MRT des Schultergelenkes

Sportverletzungen und Traumafolgen
Windhagen, 30. und 31. Mai 2008

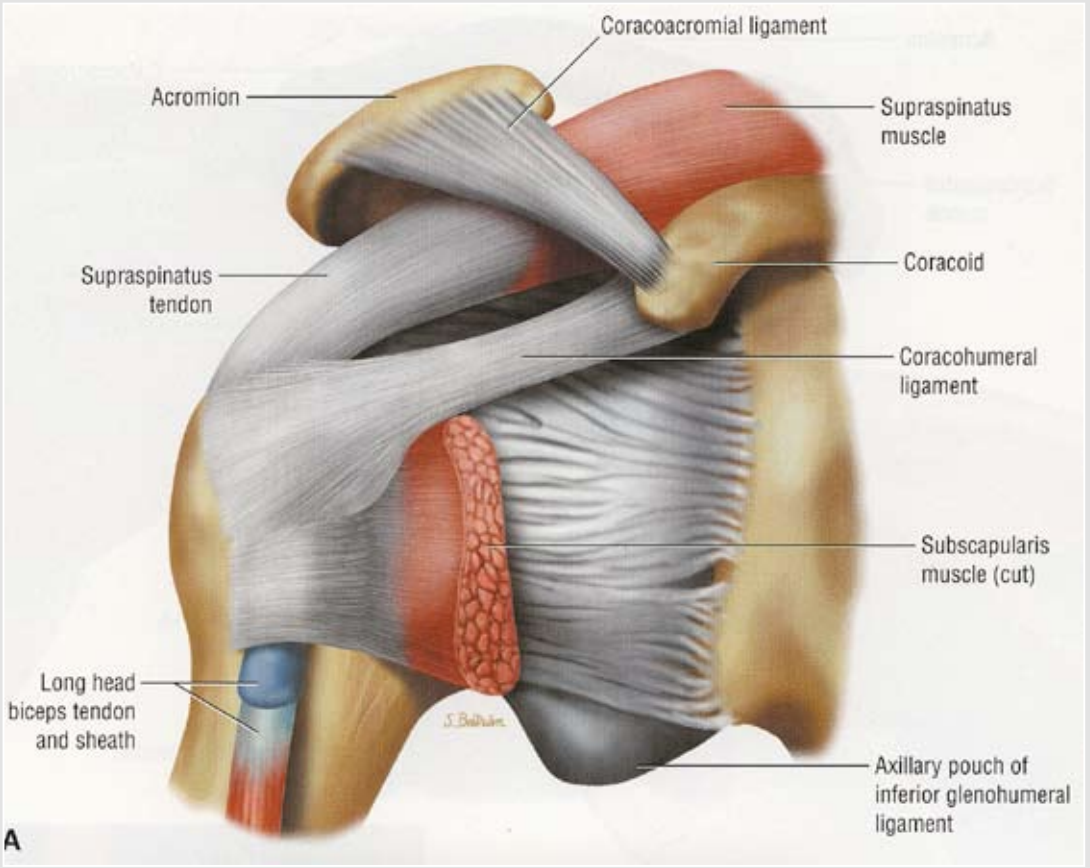
Dr. Jonas Müller-Hübenthal

PRAXIS im KÖLN TRIANGLE

MRT des Schultergelenkes - Gliederung

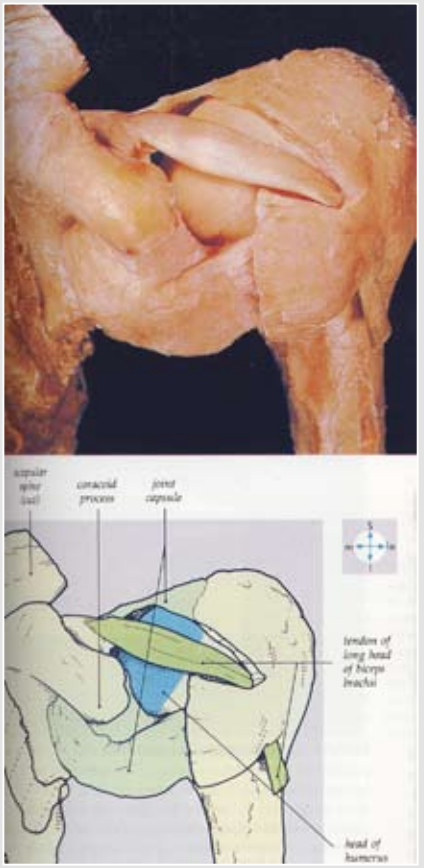
- Anatomie
- Untersuchungstechnik
- Bildinterpretation
- Beispiele
  - Subacromiales Impingement und SSS Ruptur
  - AC-Gelenk
  - Luxation, Labrumläsionen und Instabilität
  - Lange Bizepsehne, Anker und Pulley
- Fallbeispiele - MRI meets Arthroskopy
- Zusammenfassung - Take Home Points

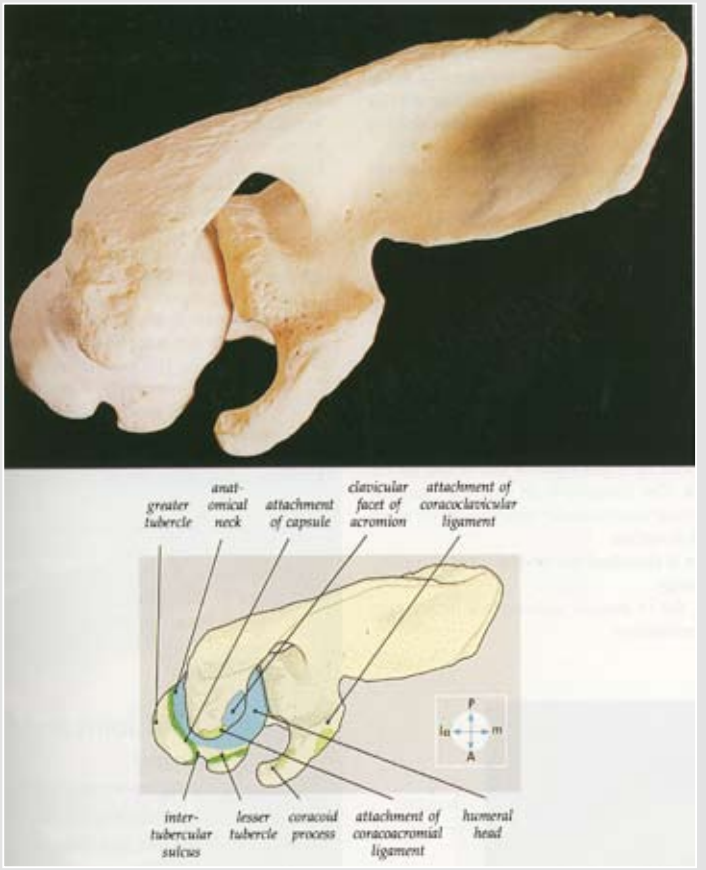
Anatomie - Ansicht von ventral

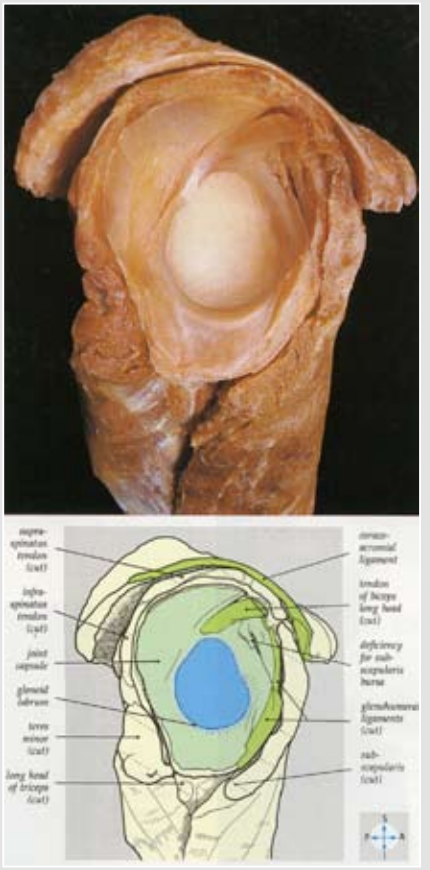


Anatomie Abb. Aus Stoller: MRI in Orthop. 3. Aufl.

Anatomie

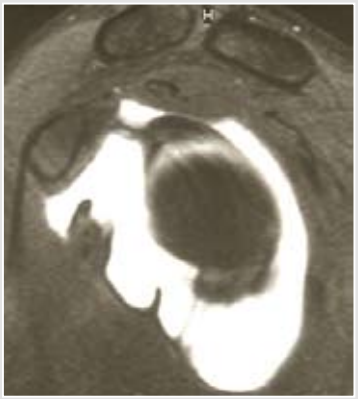


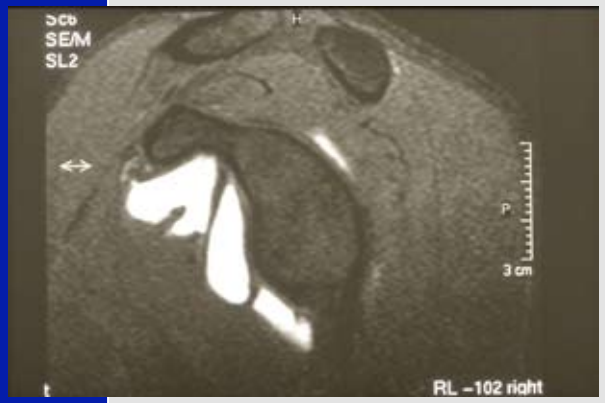


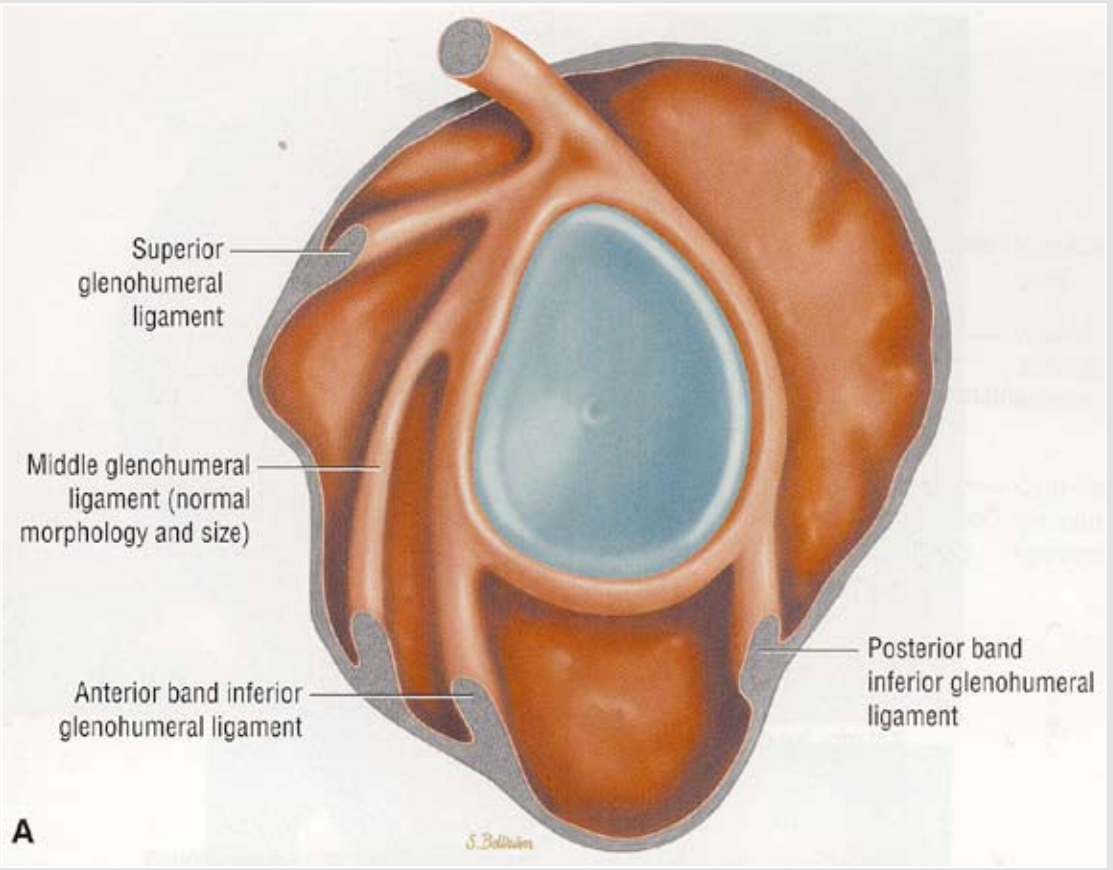


PRAXIS im KÖLN TRIANGLE

Anatomie - glenohumerale Ligamente



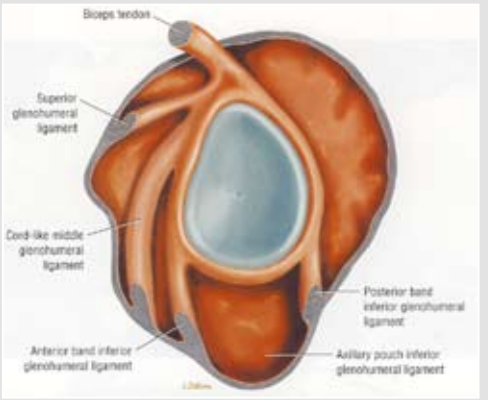


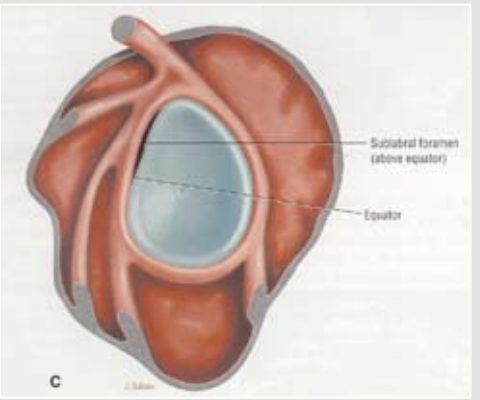


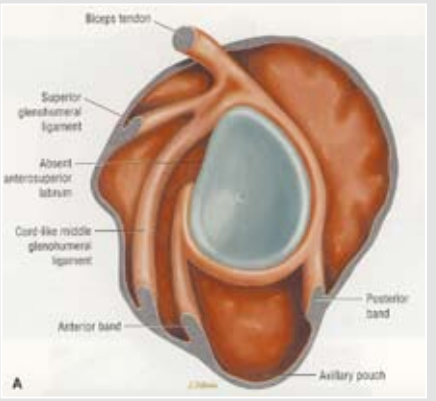
PRAXIS im KÖLN TRIANGLE

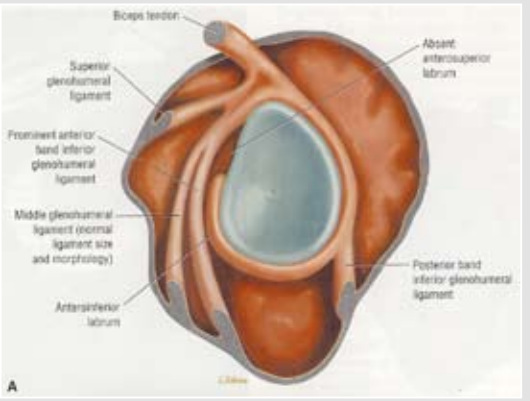
Anatomie -Labrumvariationen

- Sublabrales Foramen
- Cordlike MGL
- Buford_Komplex
- Promin. anteriores Band IGHL





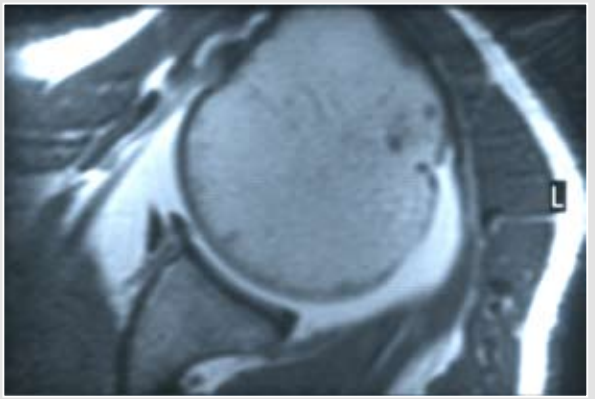


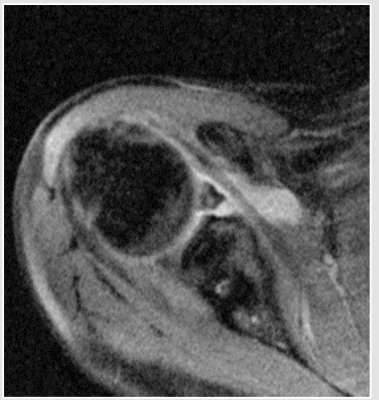


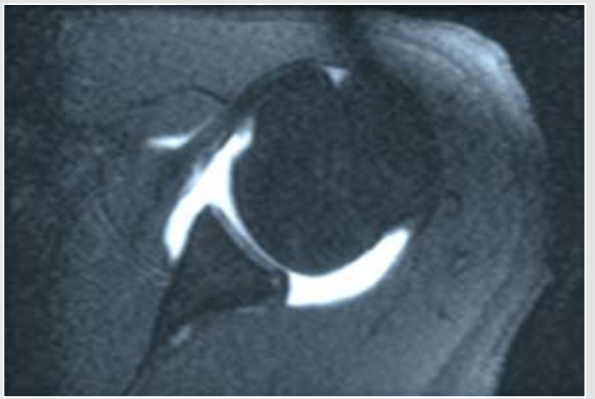
PRAXIS im KÖLN TRIANGLE

Anatomie - Labrumvariationen

- Pitfall gedoppeltes Labrum
- Aplastisches Labrum
- Sublabrales Foramen

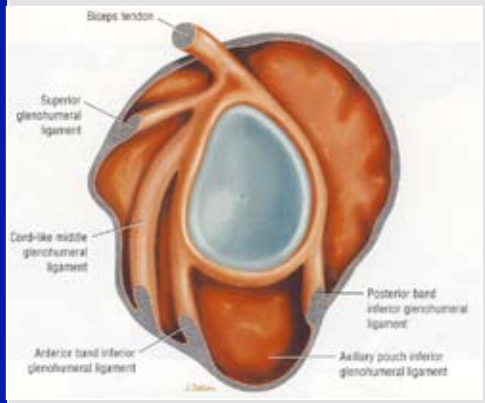


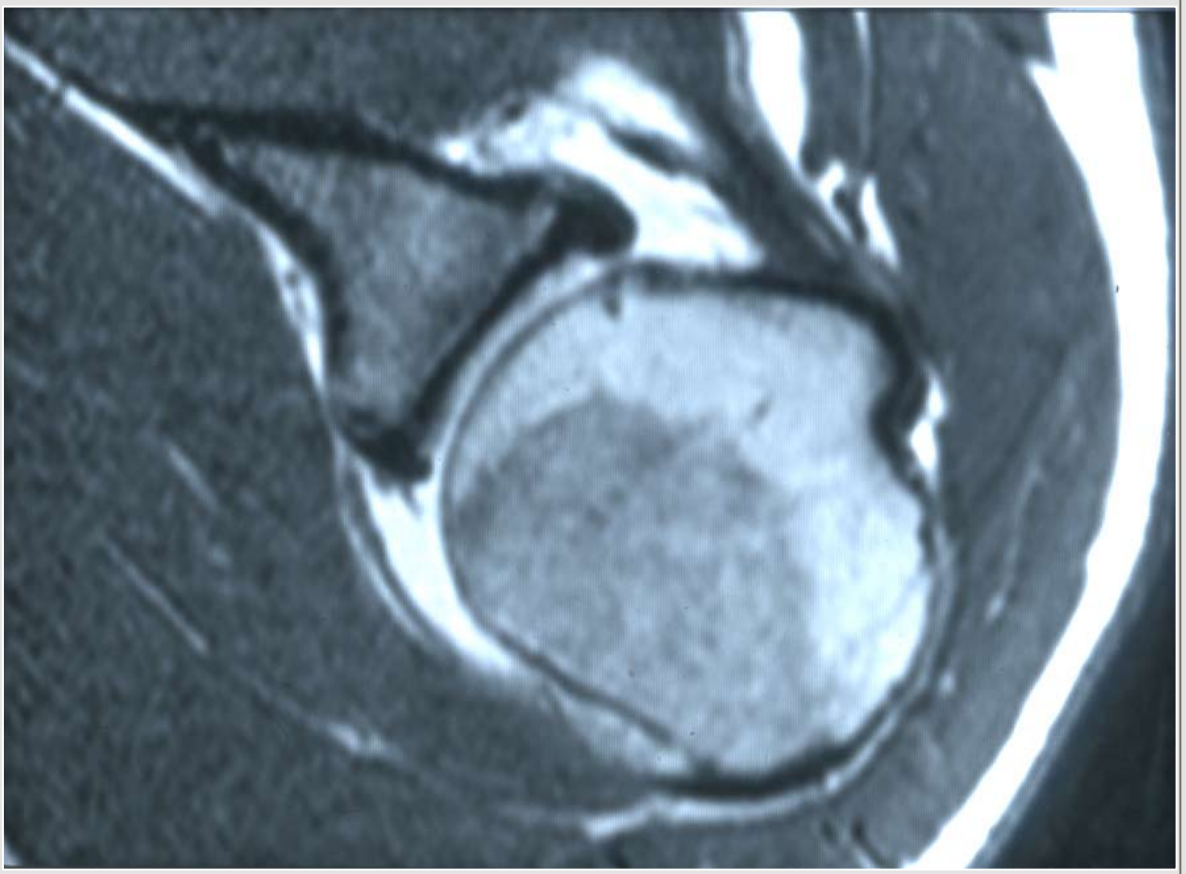




Anatomie - glenohumerale Bänder

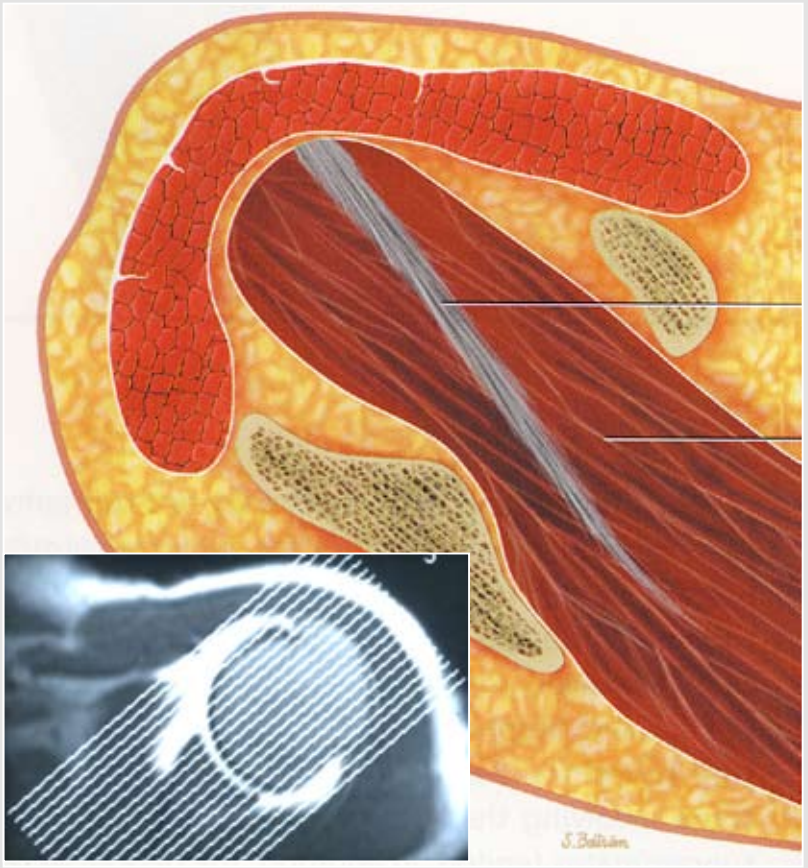
- Unauffälliges MGHL





Untersuchungstechnik

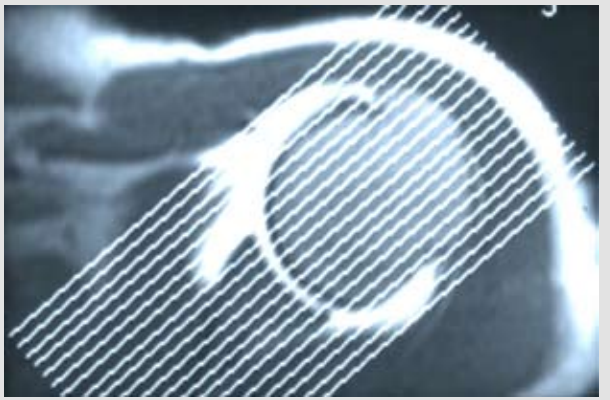
- **Schultereigene Anatomie: Referenzebene Glenoid**
- **Hilfsebene: Planung der paracor. Sequenz parallel zum Supraspinatussehnenverlauf**



PRAXIS im KÖLN TRIANGLE

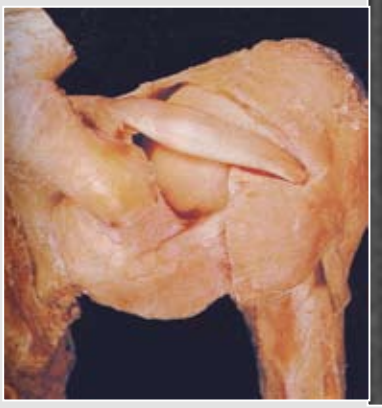
Untersuchungstechnik

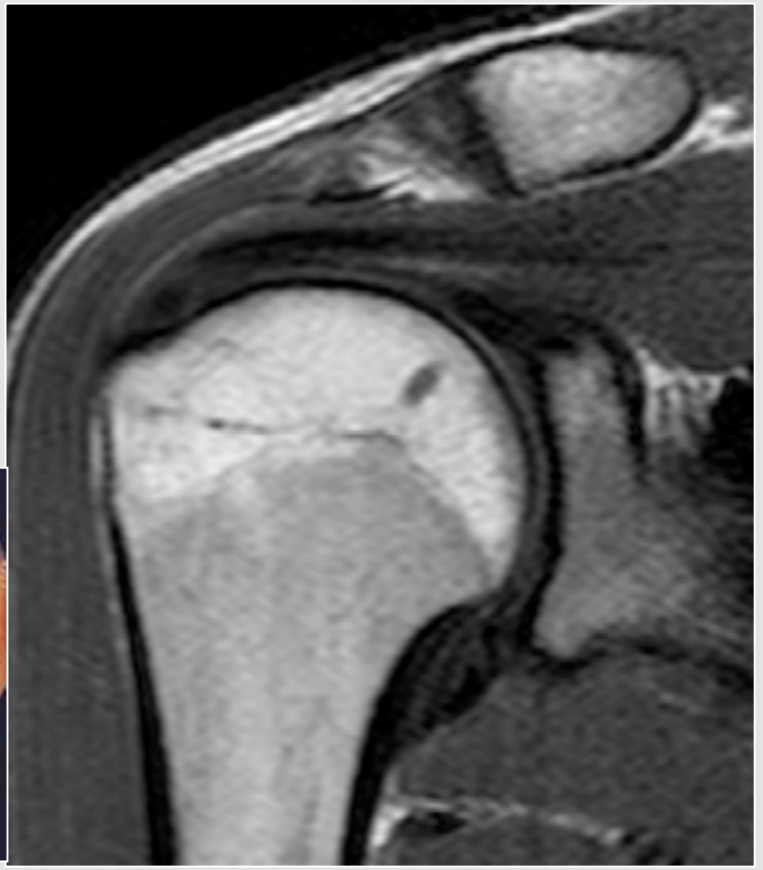
- Planung der axialen und parasagittalen Ebene senkrecht zur Glenoidebene



Untersuchungstechnik - Sequenzen

- paracor T1 TSE
- Paracor PD SPIR
- Parasag T2 TSE
- Ax 3D WATS





Untersuchungstechnik - Sequenzen

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- Paracor PD SPIR
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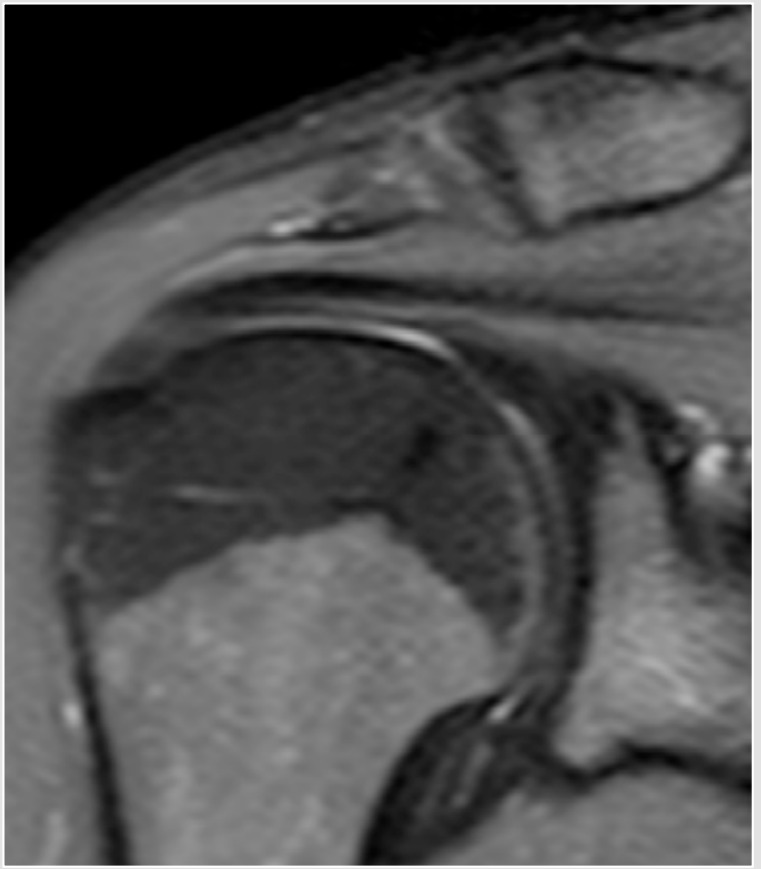
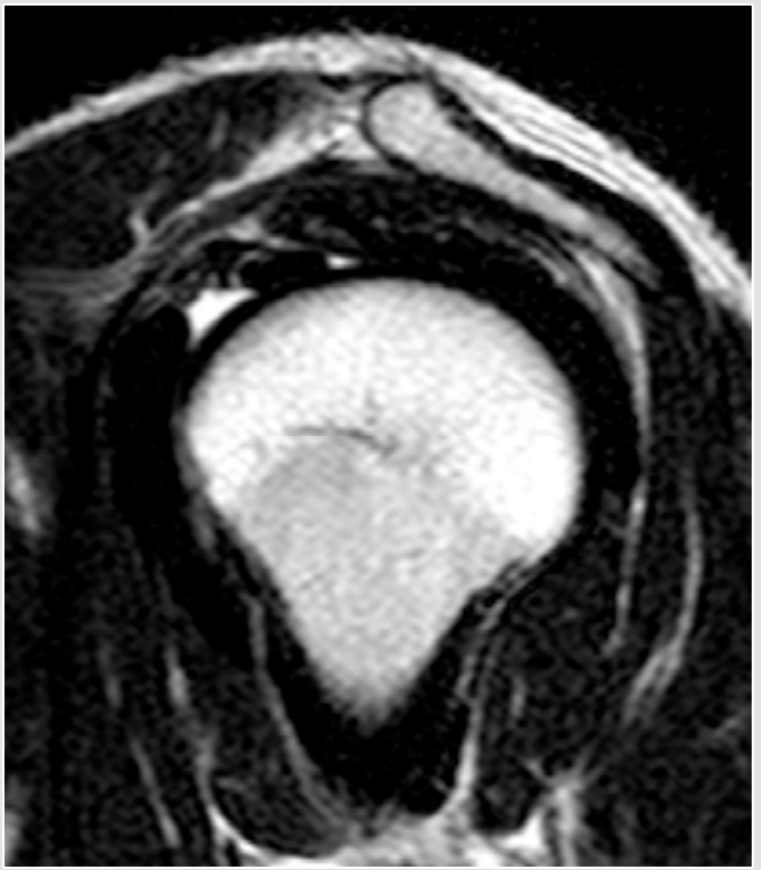
- Ax 3D WATS



PRAXIS im KÖLN TRIANGLE

Untersuchungstechnik - Sequenzen

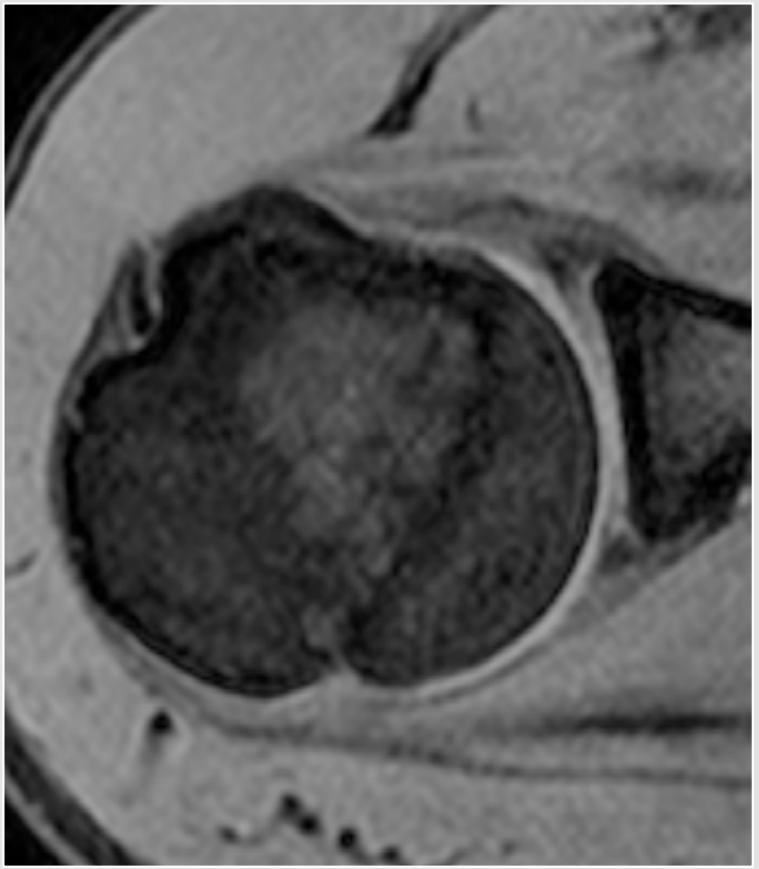
- paracor T1 TSE
- Paracor PD SPIR
- Parasag T2 TSE
- Ax 3D WATS



PRAXIS im KÖLN TRIANGLE

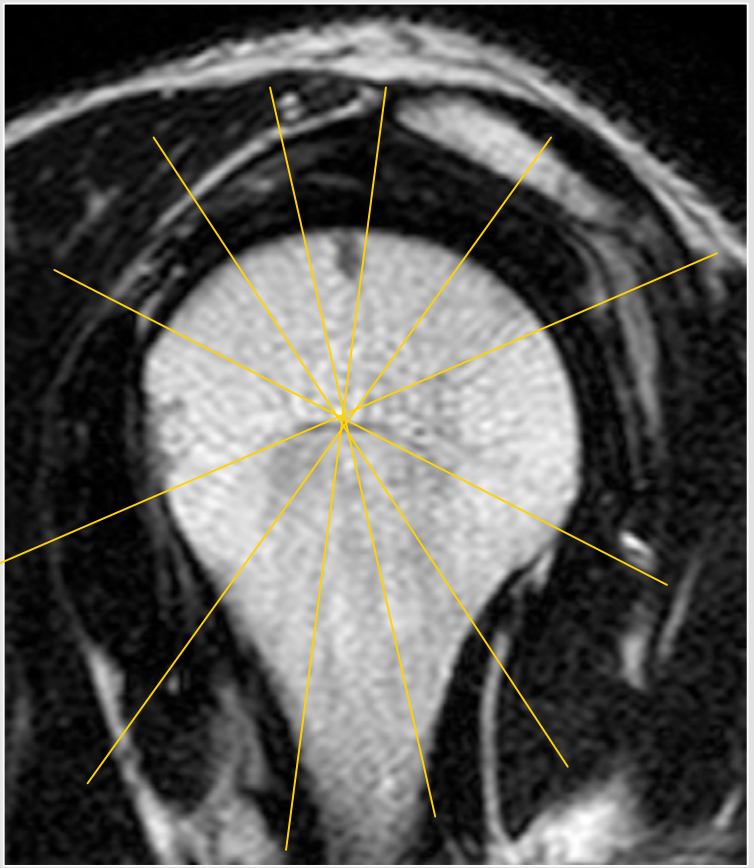
Untersuchungstechnik - Sequenzen

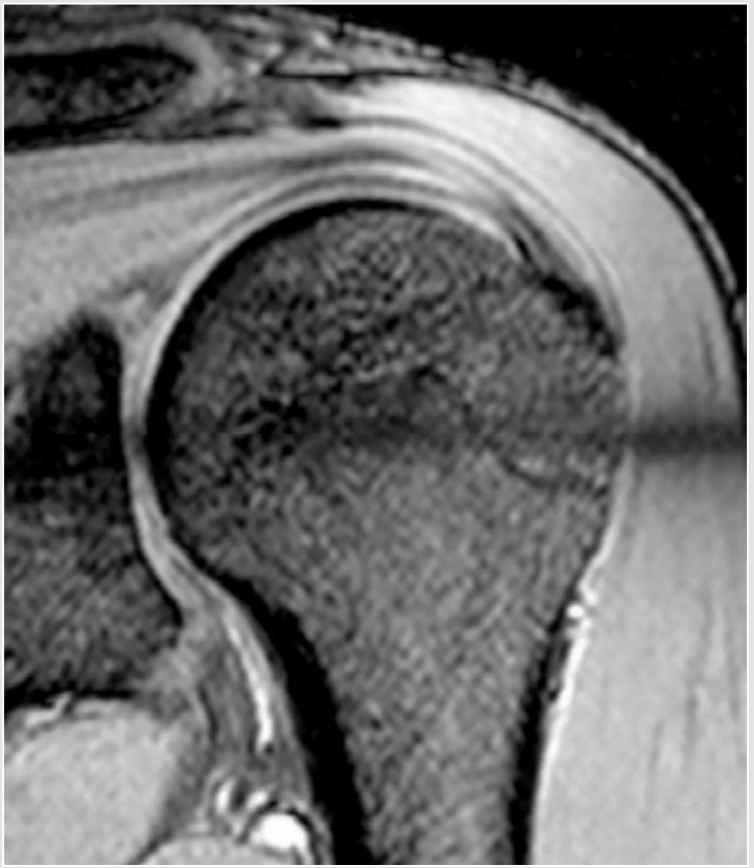
- paracor T1 TSE
- Paracor PD SPIR
- Parasag T2 TSE
- Ax 3D WATS



