

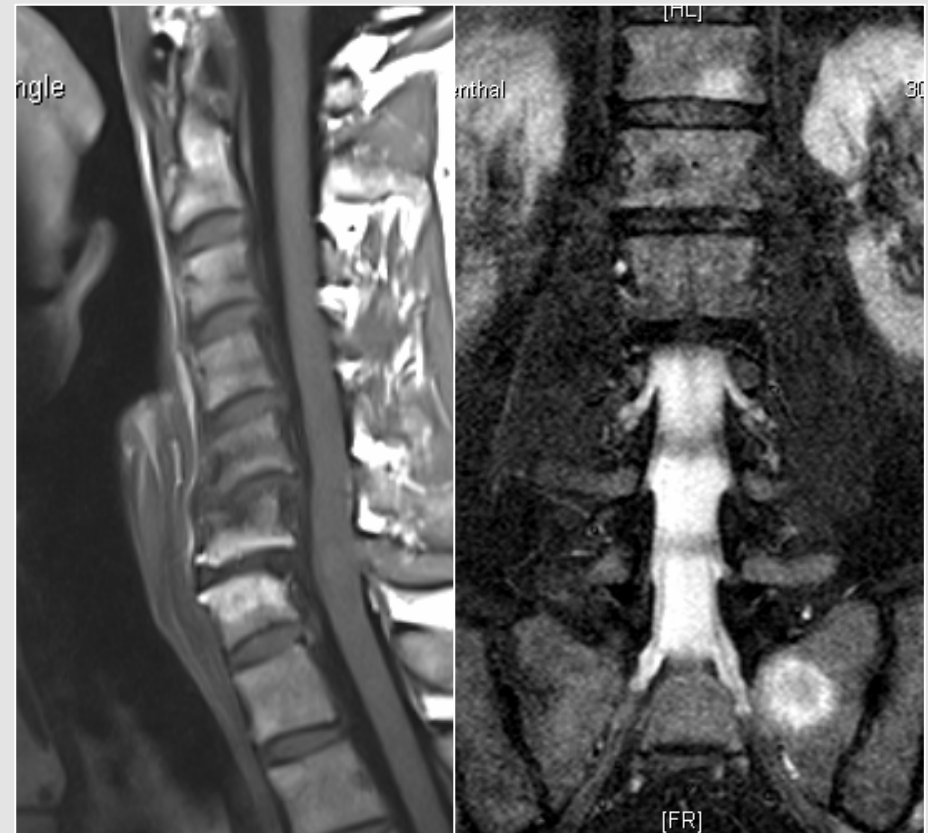
Knochenmarködeme

Qualitätszirkel Osteologie Dr. Kelter

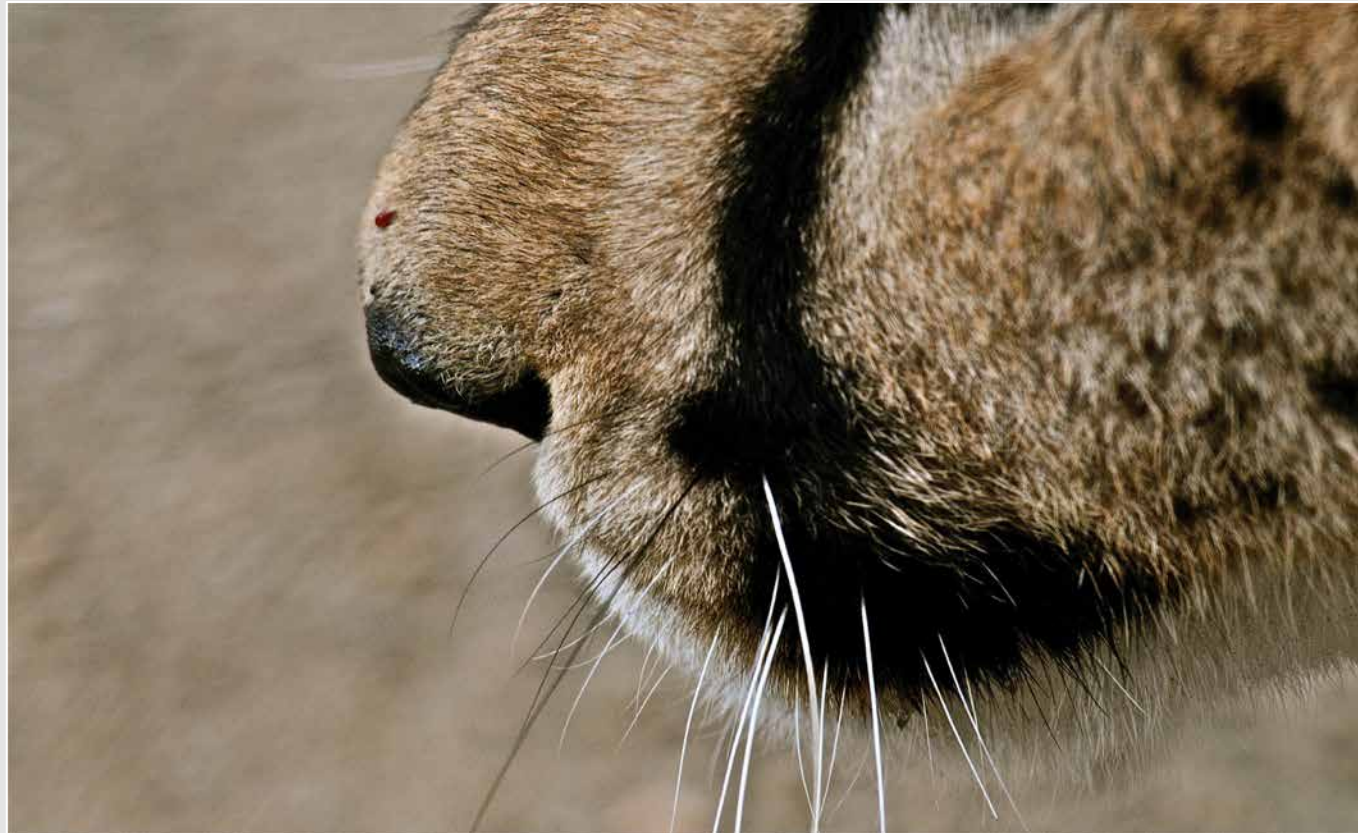
Dr. Jonas Müller-Hübenthal
Praxis im KölnTriangle
Ottoplatz 1
D-50679 Köln

Gliederung

- Was heißt „Knochenmarködem“?
 - Signal
 - Pathologie
- Trauma / Overuse
 - Knorpel-/ Meniskusschaden
 - Subchondrale Insuffizienzfraktur/ Osteonekrose
 - Mikrofraktur / Makrofraktur
 - Wandernde Ödeme CRMO
- Tumor / Zellularität
 - Aktivierte Hämatopoese
 - Diffuse Knochenmarkerkrankungen
 - Fokale Knochenmarkersetzende Prozesse
- Entzündliche Prozesse
 - (Rheumatoide) Arthritis
 - Spondylodiscitis
 - Osteomyelitis
- Take Home Points

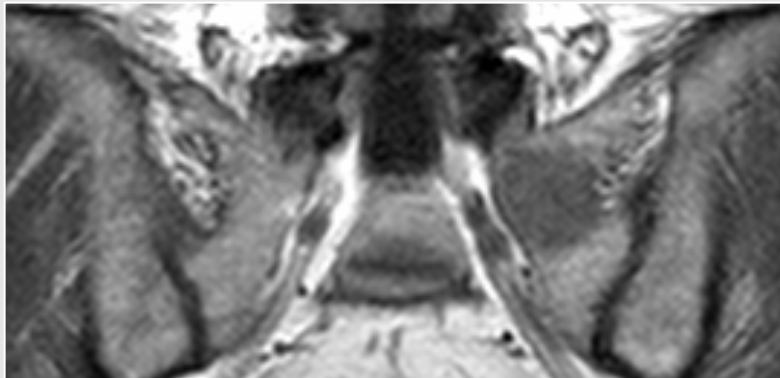


Was heißt „Knochenmarködem“?

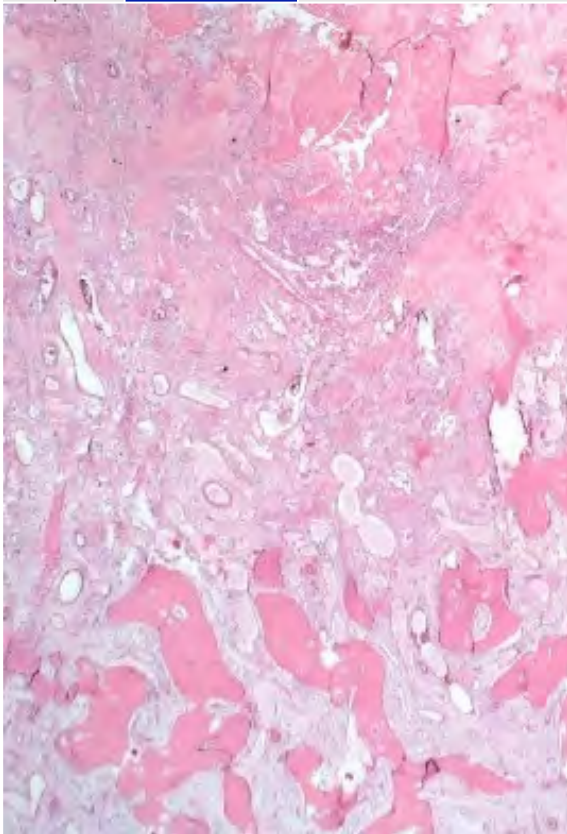


Was heißt „Knochenmarködem“

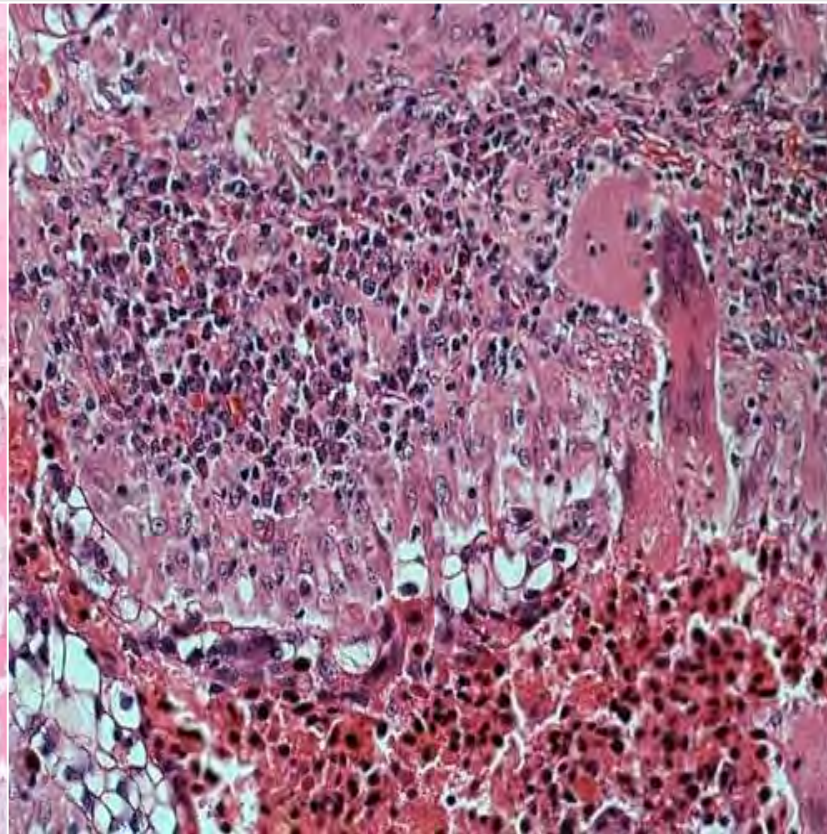
- T2 signalreich – weil Wasser
- Sichtbar bei Fettsuppression
- T1 gering signalarm: Ödem / Hyperämie / Entzündung
- T1 signalarm: Zellularität / Fibrose / Sklerose



