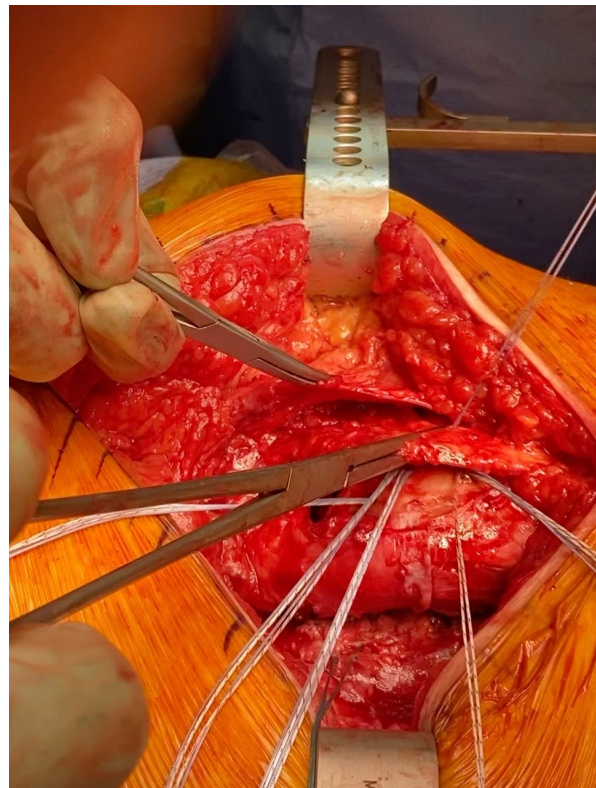










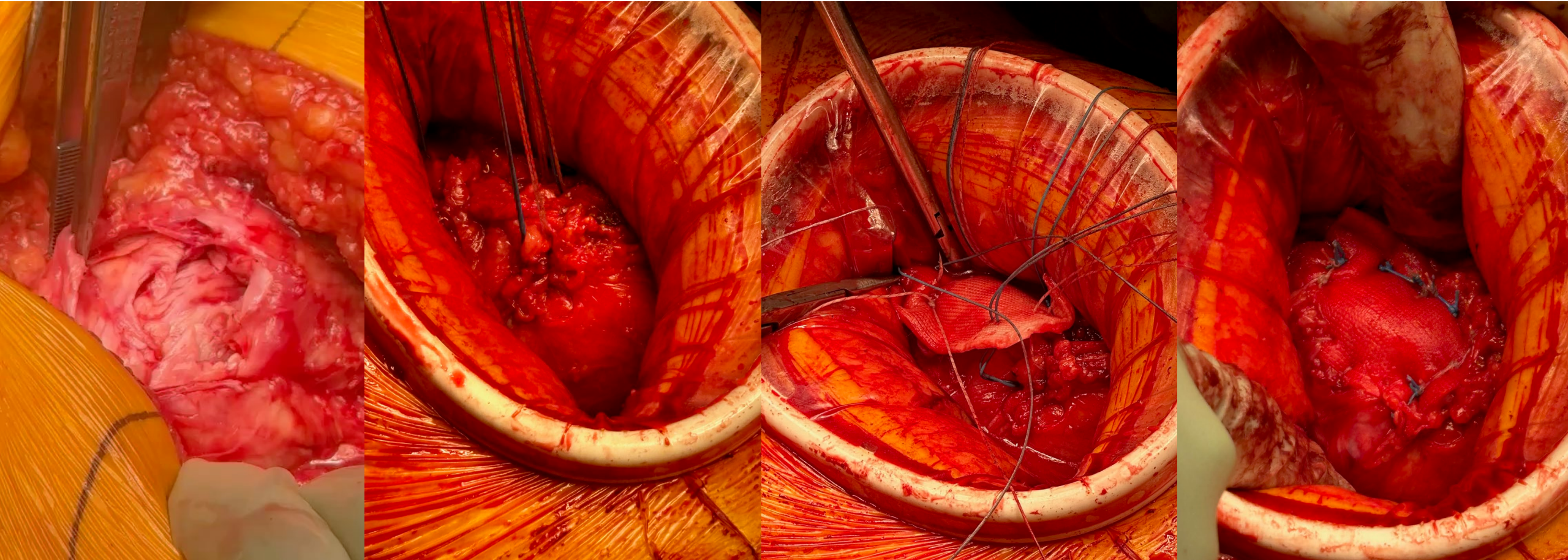


Identifying and freeing the Gmed Sleeve

R
A



Biologic Augmentation: Bio Brace (Con Med)