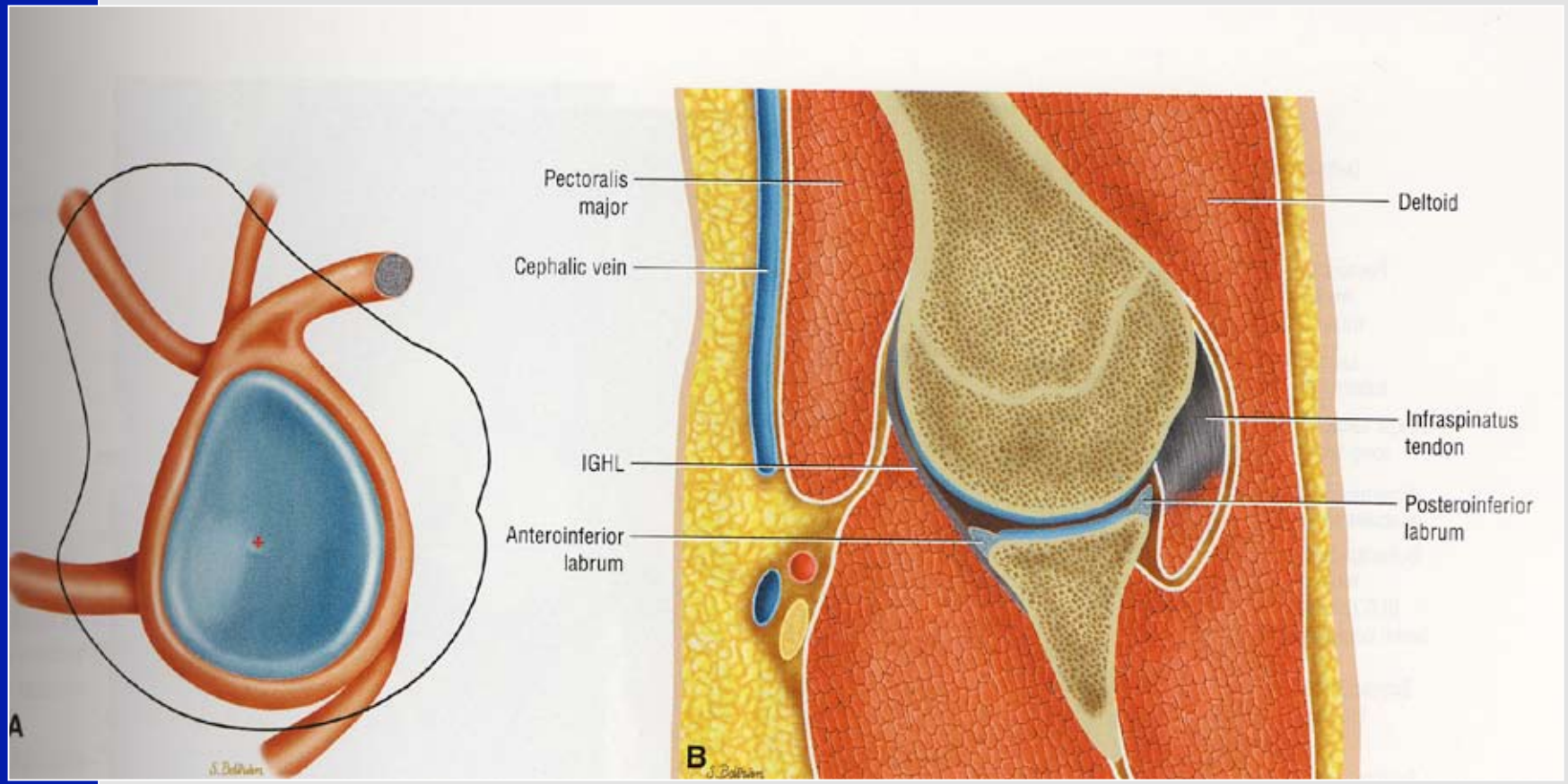
PRAXIS im KÖLN TRIANGLE

Radiale Sequenz



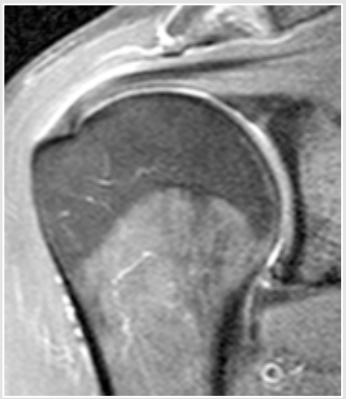


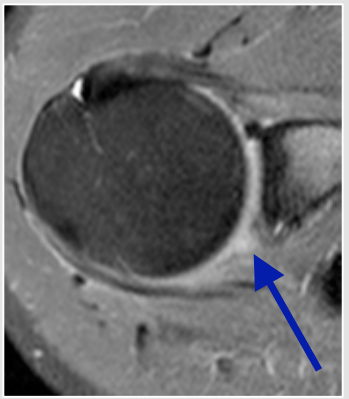
ABER-Position

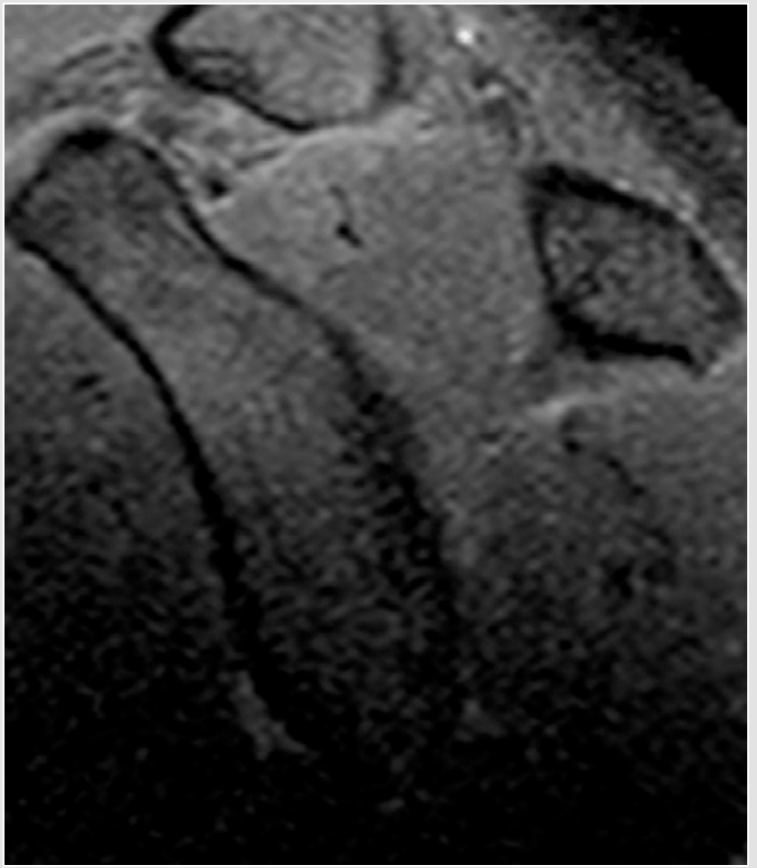


Indirekte MR-Arthrographie

- Intravenöse KM-Injektion
- Durchbewegen über 15 min
- T1 SPIR-Sequenzen axial, paracor und parasag.

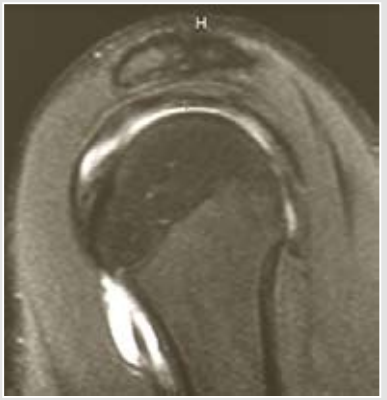


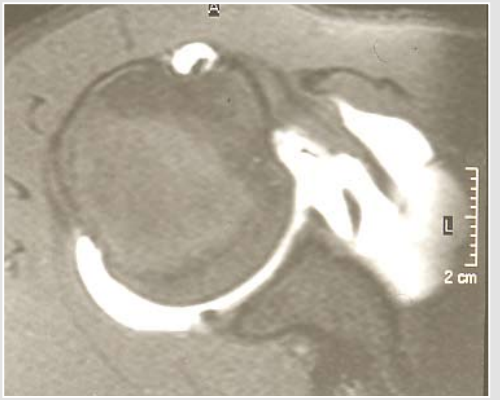


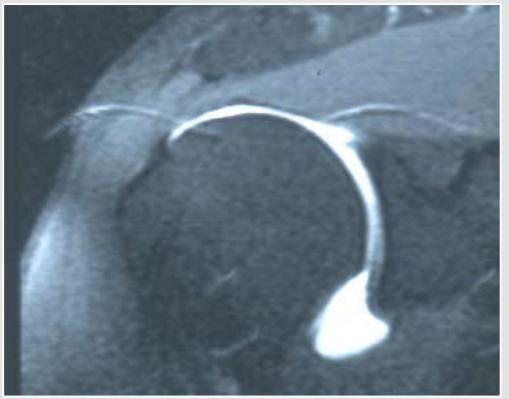


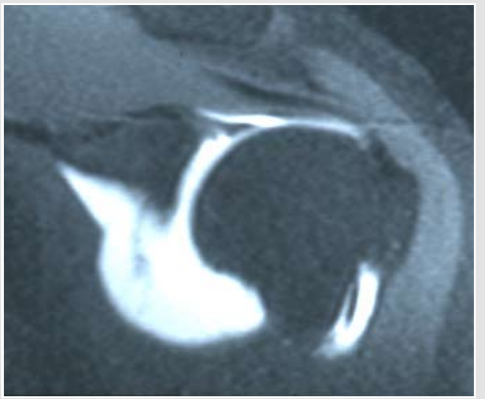
Direkte MR-Arthrographie

- Wichtig: Gute Entfaltung der Gelenkkapsel
- Kein Paravasat









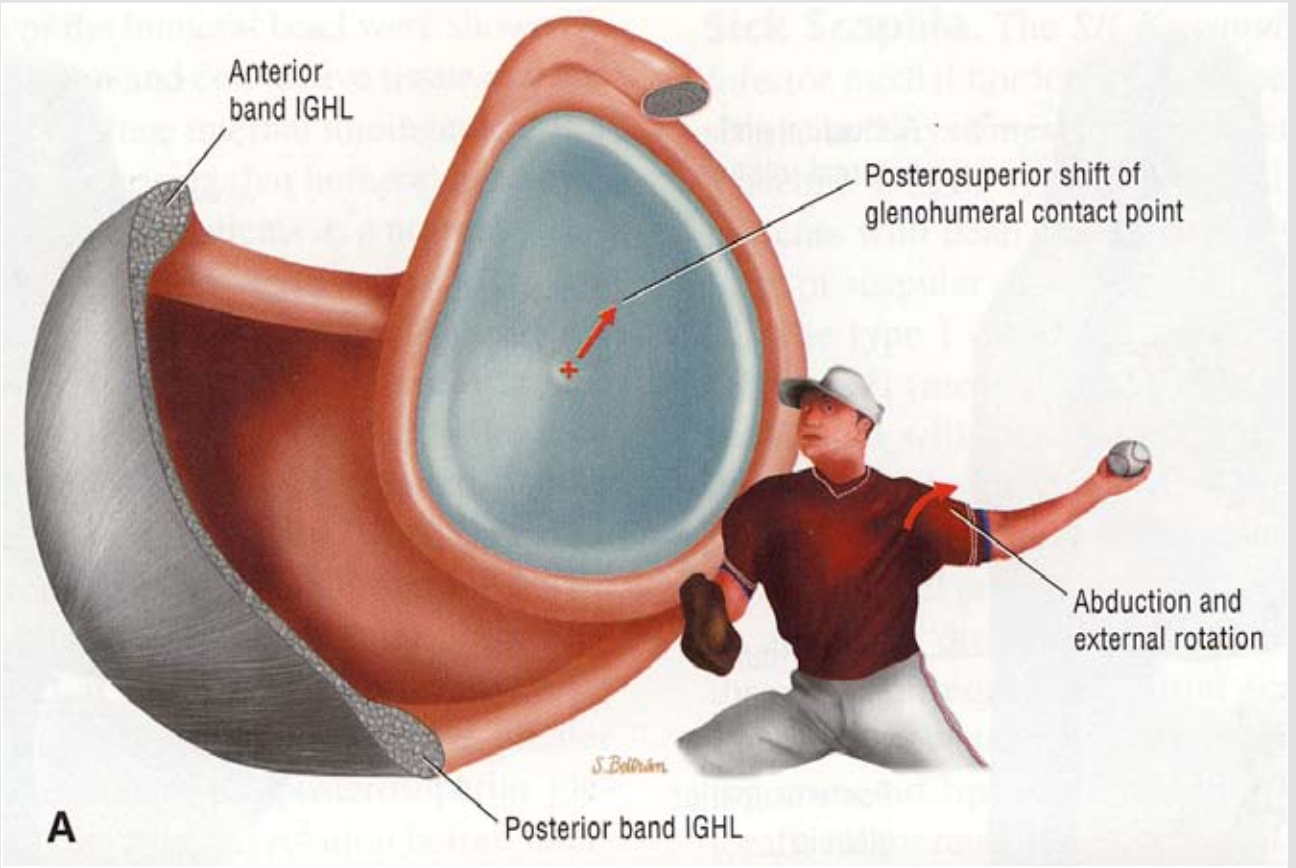
Bildinterpretation

- Verletzungsmechanismus - was ist passiert und wann?
- Schmerzlokalisation - wo tut‘s weh?
- Bildanalyse

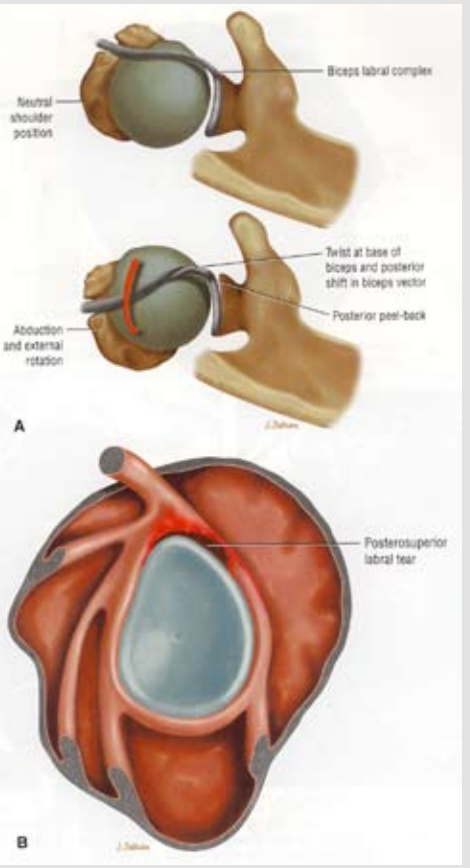
Verletzungsmechanismen

- Akutes Trauma vs. Chronisch-repetitives Trauma
- Überlastung
- Direktes Anpralltrauma vs. Verdrehtrauma
- Werfersyndrome
- Painful arc
- Instabilität?
- Atraumatisch aufgetretene Schmerzen

Hyperabduktion und Extension



Hyperabduktion und Aussenrotation



PRAXIS im KÖLN TRIANGLE

Schmerzlokalisation

- Punktförmiger superiorer Schulterschmerz AC-Gelenk
- Lateraler Schulterschmerz mit Ausstrahlung über die Oberarmaussenseite
- Posteriorer Schulter-Sz
- Mit und ohne aktiver und/oder passiver Bewegungseinschränkung

PRAXIS im KÖLN TRIANGLE

Bildanalyse

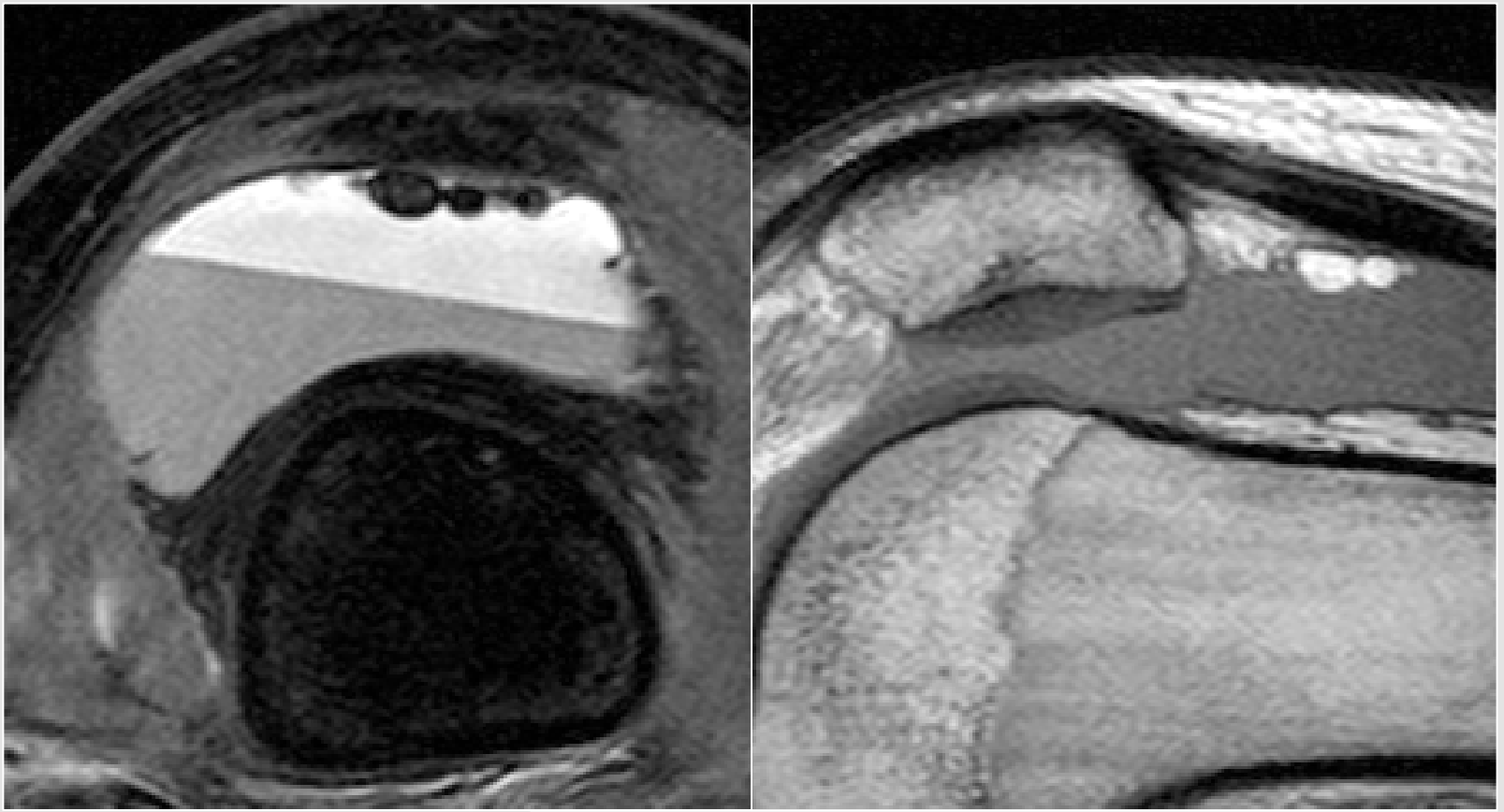
- Läsionserkennung
- Kompartment
- Begrenzung
- Signalgebung
- Fettgehalt? Knorpelmatrix? Verkalkungen?
- KM-Aufnahme

Bildanalyse

Fett	T1 und T2 hell, unter FS dunkel
Wasser	T1 dunkel T2 hell
Blut	T1 hell T2 dunkel
Kalk und Luft	schwarz in allen Sequenzen. Suszeptibilitätsartefakte

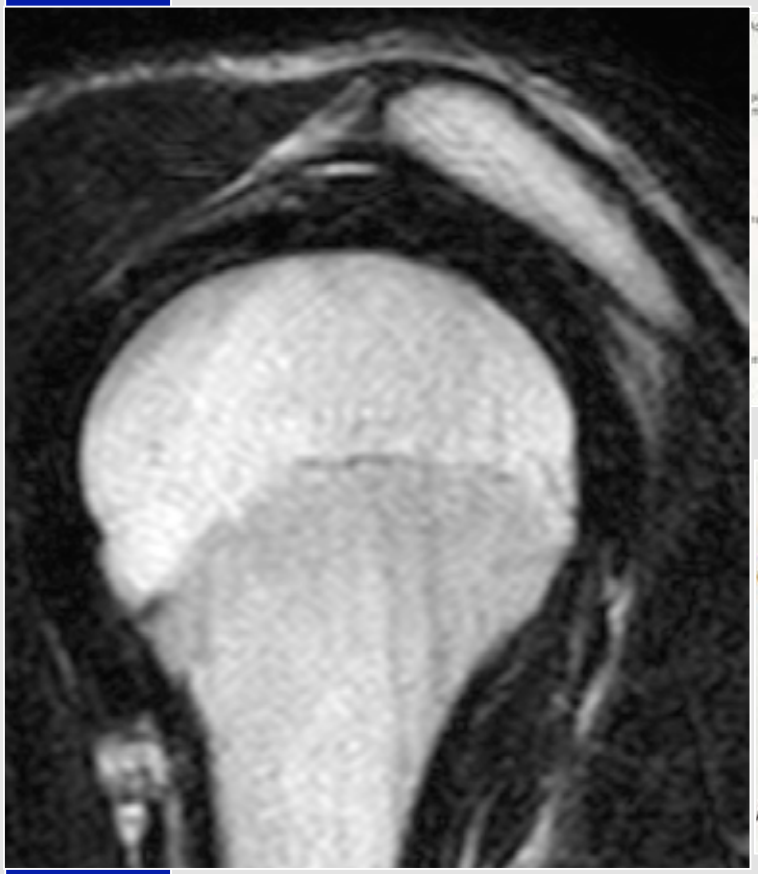
PRAXIS im KÖLN TRIANGLE

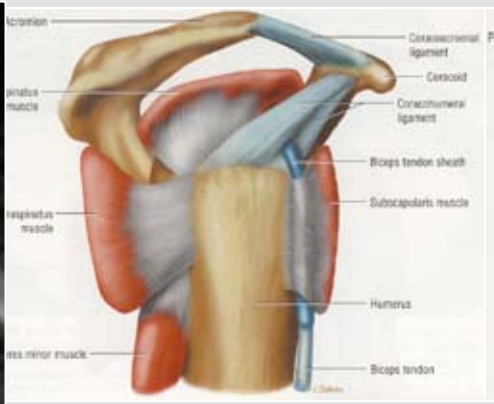
Bildinterpretation

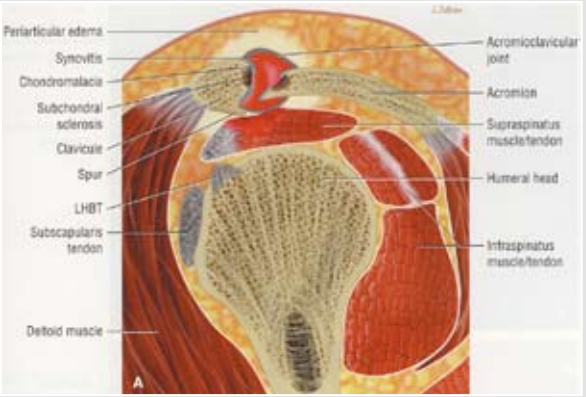


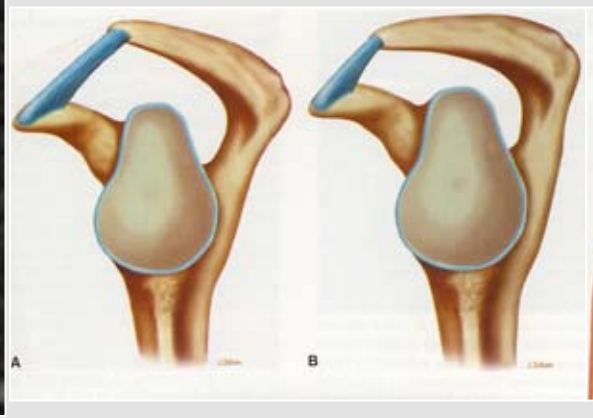
Beispiele

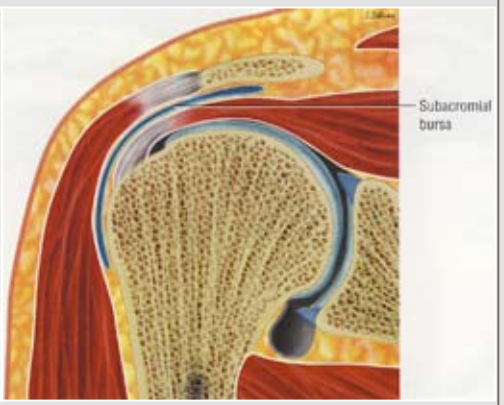
Subacromiales Impingement











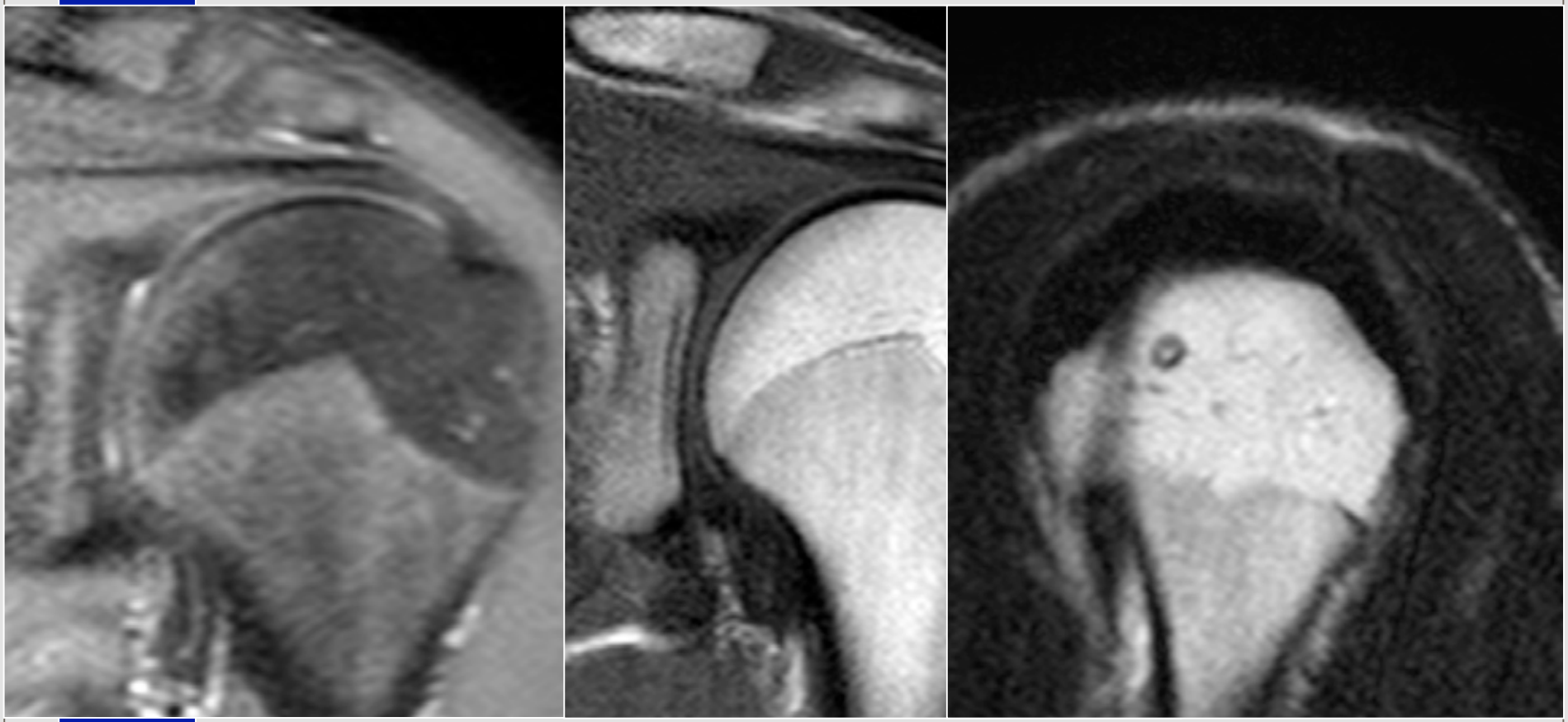
PRAXIS im KÖLN TRIANGLE

Subacromiales Impingement

- Subacromiale Enge / Akromionfehlform
- Insertionstendopathie
- Bursitis subacromialis/subdeltoidea
- Tendinosis calcarea
- Partialruptur gelenk- oder bursaseitig
- Komplettruptur
- Komplettruptur mit Retraktion und Humeruskopfglatze
- Humeruskopfhochstand & subacr. Schliffsklerose

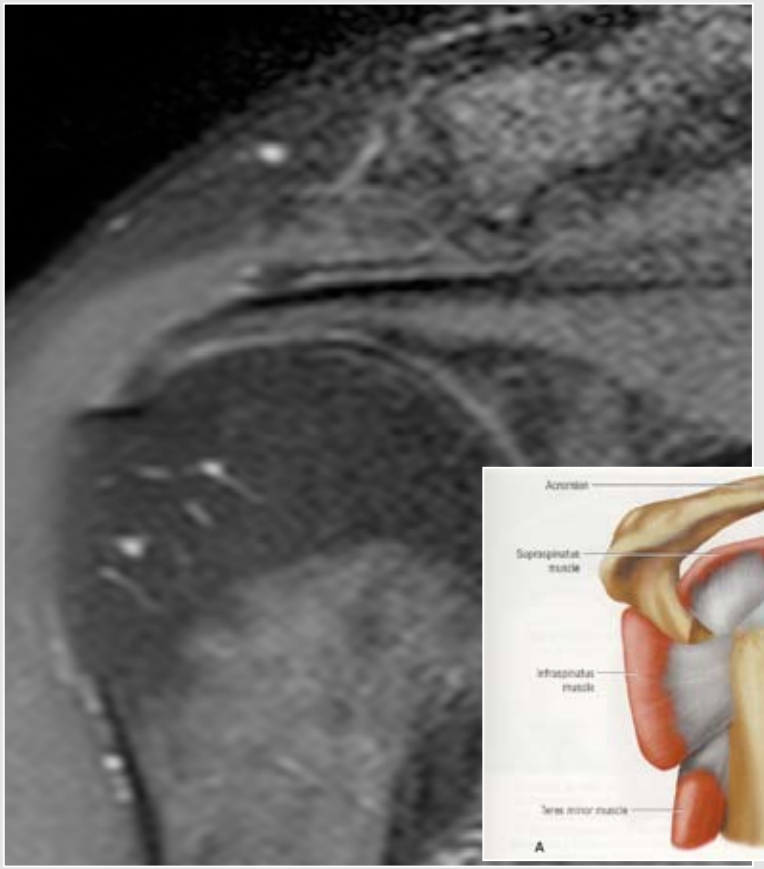
PRAXIS im KÖLN TRIANGLE

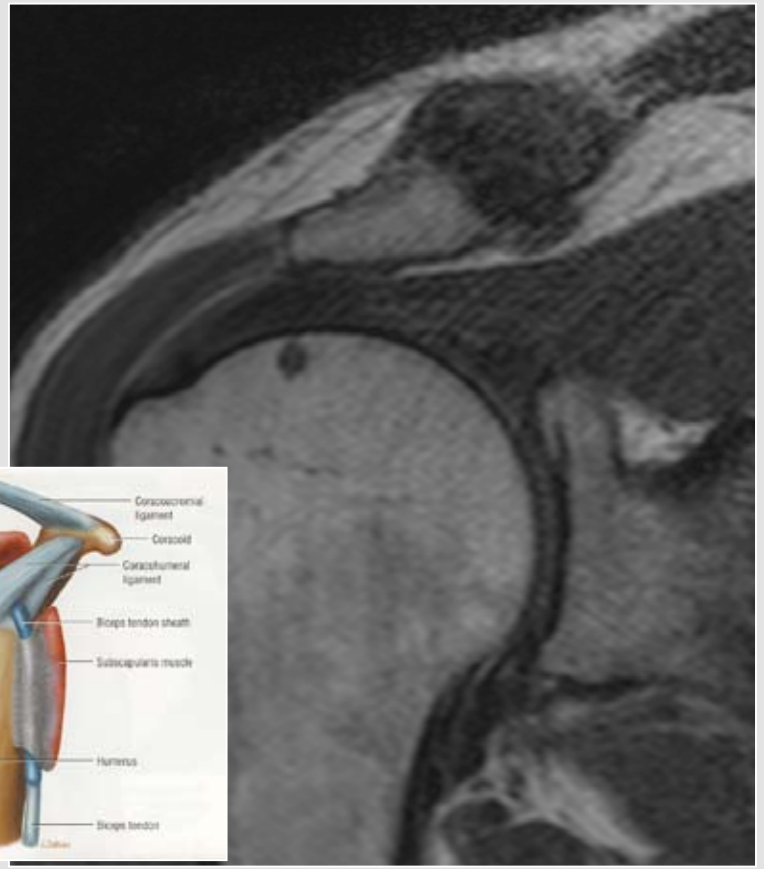
Unauffällige Supraspinatussehne

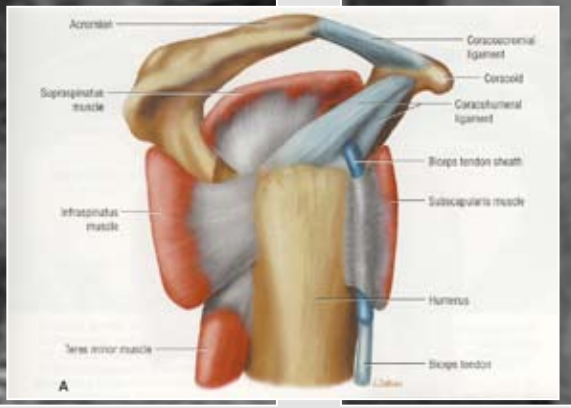


PRAXIS im KÖLN TRIANGLE

Subacromiale Enge



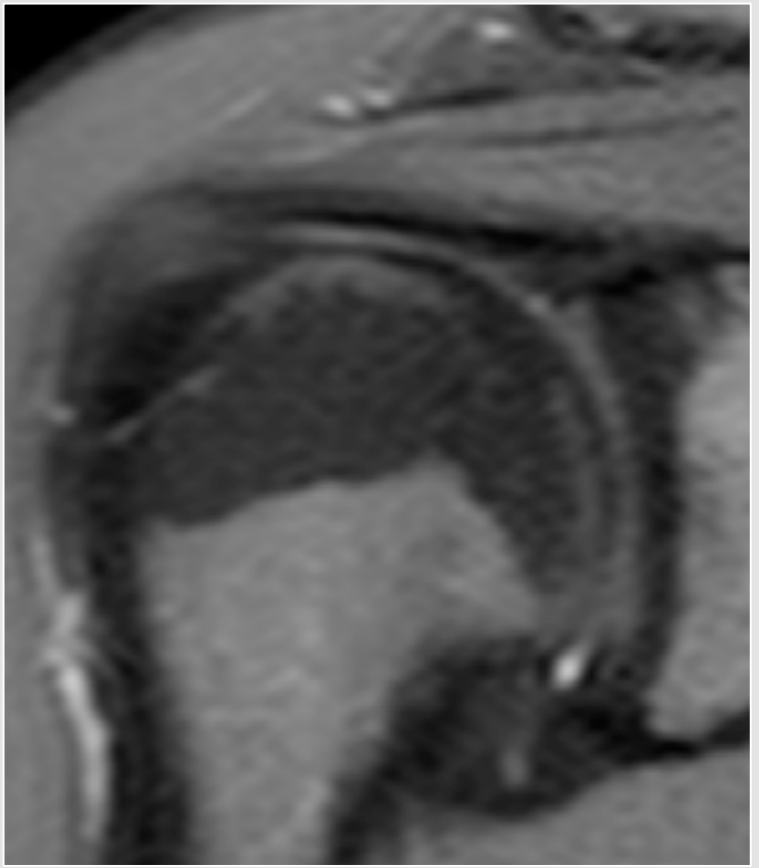




PRAXIS im KÖLN TRIANGLE

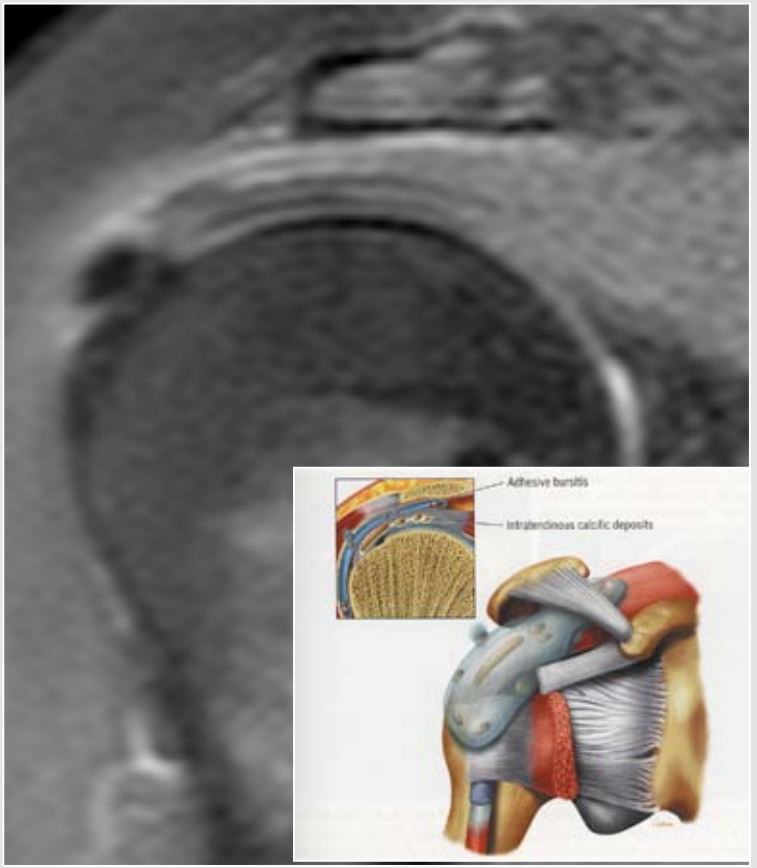
Insertionstendopathie der Supraspinatussehne