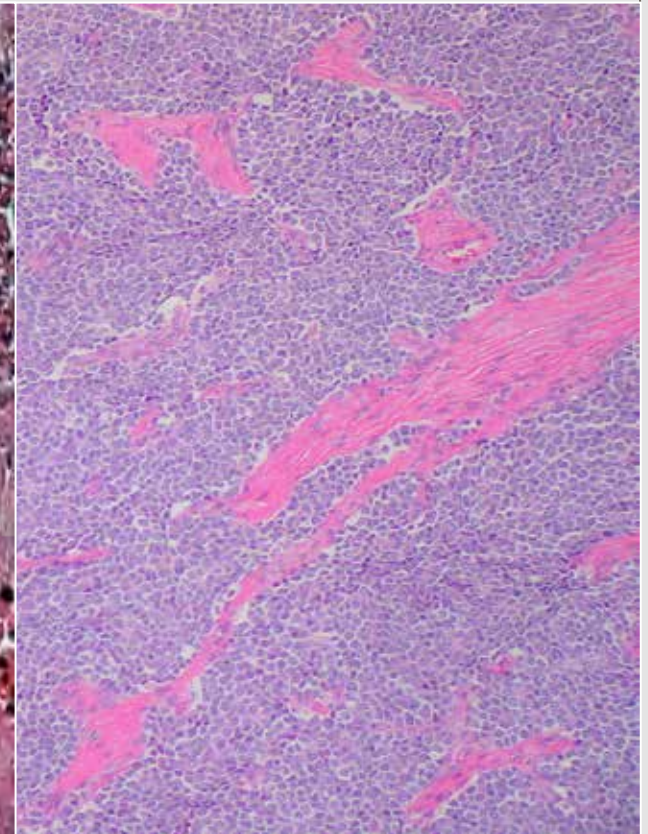
Histologie



Fraktur

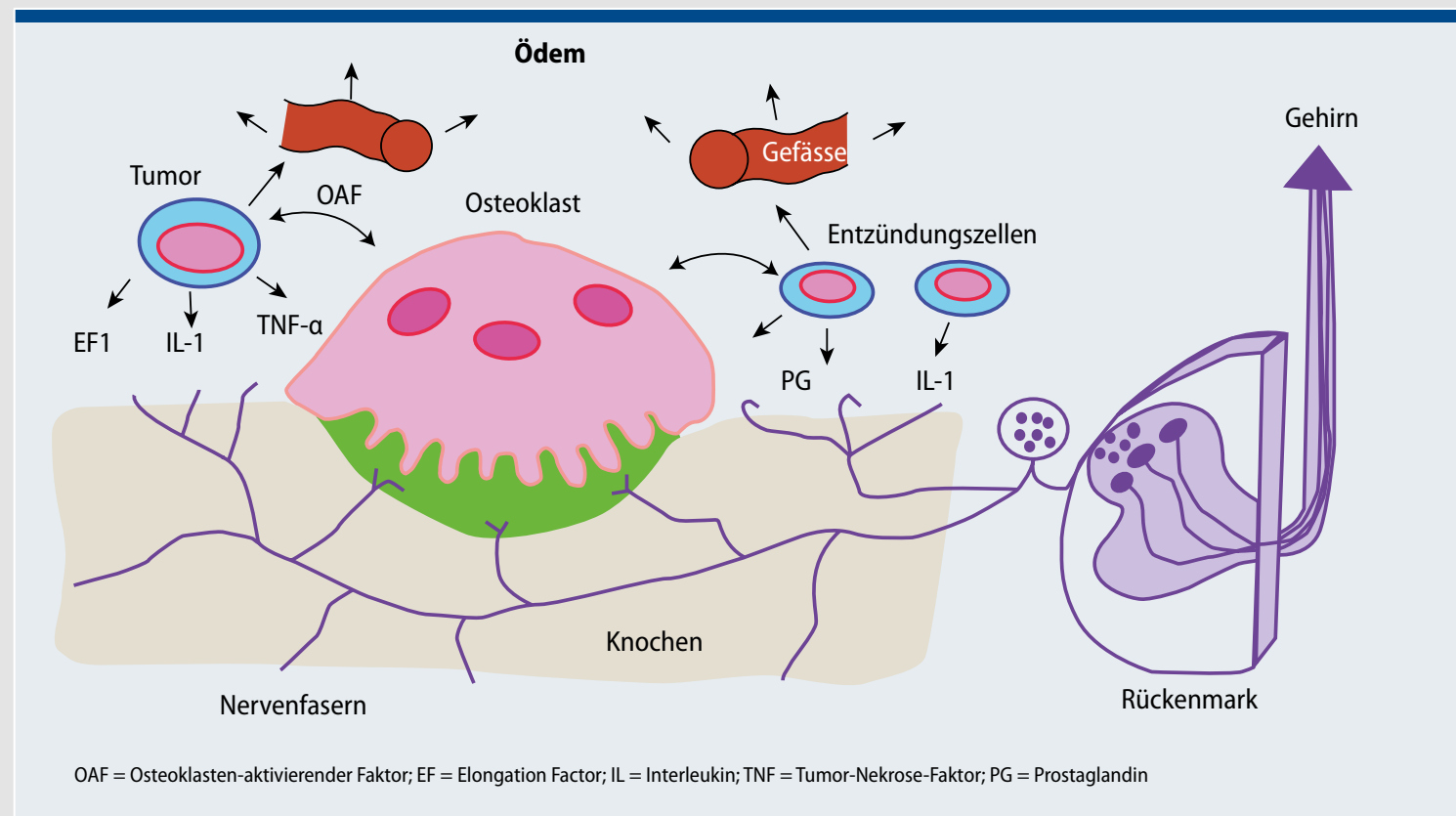


Entzündung



Tumor (Ewing)

Physiologie



Trauma / Überlastung



Indirekte Hinweise

- Überlastungsreaktion
- Floriditätskriterien
Meniskusläsion



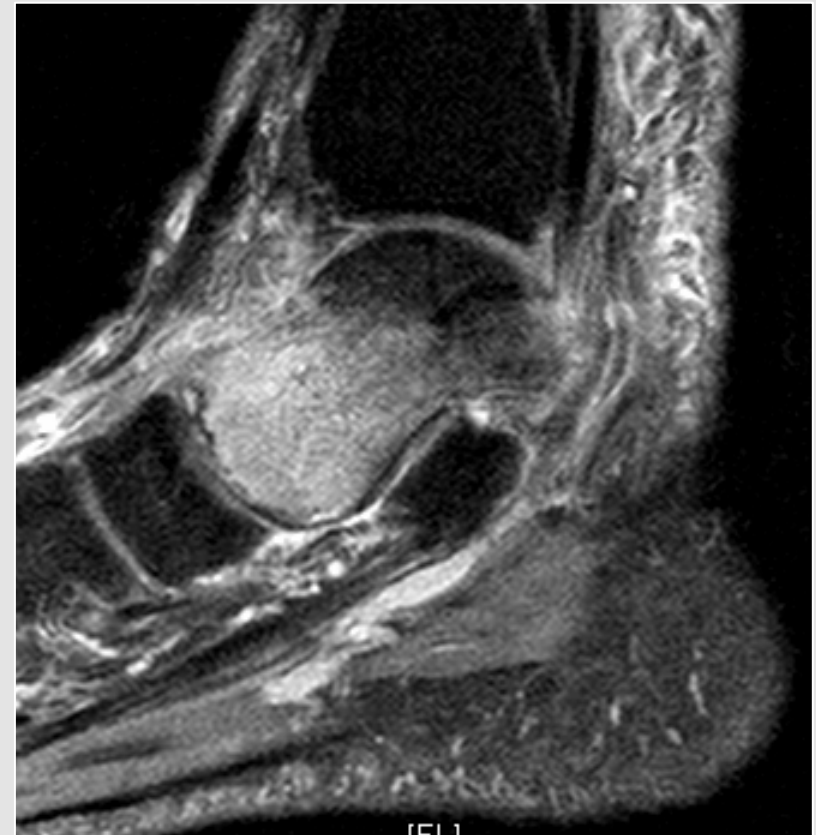
Calcaneonavikuläre Koalition

■ Überlastungsreaktion

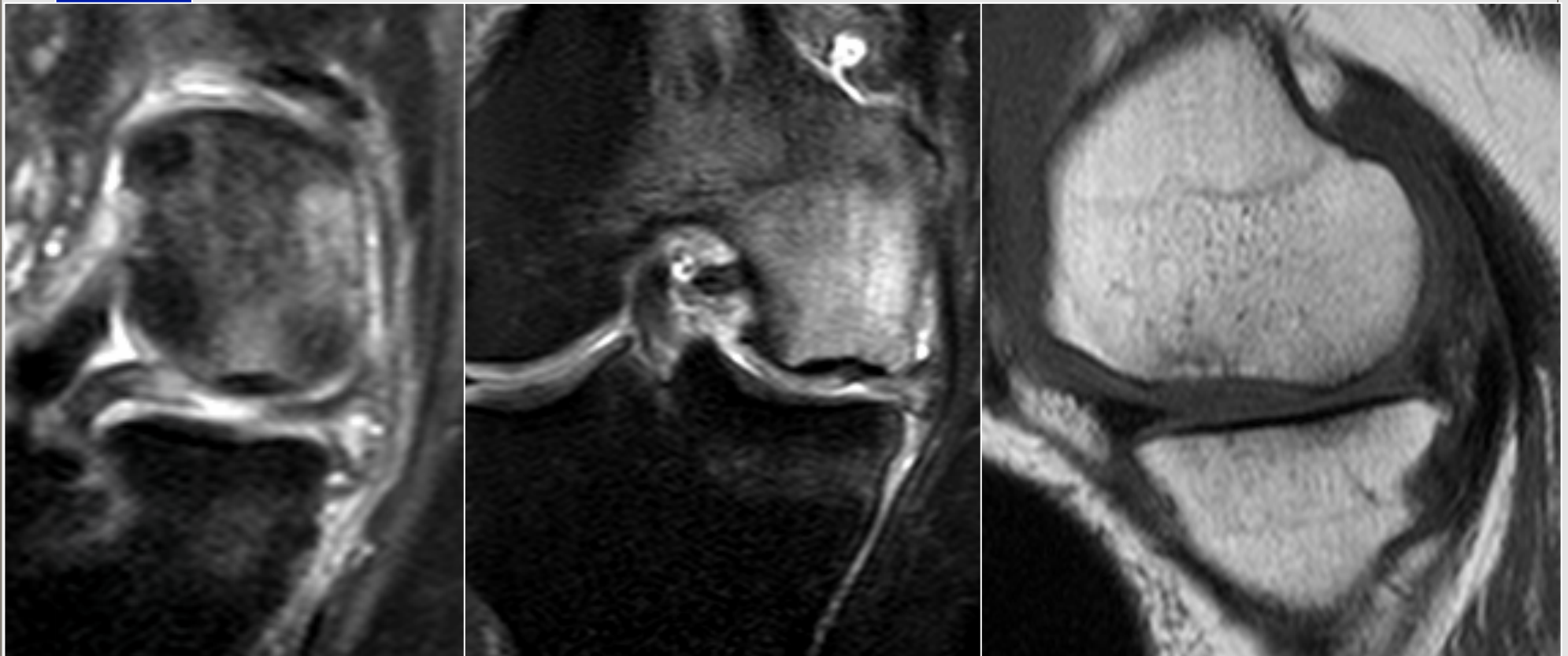


Subchondrale Insuffizienzfraktur

- Transientes Knochenmarködemsyndrom
 - reversibel
- Subchondrale Insuffizienzfraktur < 4mm
- Osteonekrose > 4mm
 - Hypovaskularisierte sklerosierte Nekrosezone (ellipsoid)

