

Pre-Course Bern Hip Symposium

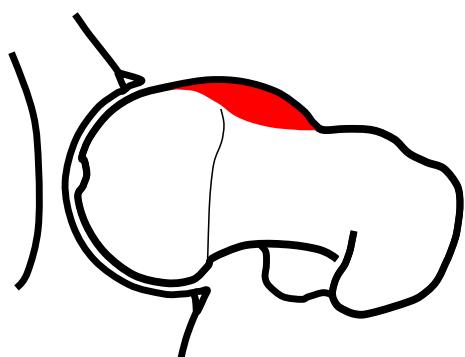
What to do: Cam-Impingement

PD Dr. med. Simon Steppacher

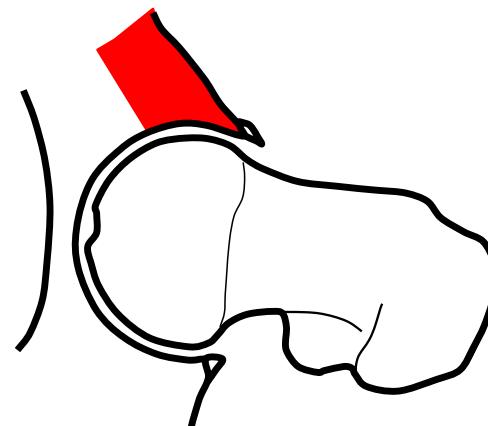
Department of Orthopaedic Surgery and Traumatology,
University of Bern, Inselspital, Bern, Switzerland

Femoroacetabular Impingement

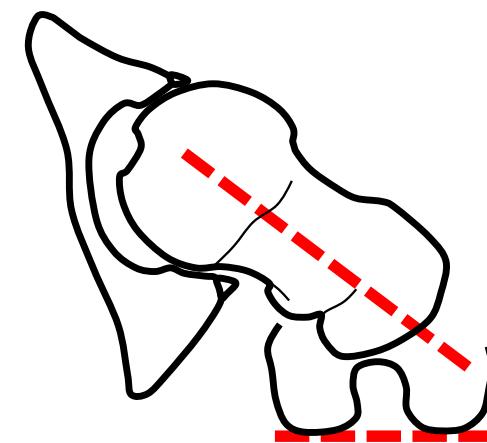
Cam



Pincer



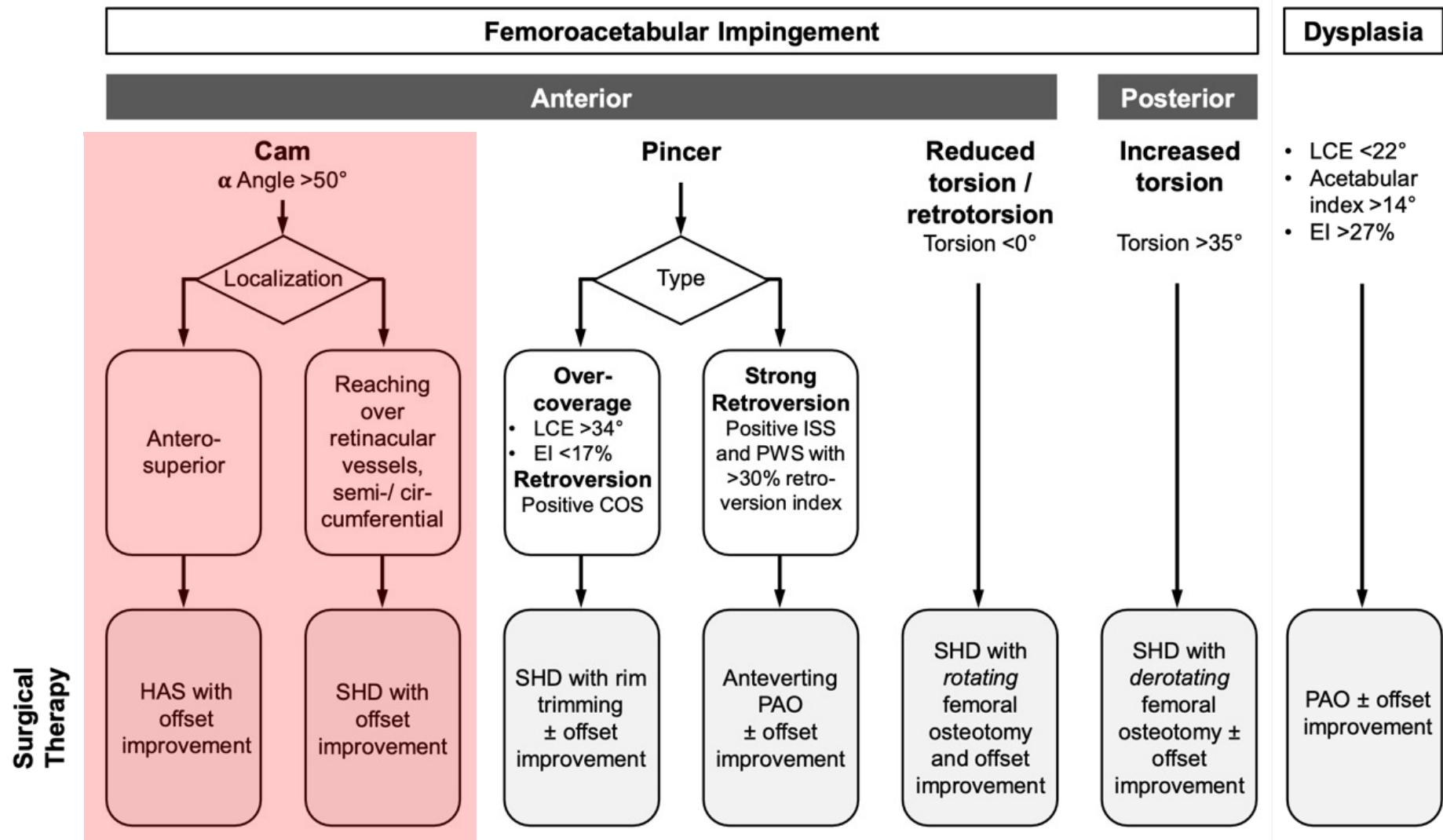
Torsional Deformities



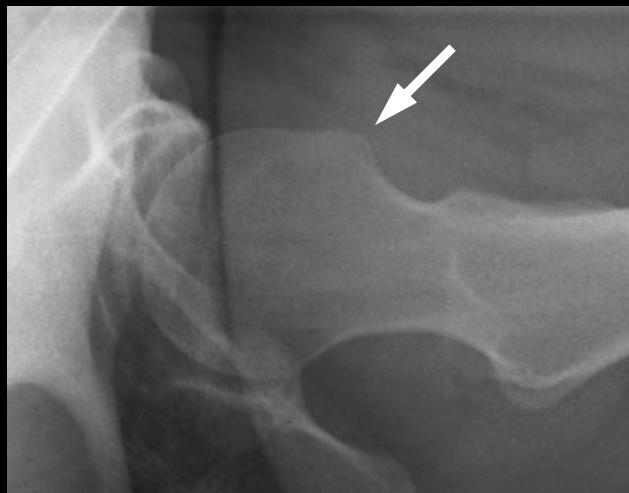
Aim

- > Presenting the Bernese treatment concept for **cam Impingement**

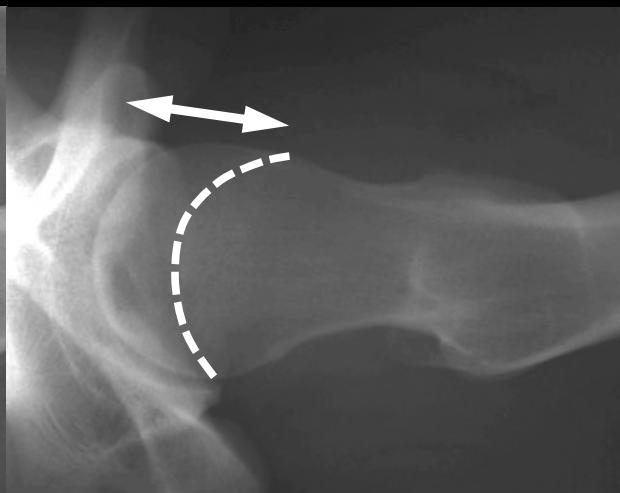
Treatment algorithm hip joint preserving surgery



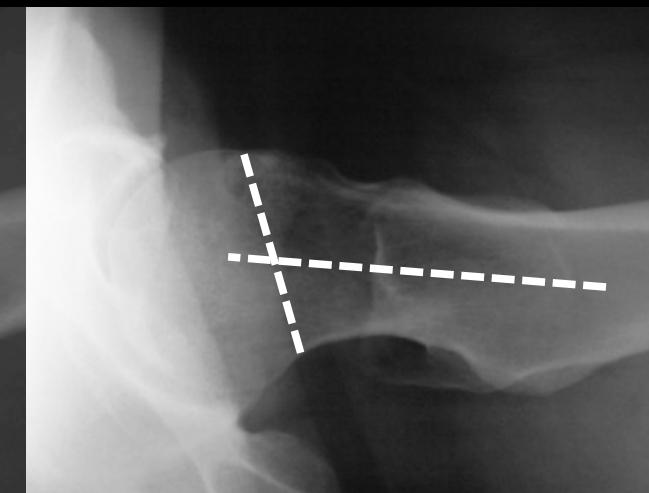
Exostosis



Extended Growth Plate



SCFE



LCPD



Posttraumatic



Tumor (osteochondroma)



Imaging for Cam Deformity

Modality

Conventional

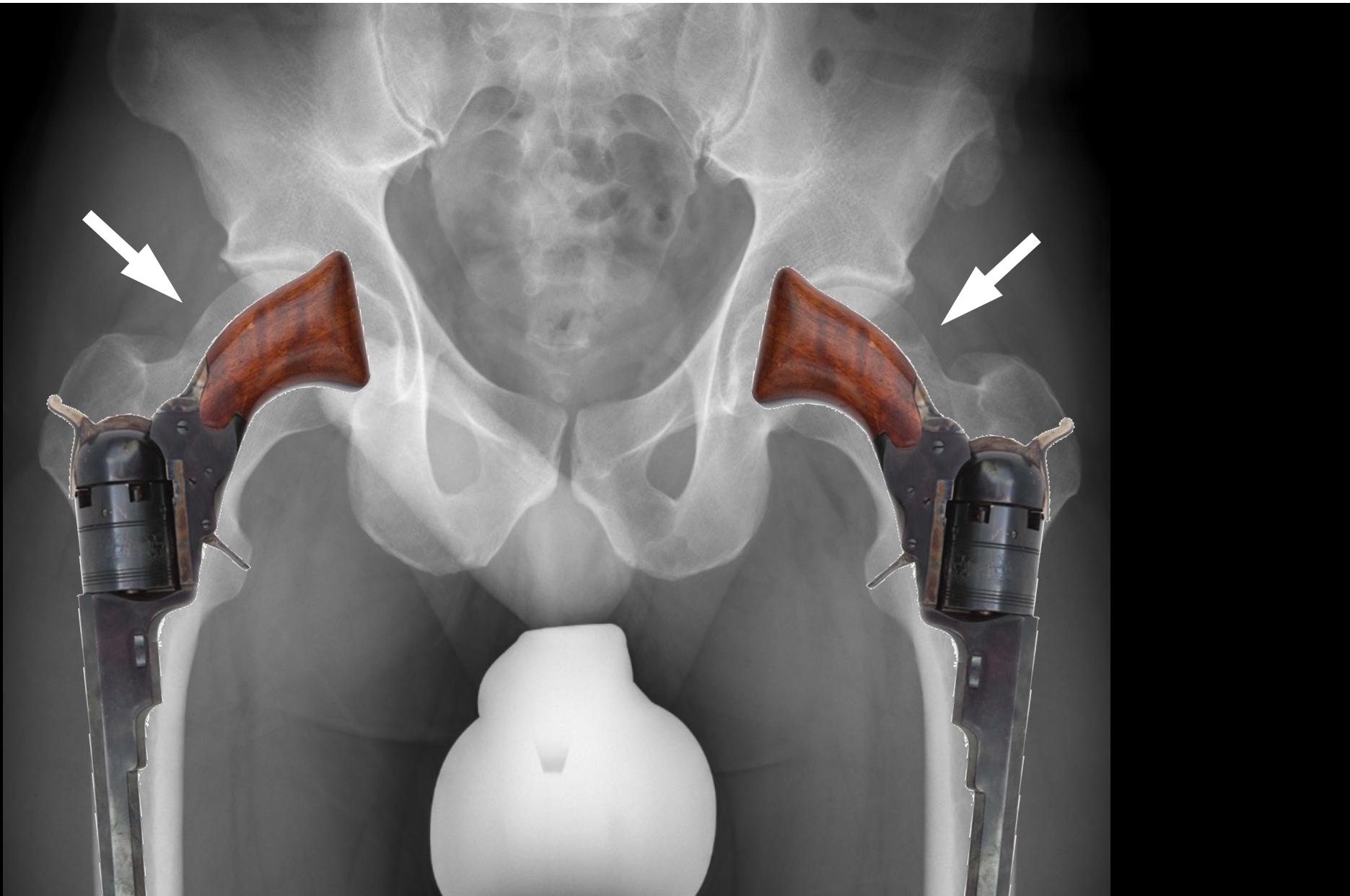
- Pelvis anteroposterior (AP)
- Axial view (cross-table, Dunn, Lauenstein)

Arthro-MRI

- Cartilage and labrum damage
- Localisation and extension of the cam lesion

Computed Tomography

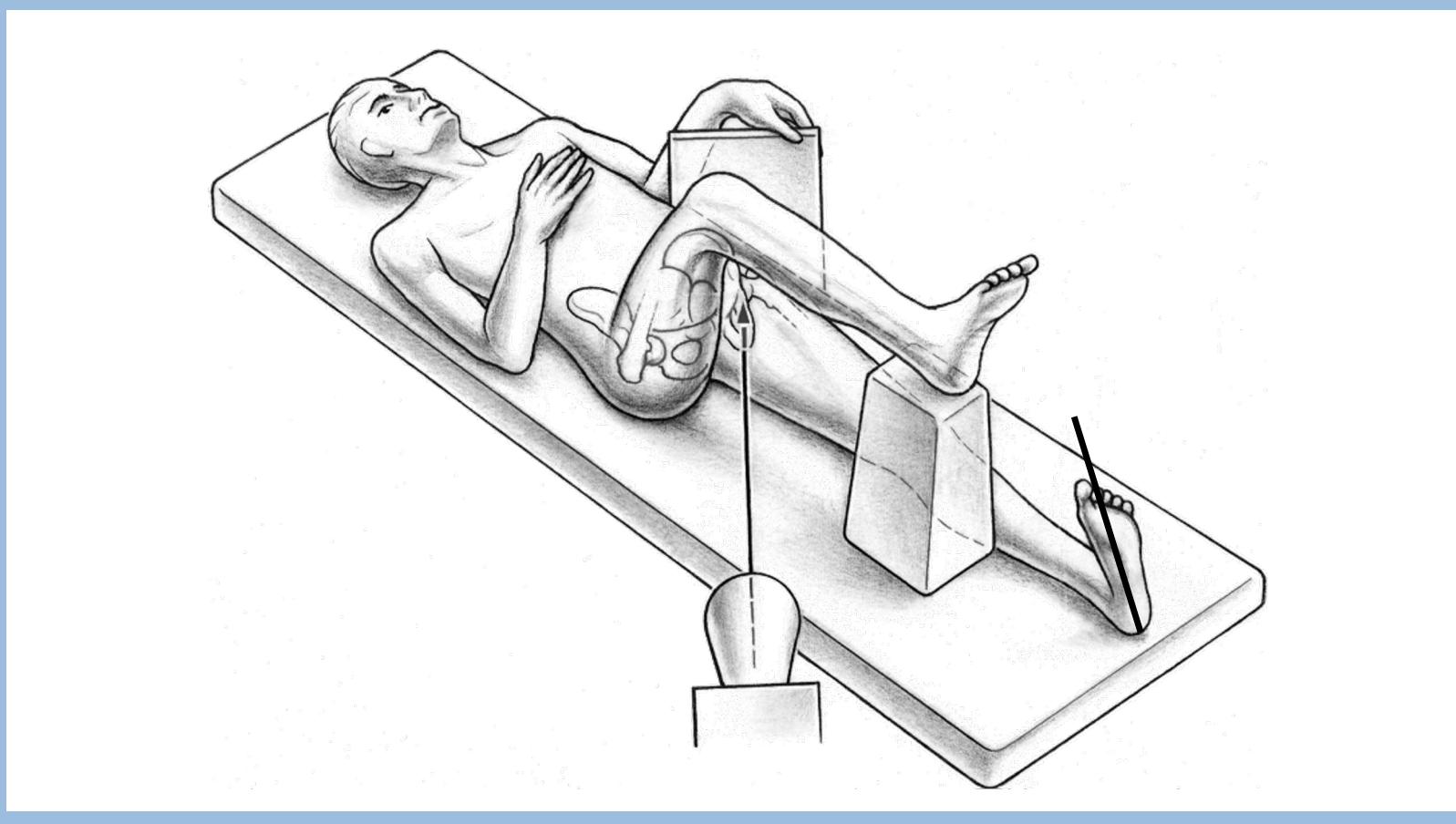
- Computer-based animation of hip range of motion



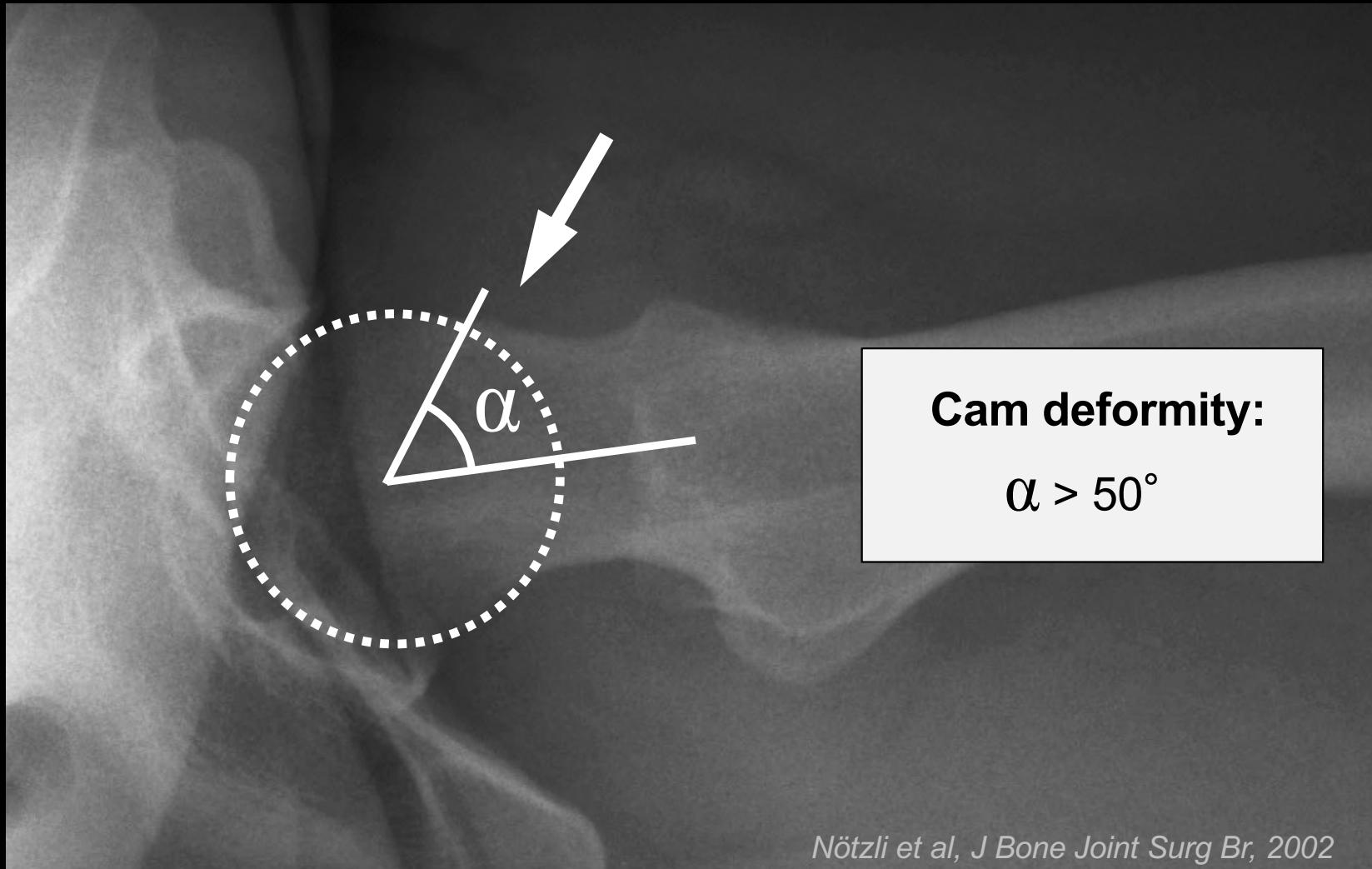
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Axial View (Cross-Table View)