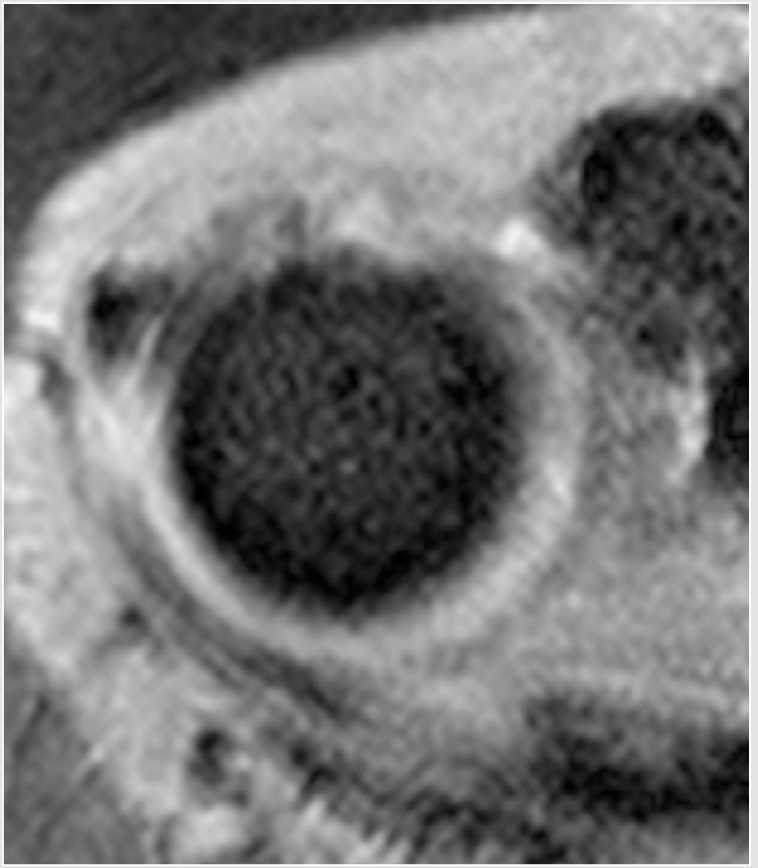
- Signalanhebung
- Auftreibung
- Erhaltene Kontinuität
- Mukoide Degeneration
- Einlagerung von Bindegewebsgrundsubstanz



PRAXIS im KÖLN TRIANGLE

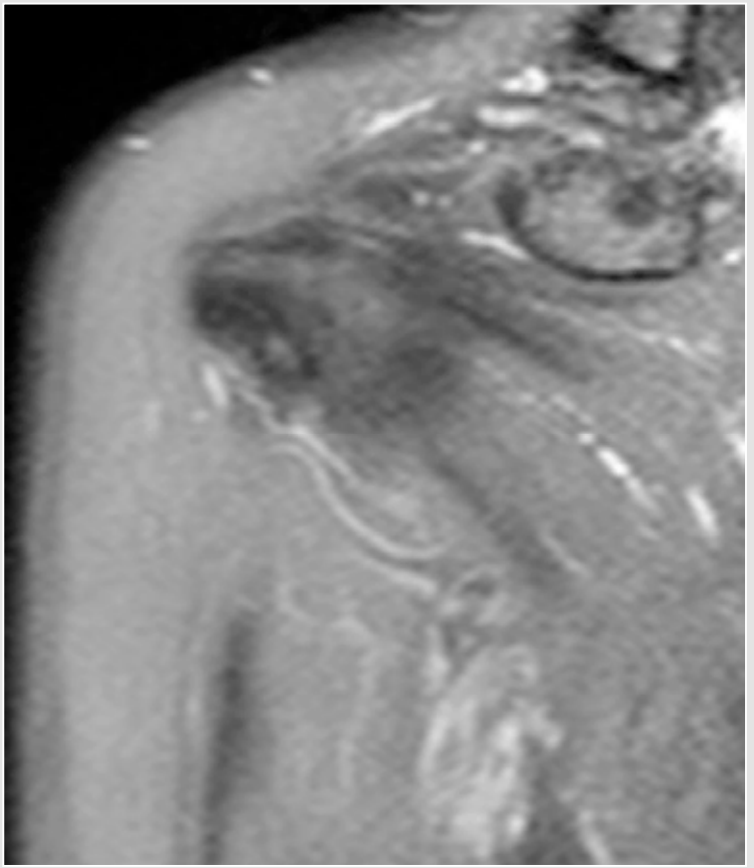
Tendinosis calcarea

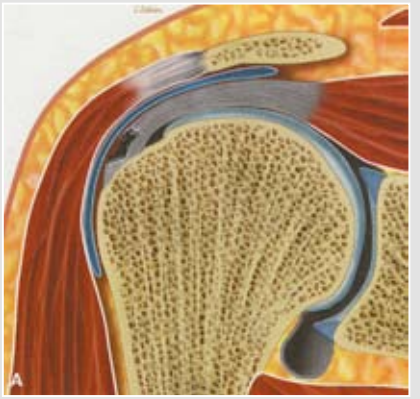


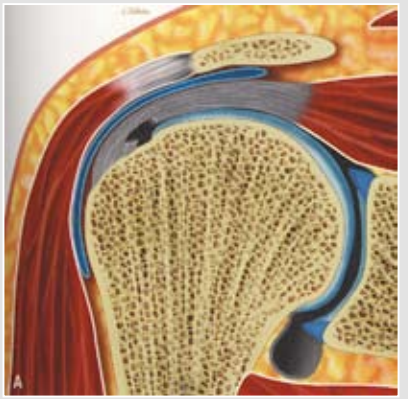


Partialruptur der Supraspinatussehne

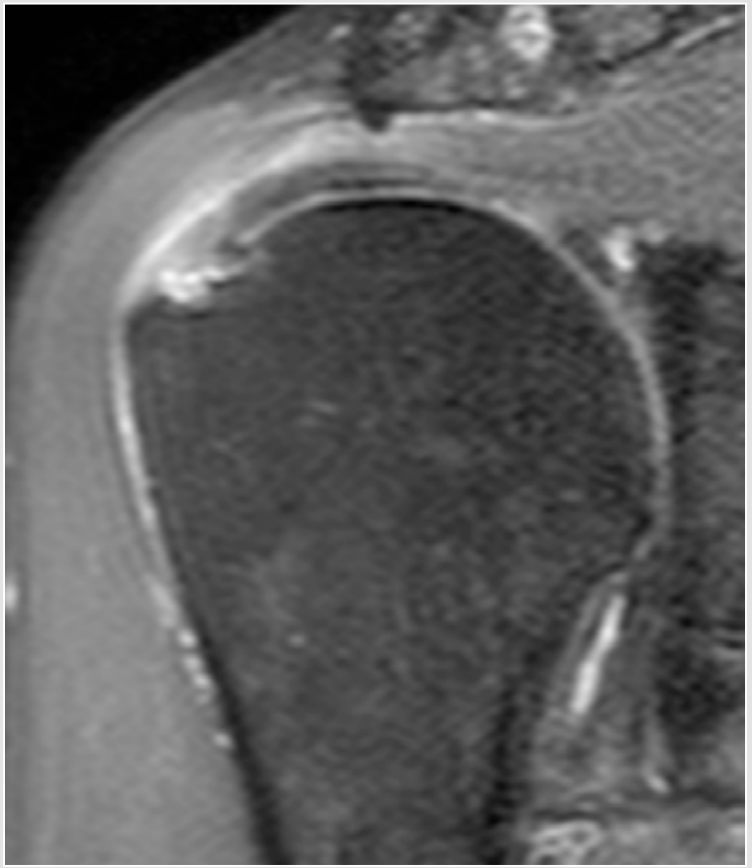
- Bursaseitig
- Gelenkseitig

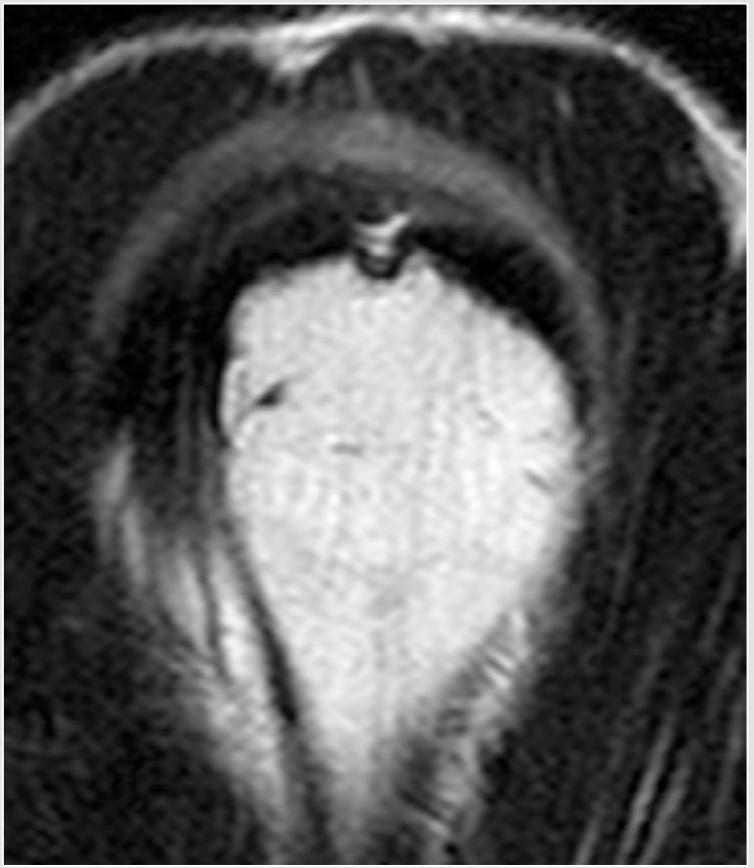




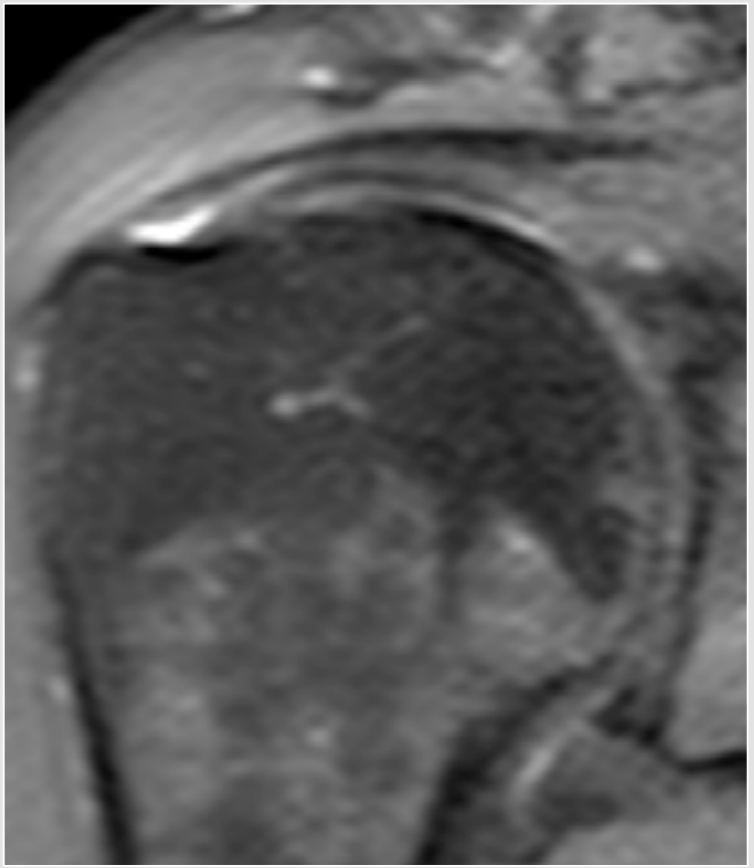


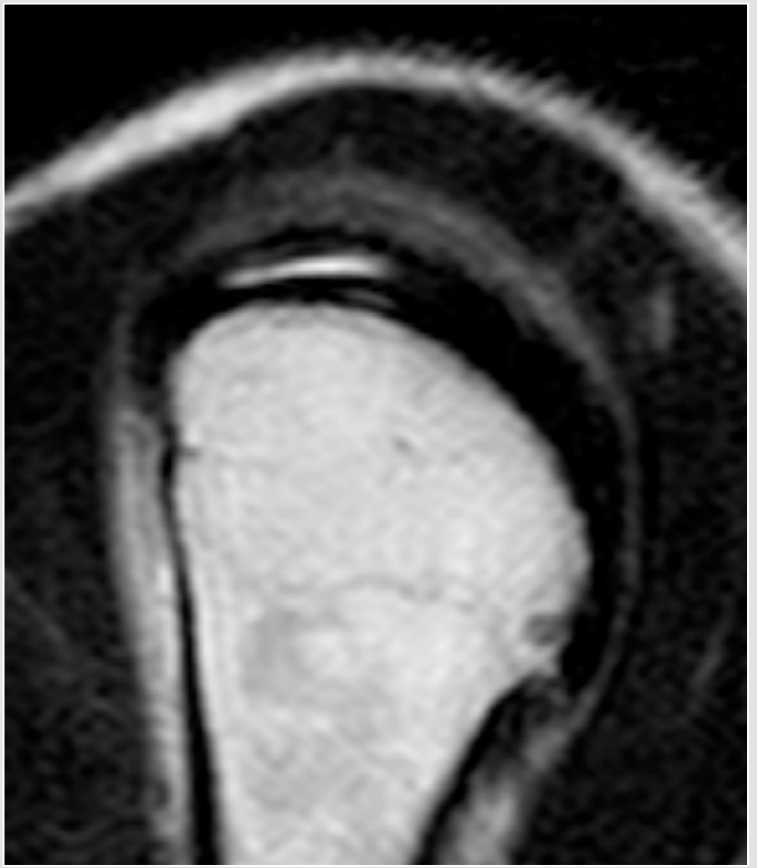
Partialruptur der Supraspinatussehne





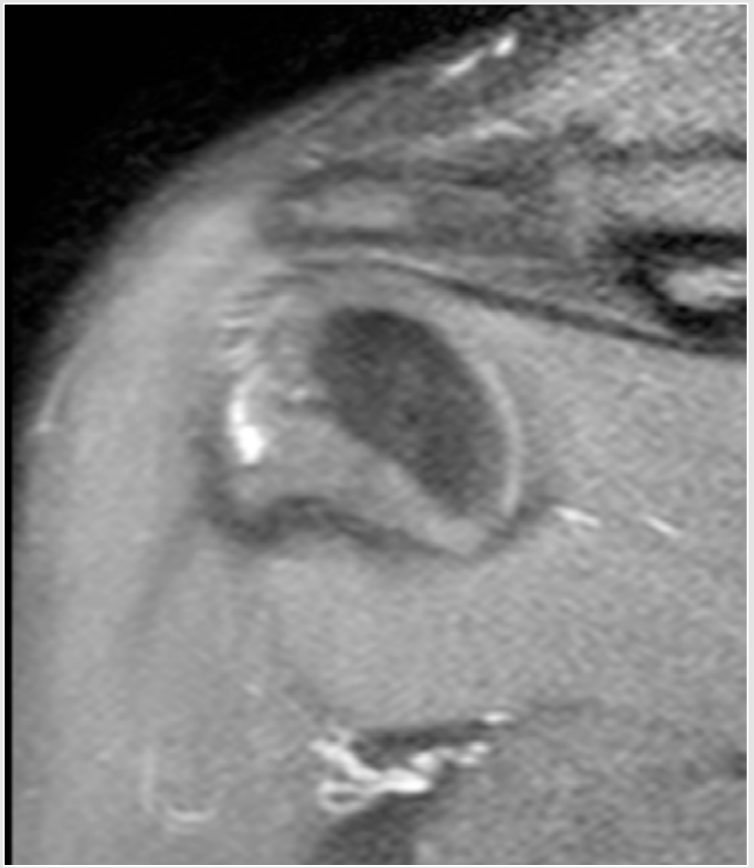
Partialruptur der Supraspinatussehne

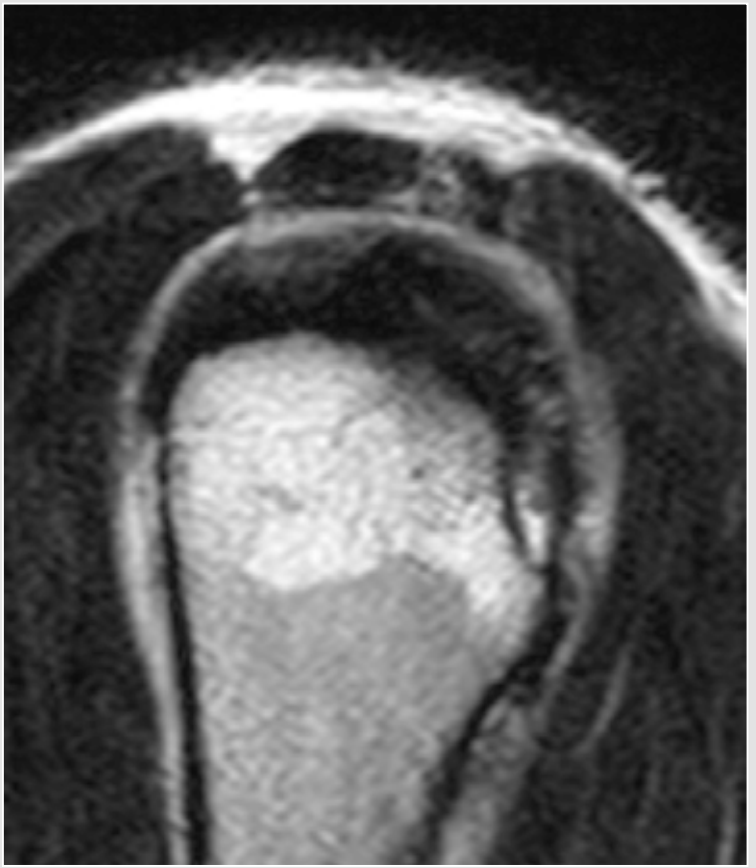




PRAXIS im KÖLN TRIANGLE

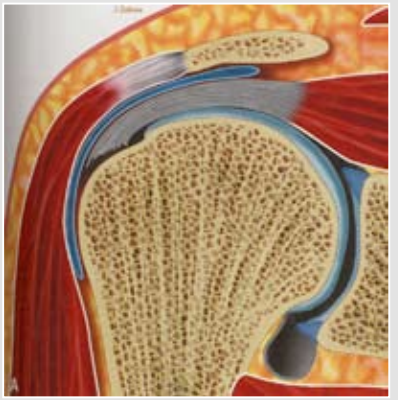
Partialruptur Infraspinatussehne

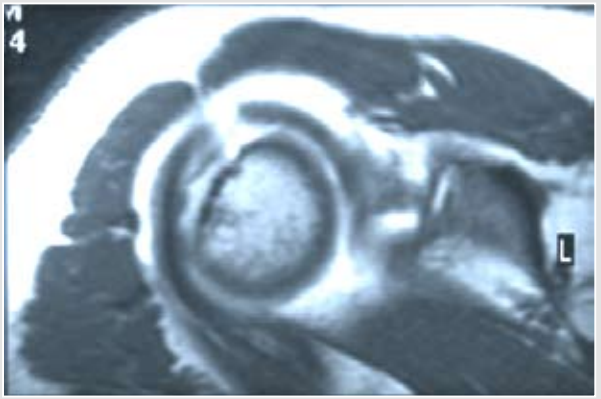


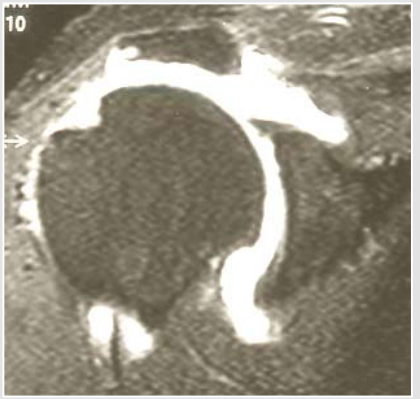


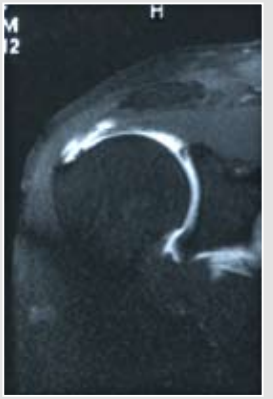
Komplettruptur der Supraspinatussehne

- Ohne Retraktion
- Mit partieller Retraktion
- Mit kompletter Retraktion

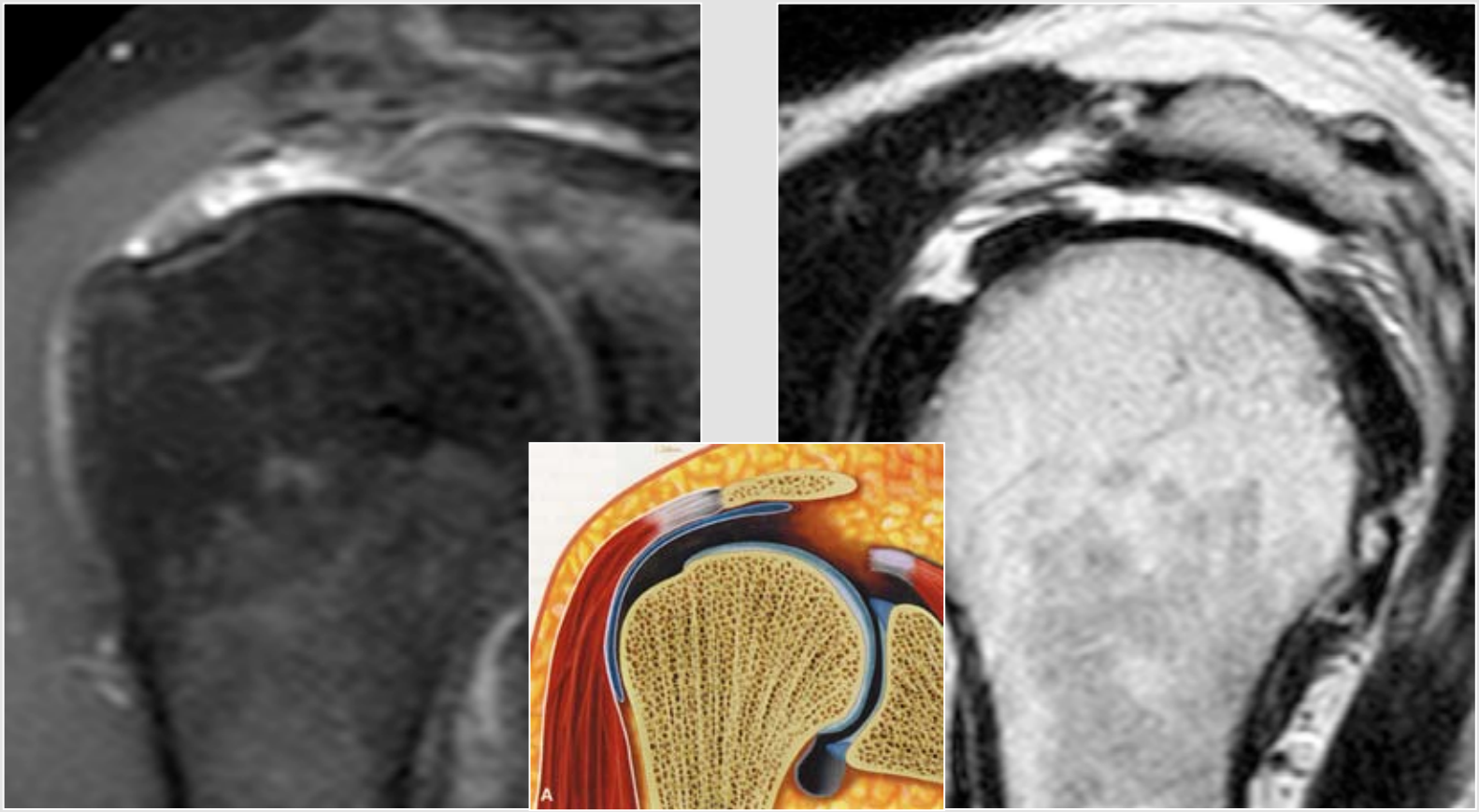






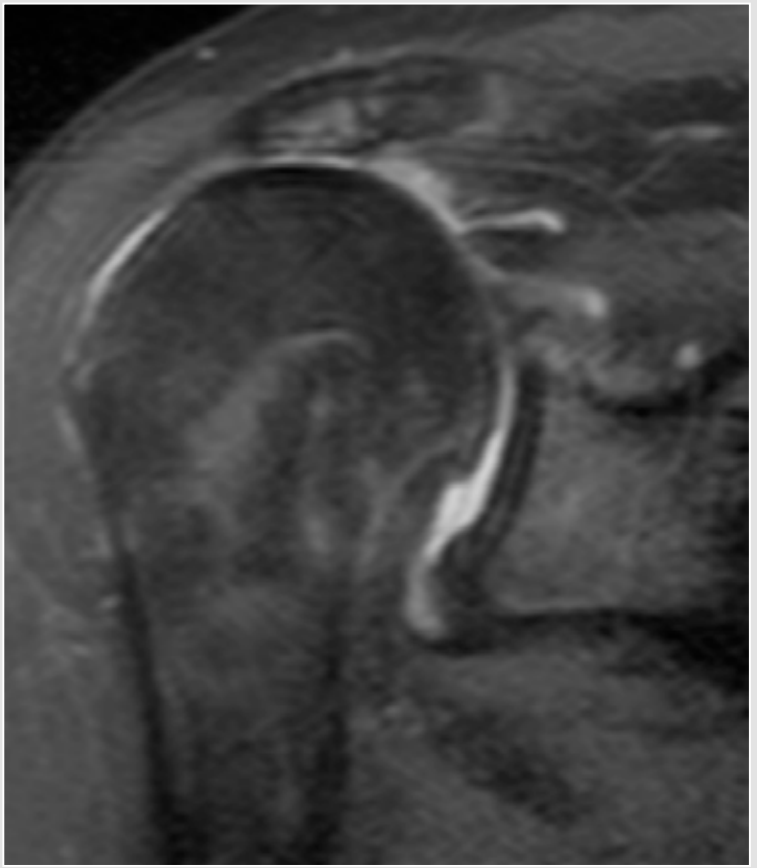


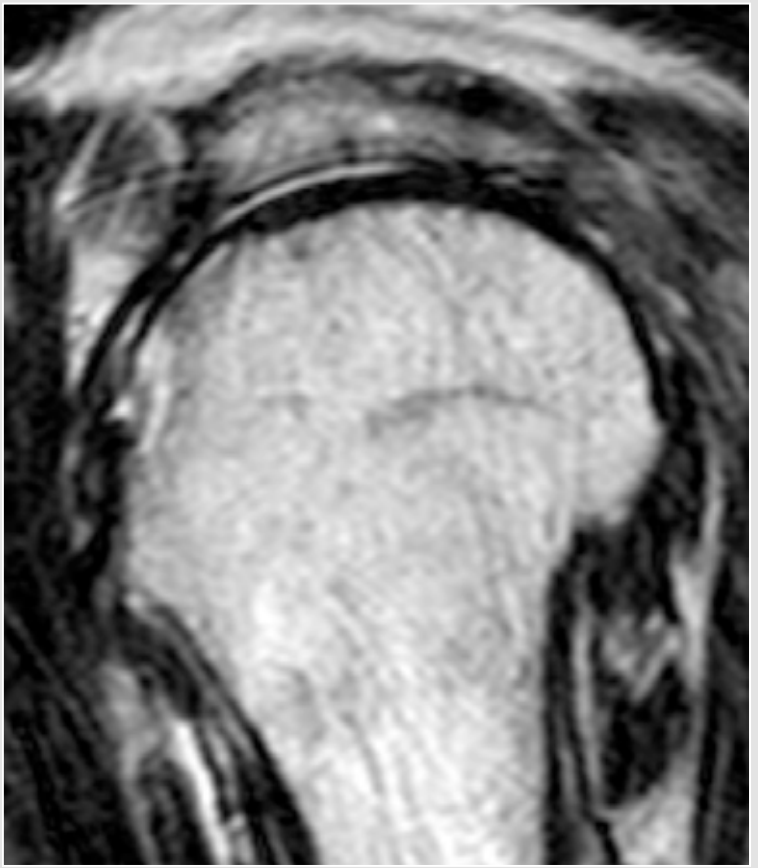
Komplettruptur der Supraspinatussehne



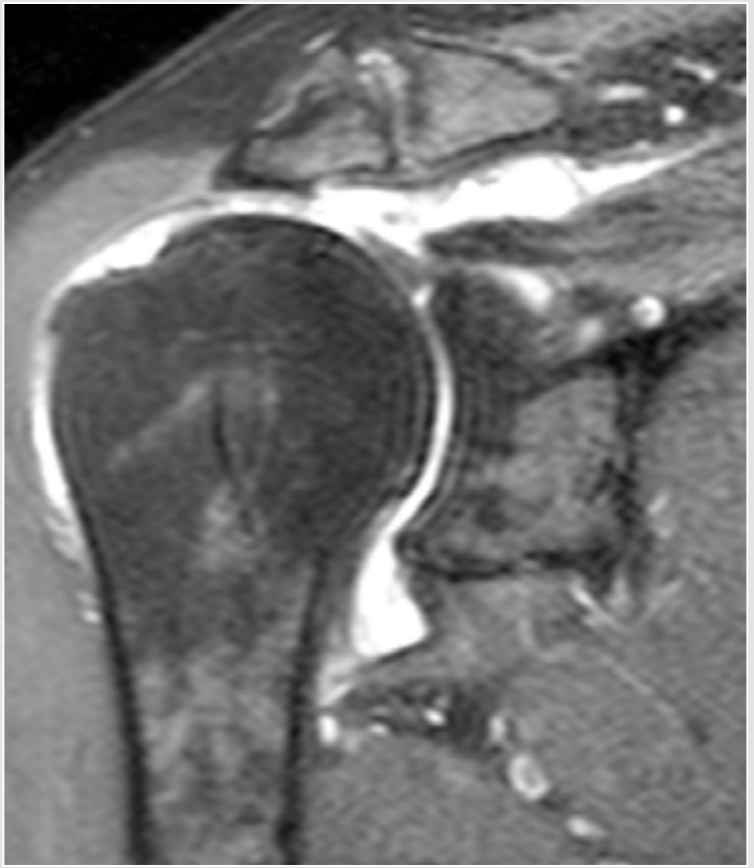
PRAXIS im KÖLN TRIANGLE

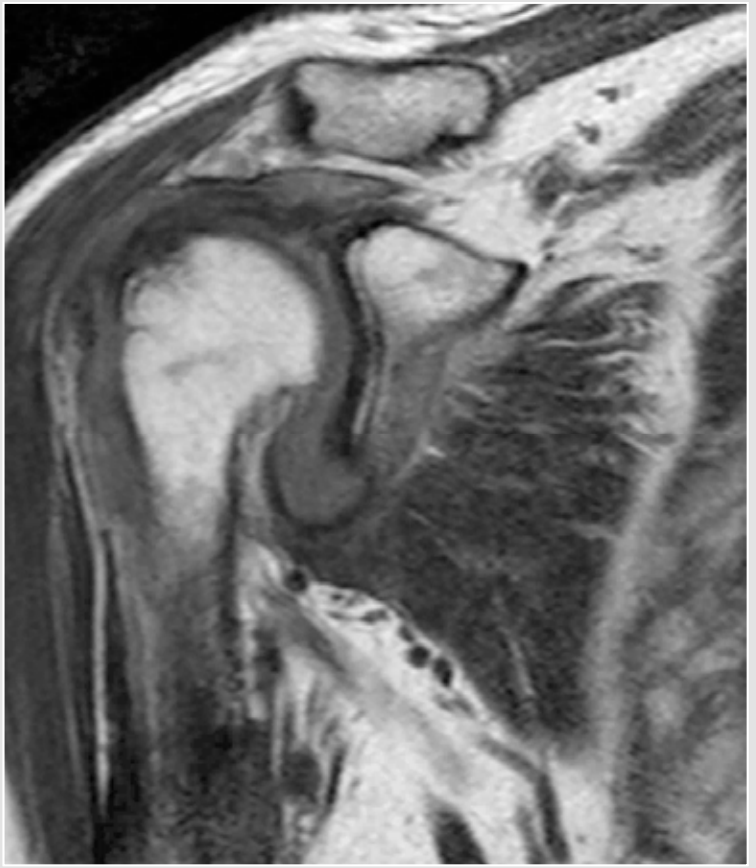
Humeruskopfhochstand & subacr. Schliffsklerose