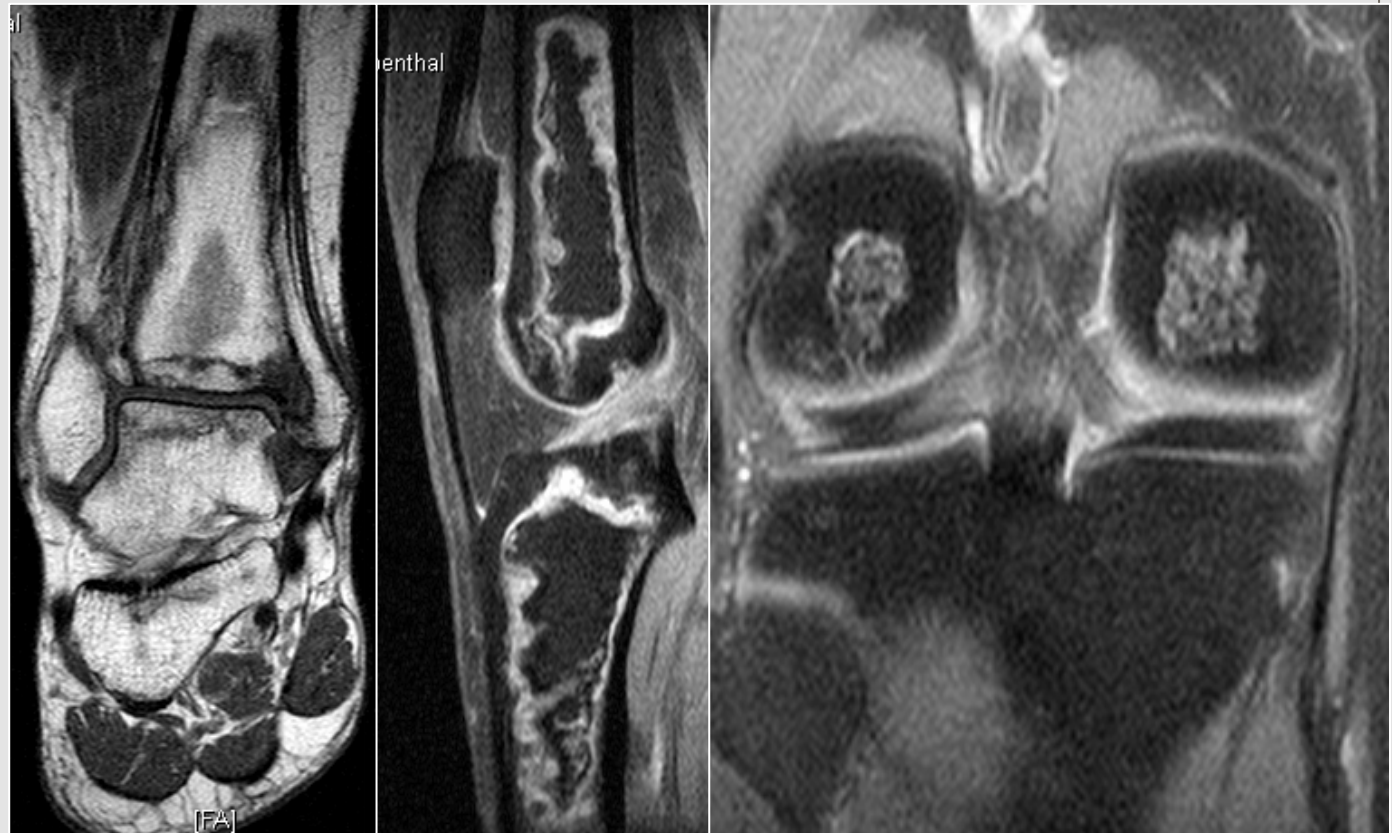


Osteonekrose

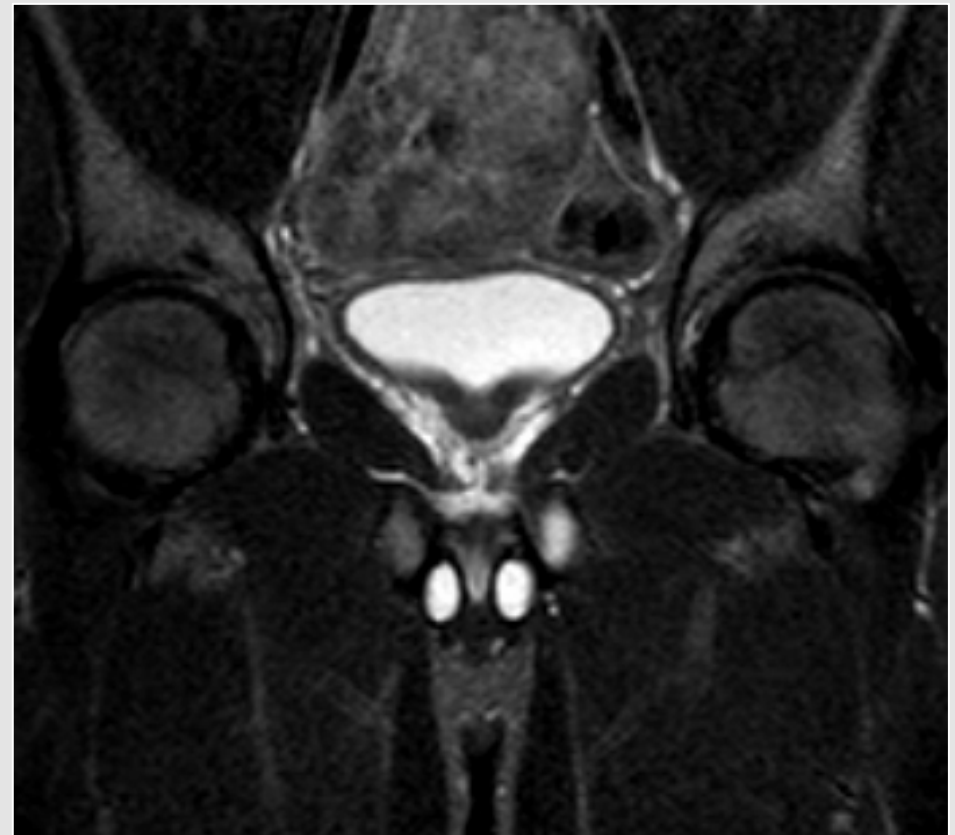


Knocheninfarkt

- Girlanden-
förmig
- Zentral
Fettgewebe
- T2
signalarmer
Saum



Kontusion



Streßfraktur

■ Streßfraktur



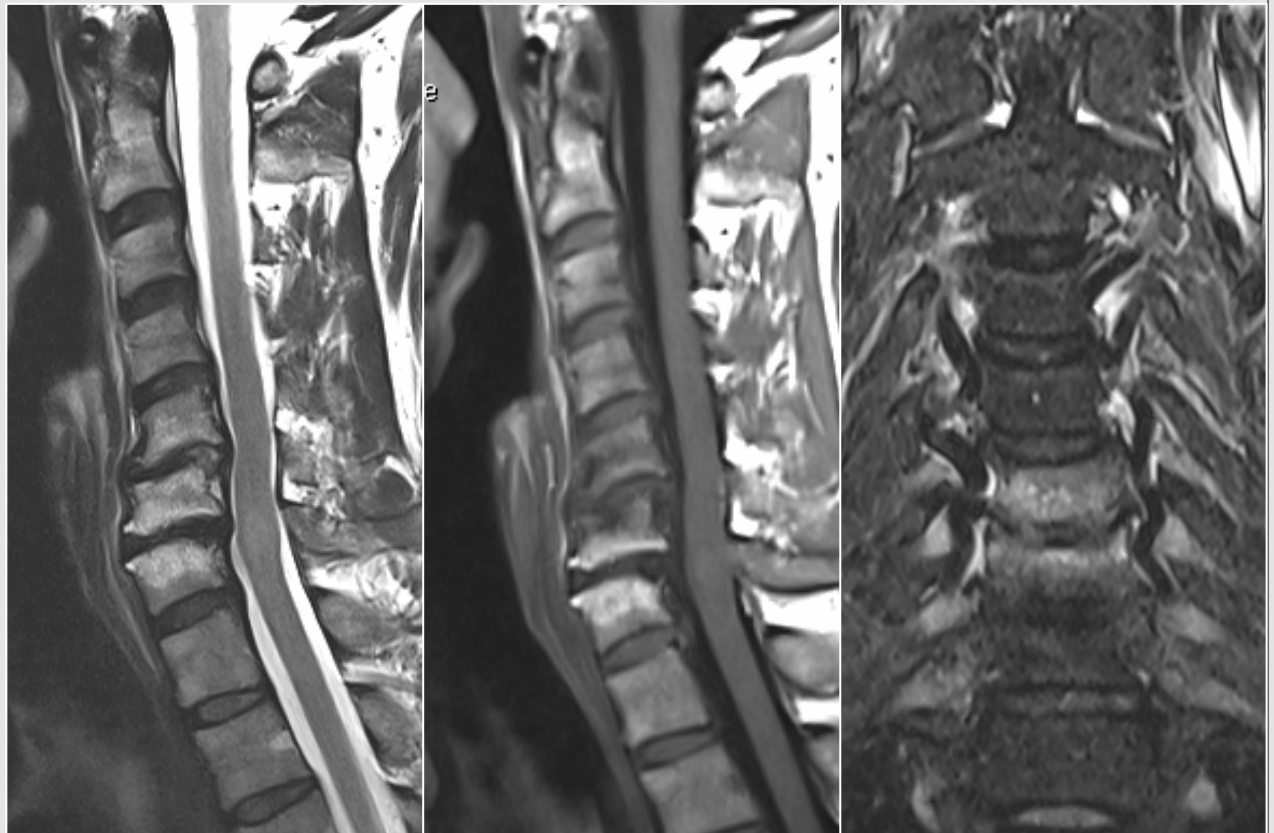
Spondylolyse in Entstehung

■ Streßfraktur



Aktivierete Osteochondrose

- Osteochondrose
- MODIC I
- MODIC II



Osteoporotische Fraktur MammaCa

■ Osteoporotische Fraktur



Tumor / Zellularität



Good or bad?

- Bösartig oder gutartig?
- Knochenmarködem?
- Was noch?

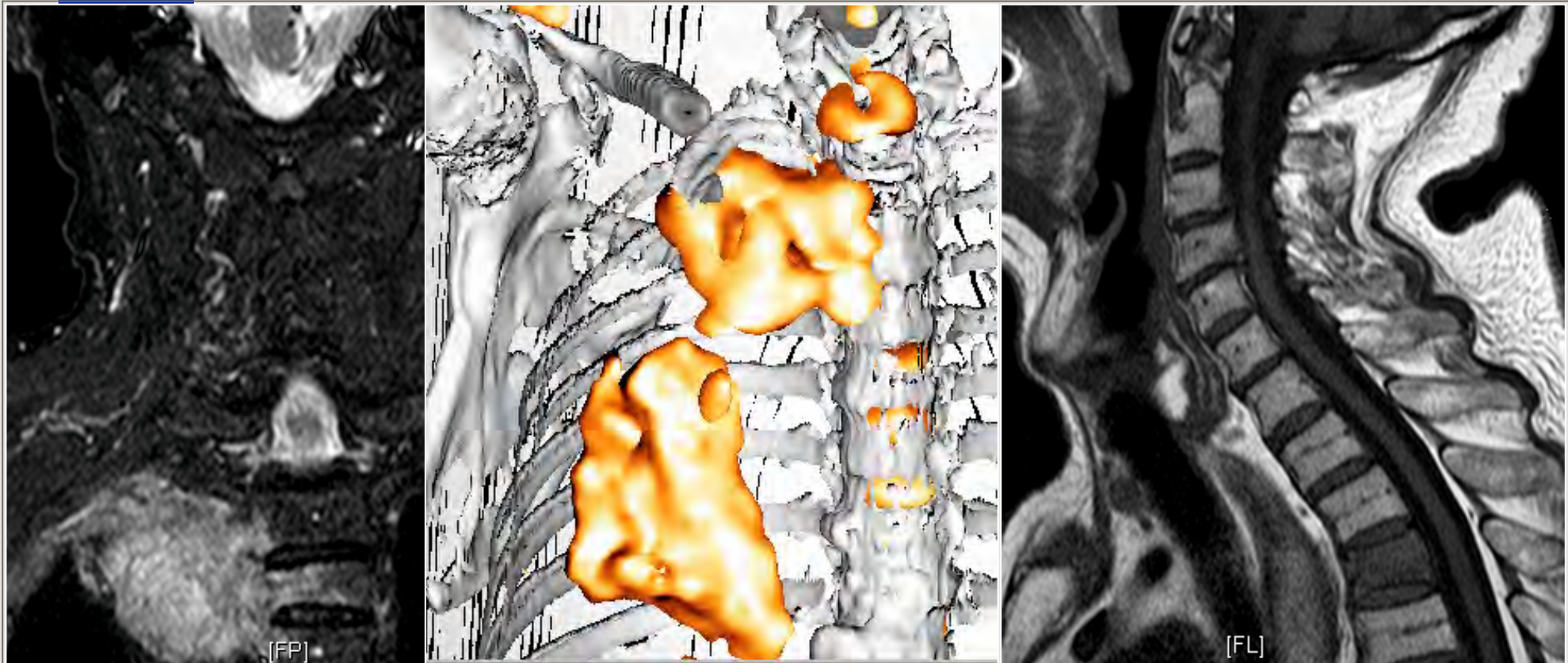
Hämangiomwirbel



Bösartig? Gutartig?



Bösartig? Gutartig?



Pancoast

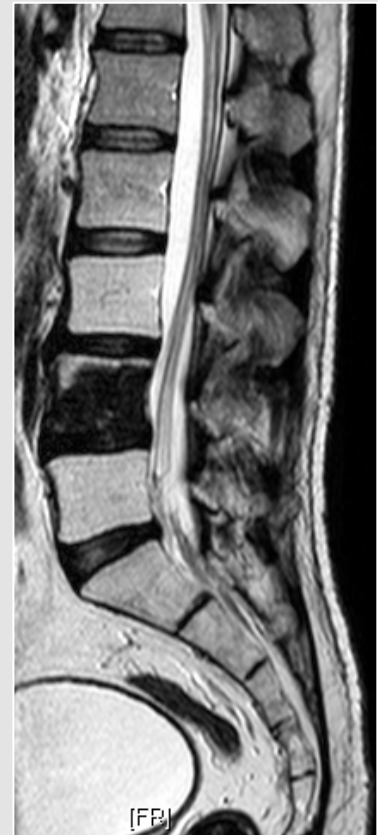
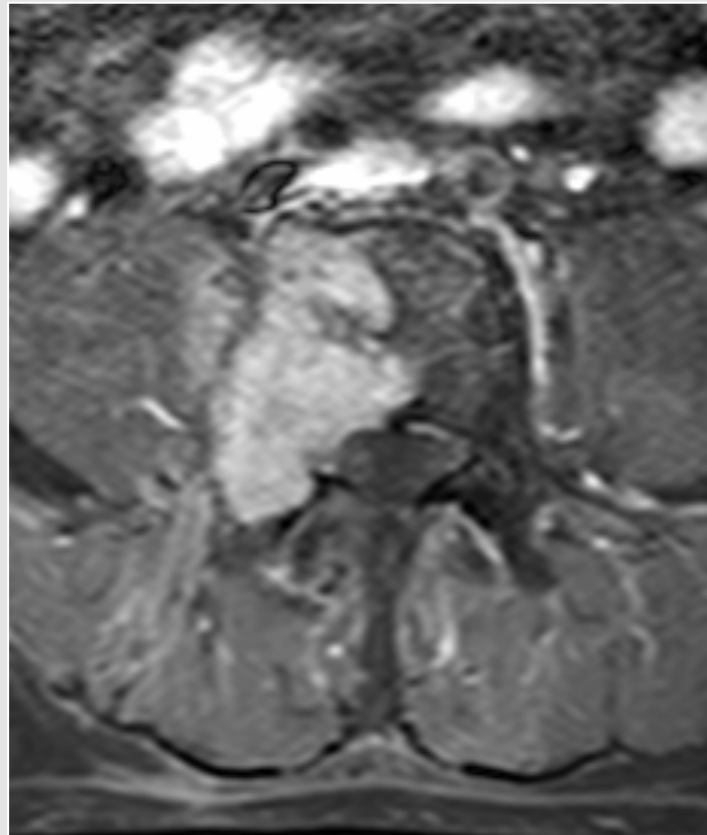
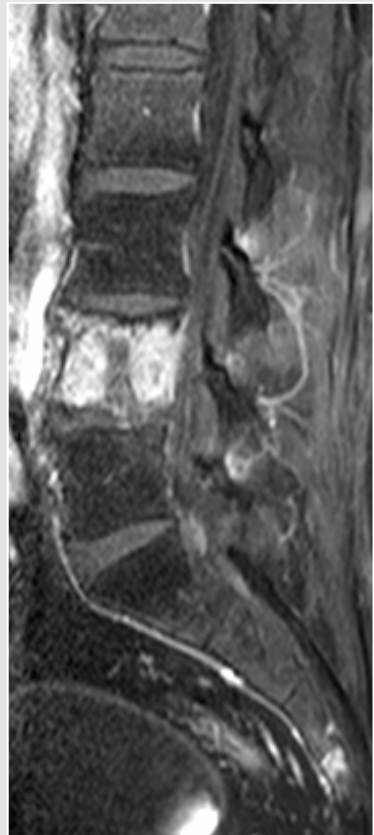
Bösartig? Gutartig?



