

RADIOLOGIE  SÜDOST 

**Sinnvolle Radiologische Abklärungen bei Rheumatologischen Krankheiten**

Herbstsymposium „Rheumatologie und Kunst“  
14.10.2021 Bad Ragaz

Dr. med. Beat Walser  
Medizinische Radiologie FMH

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- Konventionelles Röntgenbild  
*Vorteil: hohe Auflösung, hohe Spezifität*
- Ultraschall  
*Vorteil: Weichteile, Flüssigkeit, Durchblutung*
- Computertomographie  
*Vorteil: Hohe knöchernen Auflösung, Sensitiv für Kalk, Spezifische Absorption für Uratkristalle (Dual Energy CT)*
- Magnetresonanztomographie  
*Vorteil: hoher Weichteilkontrast, Knochenmarködem, Durchblutung, Verteilungsmuster (whole body)*

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**Radiologische Zeichen der RA**

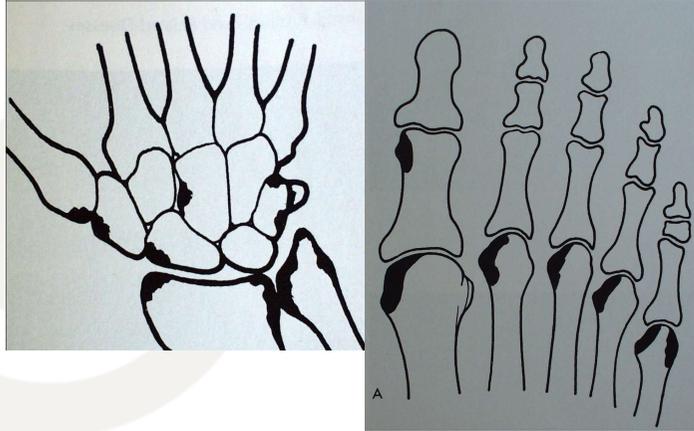


- Osteopenie
- Usuren
- Gelenkdestruktion
- Fehlstellung
- Ankylose

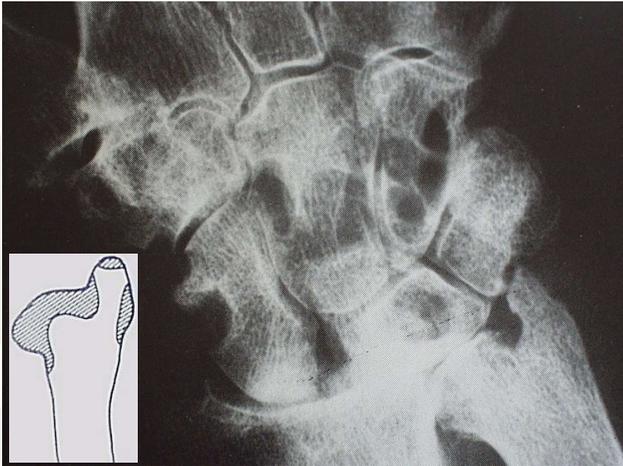
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**Prädilektionstellen der Usuren**



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**Arthritis psoriatica**



- Randständige Usuren
- Bilateral asymmetrisch
- Keine Osteopenie
- Periostitis

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**Arthritis psoriatica**



- Vorfuss häufig mitbeteiligt
- Bilateral / asymmetrisch
- Periostitis / Ossäre Proliferation
- Weichteilschwellung („Wurstfinger“)

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**Arthritis psoriatica** RADIOLOGIE SÜDOST



- Periostitis
- 10-15% der Patienten mit kutaner Psoriasis entwickeln eine Arthritis

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**Arthritis psoriatica: destruktive Form** RADIOLOGIE SÜDOST  
 „Arthritis mutilans“ mit „pencil in cup“



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**Pyrophosphat Arthropathie (CPPD)** RADIOLOGIE SÜDOST



- Knorpelschaden
- Usuren
- Osteosklerose
- Subchondrale Zysten
- Verkalkungen Diskus triangularis

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**Pyrophosphat Arthropathie (CPPD)** RADIOLOGIE SÜDOST



- „Target Sites“  
 Radio-Scaphoid Gelenk  
 Femoro-Patellar Gelenk
- Destruktion  
 Scapholunarer Kollaps

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**Pyrophosphat Arthropathie (CPPD)** RADIOLOGIE SÜDOST

