

Imagerie diagnostique et interventionnelle de l'épaule

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Sport

www.image-echographie.net

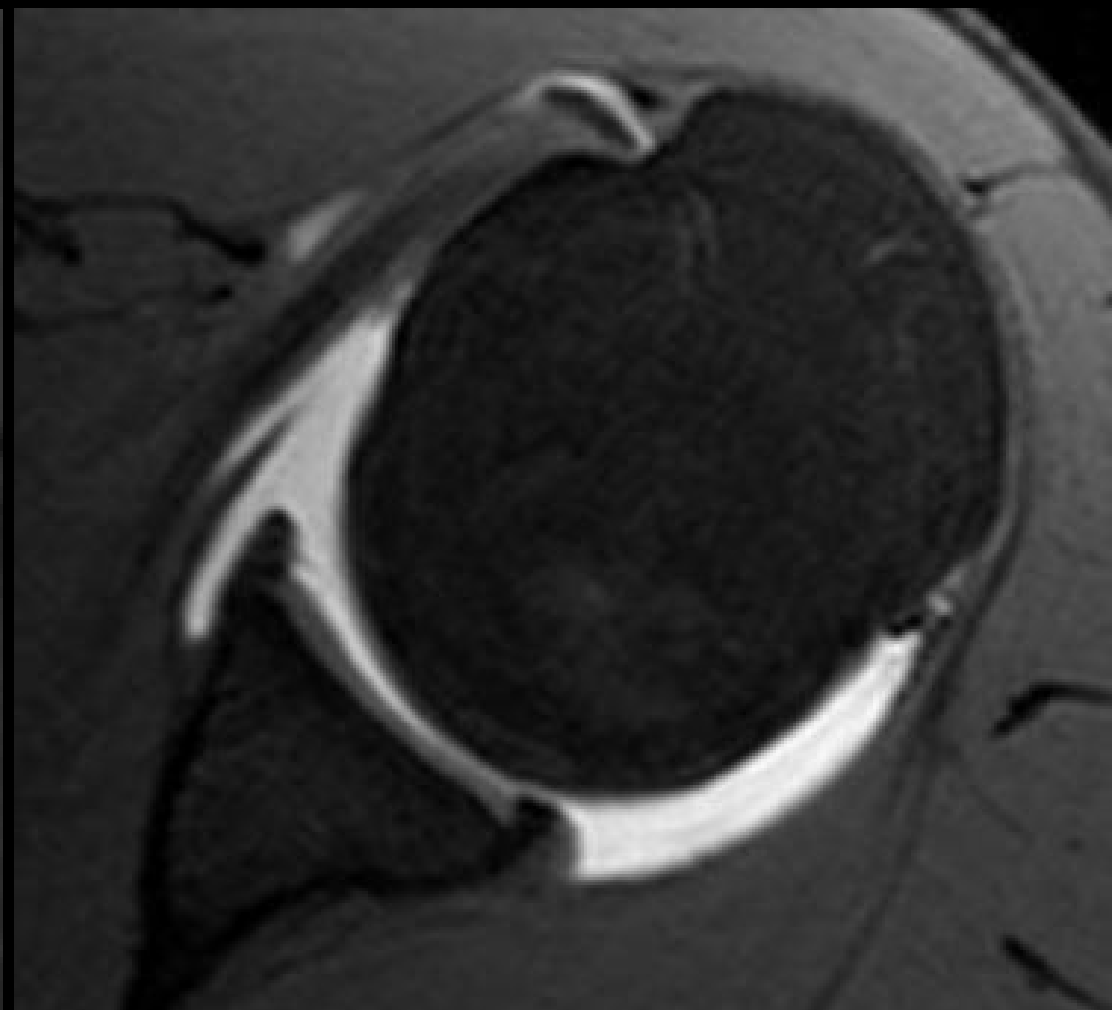
22ème journée CERM Aquitaine Poitou-Charentes
31/1/2009

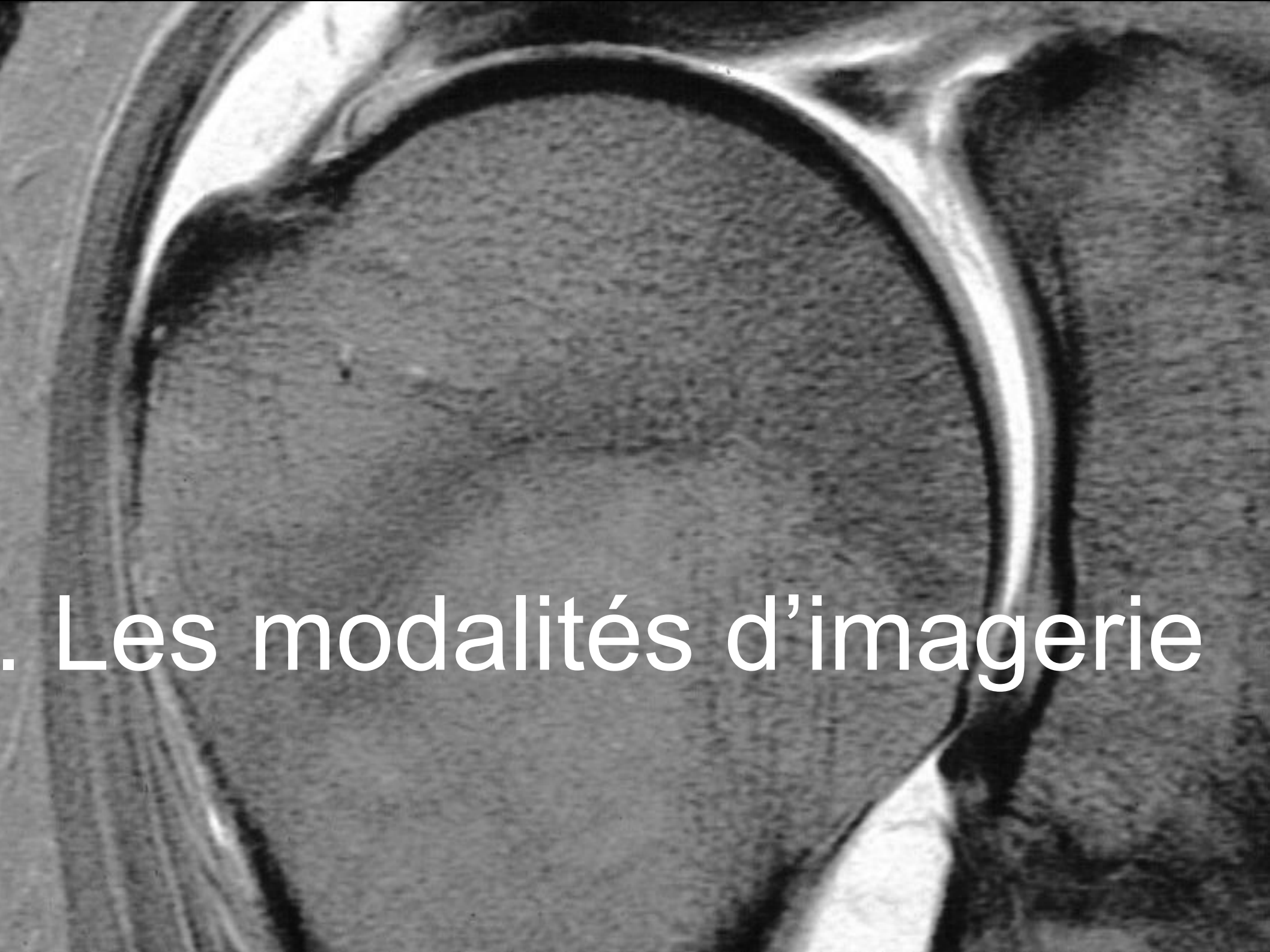


- Articulations: gléno-humérale, acromioclaviculaire, scapulo-thoracique
- Structures péri-articulaires: muscles, tendons, ligaments, labrum



- Stabilité = centrage de la tête = muscles
- Vulnérabilité capsuloligamentaire
- Pathologies: instabilité, hypersollicitation musculo-tendineuse



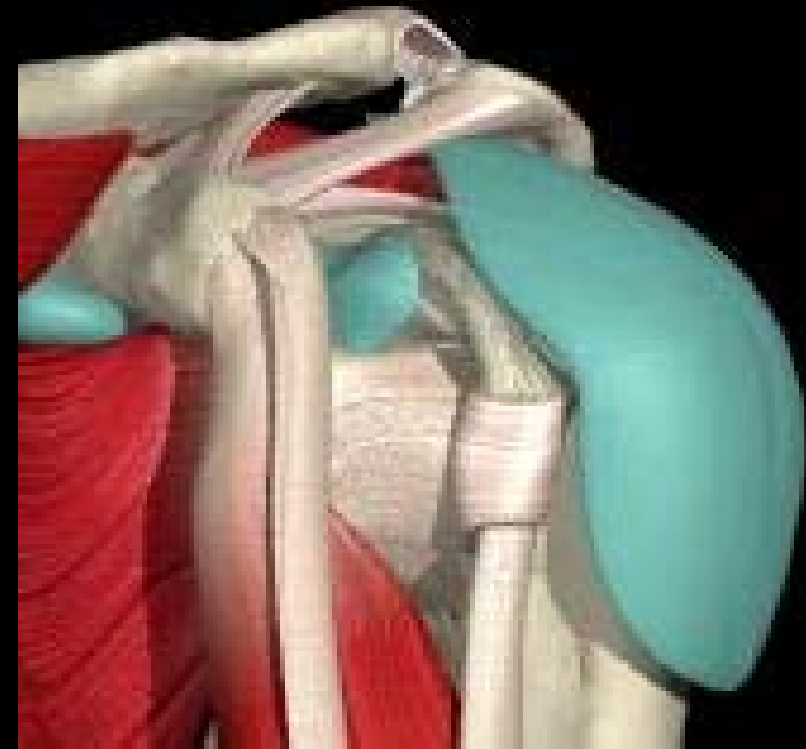
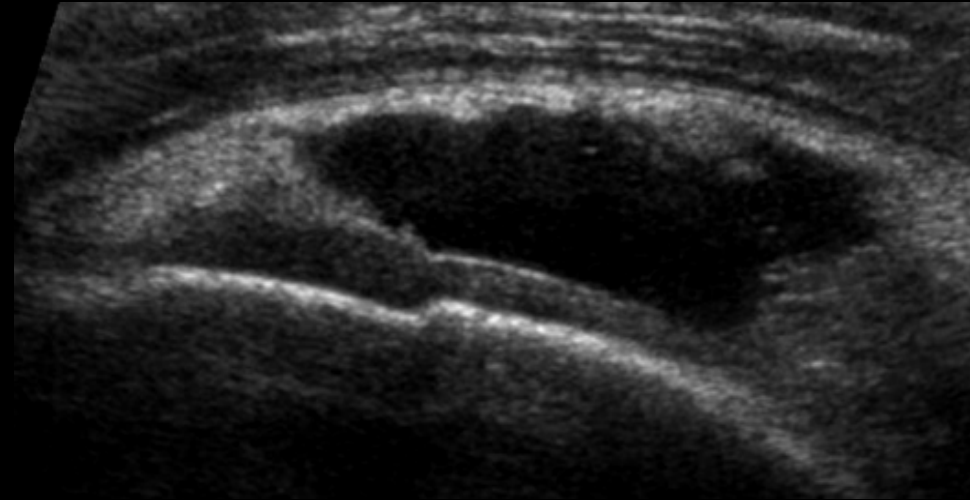
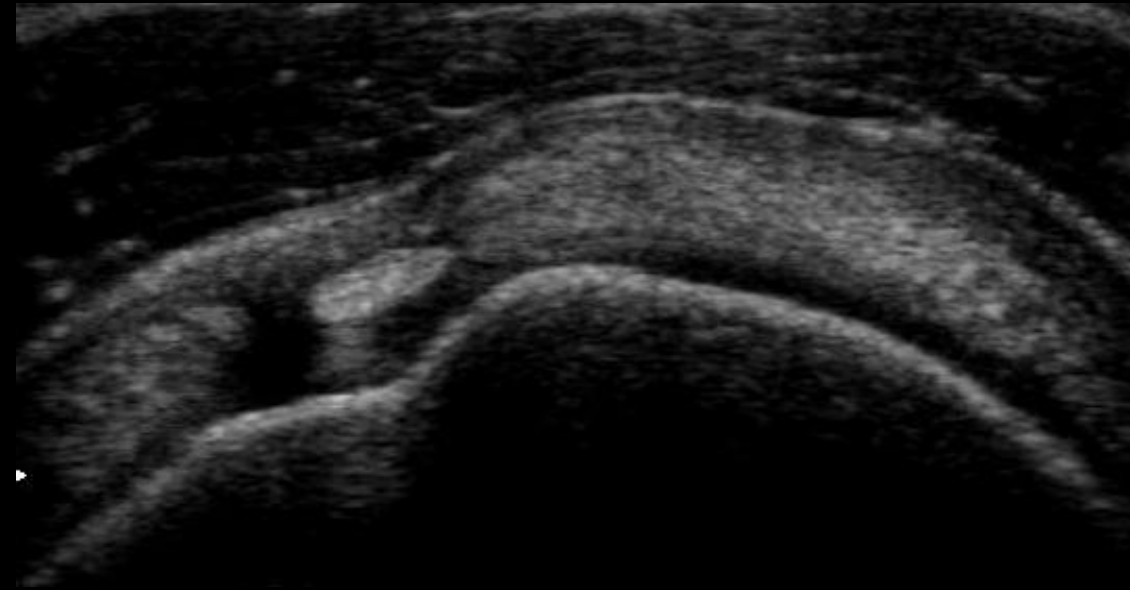


. Les modalités d'imagerie

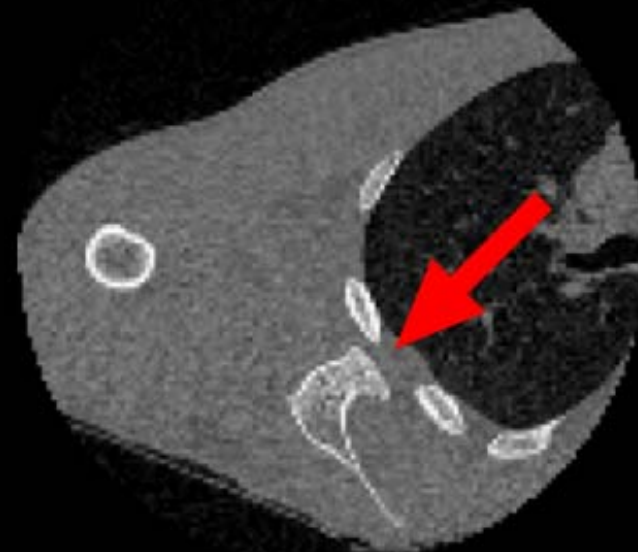
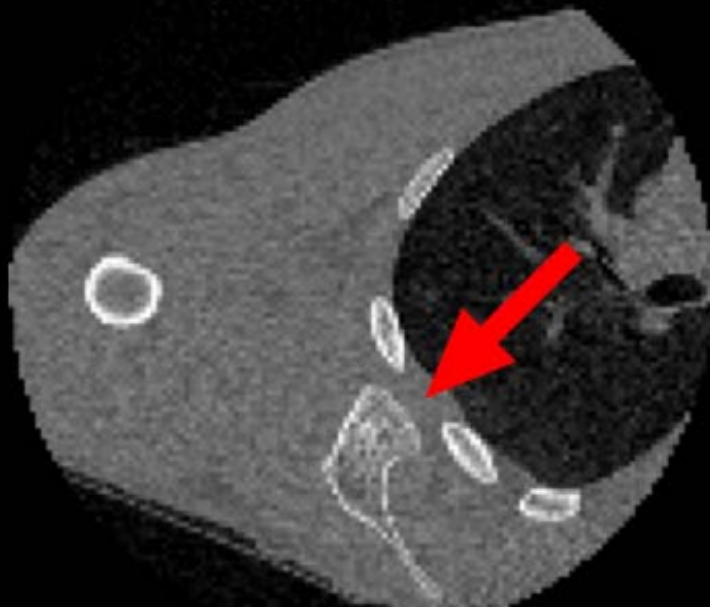
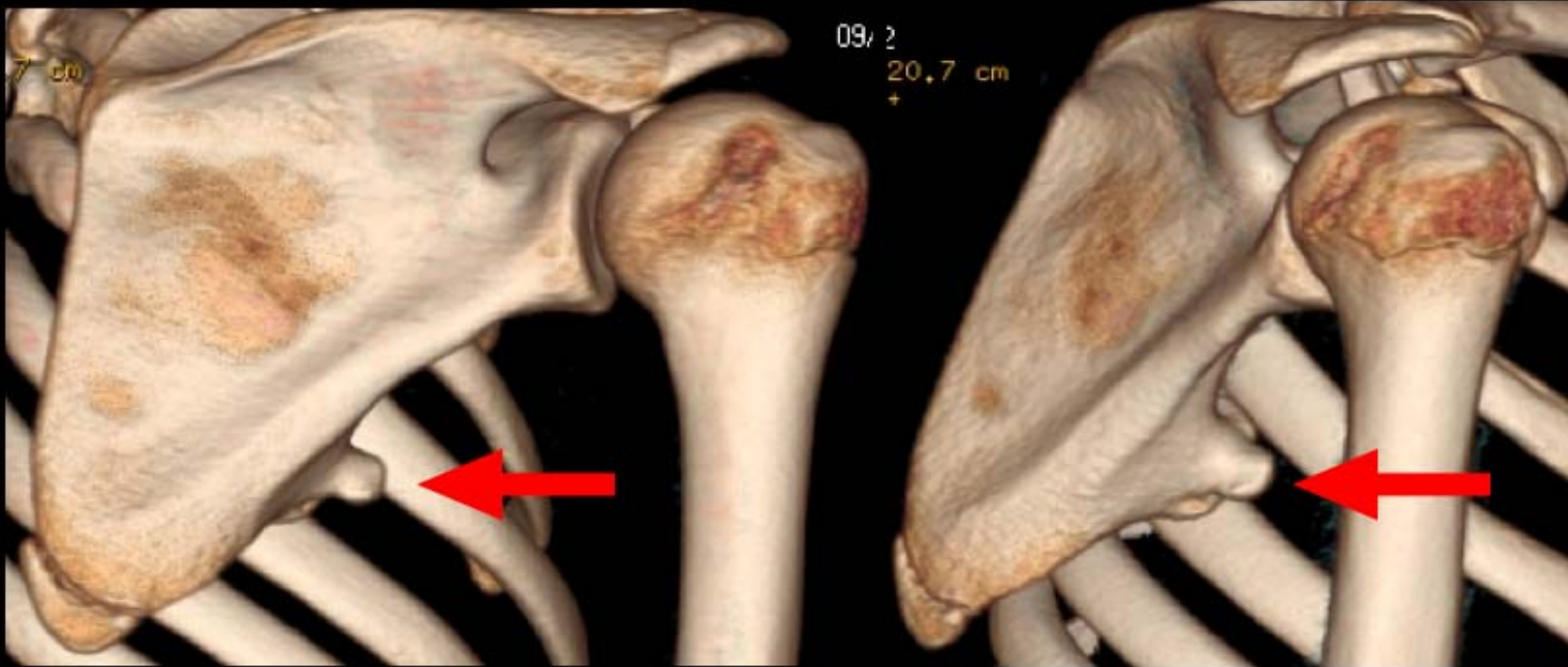
Bilan de première intention: Radiographies



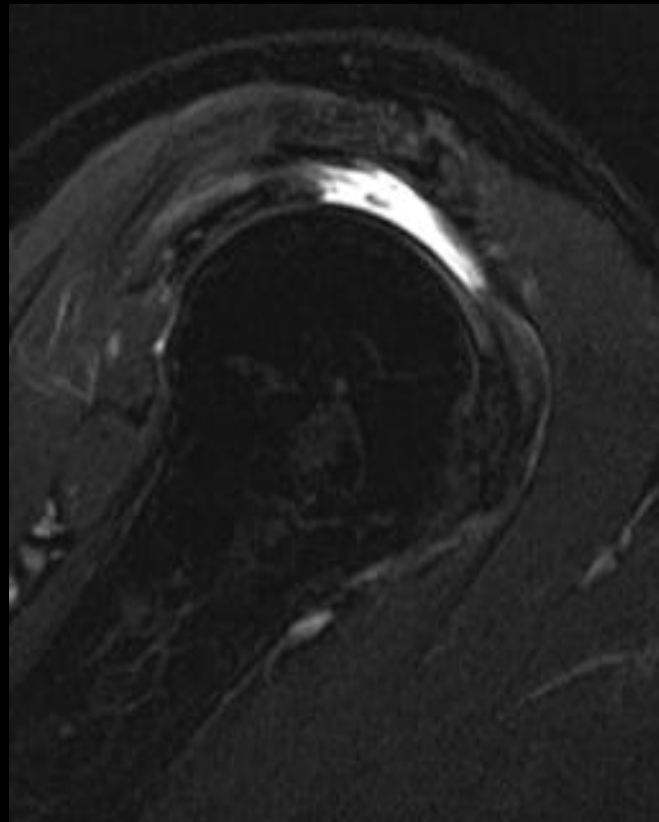
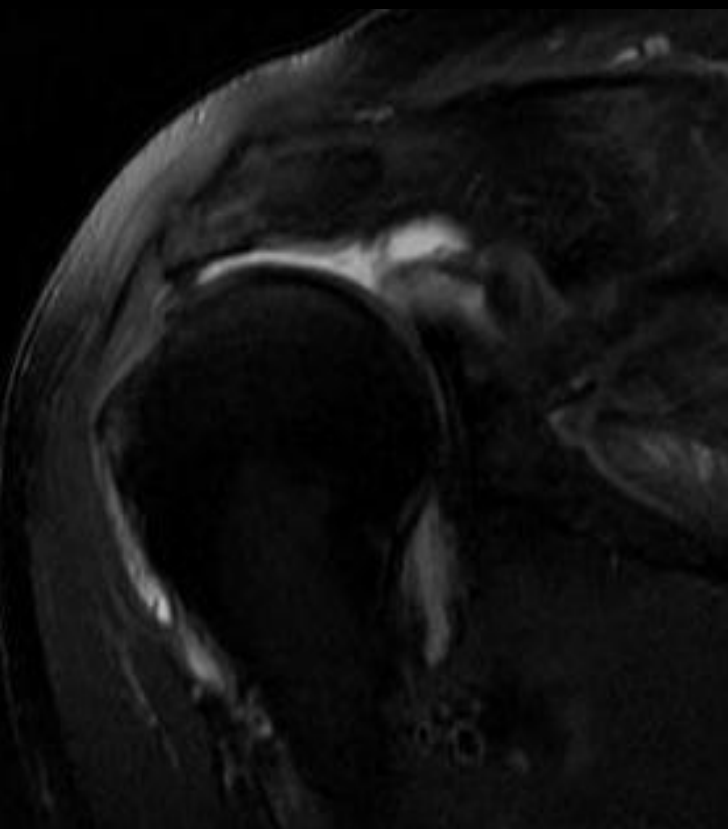
Bilan de première intention: Echographie