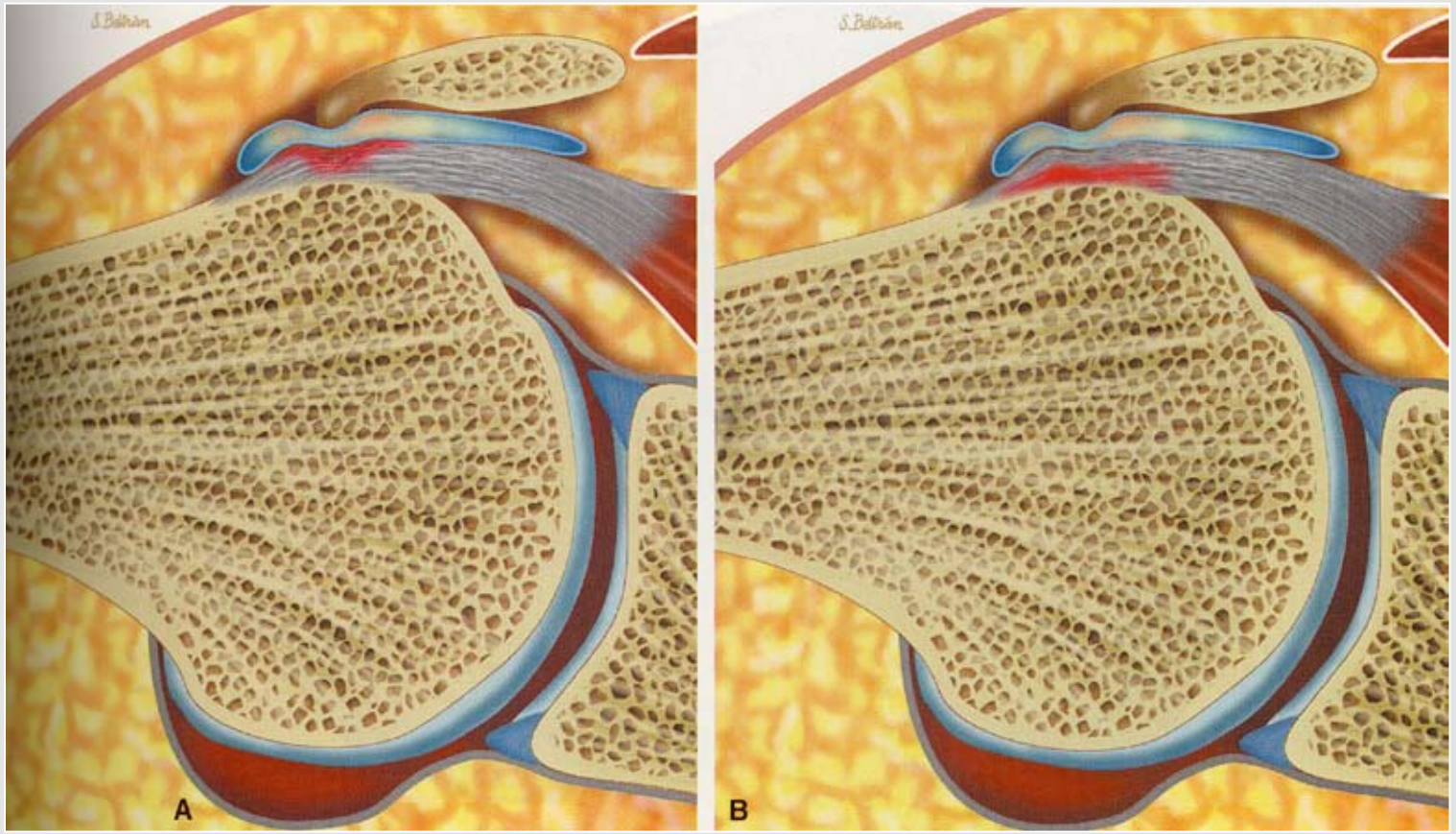
Ruptur und Atrophie Supraspinatussehne





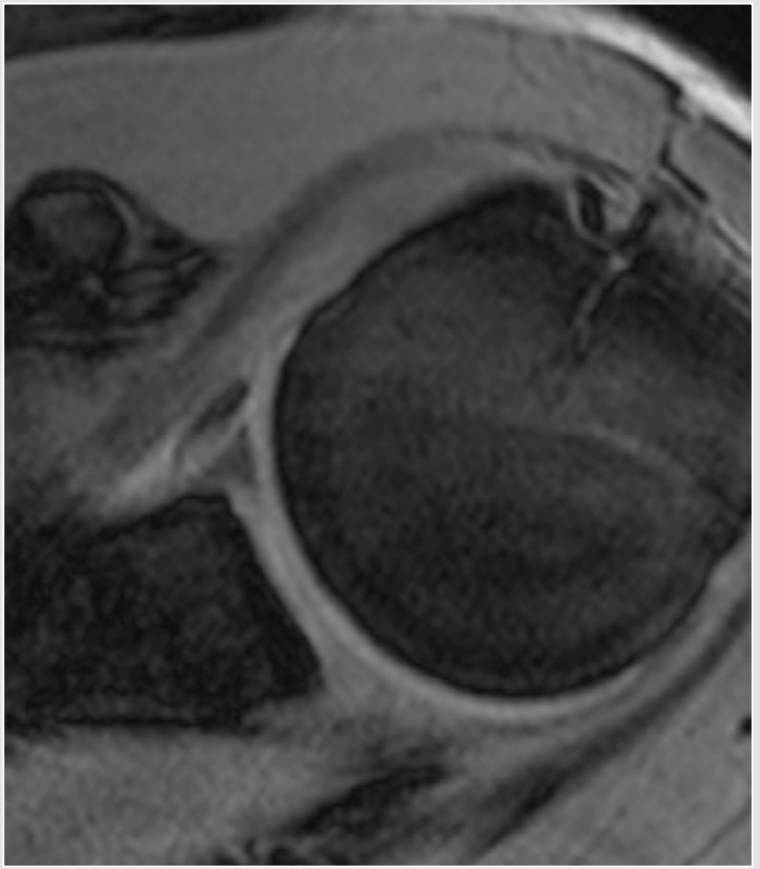
PRAXIS im KÖLN TRIANGLE

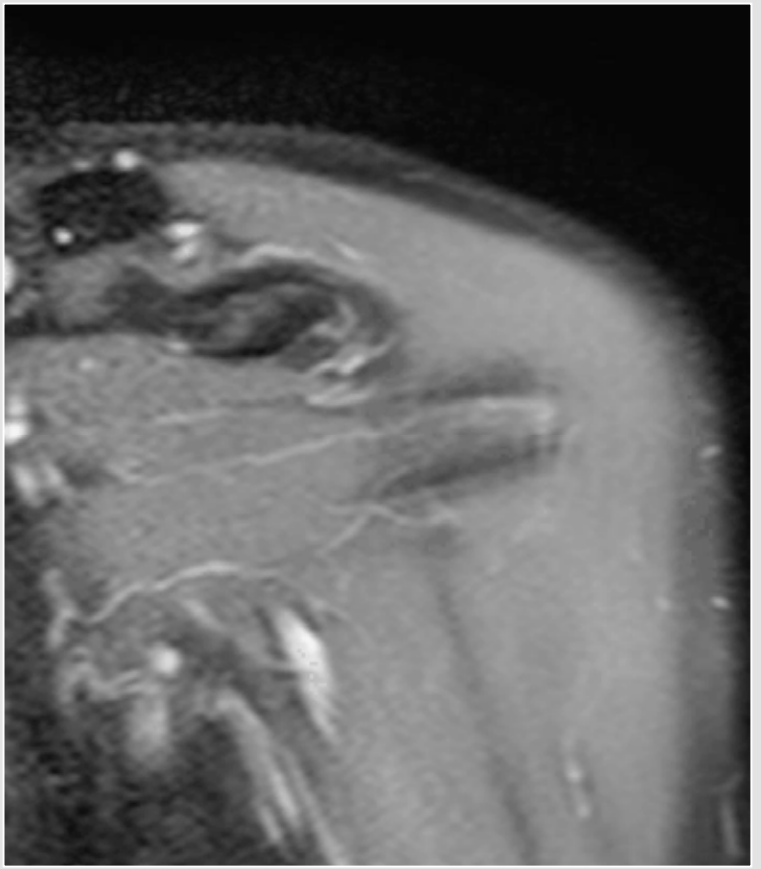
Subcoracoidales Impingement



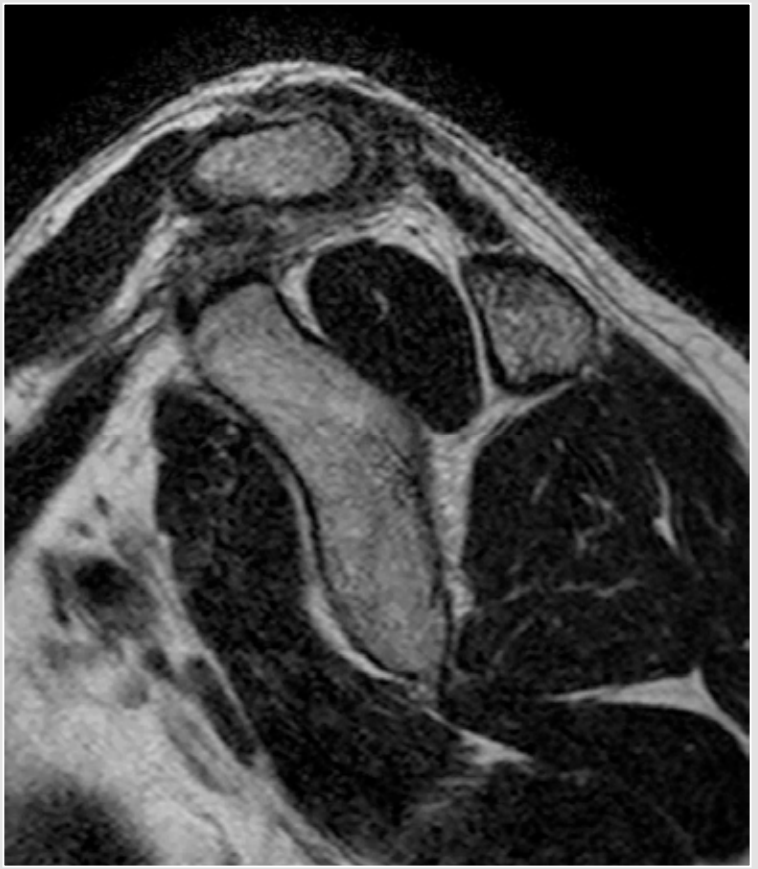
PRAXIS im KÖLN TRIANGLE

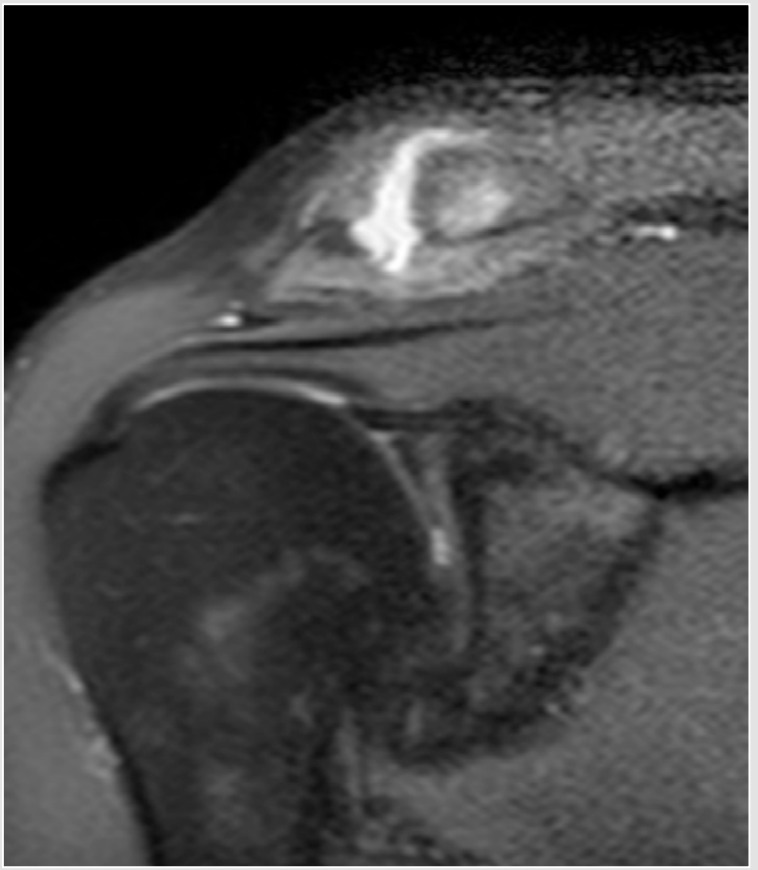
Subcoracoidales Impingement



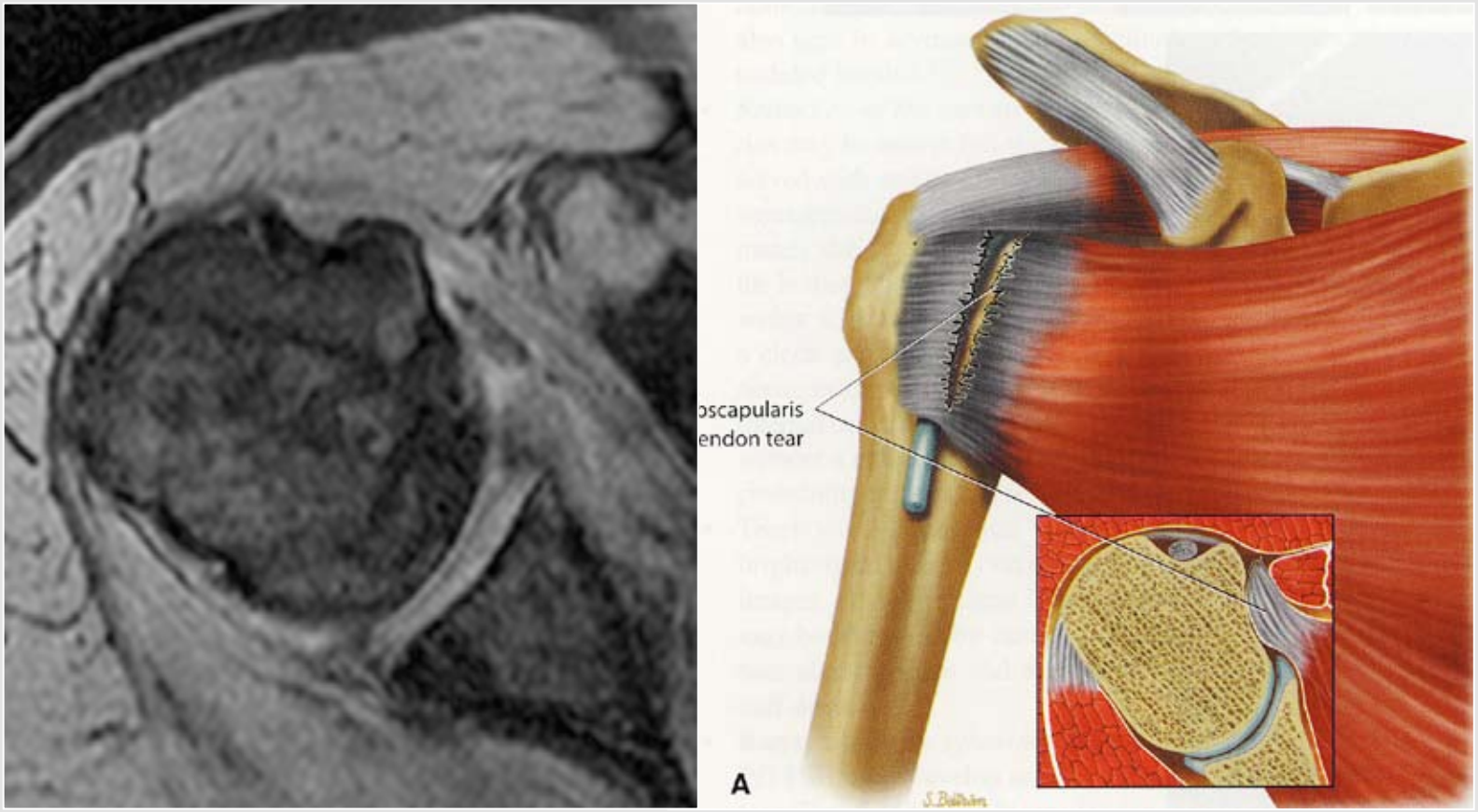


AC-Gelenkssprengung

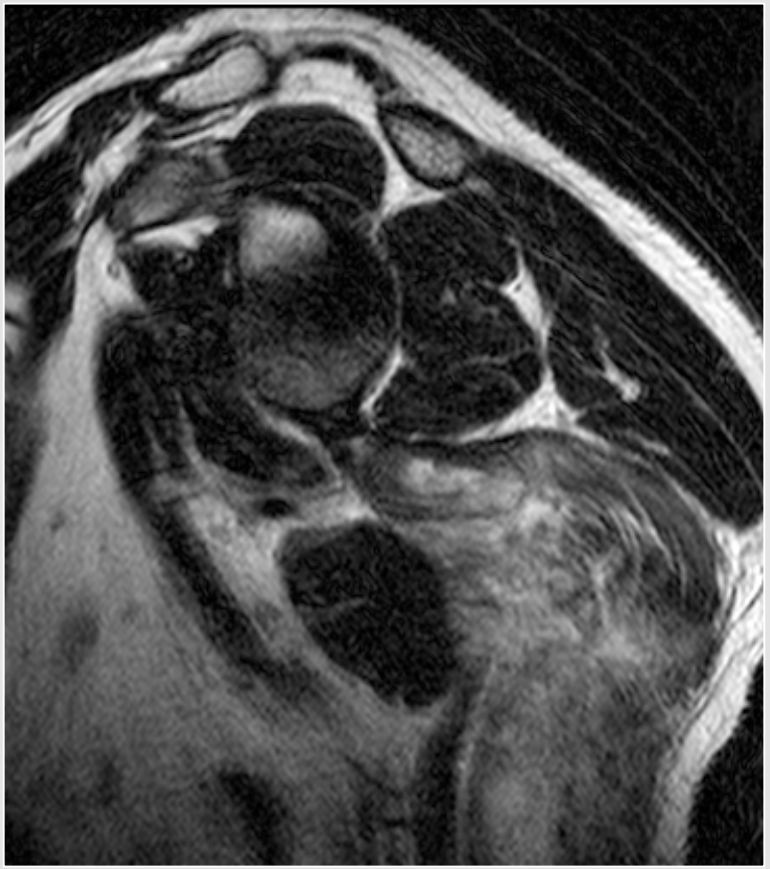


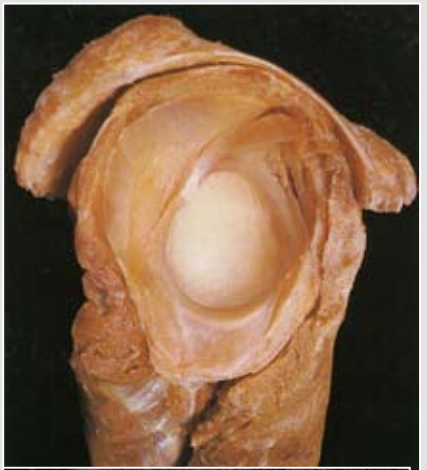


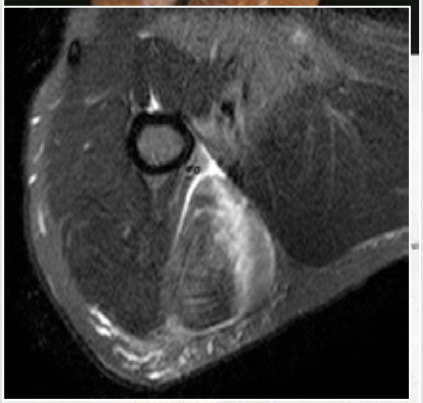
Subscapularissehnenruptur

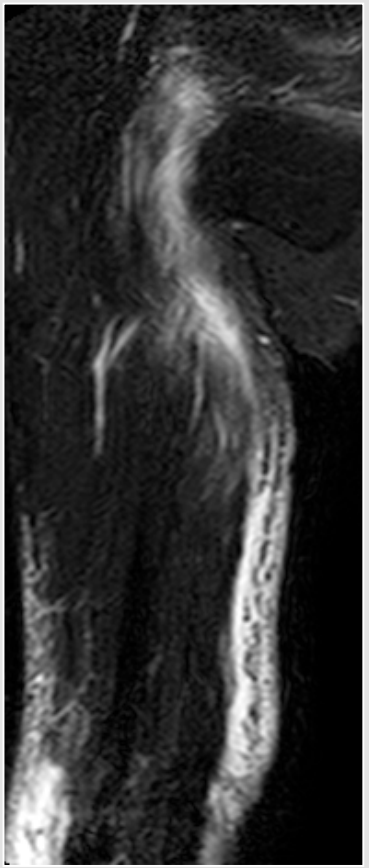


Trizepssehnenabriß



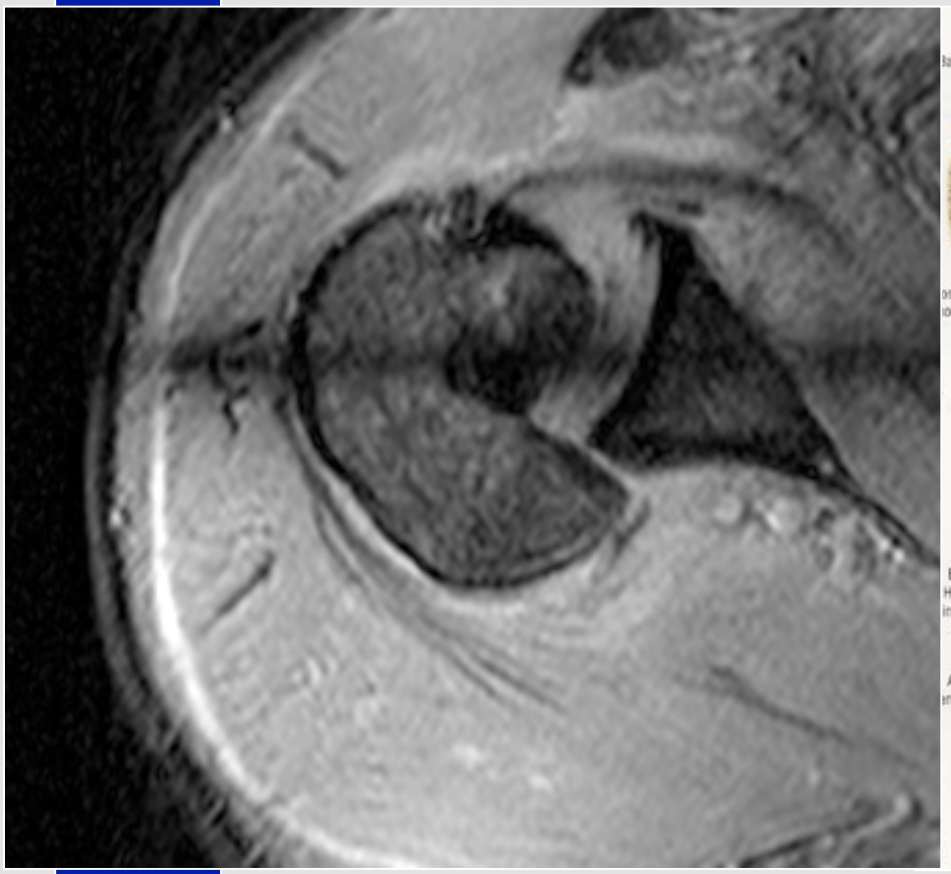


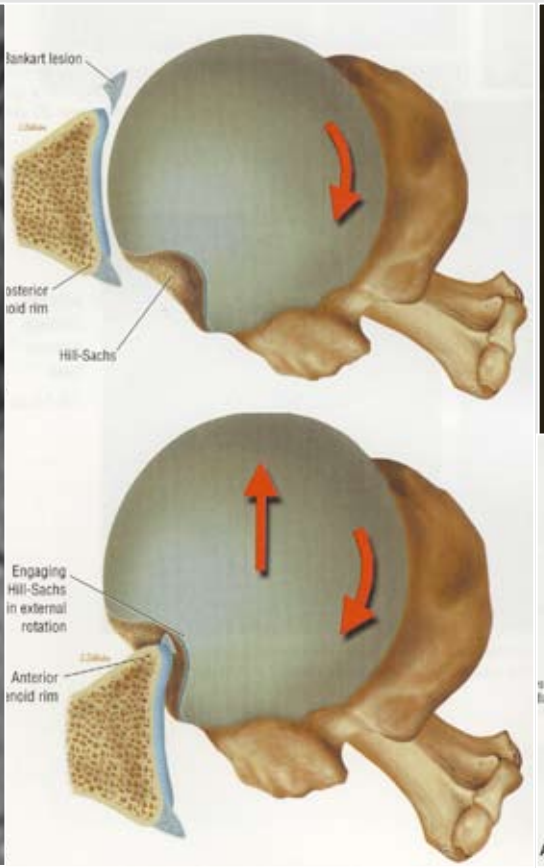


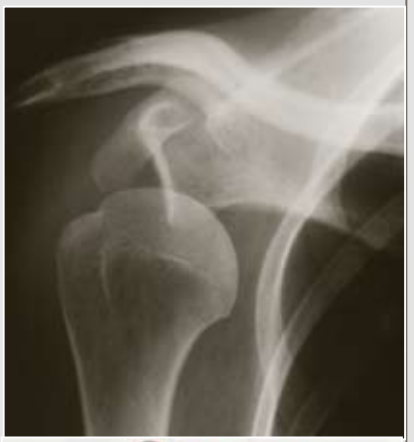


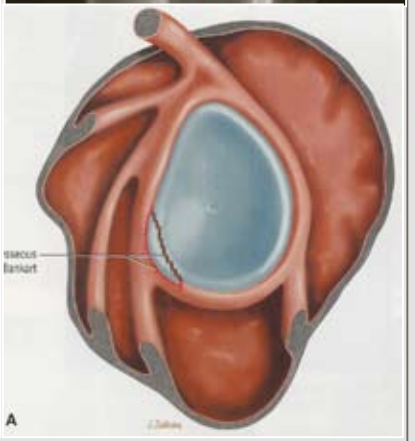
PRAXIS im KÖLN TRIANGLE

Schultergelenksluxation



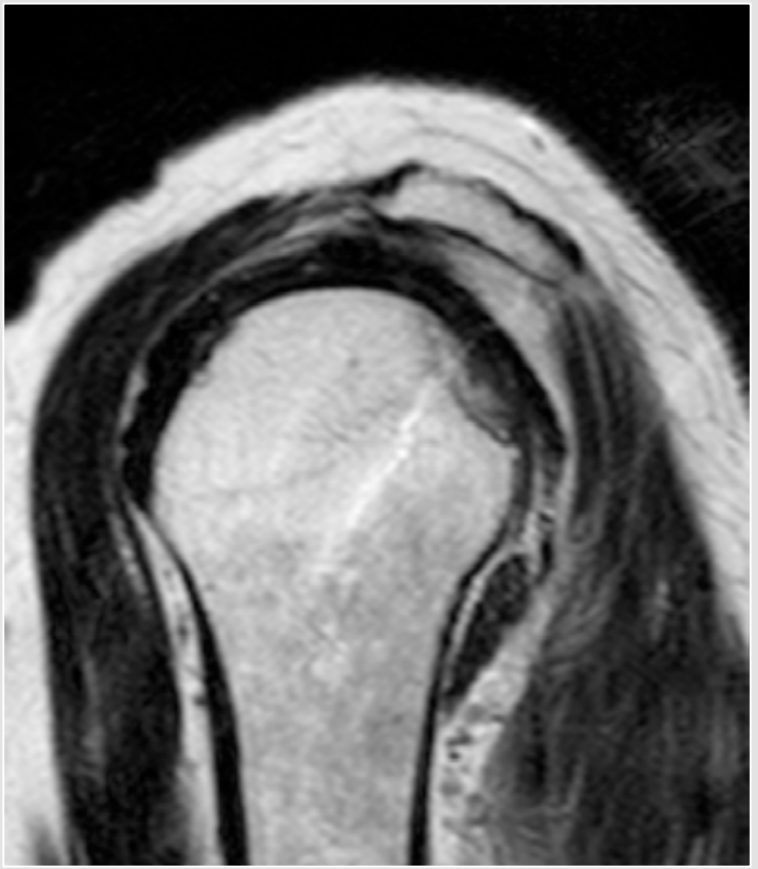


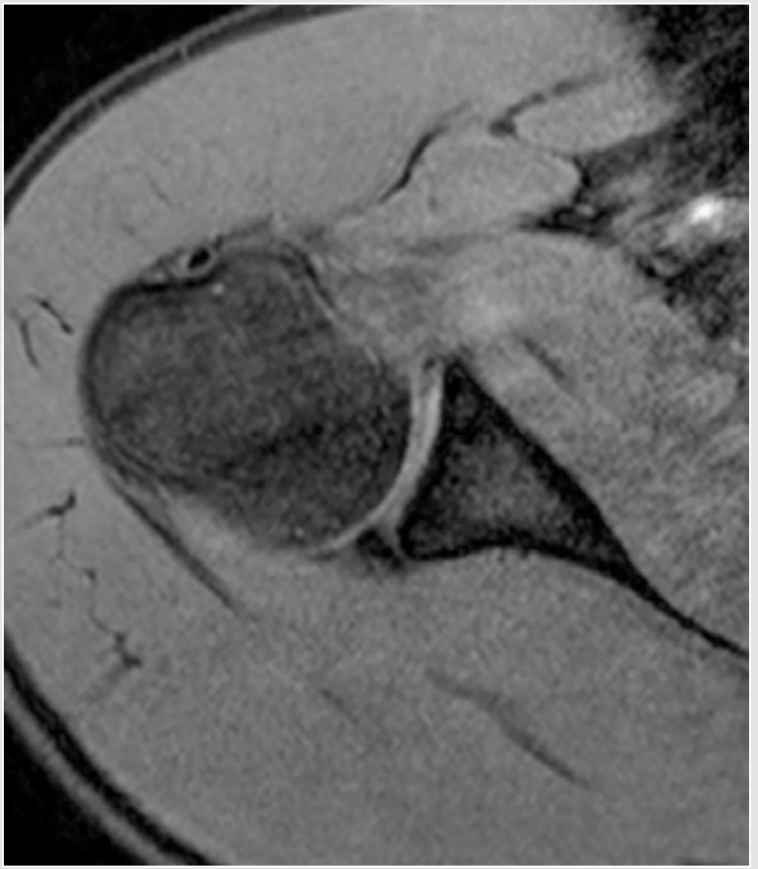




PRAXIS im KÖLN TRIANGLE

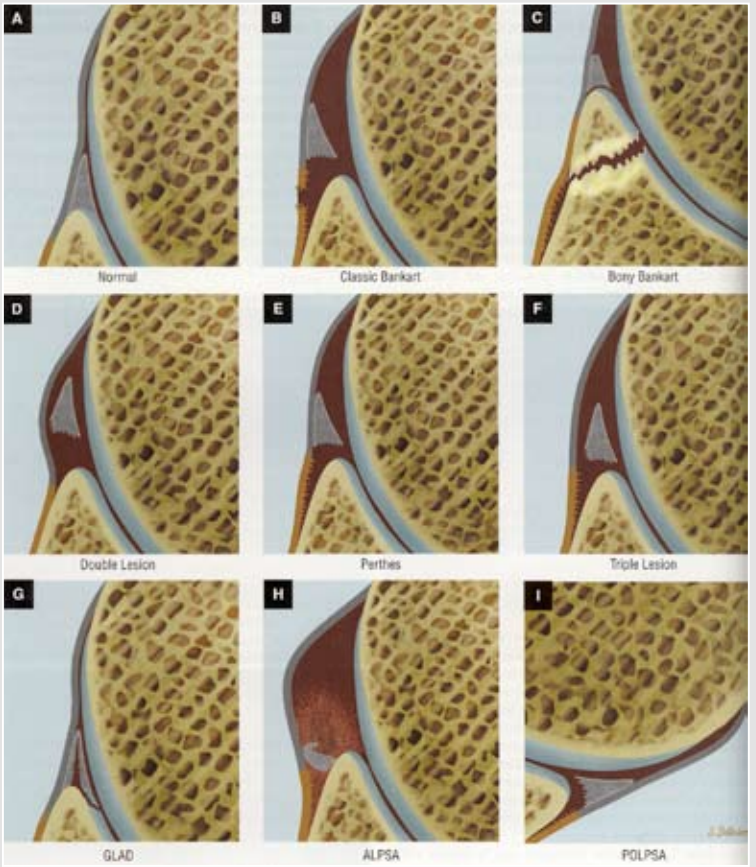
Schultergelenksluxation





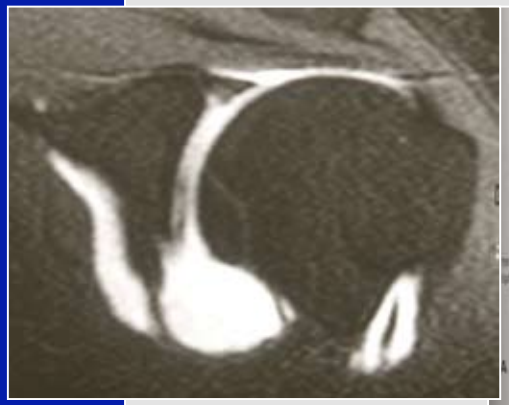
Instabilität

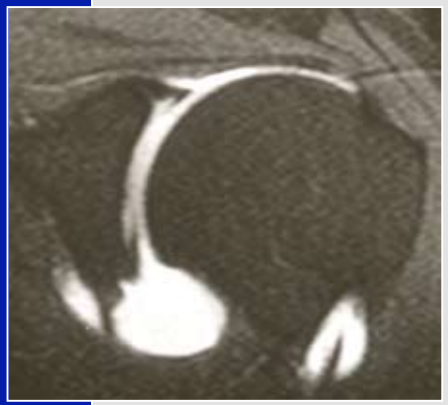
- Knöcherne Bankart-Läsion
- Knorpelige Bankart-L.
- Perthes
- ALPSA
- GLAD