- Meniskusverkalkungen
- Knorpelverkalkungen
- Weichteilverkalkungen

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**HADD** RADIOLOGIE SÜDOST

Tendinitis calcarea – häufig an der Schulter

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**HADD** RADIOLOGIE SÜDOST

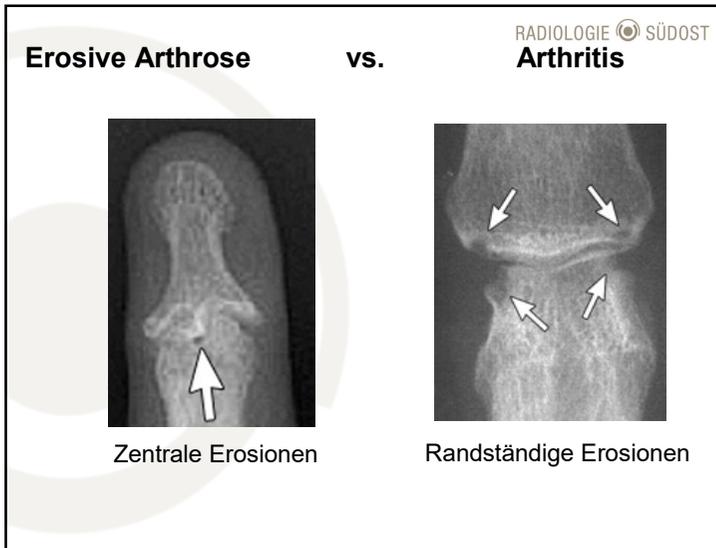
Tendinitis calcarea – häufig an der Schulter, aber nicht nur...

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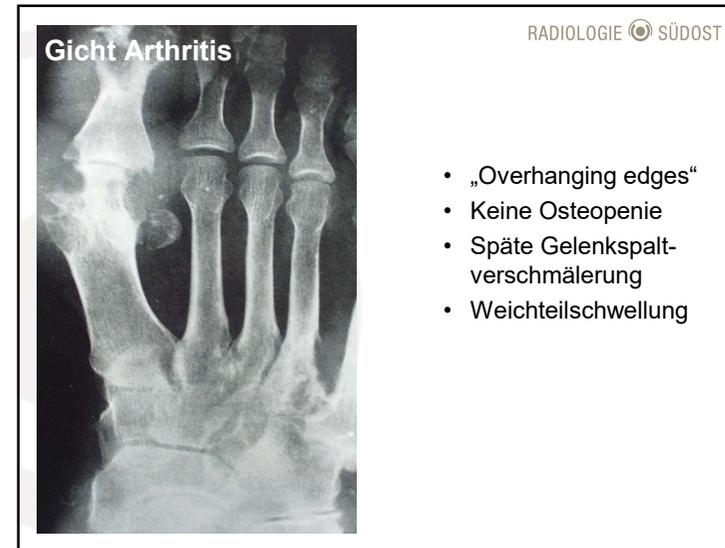
**Erosive Arthrose** RADIOLOGIE SÜDOST

- Beteiligung der DIP und PIP Gelenke
- Zentrale Erosionen
- Mövenschwingenform der Deformitäten
- Ankylosen möglich
- Keine Osteopenie
- Heberden Knötchen