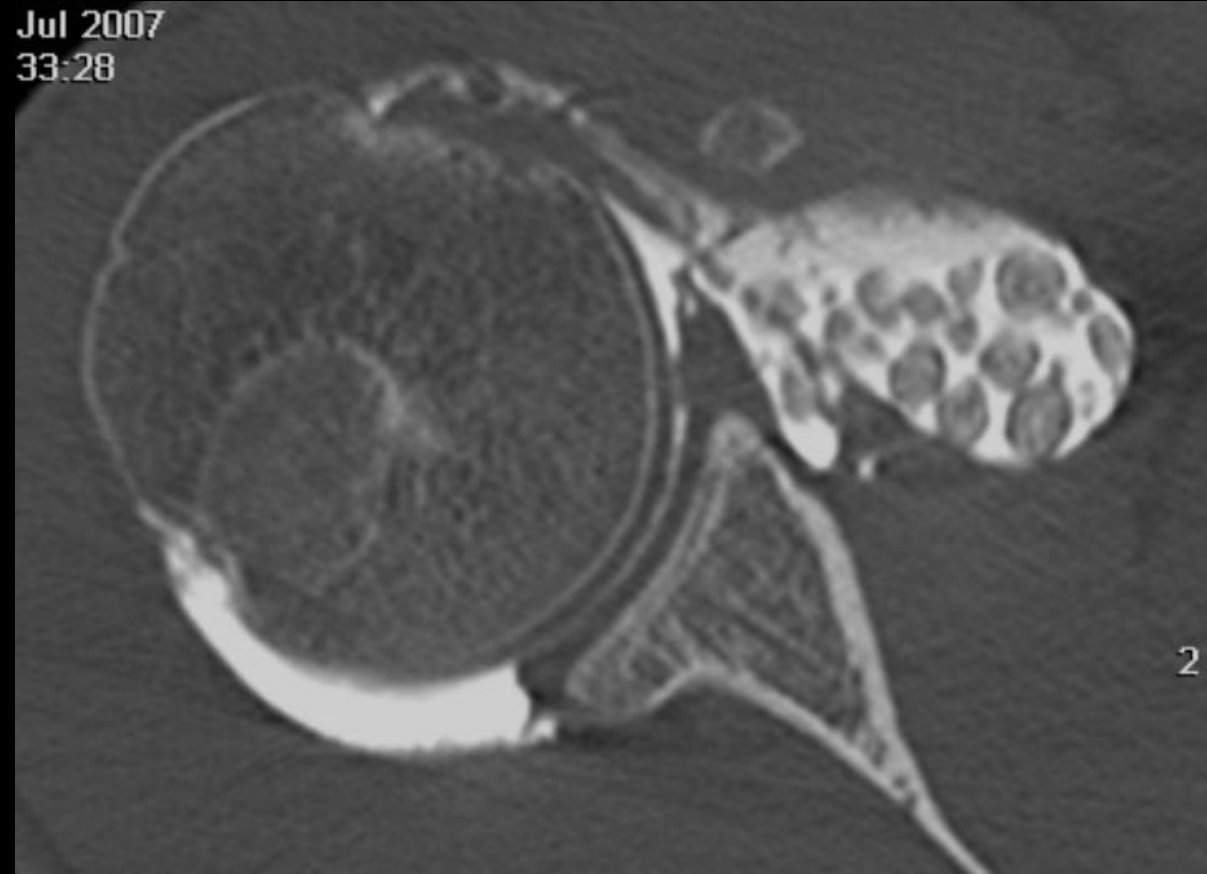
Imagerie en coupes: Scanner



Imagerie en coupes: IRM

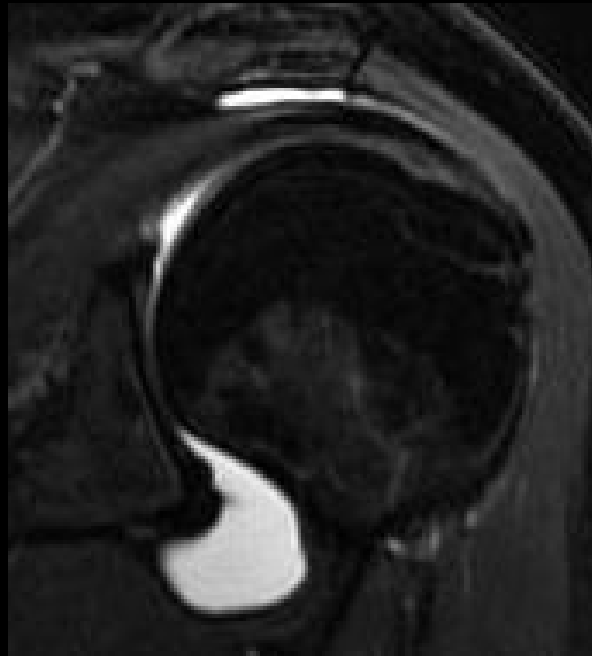
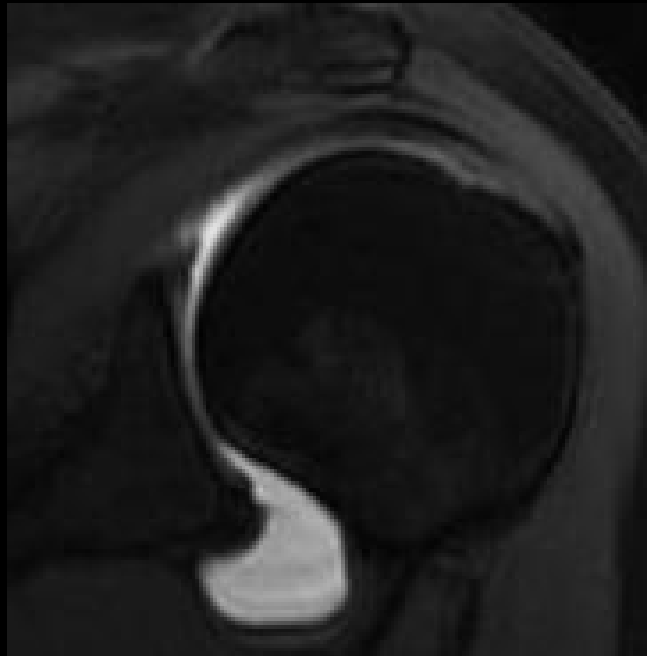
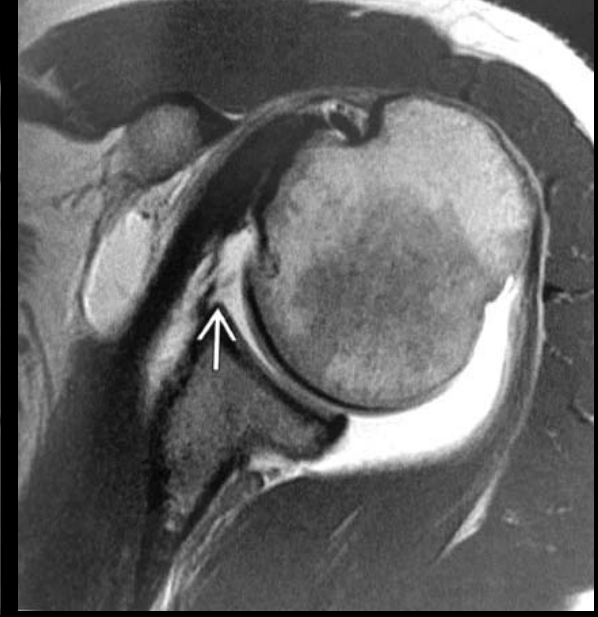
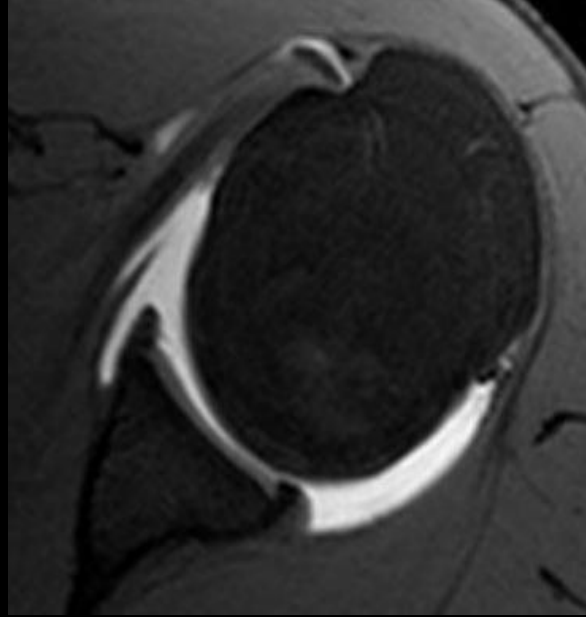


Imagerie en coupes: Arthroscanner

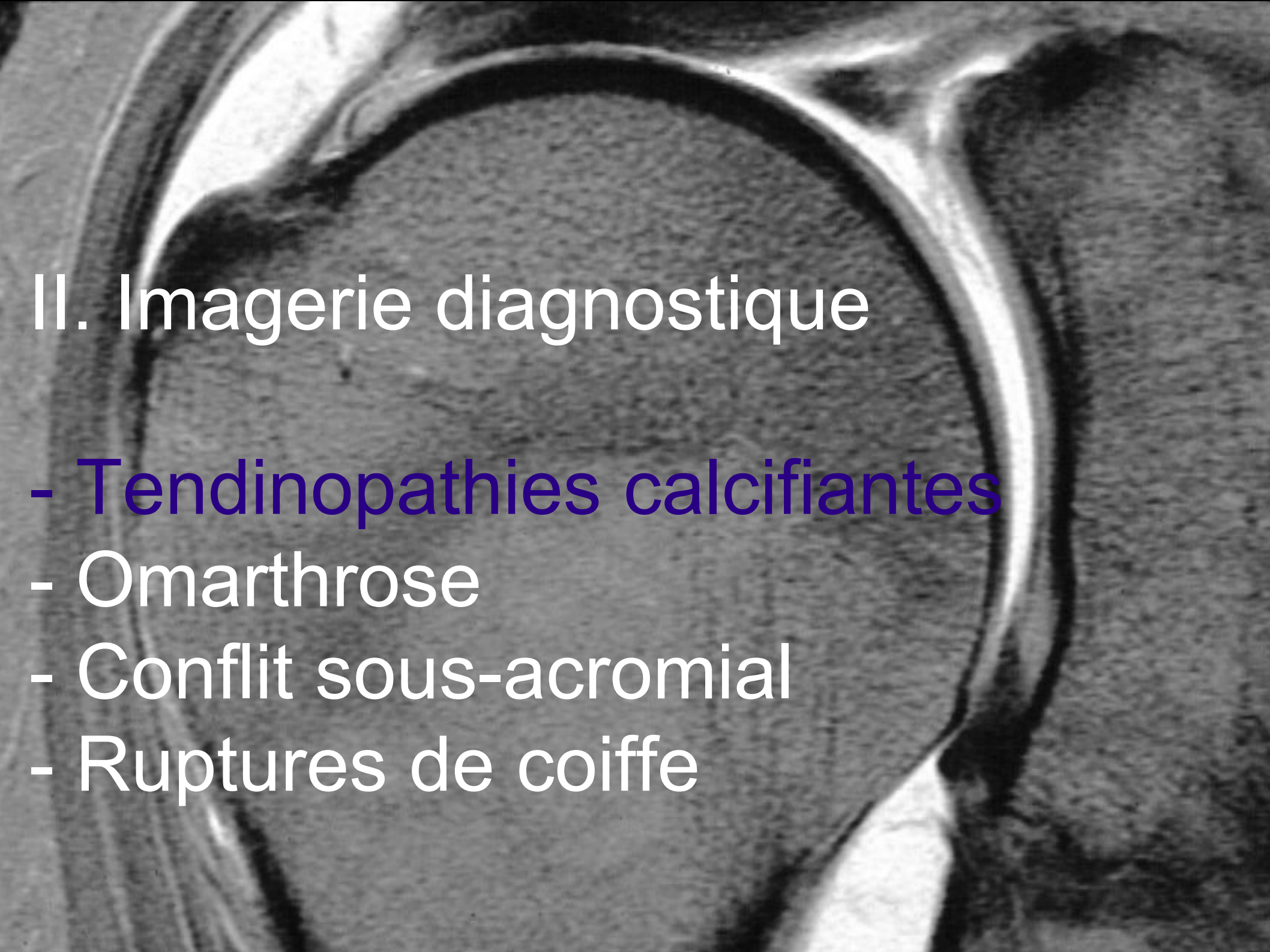


- Meilleure résolution spatiale +++
- Imagerie « indirecte »
- Irradiant

Imagerie en coupes: Arthro-IRM



- Meilleure résolution en contraste
- Plan capsulo-ligamentaire antérieur
- Visualisation directe de la coiffe
- Structures peri-articulaires (BSAD)

A grayscale MRI scan of a shoulder joint, showing the humeral head, glenoid, and surrounding soft tissue structures. The image is used as a background for the text.

II. Imagerie diagnostique

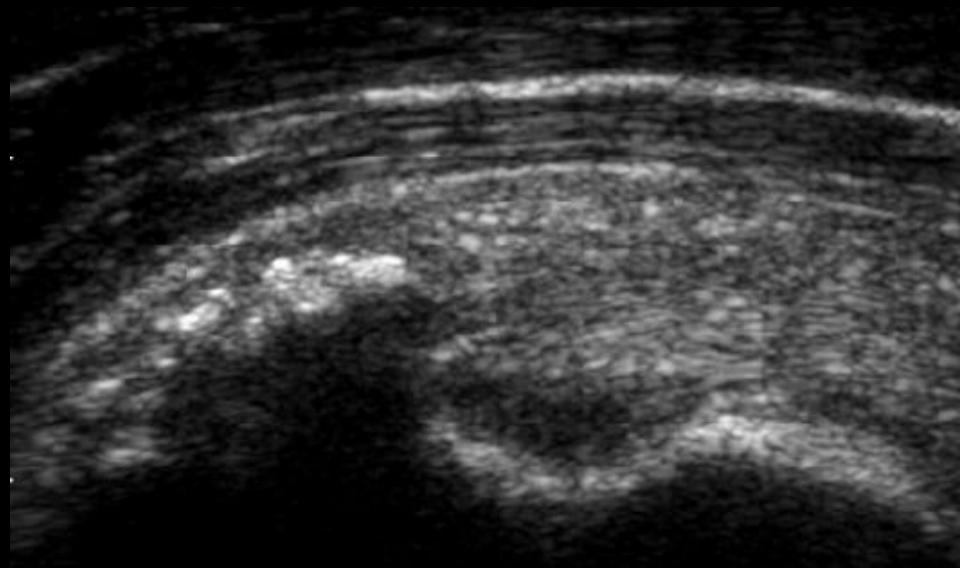
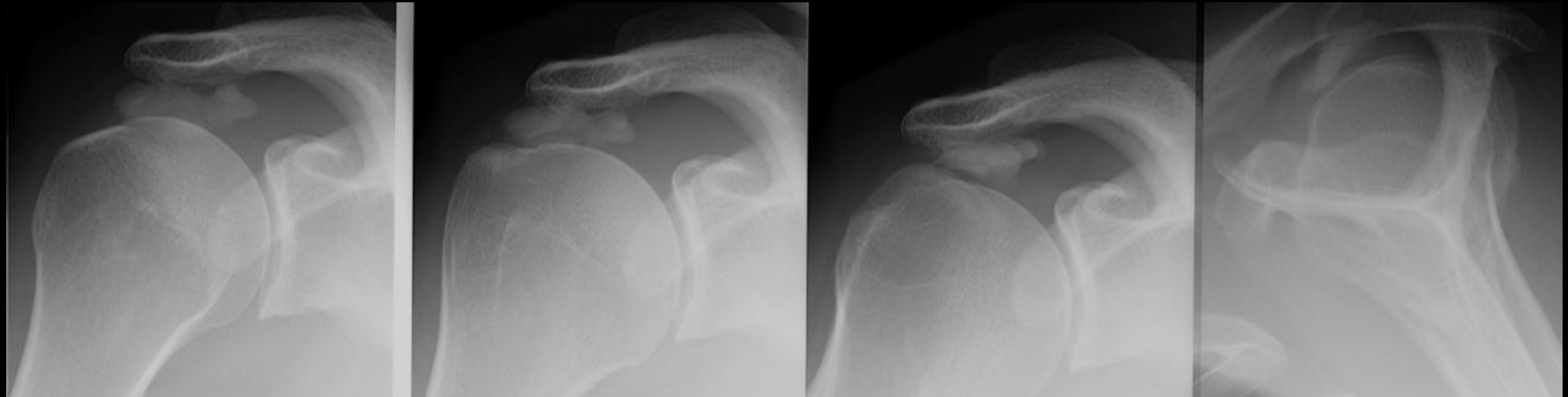
- **Tendinopathies calcifiantes**
- Omarthrose
- Conflit sous-acromial
- Ruptures de coiffe

Tendinopathies calcifiantes

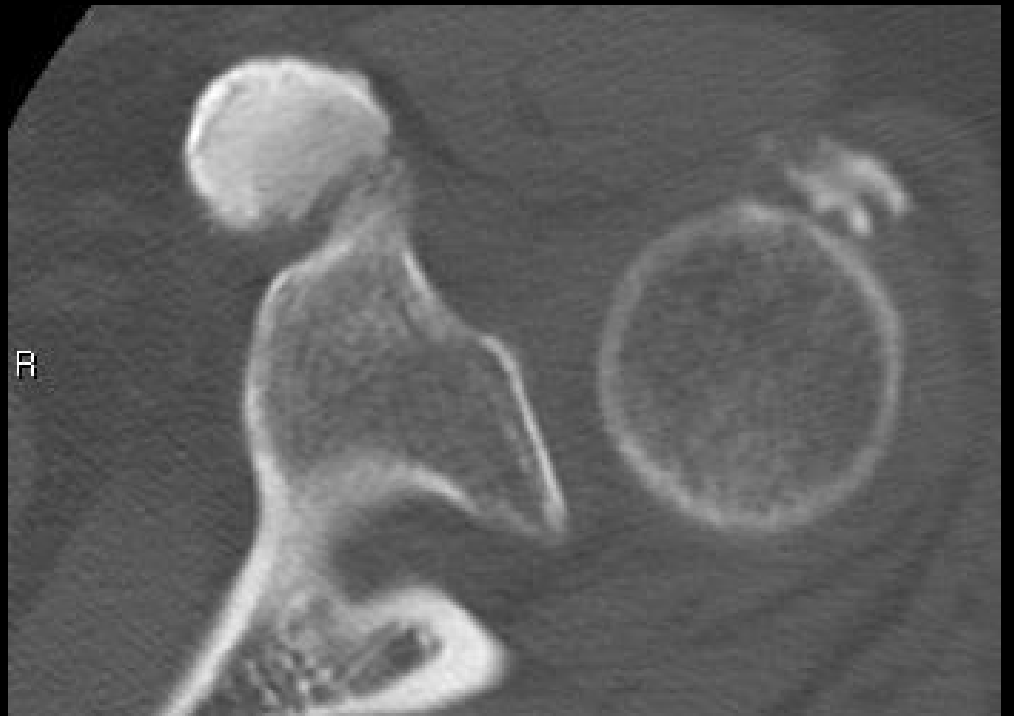
- prédominance féminine
- âge moyen
- dépôts d'hydroxyapatite +++
- SE > IE > SS
- Résorption spontanée
- Scapulalgies chroniques
- Migration = « épaule gelée hyperalgique »
 - calcification sous la BSAD
 - calcification dans la BSAD
 - liquéfaction
 - dans l'os
- Ponction-lavage-aspiration?

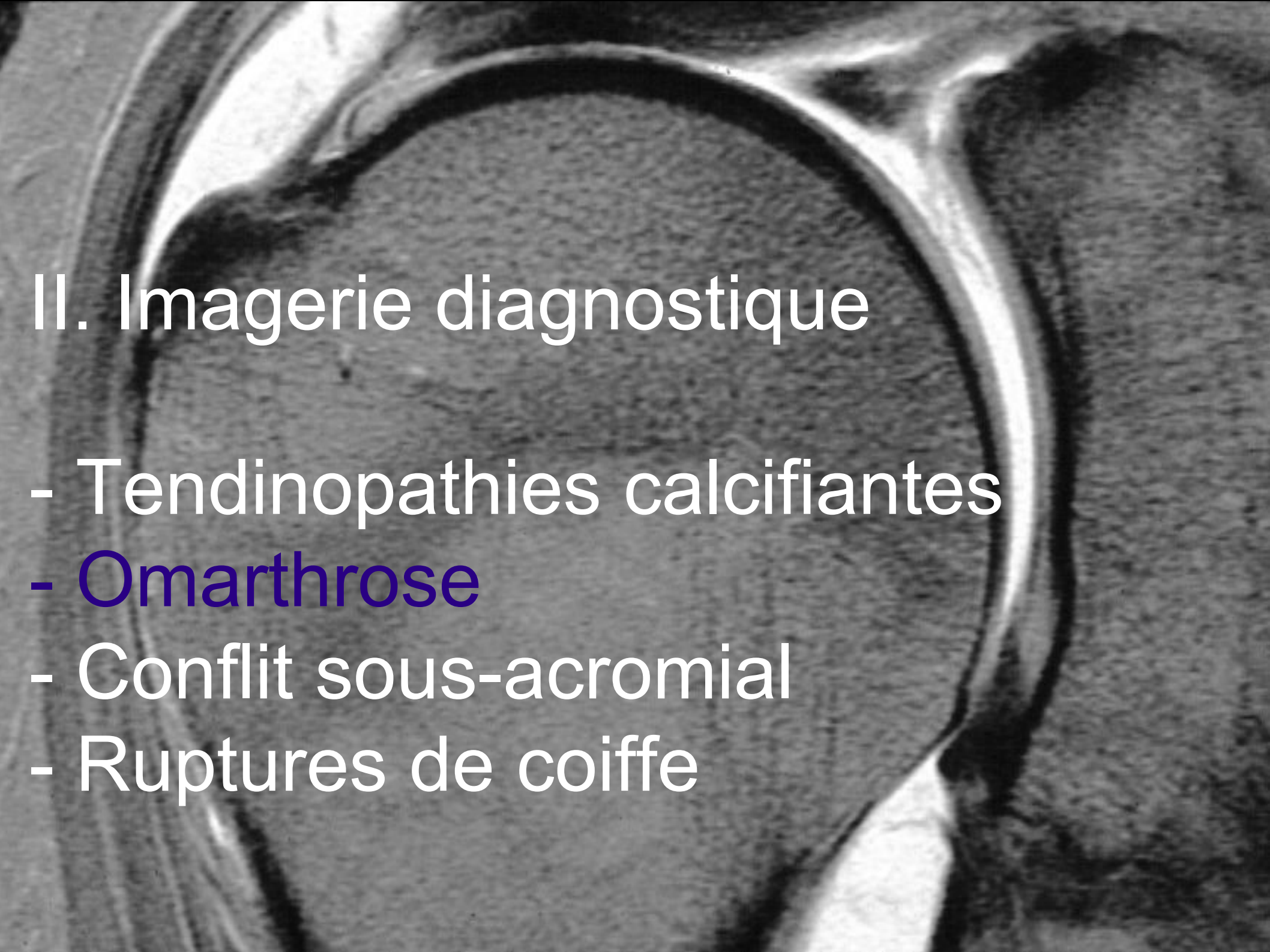


Tendinopathies calcifiantes



SUPRA EPINEUX ROTATION INTERNE CORO



A grayscale MRI scan of a shoulder joint, showing the humeral head, glenoid, and surrounding soft tissue structures. The image is used as a background for the text.

II. Imagerie diagnostique

- Tendinopathies calcifiantes
- **Omarthrose**
- Conflit sous-acromial
- Ruptures de coiffe

Omarthrose primitive

- = Arthrose à coiffe continente
- 2% de l'ensemble de la pathologie arthrosique
- Primitive ou secondaire (ostéonécrose, arthrite, fracture, intervention chirurgicale pour instabilité...)