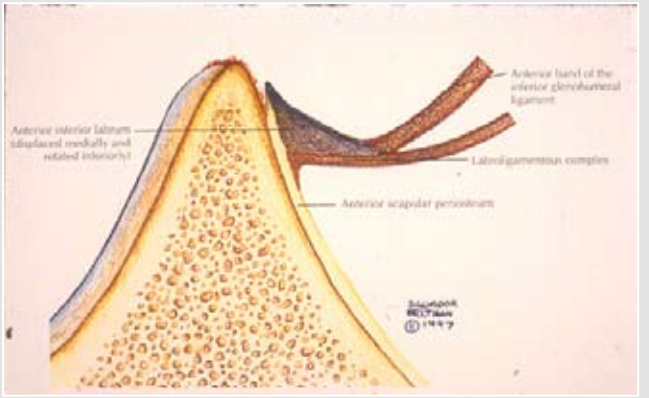


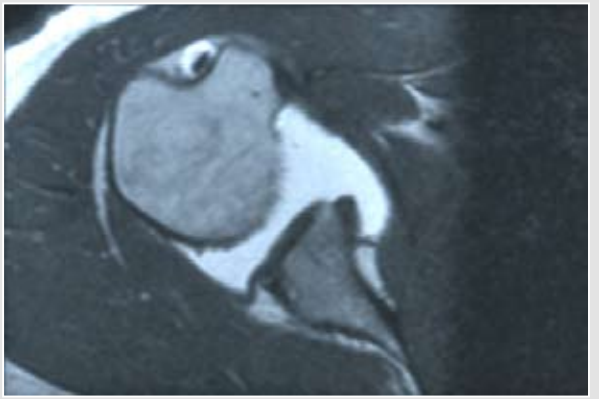
PRAXIS im KÖLN TRIANGLE

ALPSA

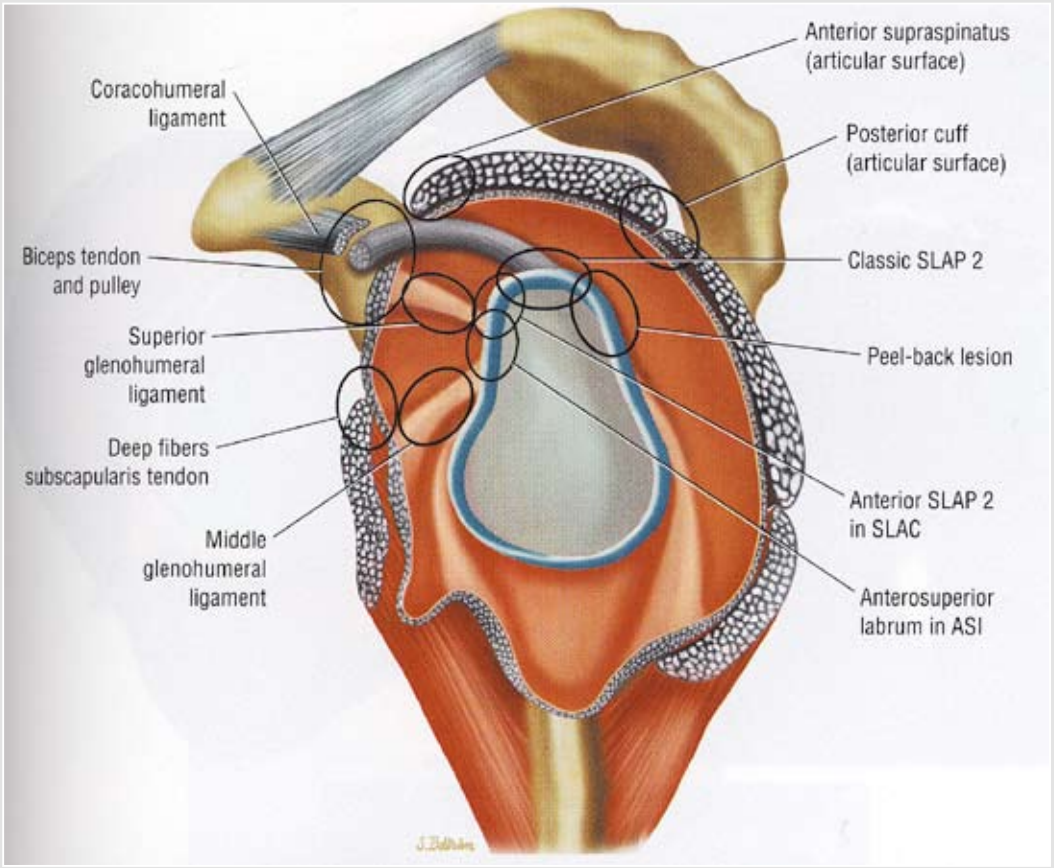




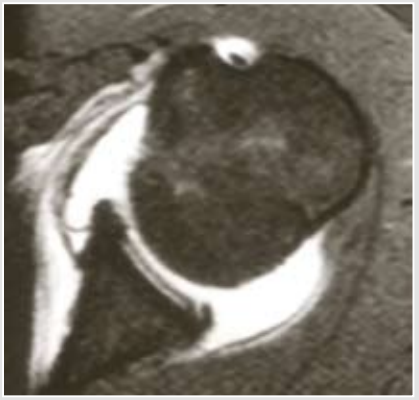


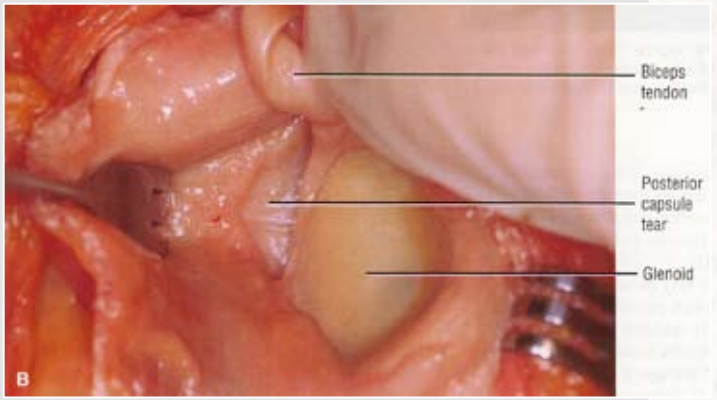


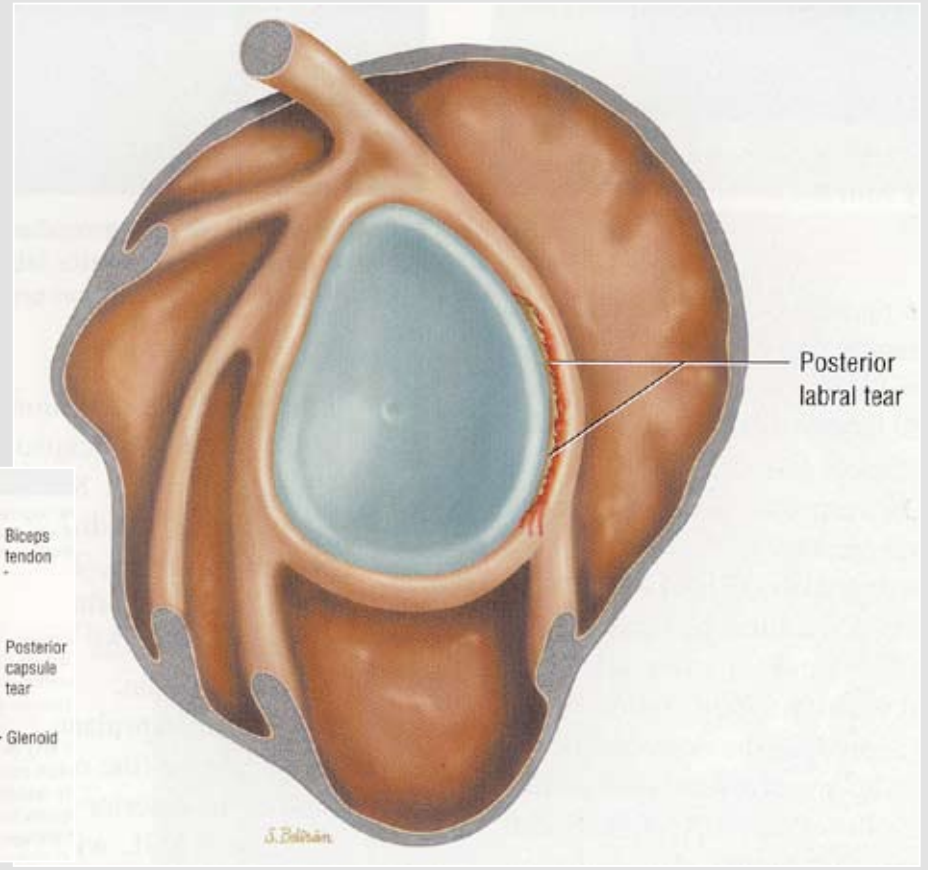
Mikroinstabilität



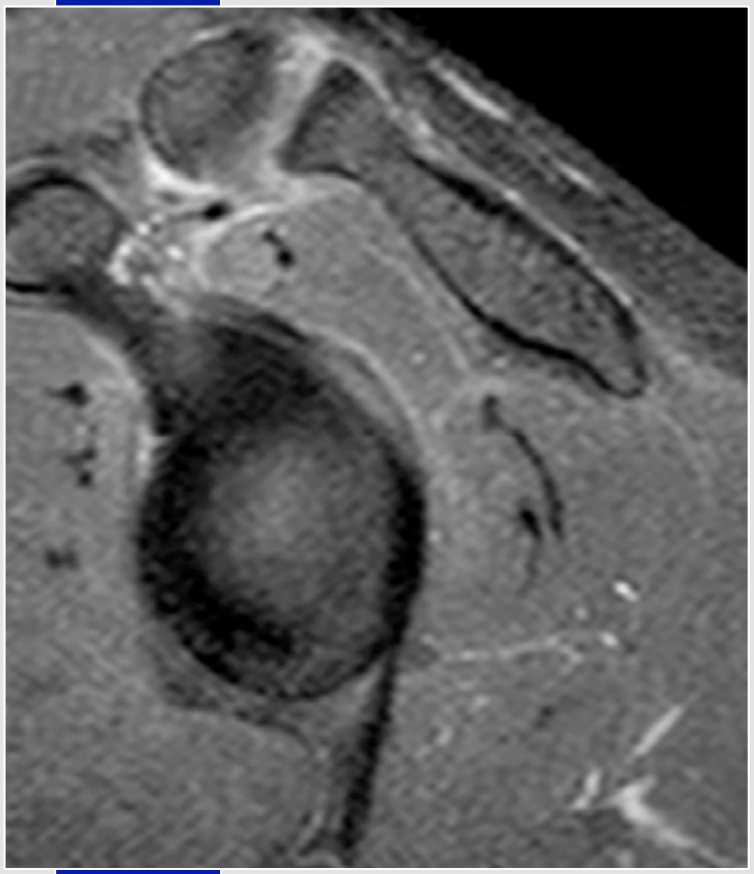
Posteriore Instabilität

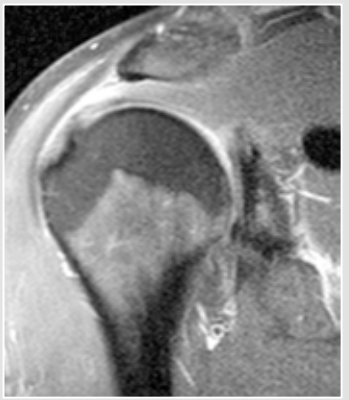


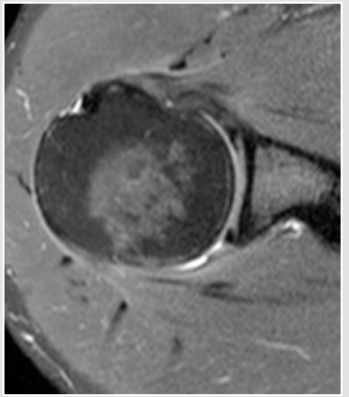


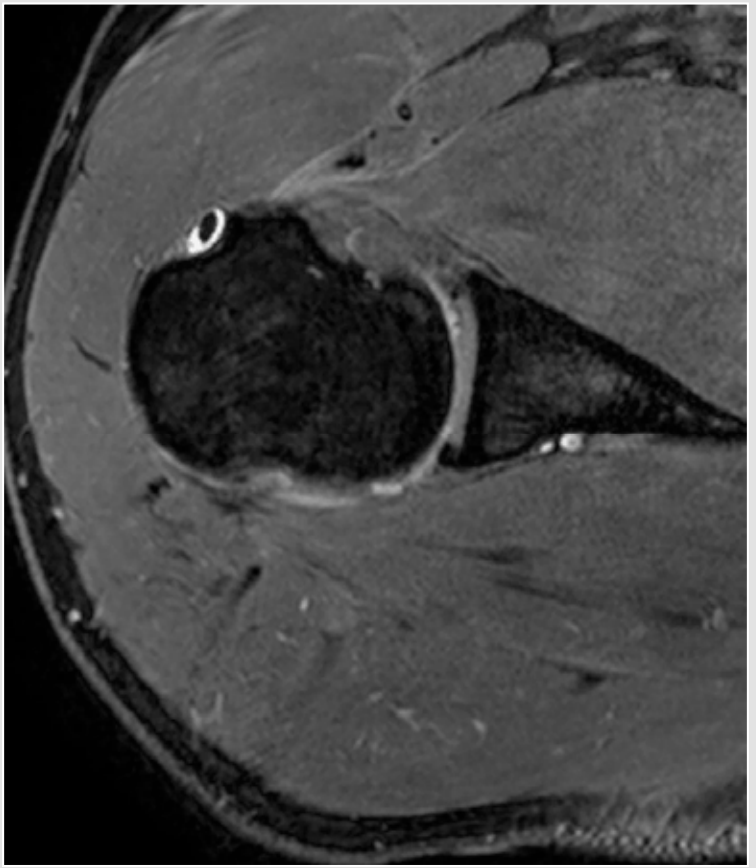


Labrumläsion - indir_Arthro_post



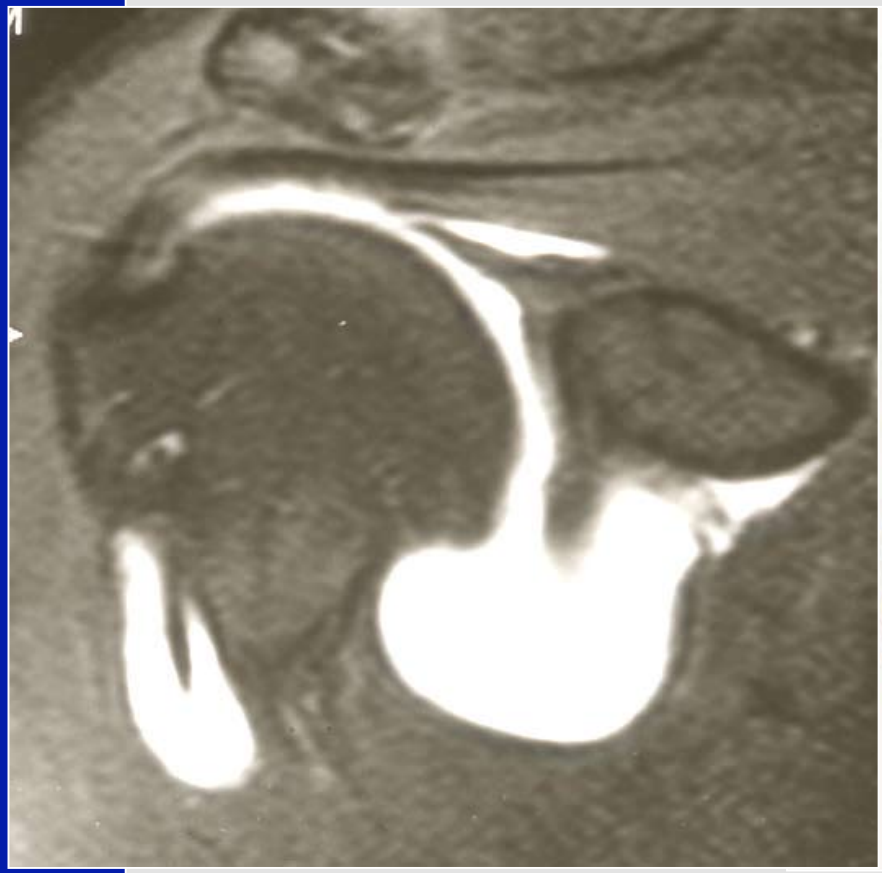


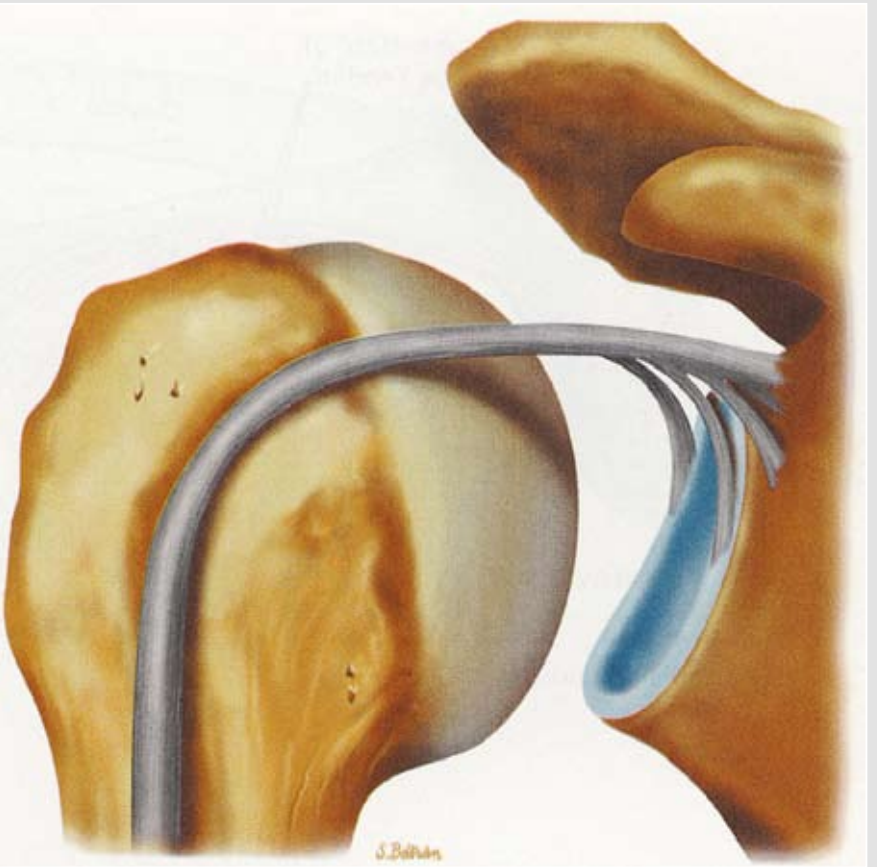




PRAXIS im KÖLN TRIANGLE

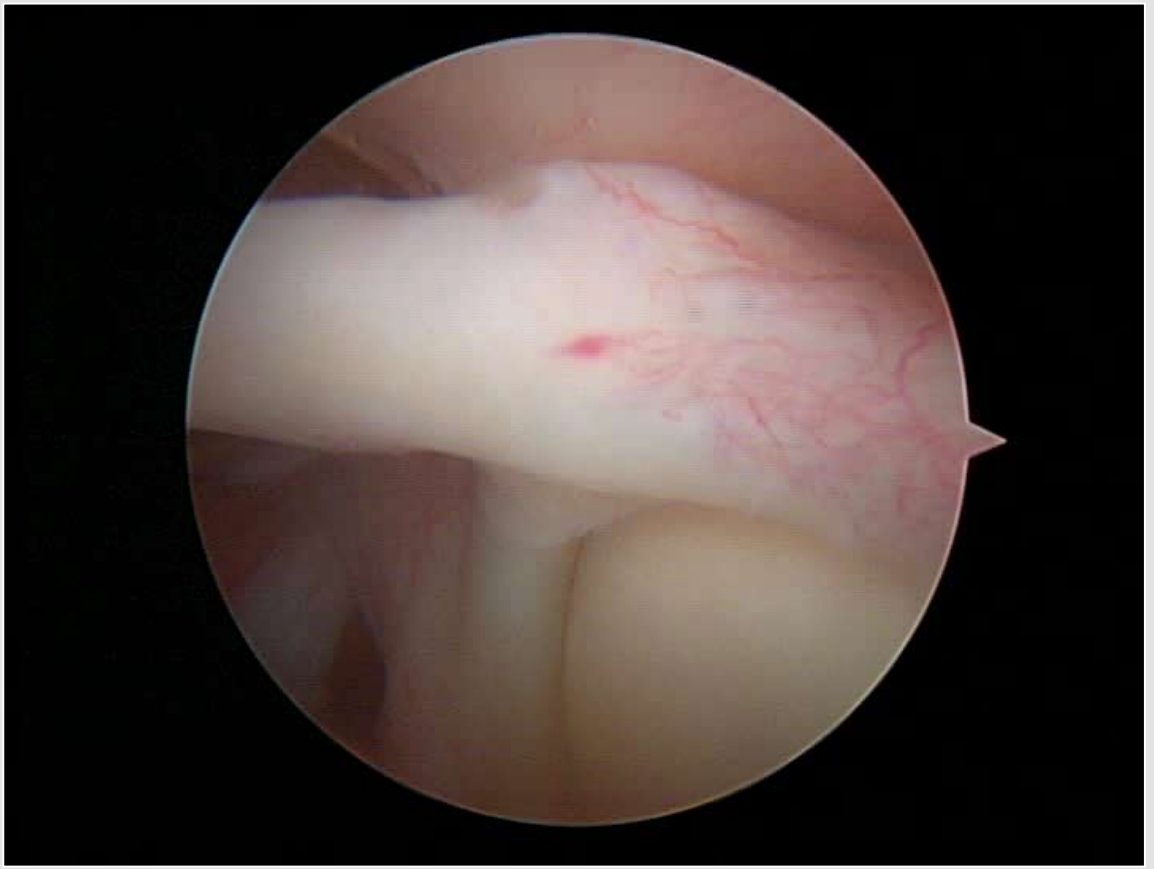
Bizepssehnenankerkomplex





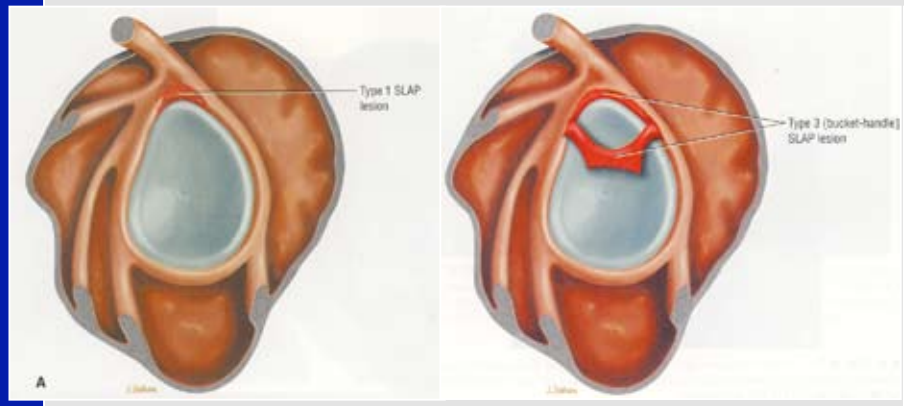
PRAXIS im KÖLN TRIANGLE

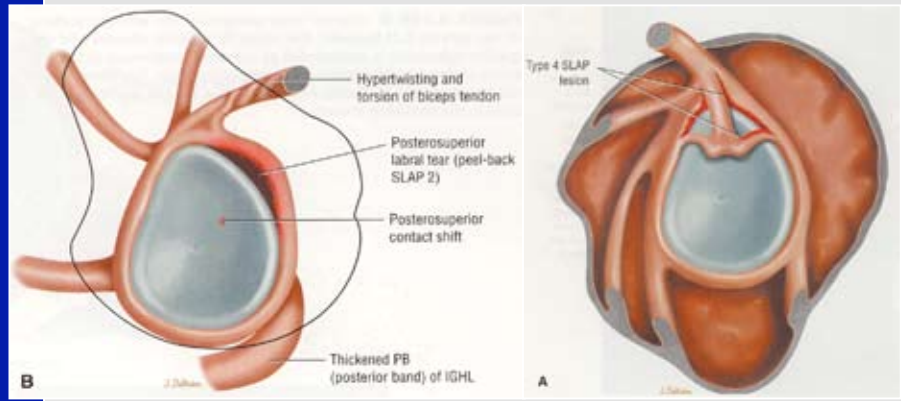
Bizepssehnenanker - Arthroskopie

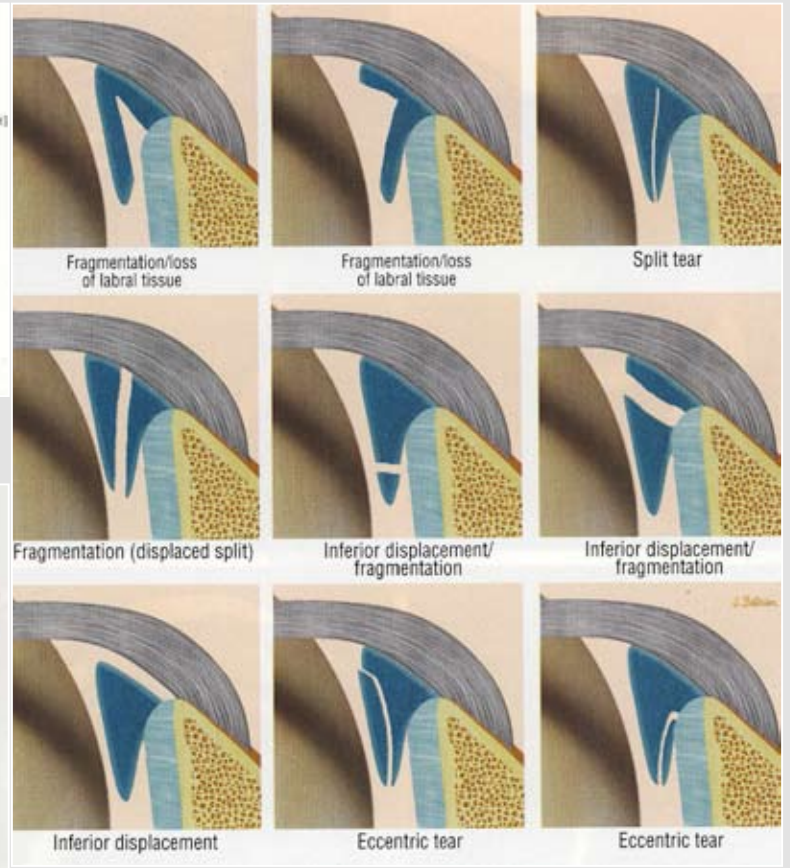


PRAXIS im KÖLN TRIANGLE

Superiores Labrum SLAP

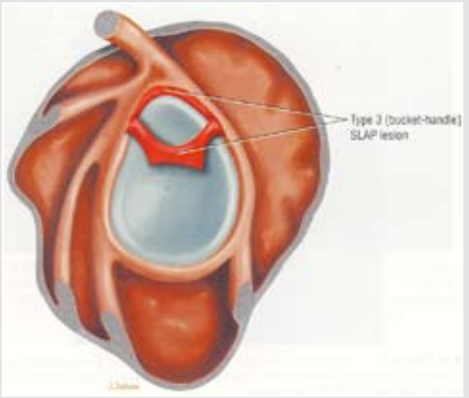


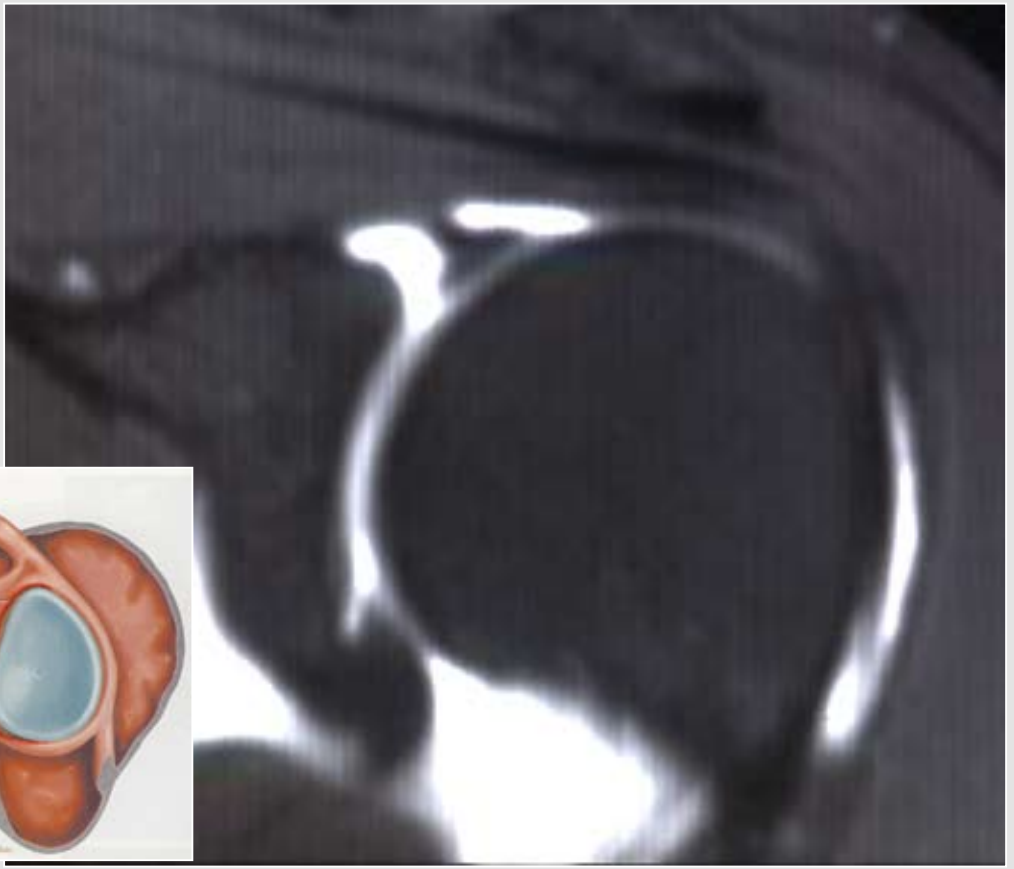


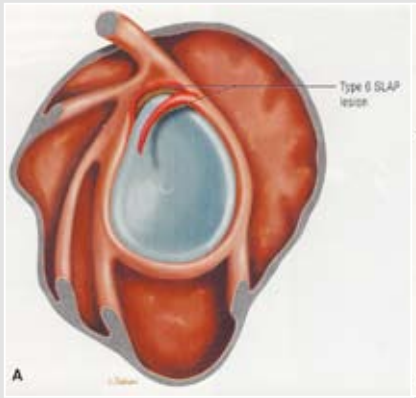


PRAXIS im KÖLN TRIANGLE

SLAP

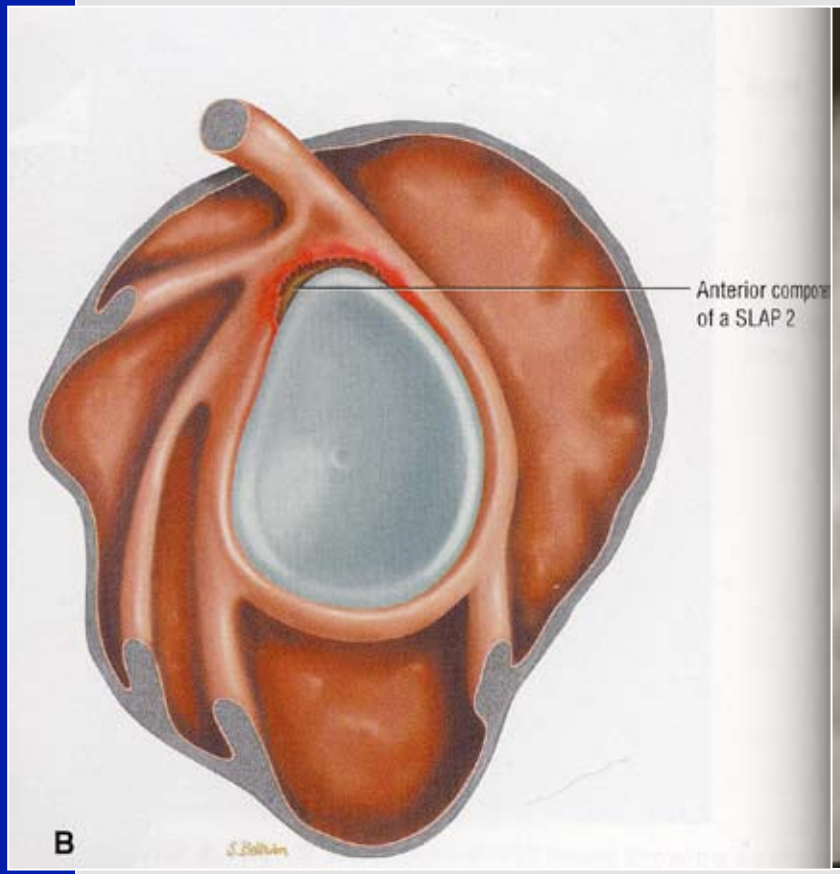

Type 3 (bucket-handle)
SLAP lesion

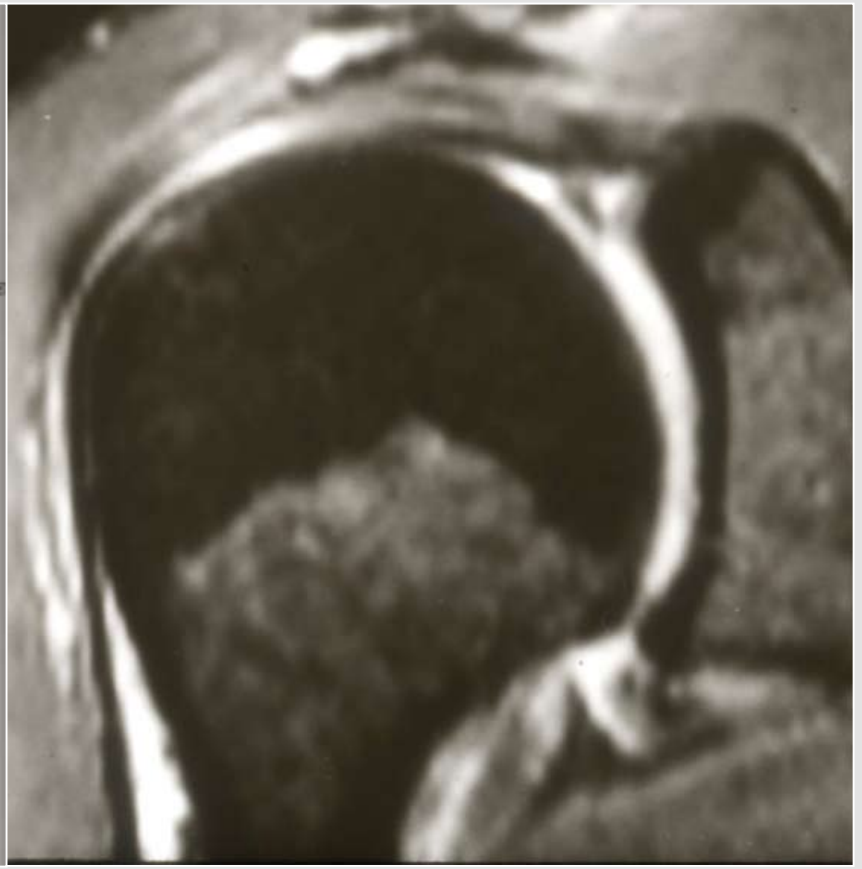



Type 6 SLAP
lesion
A

Type 5 SLAP
lesion
A

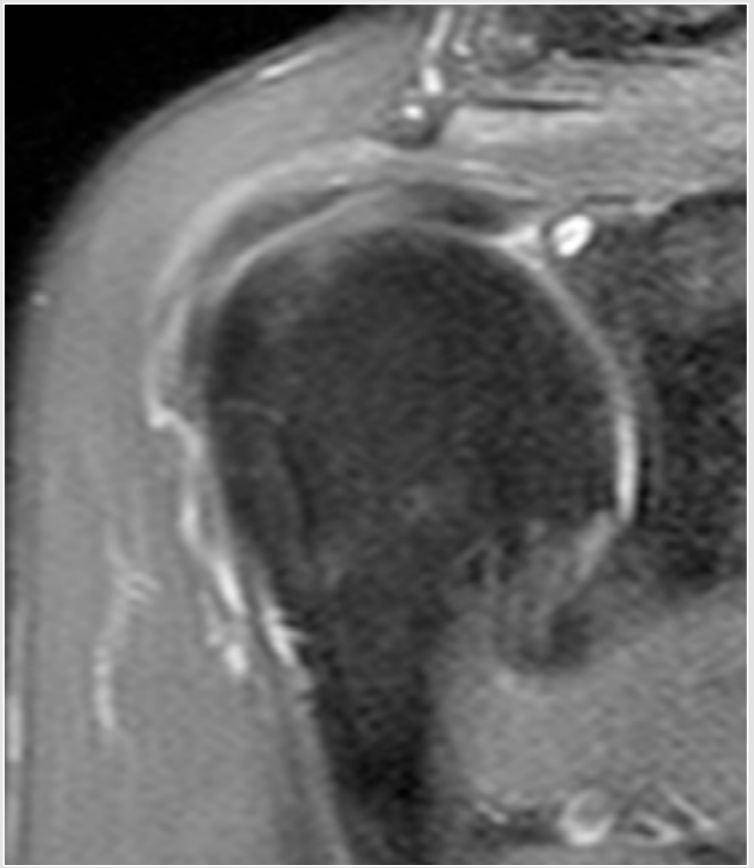