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Anterior

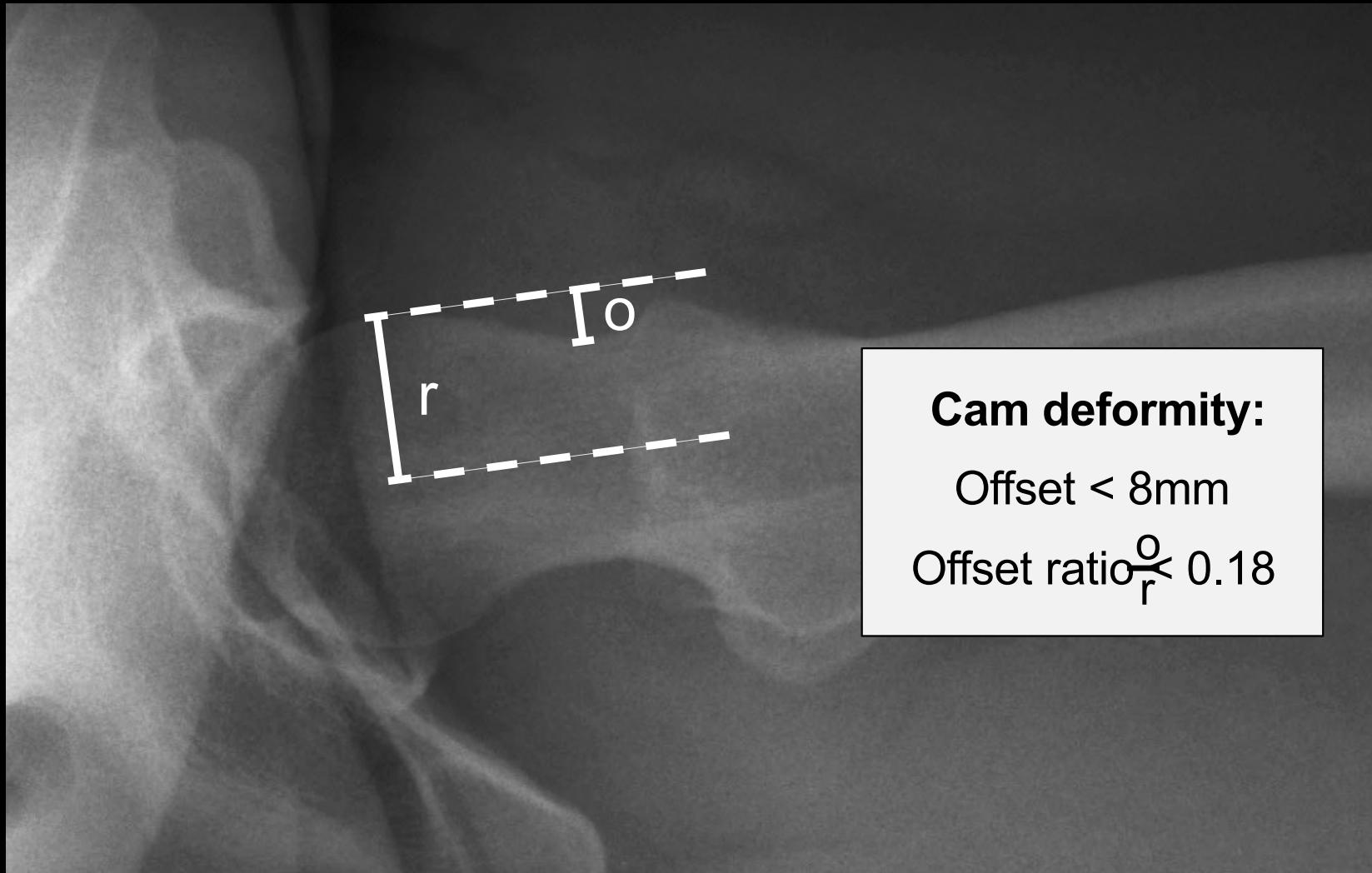


Cam deformity:
 $\alpha > 50^\circ$

Nötzli et al, J Bone Joint Surg Br, 2002

Posterior

Anterior



Cam deformity:

Offset < 8mm

Offset ratio $\frac{o}{r} < 0.18$

Posterior

Imaging for Cam Deformity

Modality

Conventional

- Pelvis anteroposterior (AP)
- Axial view (cross-table, Dunn, Lauenstein)

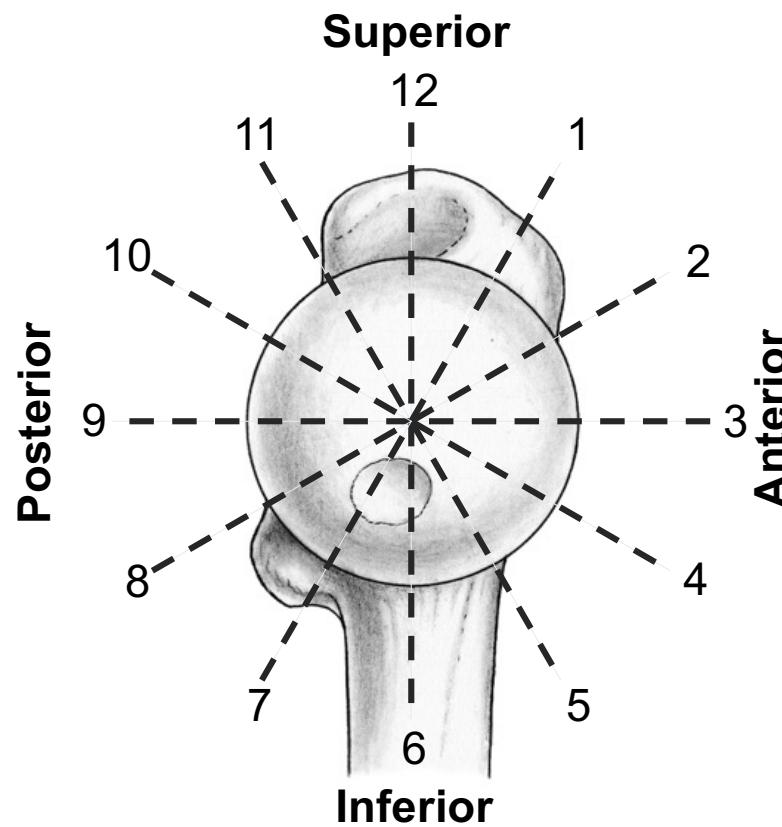
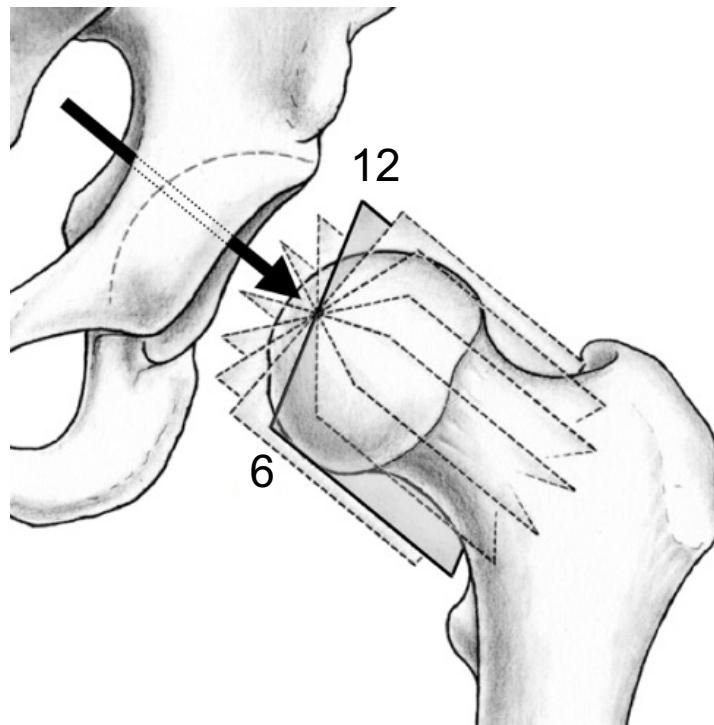
Arthro-MRI

- Cartilage and labrum damage
- Localisation and extension of the cam lesion

Computed Tomography

- Computer-based animation of hip range of motion

Arthro - MRI of the hip



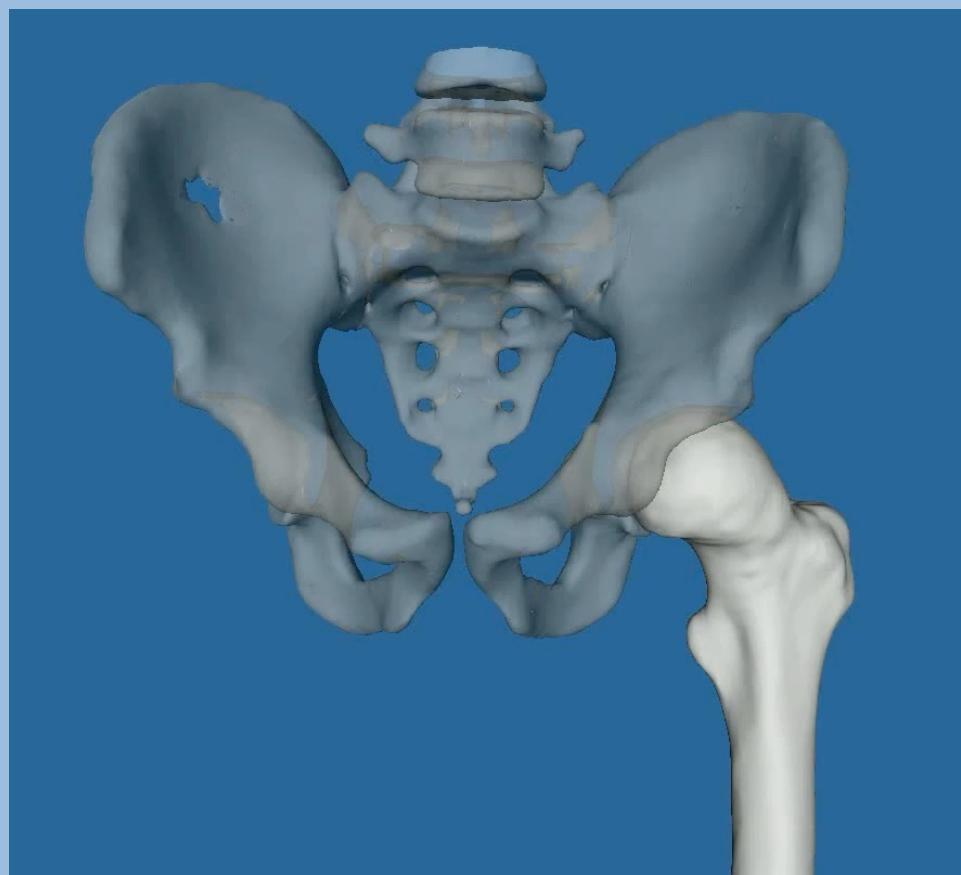
Imaging for Cam Deformity

Modality

Conventional	<ul style="list-style-type: none">- Pelvis anteroposterior (AP)- Axial view (cross-table, Dunn, Lauenstein)
Arthro-MRI	<ul style="list-style-type: none">- Cartilage and labrum damage- Localisation and extension of the cam lesion
Computed Tomography	<ul style="list-style-type: none">- Computer-based animation of hip range of motion

Computed Tomography

- > Segmentation and dynamic evaluation
- > Simulation of range of motion, impingement zones and surgical resection
- > Not indicated for isolated cam deformity



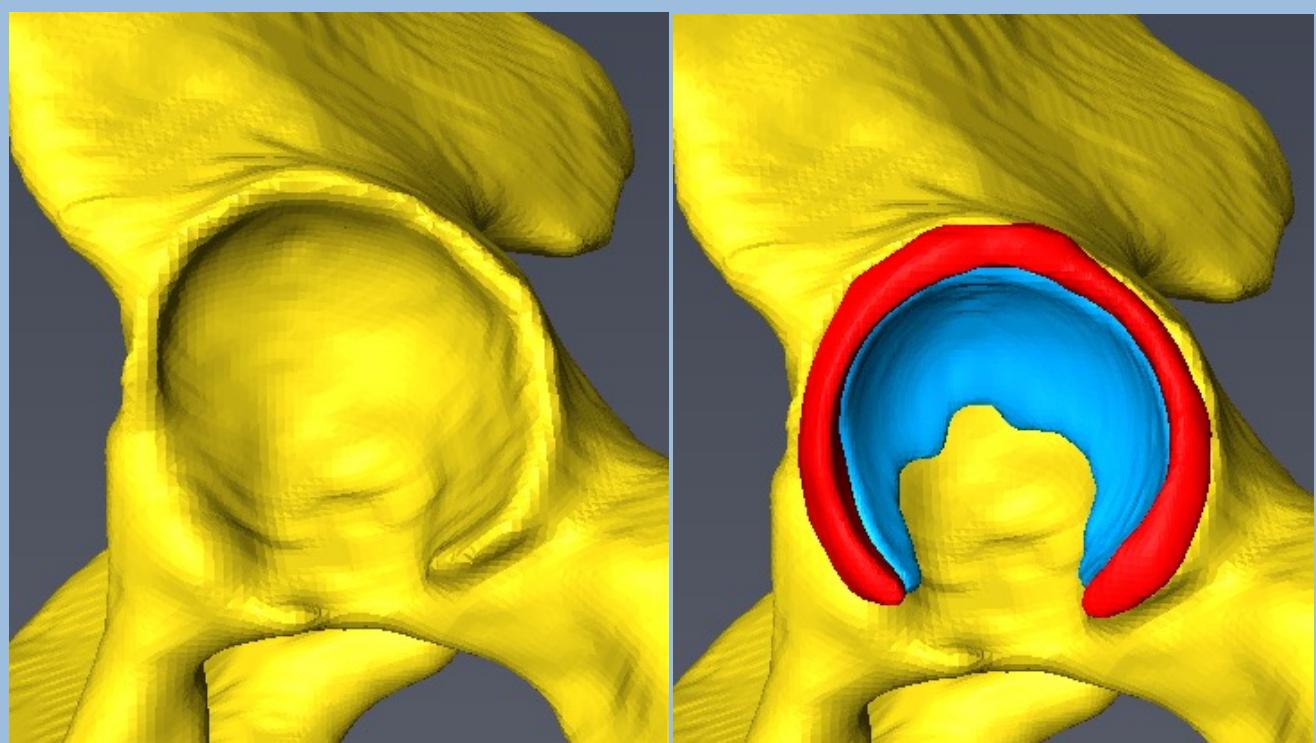
3D Segmentation

> MRI-based (VIBE Dixon sequence) and the help of artificial intelligence

> Segmentation of

- bone
- cartilage
- labrum

Zeng et al, Eur J Radiol, 2021
Zeng et al, Orth J Sports Med, 2021



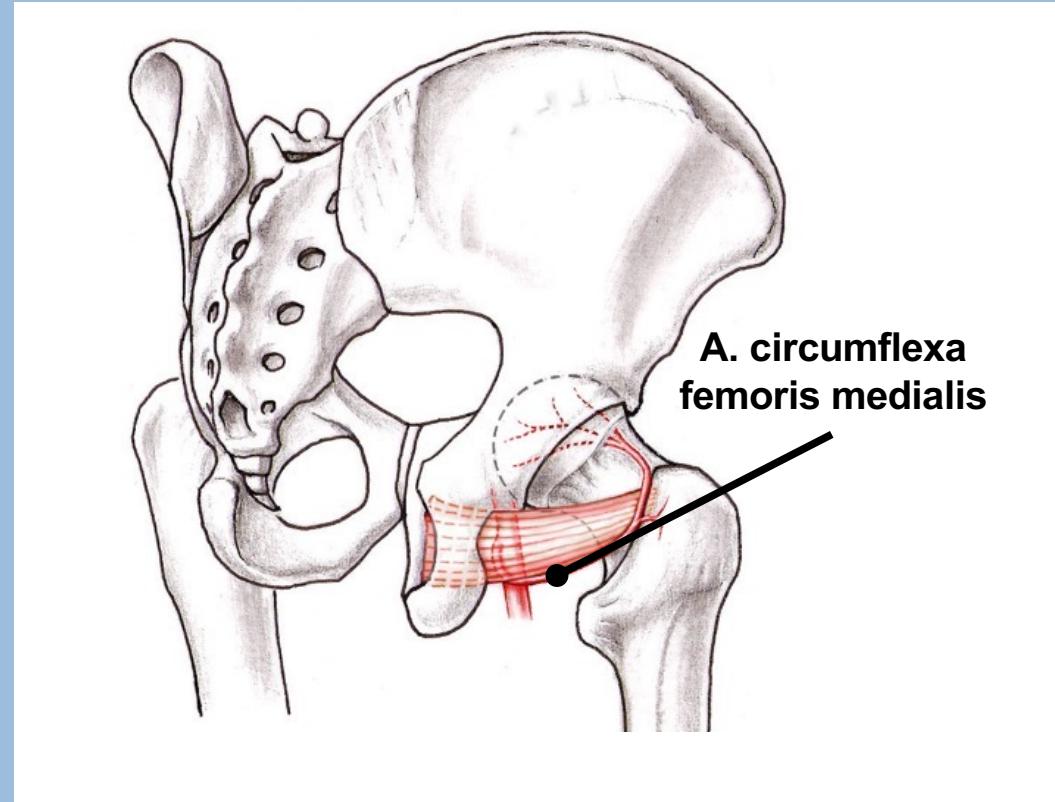
Bone

Cartilage and Labrum

Surgical Therapy of the Cam Deformity

- > Options:
 - Hip arthroscopy
 - Open surgery

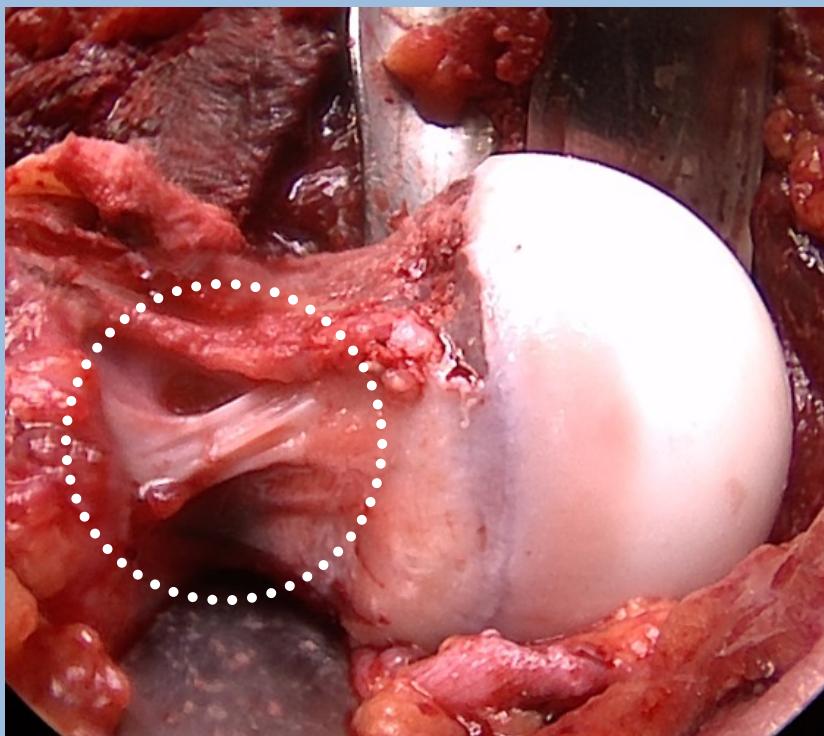
- > Indication dependent on:
 - Localisation
 - Extension
 - Relation to the **retinacular vessels**