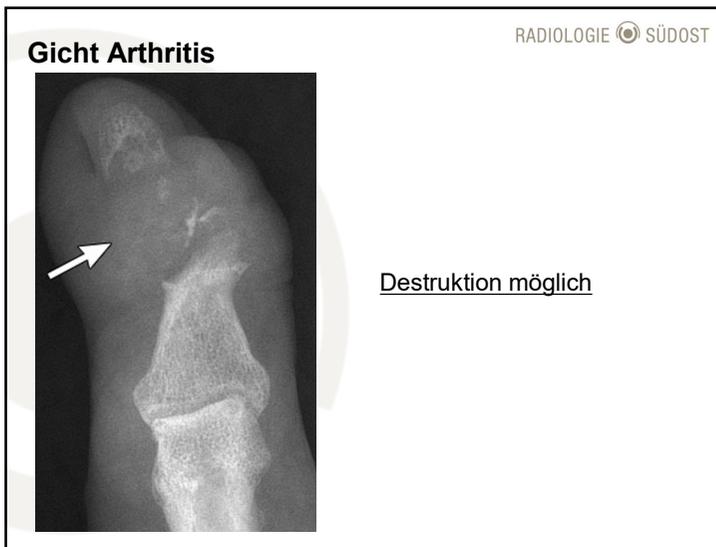
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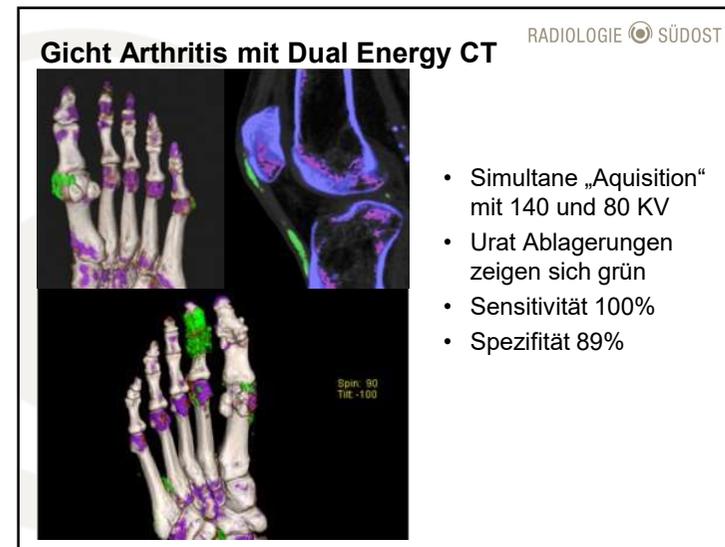
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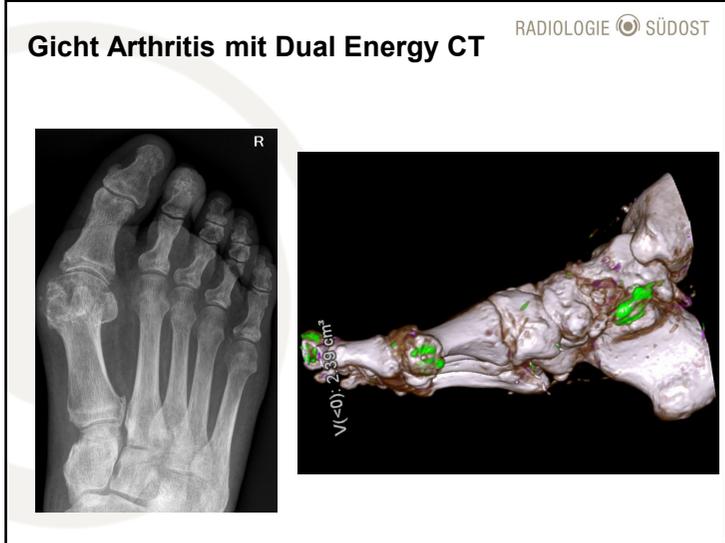
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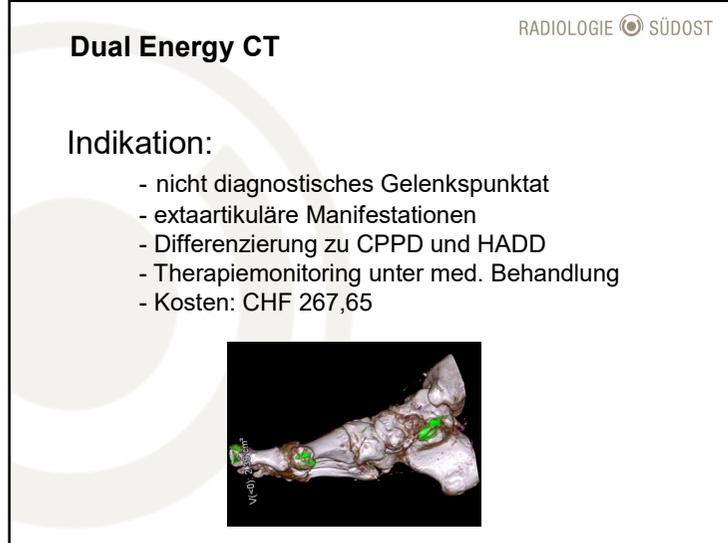
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**MRI bei Rheumatoider Arthritis (RA)** RADIOLOGIE SÜDOST

*Ann Rheum Dis* 2013;72:804-814 doi:10.1136/annrheumdis-2012-203158

**Recommendation**

**EULAR recommendations for the use of imaging of the joints in the clinical management of rheumatoid arthritis**

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**Table 1**  
Recommendations, SCR and level of evidence