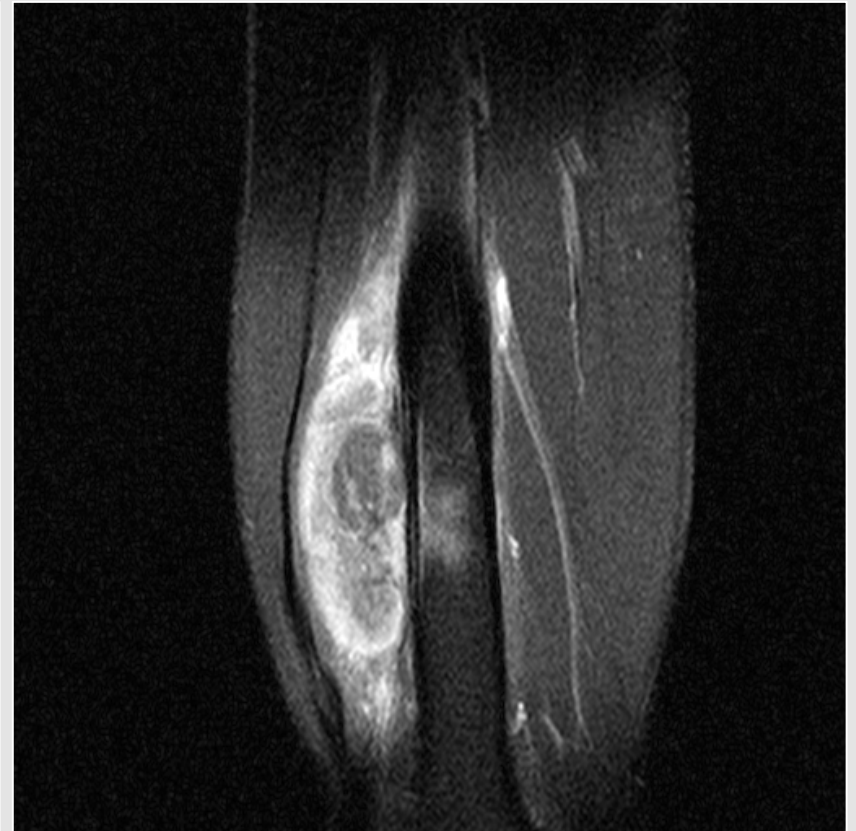
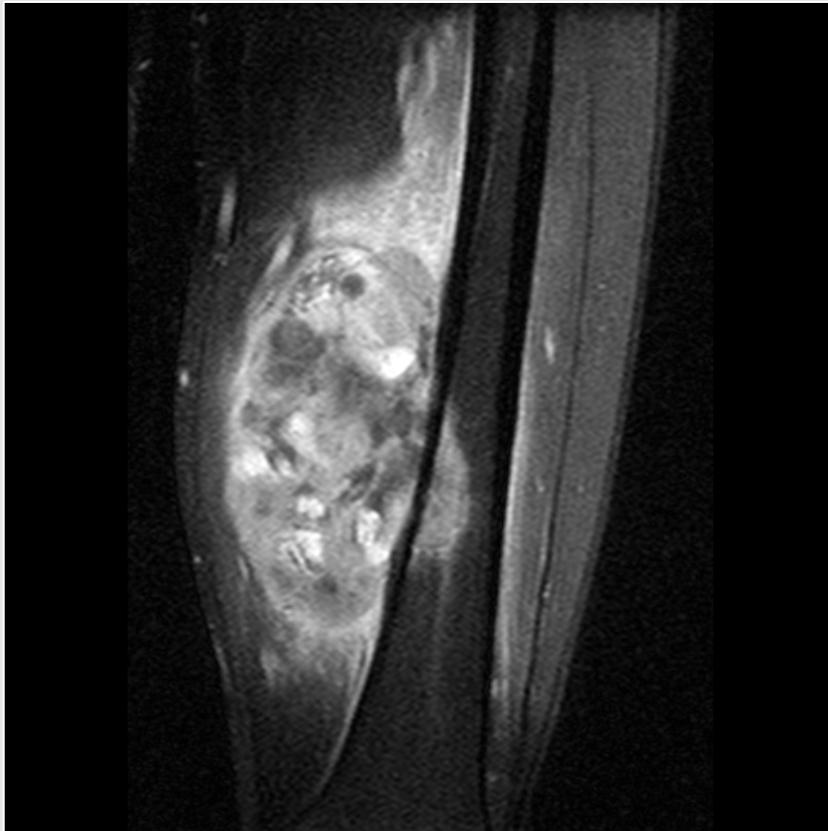
Osteoporose

Diffusionswichtung b800 und ADC

Riesenzelltumor LWK4 Knocheninfiltration

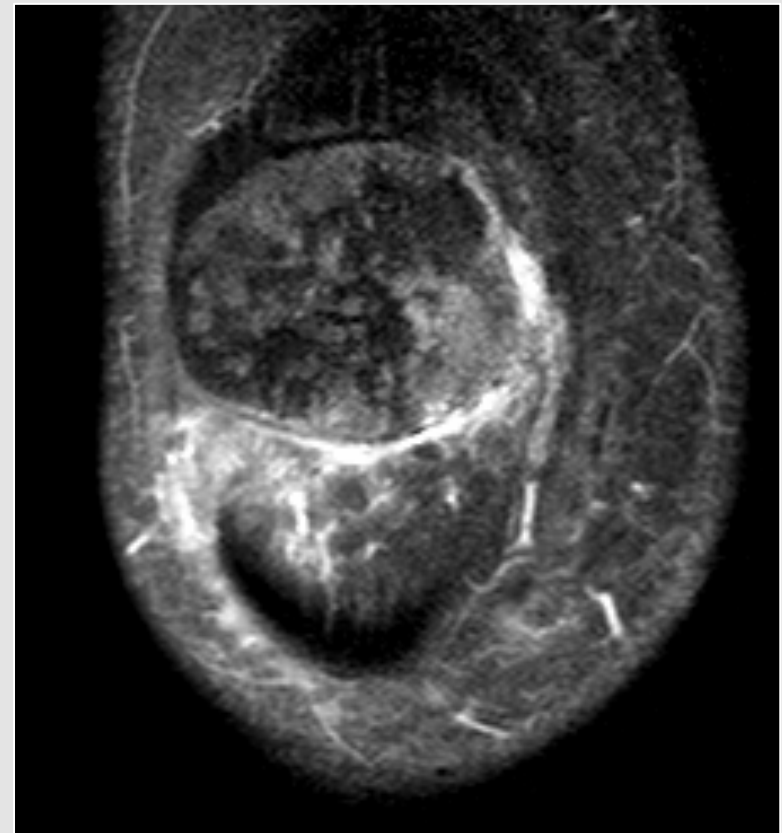


Spindelzellsarkom Knocheninfiltration

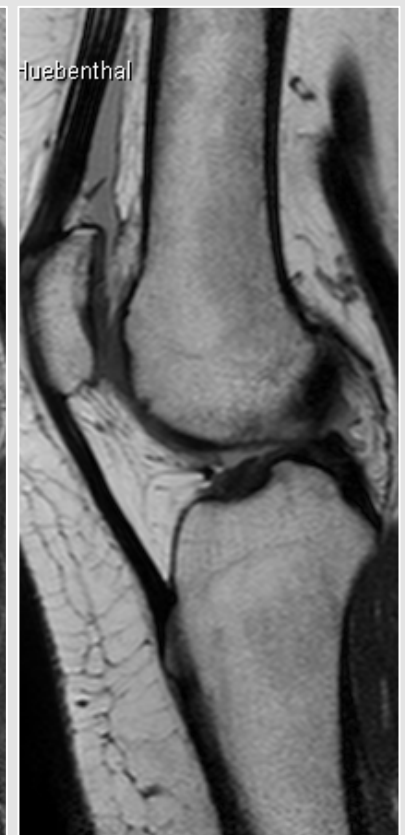
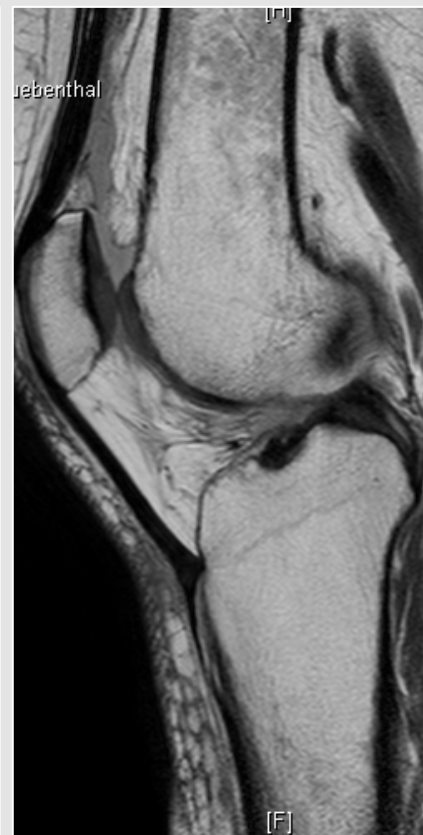
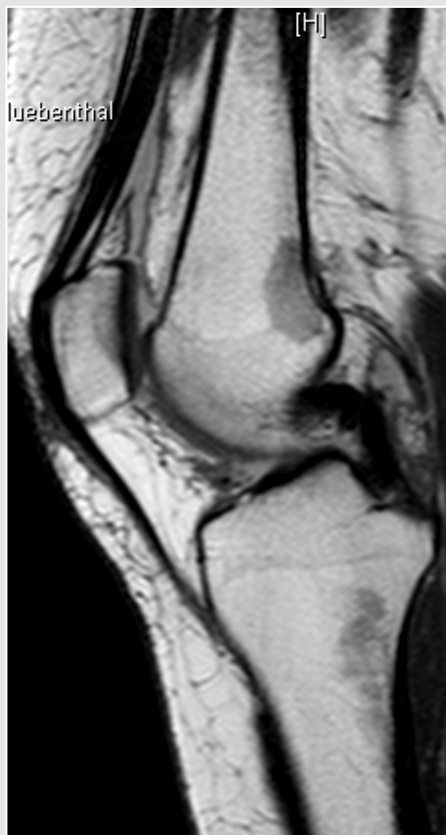
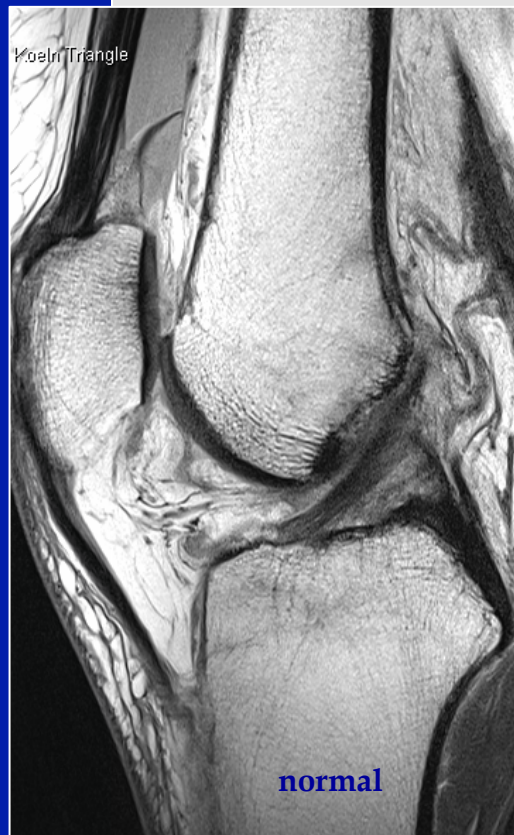


Inaktivitätsatrophie

- Kleinfleckig diffus
- Von Algodystrophie nicht zu unterscheiden



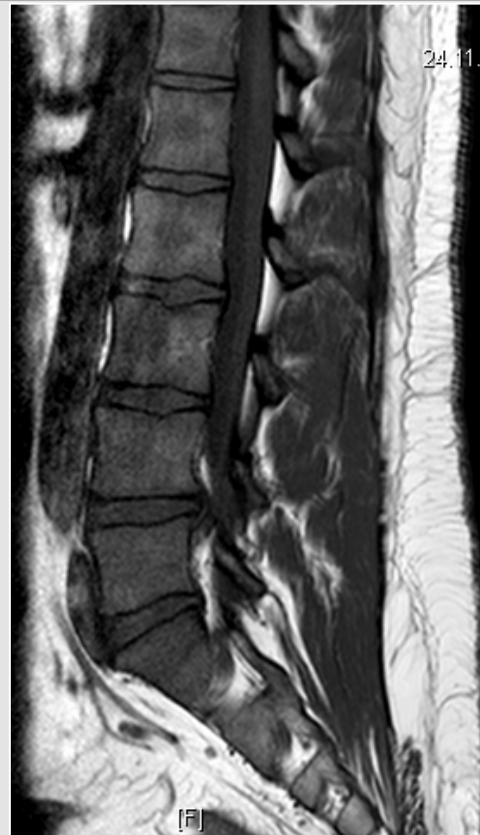
Aktivierte Hämatopoese



Zellreiches Knochenmark



normal



Normal, junger Patient



Aplastische Anämie

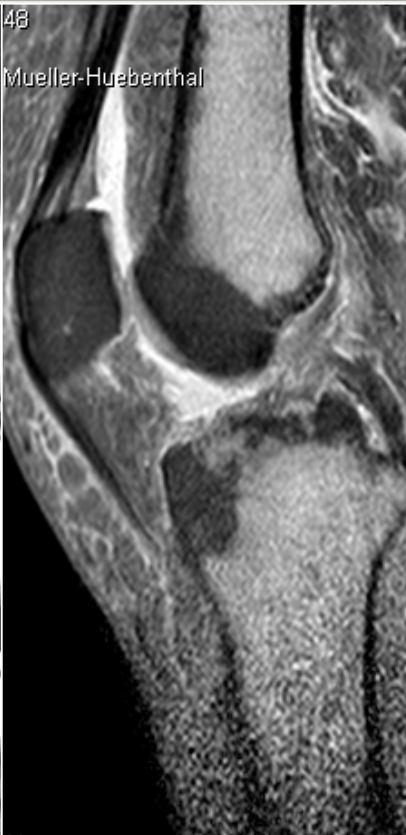


Hämochromatose

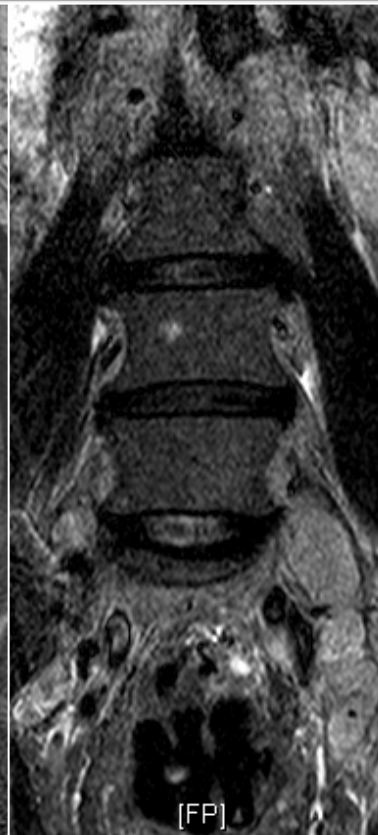
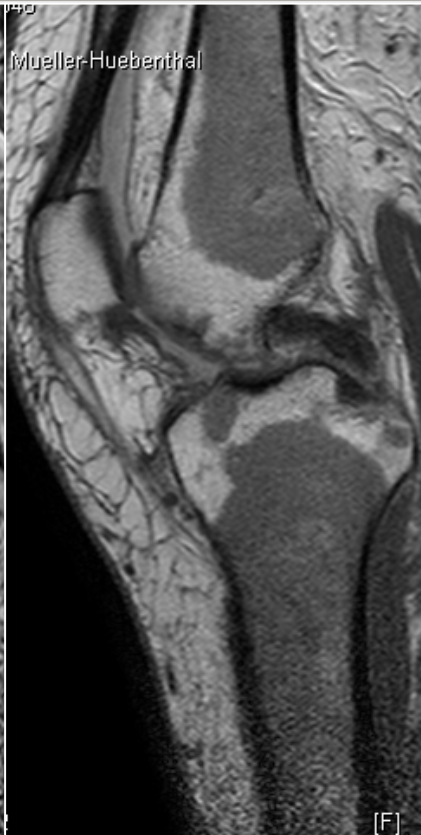
Zellreiches Knochenmark