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Retinacular Vessels

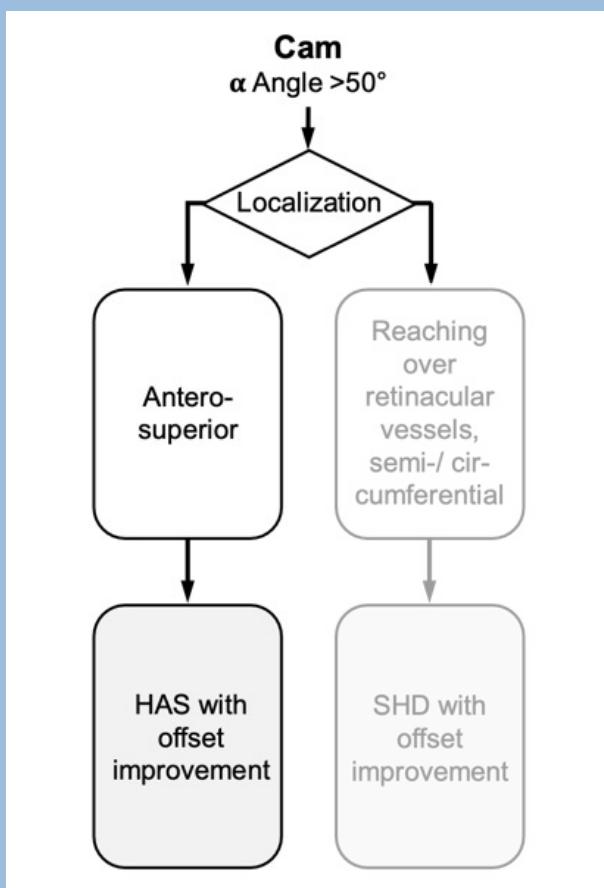


Open Surgery



Arthroscopy

Treatment Concept Cam Deformity

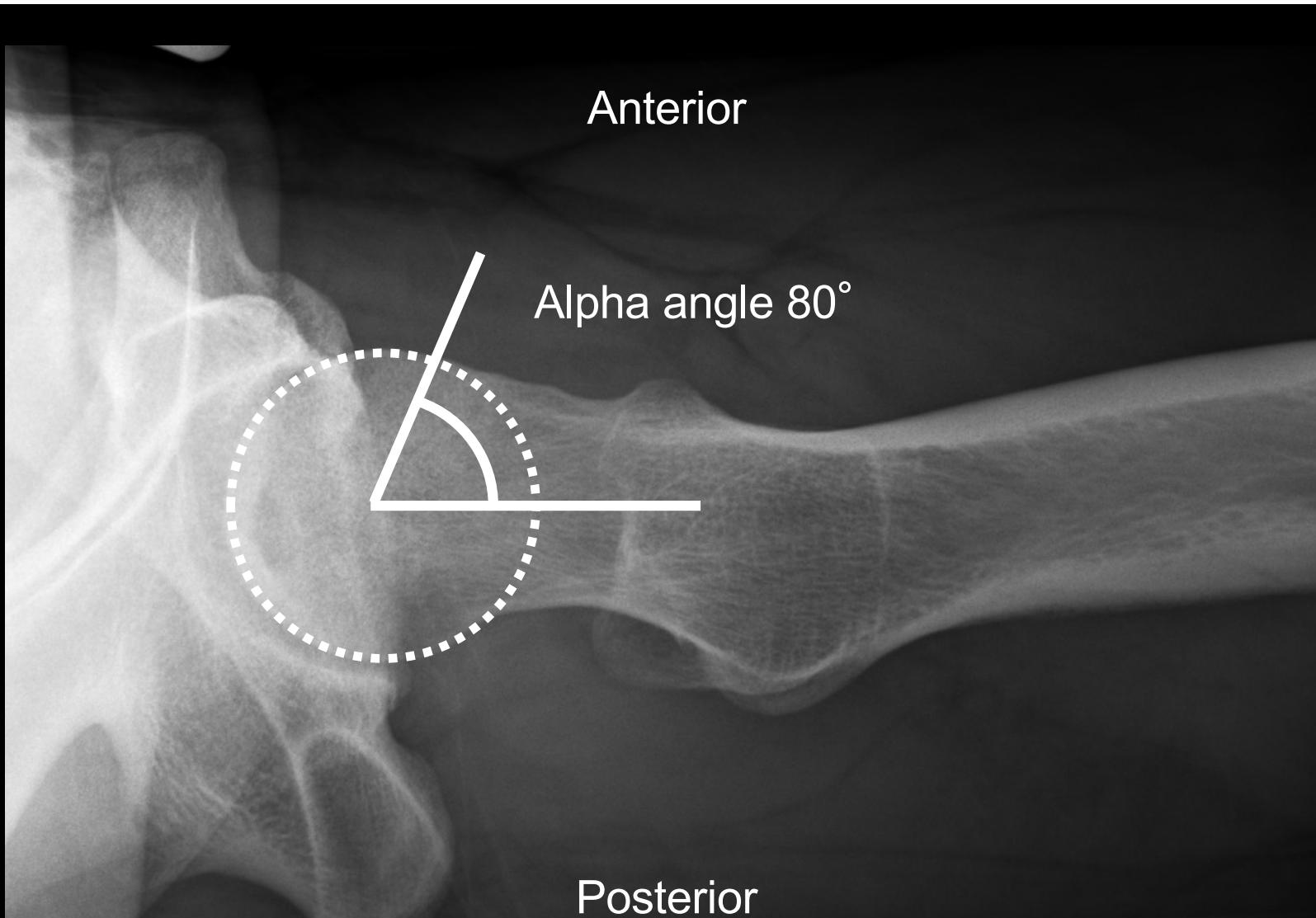


Hip arthroscopy

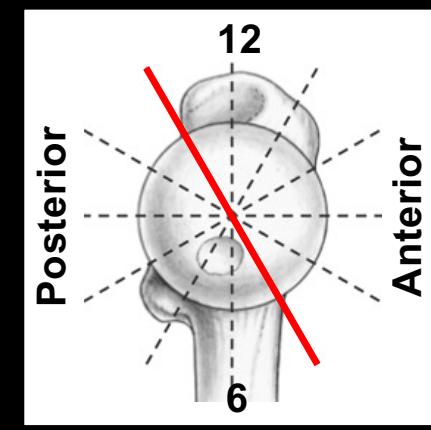
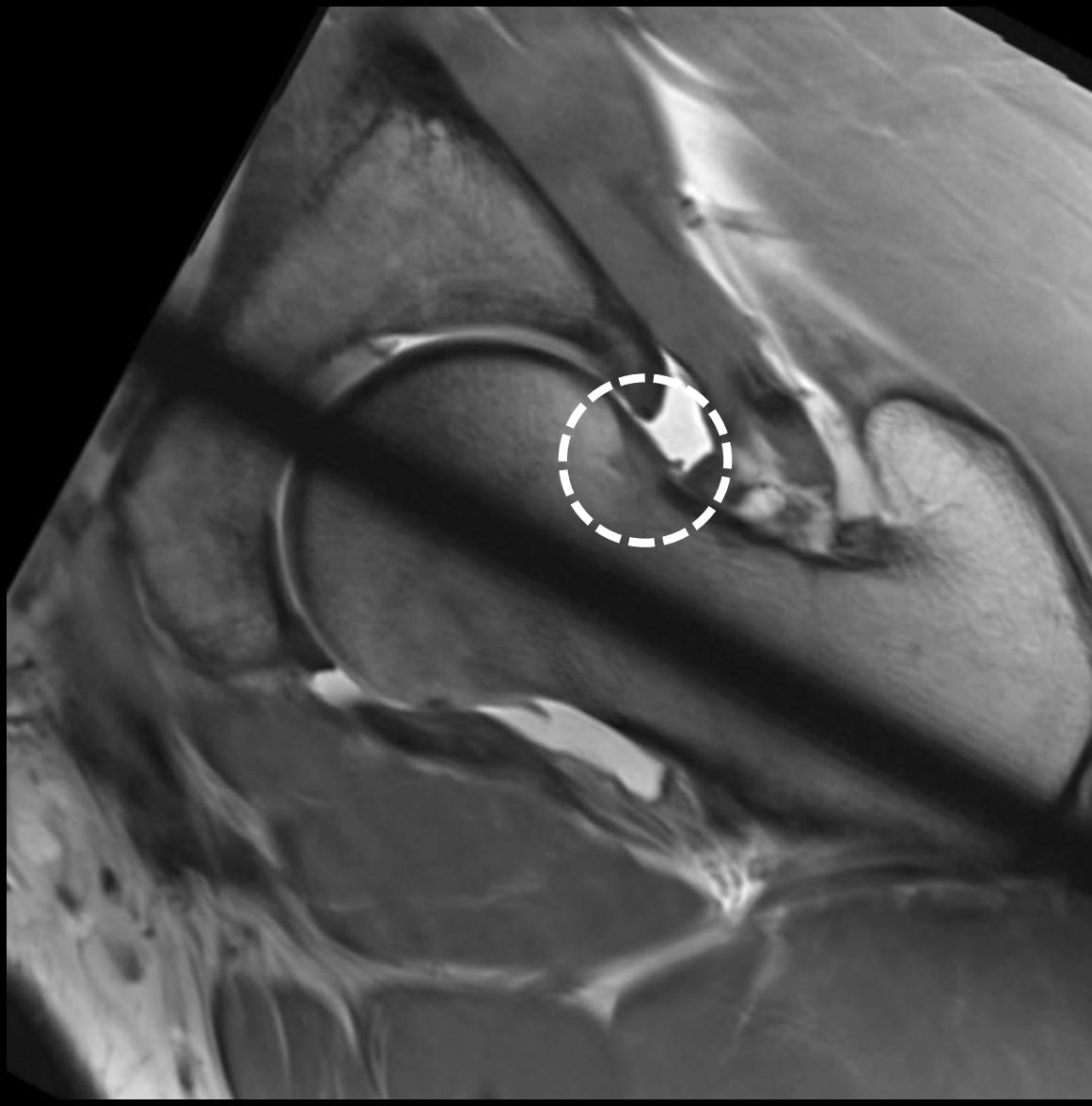
- > Localisation:
 - Anterosuperior
- > Extension:
 - local
- > Relation to the retinacular vessels:
 - Distant

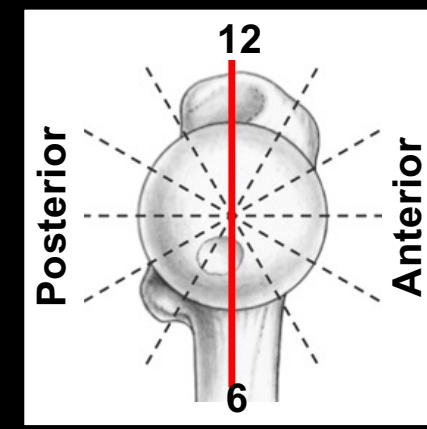


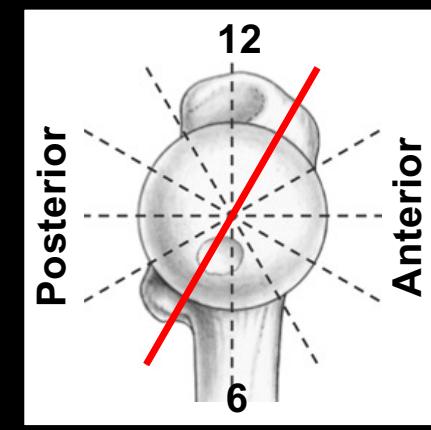
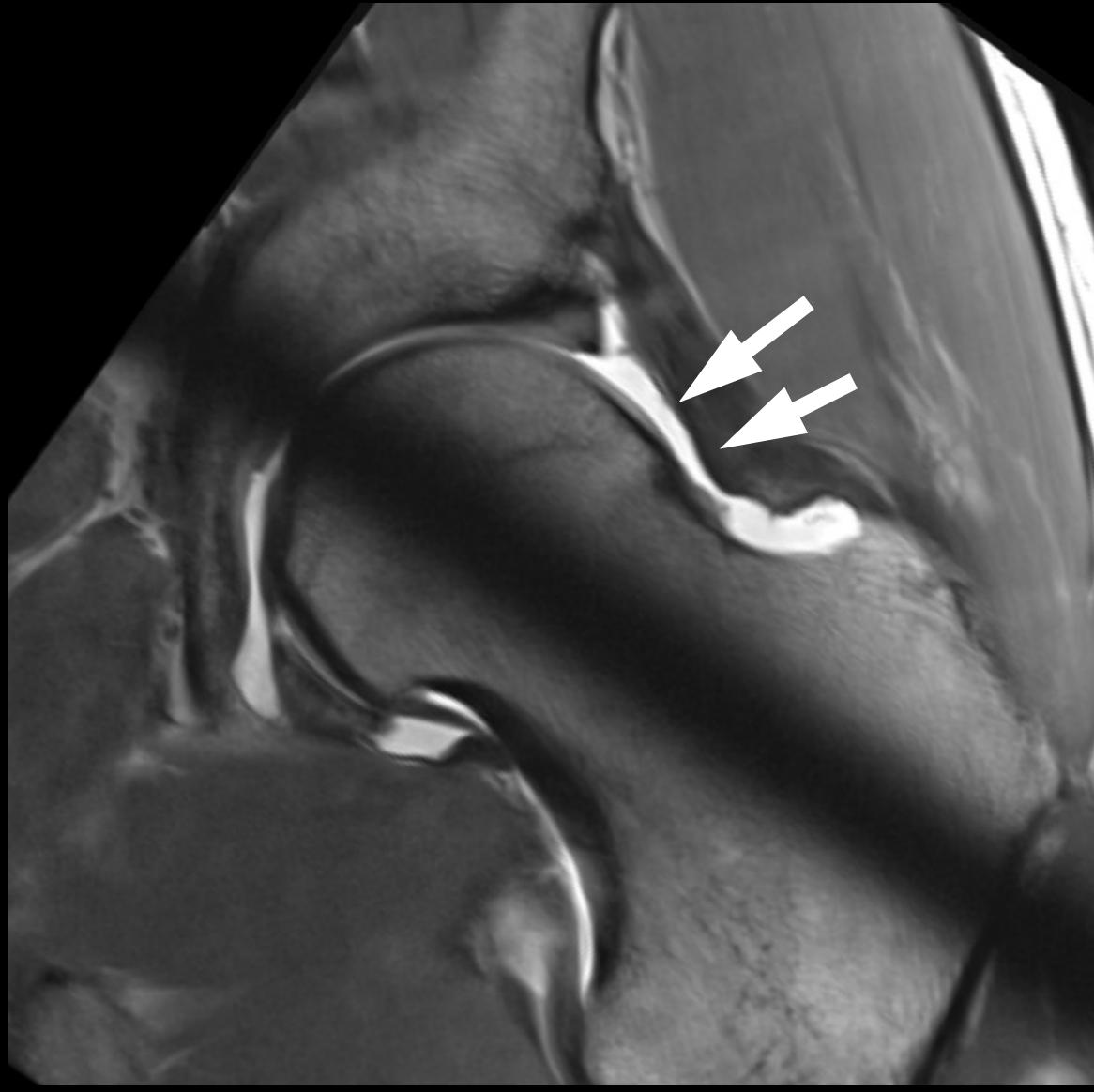
23 year old patient with hip pain

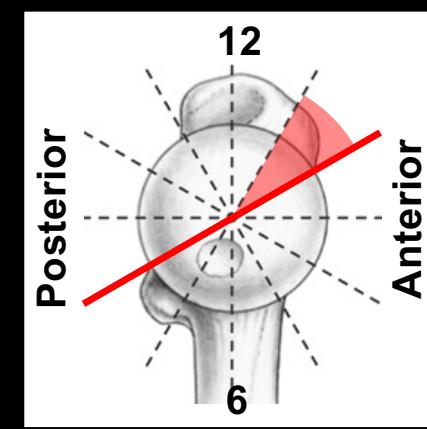
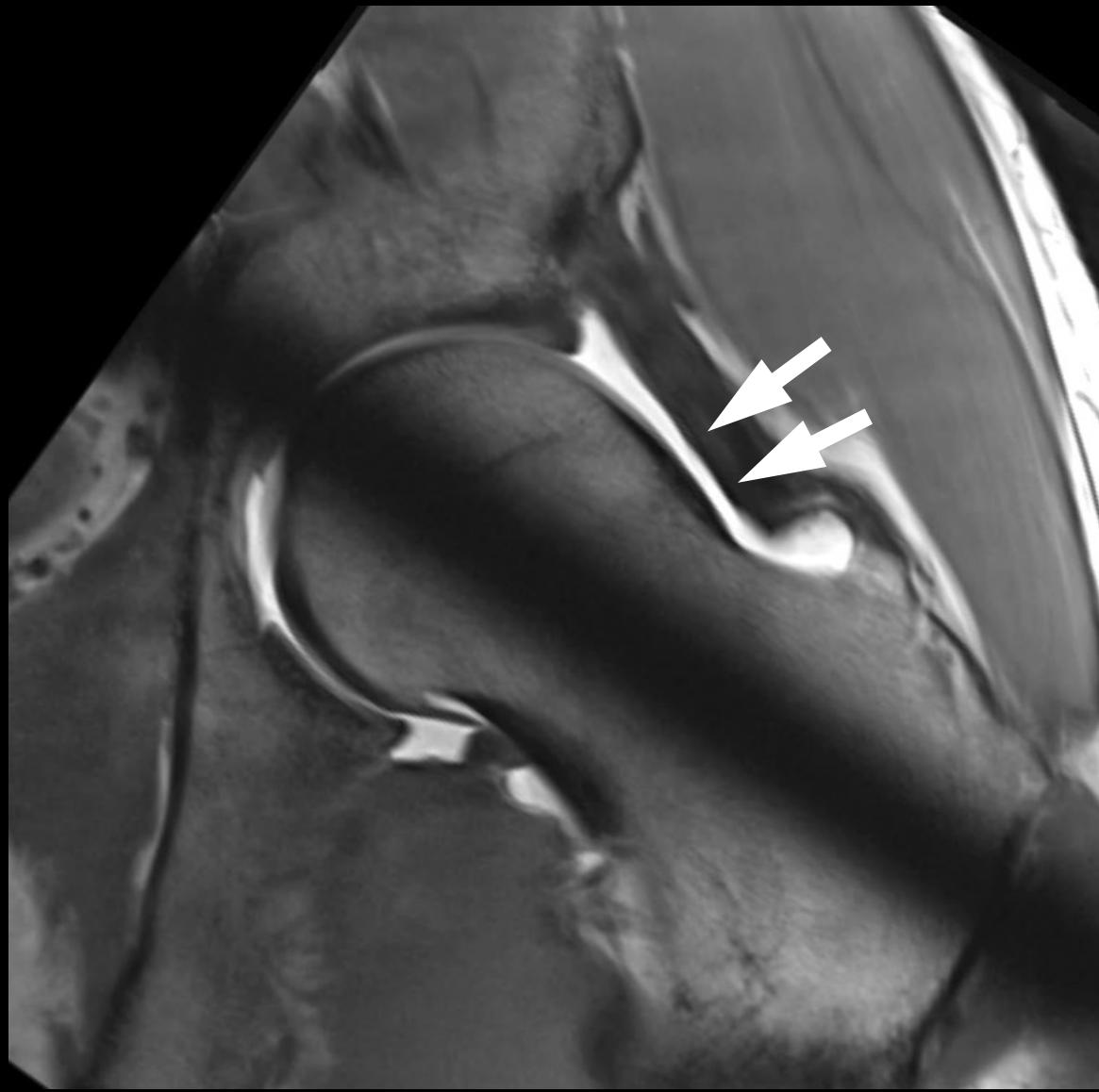


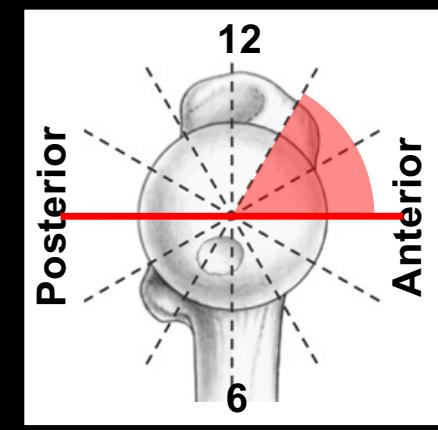
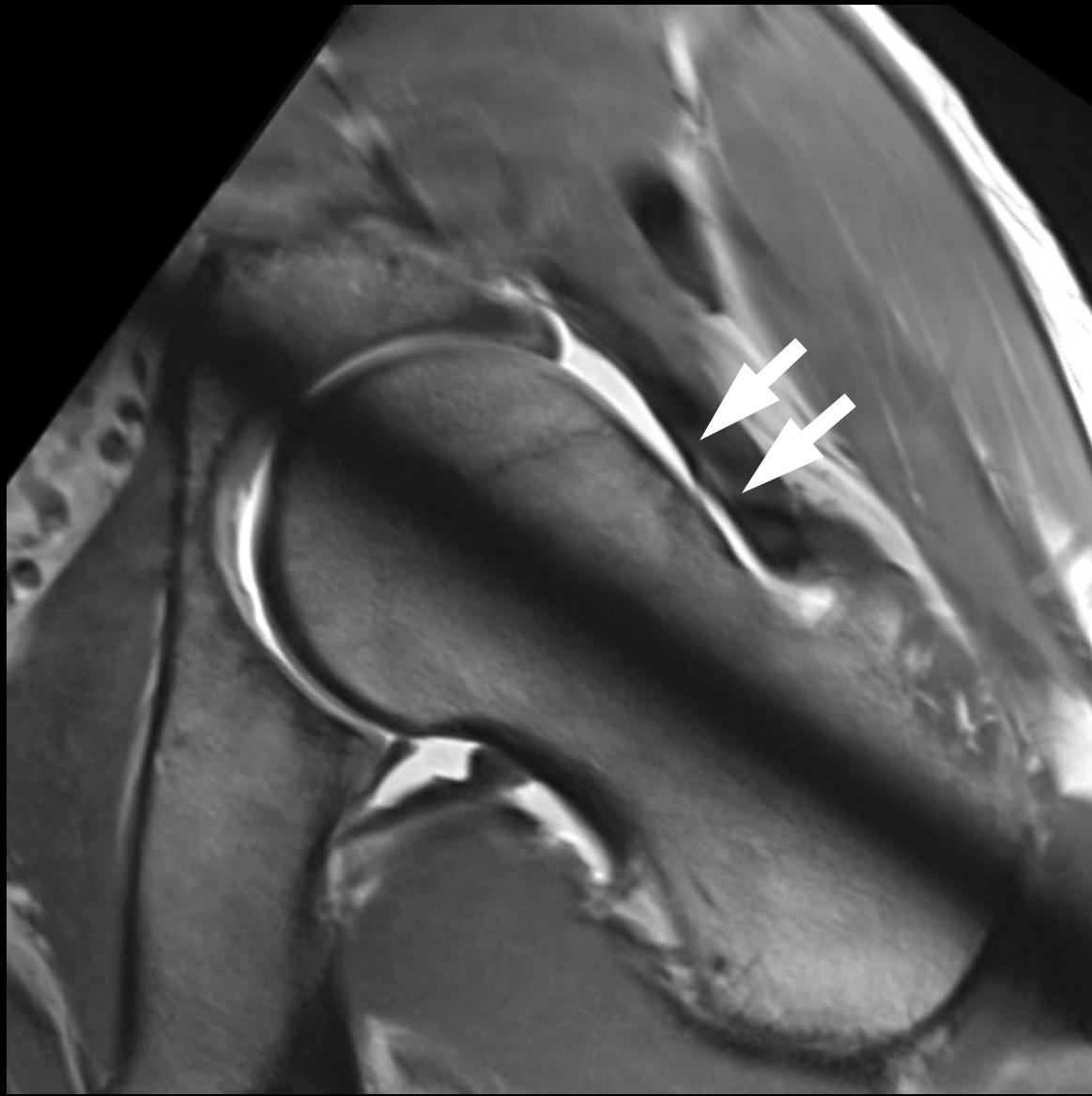
23 year old patient with hip pain

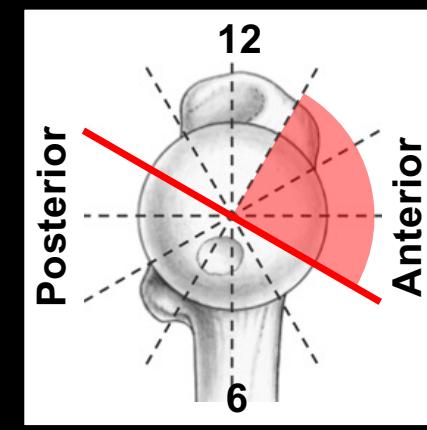
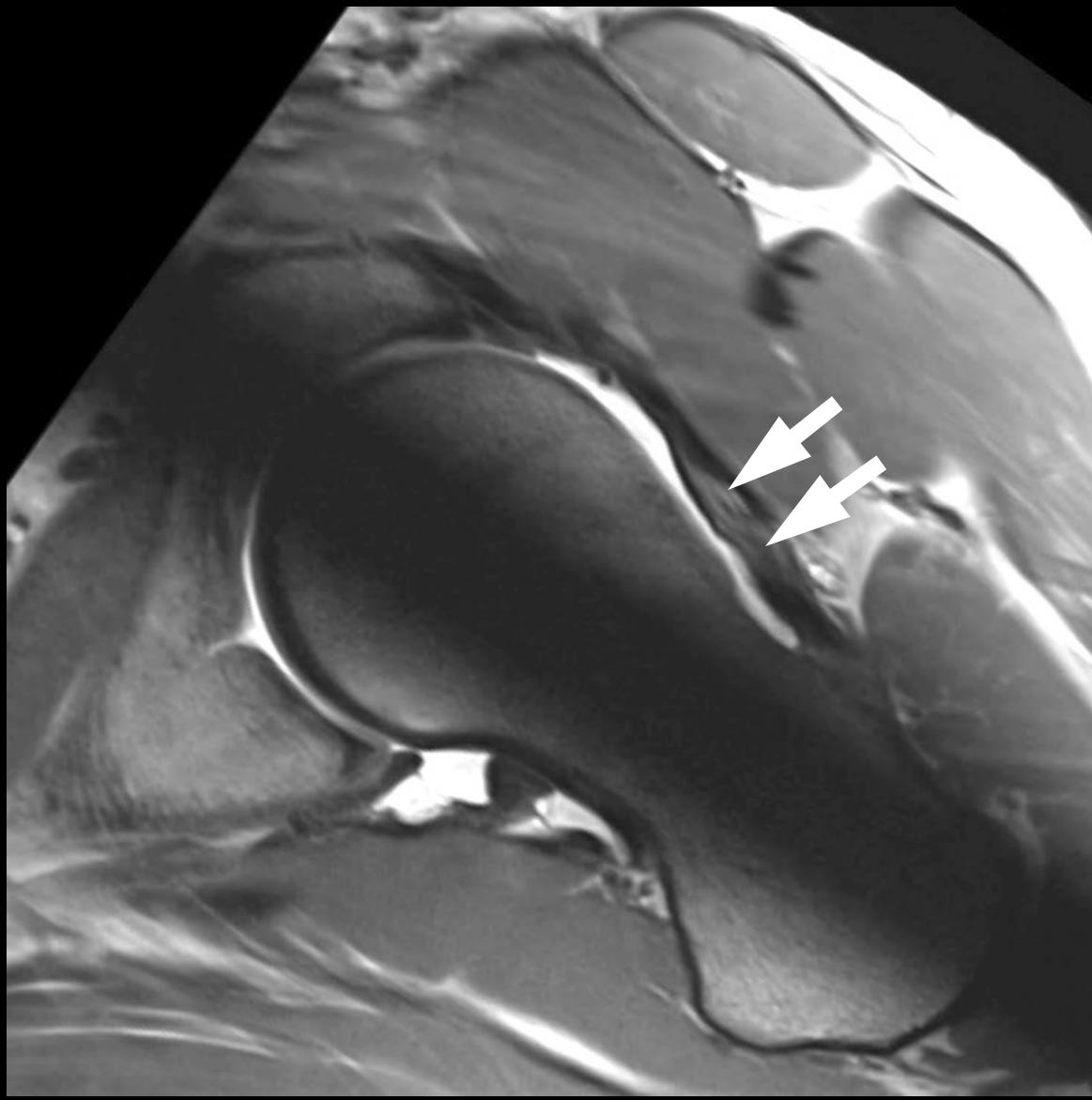