Recommendation <sup>a</sup>	SCR, mean VAS 0-10 95% CI <sup>b</sup>	Level of evidence
1 When there is diagnostic doubt, CR, ultrasound or MRI can be used to improve the accuracy of a diagnosis of RA above clinical criteria alone.	8.1 (8.0-8.2)	II
2 The presence of inflammation seen with ultrasound or MRI can be used to predict the progression to clinical RA from undifferentiated inflammatory arthritis.	7.9 (8.7-9.0)	II
3 Ultrasound and MRI are superior to clinical examination in the detection of joint inflammation. These techniques should be considered for more accurate assessment of inflammation.	8.7 (7.8-9.7)	II
4 CR of the hands and feet should be used as the initial imaging technique to detect damage. However, ultrasound and/or MRI should be considered if conventional radiographs do not show damage and may be used to detect damage at an earlier time point (especially in early RA).	8.9 (8.4-9.5)	IV
5 MRI bone oedema is a strong independent predictor of subsequent radiographic progression in early RA and should be considered for use as a prognostic indicator. Joint inflammation (synovitis) detected by MRI or ultrasound as well as joint damage detected by conventional radiographs, MRI or ultrasound can also be considered for the prediction of further joint damage.	8.4 (7.7-9.3)	II
6 Inflammation seen on imaging may be more predictive of a therapeutic response than clinical features of disease activity. Imaging may be used to predict response to treatment.	7.8 (8.7-8.0)	IIaV
7 Given the improved detection of inflammation by MRI and ultrasound than by clinical examination, they may be useful in monitoring disease activity.	8.3 (7.4-9.1)	II
8 The periodic evaluation of joint damage, usually by radiographs of the hands and feet, should be considered. MRI (and possibly ultrasound) is more responsive to change in joint damage and can be used to monitor disease progression.	7.8 (8.8-8.9)	II
9 Monitoring of functional disability of the cervical spine by lateral alignment obtained in flexion and neutral should be performed in patients with clinical features of cervical involvement. When the diagnosis of clinical or radiographic cervical involvement and signs are present, MRI should be performed.	8.4 (8.5-9.8)	II
10 MRI and ultrasound can detect inflammation that predicts subsequent joint damage when clinical criteria is present and can be used to assess persistent inflammation.	8.8 (8.0-9.6)	II

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**„Early stage“ Rheumatoide Arthritis** RADIOLOGIE SÜDOST

- MRI mit KM zeigt bei Frühformen artikuläres Enhancement vor Usuren-Nachweis im Röntgen
- Charakteristische Gelenkbeteiligung (MCP/IP/Handgelenk)

Sugimoto H. et al *Radiology* 2000; 216

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**MRI bei Rheumatoider Arthritis** RADIOLOGIE SÜDOST

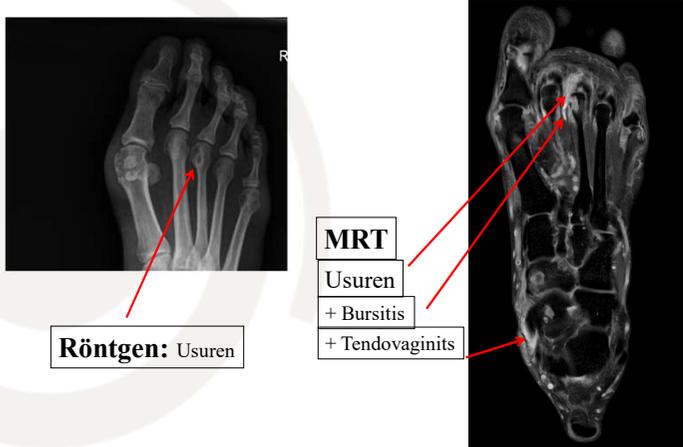


- Knochenmarksödem
- Usuren
- Synovitis
- Tenosynovitis

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**Rheumatoide Arthritis** RADIOLOGIE SÜDOST

**Röntgen vs. MRT (extraossäre entzündliche Aktivität?)**



**Röntgen:** Usuren

**MRT**  
Usuren  
+ Bursitis  
+ Tendovaginitis

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**Warum MRI bei RA?** RADIOLOGIE SÜDOST