normal



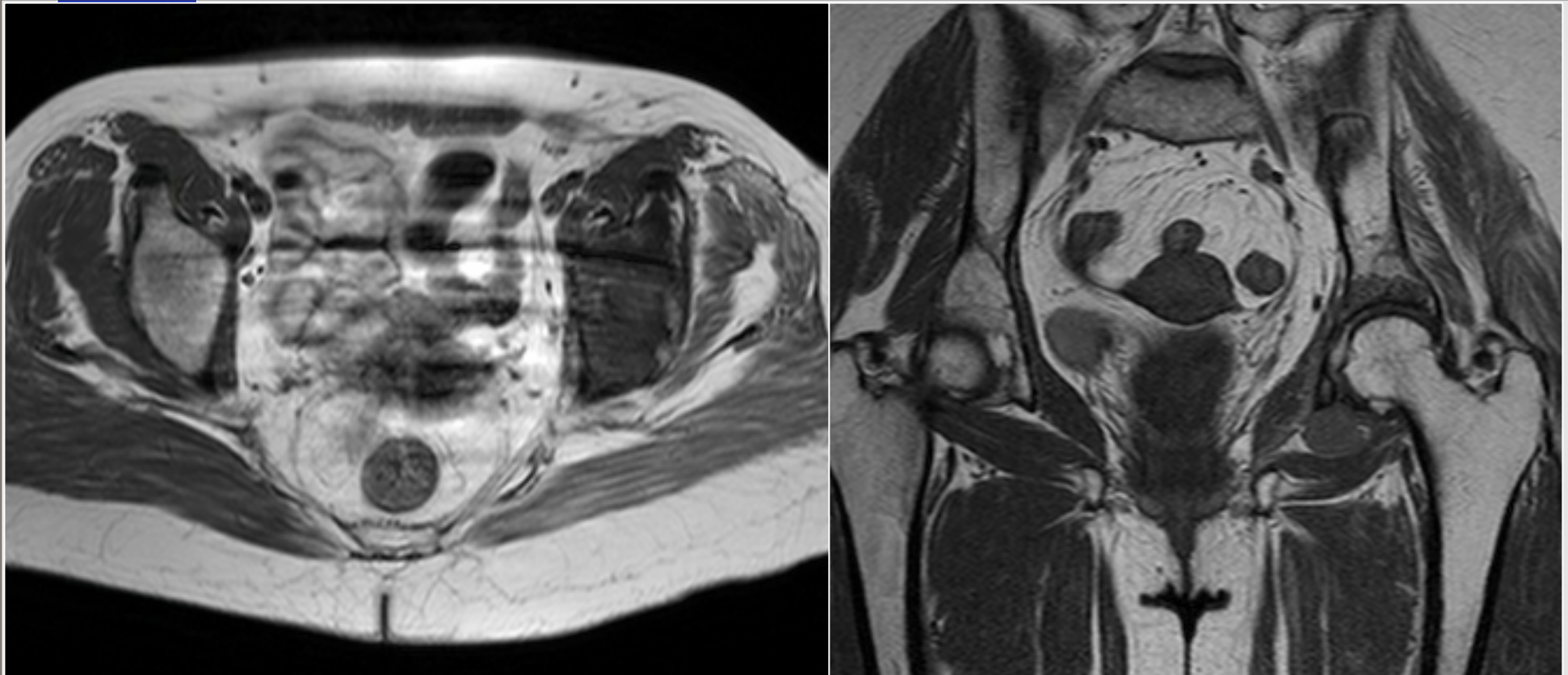
Osteomyelofibrose



NHL



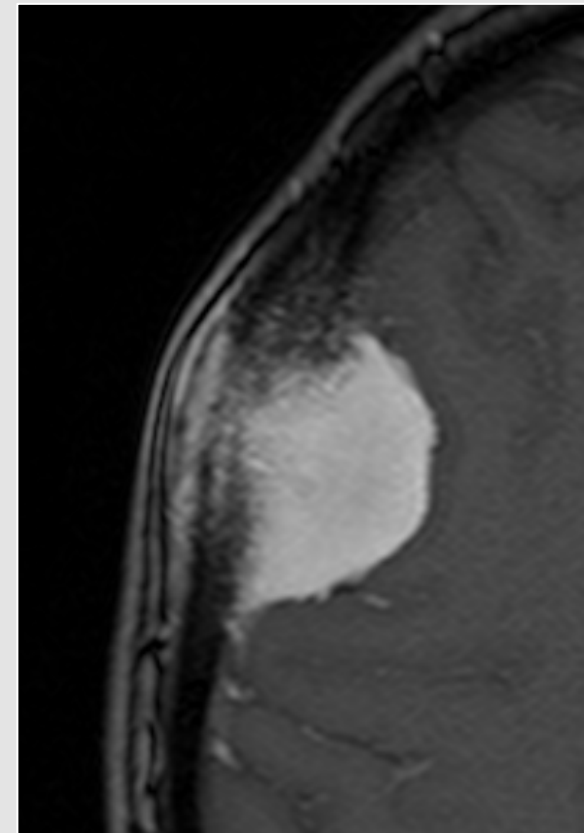
Zellreiches Knochenmark



Multiples Myelom

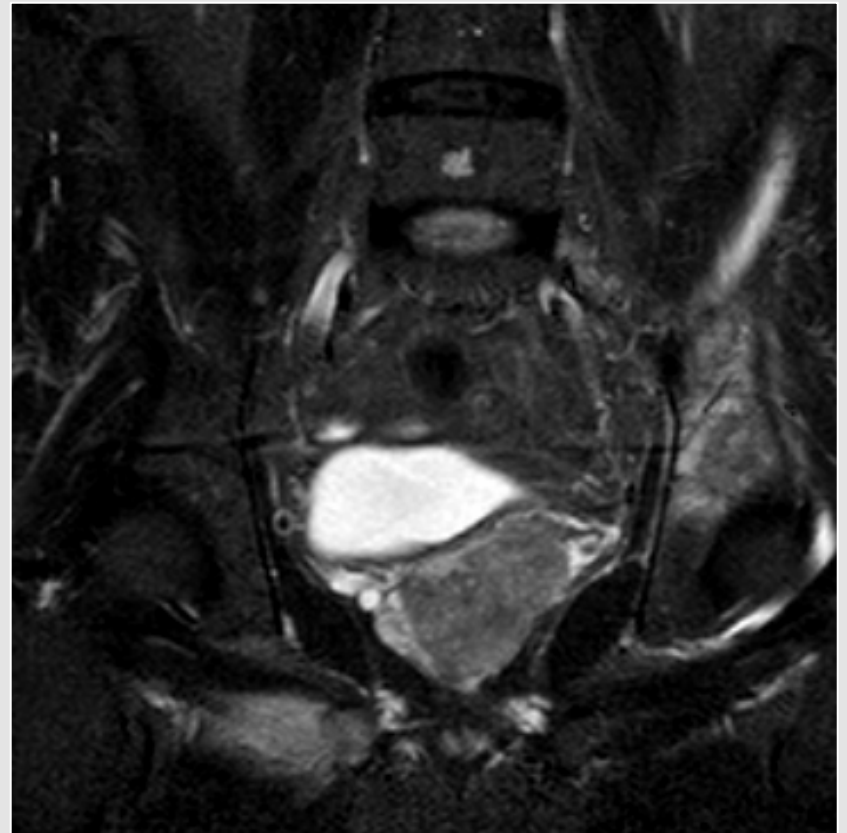
Meningeom - Kalotteninfiltration

- Durchwachsen der Kalotte
- Tumorzellen
- Homogene KM Aufnahme
- Dural tail
- KEIN Ödem!!!

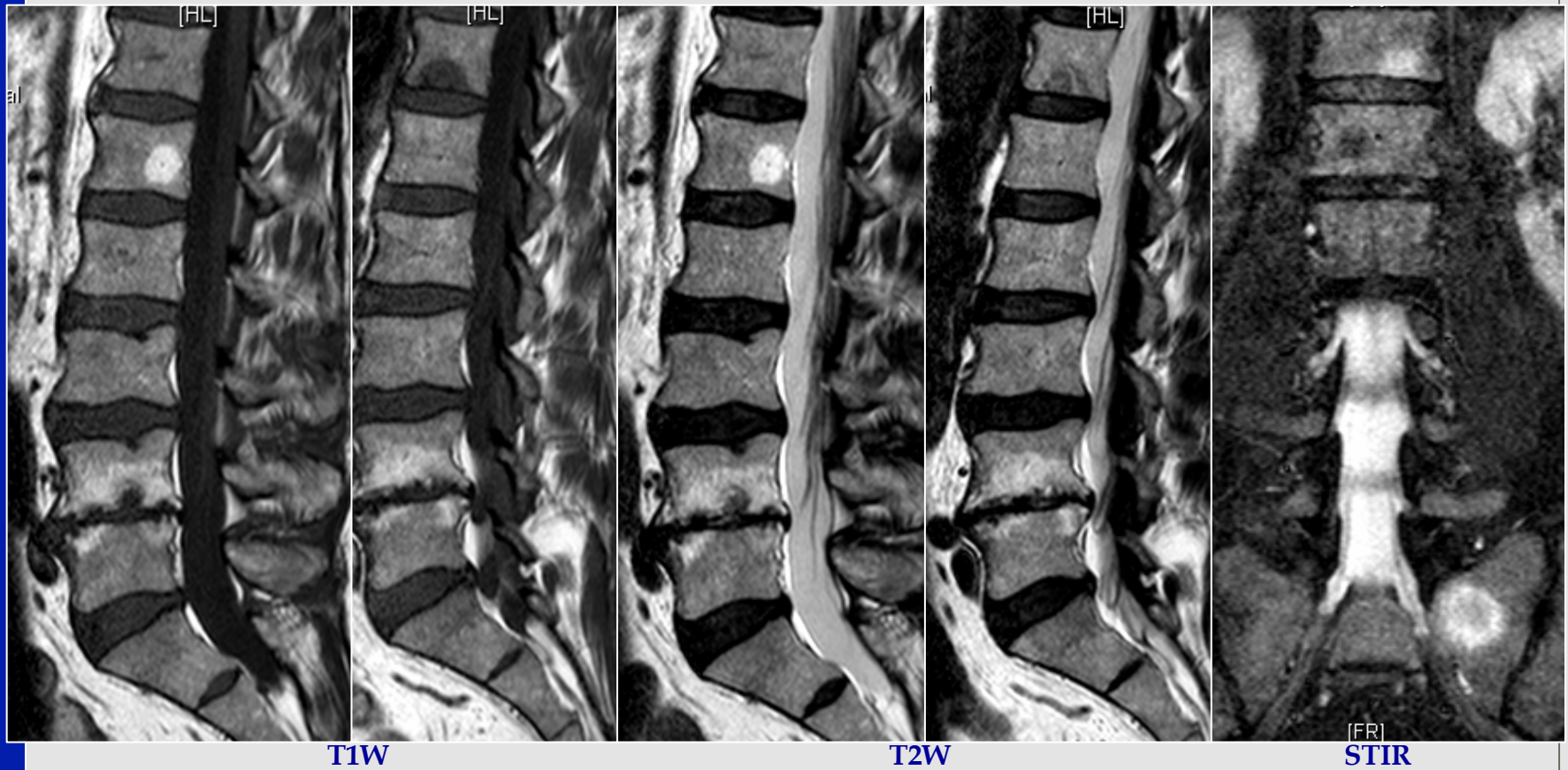


Metastase

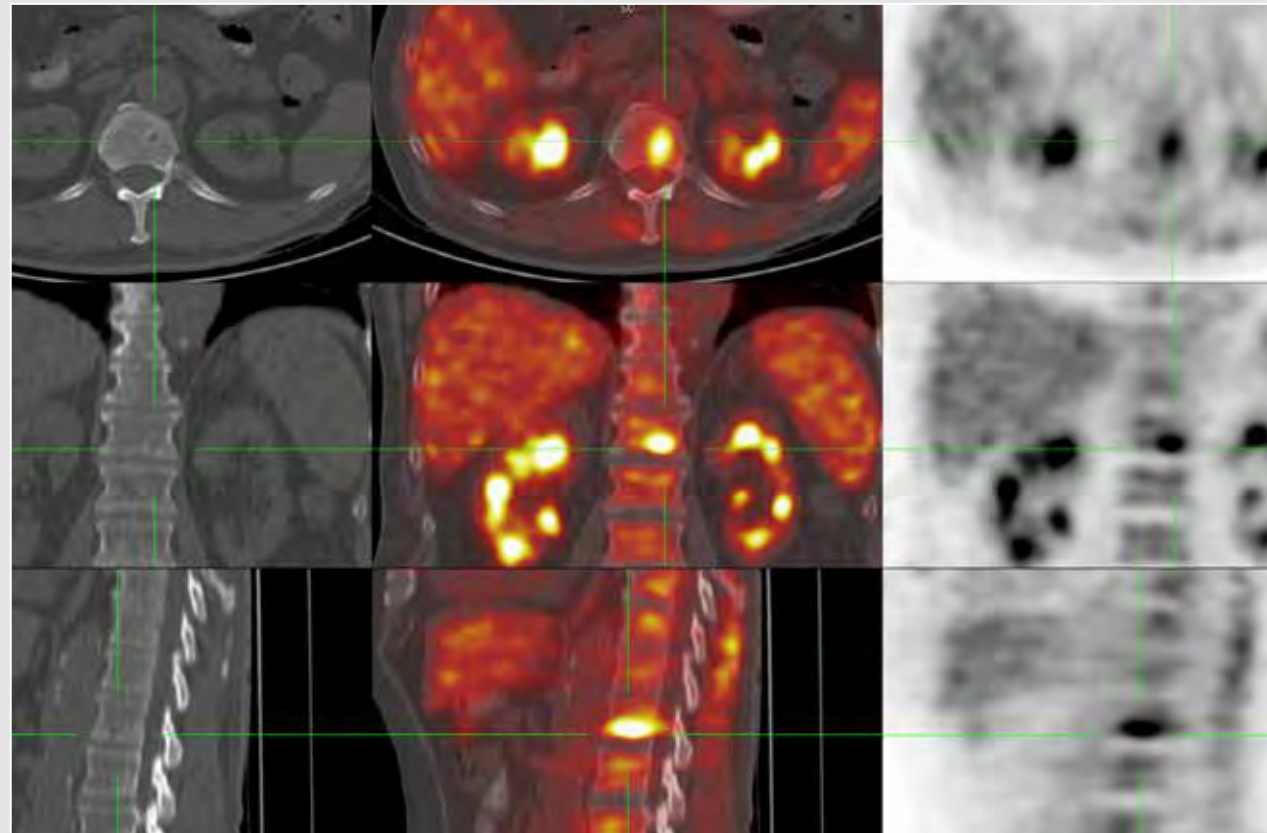
- Wo ist die Metastase?
- Wo ist der Tumor?