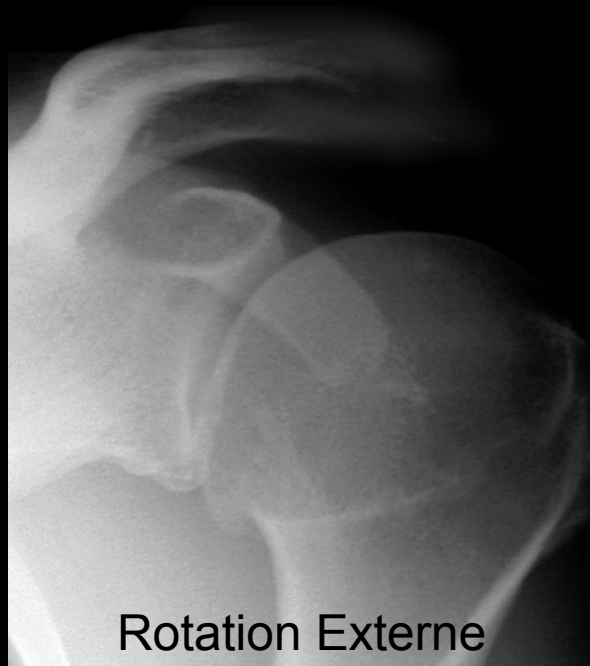
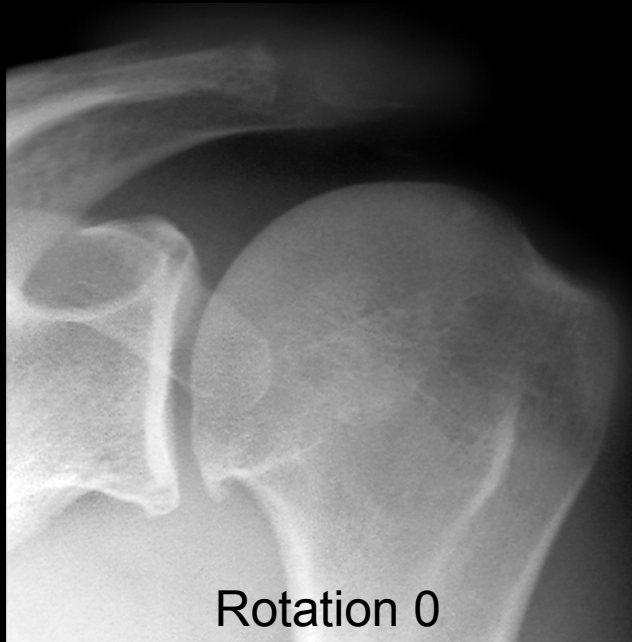
Omarthrose primitive

- *Se définit par :*
- Une ostéophytose céphalique humérale .
- Un espace sous acromial respecté.
- Un pincement tardif de l'interligne gléno-huméral.
- Evolution vers une excentration antéro-postérieure avec subluxation postérieure.



Omarthrose primitive: radiographies

- Ostéophytes : le long des attaches capsulaires (bord antéro-inférieur de l'articulation)
- Pincement gléno-huméral : cliché en rotation externe+++
- Ostéocondensation sous-chondrale
- Respect de l'espace sous-acromial
- Aplatissement de la tête humérale



Omarthrose excentrée

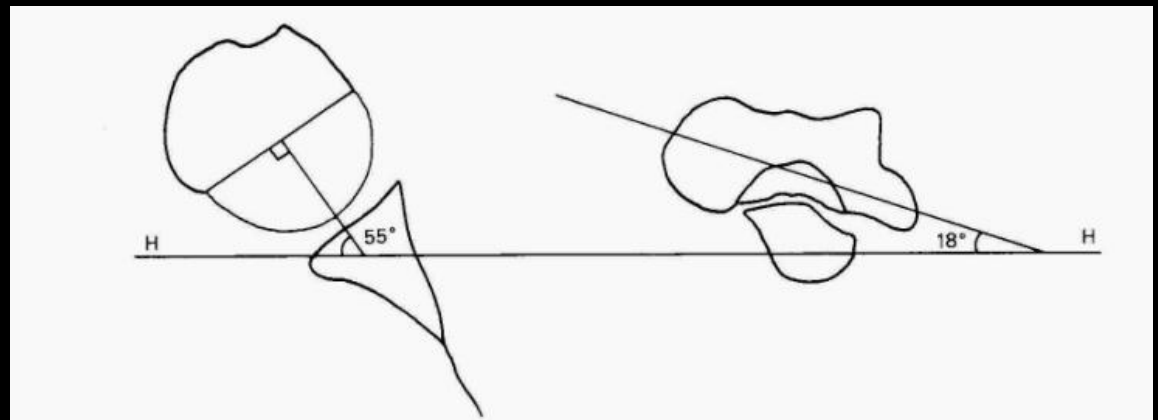
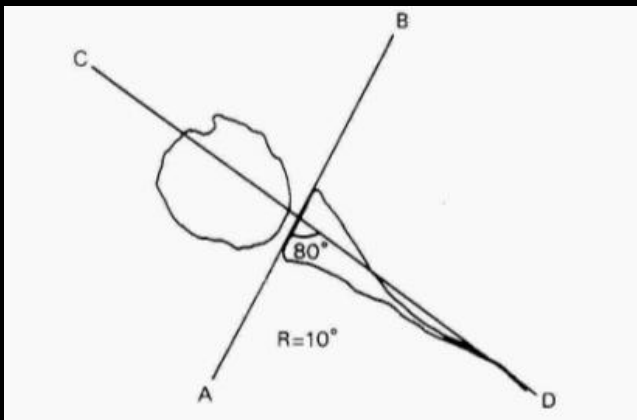
ou omarthrose secondaire à une rupture de coiffe

- *Se définit radiologiquement par :*
- Un pincement de l'ESA.
- Une arthropathie sous-acromiale avec remodelage du tubercule majeur.
- *Ses signes peuvent se compliquer par :*
- La constitution d'une néoarticulation acromio humérale.
- Une chondrolyse gléno-humérale

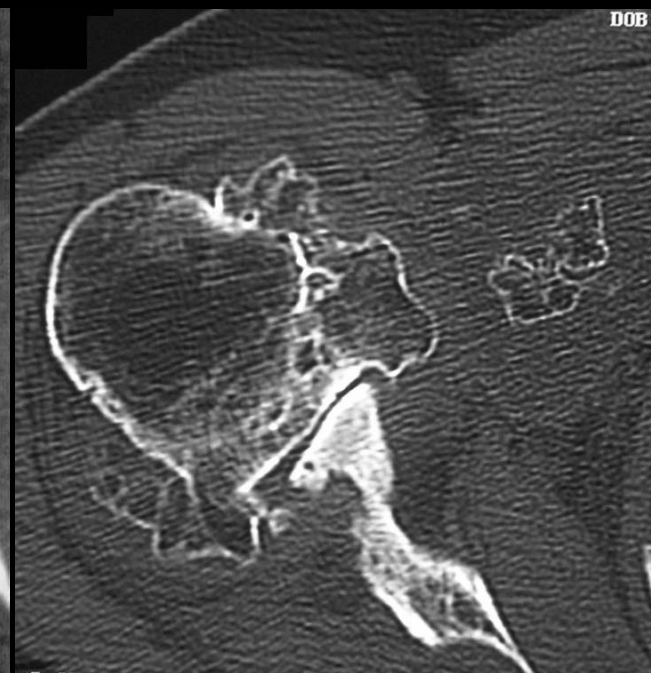
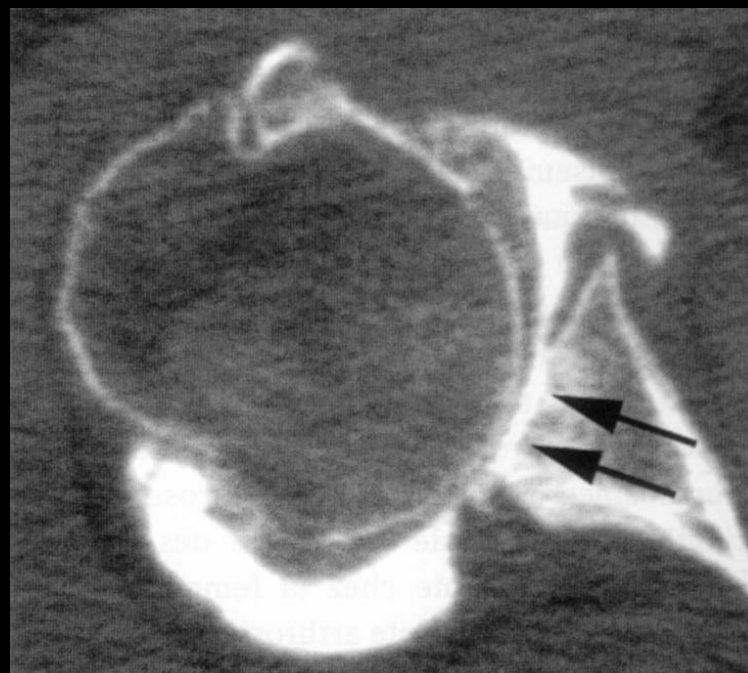


Omarthrose: imagerie en coupes

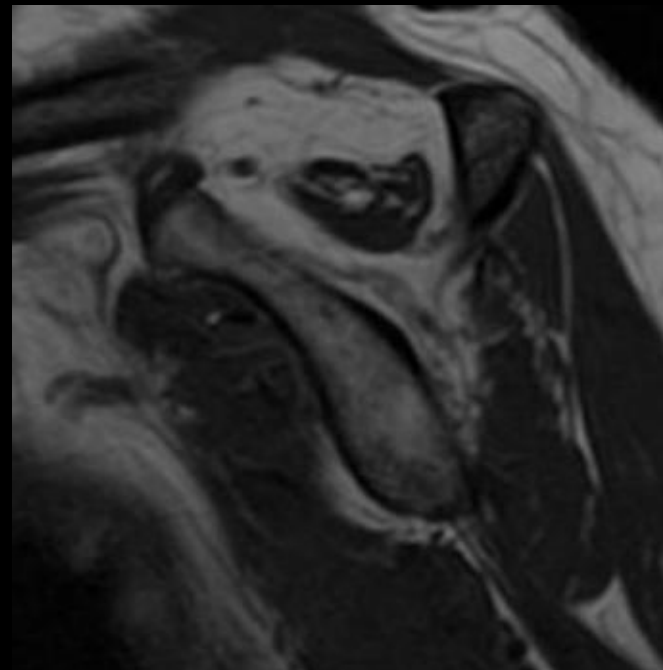
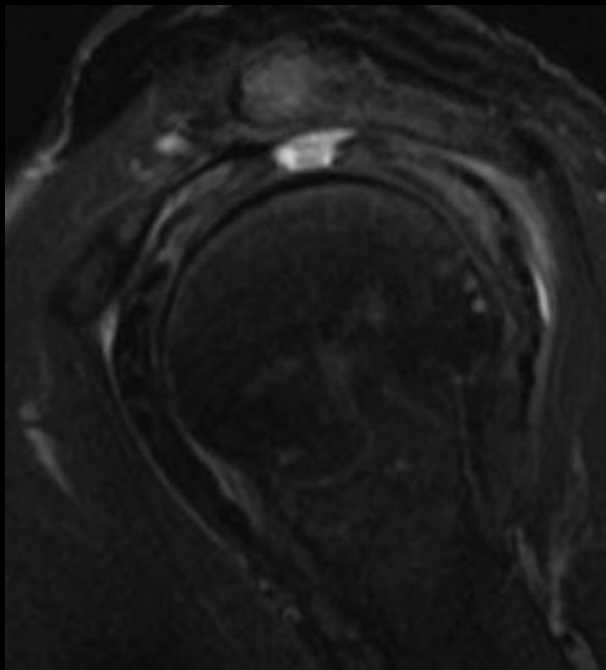
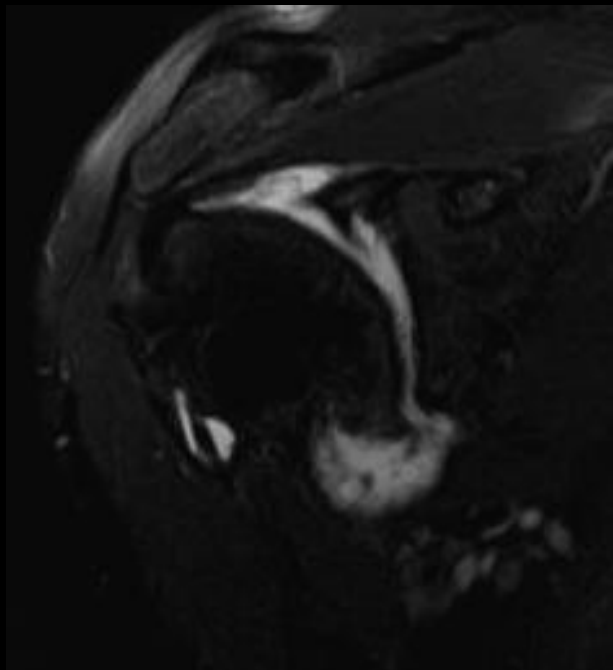
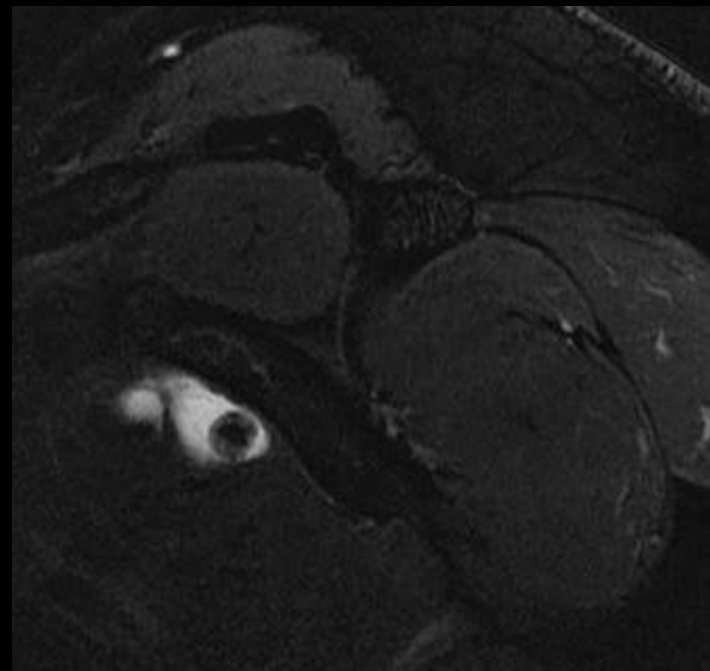
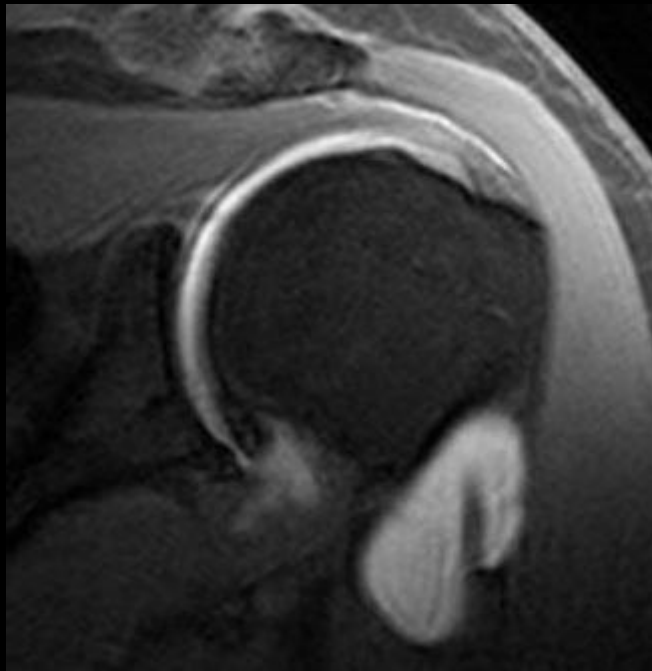
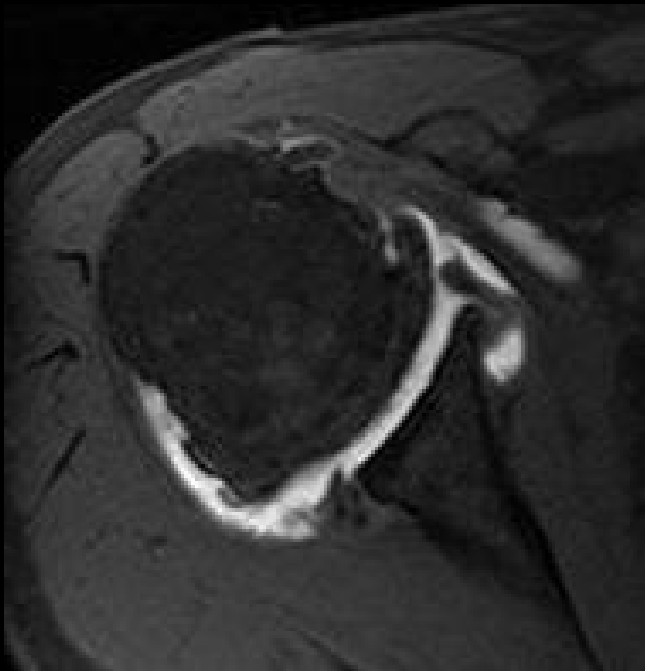
- *Permet d'apprécier :*
- Le capital osseux de la glène $\Rightarrow$ choix de la prothèse.
- Une subluxation postérieure de la tête humérale.
- Un excès de rétroversion glénoïdale ($N \leq 10^\circ$).
- Une diminution de la rétroversion humérale ($25^\circ < N < 40^\circ$).
- L'importance de la chondrolyse.
- La présence d'ostéochondromes.
- Une rupture de la coiffe des rotateurs (7 a 23%).
- L'atteinte acromio claviculaire.



Omarthrose: Arthroscanner



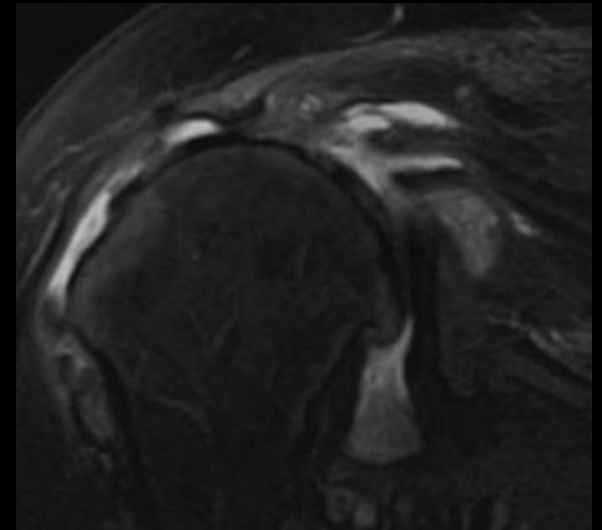
Omarthrose: IRM

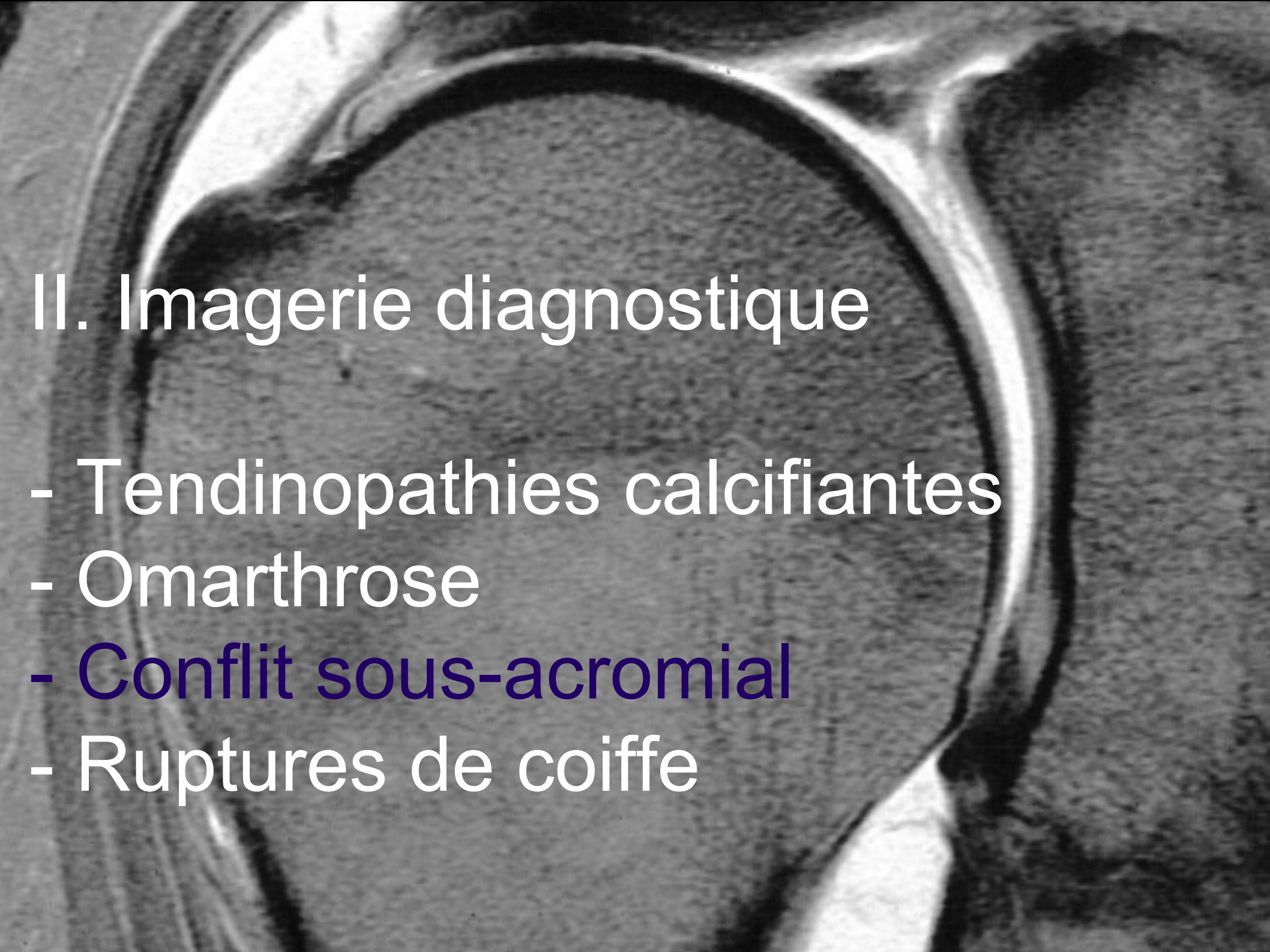


Omarthrose: bilan pré-chirurgical

Le choix du type de prothèse dépend:

- Du stock osseux glénoïdal.
- De l'état de la coiffe des rotateurs.
- De l'âge du patient.