Clinical Outcomes of Hip Abductor Repair Using Transosseous Sutures Versus Suture Anchors

A Systematic Review and Meta-analysis

Eduardo Portela-Parra,^{*†} BA, Elliot Sappey-Marinier,[†] MD, PhD, Kaitlyn Julian,[†] BS , and Stefano A. Bini,[†] MD

Investigation performed at Department of Orthopaedic Surgery, University of California, San Francisco, San Francisco, California, USA

Archives of Orthopaedic and Trauma Surgery
<https://doi.org/10.1007/s00402-021-03787-2>

ORTHOPAEDIC SURGERY

Impact of fatty degeneration on the functional outcomes of 38 patients undergoing surgical repair of gluteal tendon tears

Alexander Maslaris^{1,2,3} · Thomas P. Vail¹ · Alan L. Zhang¹ · Rina Patel⁴ · Stefano A. Bini¹

Received: 20 August 2020 / Accepted: 15 October 2020
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The Journal of Arthroplasty
Volume 35, Issue 6, Supplement, June 2020, Pages S352-S358



Complications - Other

Equivalent Mid-Term Results of Open vs Endoscopic Gluteal Tendon Tear Repair Using Suture Anchors in Forty-Five Patients

Alexander Maslaris MD ^{a, b} , Thomas P. Vail MD ^a, Alan L. Zhang MD ^a, Rina Patel MD ^c, Marcus Jäger MD ^d, Stefano A. Bini MD ^a

Gluteus Medius Tendon Open Repair

- Barrera 2021
 - Short term outcomes of mini-open repair double row technique
 - 14 patients (1 male)
 - 38 point improvement of MHHS (MCID = 13)
 - 6 point improvement in VAS
 - 70% decrease in Trendelenburg sign
- Zimmerer 2021
 - Sleep quality in 28 patients
 - 95% poor quality preop to 25% post op
- Fox et al 2020
 - 165 patients, min 5 year f/up, trans-osseous recon
 - Reliable results at LTF

Endoscopic Repair full thickness Gmed Tears

- McCormick et al (Brigham) 2013 Journal of Arthroscopy
 - 12 patients , all retracted tears
 - 70% female
 - 90% patient satisfaction
- Nazal, 2020 J Arthro
 - 15 hips
 - 93% resolved Trendelenburg sign