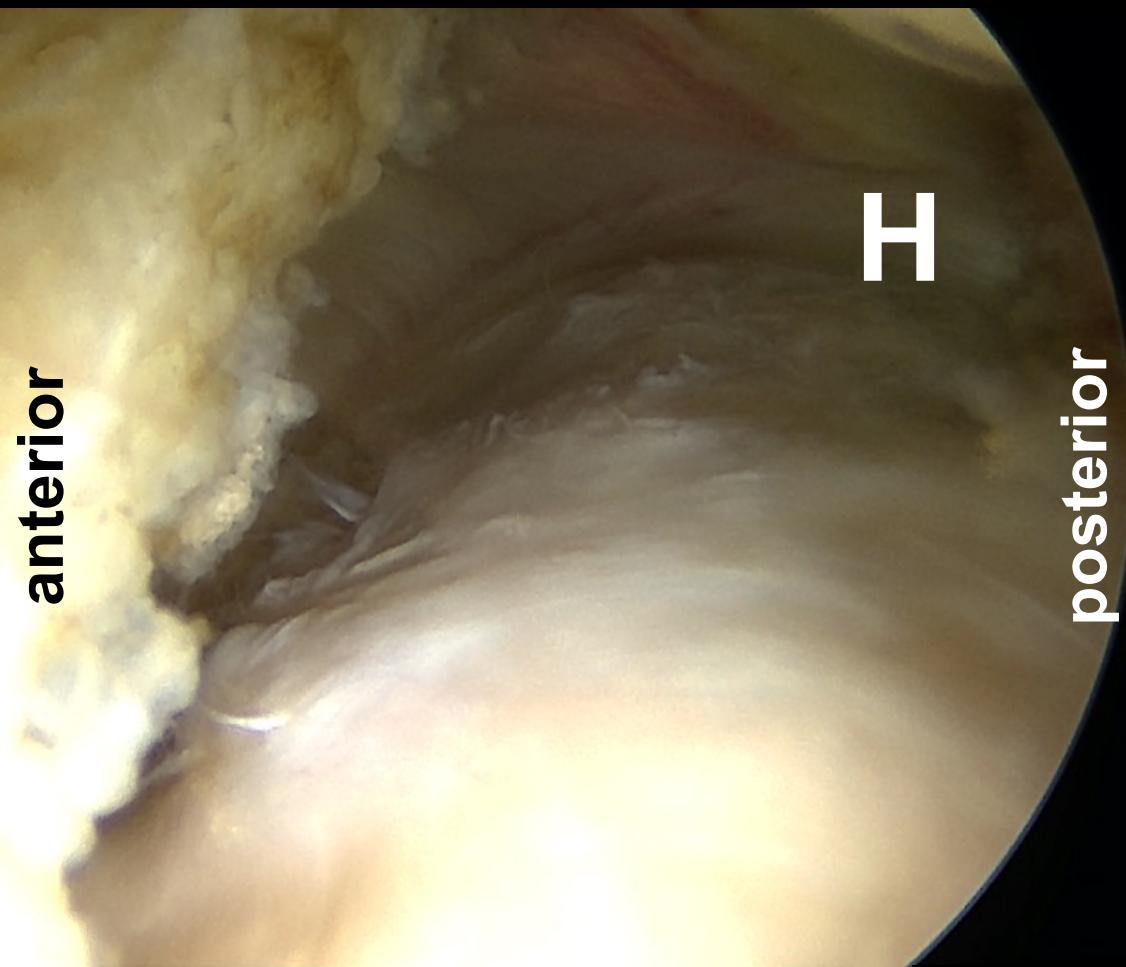
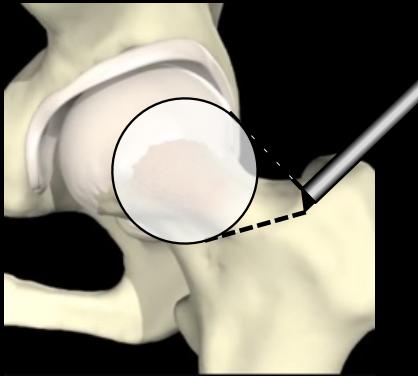


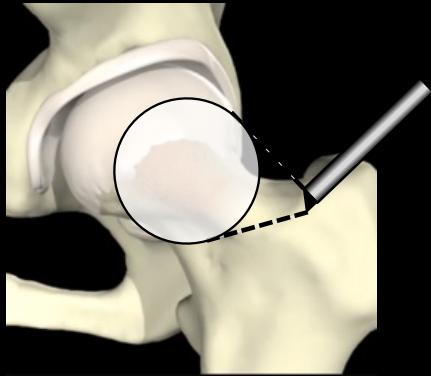


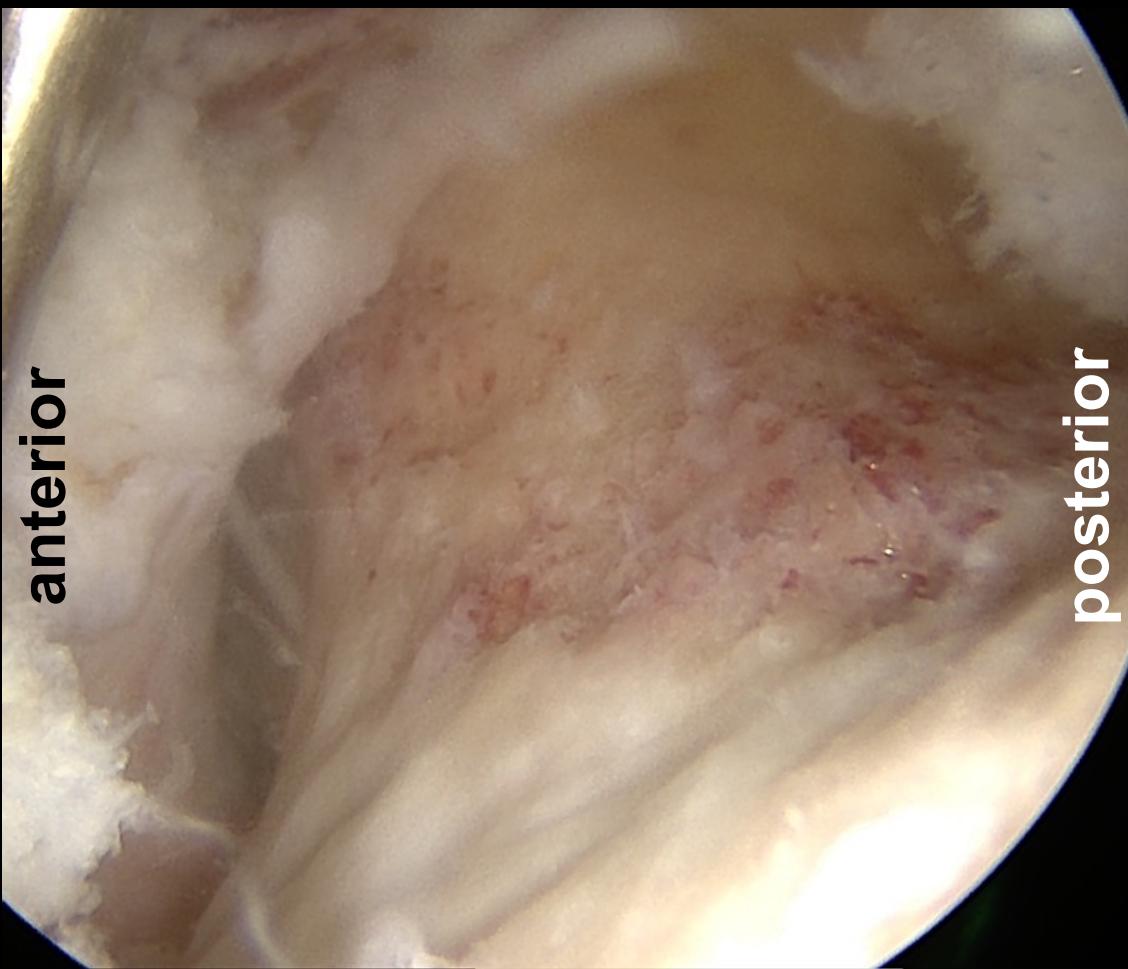
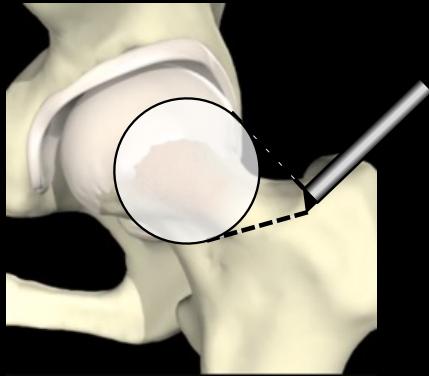








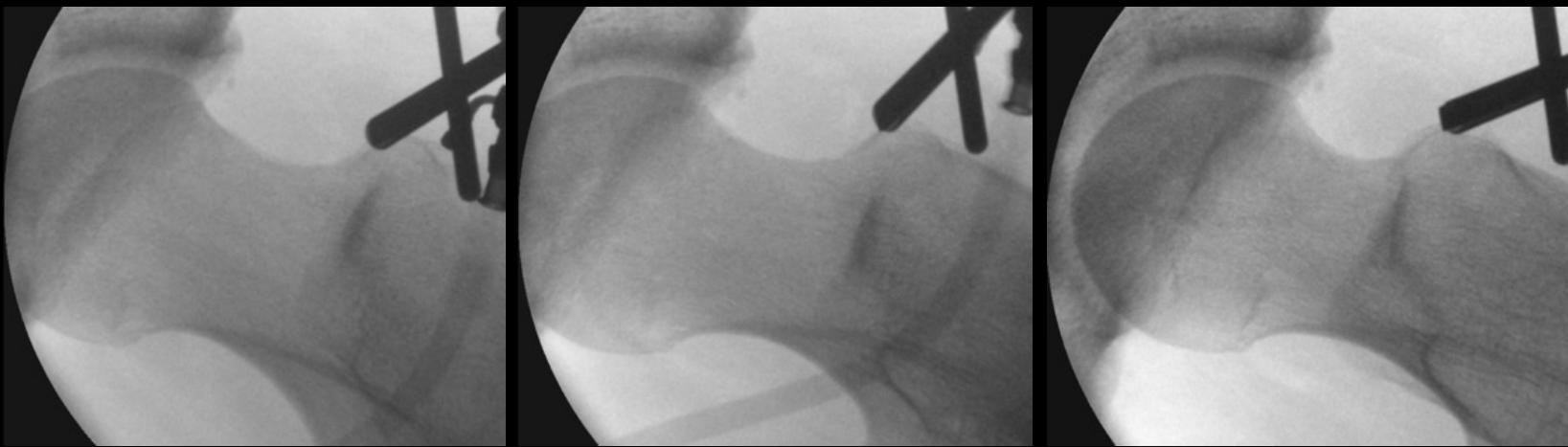




Cam Deformity



After Offset Improvement





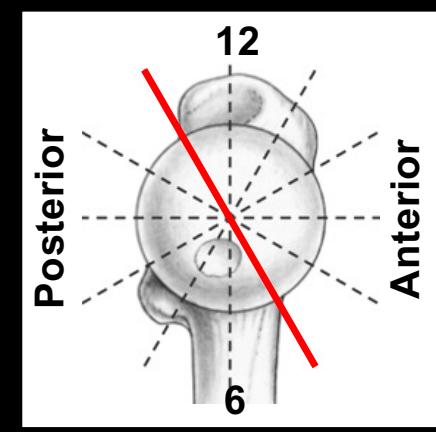
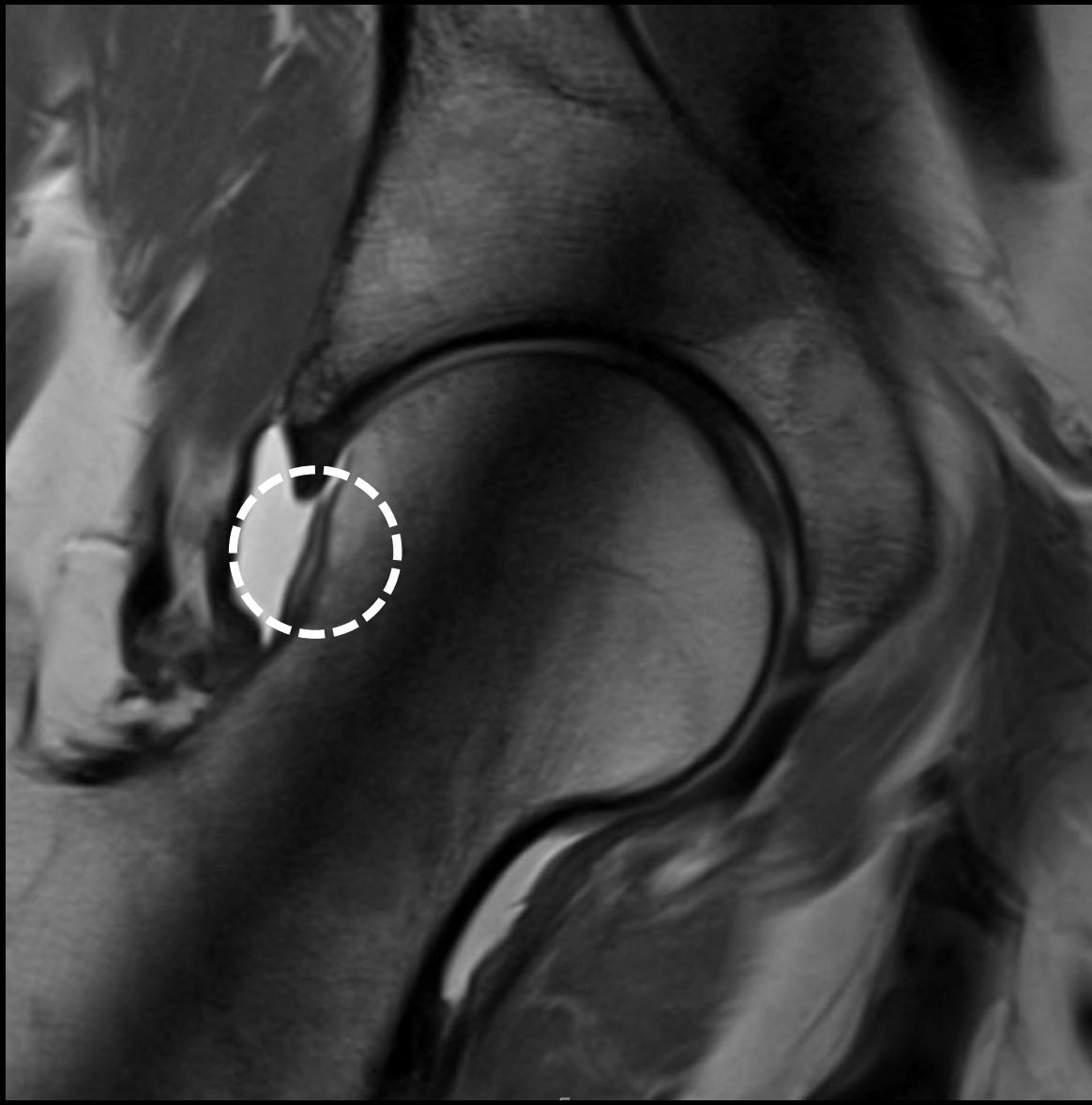
32 year old patient with hip pain

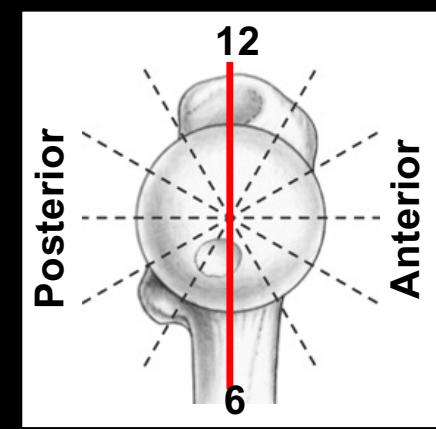
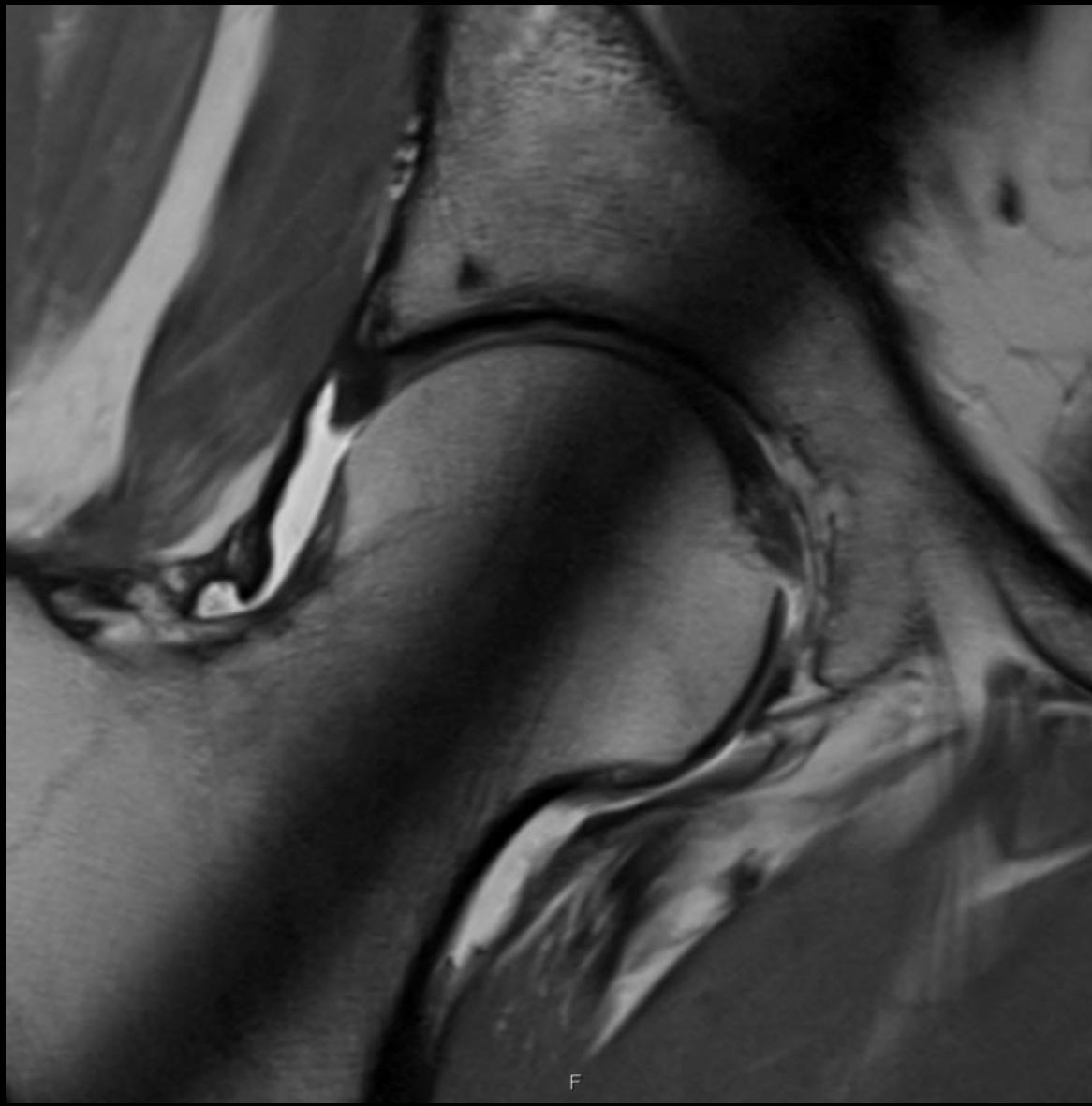
Anterior