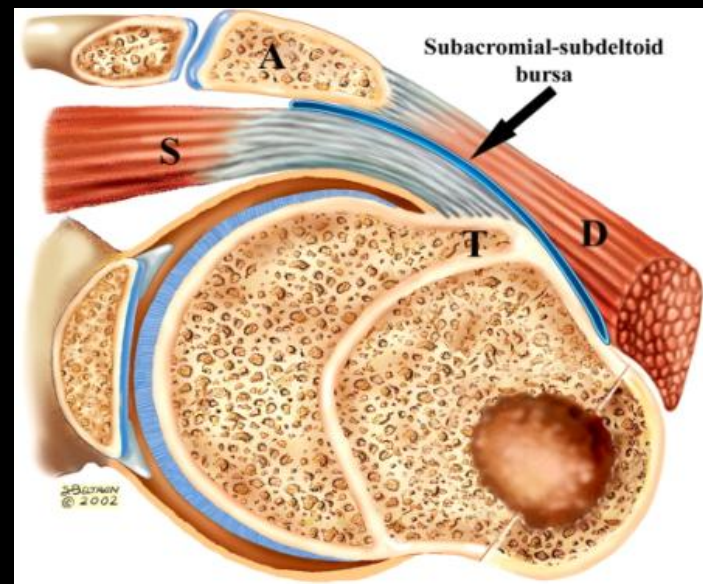
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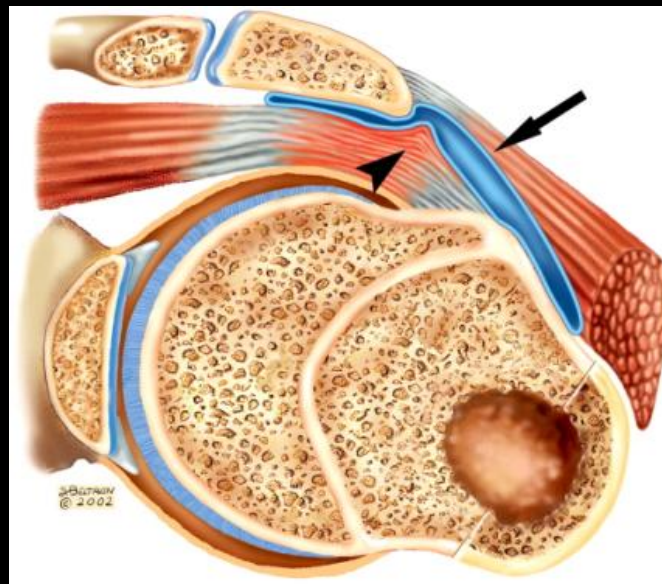
- Tendinopathies calcifiantes
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- **Conflit sous-acromial**
- Ruptures de coiffe

Conflit sous-acromial

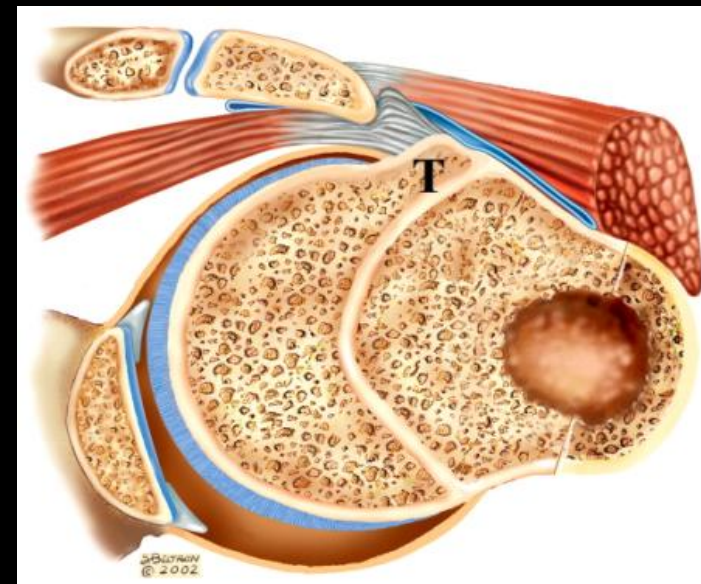
- le plus fréquent des conflits
- inadéquation contenant/contenu



**Grade 1: cause osseuse
= Arthropathie AC**



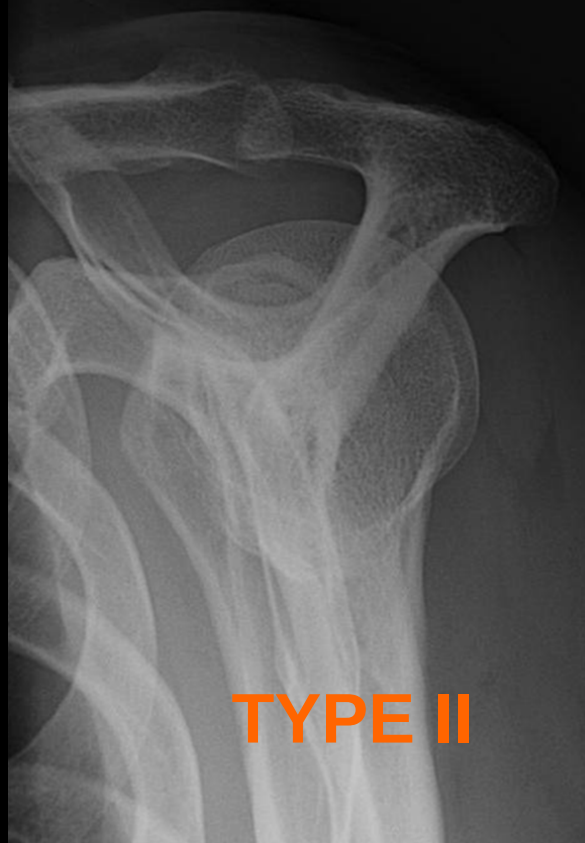
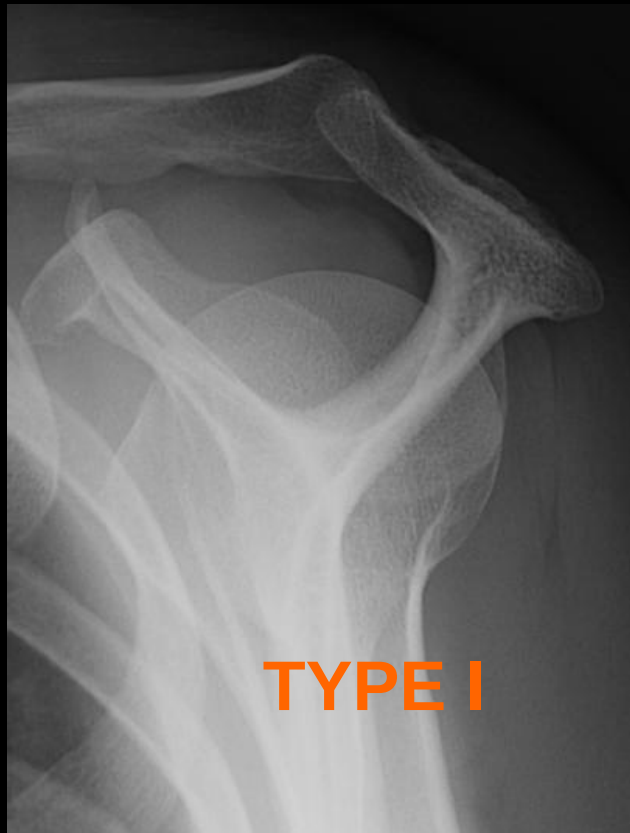
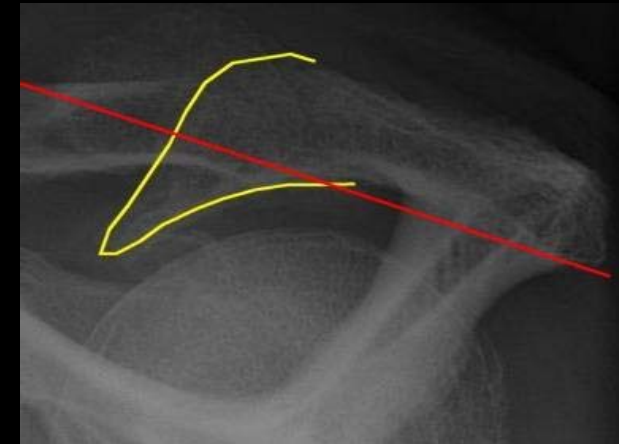
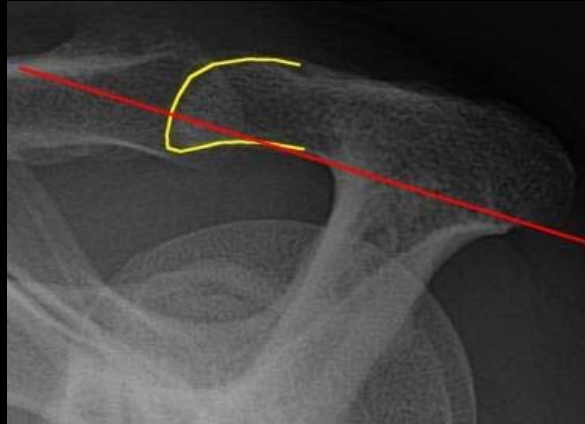
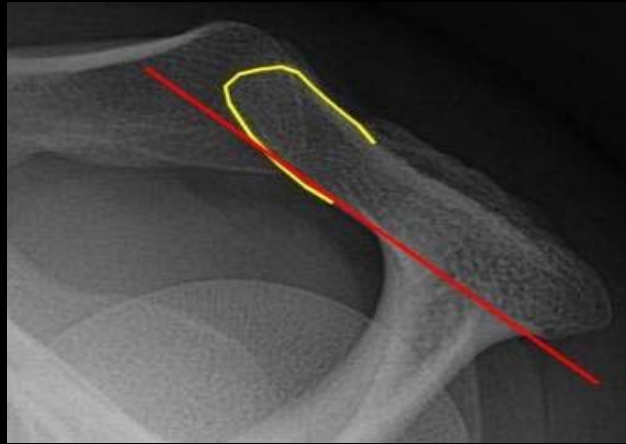
Grade 2: cause tendineuse



**Grade 3:
migration supérieure
de la tête humérale**

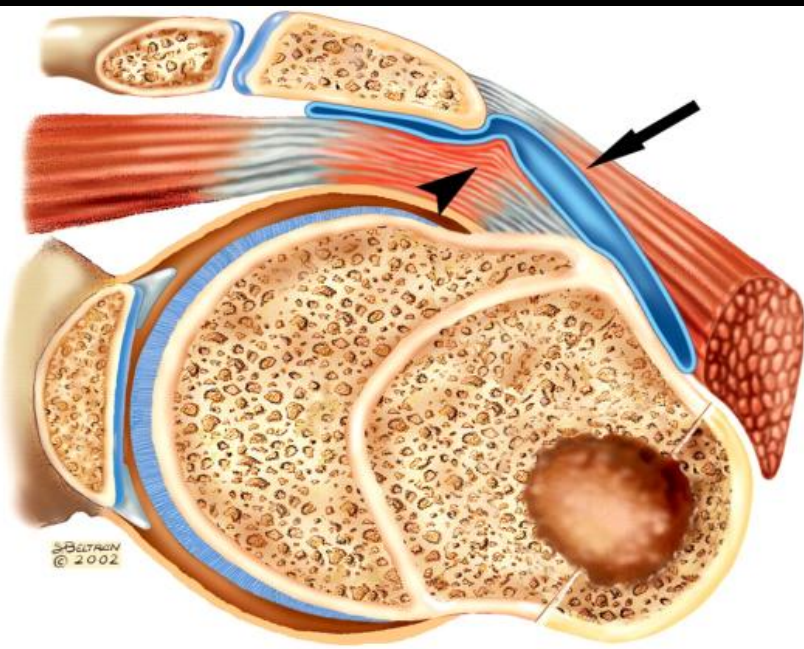
Conflit sous-acromial

Radiographies: Classification de Bigliani



Conflit sous-acromial

Echographie

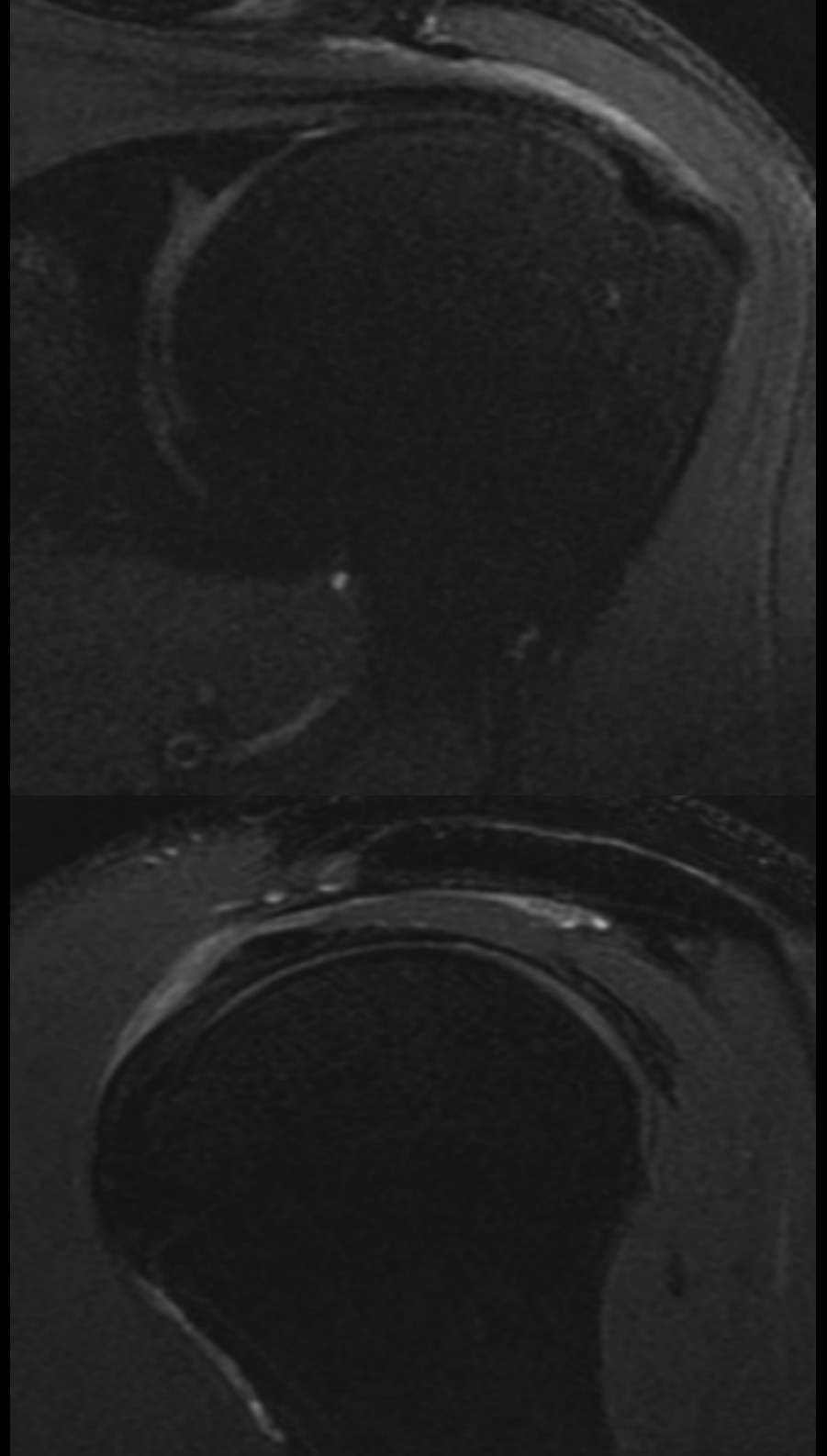
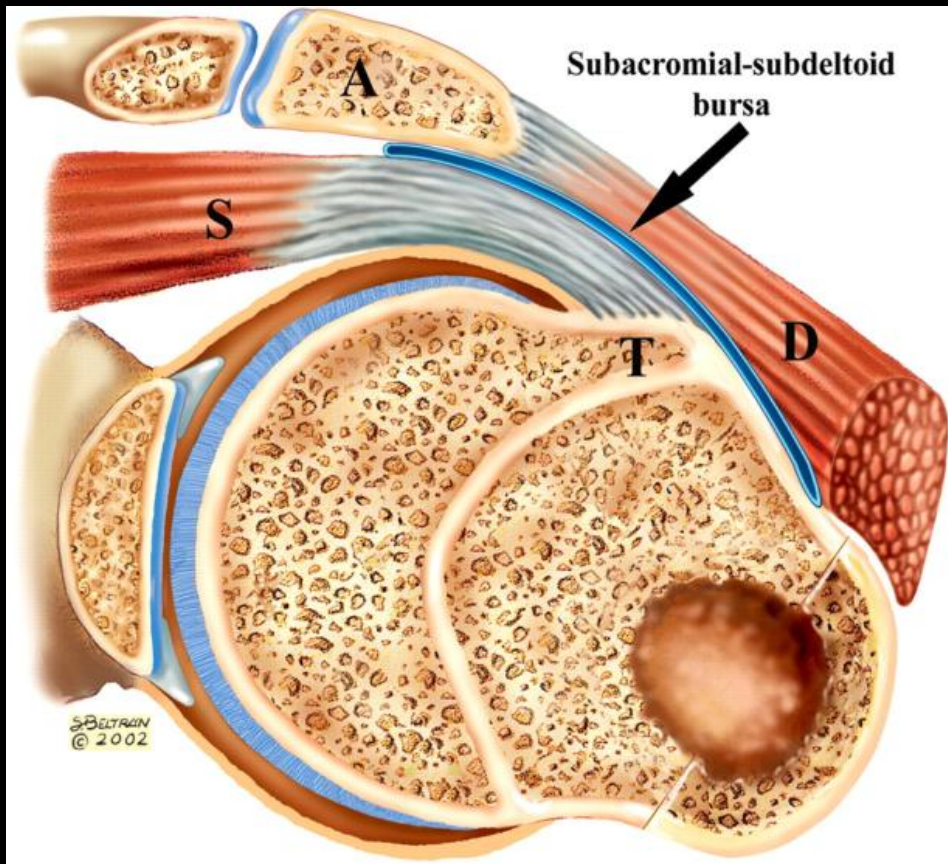


2D
87%
C 57
P Bas
Rés



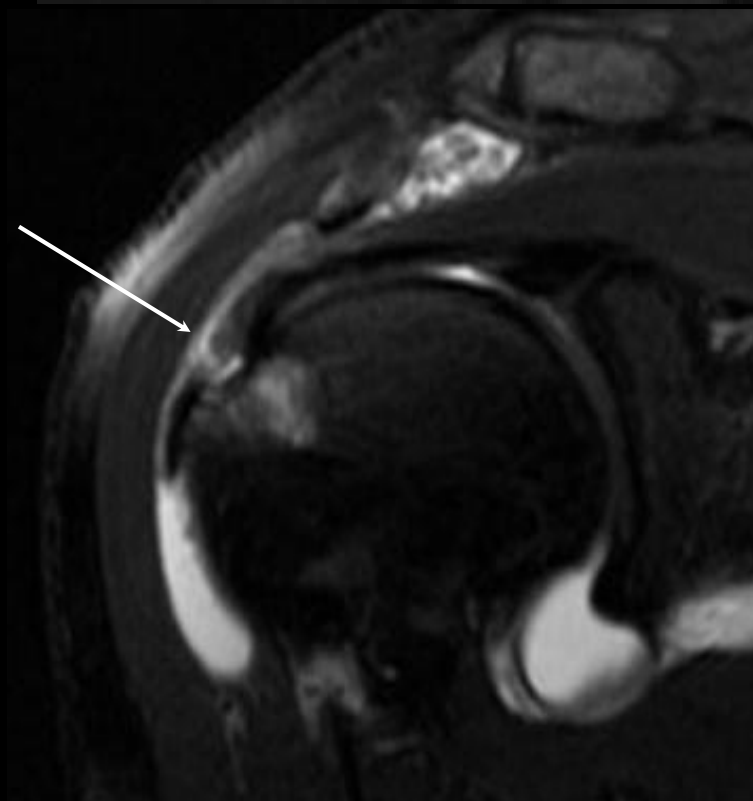
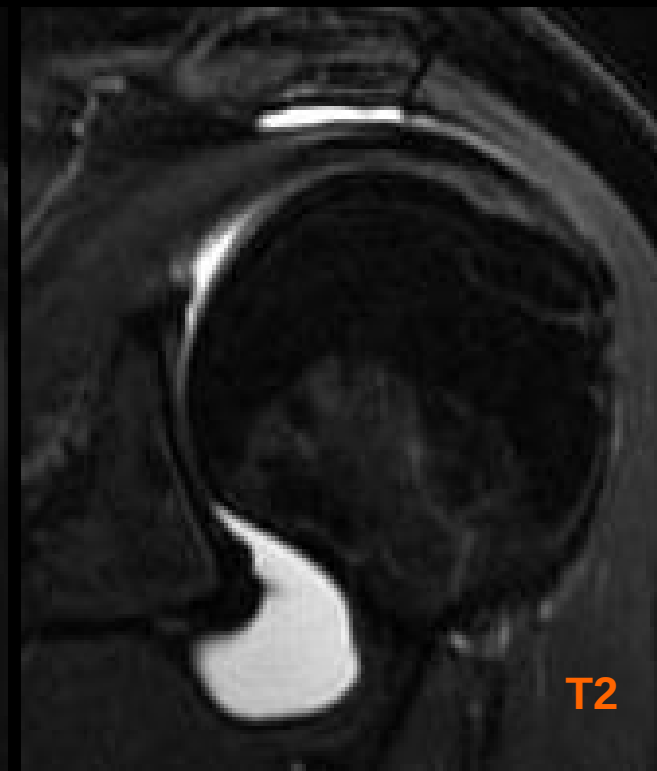
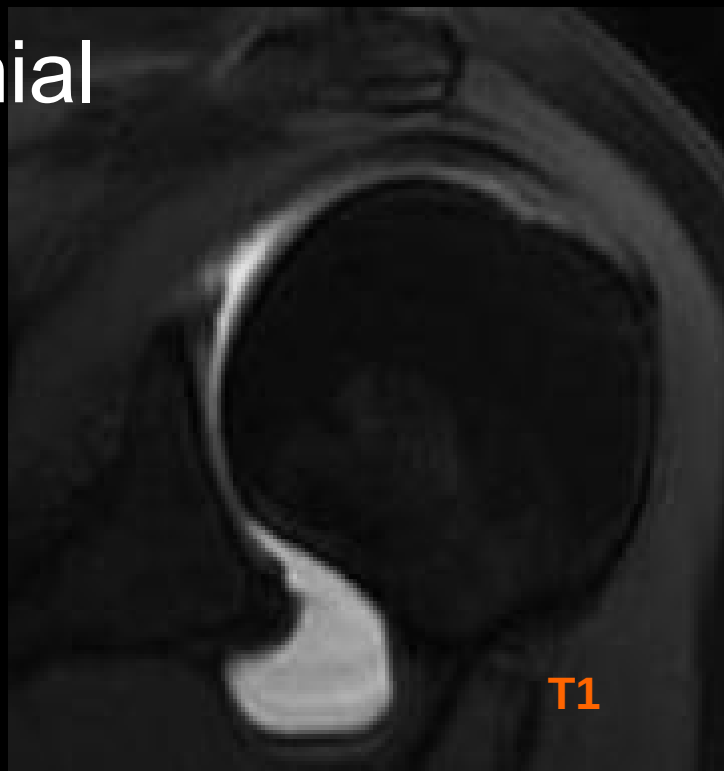
Conflit sous-acromial