LIT SUMMARY

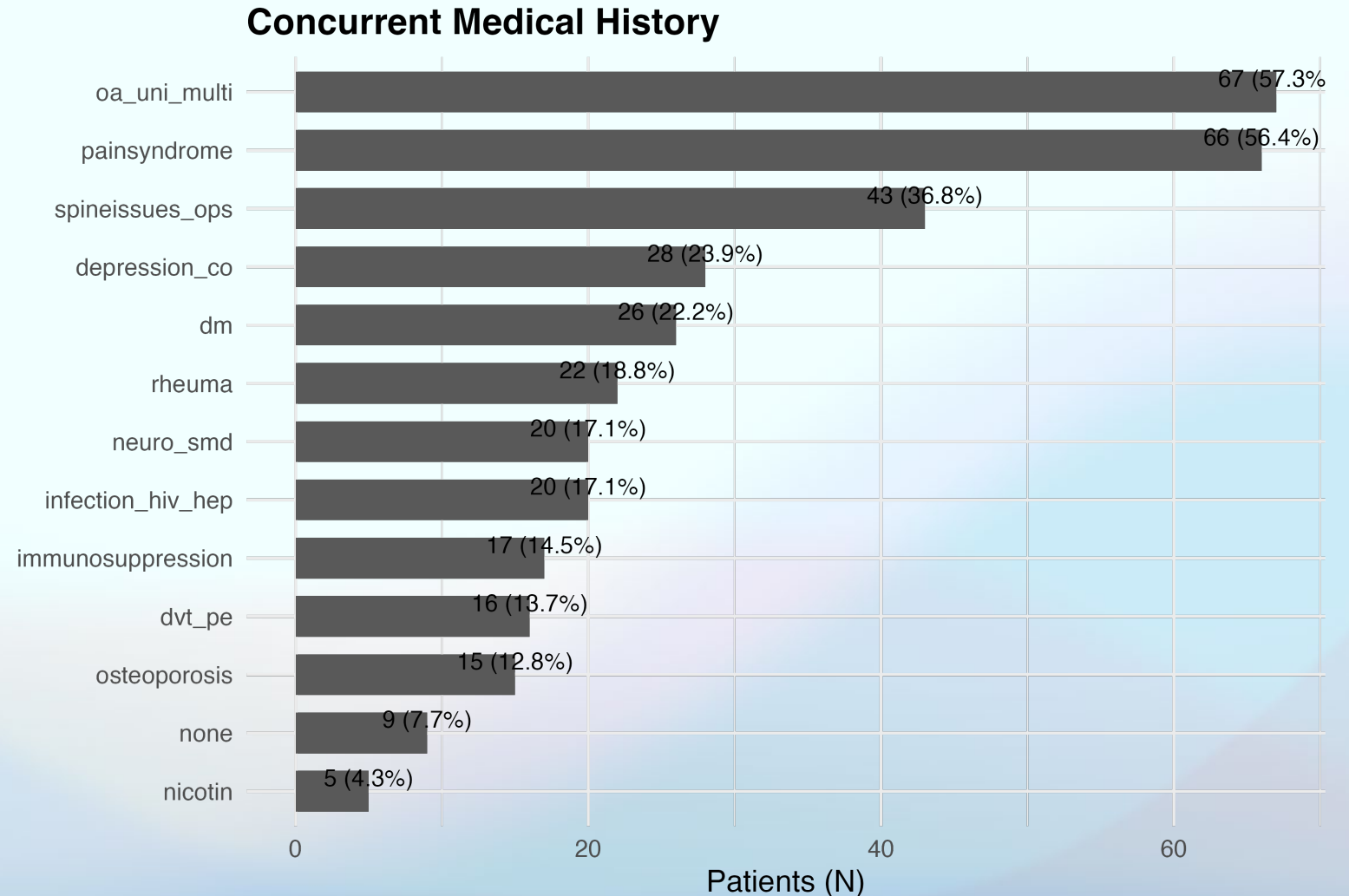
- Open and Closed repairs both work
- 70-100% of patients get better
- Small tears do better
- Large tears do worse
 - 0-25% retear rate
 - 20% residual pain despite successful repair
- Fatty atrophy does not resolve
- Operating earlier is better

GMED RESULTS (Preliminary)

- Matthew Allen (UCSF) and Richard Liu (Toro University) Dr. Diaz (UCSF)
- Design: Retrospective cohort study, 2015-2024
- Surgeon: All cases by Dr. Stefano Bini, MD.
- **Sample: 117 repairs.**
- Data collected: demographics, BMI, cause type, tear size, pain VAS, mHHS.
- Endpoints: pain reduction, functional improvement, complications ,and reoperations.