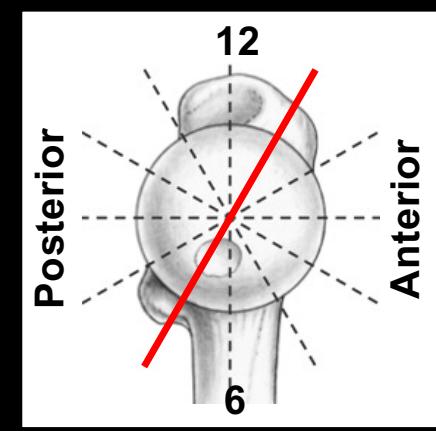
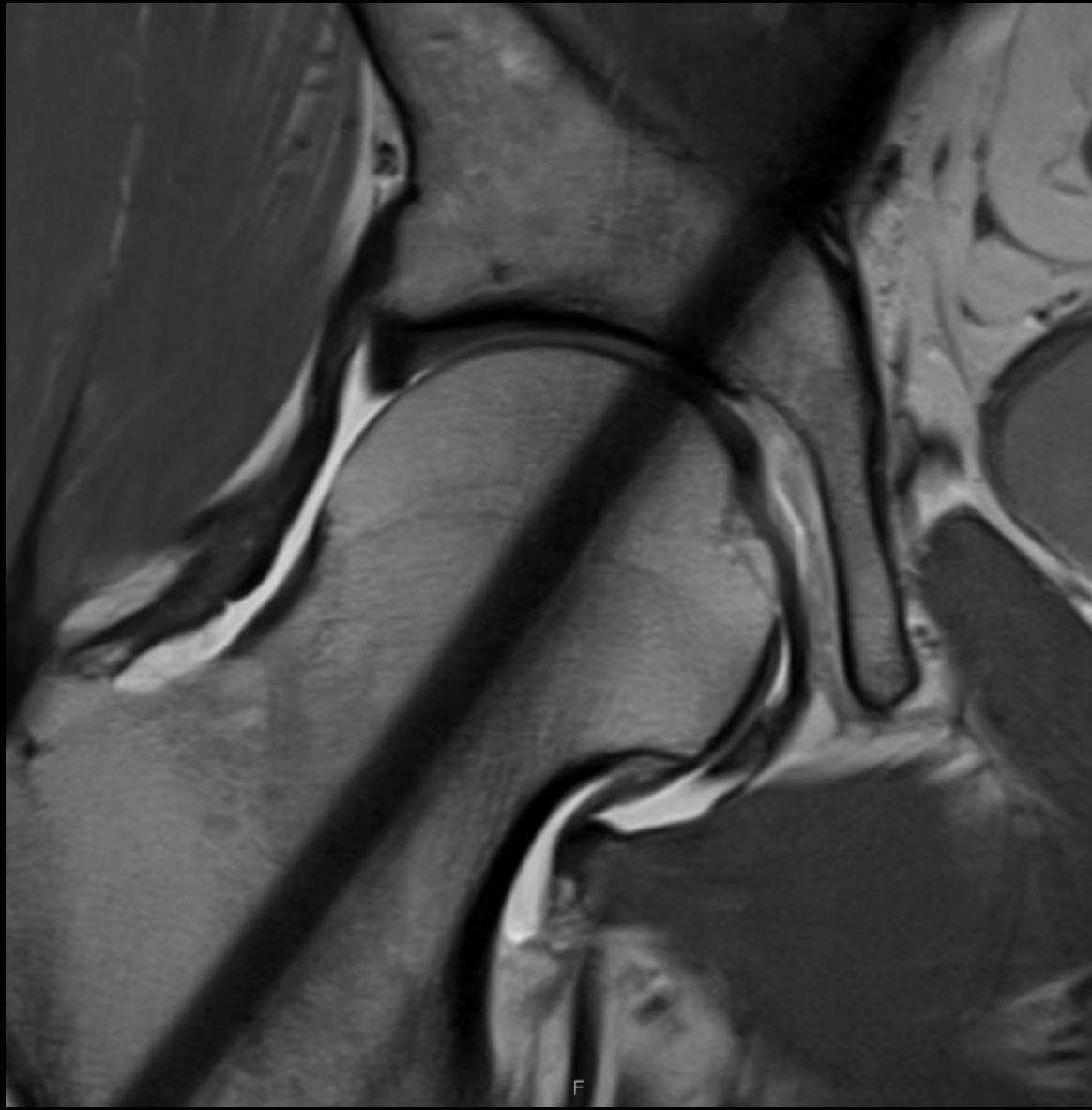


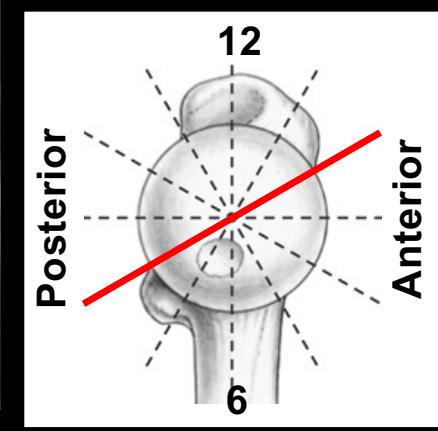
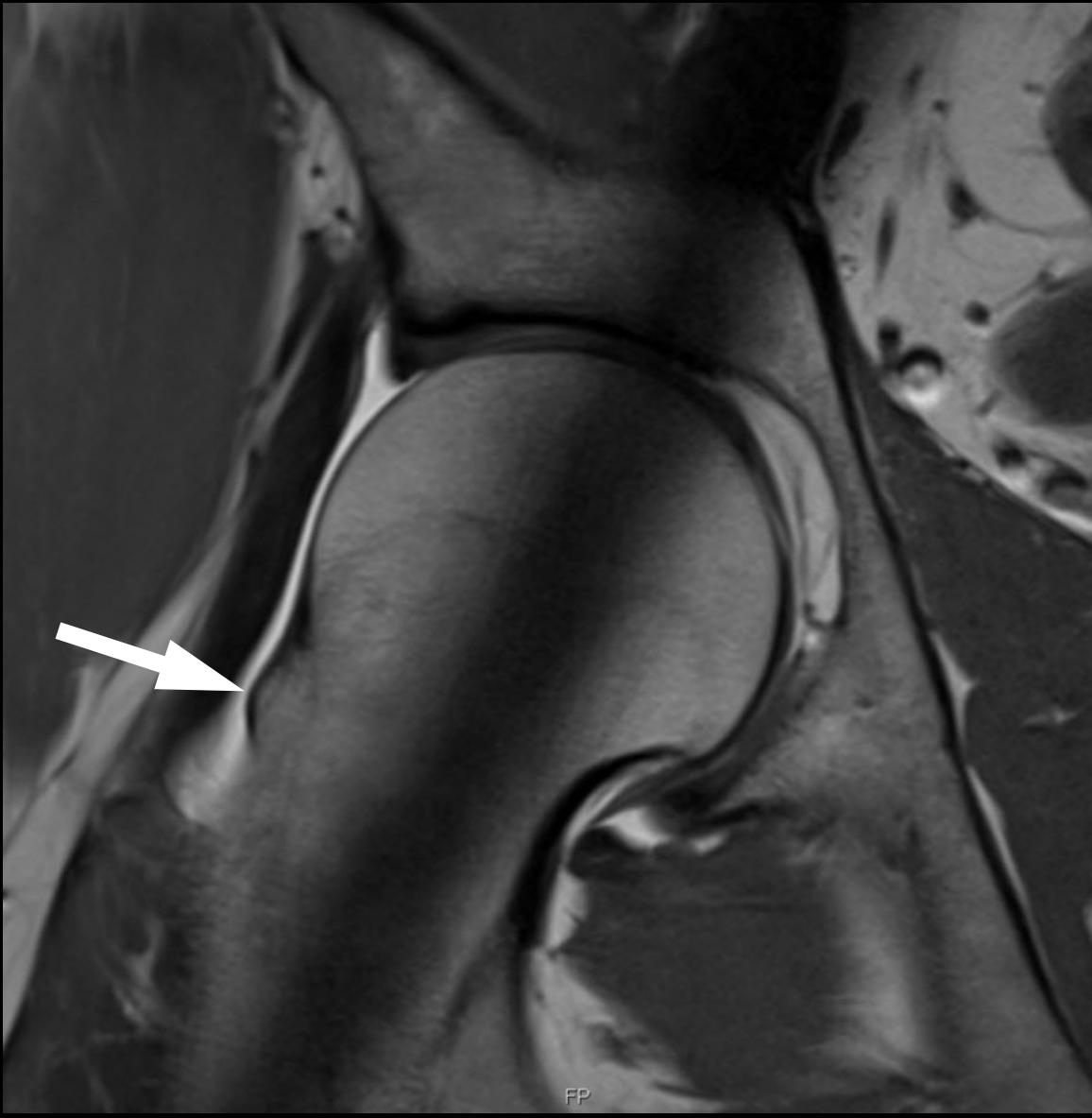
Posterior

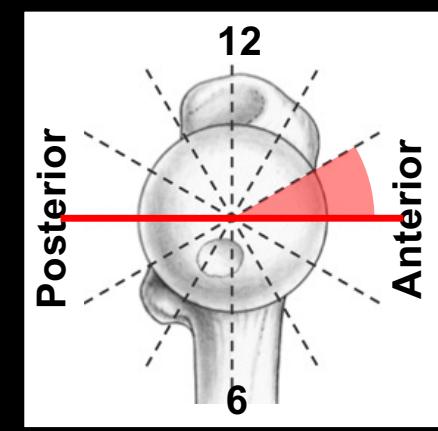
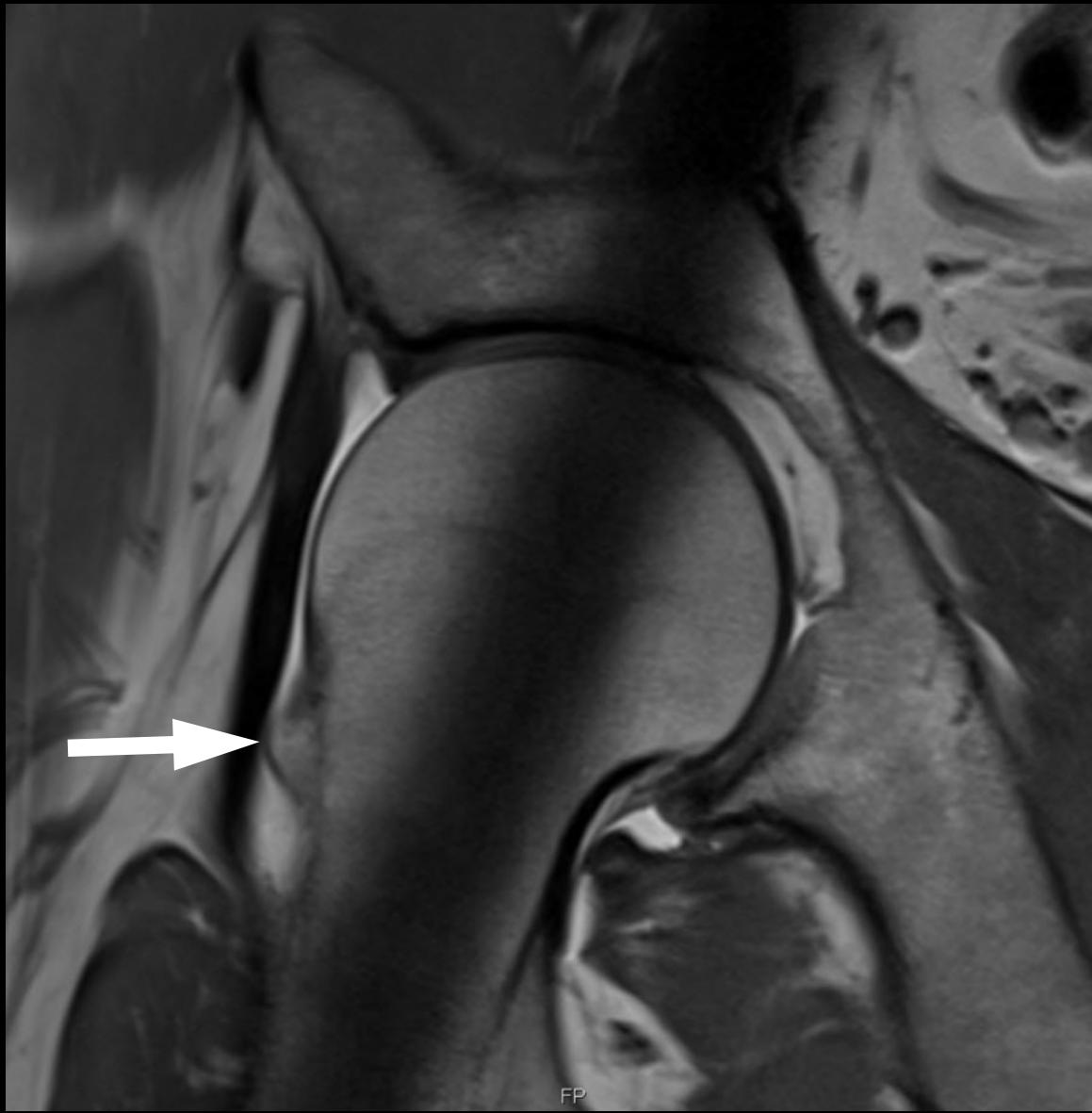
32 year old patient with hip pain

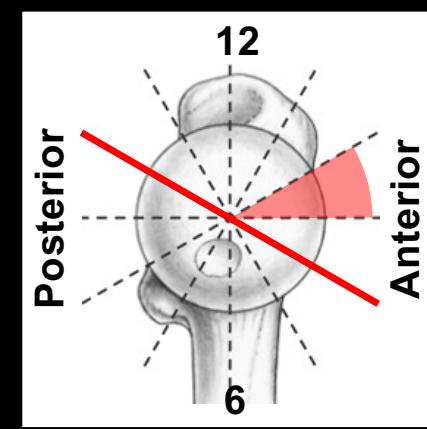




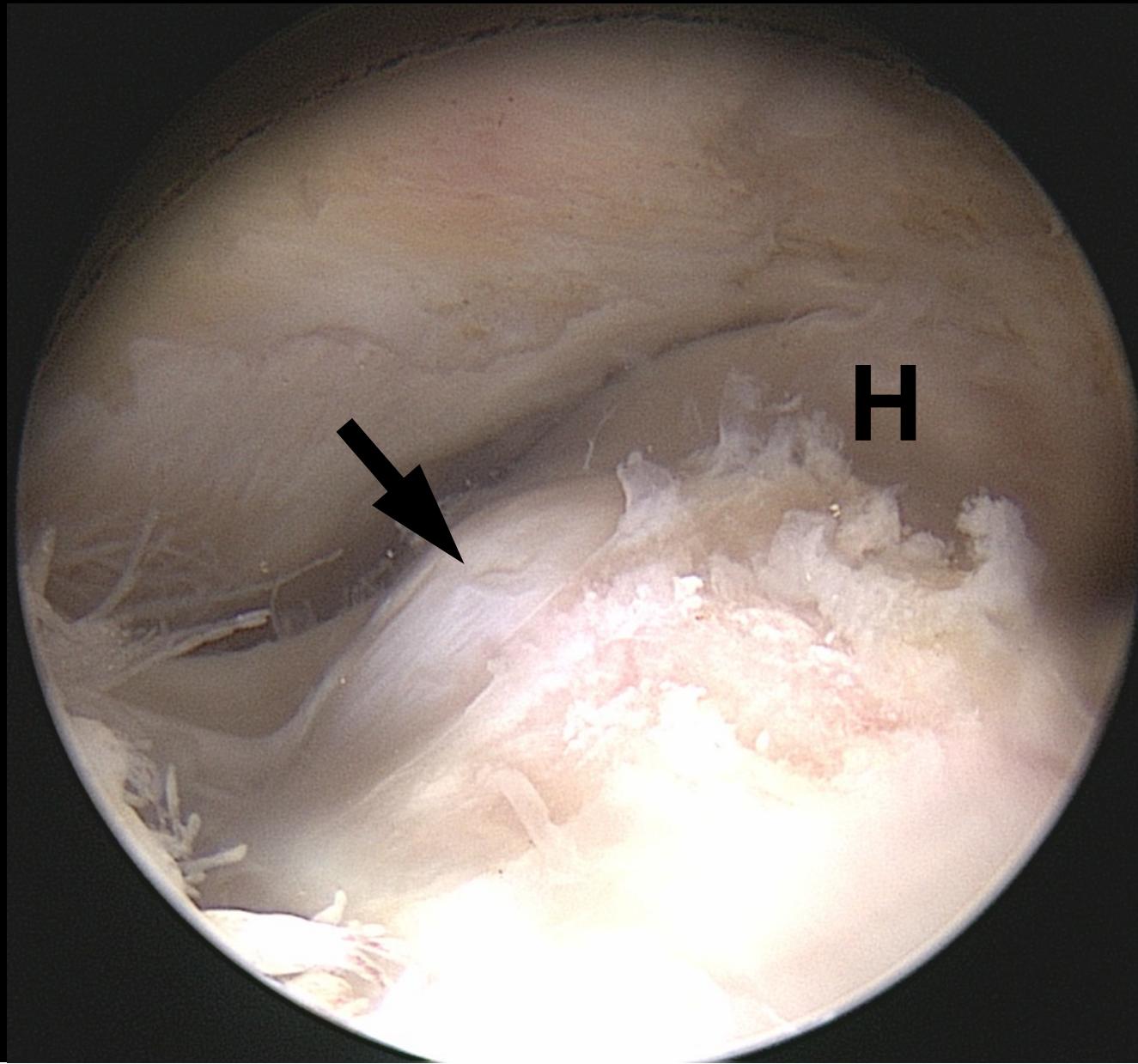






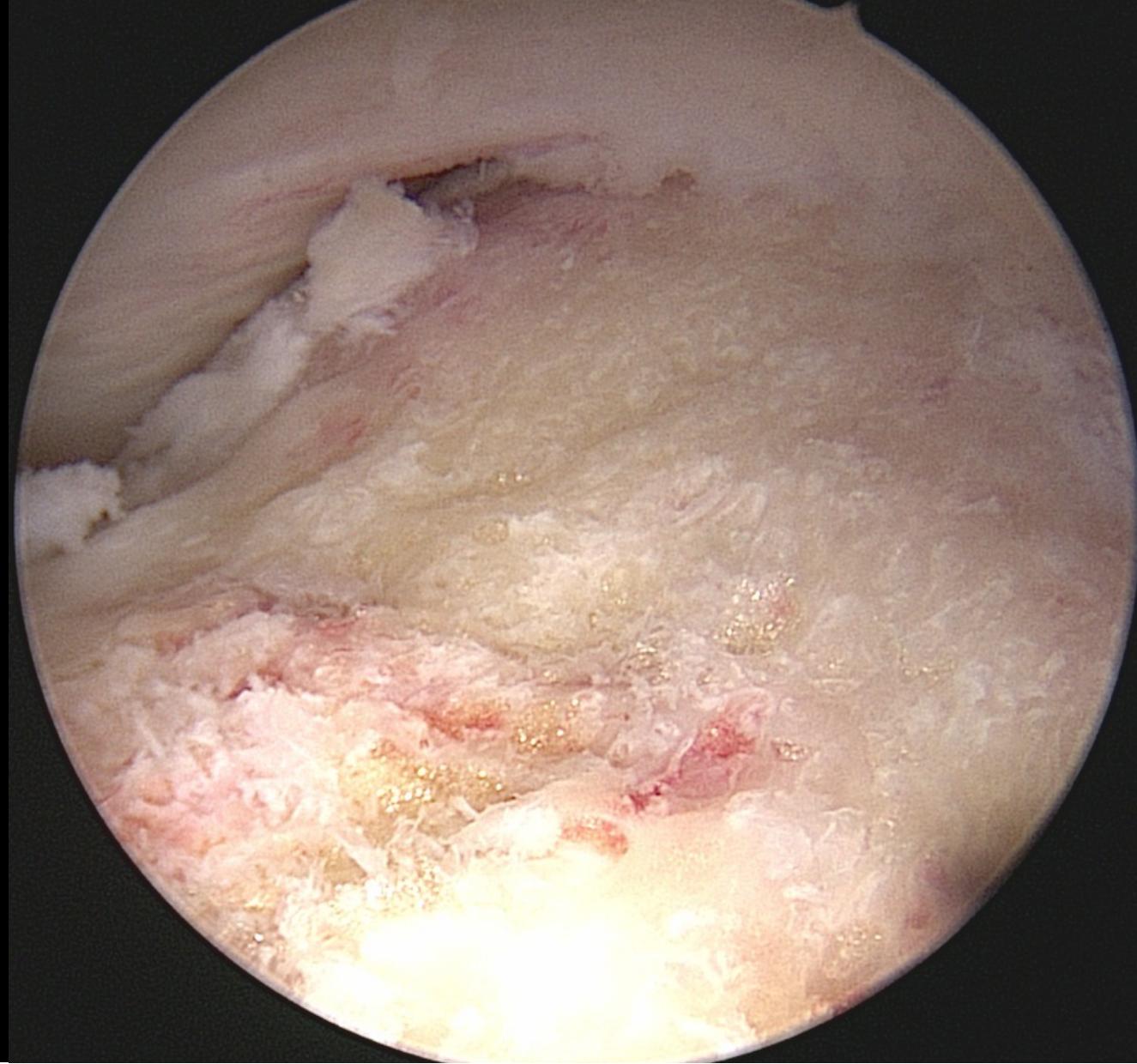


anterior



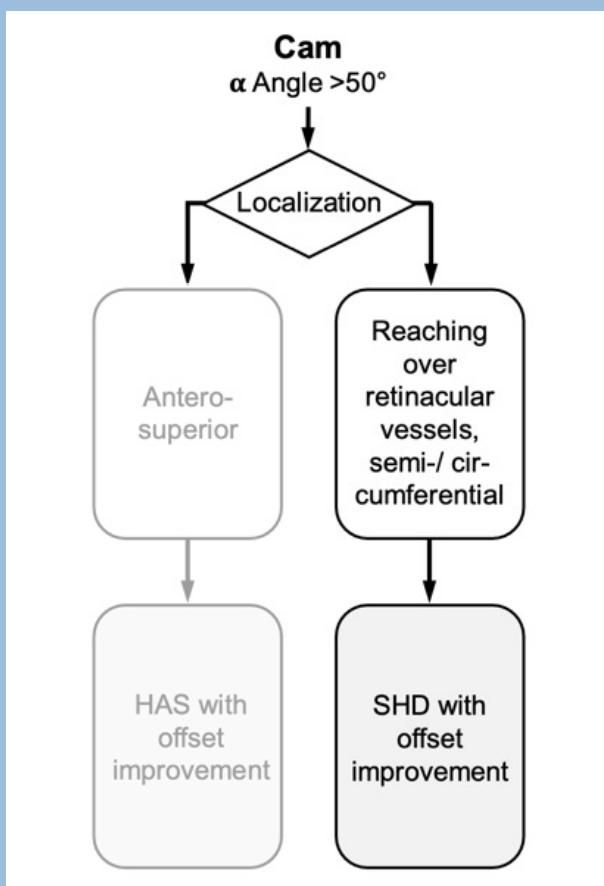
posterior

anterior



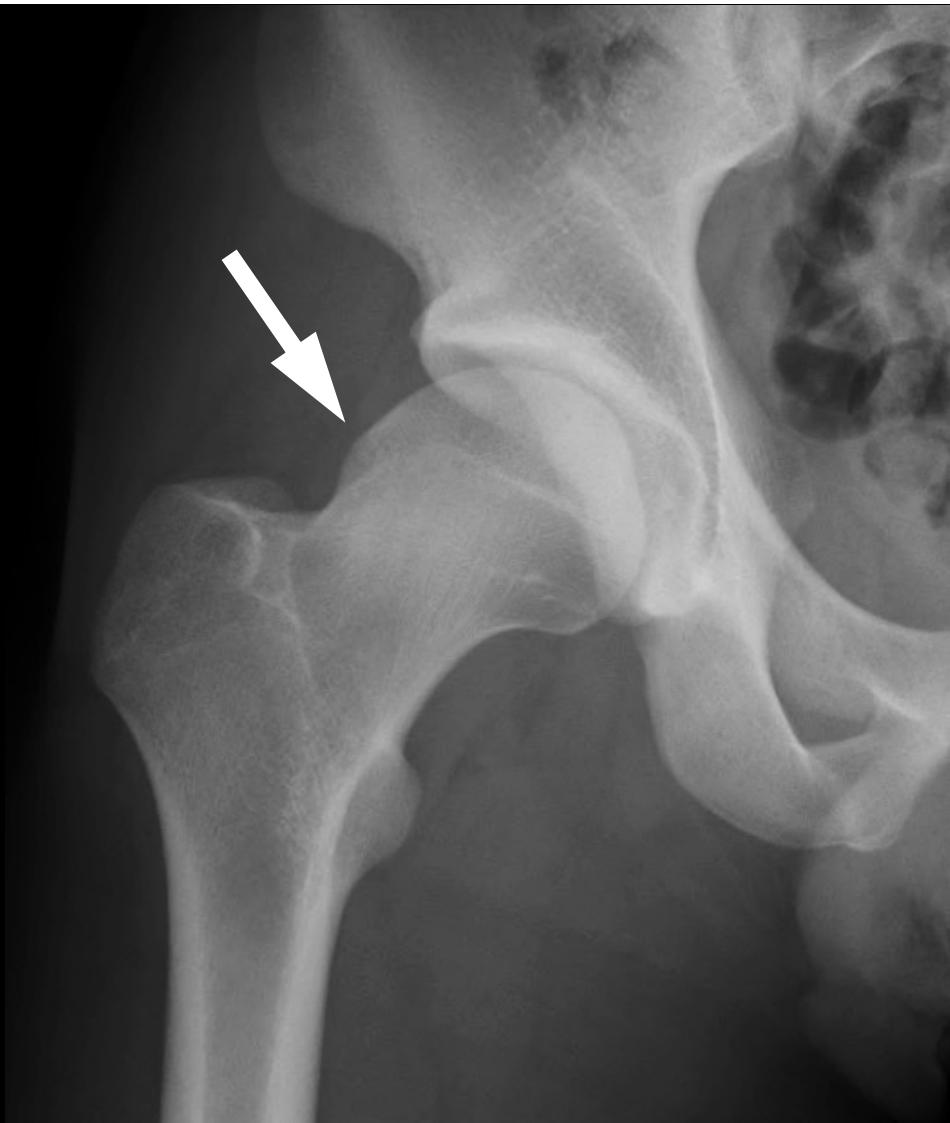
posterior

Treatment Concept Cam Deformity



Surgical hip dislocation

- > Localisation:
 - Posterior
- > Extension:
 - Semi / circumferential
- > Relation to the retinacular vessels:
 - Close