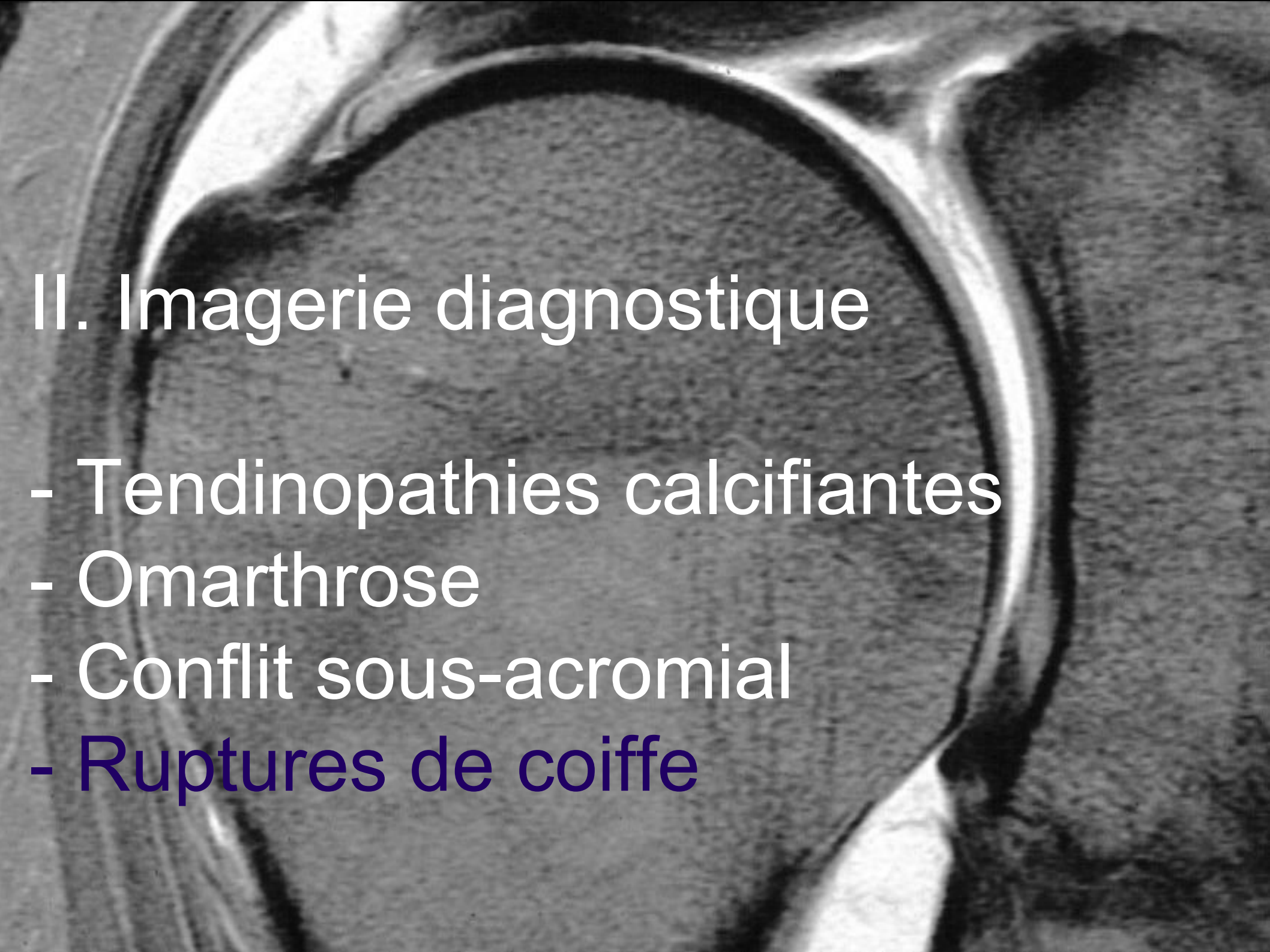
Imagerie en coupes



Conflit sous-acromial

Bilan pré-opératoire



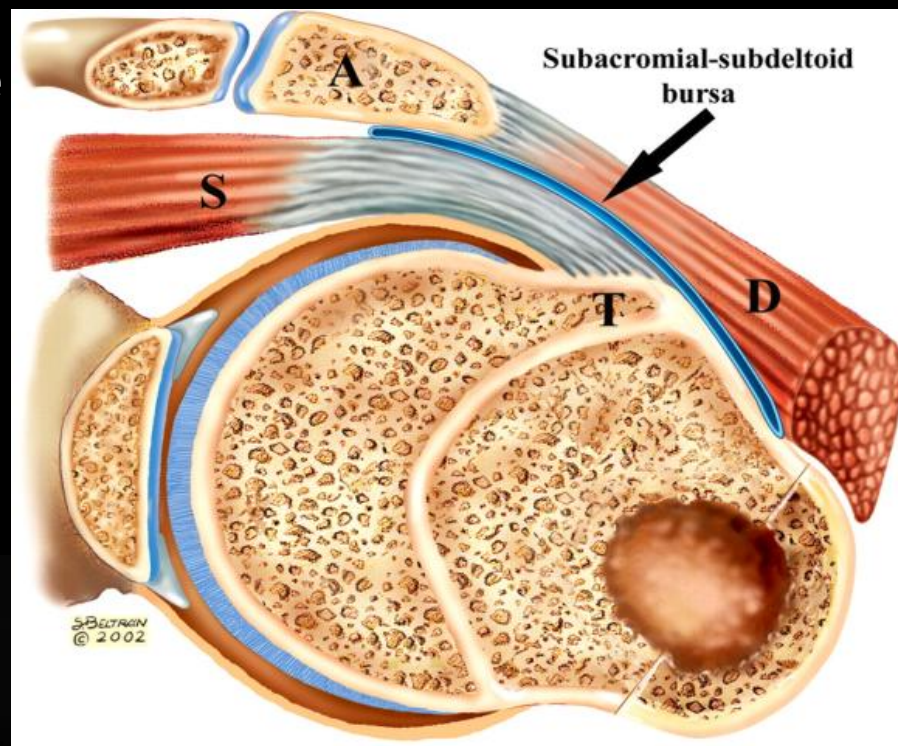
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- Omarthrose
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- Ruptures de coiffe

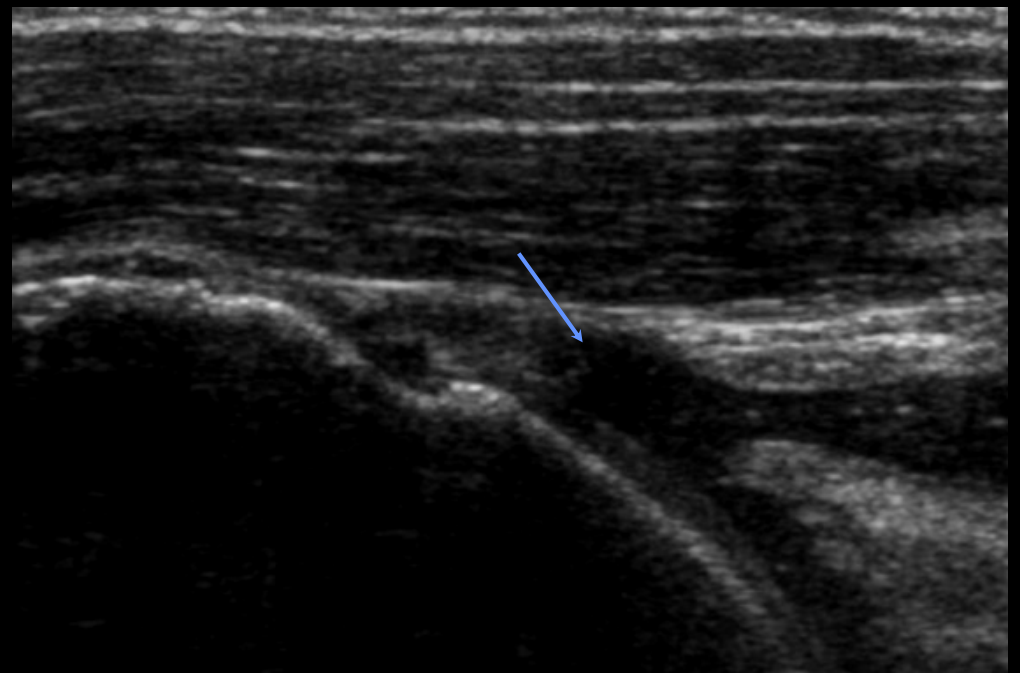
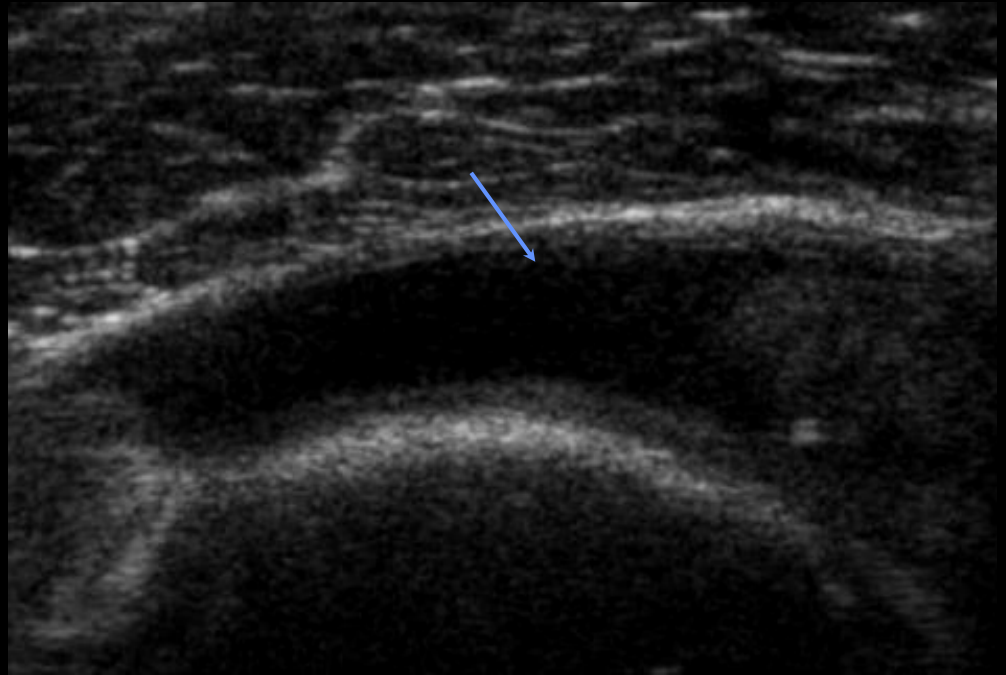
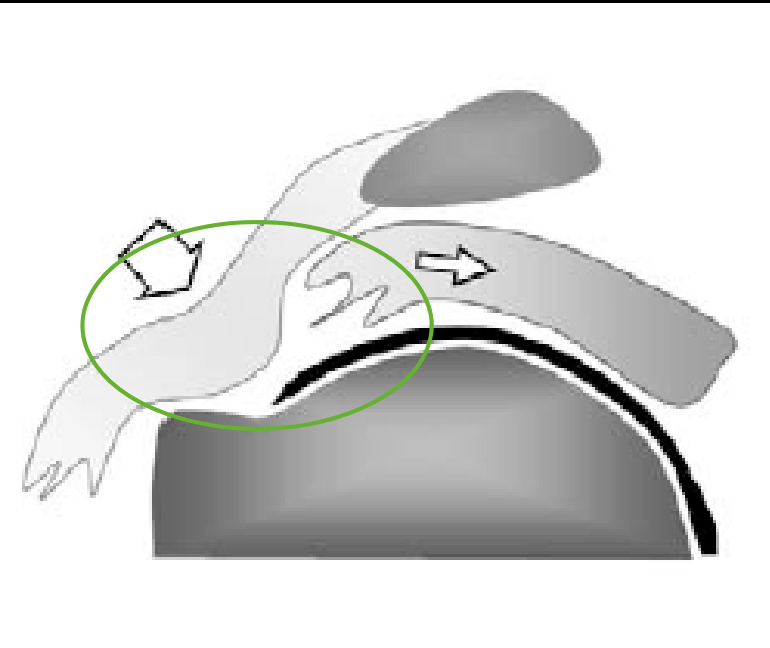
Ruptures de coiffe

Radiographies



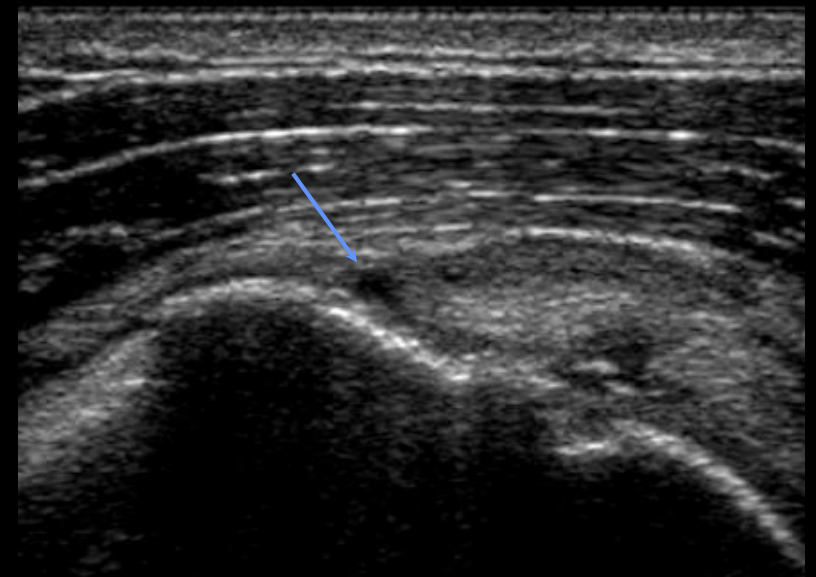
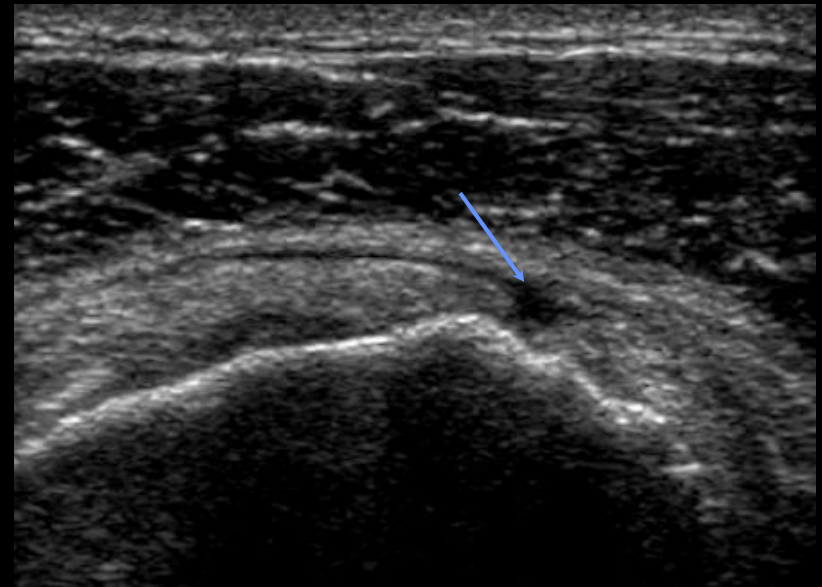
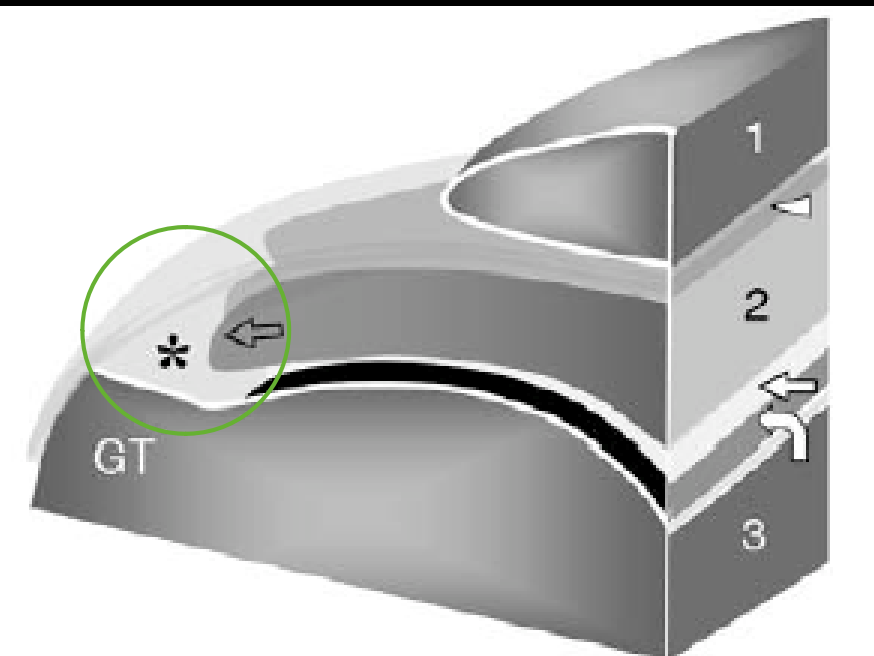
Ruptures de coiffe

Echographie: larges ruptures



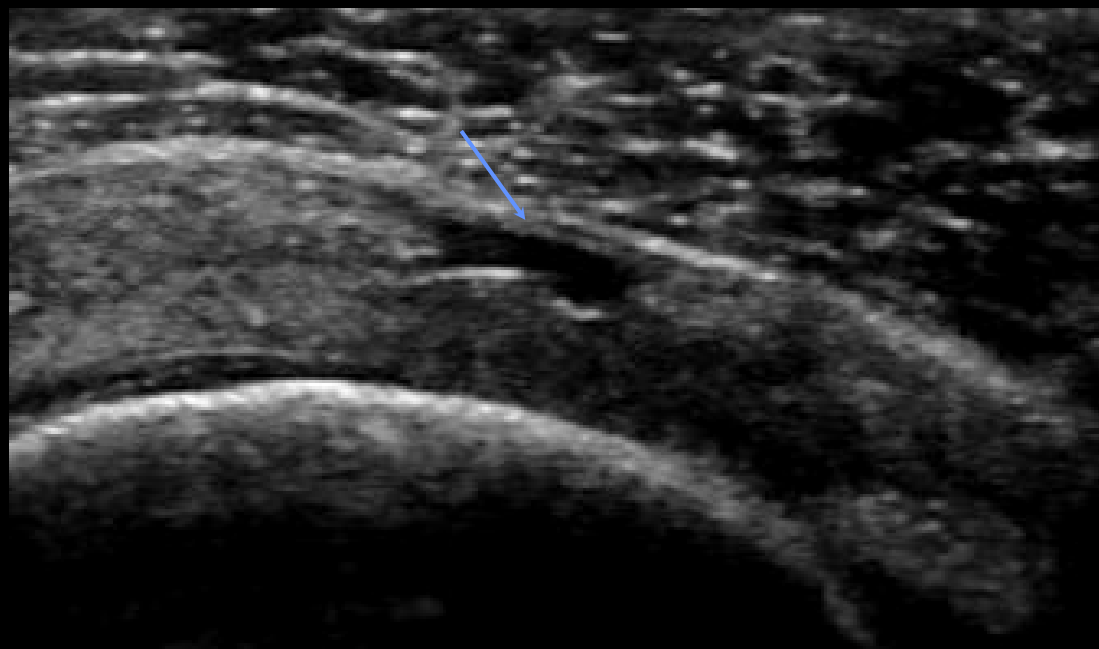
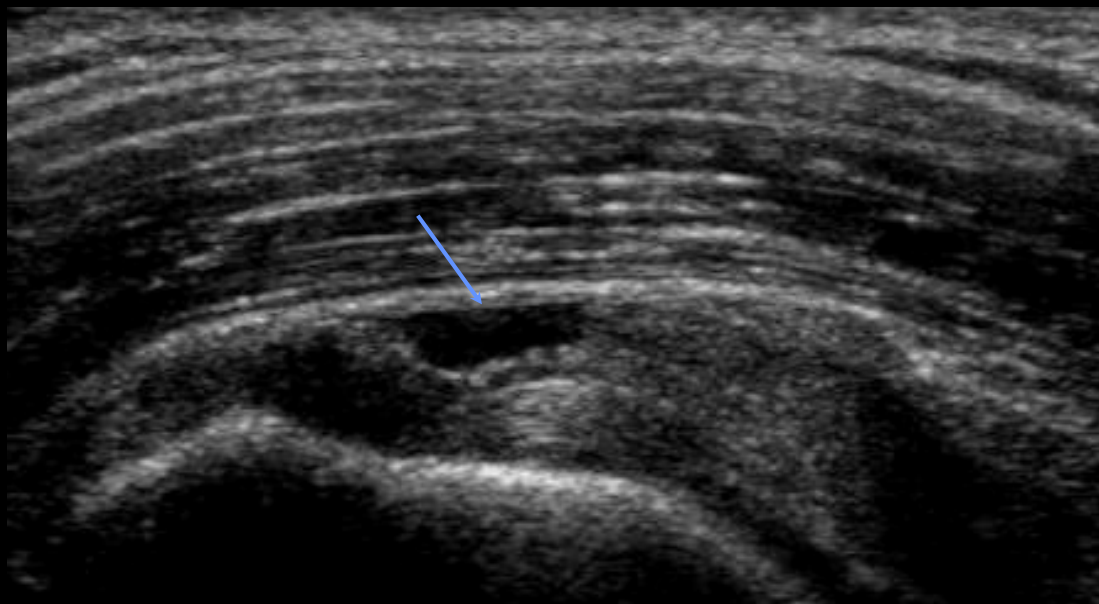
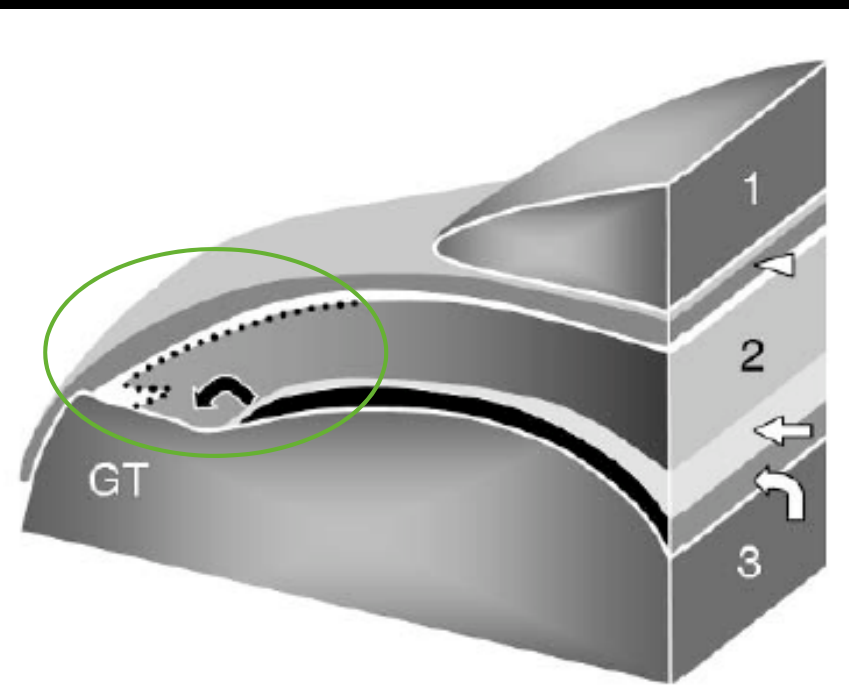
Ruptures de coiffe