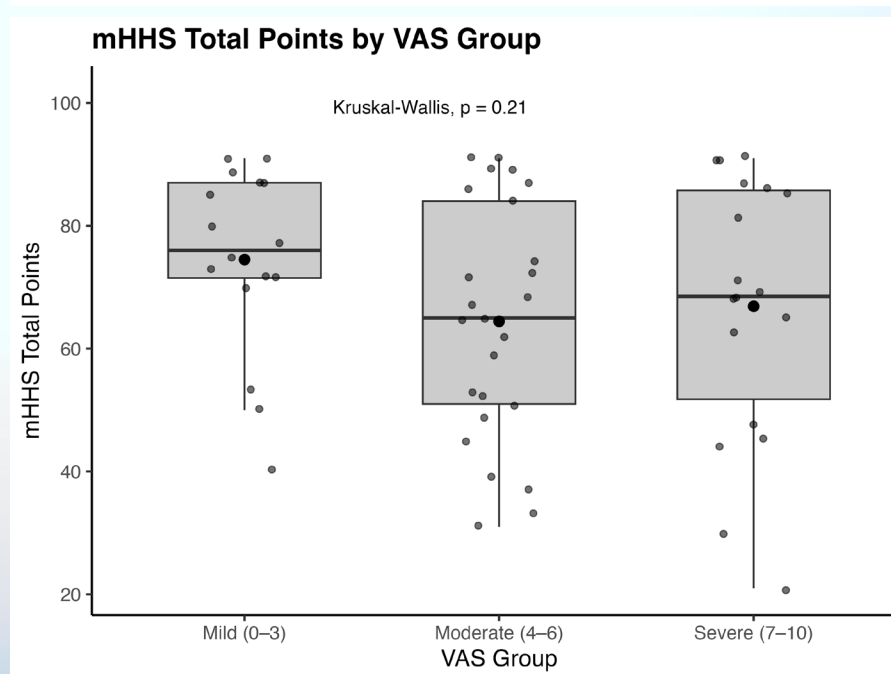
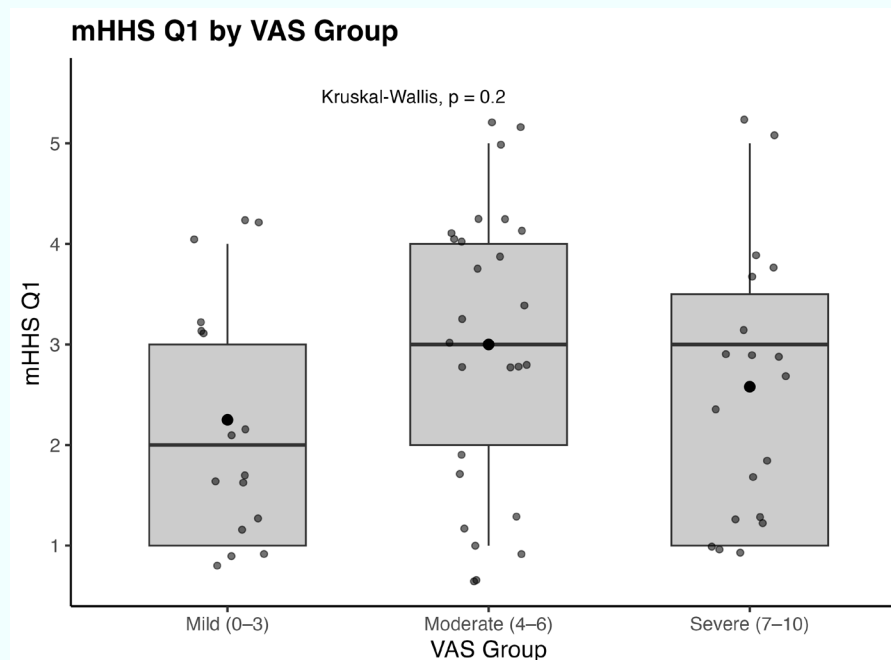
Co-morbidities

- > 57% hip OA
- >56% pain syndromes.
- > 37% spine pathology.
- > 23% Depression
- High comorbidity burden may impact outcomes.