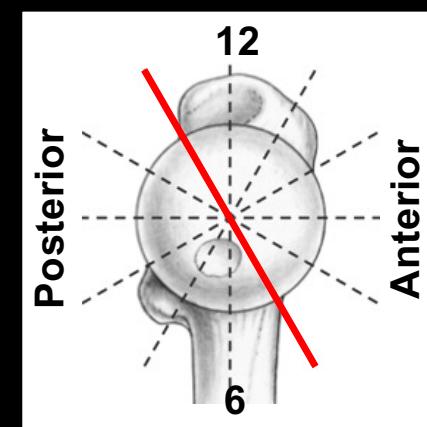
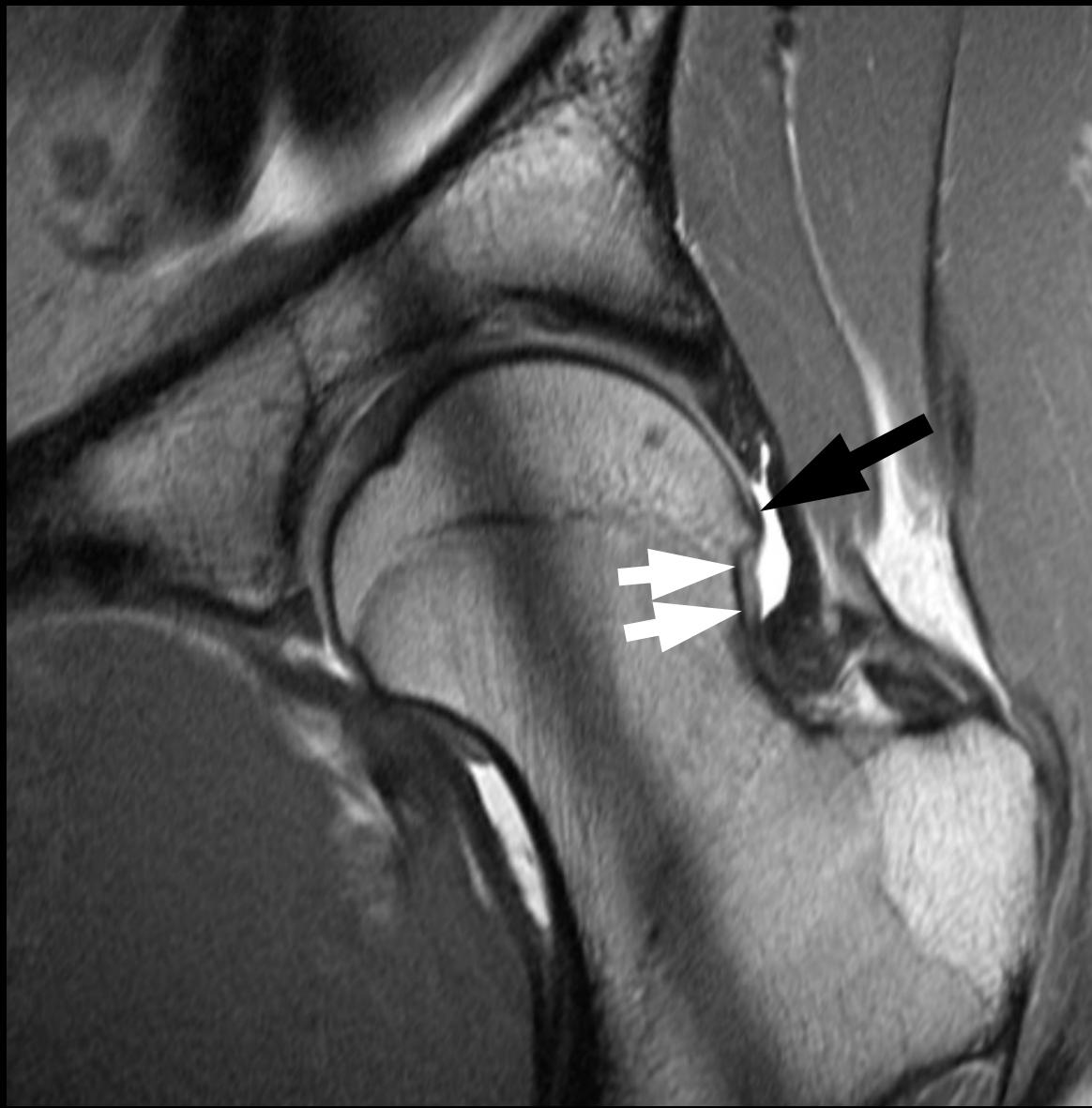
26 year old patient with hip pain