SLAP II indir. MR-Arthro

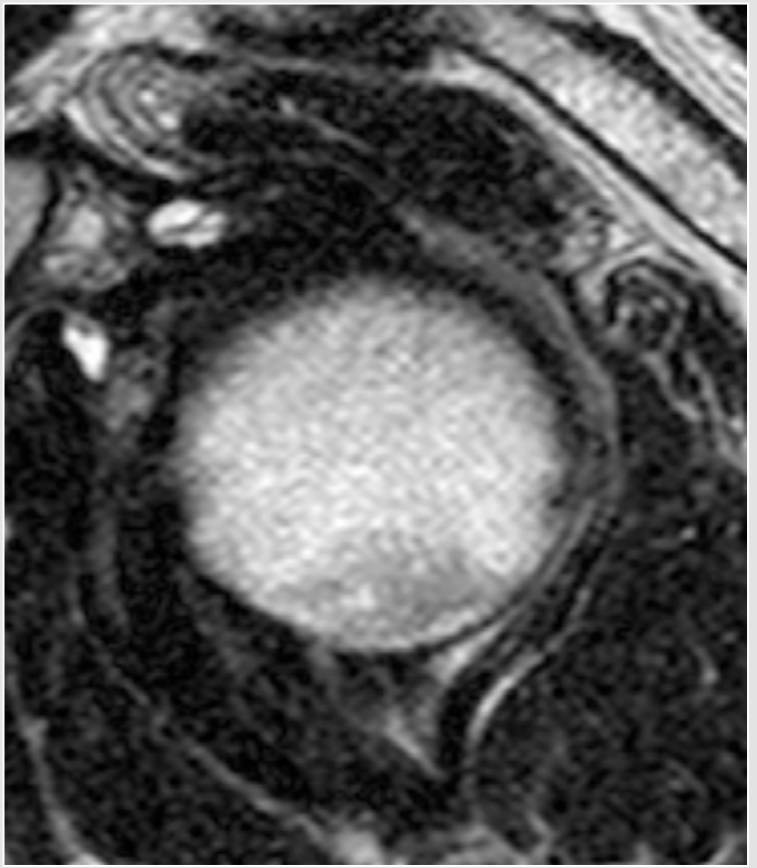




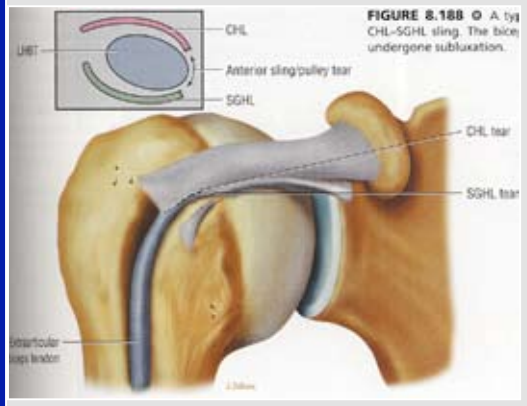
PRAXIS im KÖLN TRIANGLE

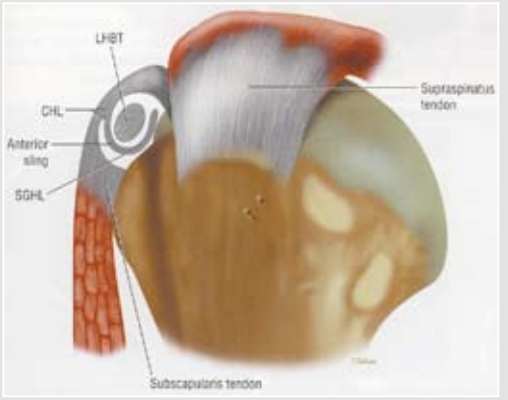
Labrumzyste

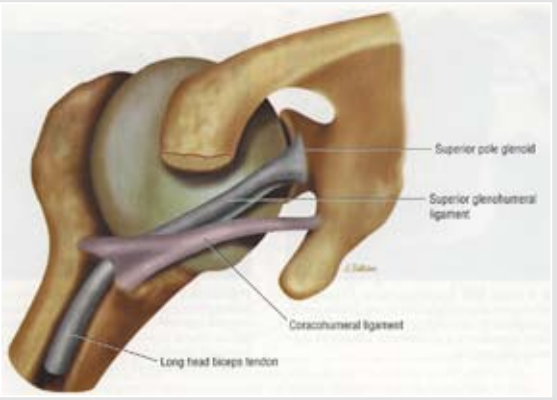


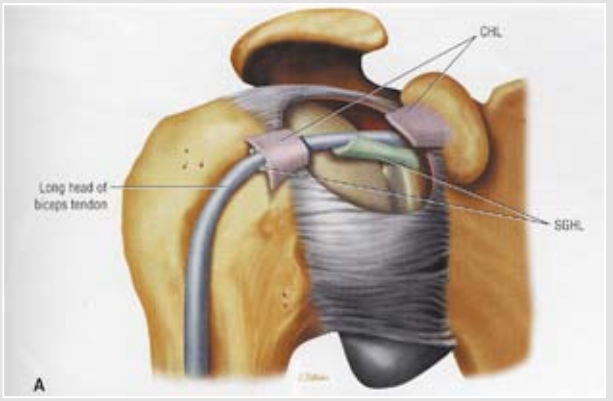


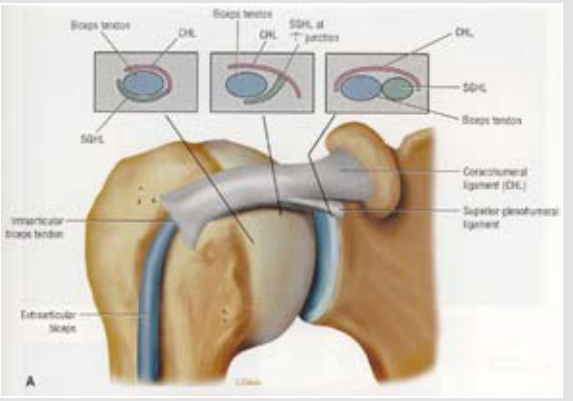
Pulleyläsion





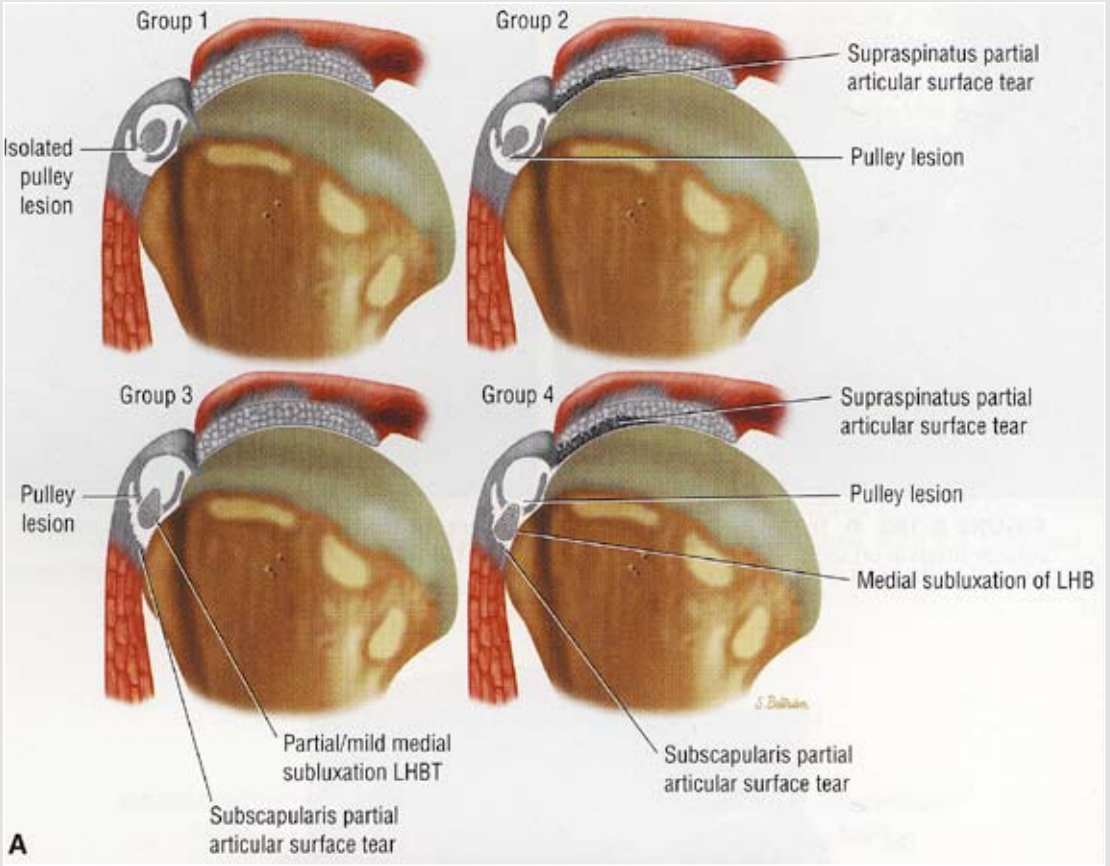




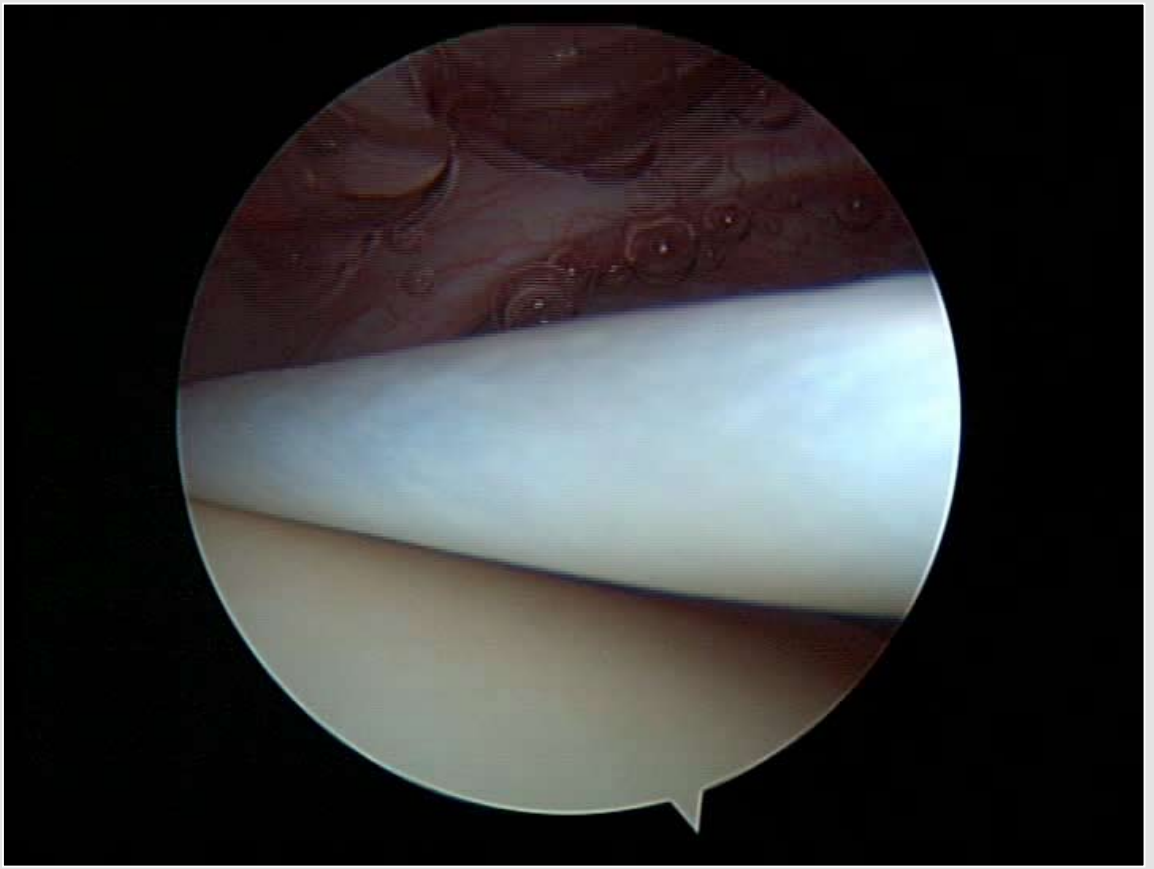


PRAXIS im KÖLN TRIANGLE

Pulley-Läsion Habermeyer-Einteilung

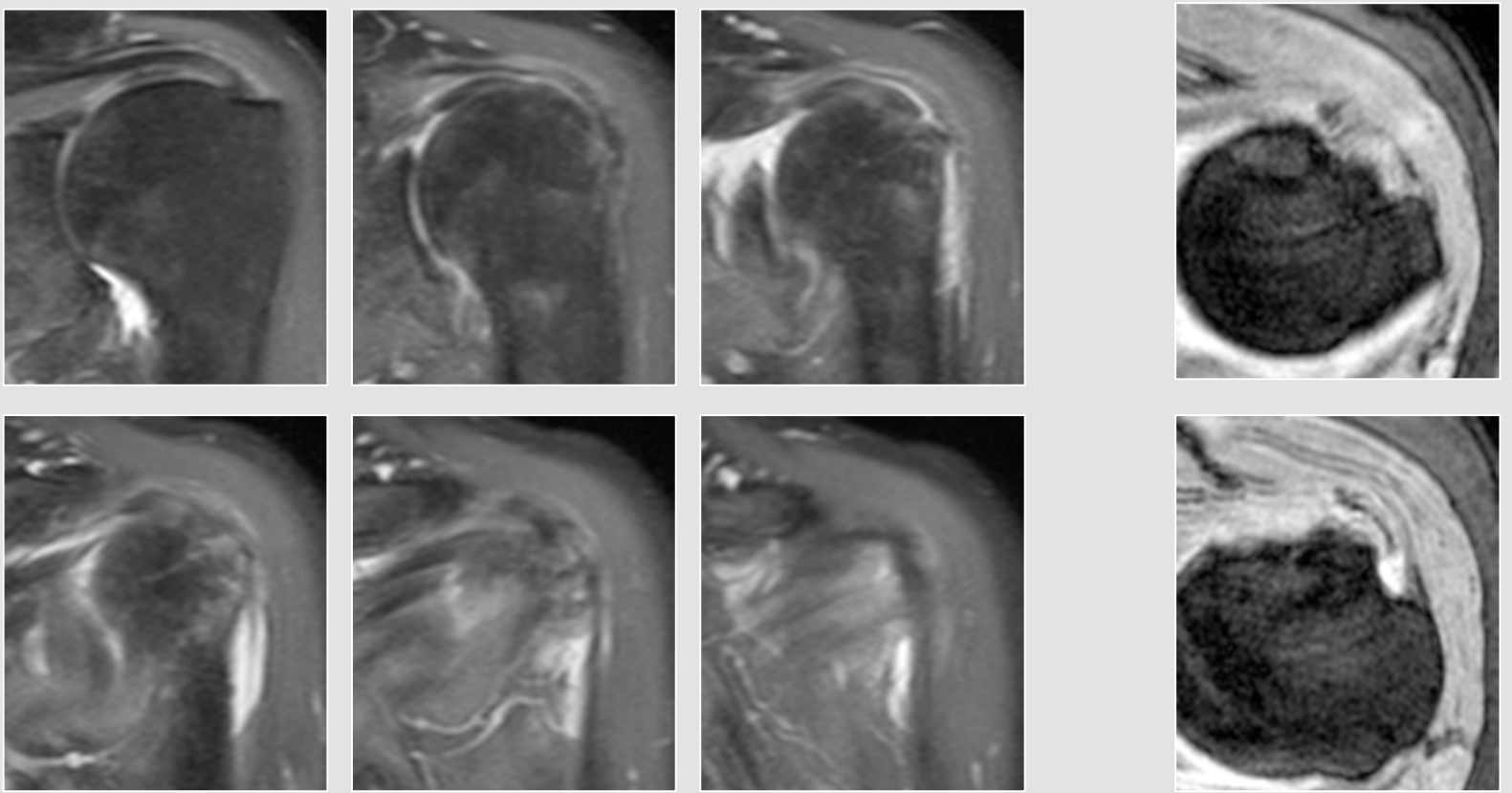


Pulley - Arthroskopie



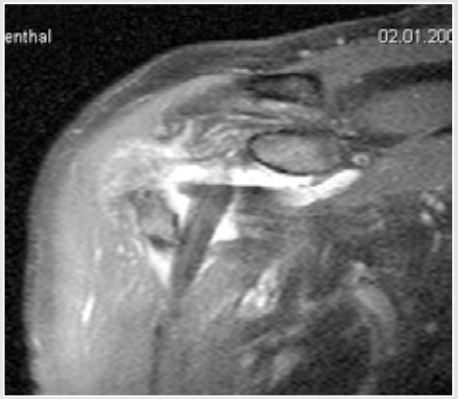
PRAXIS im KÖLN TRIANGLE

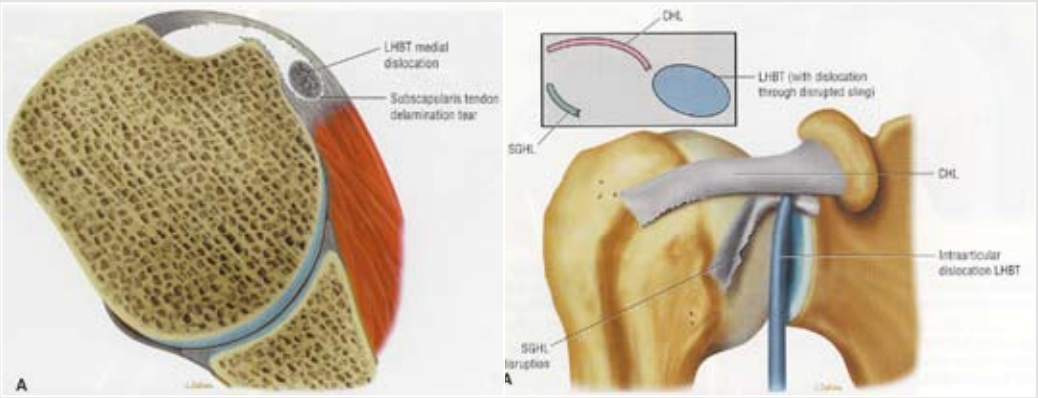
Subluxation lange Bizepssehne

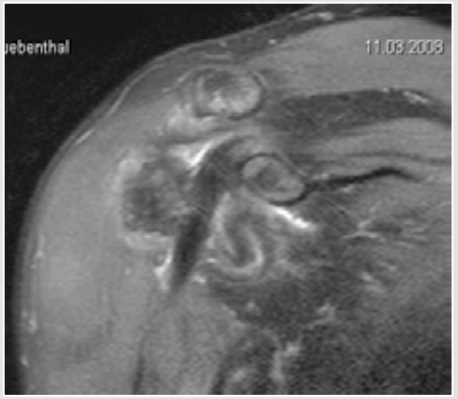


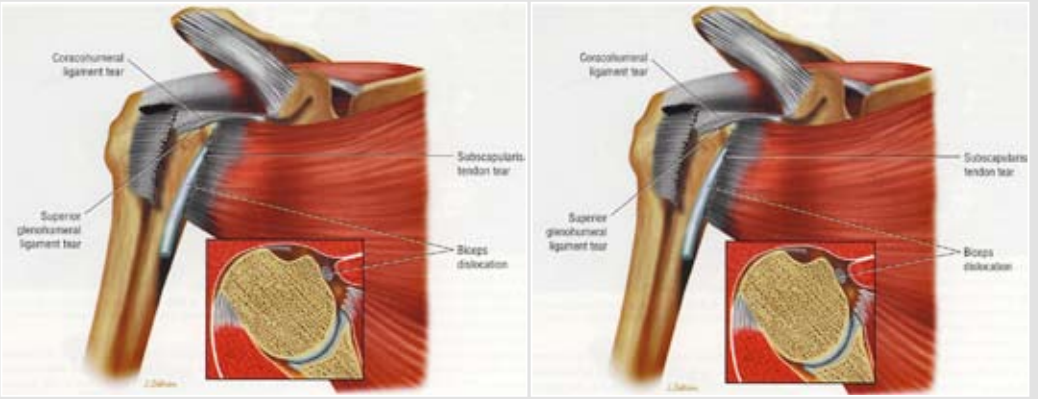
PRAXIS im KÖLN TRIANGLE

Bizepssehnenluxation

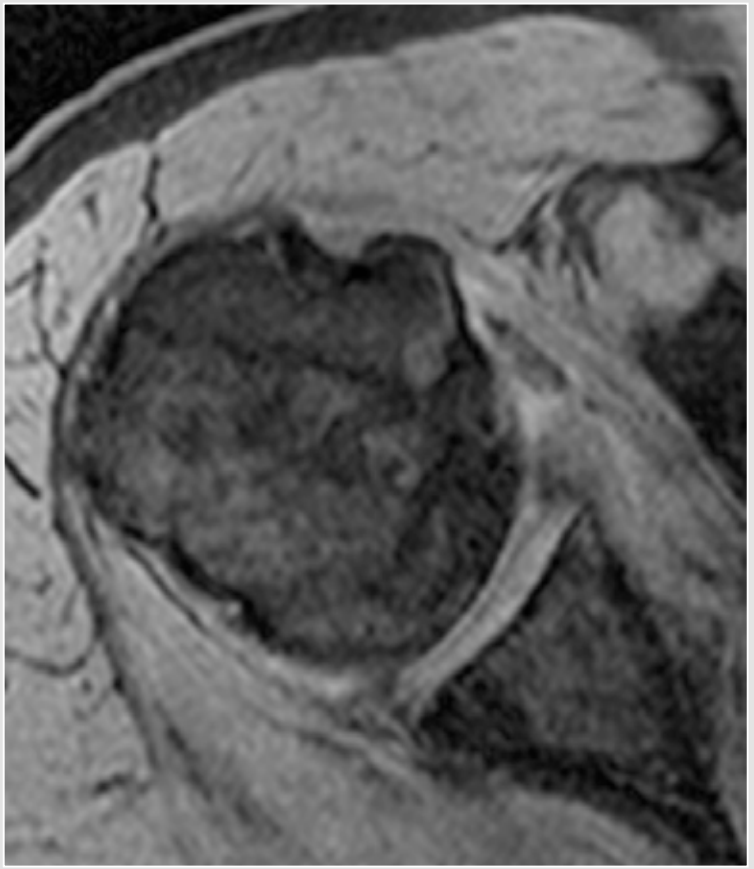


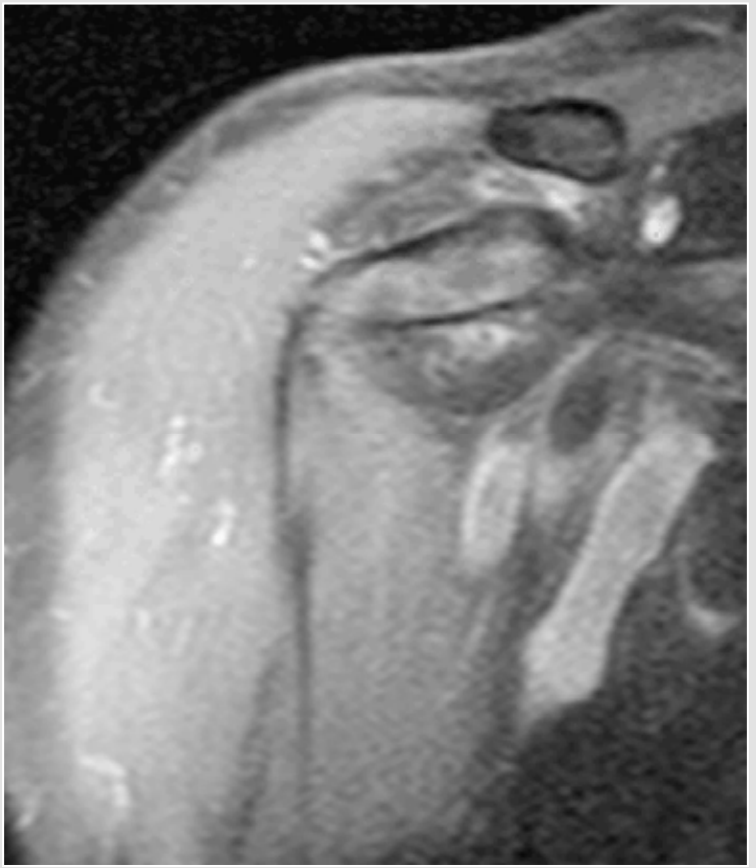






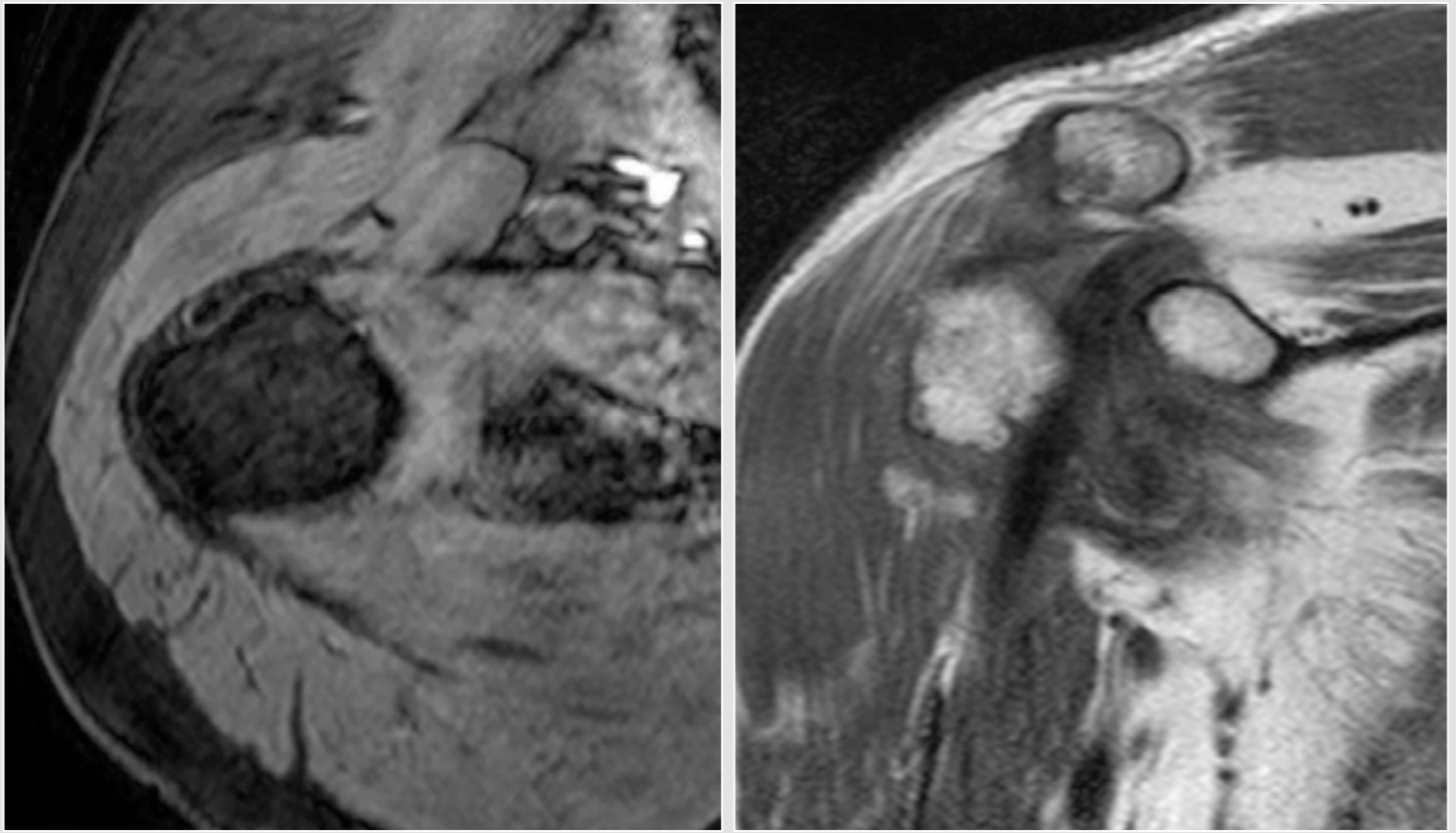
Bizepssehnenluxation



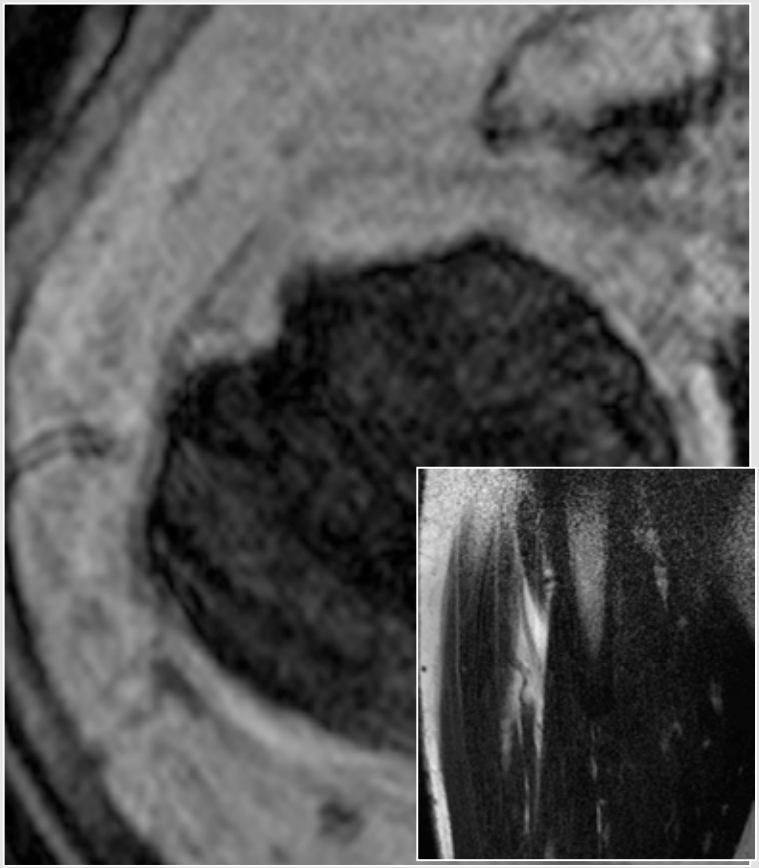


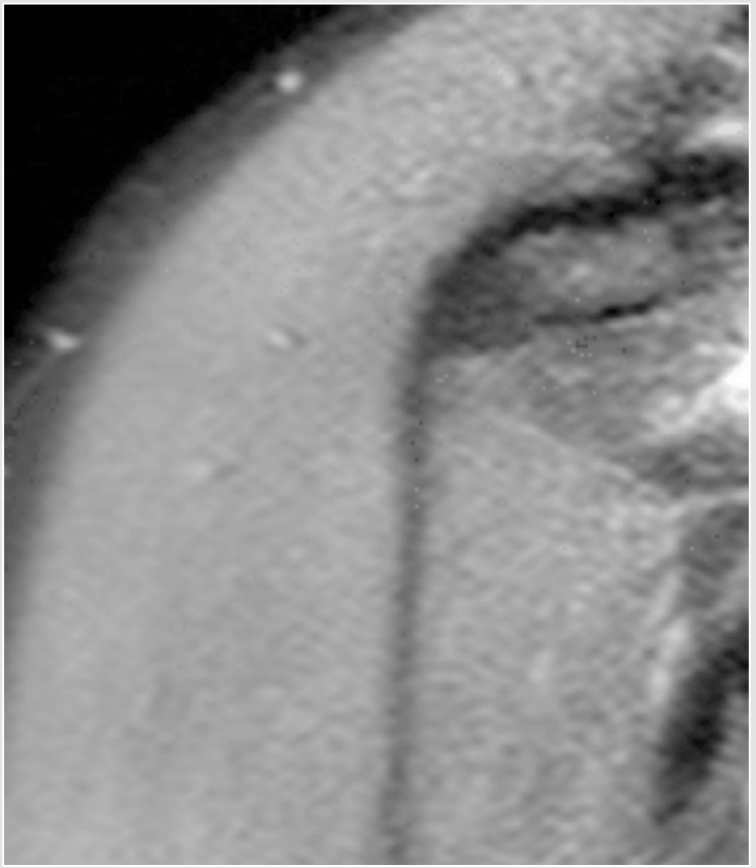
PRAXIS im KÖLN TRIANGLE

Bizepssehnenluxation



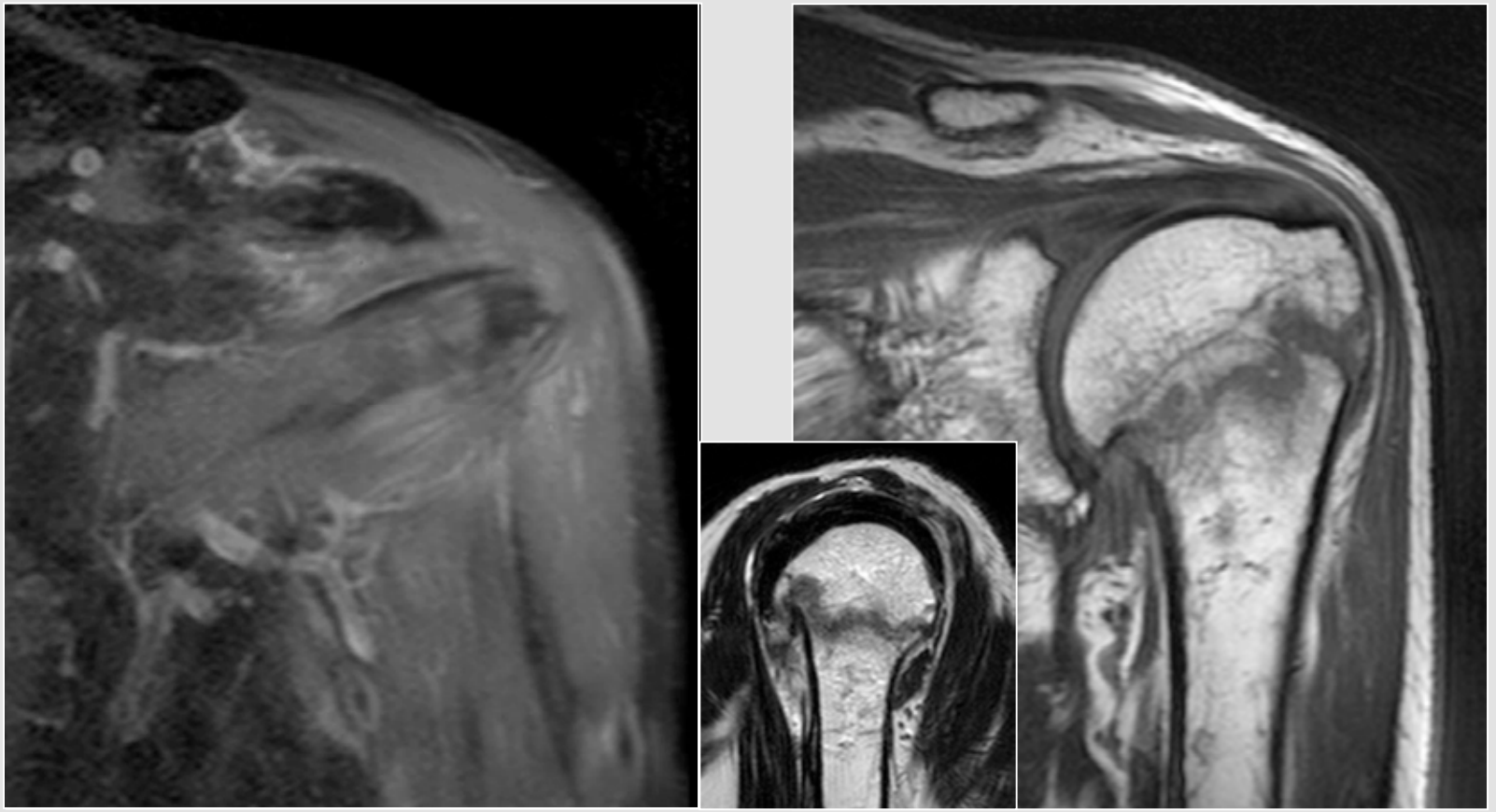
Bizepssehnenabriss





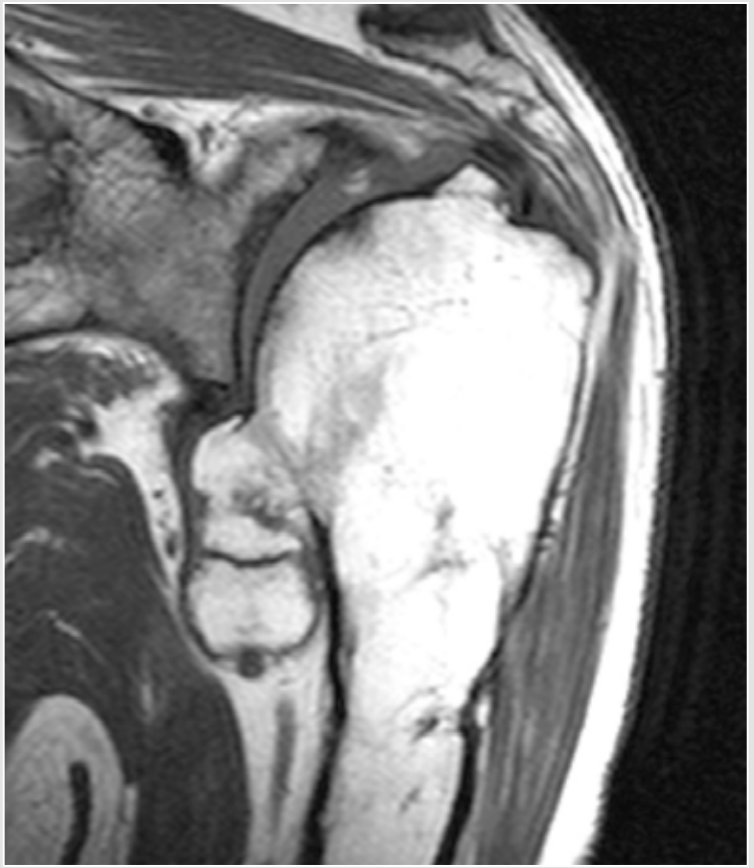
PRAXIS im KÖLN TRIANGLE

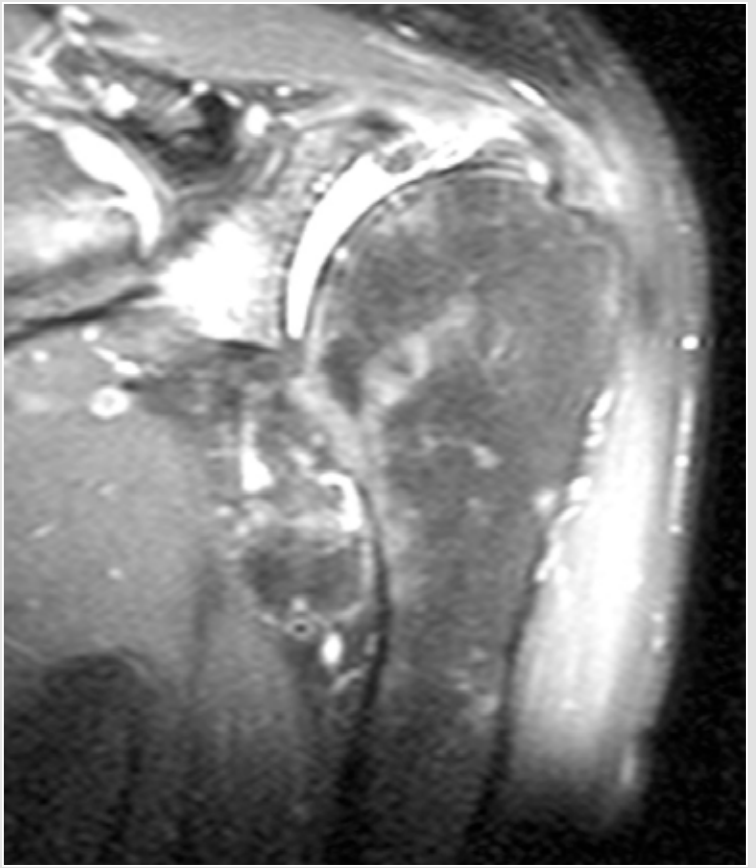
Subcapitale Humerusfraktur, radiol. okkult