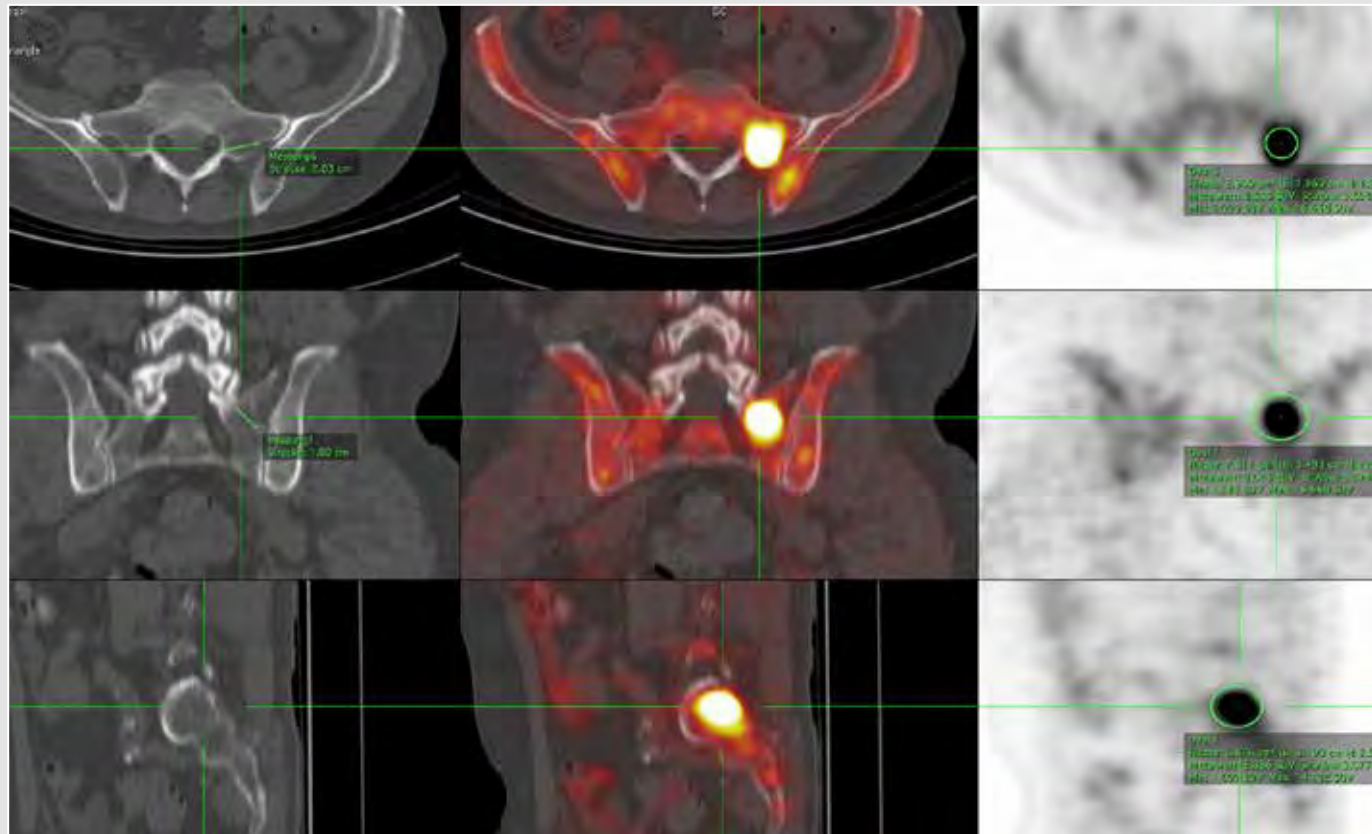
Who is who?



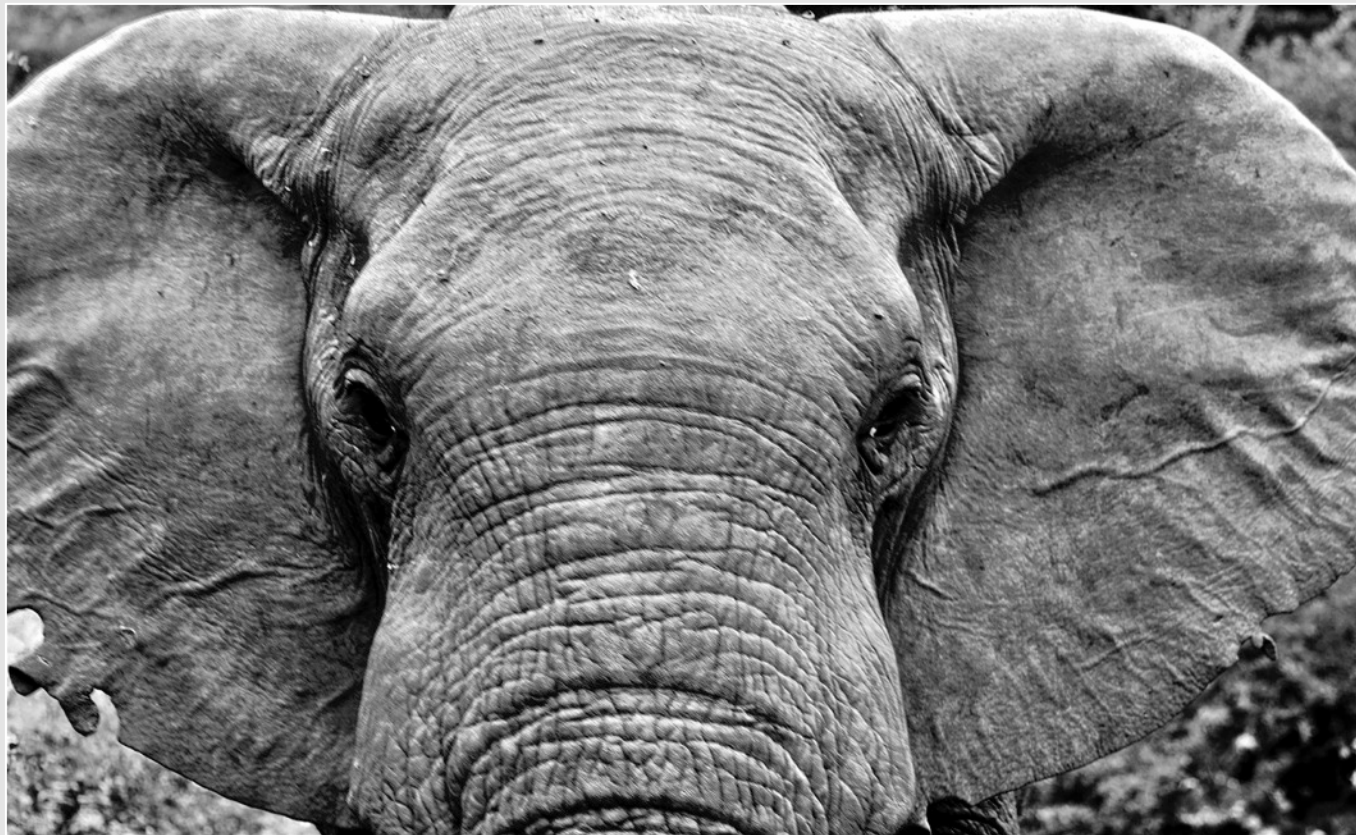
Who is who?



Who is who?



Entzündliche Prozesse

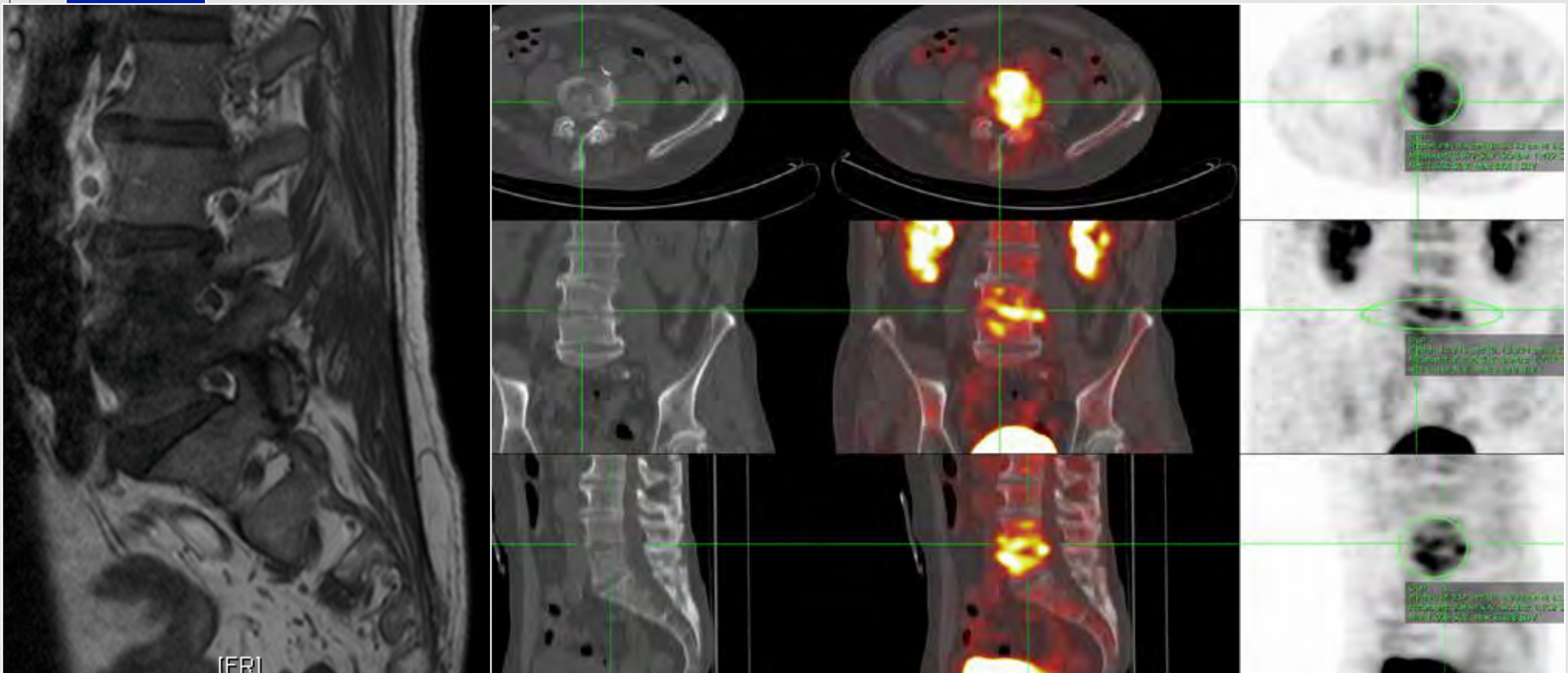


Aktivierter Osteochondrose vs. Spondylodiscitis

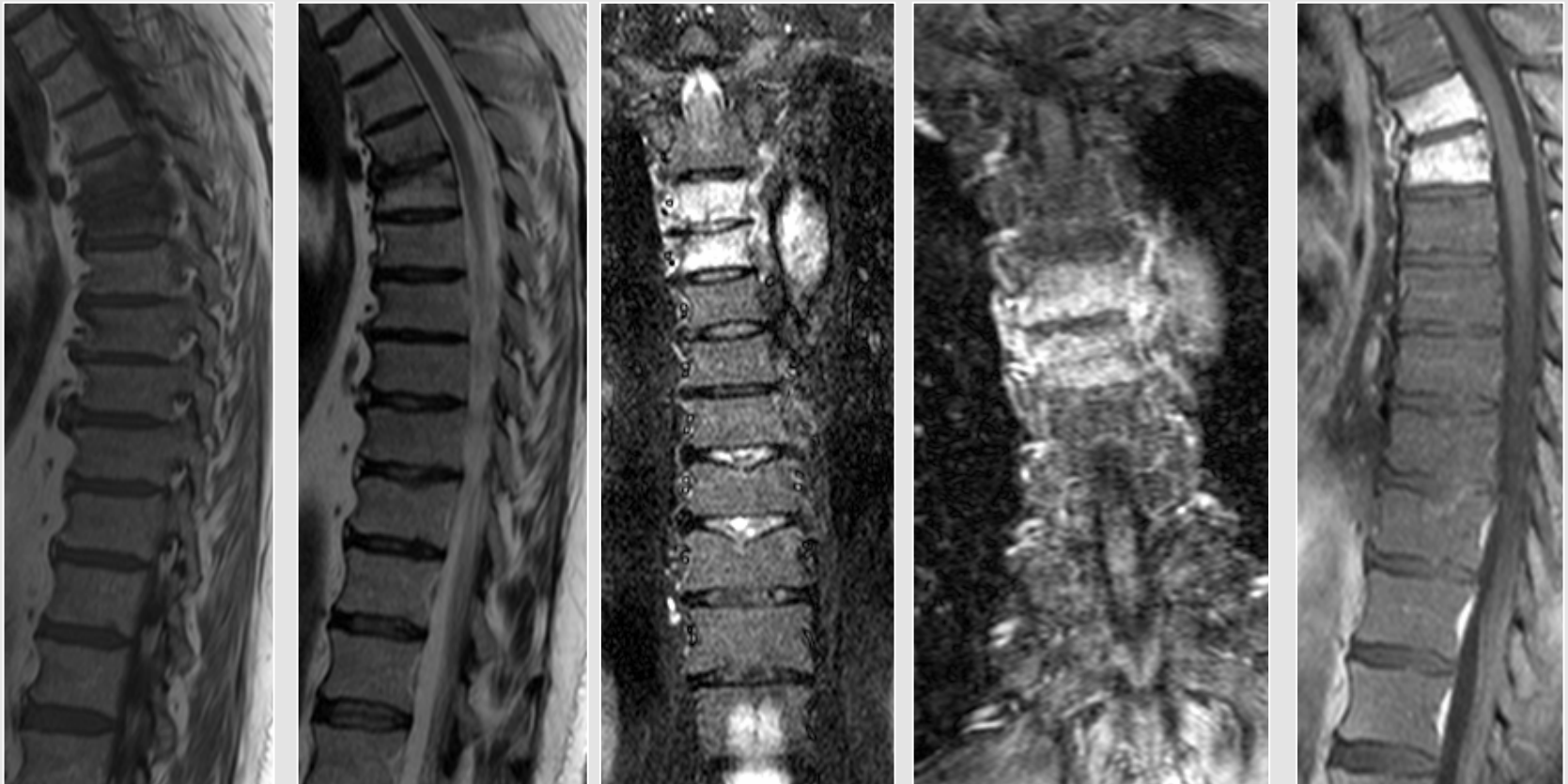
- Bandscheibenassoziiertes „KMÖ“
- Überschreitet Wirbelkörpermitte
- Weichteilbeteiligung / Abszeß
- Anamnese (OP?)
- Paraklinische Befunde