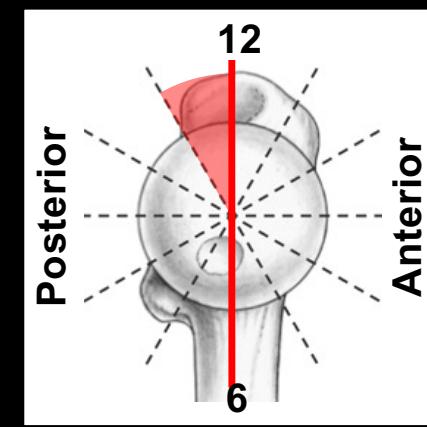
Anterior

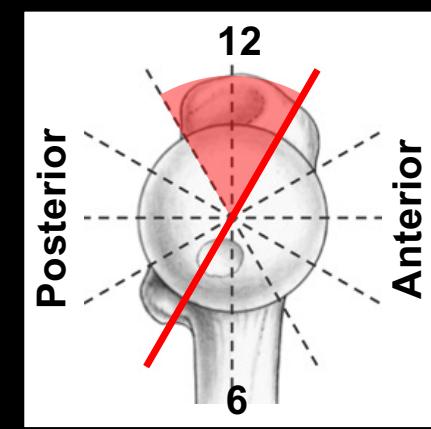


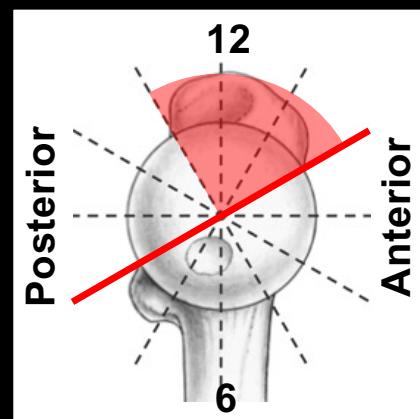
Posterior

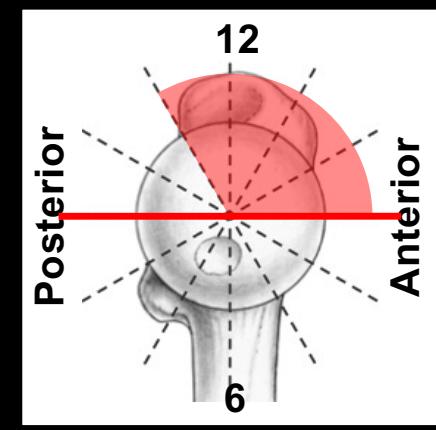
26 year old patient with hip pain

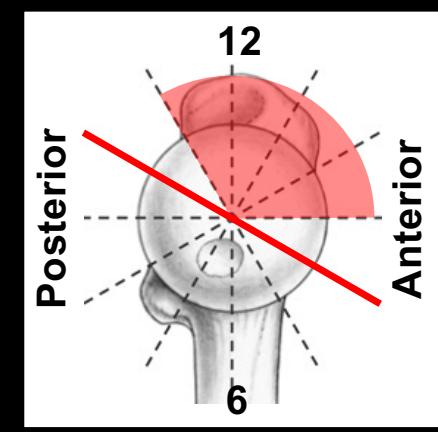


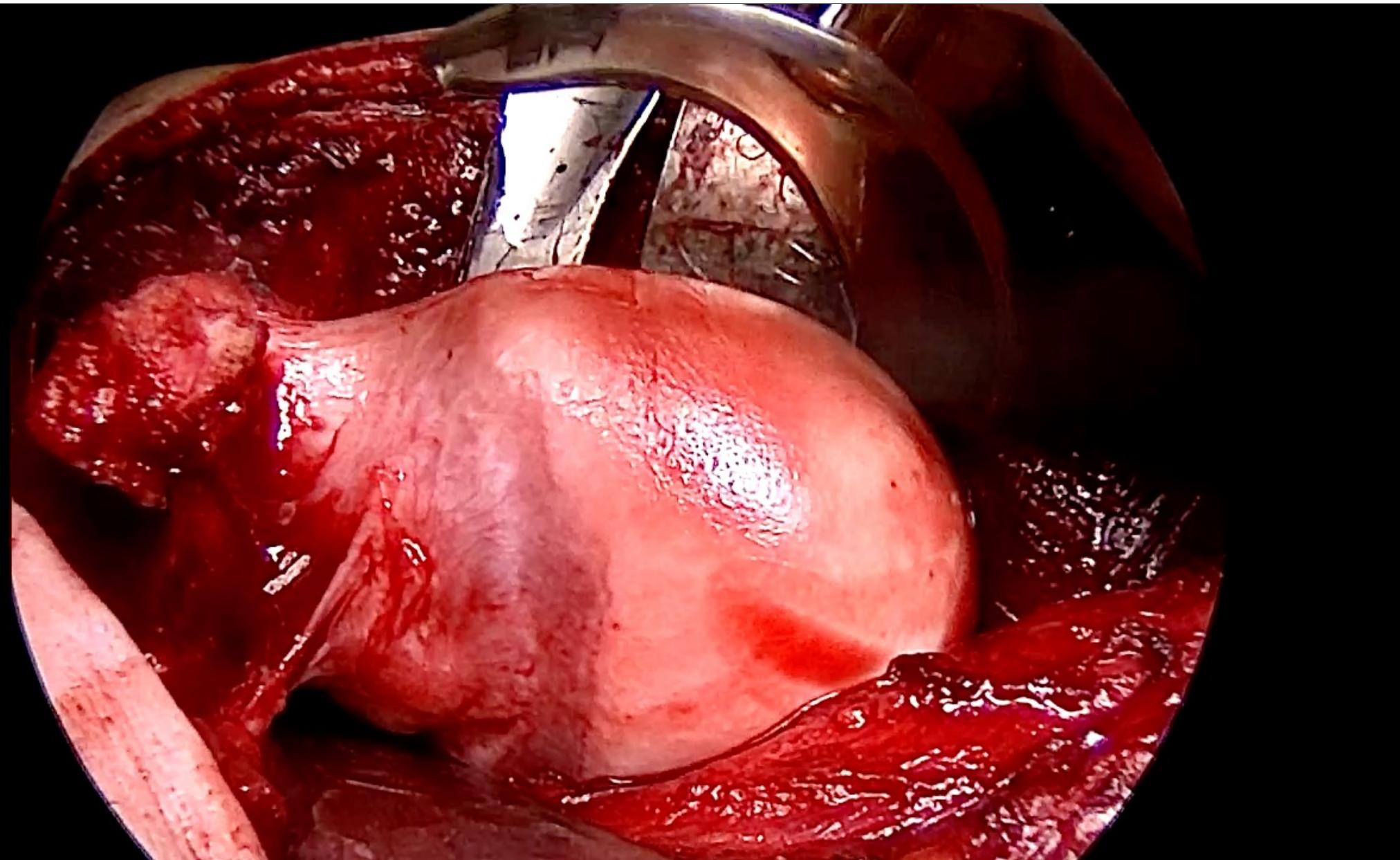


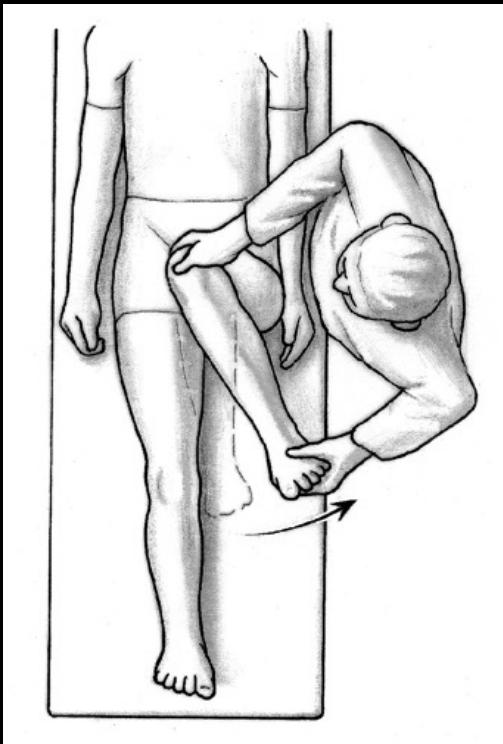




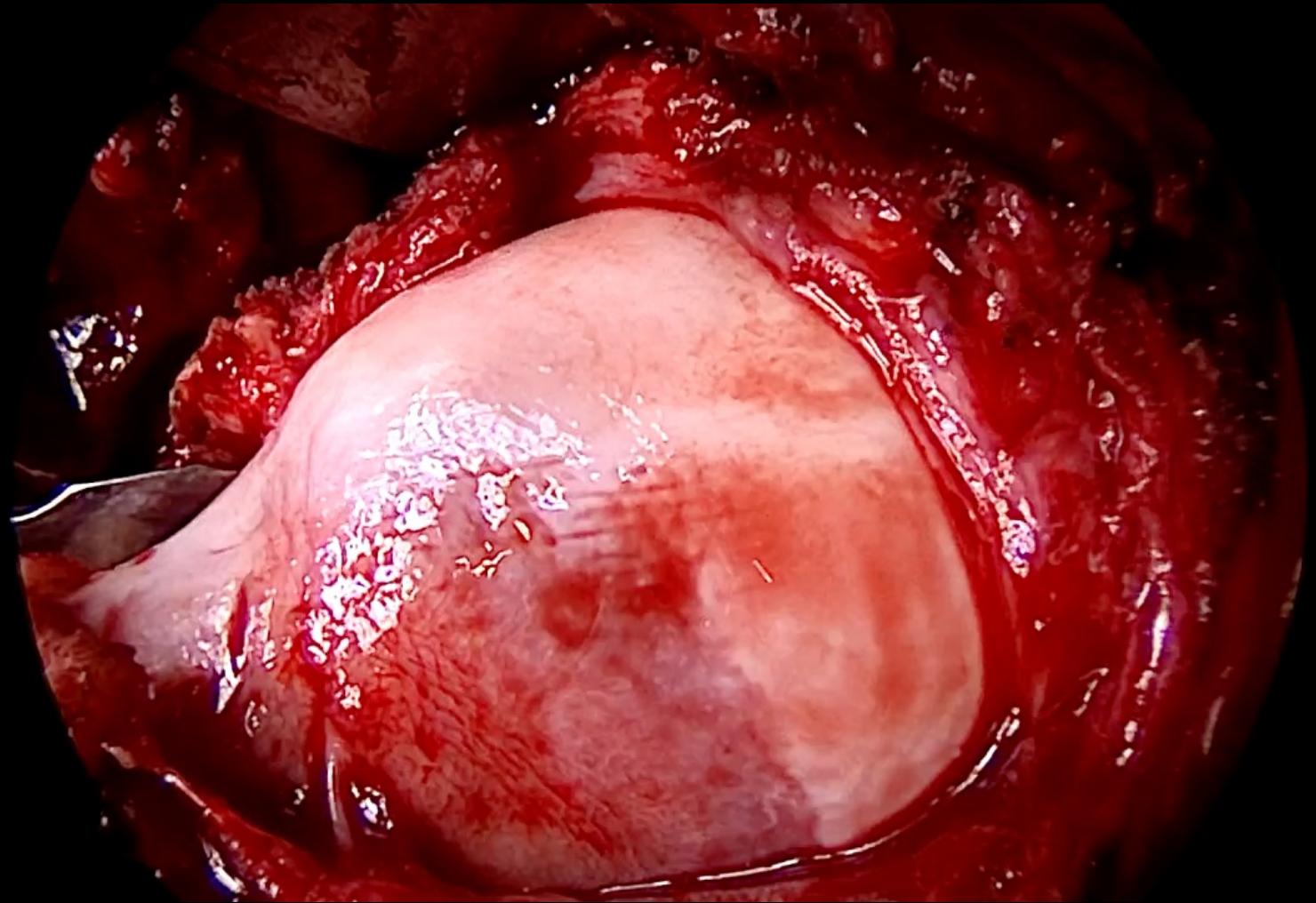


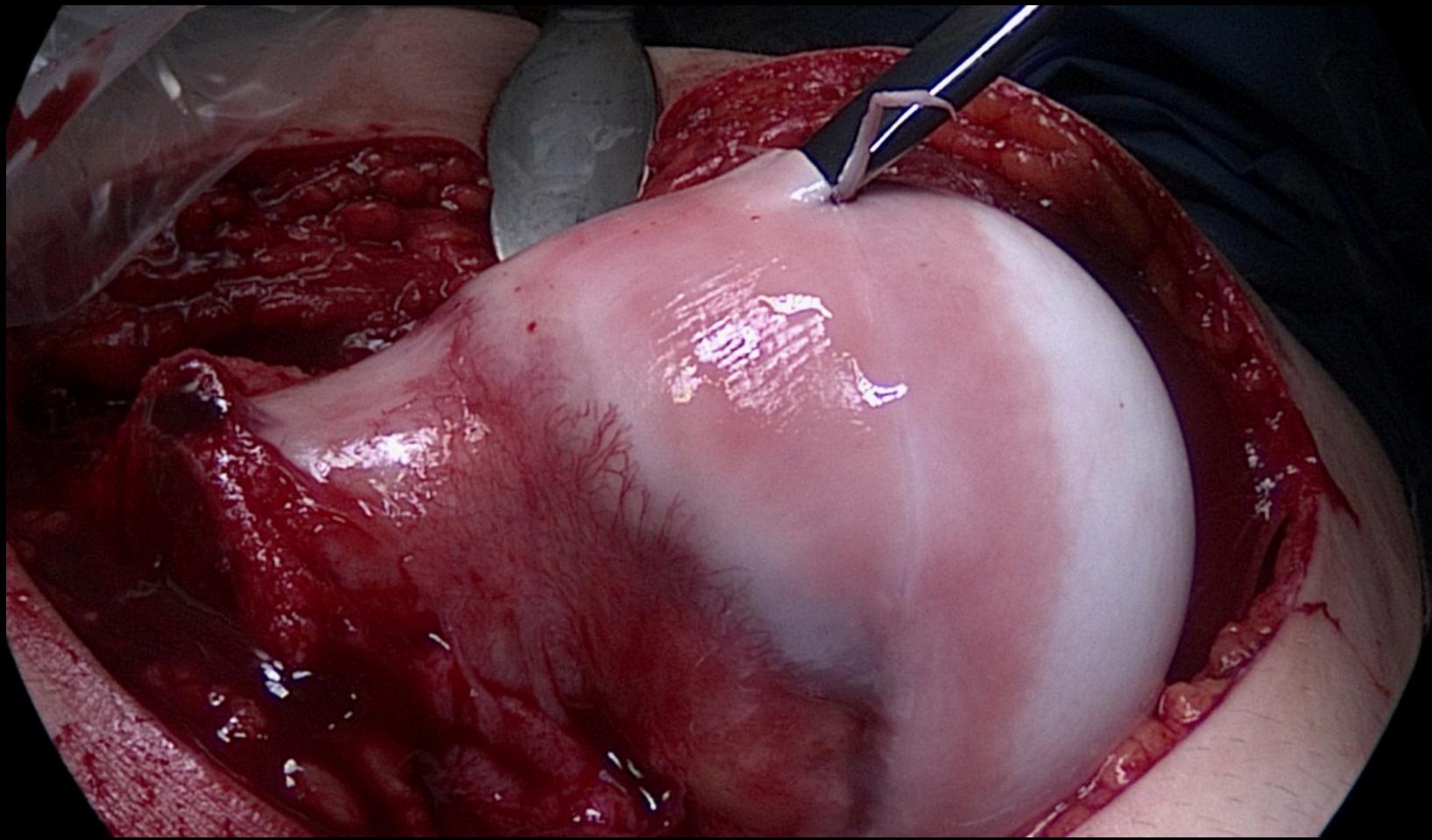


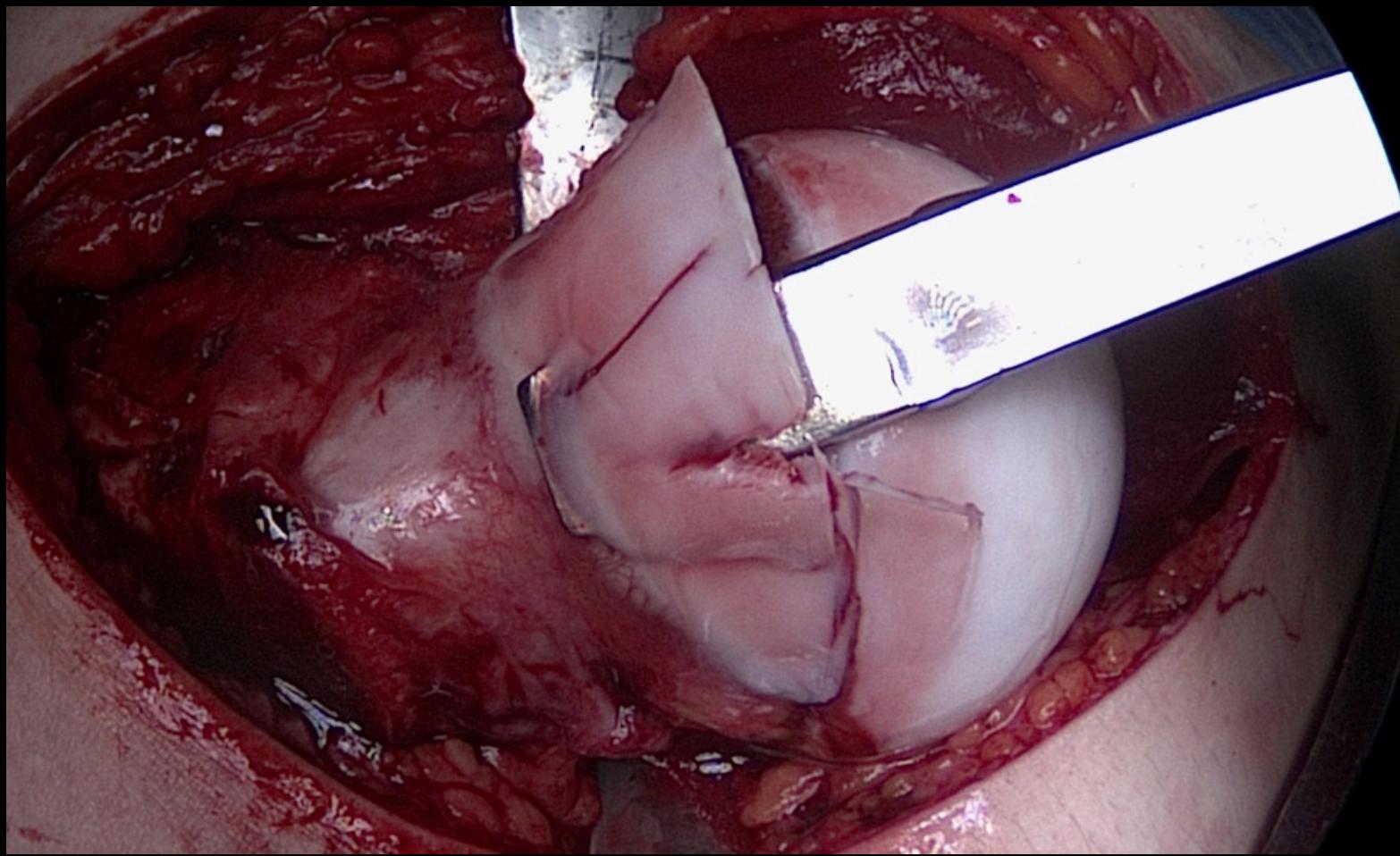


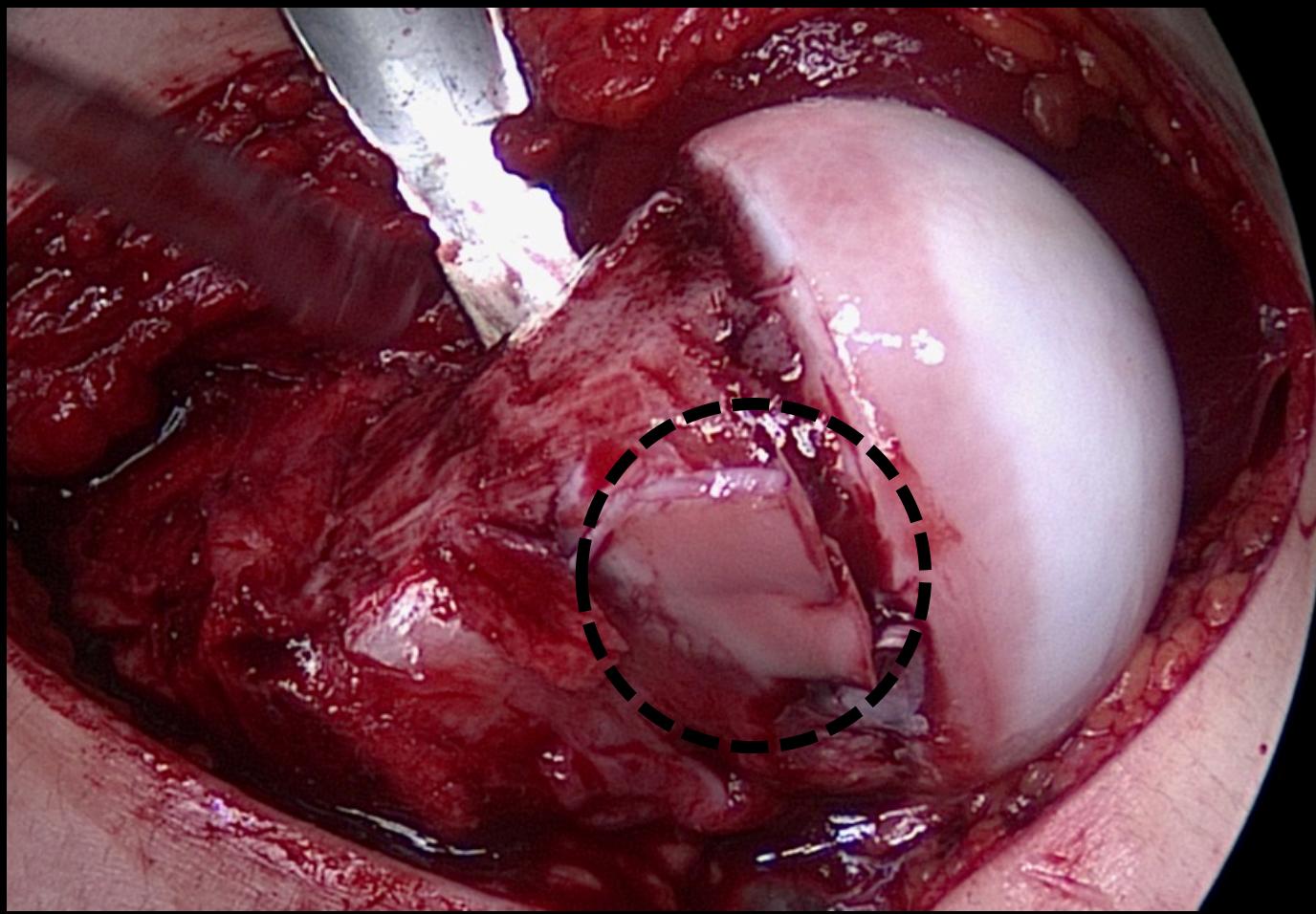


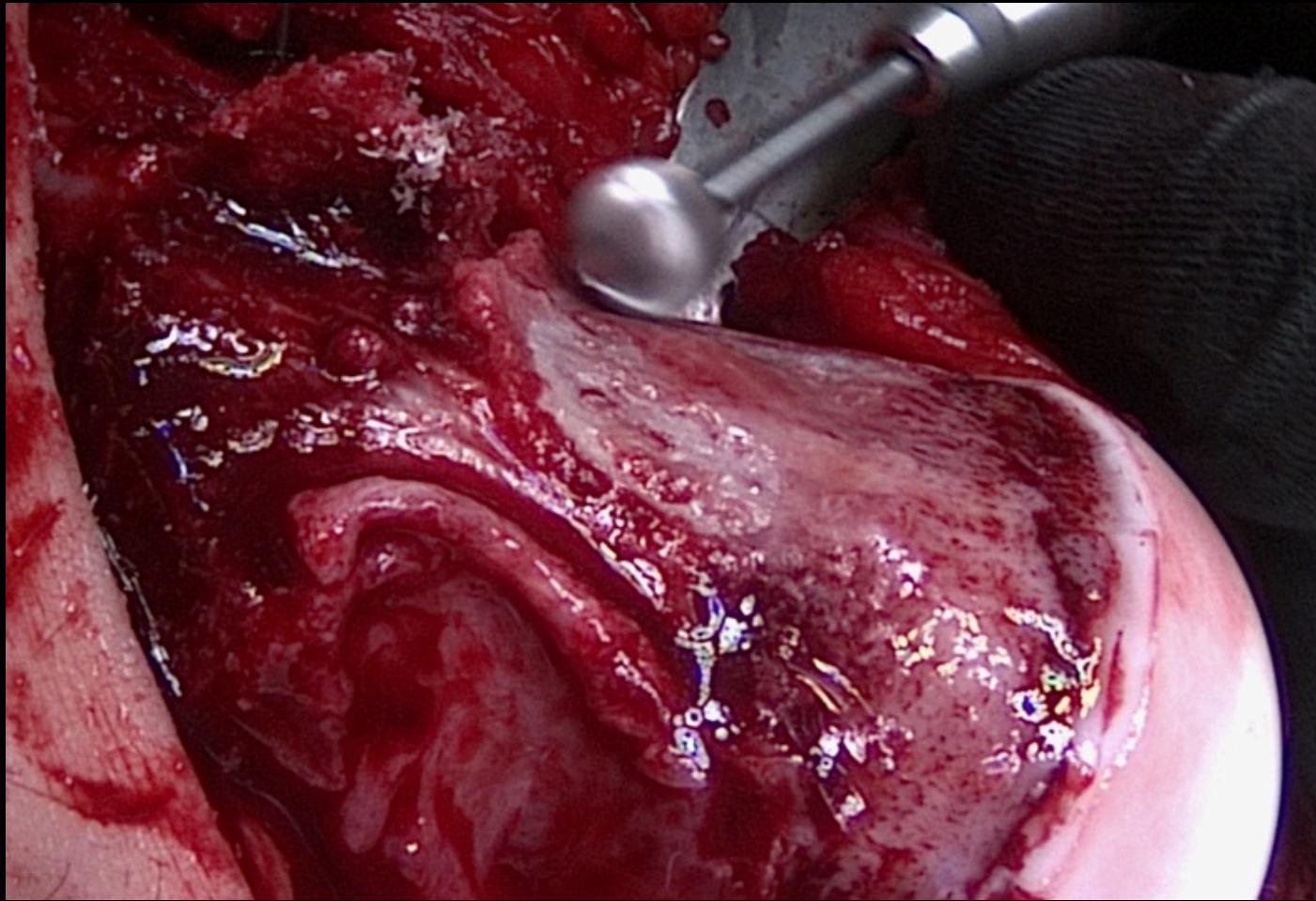
Flexion and
Internal rotation

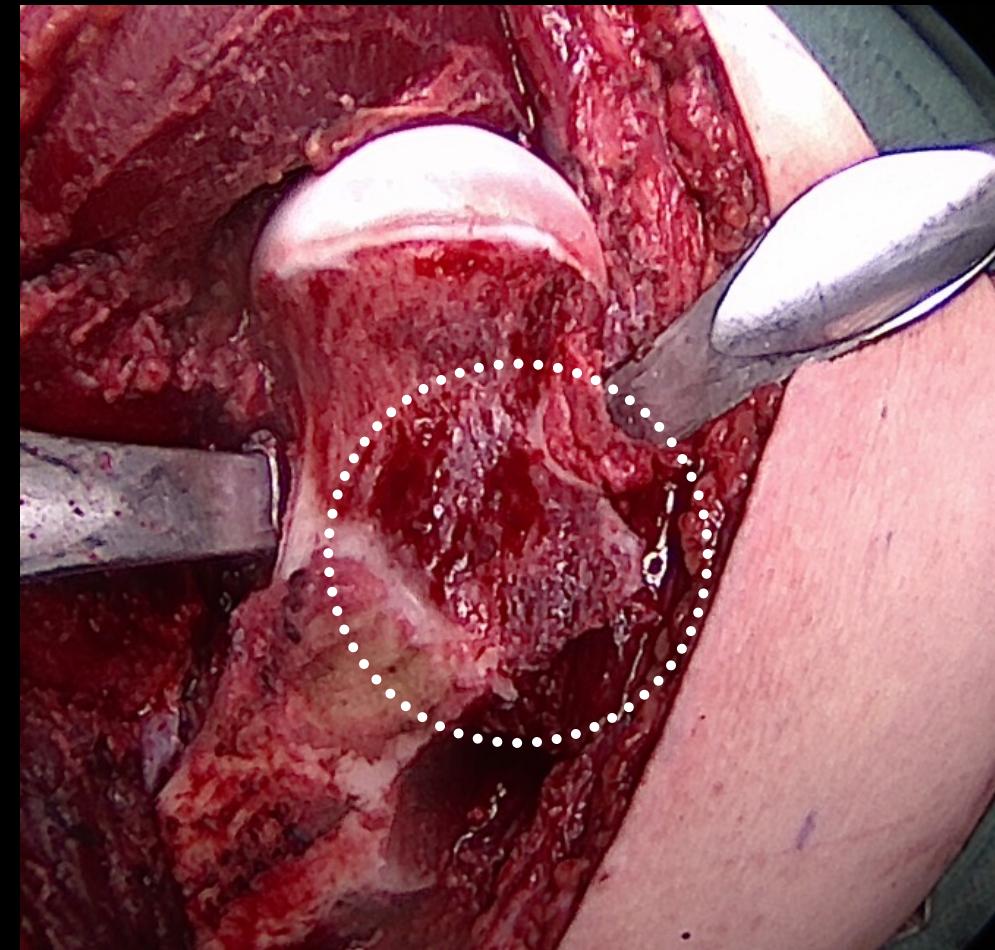
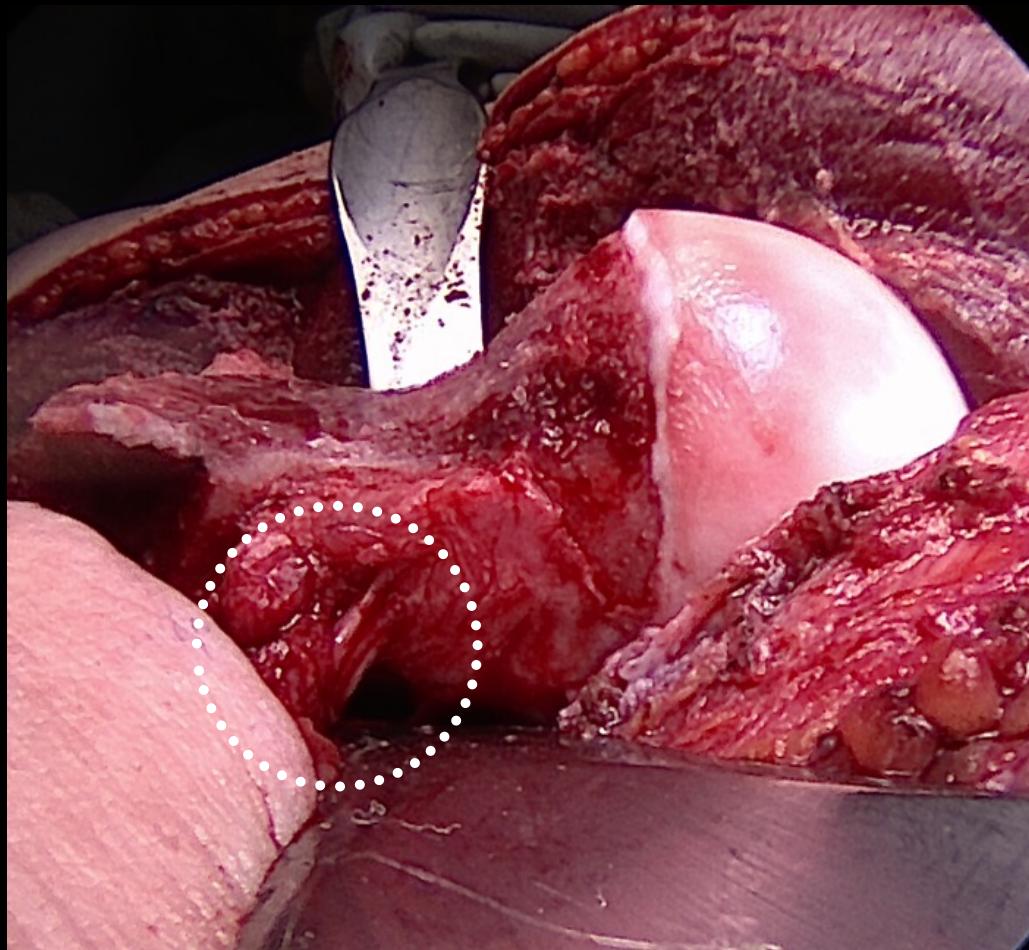


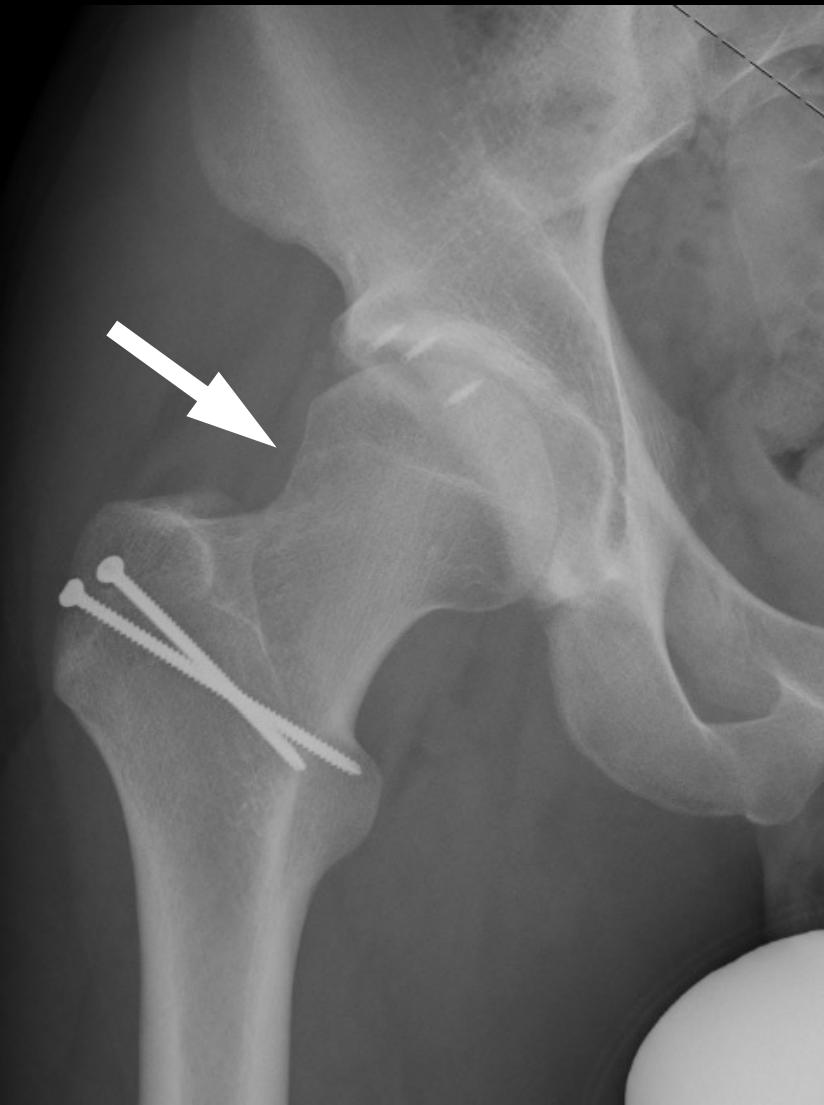
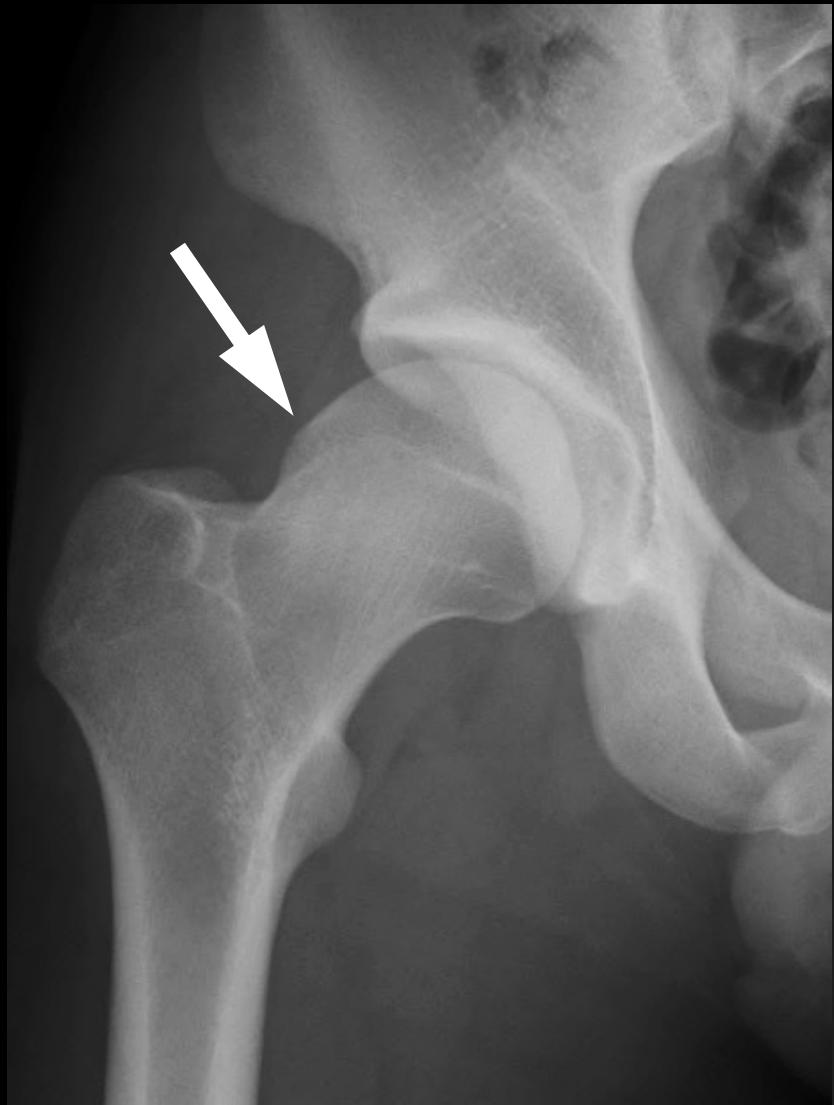