Echographie: ruptures distales



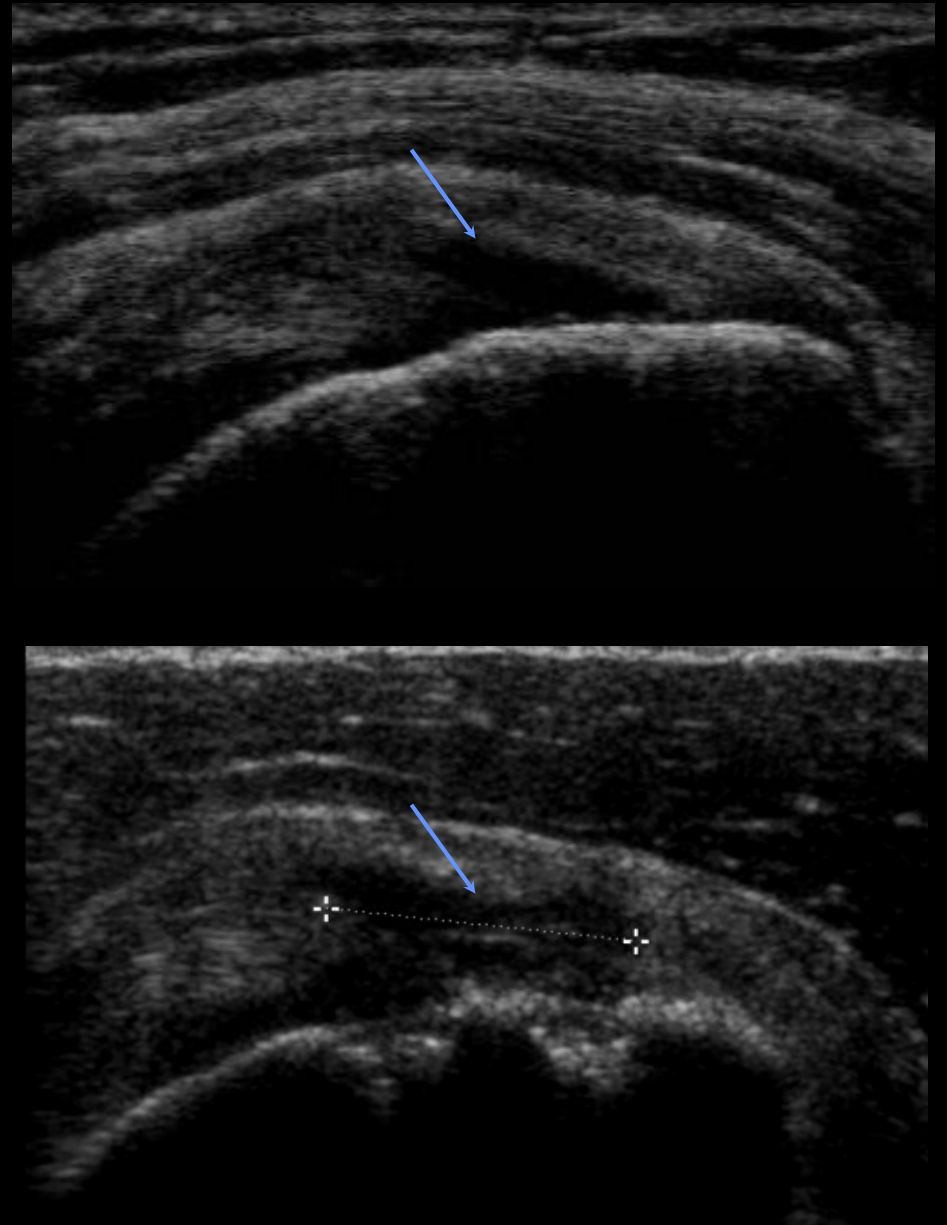
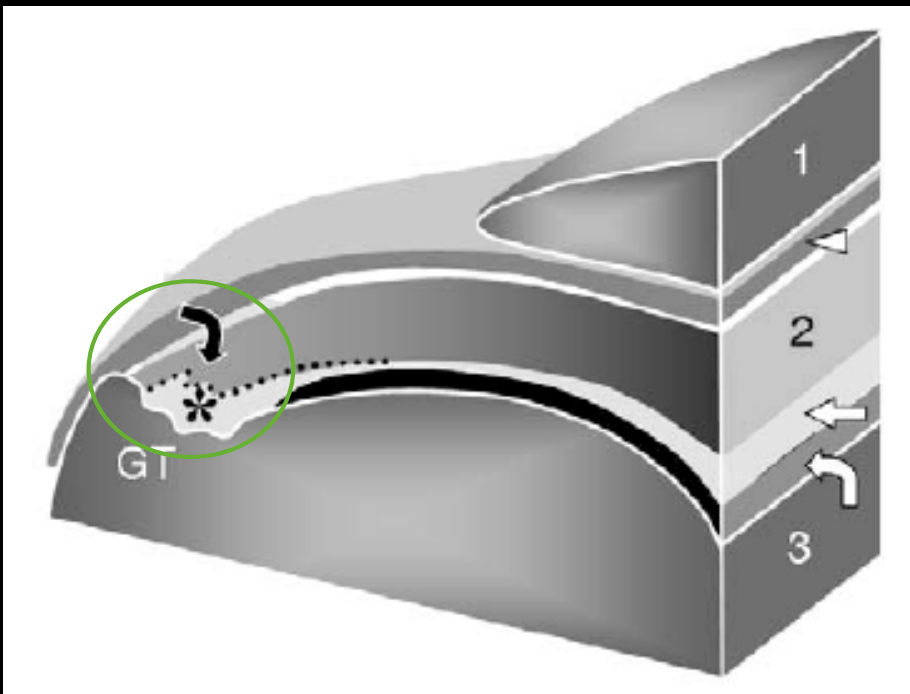
Ruptures de coiffe

Echographie: ruptures superficielles



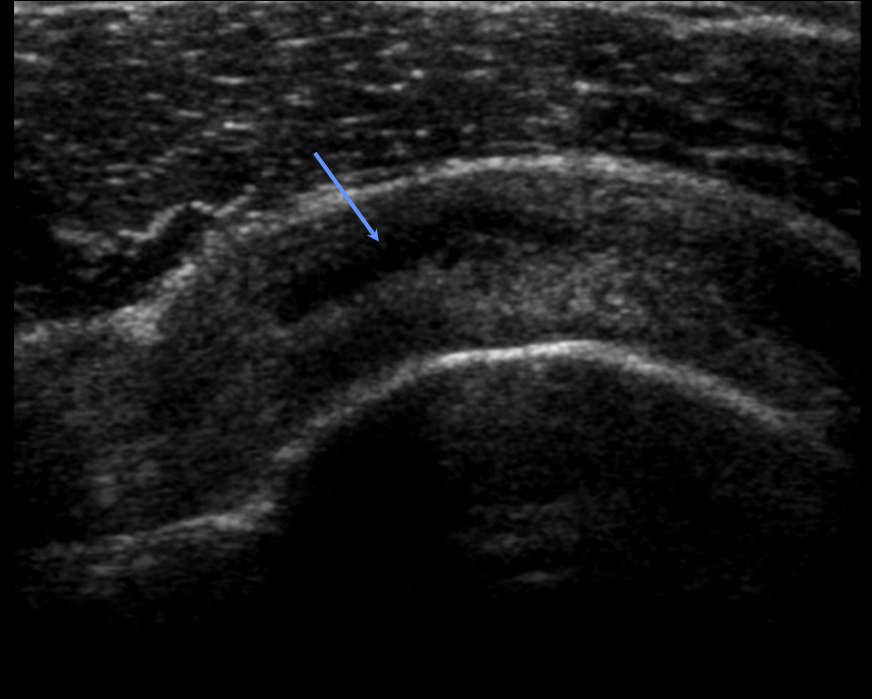
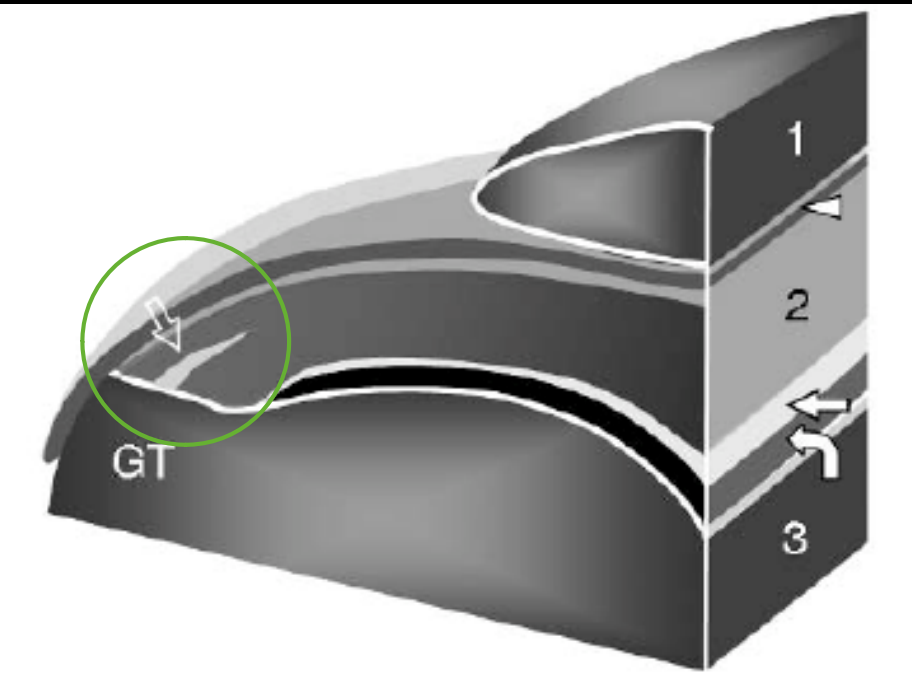
Ruptures de coiffe

Echographie: ruptures profondes



Ruptures de coiffe

Echographie: ruptures interstitielles



Ruptures de coiffe: Imagerie en coupes

En seconde intention

En cas de discordance radio-clinique.

Si un geste chirurgical est envisagé.

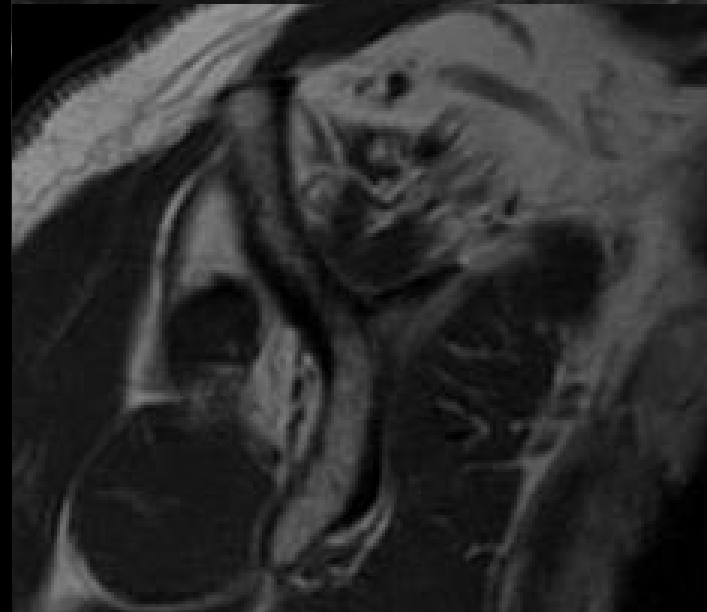
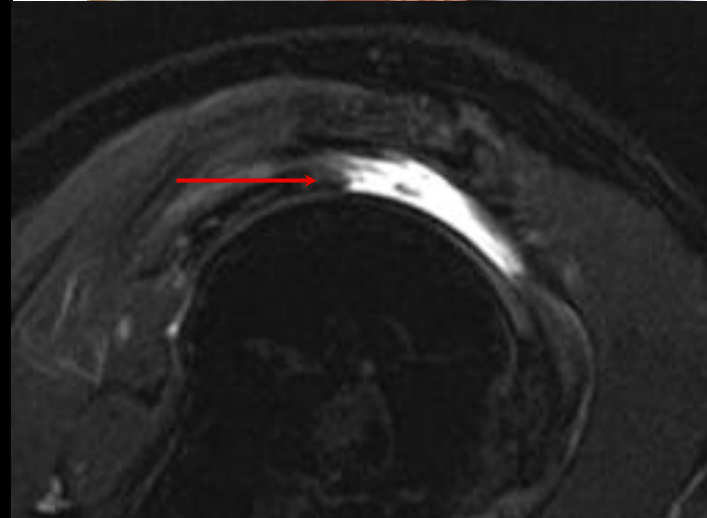
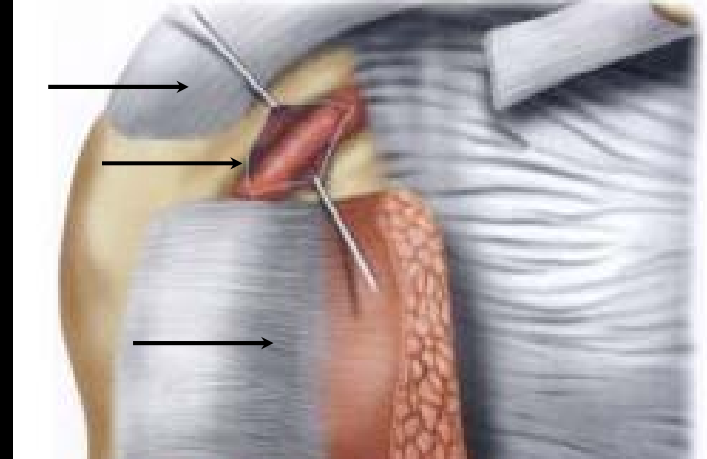
Confirme et précise la lésion :

Localisation et nombre de tendons atteints.

Taille de la déchirure.

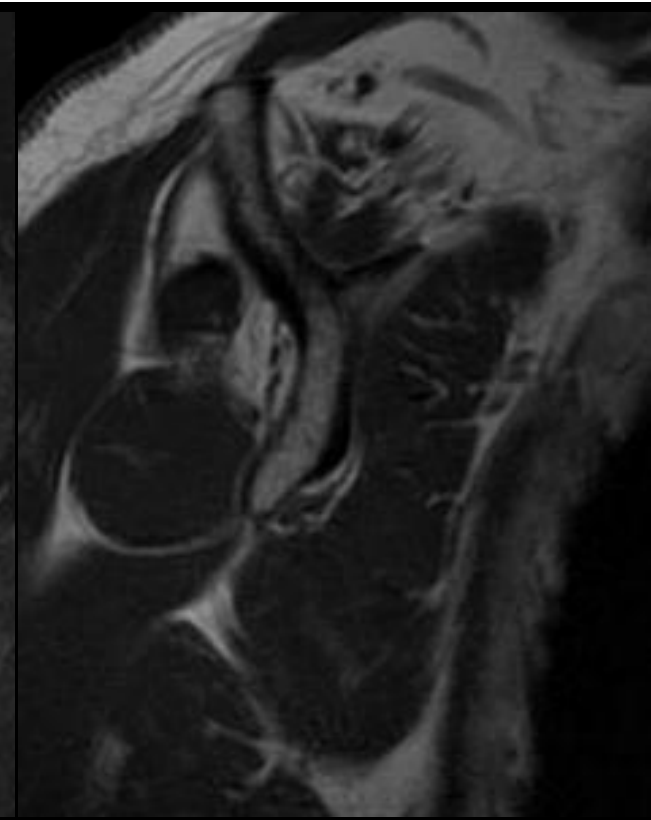
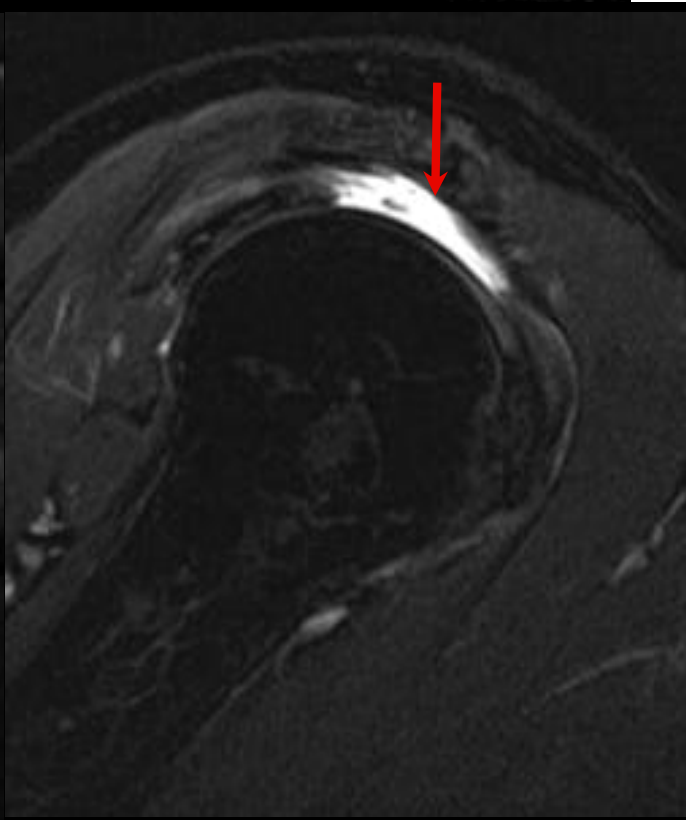
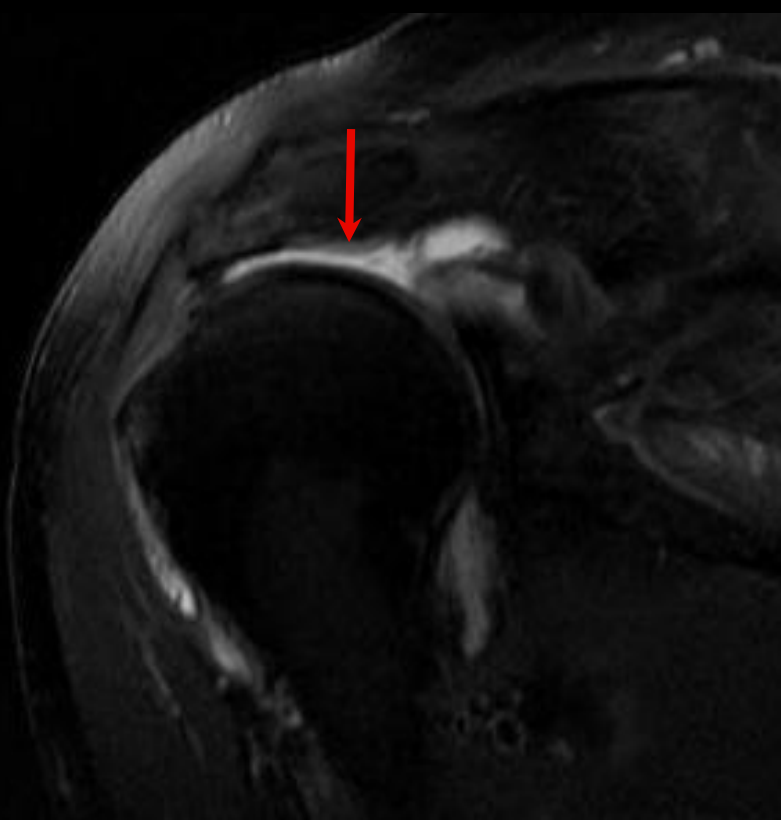
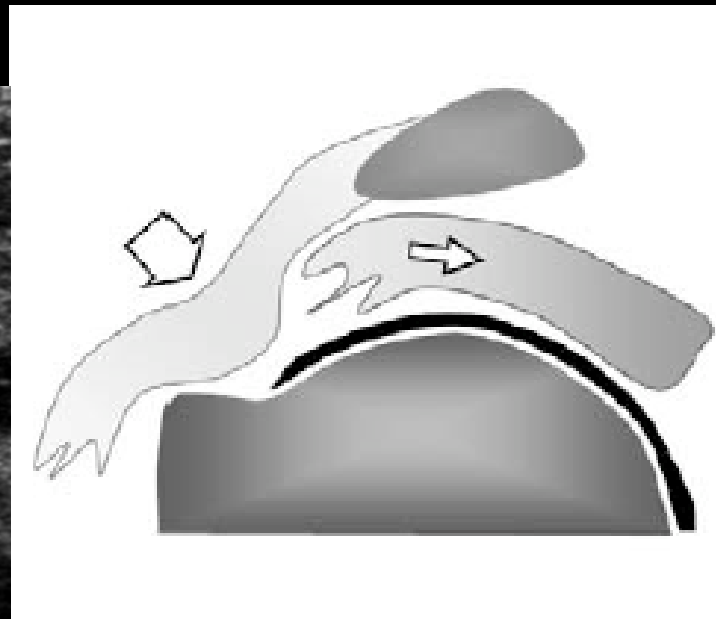
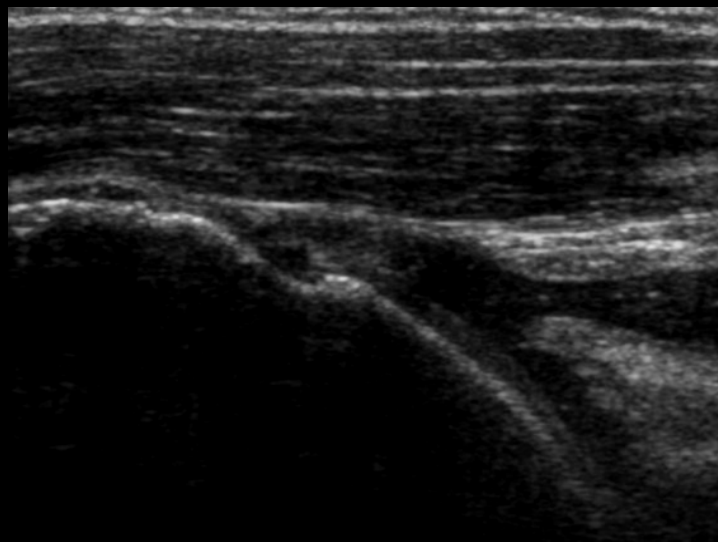
Degré de rétraction tendineuse.

Amyotrophie et dégénérescence graisseuse.