- Hohe Prognostische Aussagekraft bei „early RA“  
*Selektion für aggressive Therapie*
- Hilft bei der Differential Diagnose und unklaren Fällen  
*Zusätzliches Kriterium ACR/EULAR Score*
- Erlaubt Monitoring und Therapie Response  
*wirkt Therapie?*
- Zeigt residuelle Entzündung bei klinischer Remission  
*Klinische Remission vs „true remission“*

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**MRI bei Spondyloarthritis (SpA)** RADIOLOGIE SÜDOST

Ann Rheum Dis doi:10.1136/annrheumdis-2014-206971

**Recommendation**

**EULAR recommendations for the use of imaging in the diagnosis and management of spondyloarthritis in clinical practice**

P Mandl<sup>1</sup>, V Navarro-Compán<sup>2,3</sup>, L Terslev<sup>4</sup>, P Aegerter<sup>5</sup>, D van der Heijde<sup>2</sup>, M A D'Agostino<sup>6</sup>, X Baraliakos<sup>7</sup>, S J Pedersen<sup>8</sup>, A G Jurik<sup>9</sup>, E Naredo<sup>10</sup>, C Schueller-Weidekamm<sup>11</sup>, U Weber<sup>12</sup>, M C Wick<sup>13</sup>, P A C Bakker<sup>14</sup>, E Filippucci<sup>14</sup>, P G Conaghan<sup>15</sup>, M Rudwaleit<sup>16</sup>, G Schett<sup>17</sup>, J Sierp<sup>18</sup>, S Tarp<sup>19</sup>, H Marzo-Ortega<sup>16</sup>, M Østergaard<sup>4</sup>

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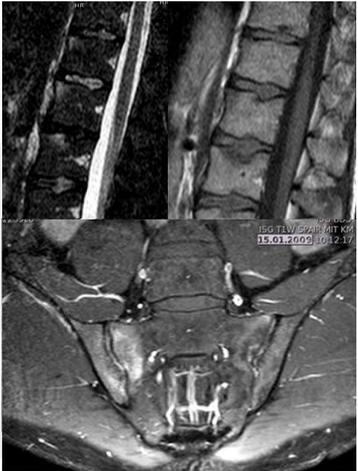
Received 11 November 2014  
Revised 23 February 2015  
Accepted 7 March 2015  
Published Online First 2 April 2015

	SOE	LOE
1 Ankle SpA diagnosis	0.0	II
A. In general, conventional radiography of the SI joints is recommended as the first imaging method to diagnose spondyloarthritis as part of ankle SpA, in order to rule out other causes of ankle pain and synovial disease. MRI of the SI joints is an alternative first imaging method.	0.0-0.0	
B. In the diagnosis of ankle SpA, both ankle conventional based on distal features and conventional radiography, and ankle SpA, is still supported. MRI of the SI joints is recommended. On MRI, both active inflammation (bone oedema) and some inactive osteitis and structural lesions (such as bone erosions, new bone formation, sclerosis and fat infiltration) can be diagnosed. MRI of the spine is not generally recommended to diagnose ankle SpA.	0.0-0.0	
C. Imaging modalities, other than conventional radiography and MRI are generally not recommended in the diagnosis of ankle SpA.	0.0-0.0	
2 Peripheral SpA diagnosis	0.0	II
When peripheral SpA is suspected, US or MRI may be used to detect peripheral arthritis, which may support the diagnosis of SpA. Furthermore, US or MRI might be used to detect distal enthesitis, tenosynovitis and bursitis.	0.0-0.0	
3 Ankle SpA monitoring activity	0.2	II
MRI of the SI joints across the spine may be used to assess and monitor disease activity in ankle SpA, providing additional information on top of distal and biochemical assessments. The decision on when to repeat MRI depends on the clinical circumstances. In general, STR sequences are sufficient to detect inflammation and the use of contrast medium is not needed.	0.0-0.0	
4 Ankle SpA monitoring structural changes	0.3	II
Conventional radiography of the SI joints and/or spine may be used for long-term monitoring of structural damage, particularly in spine enthesitis, in ankle SpA. If performed, it should not be repeated more frequently than every second year. MRI may provide additional information.	0.0-0.0	
5 Peripheral SpA monitoring activity	0.0	II
US and MRI may be used to monitor disease activity (particularly synovitis and enthesitis) in peripheral SpA, providing additional information on top of distal and biochemical assessments. The decision on when to repeat US/MRI depends on the clinical circumstances. US with high frequency colour or power Doppler is sufficient to detect inflammation and the use of US contrast medium is not needed.	0.0-0.0	
6 Peripheral SpA monitoring structural changes	0.0	II
In peripheral SpA, if the clinical scenario requires monitoring of structural damage, then conventional radiography is recommended. MRI and/or US might provide additional information.	0.0-0.0	
7 In patients with enthesitis-related spondyloarthritis	0.0	II
Ankle SpA monitoring disease activity	0.0	II
Ankle SpA monitoring structural changes	0.0	II
8 Ankle SpA monitoring disease activity	0.0	II
9 Ankle SpA monitoring structural changes	0.0	II
10 Concomitant	0.4	II
In patients with ankle SpA without enthesitis/tenosynovitis in the lumbar spine on conventional radiography, osteoporosis should be assessed by the SpA and if present, CT should be performed. In patients with enthesitis/tenosynovitis in the lumbar spine on conventional radiography, osteoporosis should be assessed by the SpA and if present, CT should be performed. In patients with enthesitis/tenosynovitis in the lumbar spine on conventional radiography, osteoporosis should be assessed by the SpA and if present, CT should be performed. In patients with enthesitis/tenosynovitis in the lumbar spine on conventional radiography, osteoporosis should be assessed by the SpA and if present, CT should be performed.	0.0-0.0	