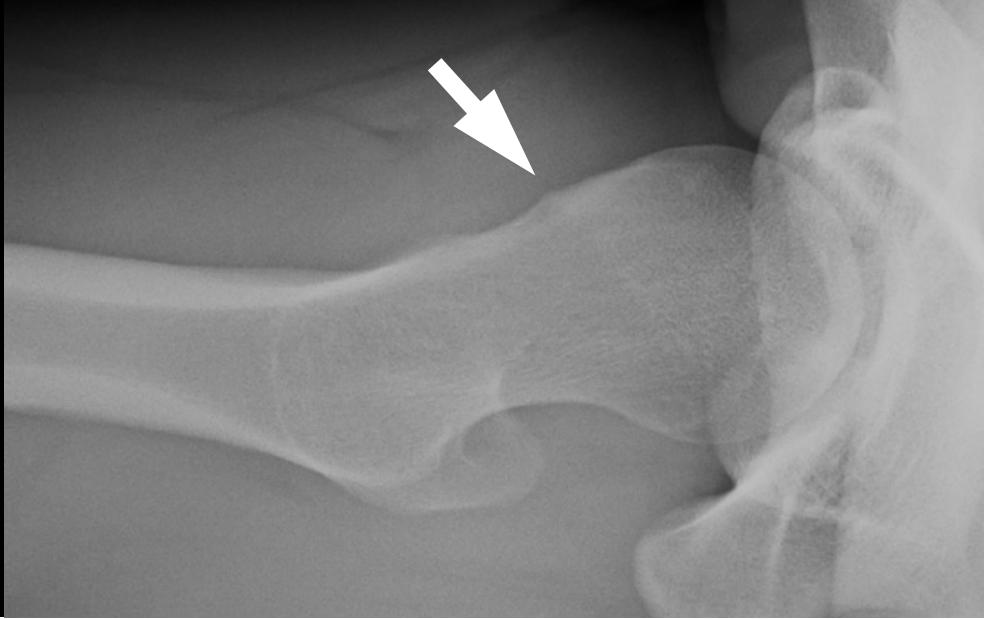
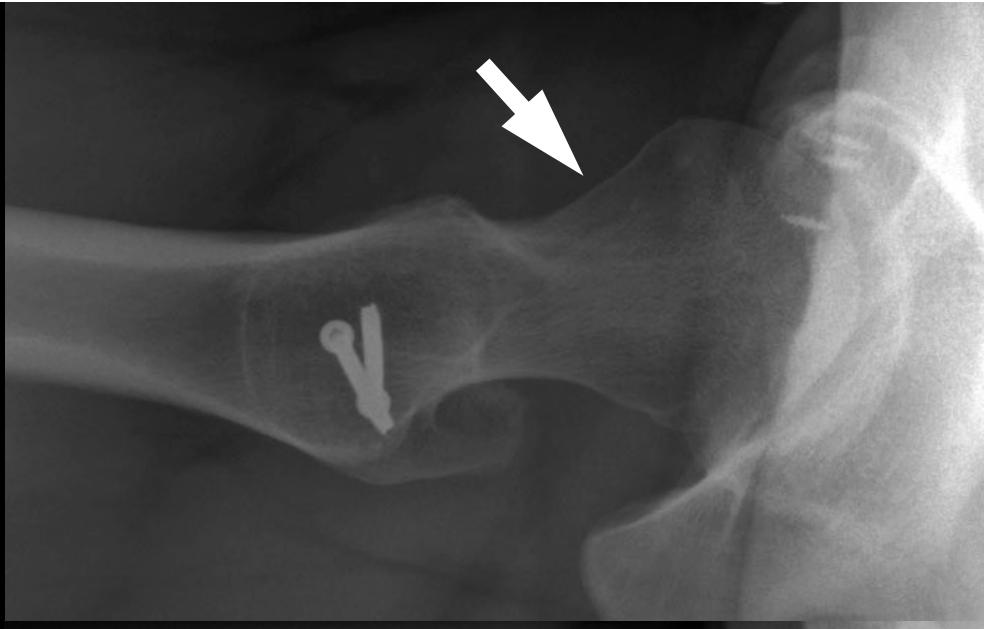














35 year old female patient with hip pain

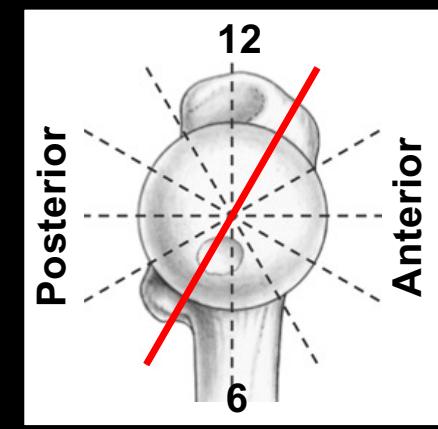


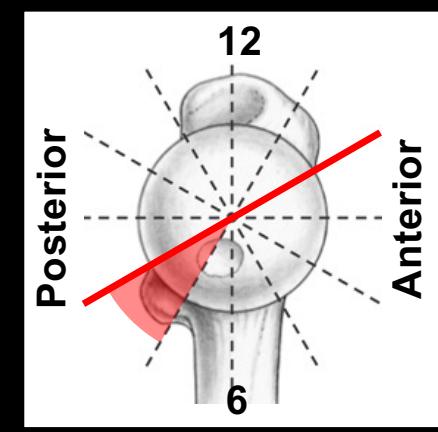
Anterior

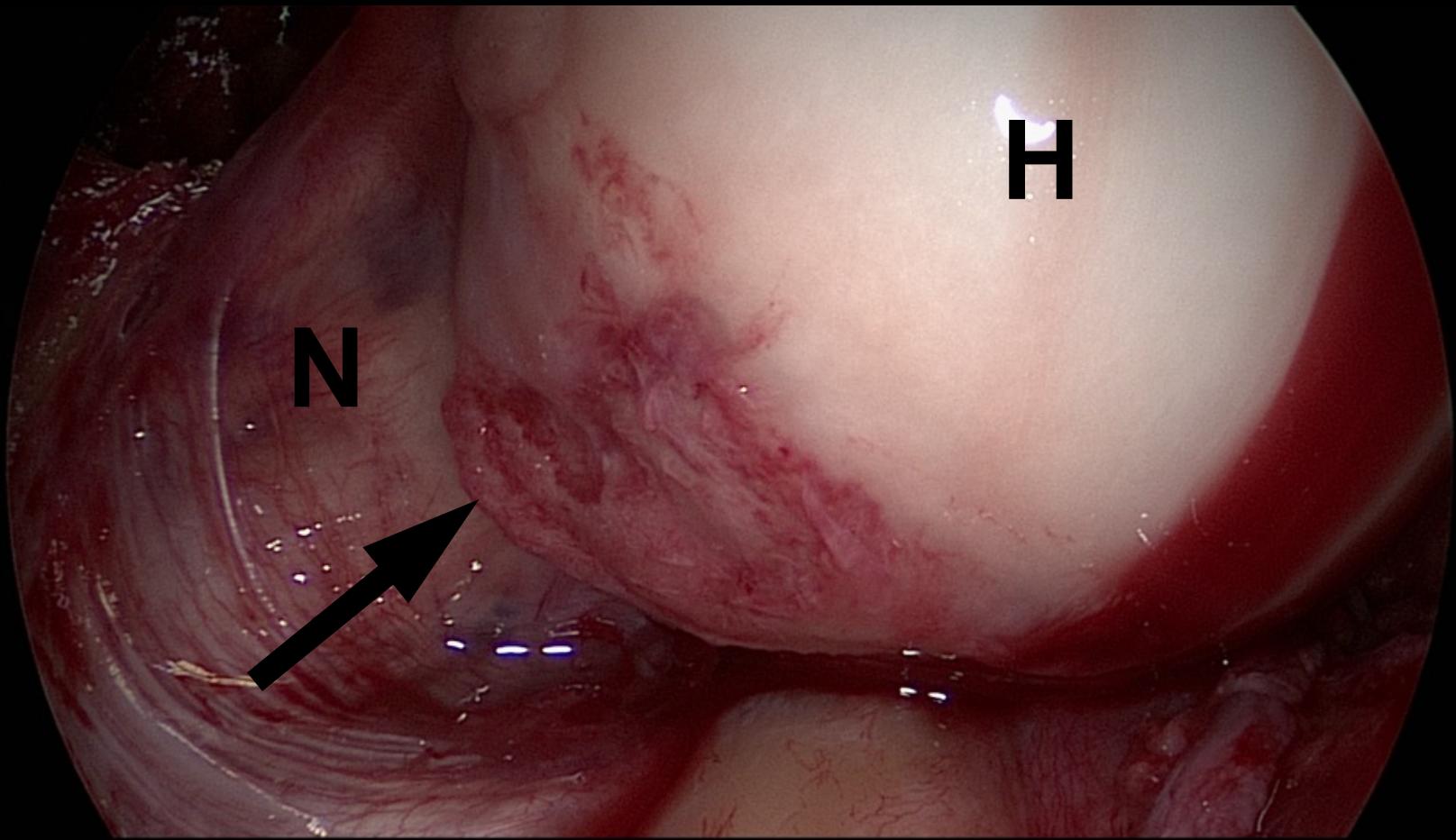


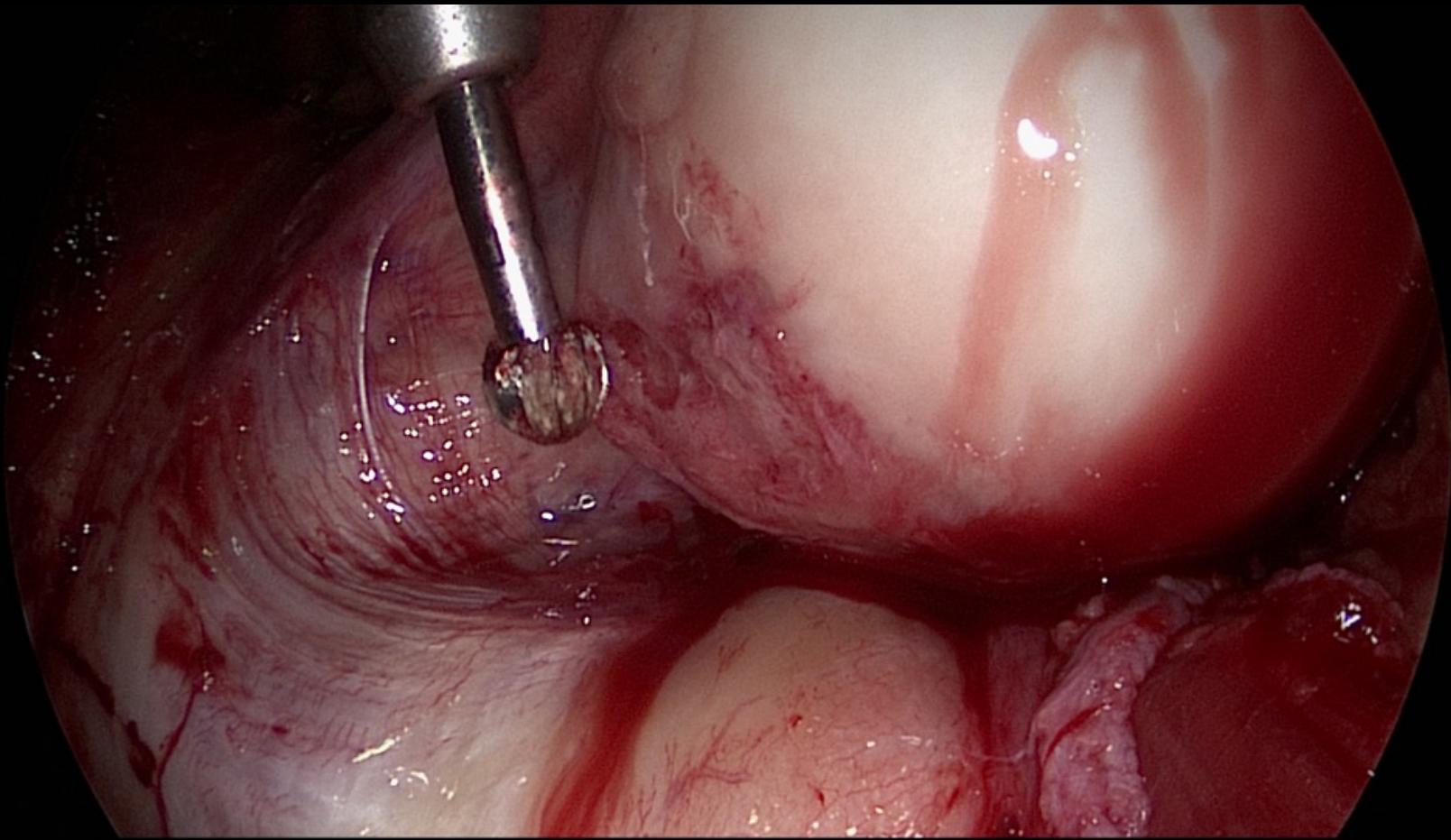
Posterior

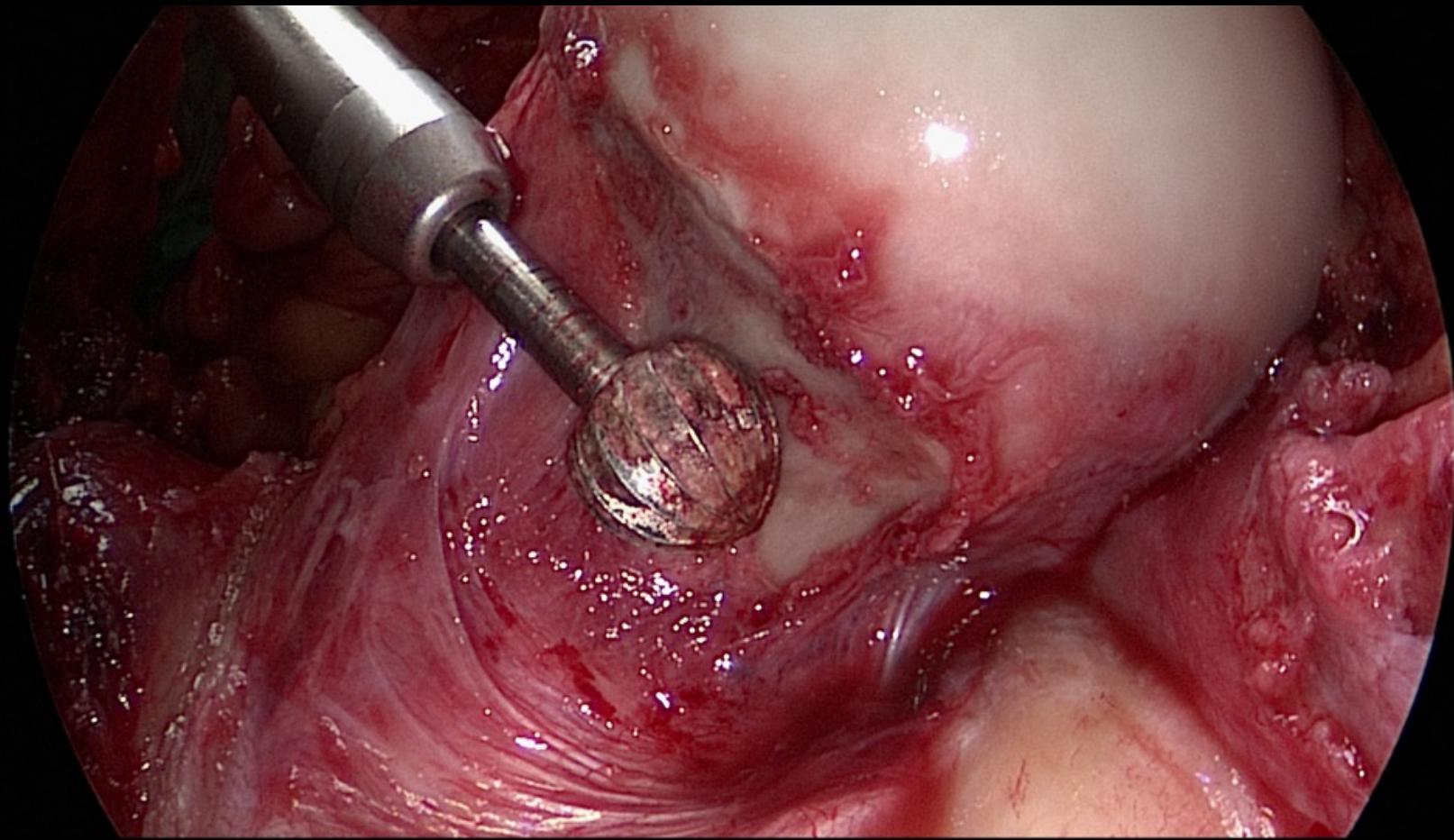
35 year old female patient with hip pain

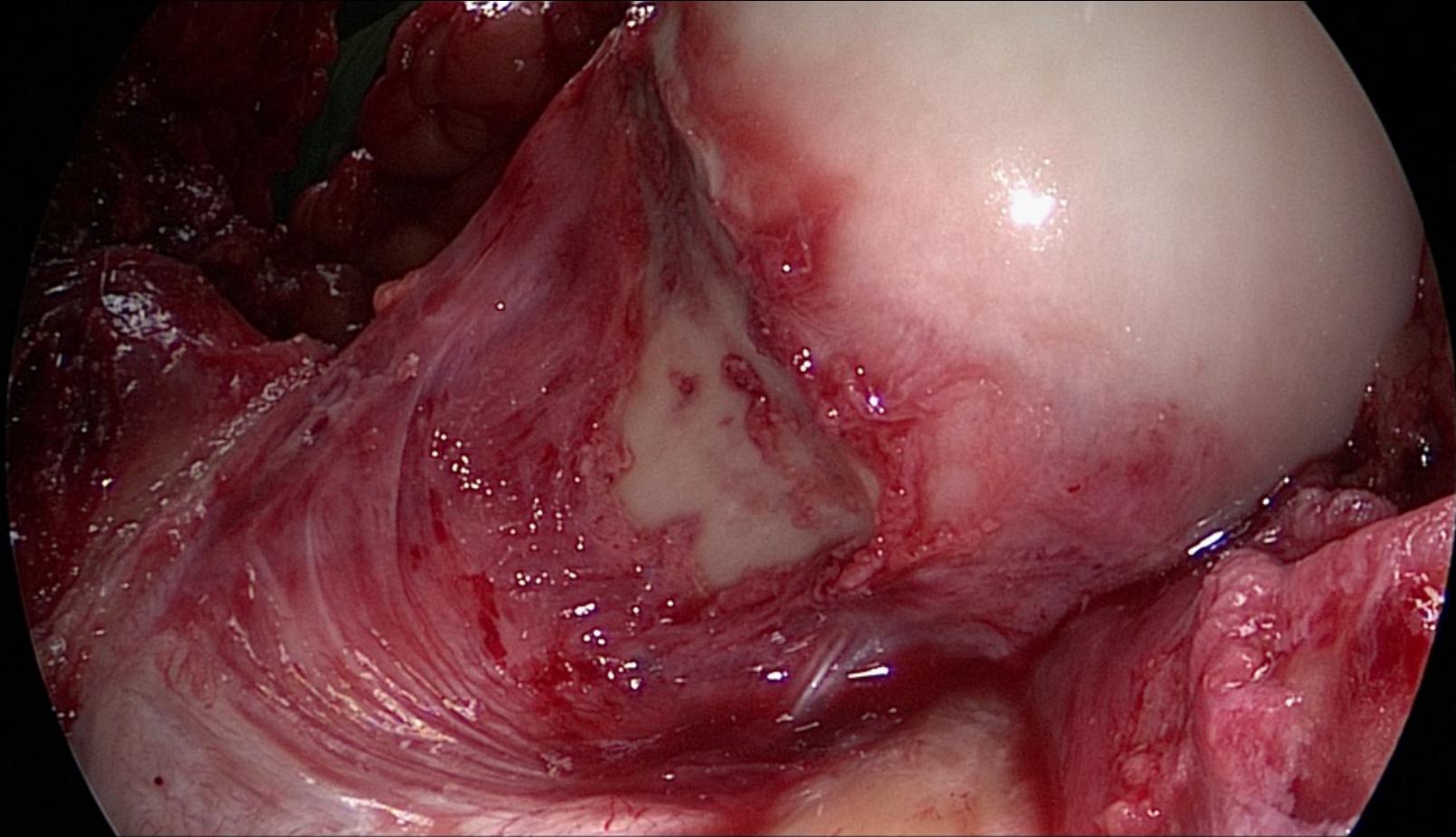












Postoperative



Preoperative



Conclusion

- > Surgical therapy of cam deformity
 - The course of the retinacular vessels must be taken into account.
 - Correction of the entire deformity: if not possible arthroscopically, then with open surgery
 - Indication depending on location and extension of cam deformity and relation to retinacular vessels