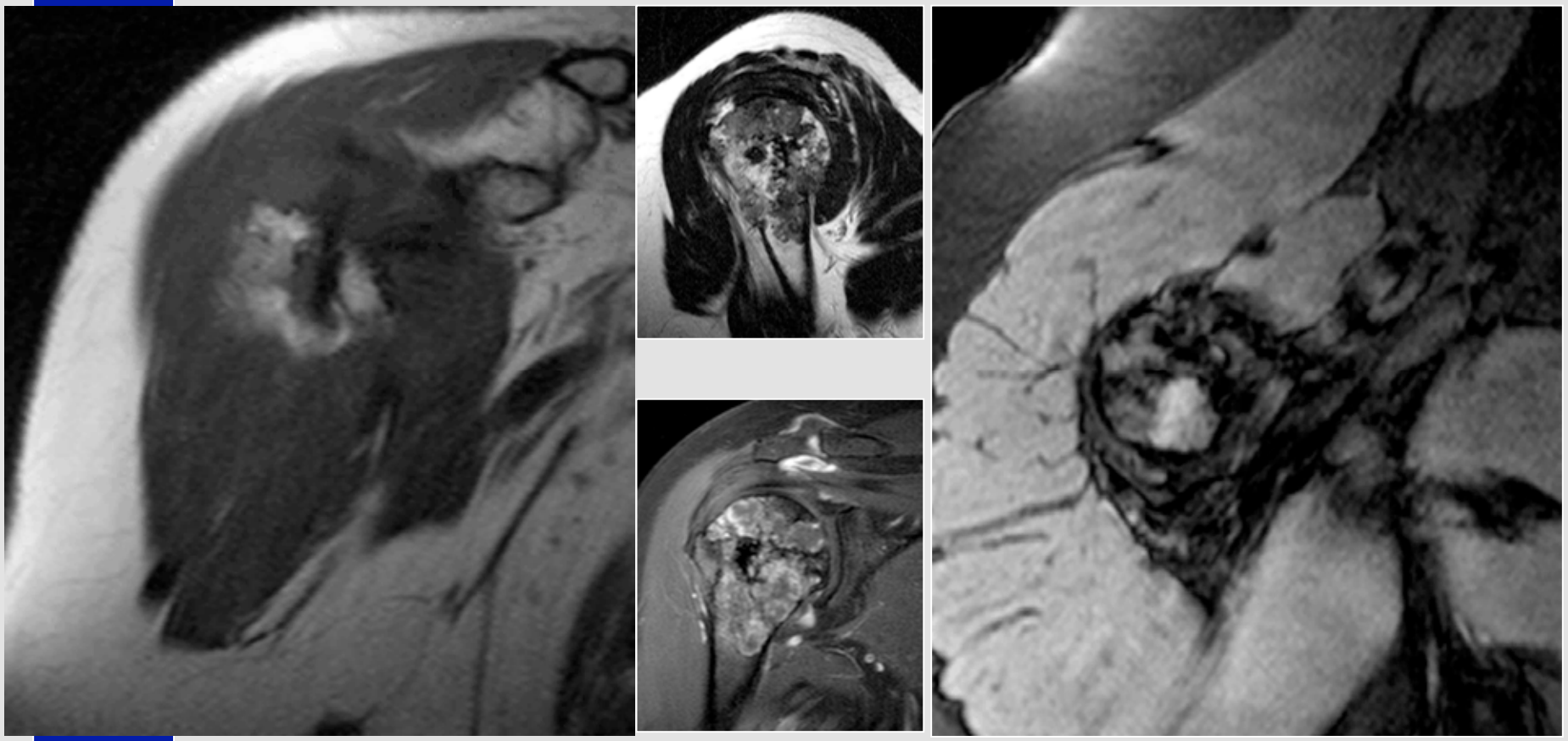
PRAXIS im KÖLN TRIANGLE

Omarthrose nach Fraktur





Metastase



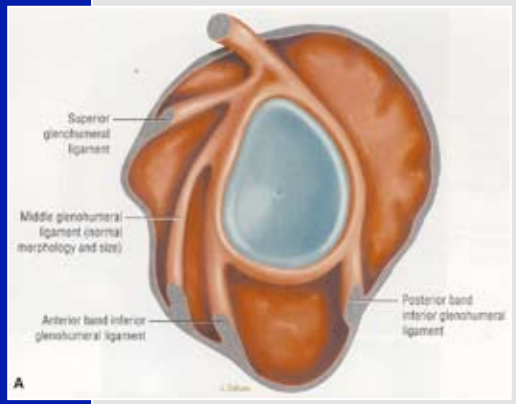
MRI meets Arthroskopy

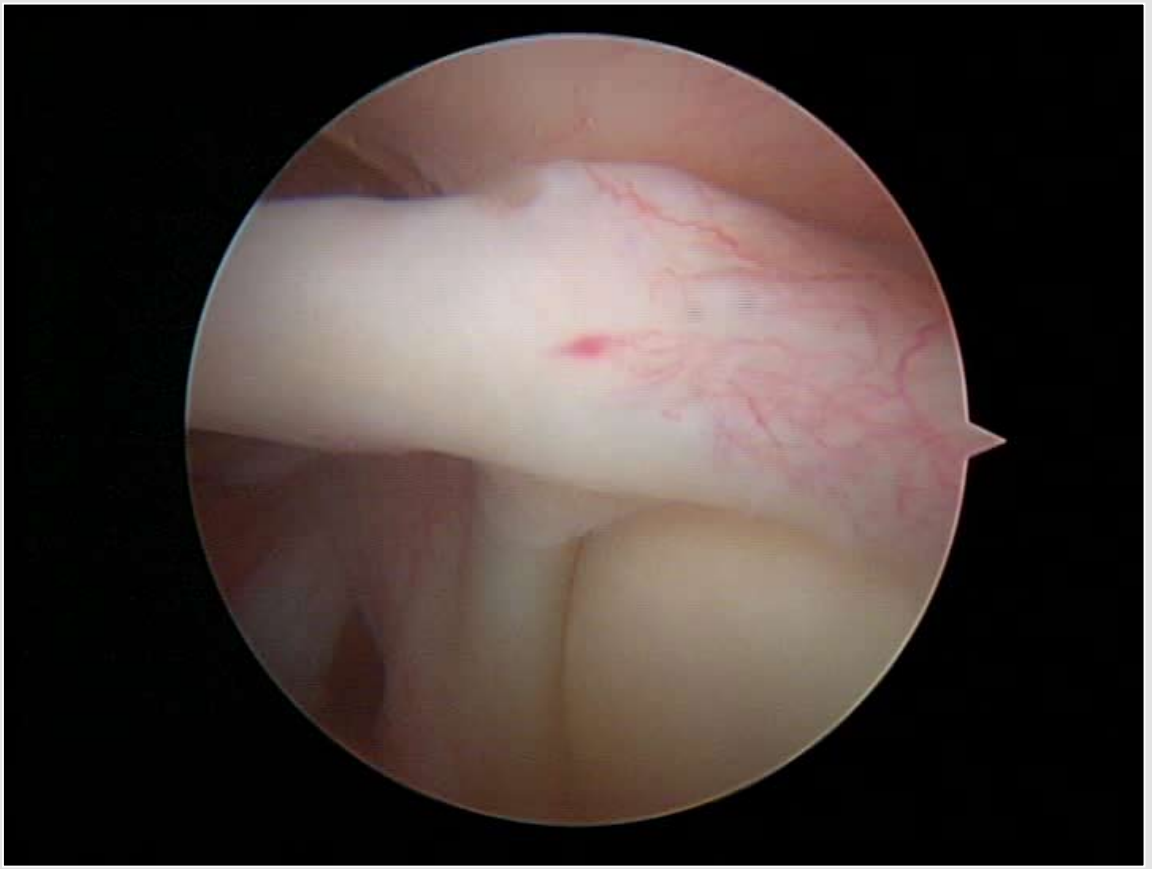
Oliver Greshake

Jonas Müller-Hübenthal

PRAXIS im KÖLN TRIANGLE

Arthroskopie Einführung





PRAXIS im KÖLN TRIANGLE

Arthroskopie Pulley

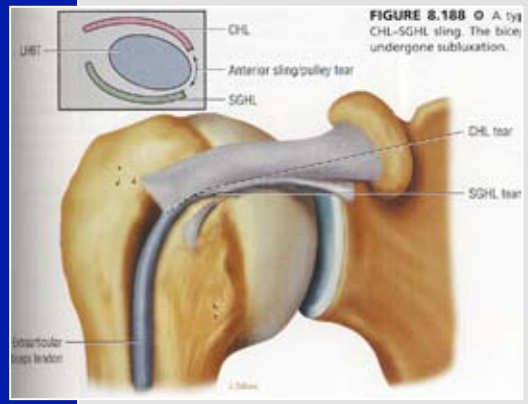
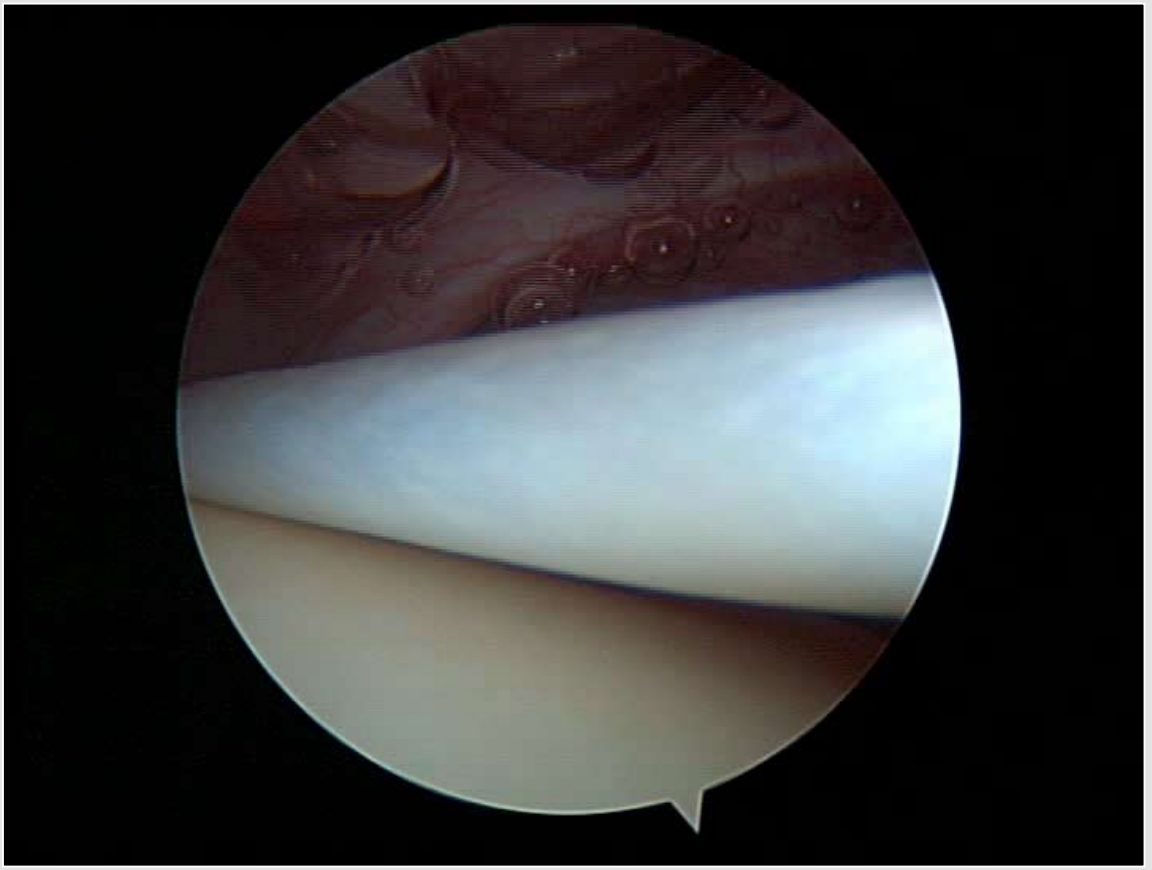
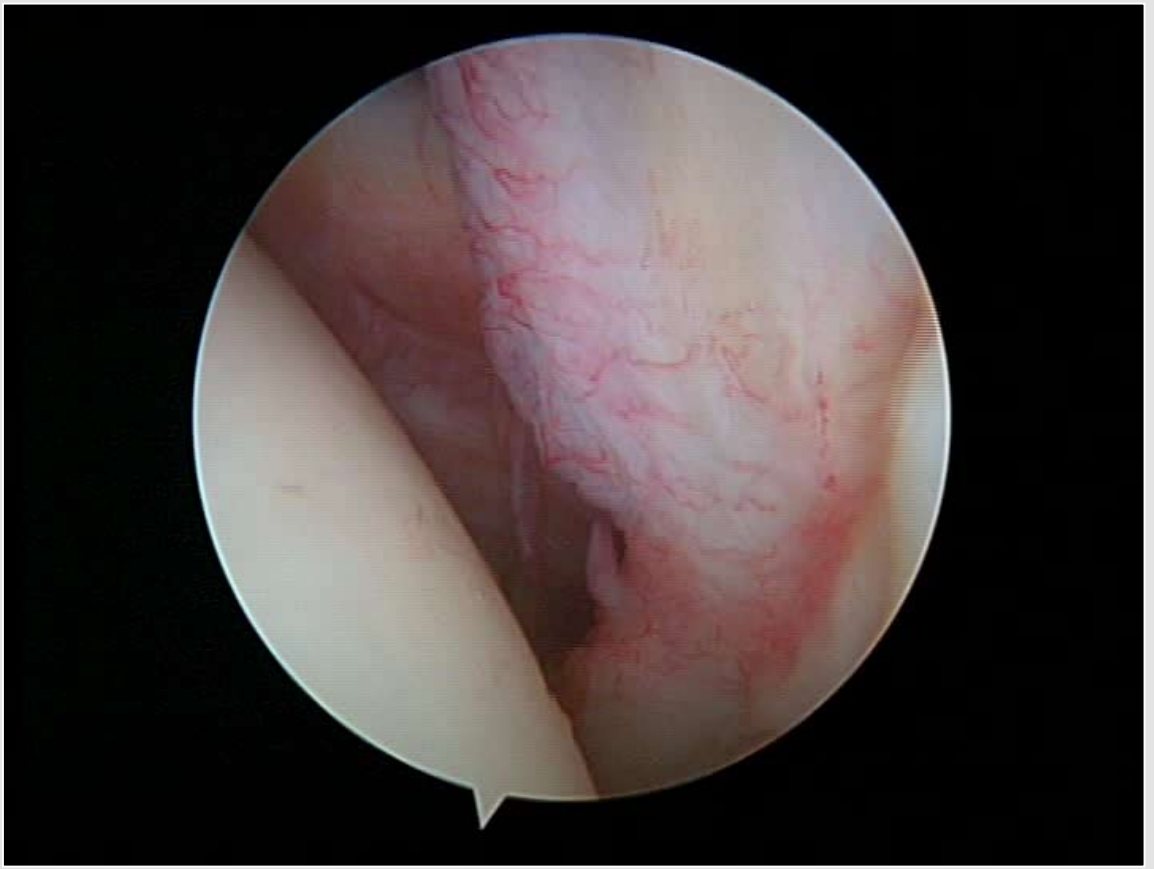


FIGURE 8.188 ⊙ A ty
CHL-SGHL sling. The bice
undergone subluxation.



PRAXIS im KÖLN TRIANGLE

Arthroskopie Bare area

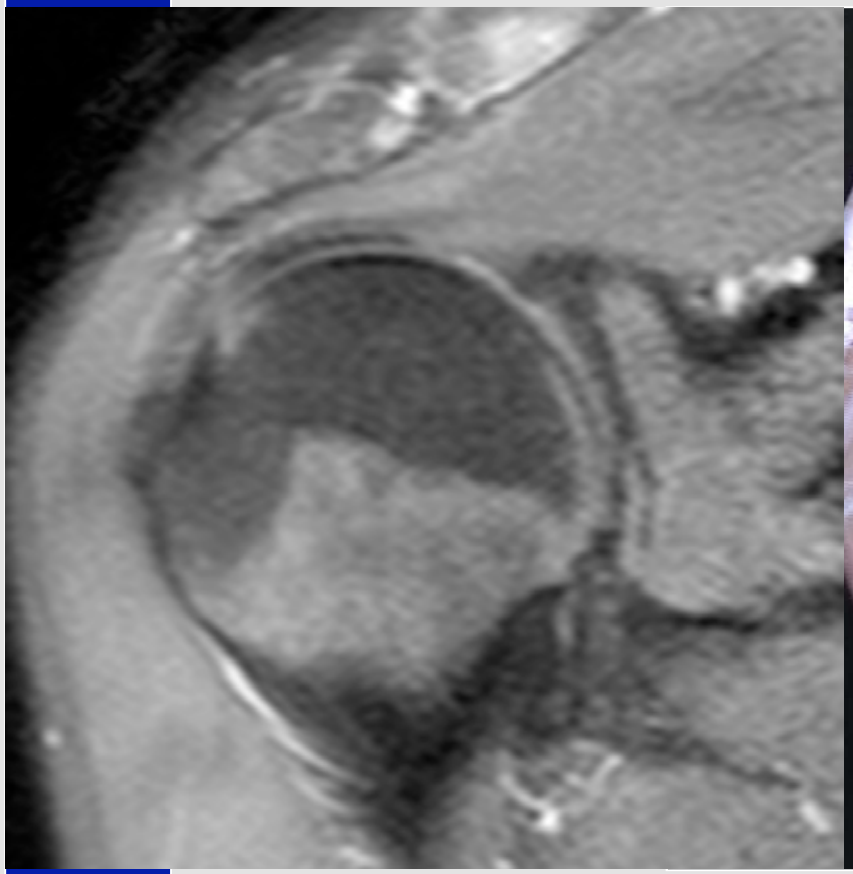


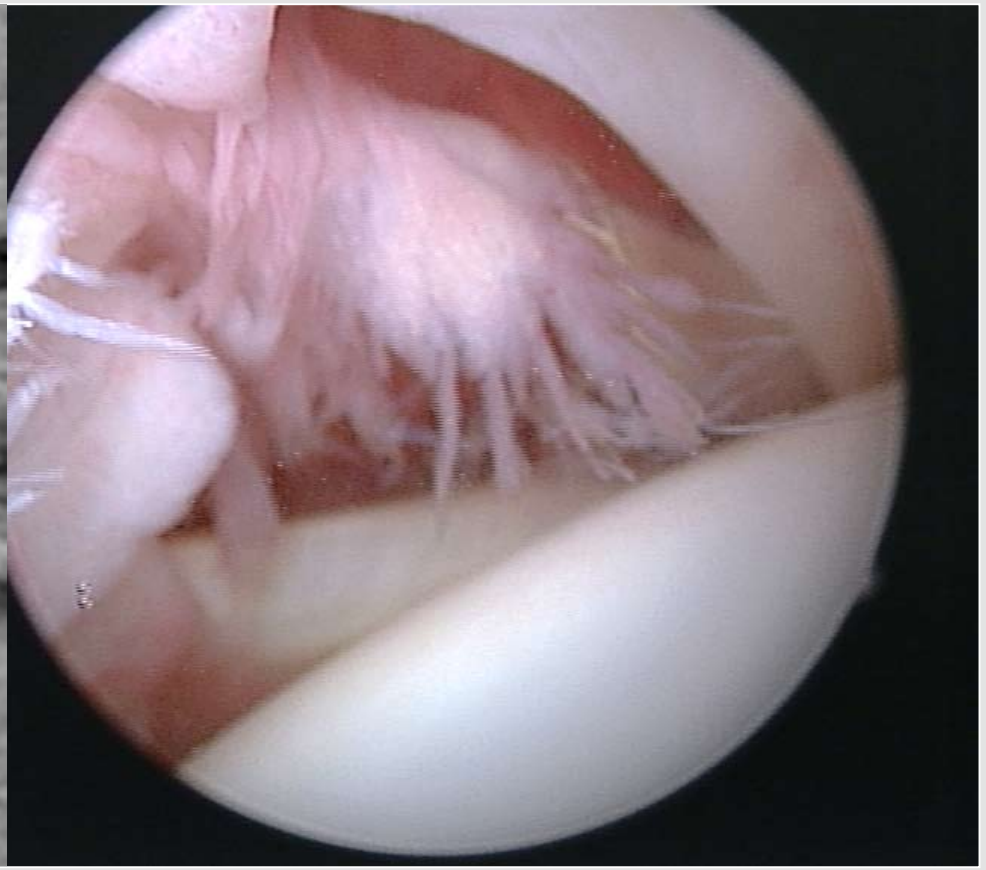
PRAXIS im KÖLN TRIANGLE

Fallbeispiele

PRAXIS im KÖLN TRIANGLE

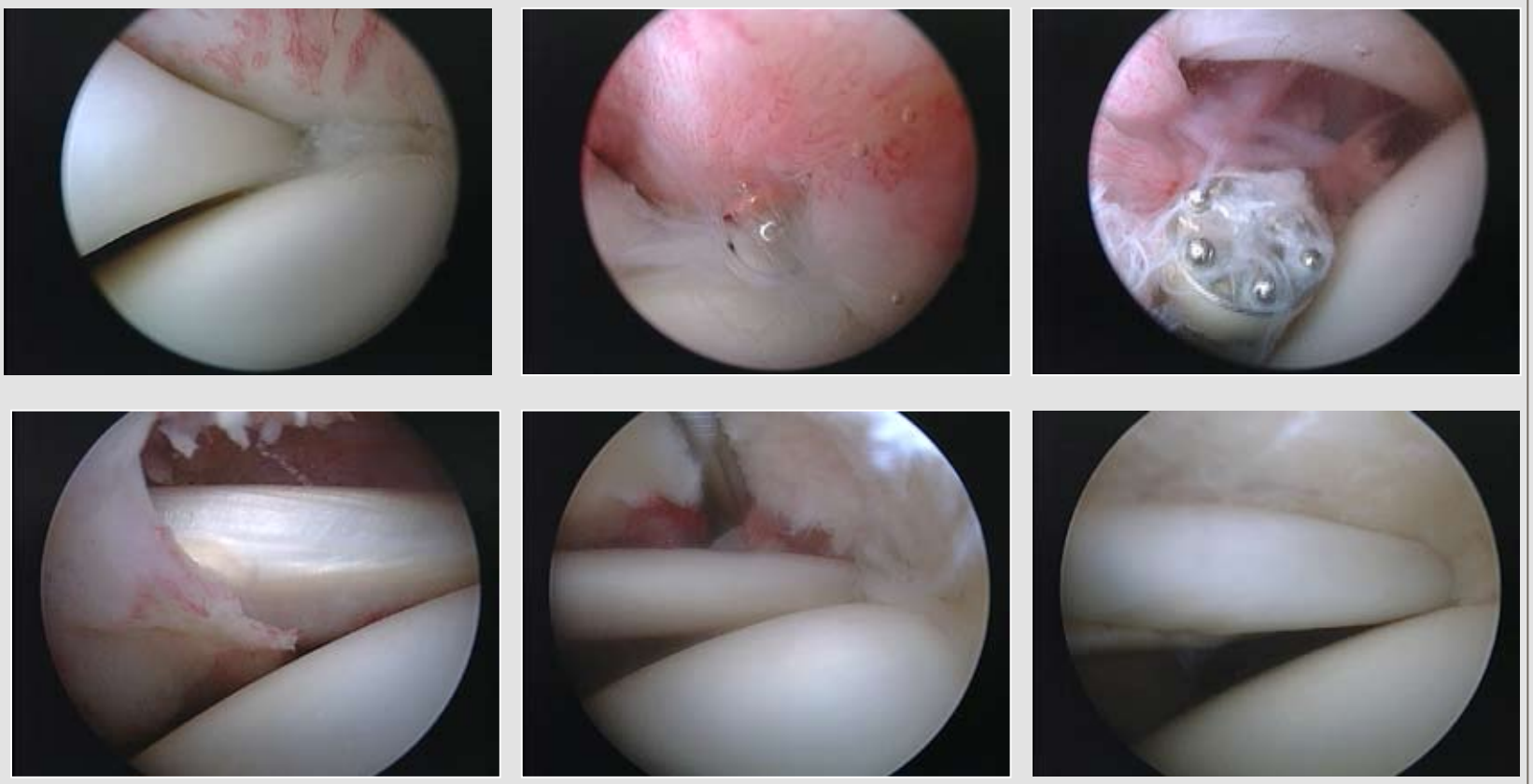
B., T., 30j, m.: Auffaserung SSS gelenkseitig