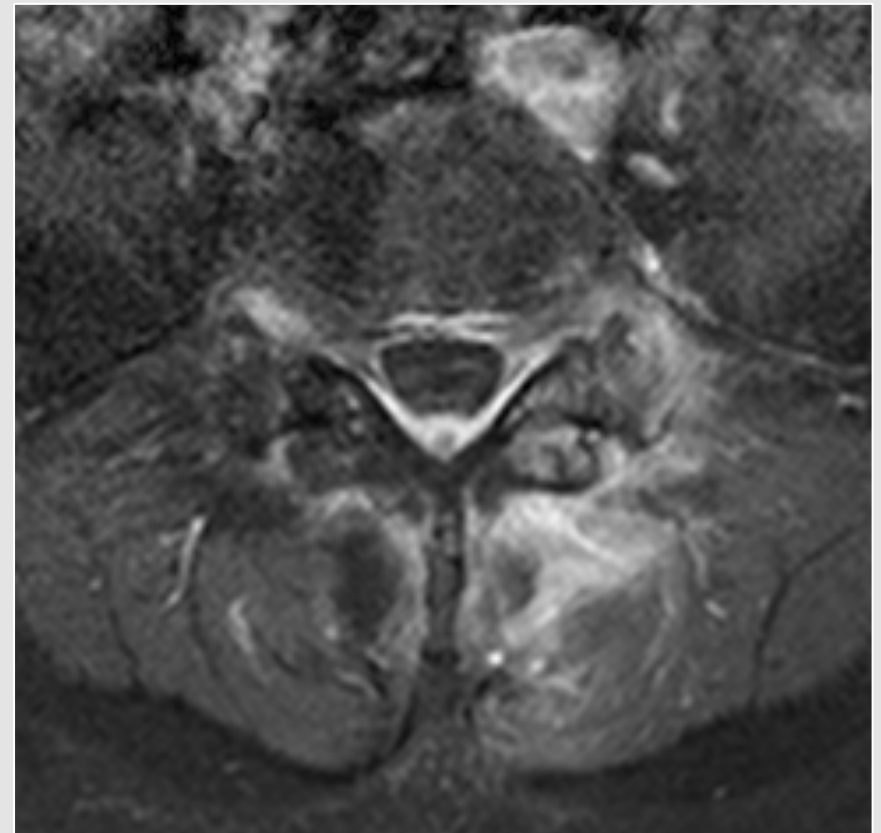
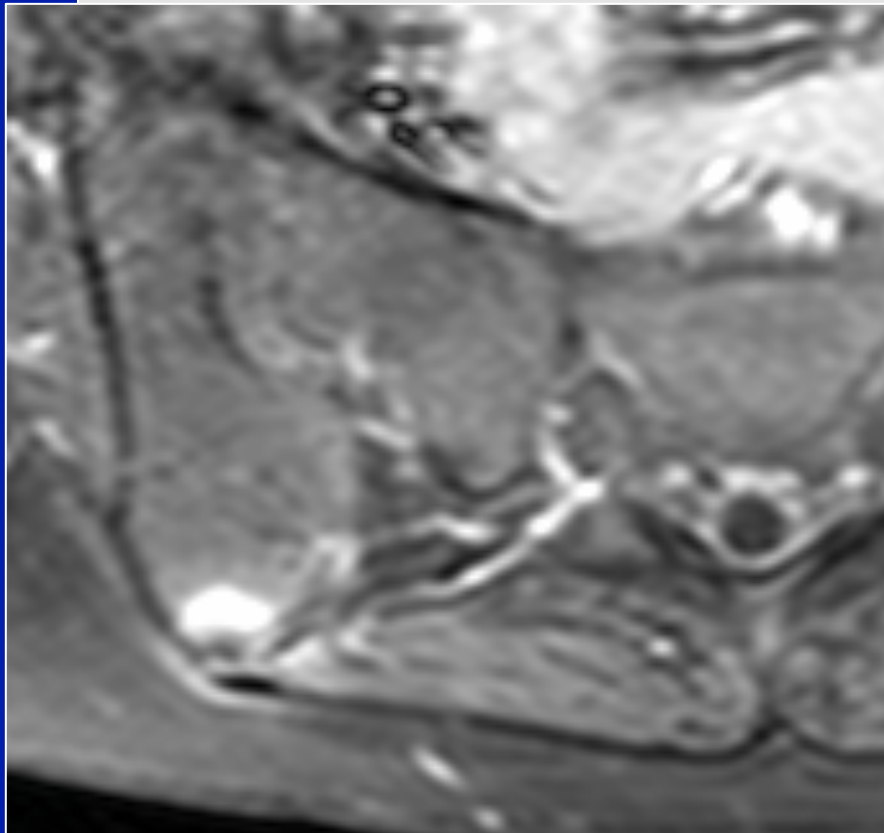
Spondylodiscitis



Spondylitis

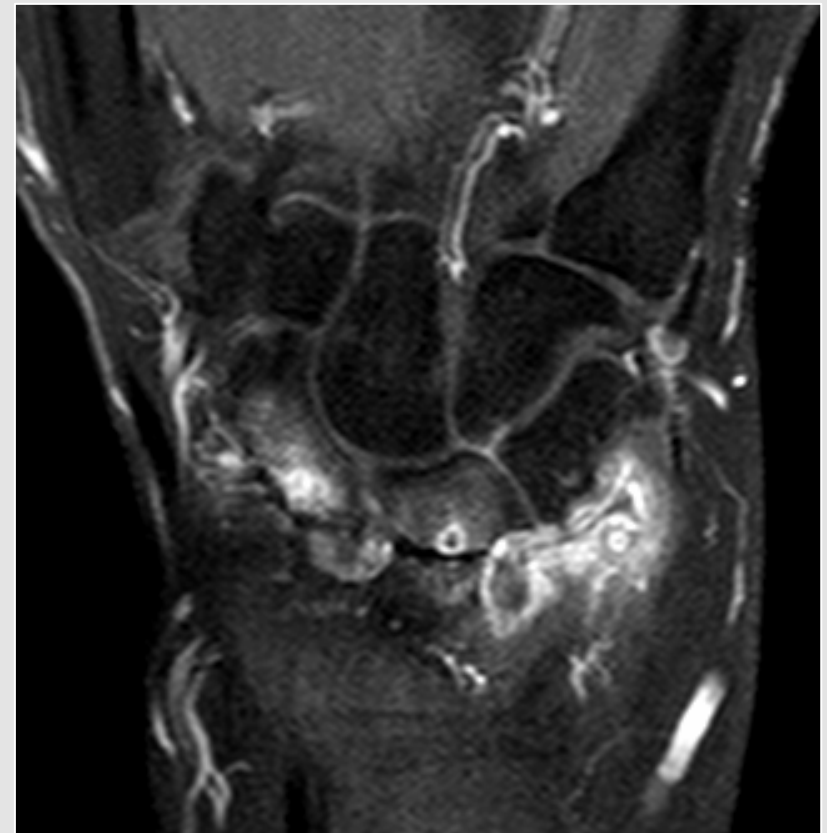
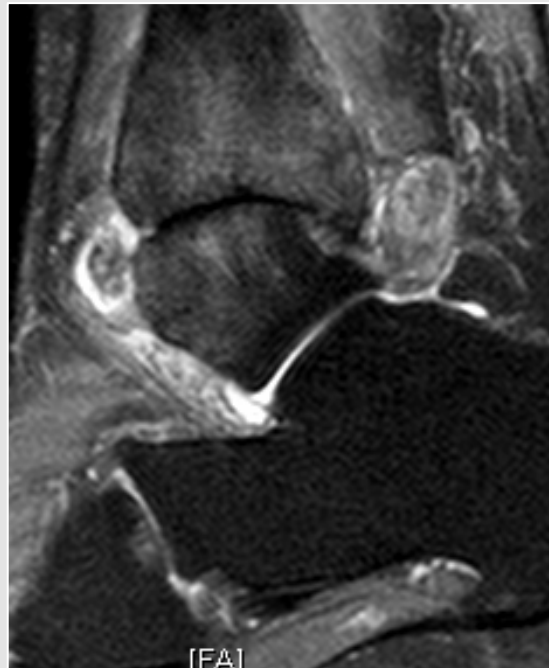


Psoriasisassoziierte Facettengelenksarthrit

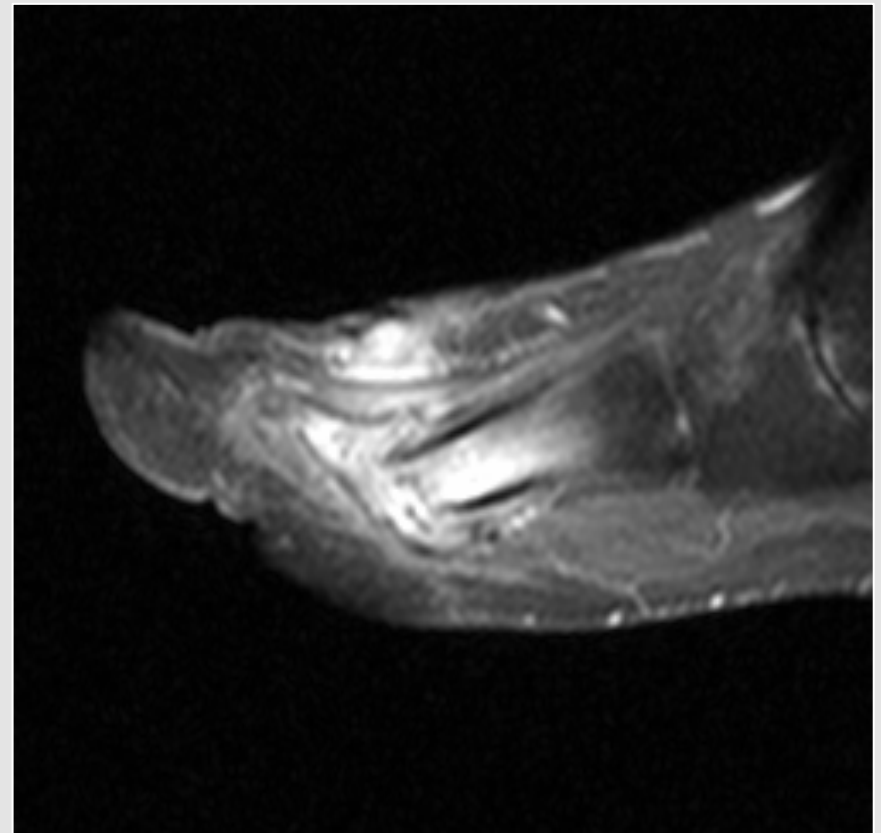


RA

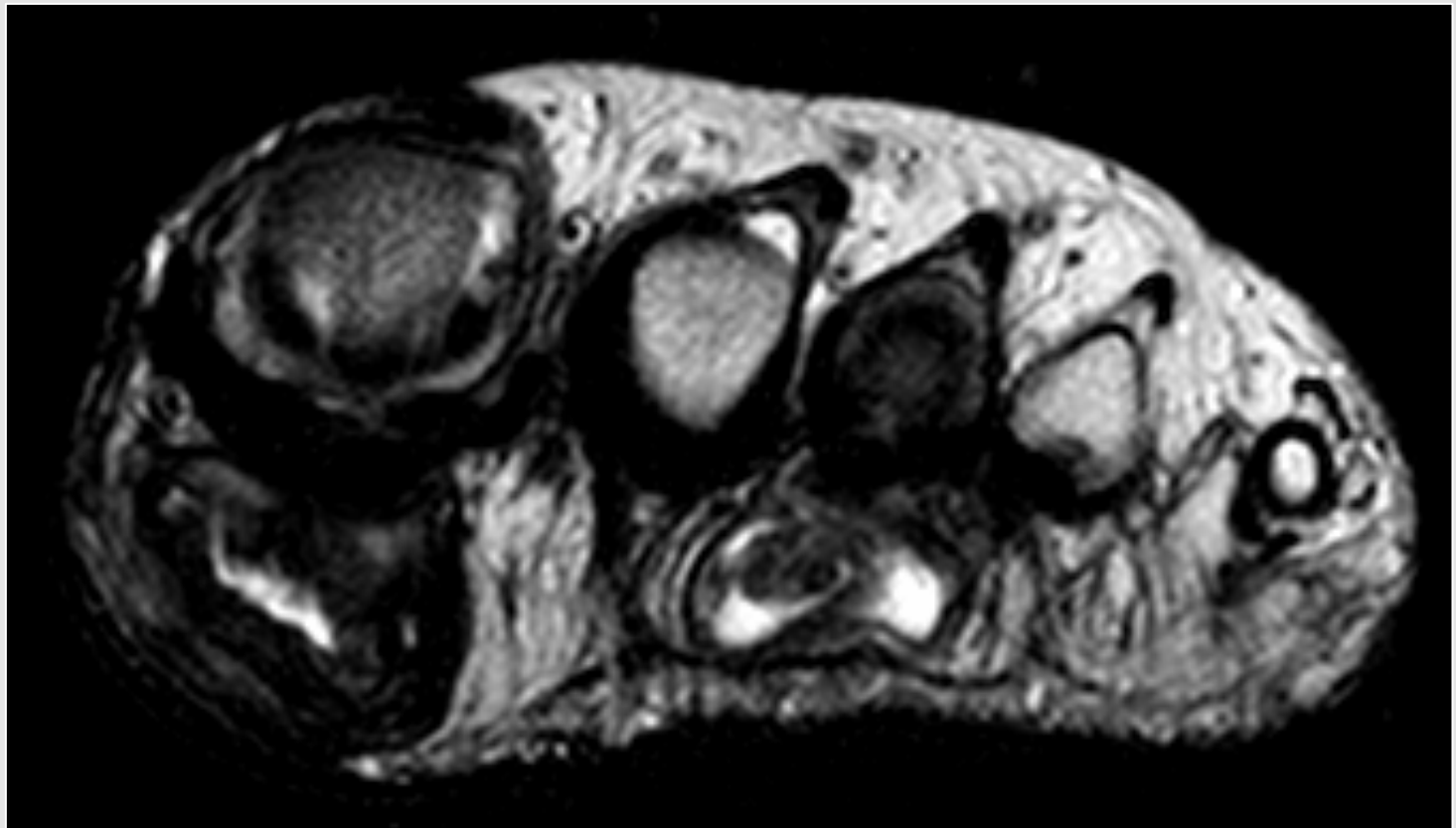
- Rheumatoide Arthritis
- Direkt- und Kollateralzeichen