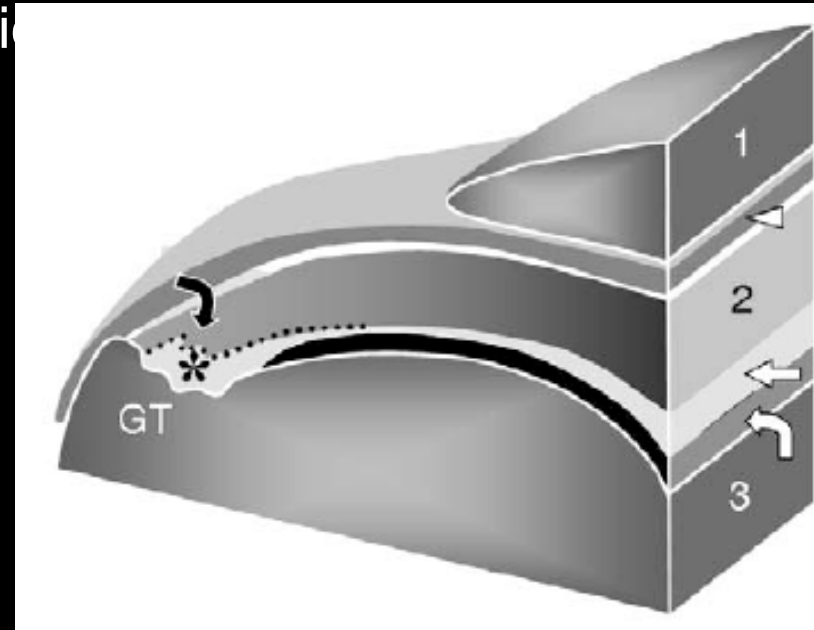
Ruptures de coiffe: IRM

Bilan d'une large rupture à l'échographie



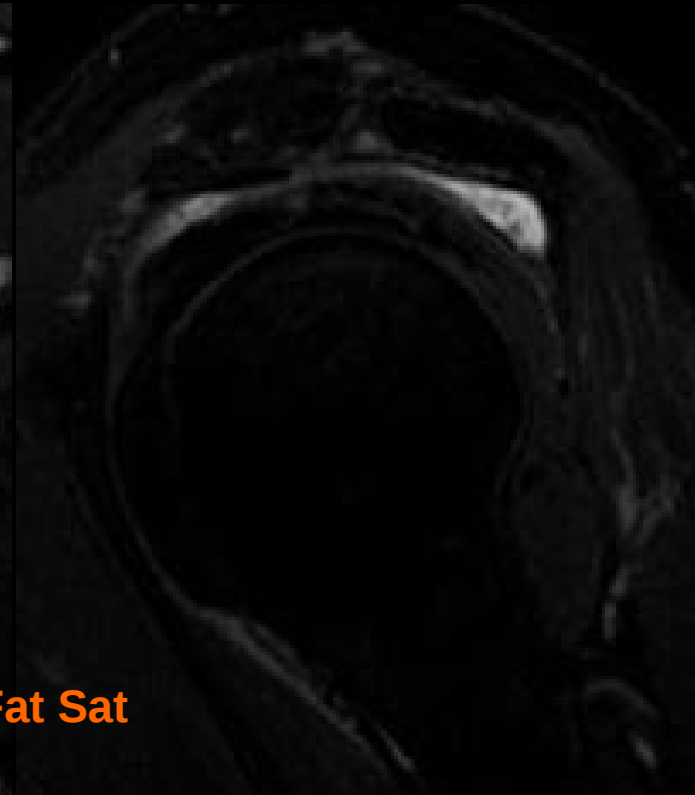
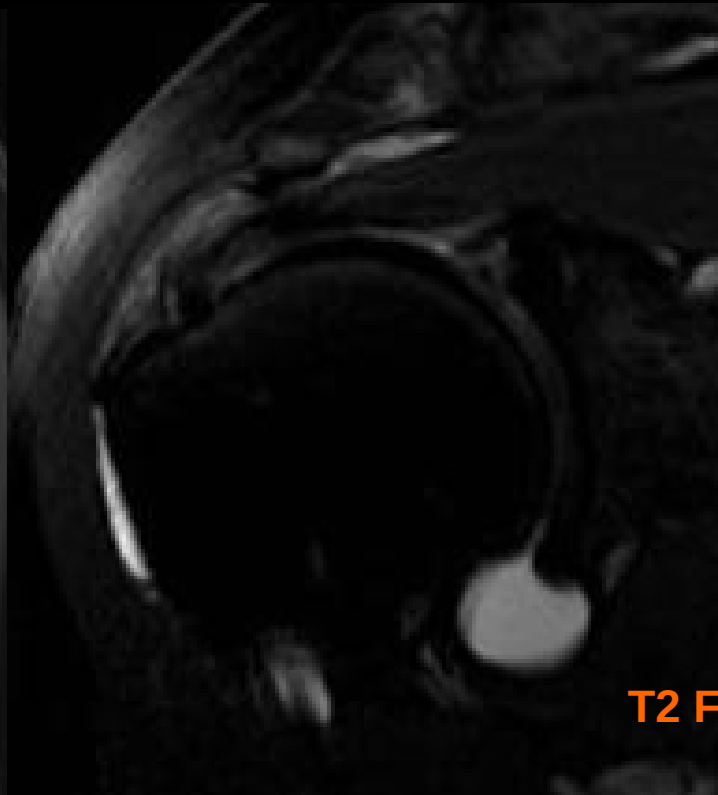
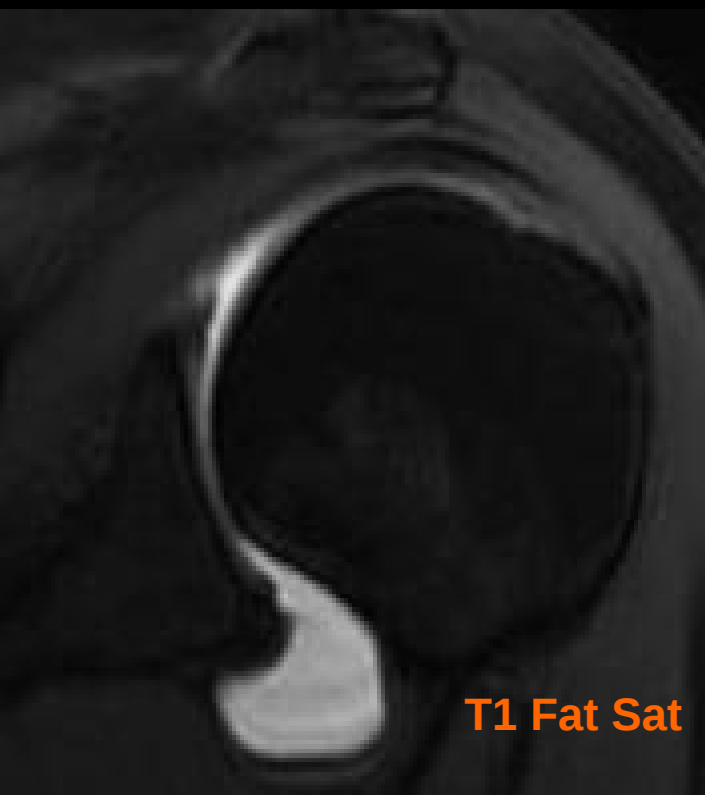
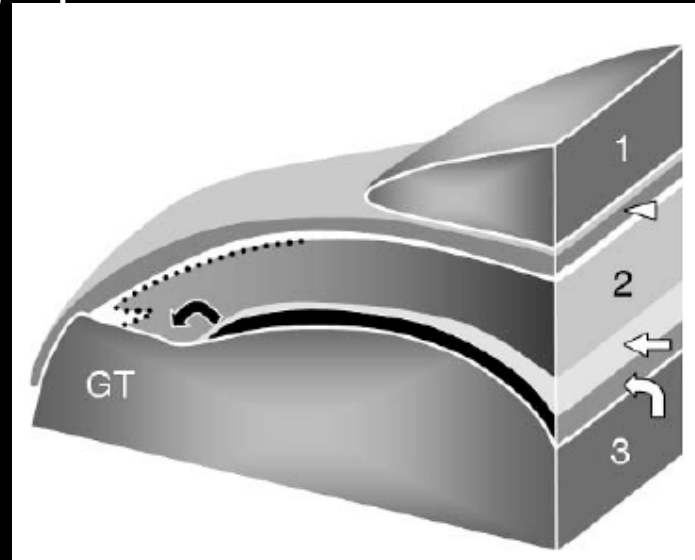
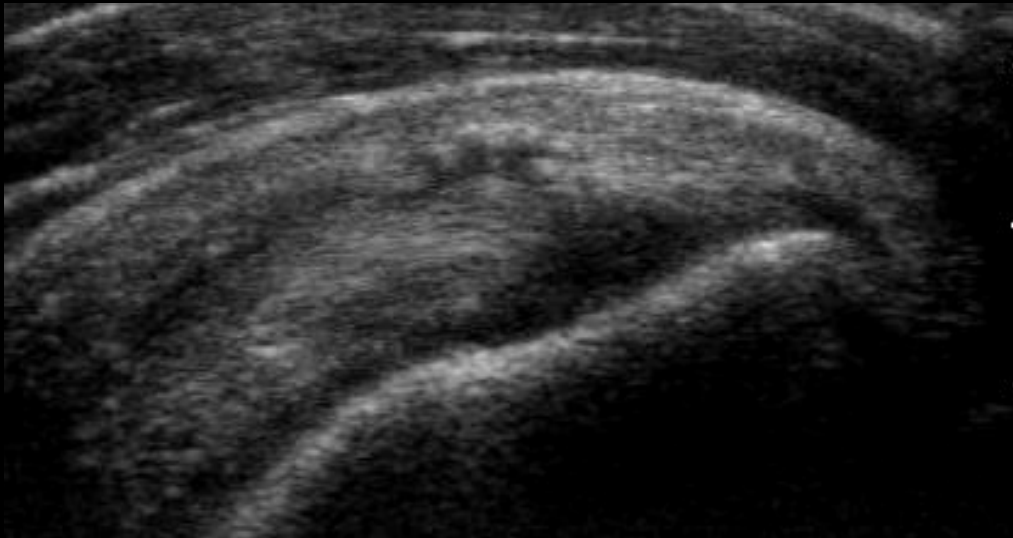
Ruptures de coiffe: Arthroscanner

Bilan d'une lésion partielle profonde à l'échographie



Ruptures de coiffe: ArthroIRM

Bilan d'une lésion superficielle ou interstitielle à l'échographie



Ruptures de coiffe: ArthroIRM ou Arthroscanner?

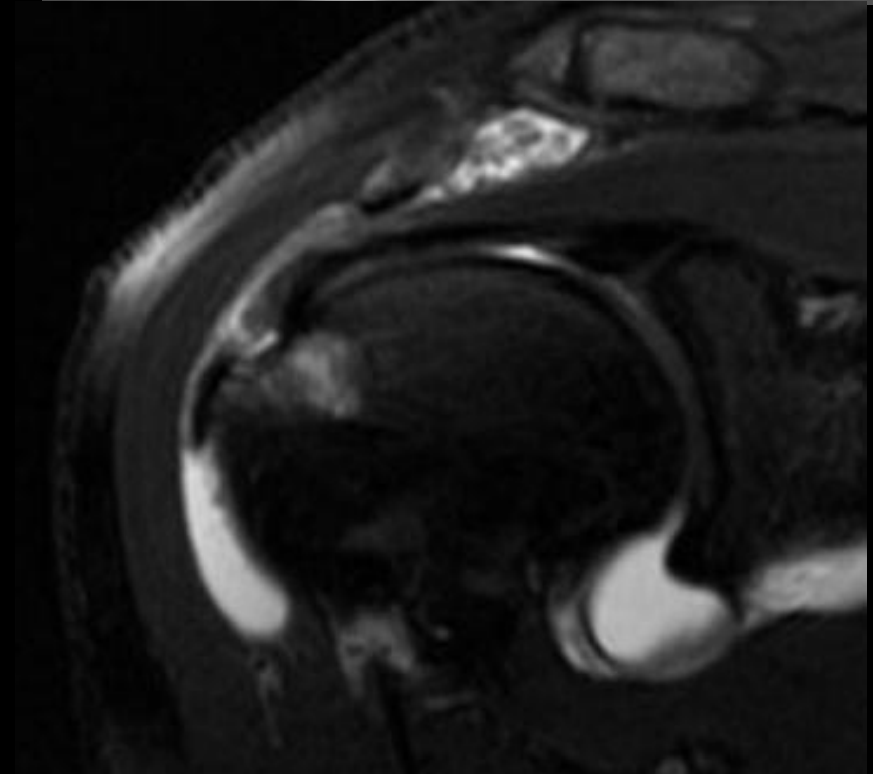
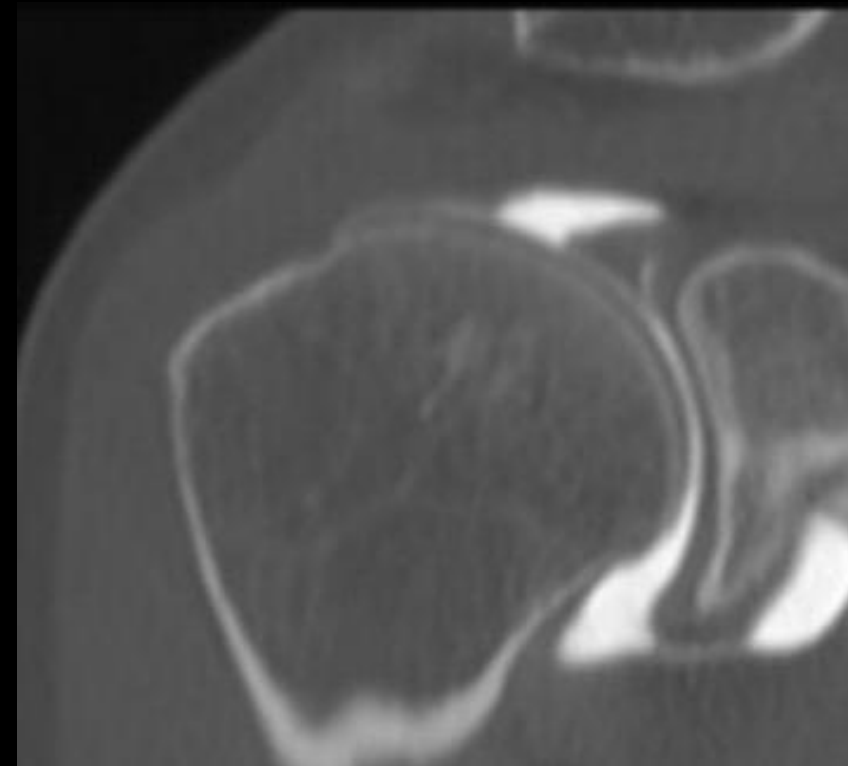
Arthro IRM :

Examen le plus informatif et non irradiant,

Permet une vision intra ET péri articulaire,

Rapport bénéfice/coût + élevé

Moins disponible



Radiographies/Echographie

Lésion
profonde

« Petite Coiffe »

Rupture punctiforme

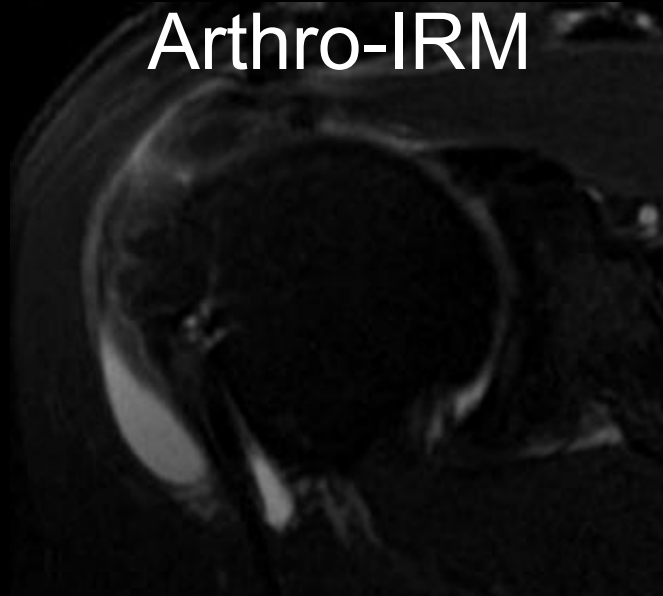
Rupture
superficielle/interstitielle

Large Rupture de
la Coiffe

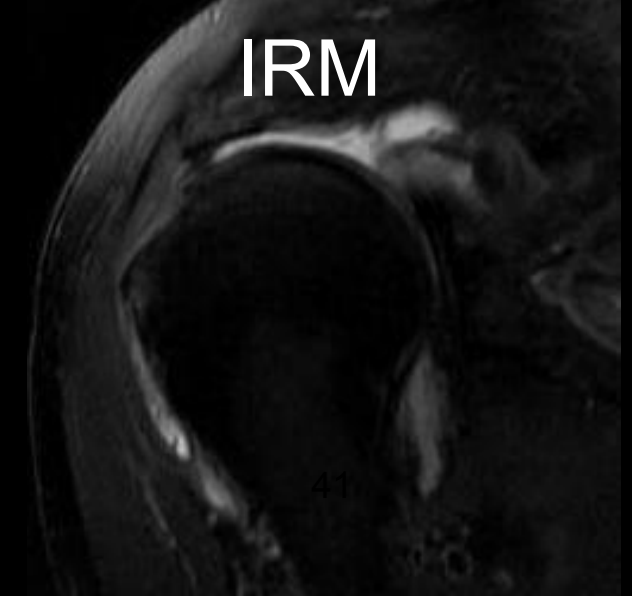
Arthroscanner

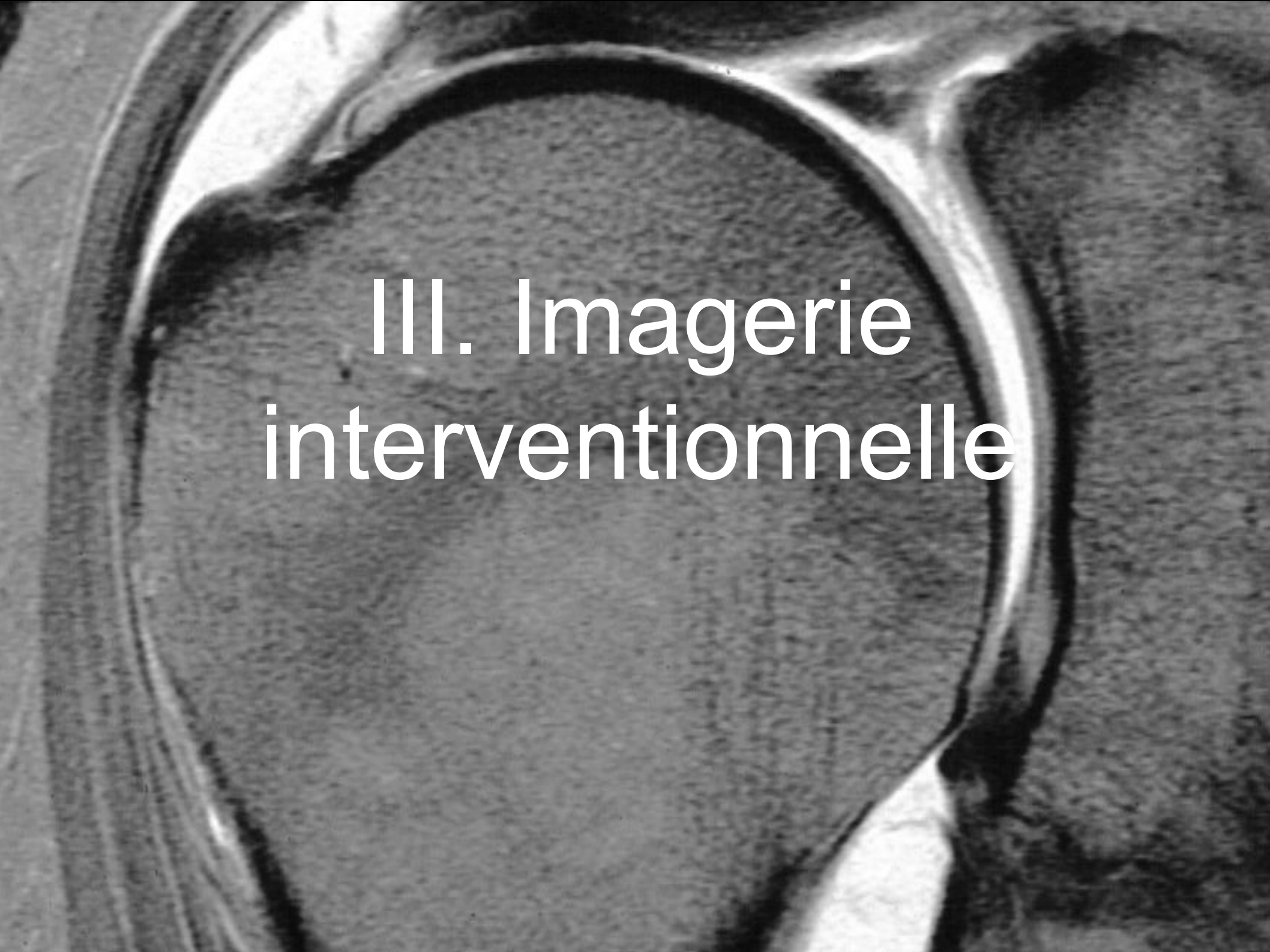


Arthro-IRM



IRM

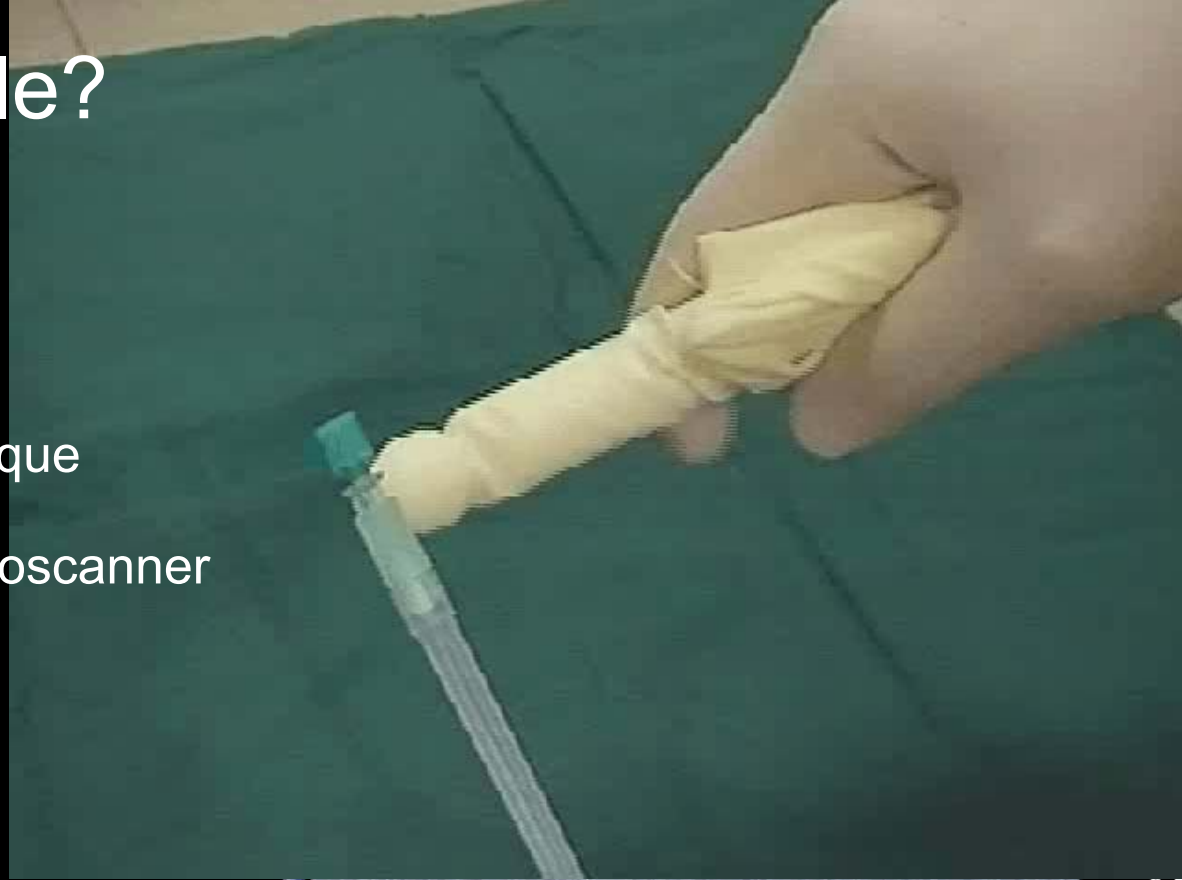


A grayscale MRI scan of a knee joint, showing the femur, tibia, and patella. The image is used as a background for the text.

III. Imagerie interventionnelle

Imagerie interventionnelle?