Results

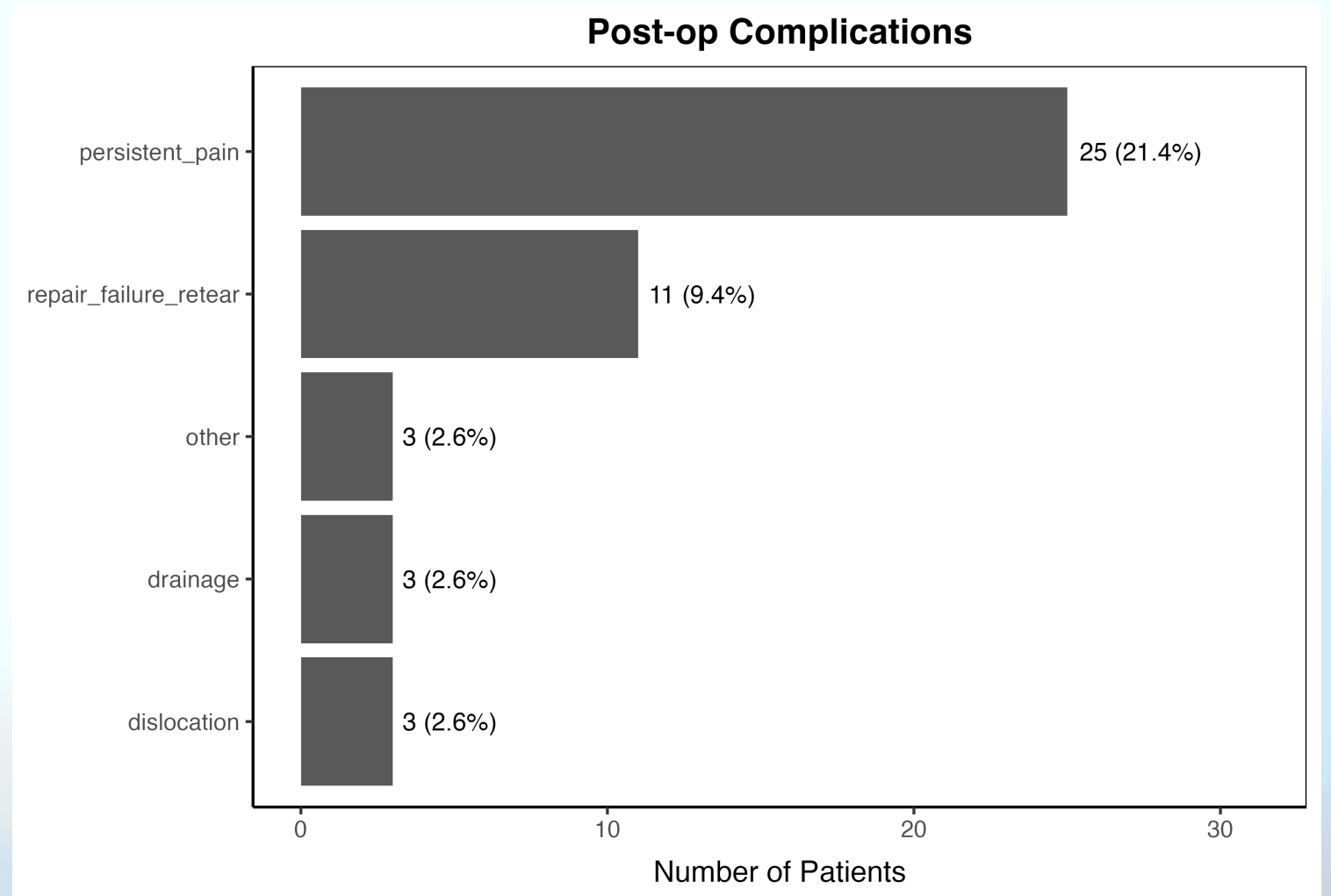
- Previous (2019) datapull mean total mHHS (modified Harris Hip Score) : **65.51/91**
- Current (2024) datapull mean total mHHS score: **67.14/91**
- Matched mean total mHHS score from current (2024) datapull: **71.11/91**
- Patient reported mHHS is not correlated to pre-op VAS scores.