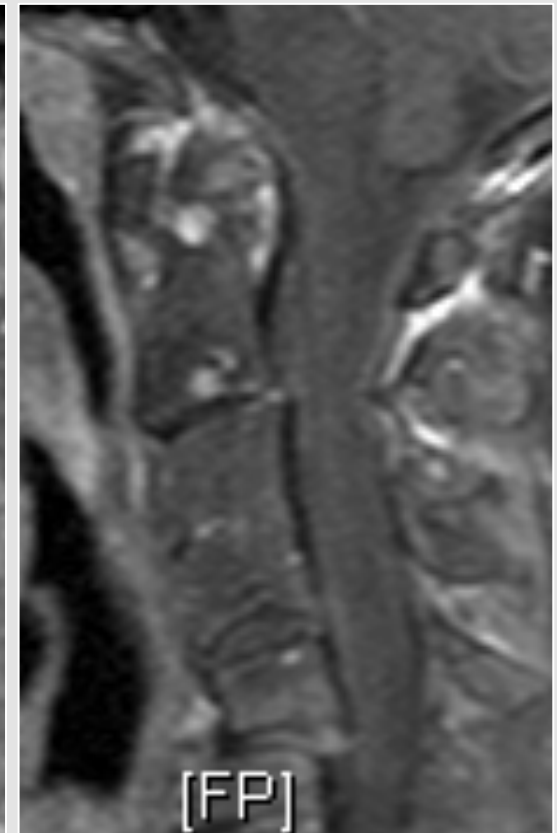
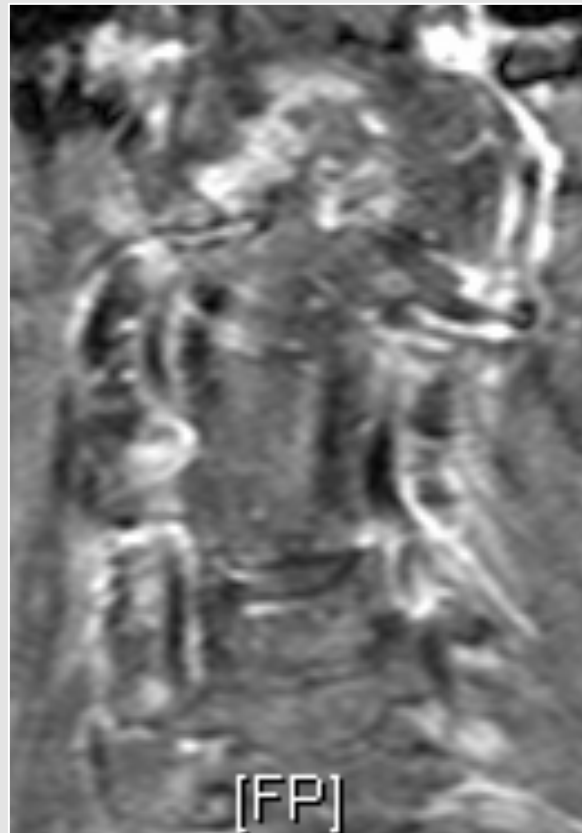
Arthritis



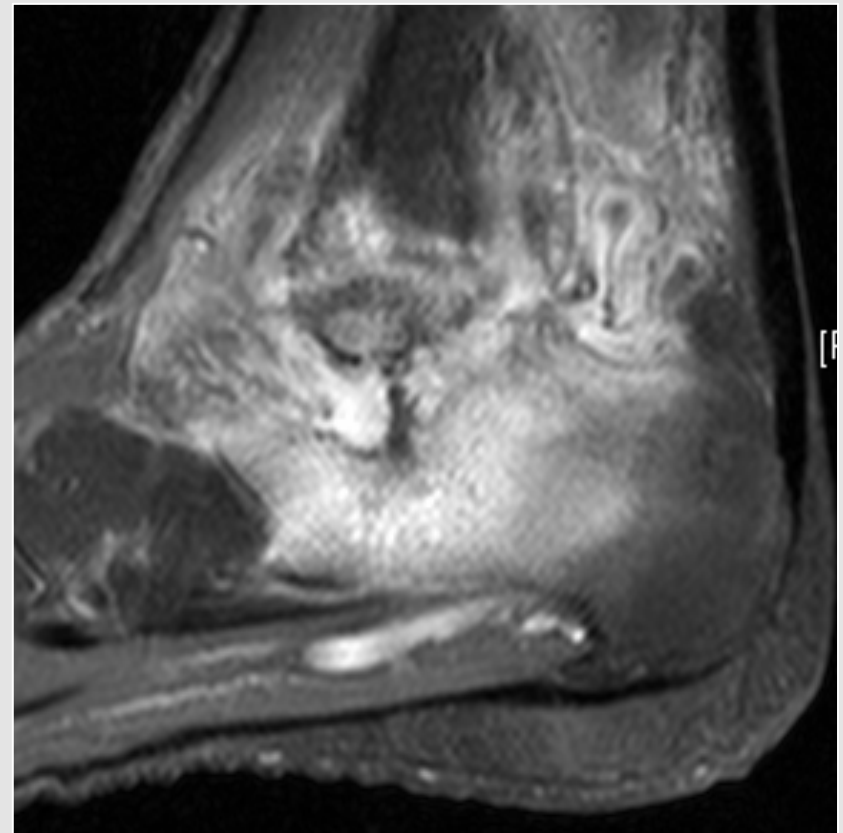
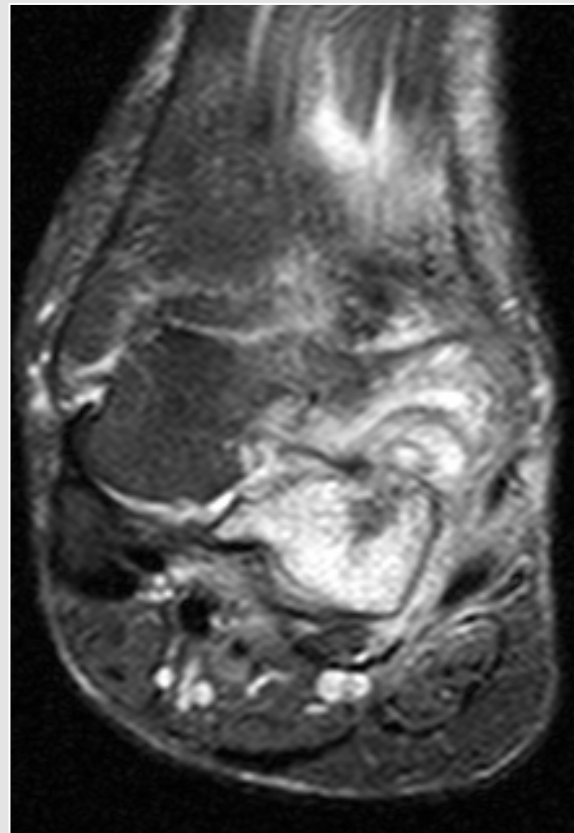
Rheumatoide Arthritis, Rheumaknoten



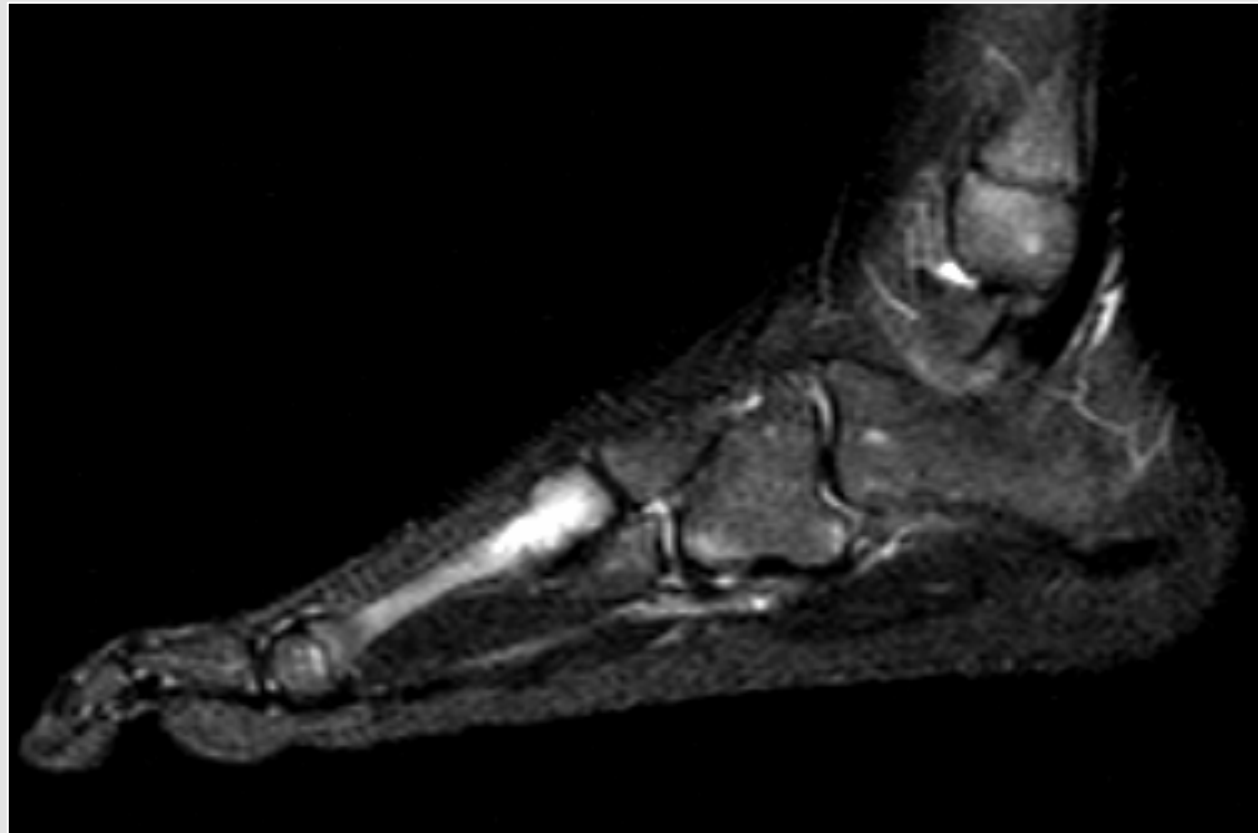
RA



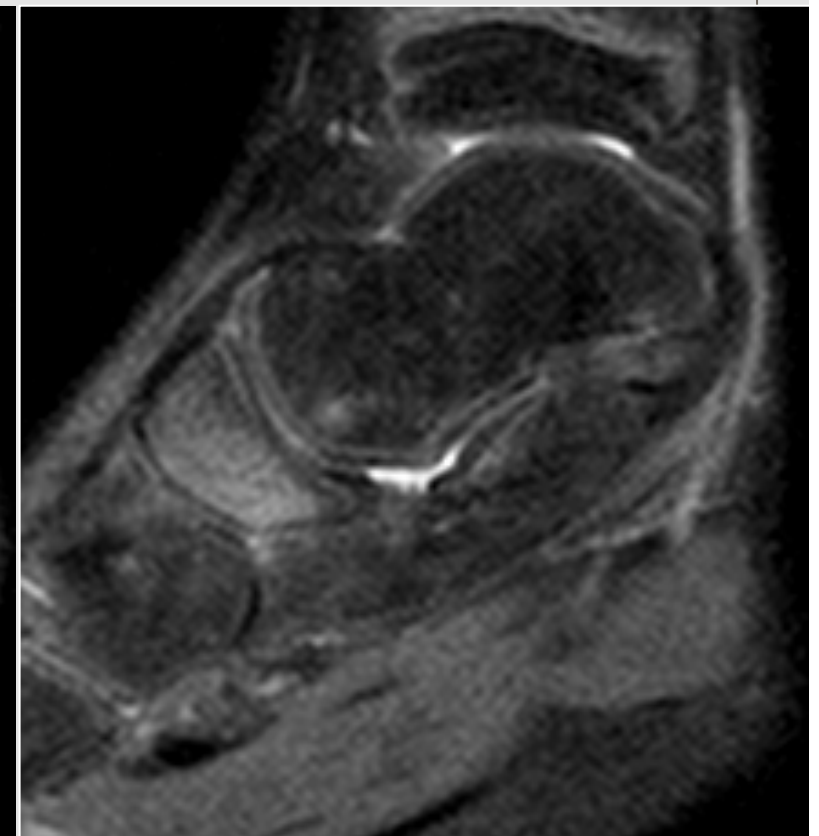
Tuberkulöse Arthritis



Wandernde KMÖ / CRMÖ 10/2013



CRMO 3/2014



Take Home Points



Take Home Points

- „Ödem“:
 - T1 signalarm,
 - T2 signalreich
 - Hell in Fettsättigung
- Cave Zelldichte! Dunkel in T1!
- Charakterisierung durch
 - Klinische Zusatzinformationen
 - Lokalisation
 - T1-Signal
 - Diffusionswichtung
 - Ggf. KM
- Therapie? Jetzt sind SIE dran!



Thanks for listening!

Das Team der
Praxis im KölnTriangle
2016