CT may provide additional information on structural damage if conventional radiography is negative and MRI cannot be performed. Conventional radiography and US are not recommended for diagnosis of sacroiliitis as part of ankle SpA.

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**MRI bei SpA** RADIOLOGIE SÜDOST

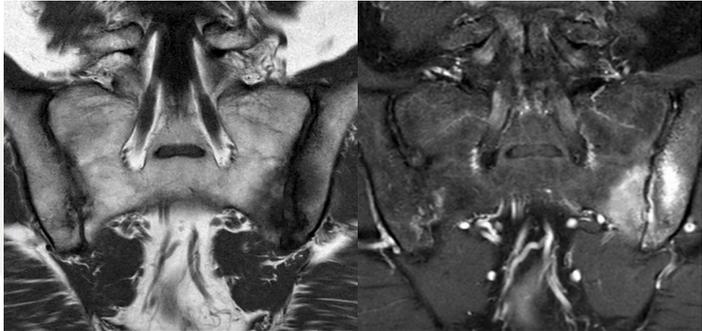


- Wirbelsäule  
Shiny Corner  
Usuren
- ISG  
Knochenmarködem  
2 Läsionen auf einer  
Schicht typisch  
Usuren

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**MRI bei SpA** RADIOLOGIE SÜDOST

Patient 39y, männlich, Rückenschmerzen



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**MRI bei SpA** RADIOLOGIE SÜDOST



- Patient, w 35y
- sportlich
- seit 1 Jahr  
Rückenschmerzen

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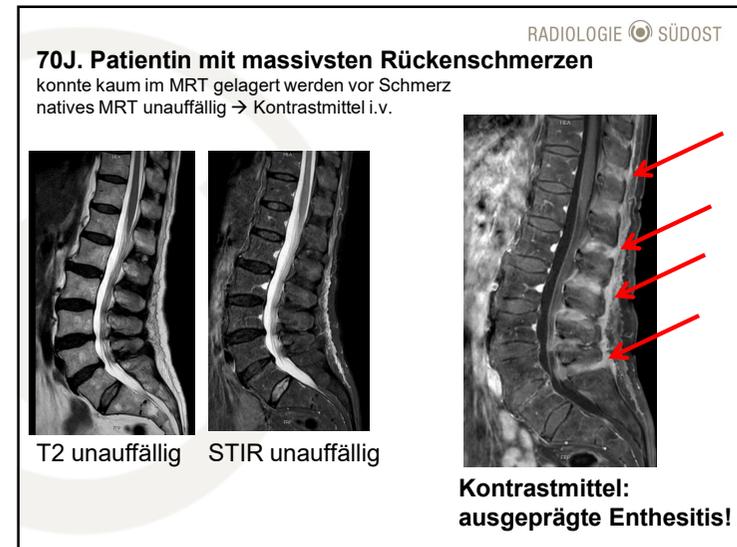
**MRI bei SpA** RADIOLOGIE SÜDOST