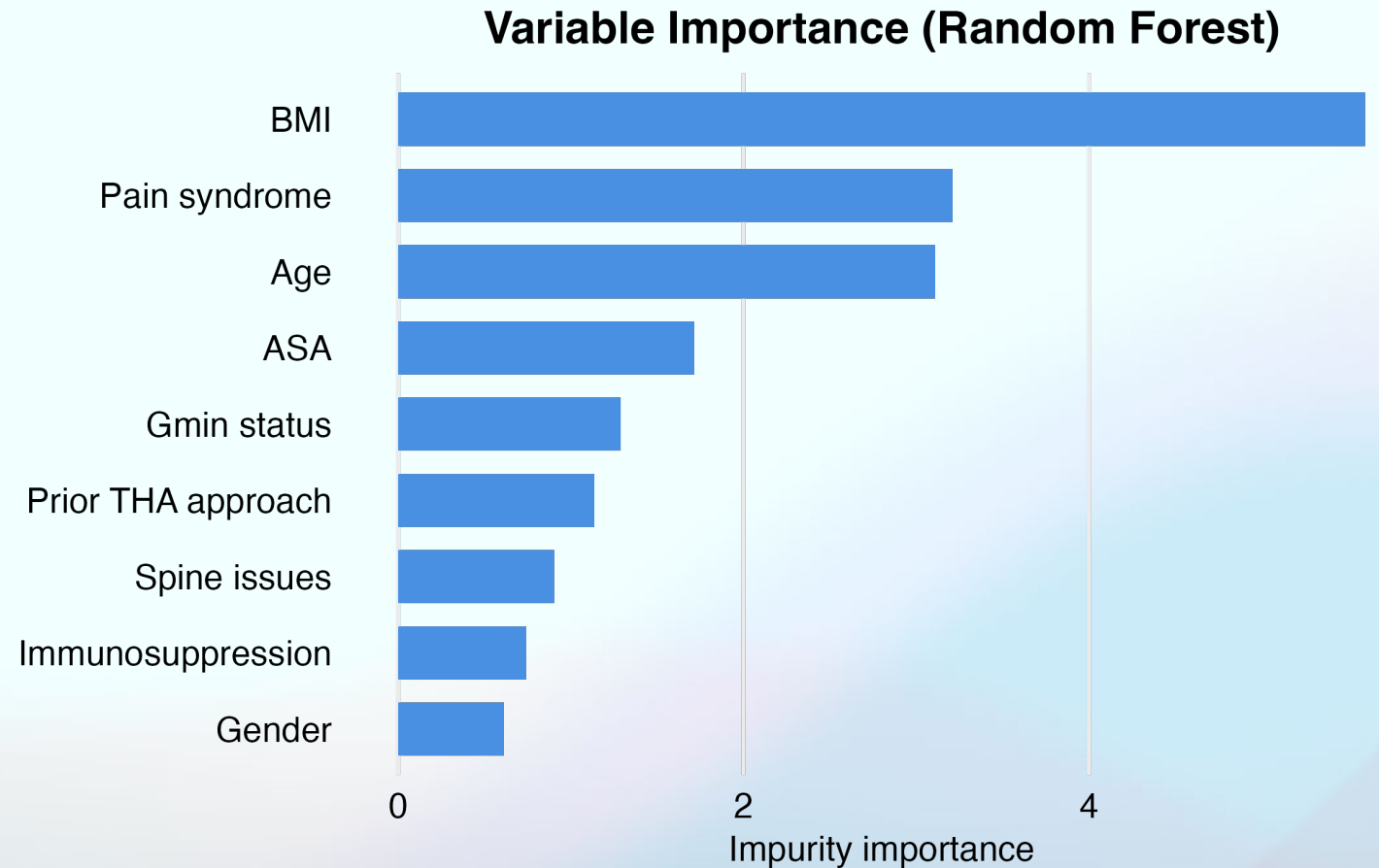
Results

- Persistent pain = most common complication (21%).
- Re-tear/repair failure in ~10%.



Predictive Modeling (ML)

- Random forest identified **BMI, pain syndrome, and age** as the strongest predictors of post-operative function (mHHS < 80).
- Model highlights the role of patient comorbidities and baseline factors in determining outcomes.



Muscle Transfers

- Gmax + Tensor Fascia Lata
- Done with plastic surgery
- Disastoramas
- Results usually address pain
- Function ... depends
- 7/17 improved function
Maldonado
- 48% improved function
- Balazas

SCIENTIFIC ARTICLES

Combined Transfer of the Gluteus Maximus and Tensor Fasciae Latae for Irreparable Gluteus Medius Tear Using Contemporary Techniques

Short-Term Outcomes

 Maldonado, David R. MD¹;  Annin, Shawn MD¹;  Chen, Jeffrey W. BA²;  Yelton, Mitchell J. BS¹;  Shapira, Jacob MD¹;  Rosinsky, Philip J. MD¹;  Lall, Ajay C. MD, MS^{1,3,4};  Domb, Benjamin G. MD^{1,3,4,a}

[Author Information](#) 

JBJS Open Access 5(4):p e20.00085, October-December 2020. | DOI: 10.2106/JBJS.OA.20.00085 

SPECIAL TECHNICAL ARTICLES

Gluteus Maximus Transfer for Irreparable Hip Abductor Tendon Tears: Technique and Clinical Outcomes

Balazs, George C. MD^{*}; Dooley, Matt BS[†]; Wang, Dean MD[‡]; O'Sullivan, Eilish PT, DPT, OCS, SCS[†]; Gayle, Lloyd B. MD^{§,¶,||}; Kelly, Bryan T. MD[†]

[Author Information](#) 

Techniques in Orthopaedics 36(1):p 87-91, March 2021. | DOI: 10.1097/BTO.0000000000000399 

Summary

- Diagnosis Clinical
 - Degenerative
 - Iatrogenic
 - 80% women
- XR
 - 20% of THA patients
 - Source of lateral hip pain
- MRI
 - Tendinosis
 - Subsurface tears
 - Partial Tears
 - Full tears
 - Goutallier/Fuchs classification
- Surgical Approach
 - Arthroscopic
 - Best for isolated G Min pathology
 - Patient not needing an open approach
 - Open
 - Easy at time of THA
 - Muscle / Tendon Transfers
- Results
 - Excellent if diagnosed early
 - Poor if retracted with + fatty degeneration
- Billing

Thank you.
Fix it if you
see it!

And one more thing...