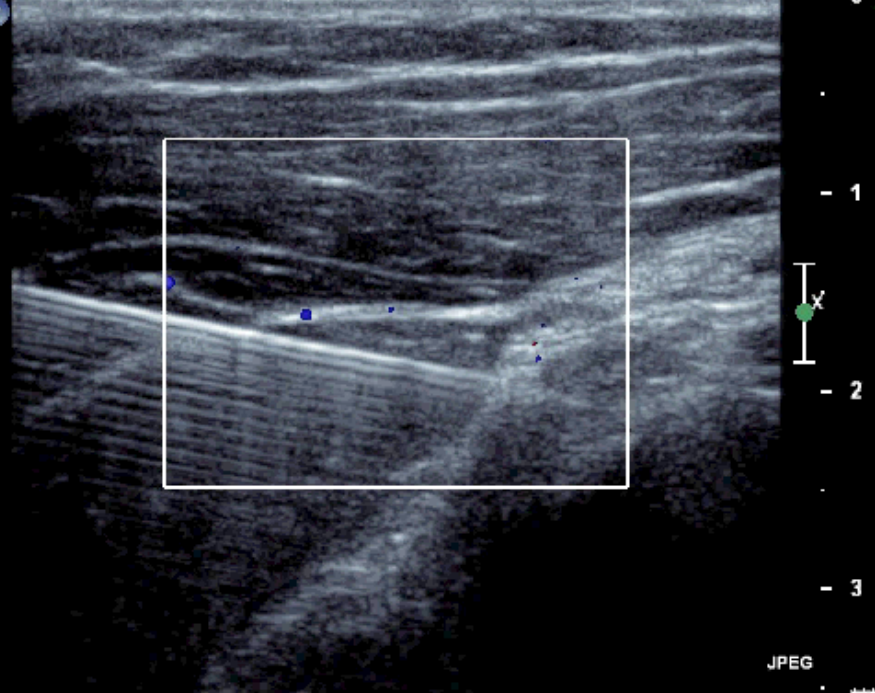
- But: traitement de la douleur
- Gestes radioguidés plus efficaces
- Nouveaux produits: acide hyaluronique
- Nouveaux outils: échographie, fluoroscanner
- Nouvelles indications: cancérologie



Au niveau de l'épaule:

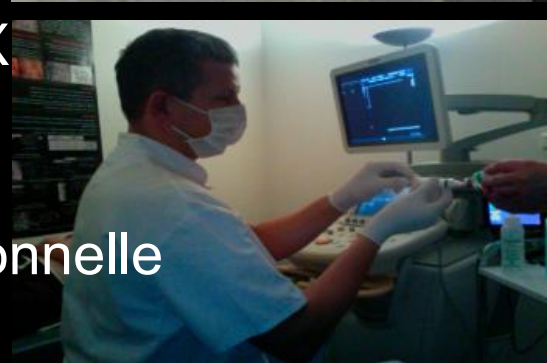
- Infiltrations: articulaires, sous-acromiales
- Viscosupplémentations: omarthrose
- Ponctions: calcifications, kystes
- Cimentoplasties

2D
70%
C 61
P Moy
Gén
Coul
75%
500Hz
FP 27Hz
Bas



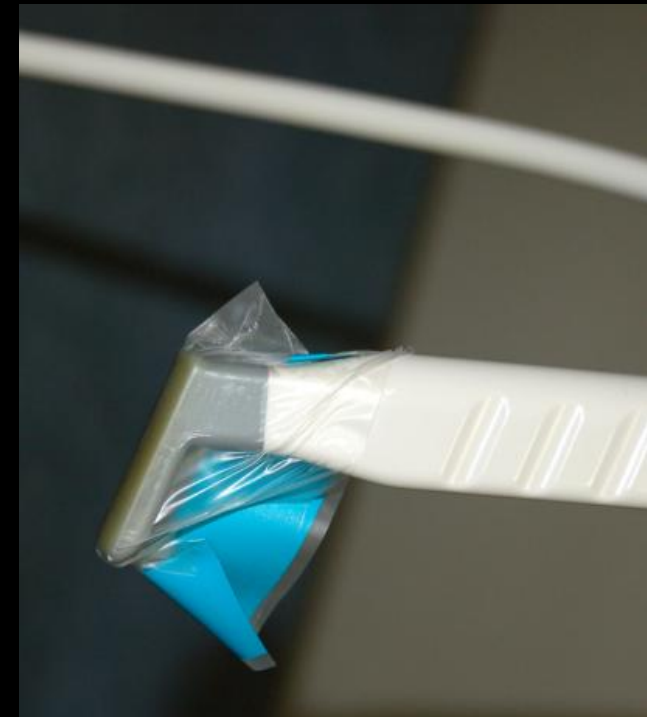
L'exemple des ponctions des tendinopathies calcifiantes de l'épaule

- ponction-lavage-aspiration / écho = technique récente
- technique ancienne $\neq$ ponction-triturations sous contrôle RX
- progrès des opérateurs = essor de l'échographie interventionnelle
- progrès du matériel:
 - = petites sondes de haute fréquence
- indications: tendinopathies calcifiantes symptomatiques

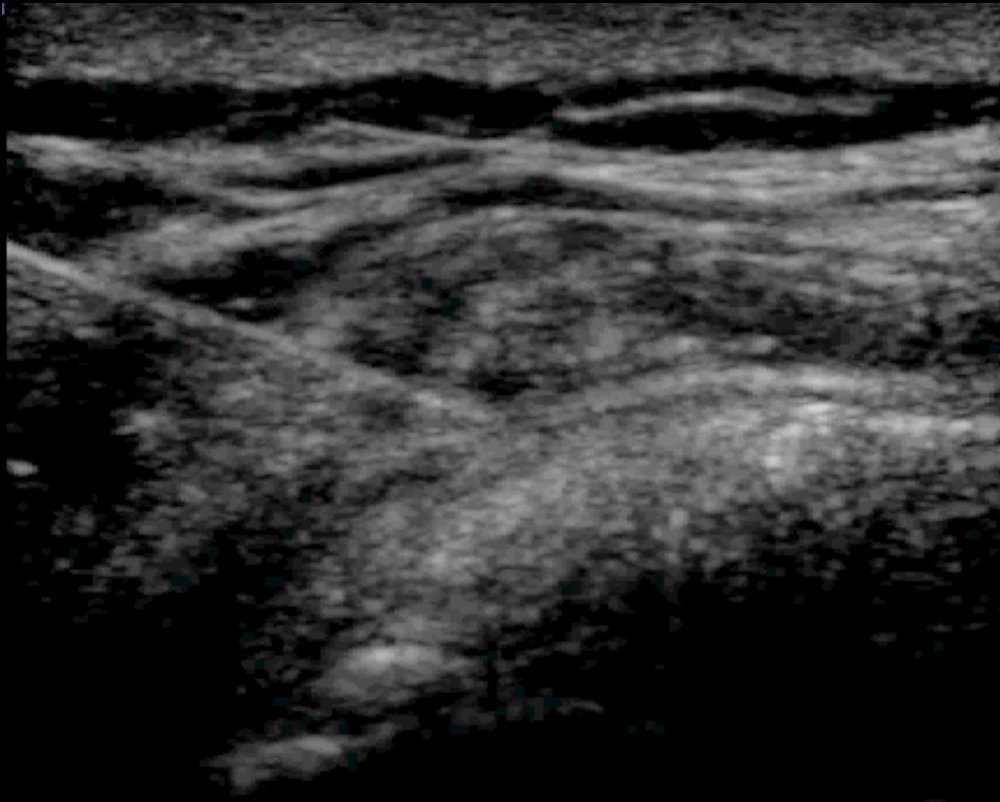


Asepsie +++

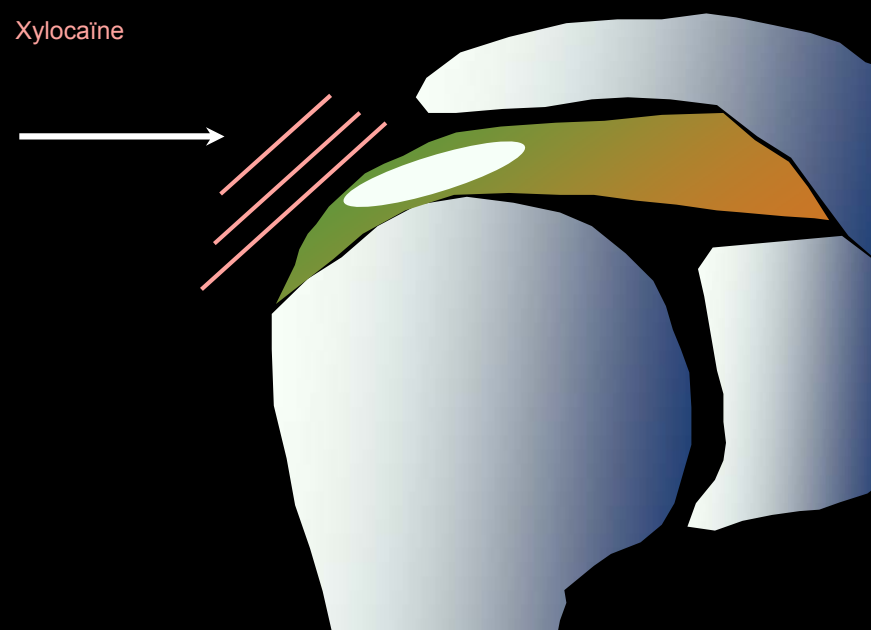
- Lavage des mains
- Port d'un masque et de gants
- Utilisation d'un champ stérile
- Désinfection cutanée
- Protection de sonde



PLA des tendinopathies calcifiantes: Technique

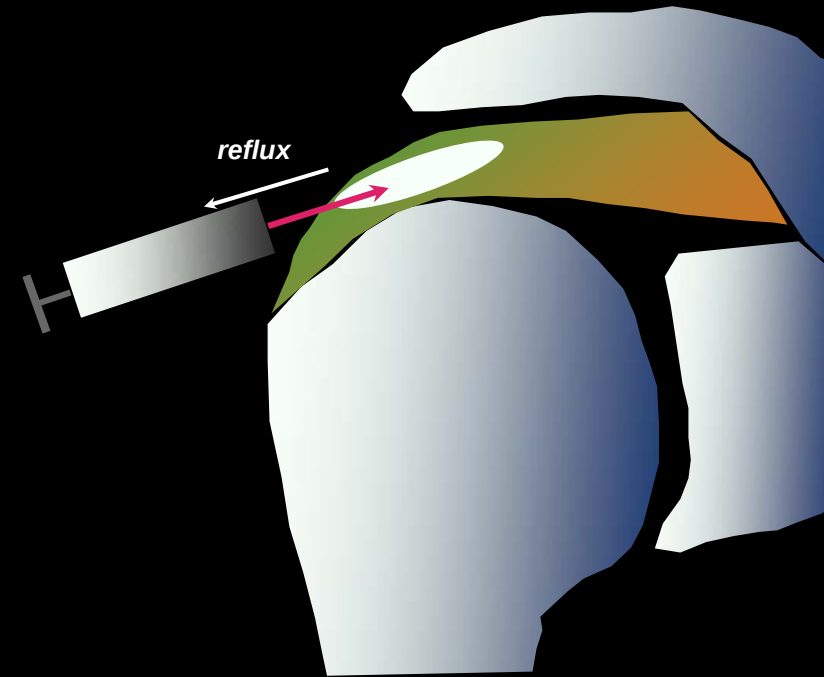
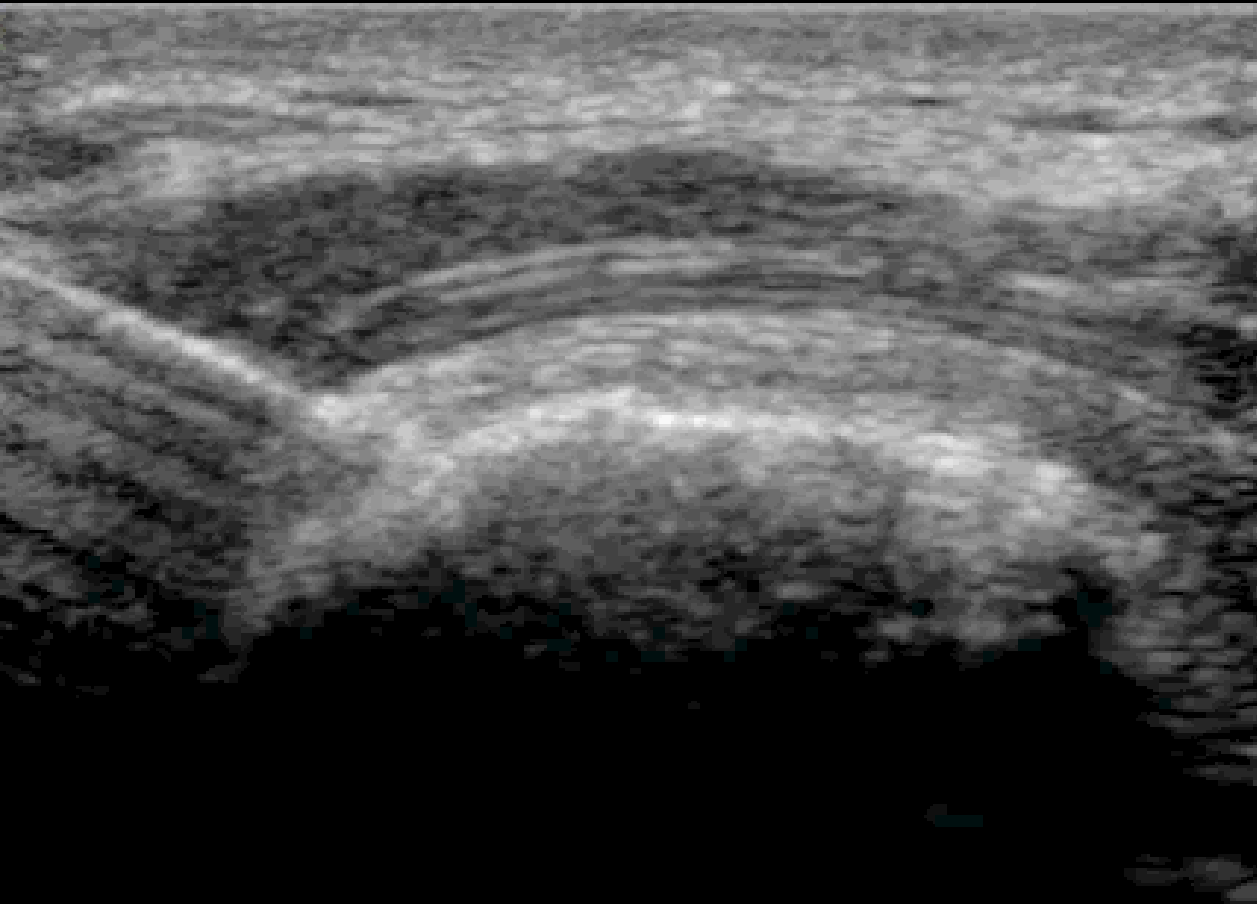


Xylocaïne



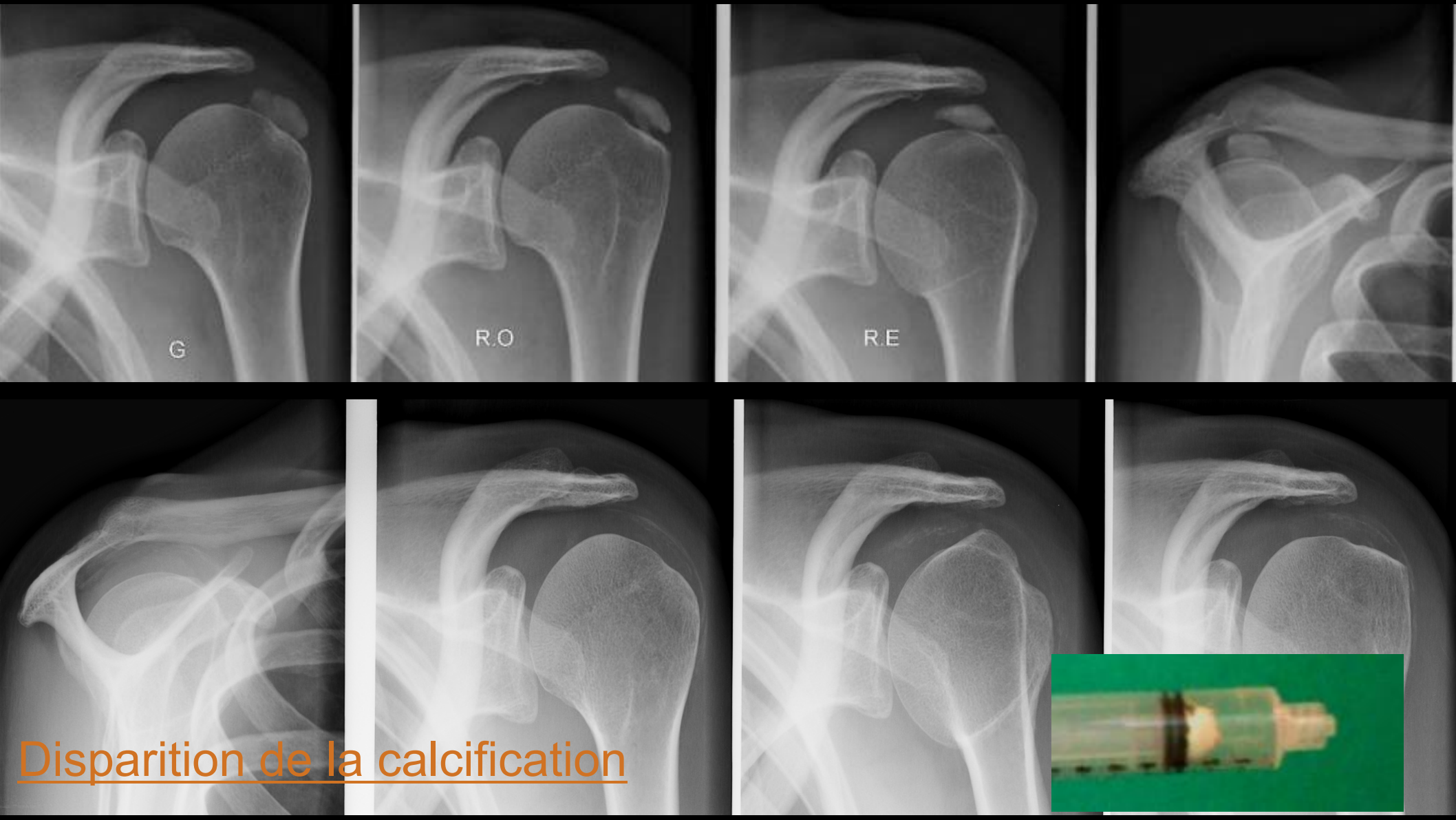
1er temps - Analgésie

PLA des tendinopathies calcifiantes: Technique



2ème temps - Lavage-Aspiration: sérum physiologique

PLA des tendinopathies calcifiantes: Résultats



PLA des tendinopathies calcifiantes: Résultats

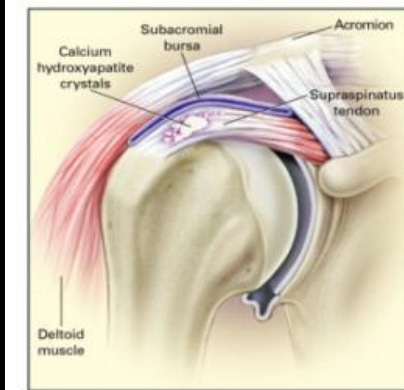
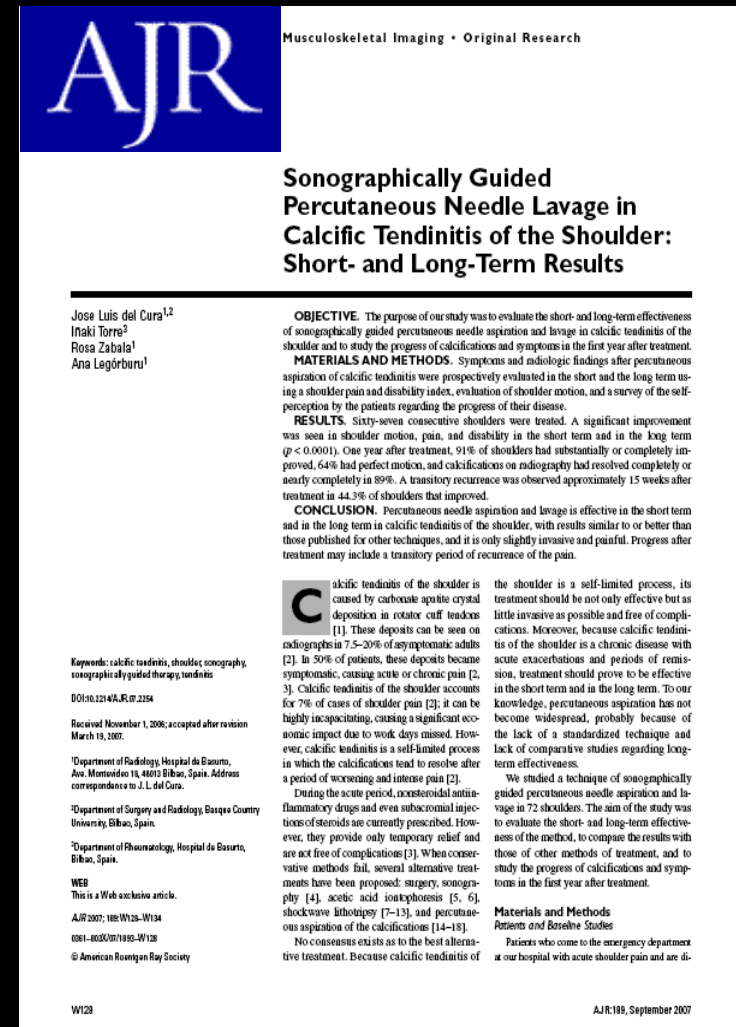


Disparition incomplète de la calcification; nouvelle
procédure

PLA des tendinopathies calcifiantes: Discussion

Matériels et méthodes

- ✓ Etude prospective: 2002 / 2004
- ✓ Evaluation clinique:
 - amplitudes articulaires
 - SPADI
- ✓ Evaluation radiologique: RX /US
- ✓ Suivi à S5, S10 et A1



PLA des tendinopathies calcifiantes: Discussion

Résultats

- ✓ 67 épaules traitées chez 65 patients
- ✓ SE: 57 / IE: 12 / SS: 3 (Multiples: 5)
- ✓ Ancienneté des douleurs: 30 mois
- ✓ Volume extrait moyen: 0,4 mL
- ✓ 11ème séance: 16 patients
- ✓ Disparition de la calcification:
= S10: 65% - A 1 an: 89%
- ✓ Disparition complète des douleurs:

TABLE 1: Shoulder Scores and Measurements Before and After Treatment

Item Scored	Before Treatment (n = 67)	After Treatment	
		10 Weeks (n = 67)	1 Year (n = 64)
SPADI pain score (points) ^a	20–98 (mean, 56.5)	0–86 (mean, 32)	0–74 (mean, 17.4)
SPADI disability score (points) ^b	0–86.3 (mean, 43.9)	0–72.5 (mean, 22)	0–64 (mean, 12.1)
SPADI total score	10–90.1 (mean, 50.2)	0–77.4 (mean, 27)	0–62.8 (mean, 14.7)
SPADI score < 10 ^c	0	22 (33%)	41 (64%)
Shoulder range of motion	510–1,280° (mean, 1,039°)	810–1,280° (mean, 1,187°)	940–1,280° (mean, 1,256°)
Full range of motion without pain ^d	1 (1.5%)	19 (28%)	44 (69%)

Note—SPADI = Shoulder Pain and Disability Index [19].

^a0 = no pain, 100 = maximum pain.

^b0 = no difficulty, 100 = unable to do.

^cNumber (%) of shoulders.

^dNumber (%) of shoulders having range of motion of 1,280° on examination.

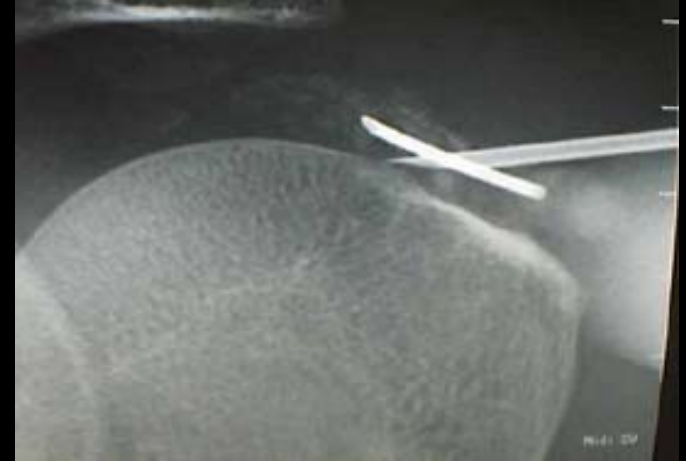
TABLE 2: Shoulder Calcifications on Radiographs After Treatment

Calcifications	Time After Aspiration and Lavage		
	5 Weeks (n = 67)	10 Weeks (n = 67)	1 Year (n = 64)
No changes	7 (10.4)	5 (7.5)	2 (3.1)
Lower density	14 (20.9)	9 (13.4)	2 (3.1)
Lower volume	12 (17.9)	9 (13.4)	3 (4.7)
Scant remainder	27 (40.3)	27 (40.3)	7 (10.9)
None	7 (10.4)	17 (25.4)	50 (78.1)

Note—Data are numbers (%) of shoulders.

PLA des tendinopathies calcifiantes: Avantages

- Par rapport à la ponction-trituration:
 - Non-irradiant
 - Non-délétère
 - Une seule aiguille
- Diminution rapide des symptômes
- Disparition de la calcification
- Plus efficace que les ondes de chocs
- Pas de rééducation
- Reprise rapide des activités
- Rapport bénéfice/coût élevé
- Pas de complication
- LIMITES
 - Pas d'études Vs autres techniques
 - Opérateur-dépendant



CONCLUSION:

- Bilan de lère intention: RX + US
- Imagerie en coupes: seconde intention
 - ▶ selon pathologie
 - ▶ selon avis du radiologue
- MERCI POUR VOTRE ATTENTION