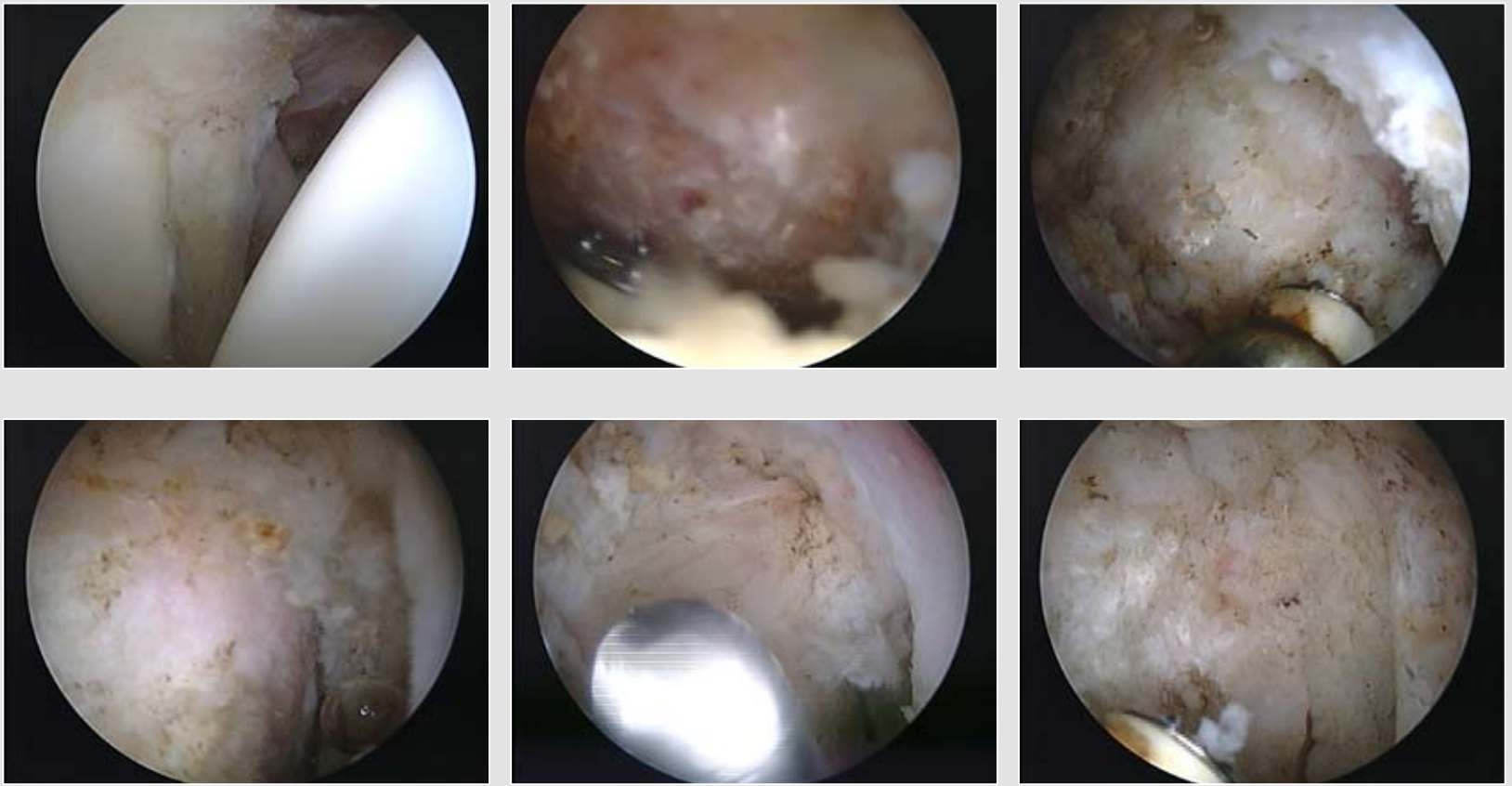
PRAXIS im KÖLN TRIANGLE

B., T., 30j, m



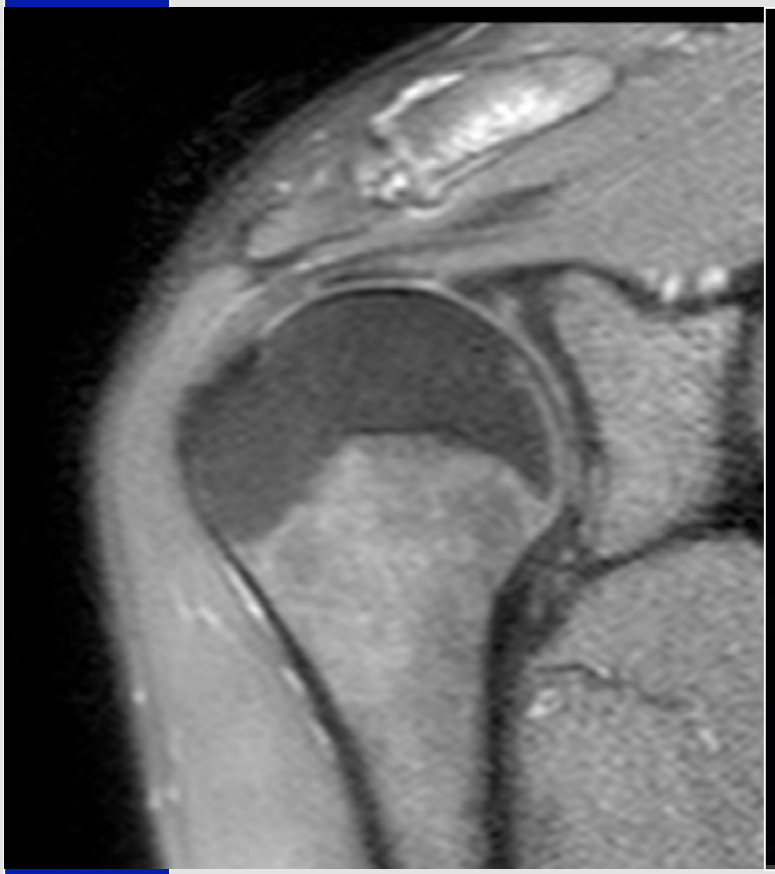
PRAXIS im KÖLN TRIANGLE

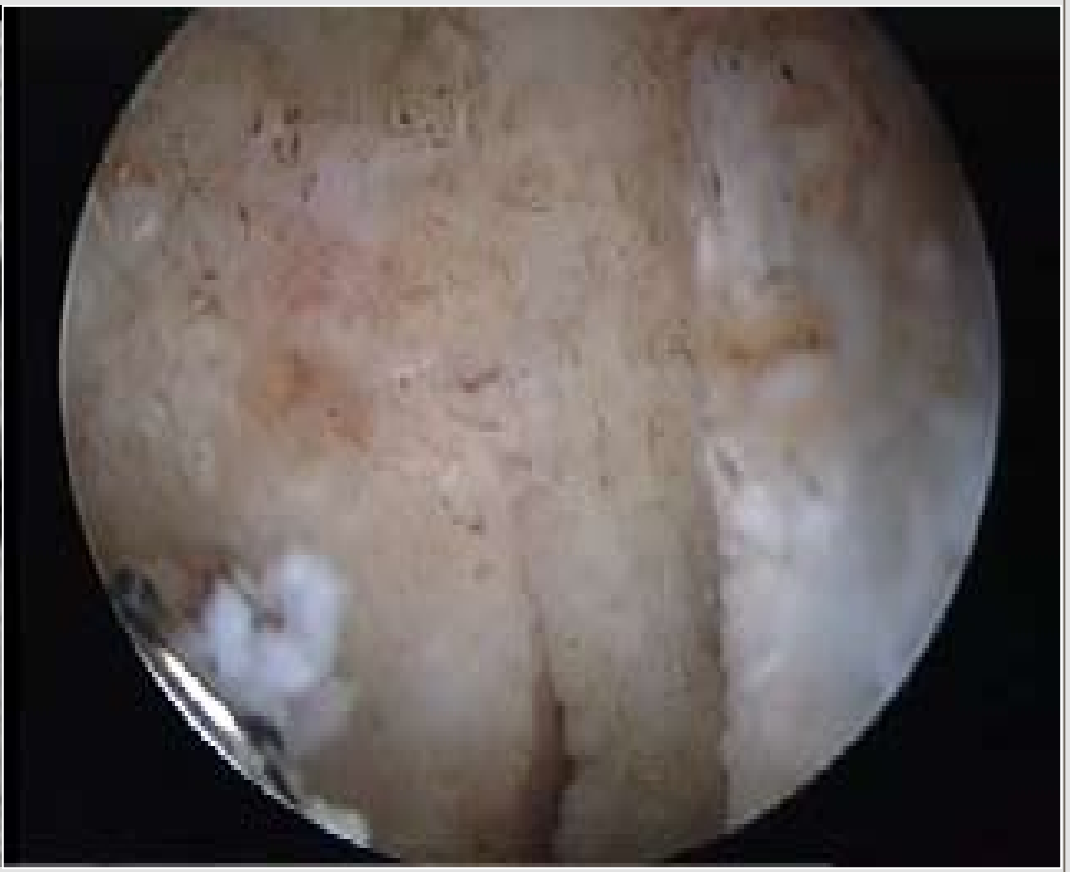
B., T., 30j, m



PRAXIS im KÖLN TRIANGLE

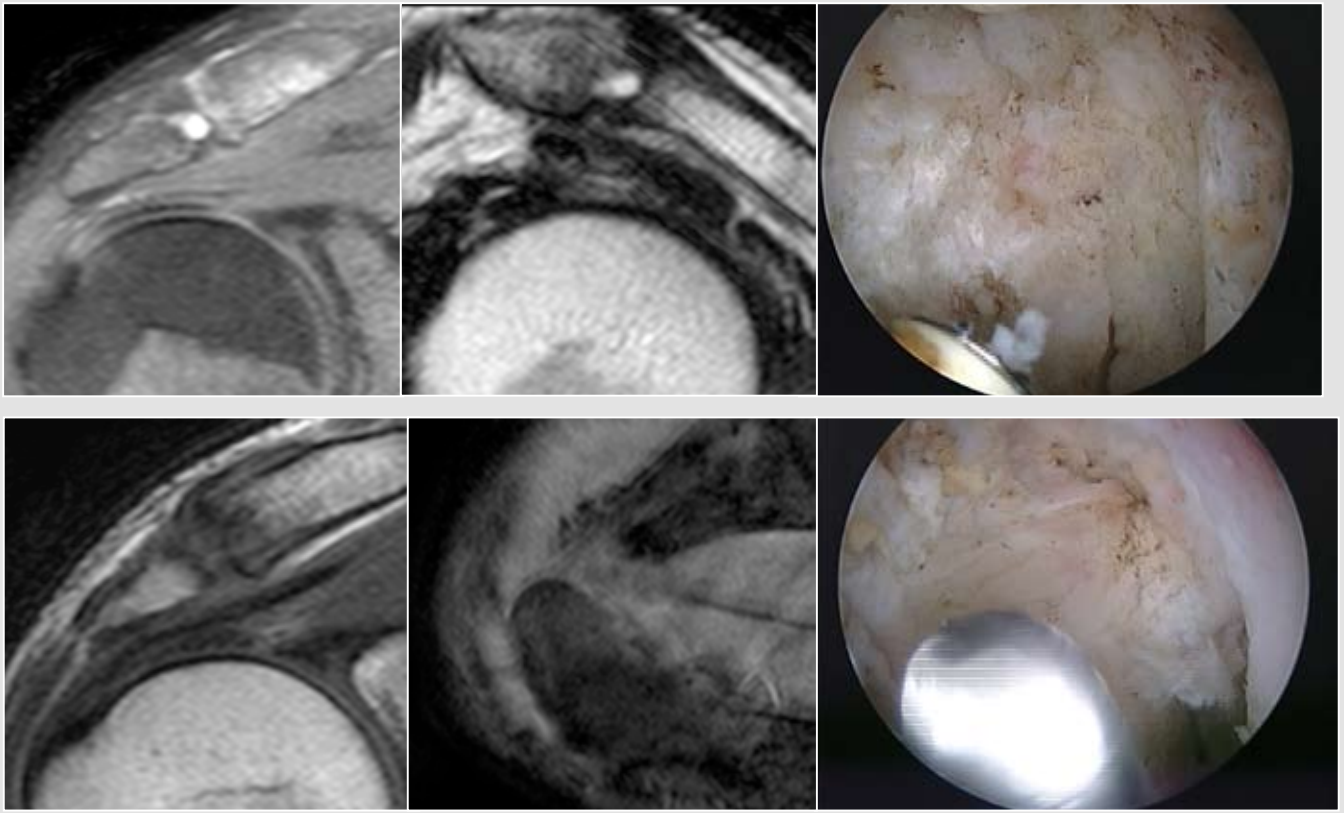
B., T., 30j, m.: AC-Gelenksarthrose



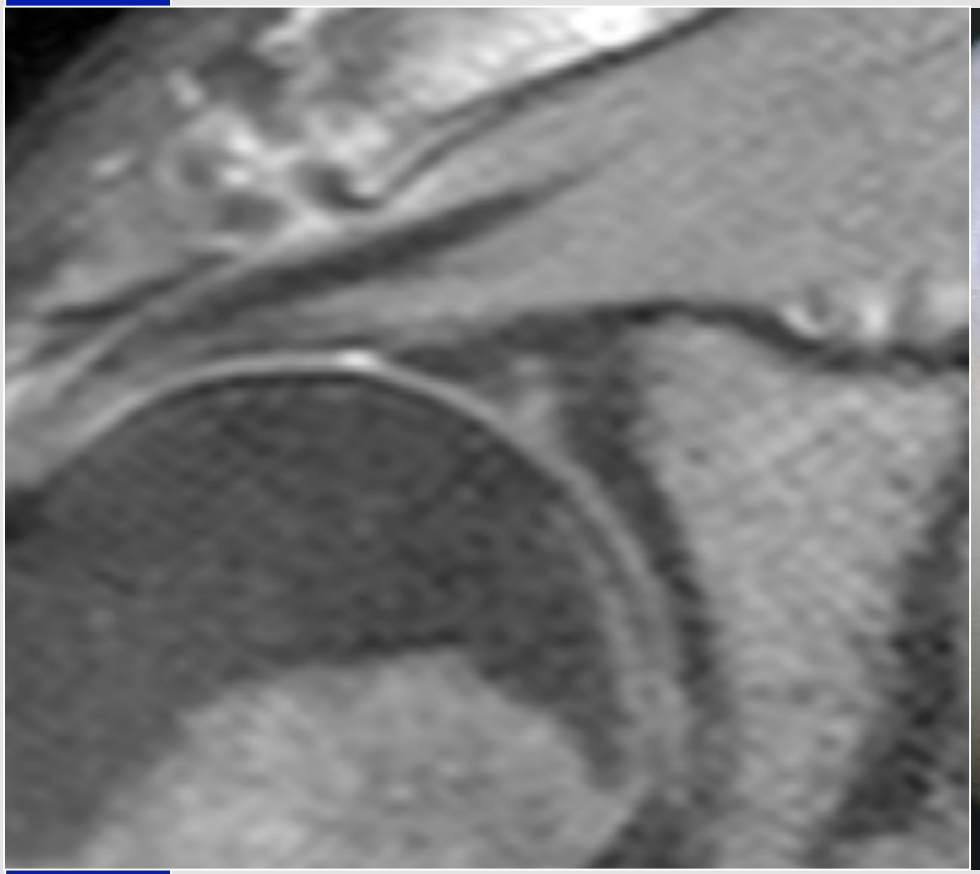


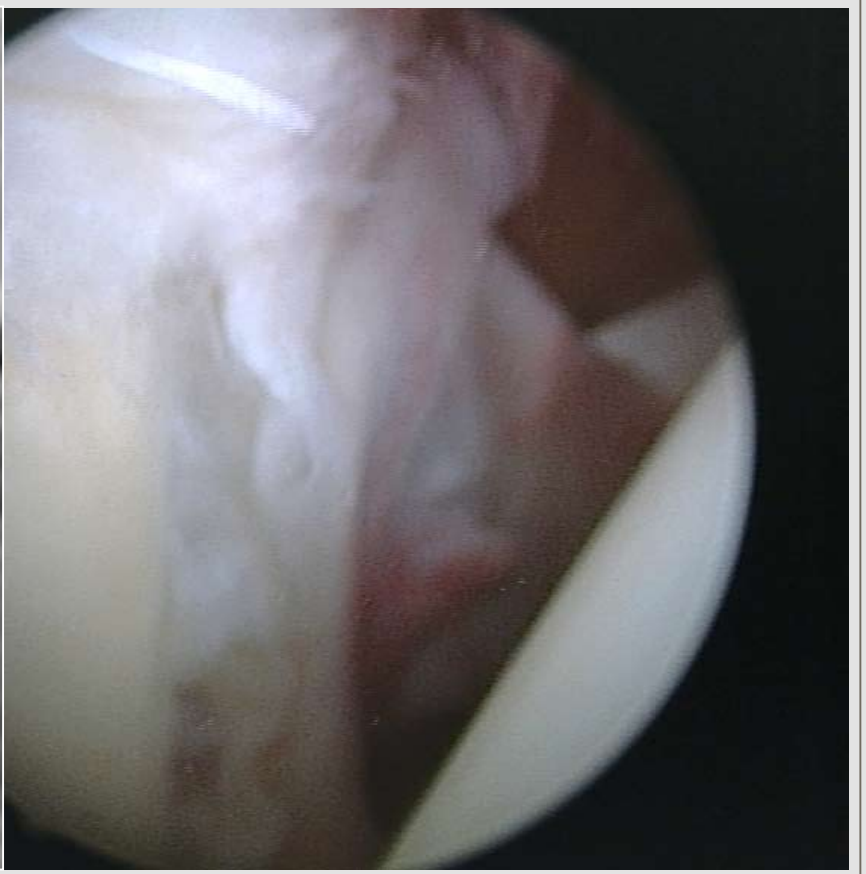
PRAXIS im KÖLN TRIANGLE

B., T., 30j, m.: AC-Gelenksarthrose



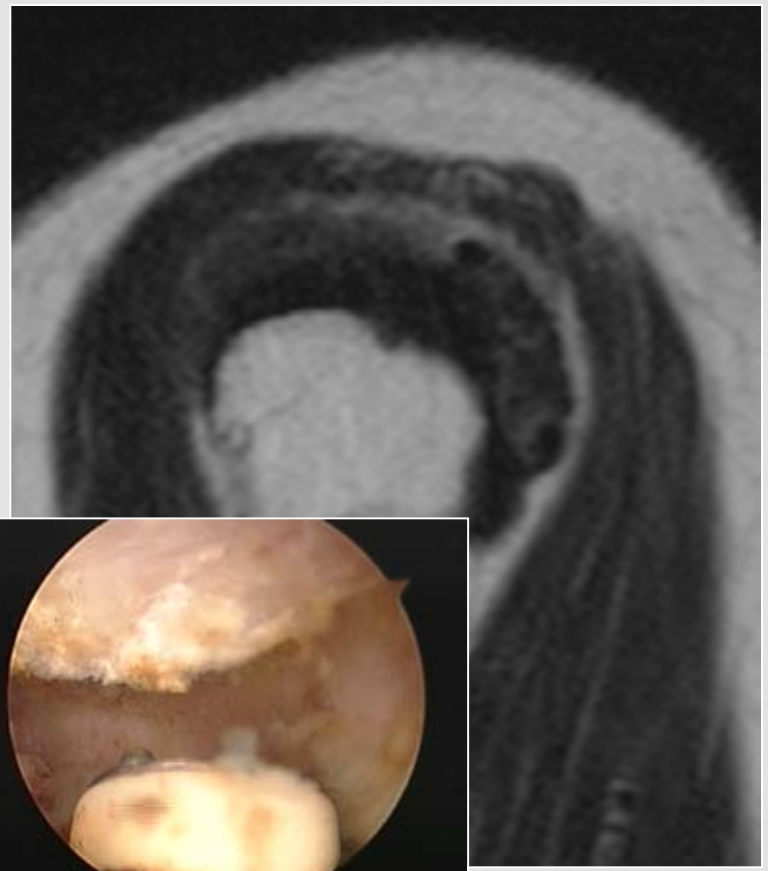
B., T., 30j, m.: SLAP I

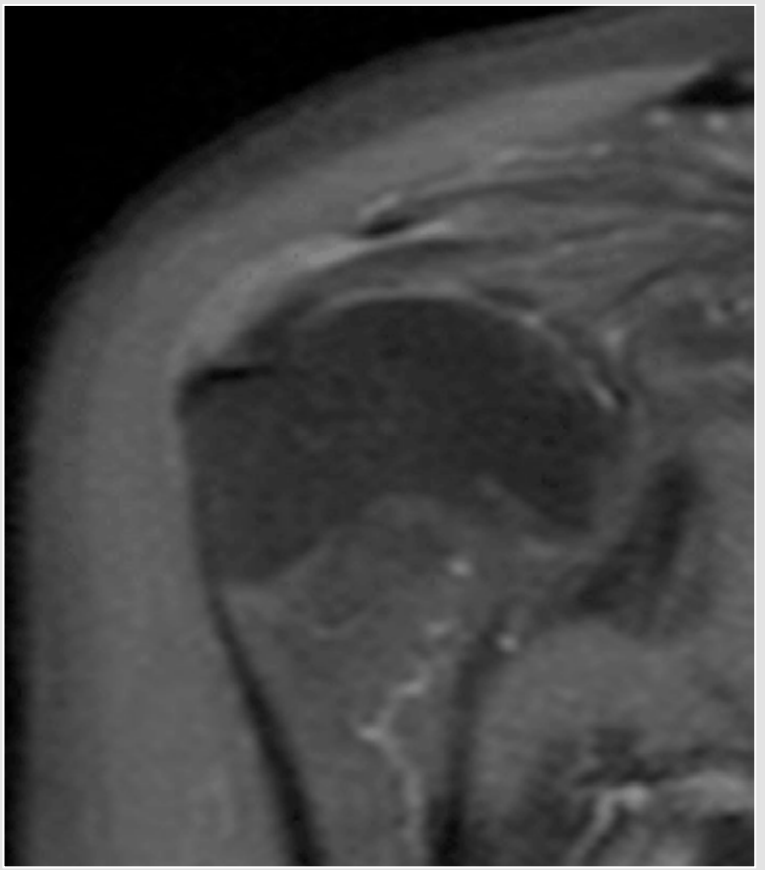




PRAXIS im KÖLN TRIANGLE

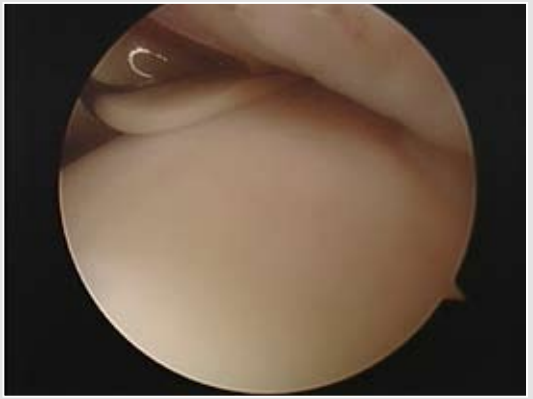
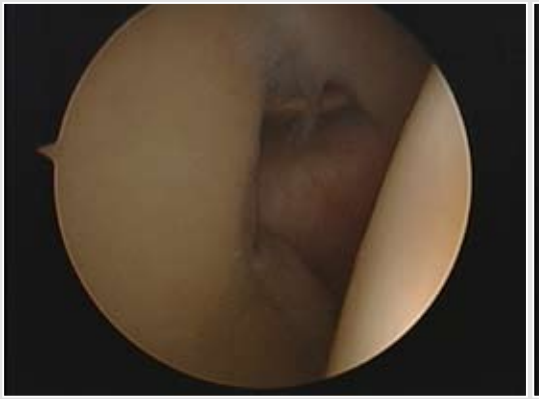
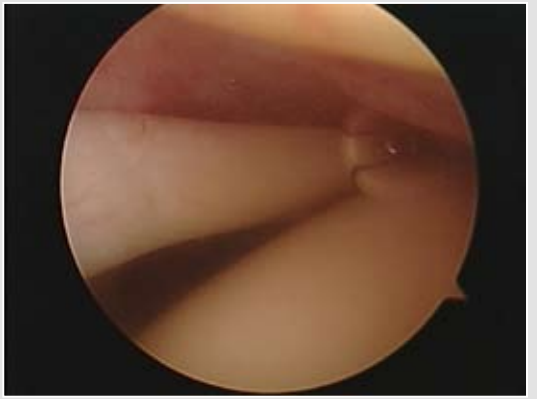
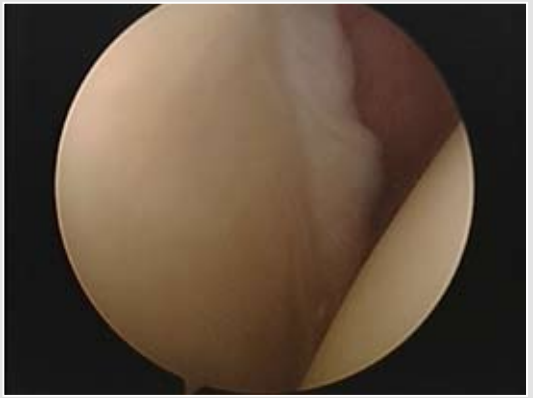
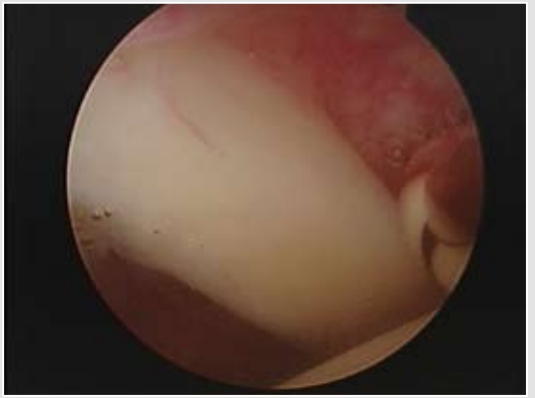
R., R. 55J, w. Tendinosis calcarea





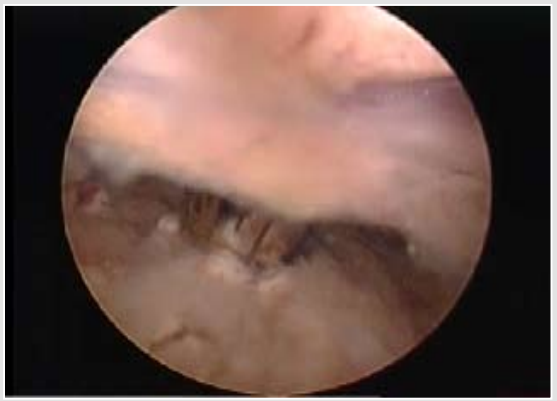
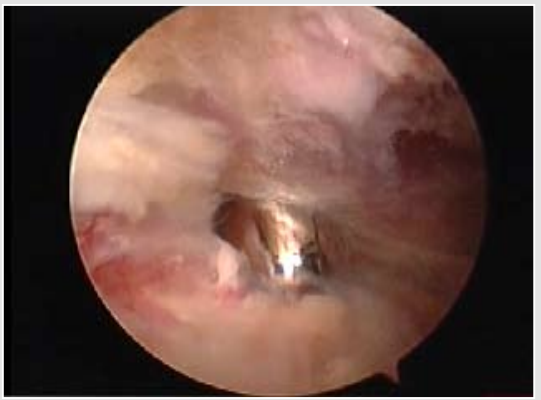
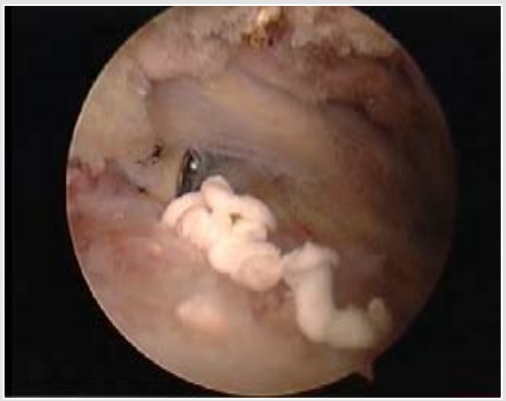
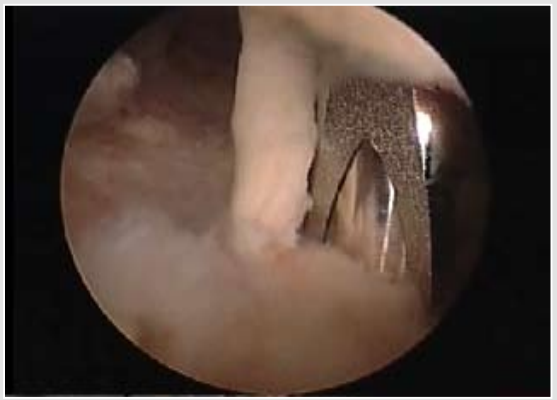
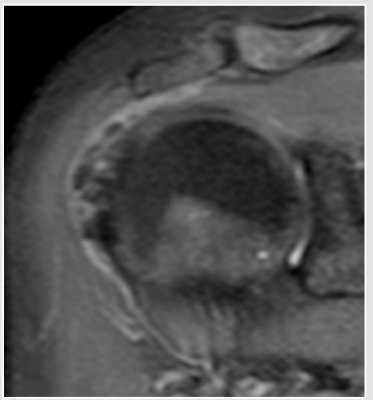
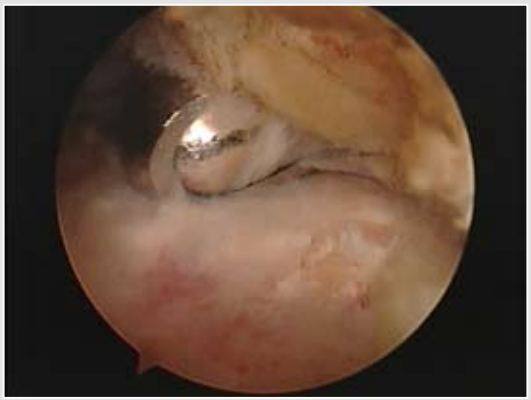
PRAXIS im KÖLN TRIANGLE

R., R., 55J, w.

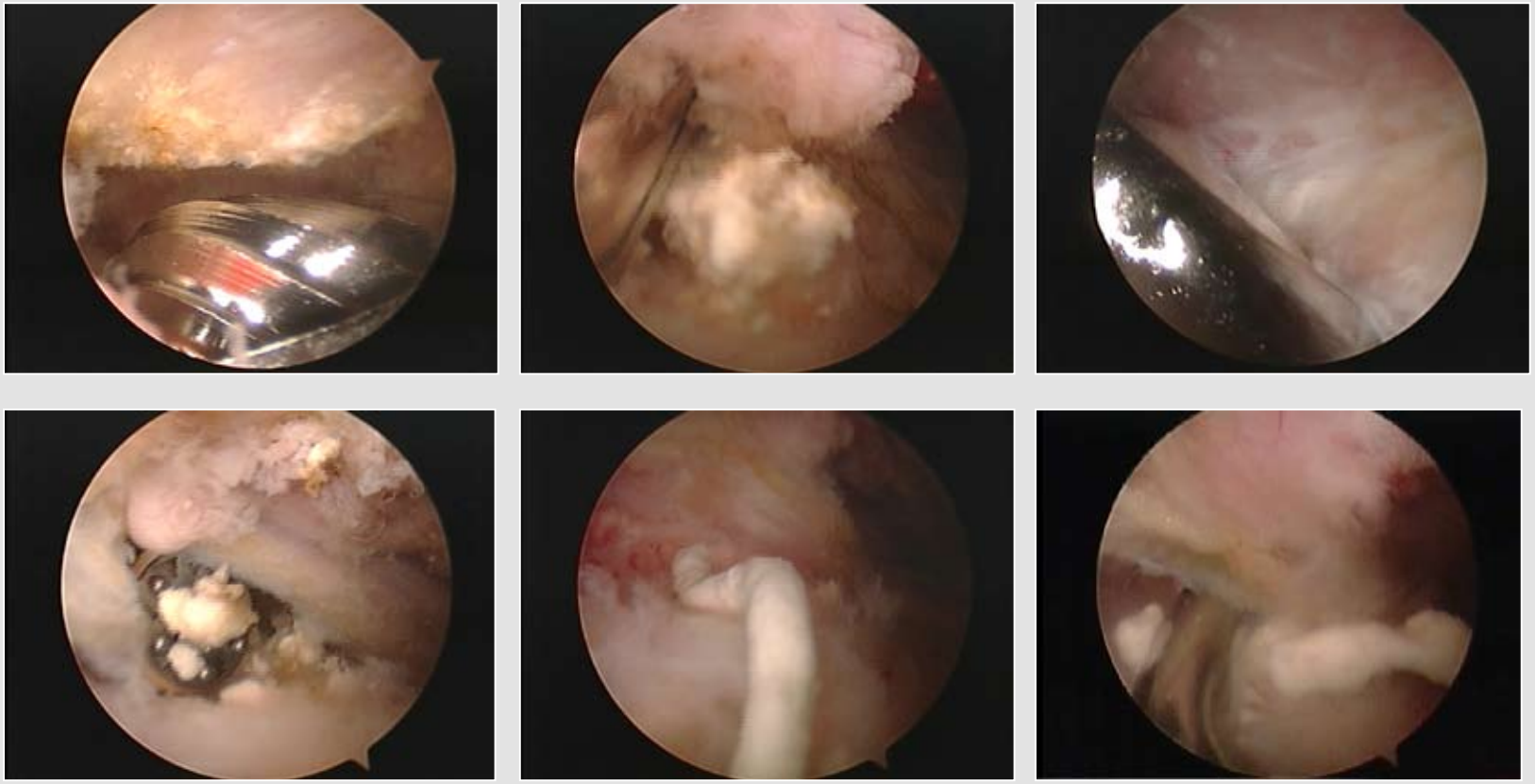
PRAXIS im KÖLN TRIANGLE

R., R., 55J, w.

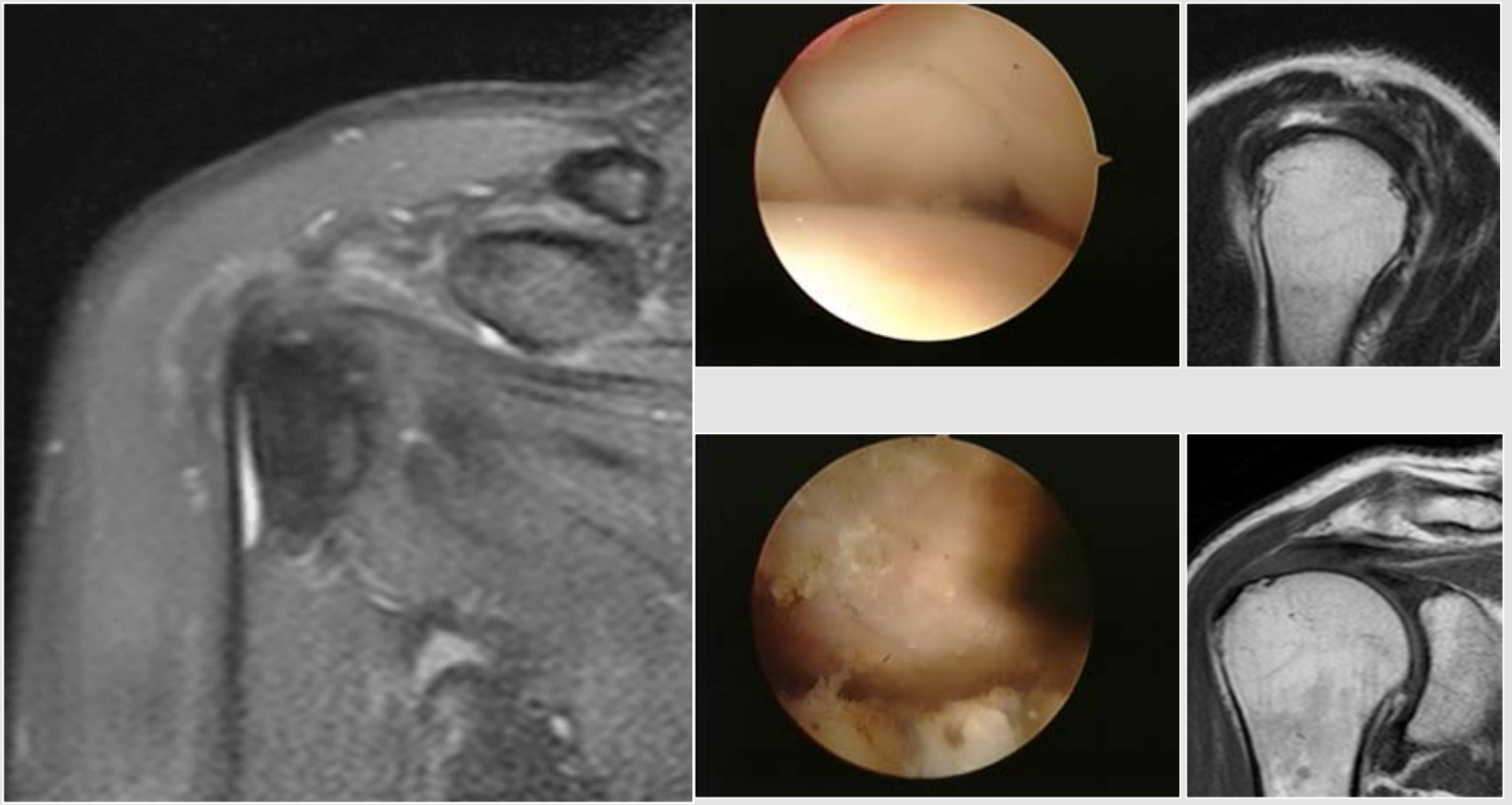
PRAXIS im KÖLN TRIANGLE

R., R., 55J, w

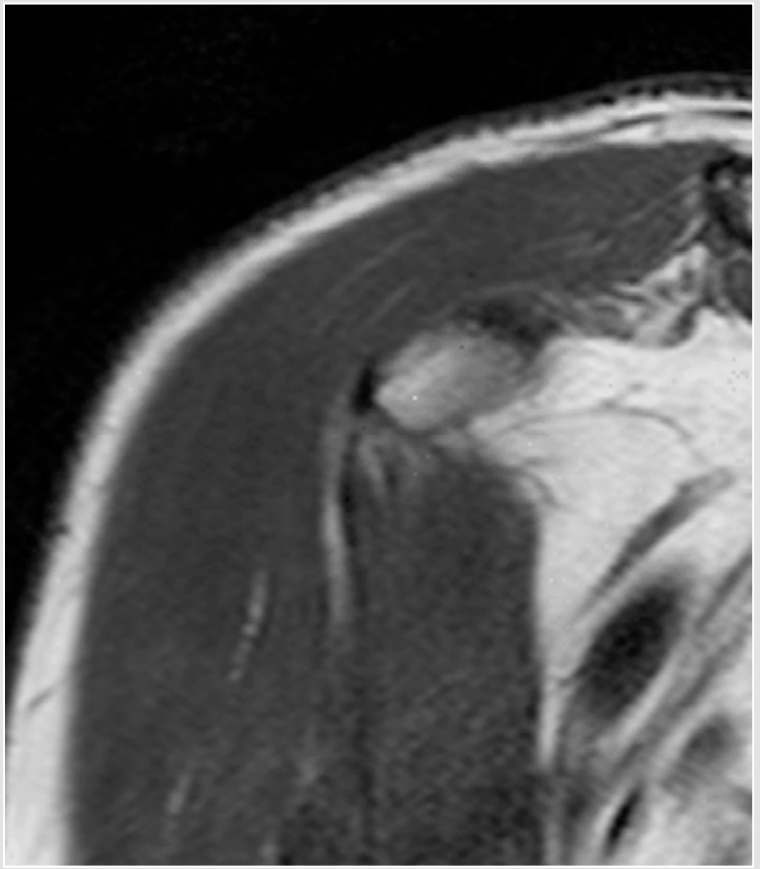


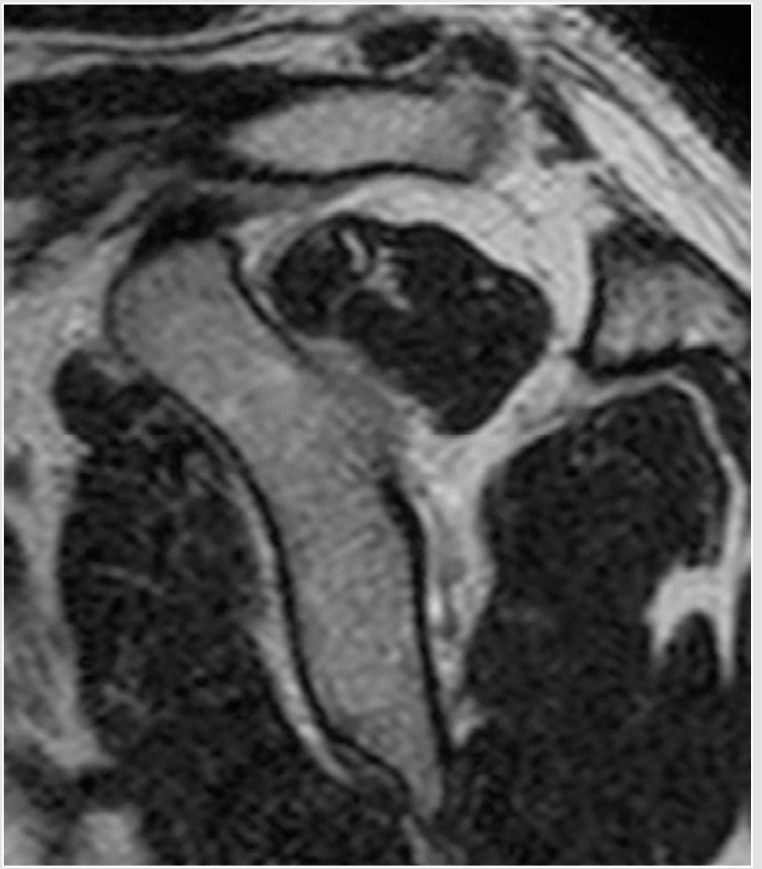
PRAXIS im KÖLN TRIANGLE

W., E. 71J, m SSS Ruptur

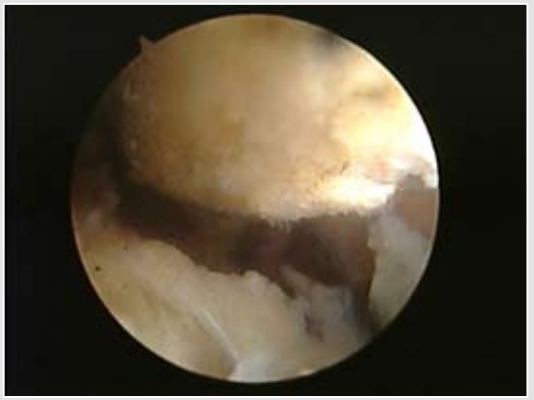


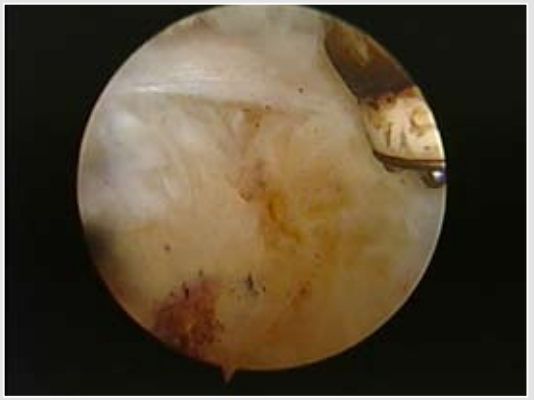
W., E. 71J, m SSS Ruptur

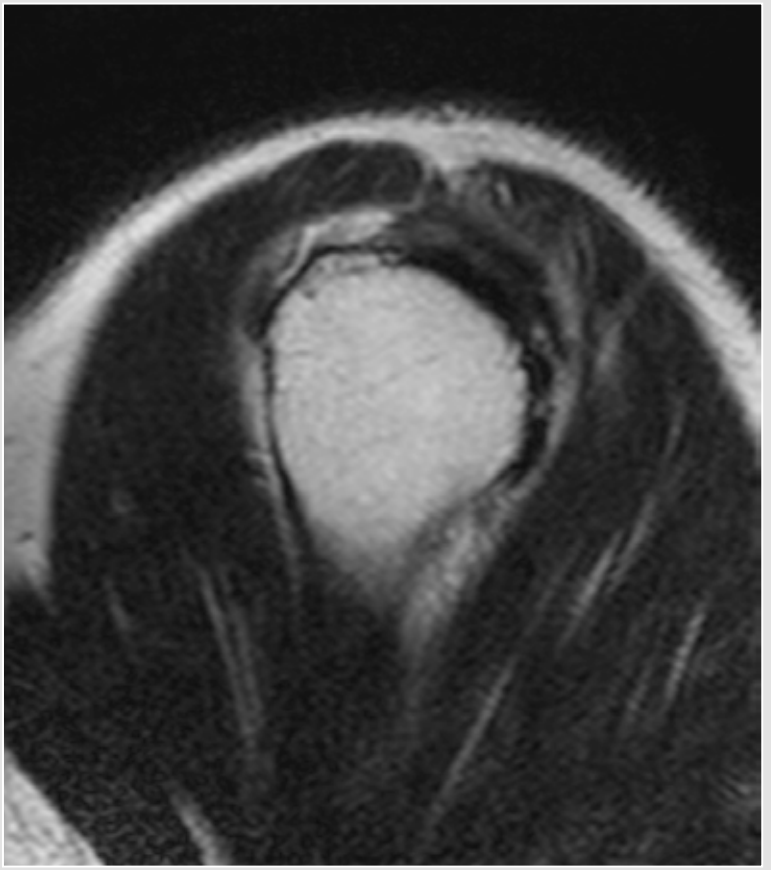




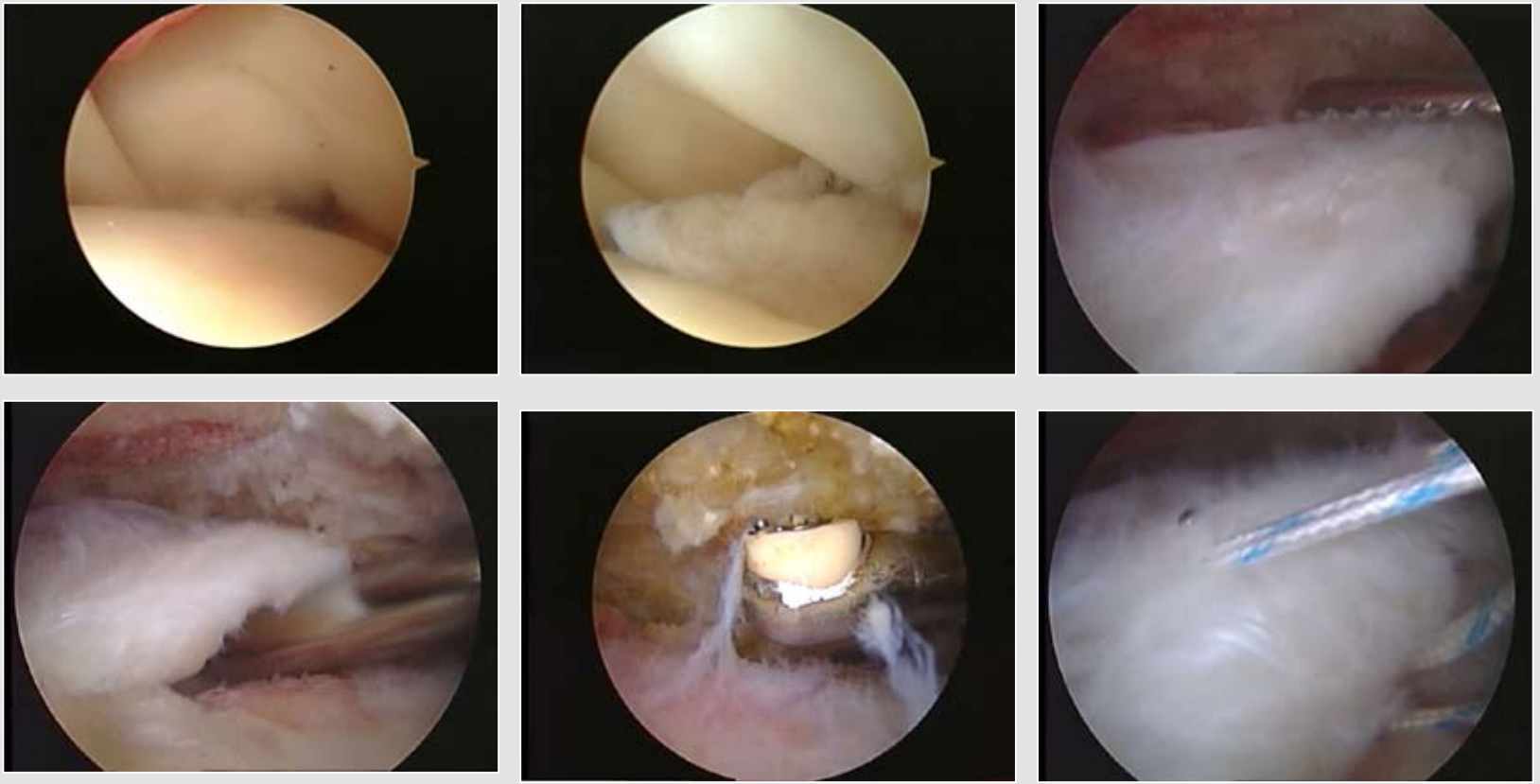
W.,E., 71, m





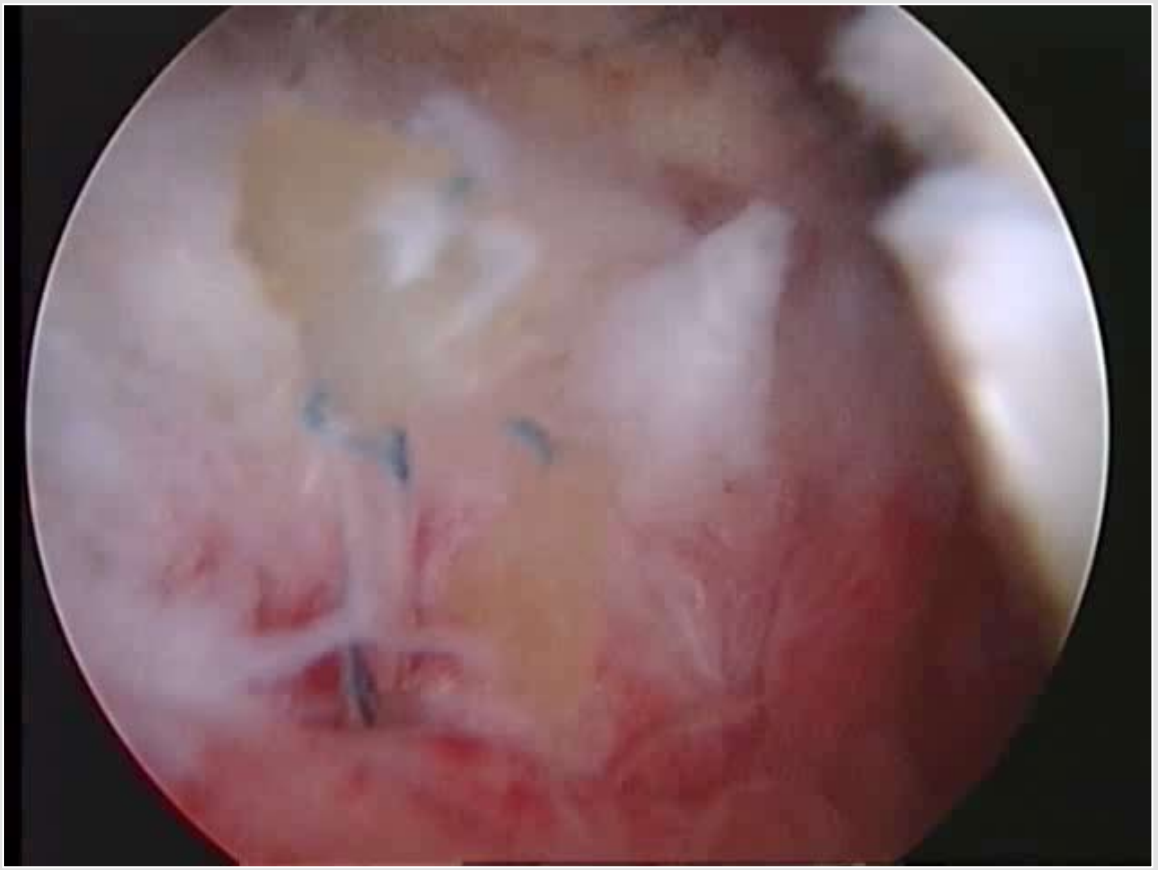


W., E. 71J, m Mobilisieren, Anfrischen, Brutzeln, Naht



PRAXIS im KÖLN TRIANGLE

W., E., 71J, m Abschluß



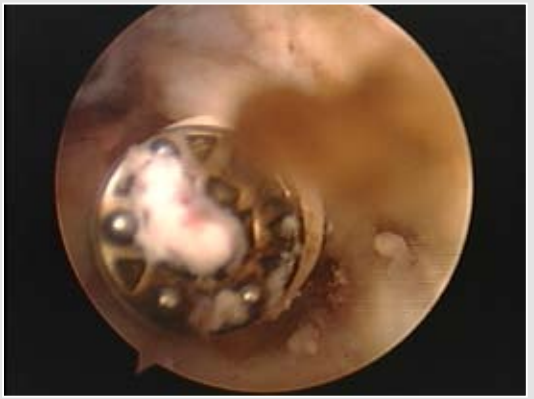
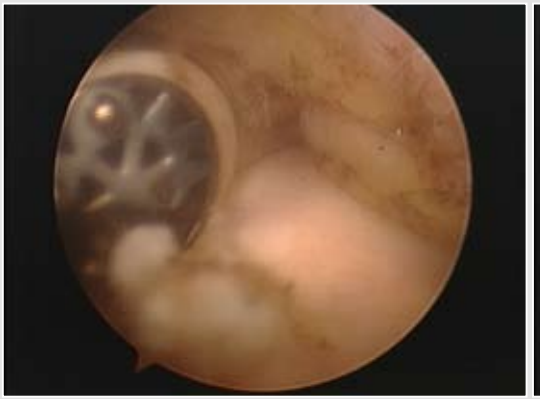
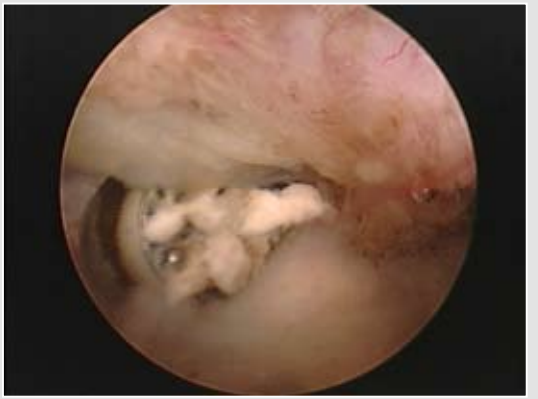
PRAXIS im KÖLN TRIANGLE

Vielen Dank für ihre Aufmerksamkeit!

Oliver Greshake
Jonas Müller-Hübenthal

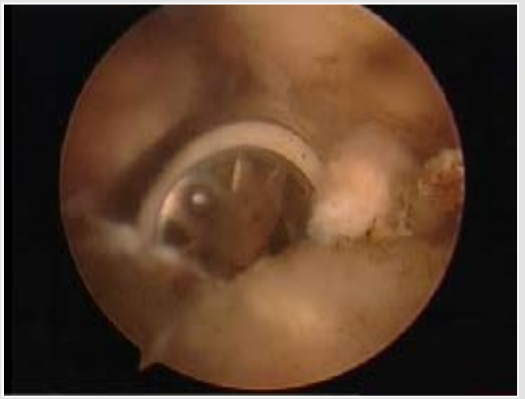
PRAXIS im KÖLN TRIANGLE

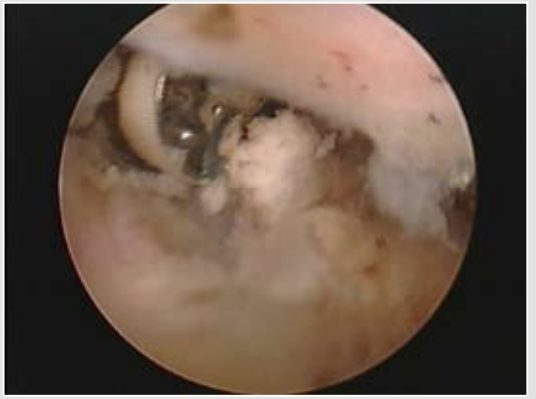
R., R., 55J, w.

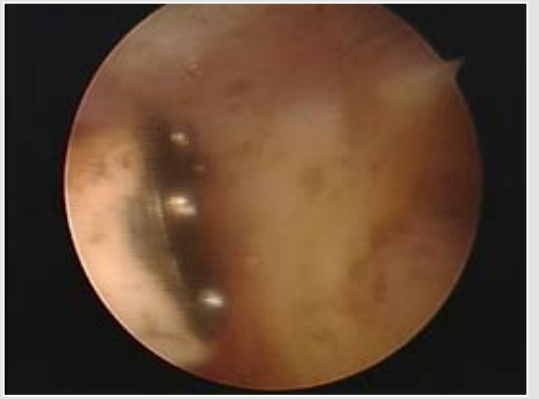




PRAXIS im KÖLN TRIANGLE

R., R., 55J, w







PRAXIS im KÖLN TRIANGLE

W., E., 71J, m