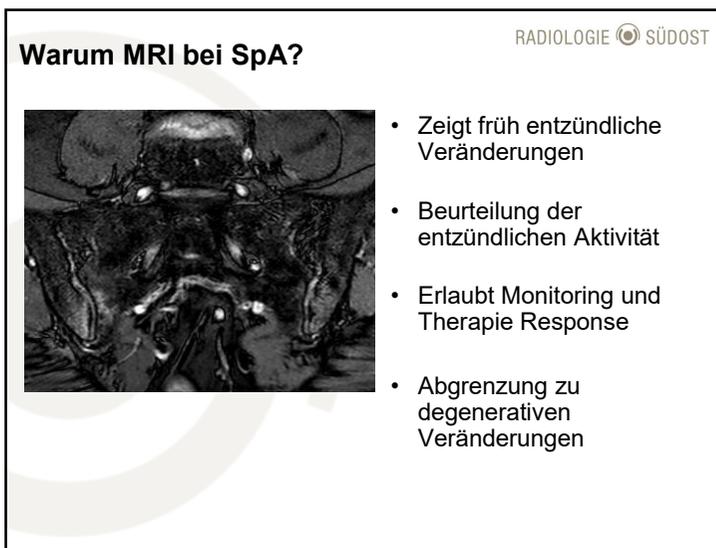
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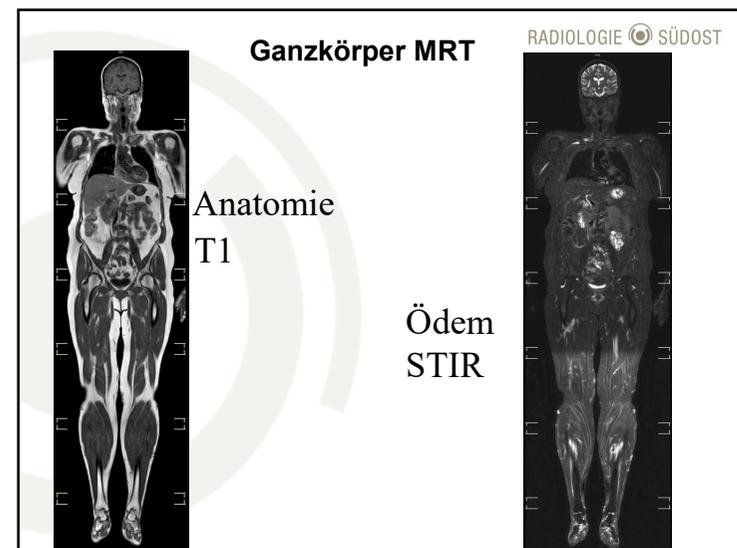
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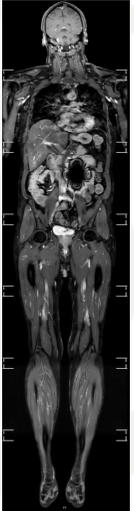
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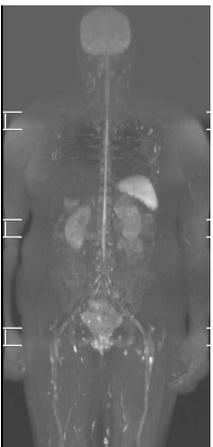
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### Ganzkörper MRT



Gadolinium  
T1 FS



Diffusion  
Onkologie

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### Ganzkörper MRT

**Indikationen:**

- Dermatomyositis / Polymyositis  
8% paraneoplastisch
- DD Myopathien anderer Genese
- Eosinophile Fasziitis
- Befallsmuster der Gelenke rheumatologischer Erkrankungen
- Multiples Myelom

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### Ganzkörper MRT

**Vorteile:**

- hohe Sensitivität bezüglich Muskelödem
- Ausmass und Verteilungsmuster
- Muskelauswahl vor Biopsie
- Verlaufskontrolle und Therapiemonitoring

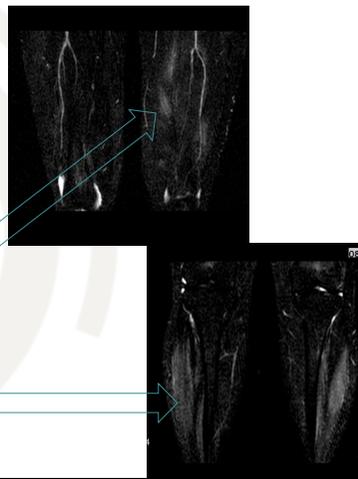
Kosten  
CHF 388.64 nativ / CHF 764.35 mit KM

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### Patientin 40J. Dermatomyositis

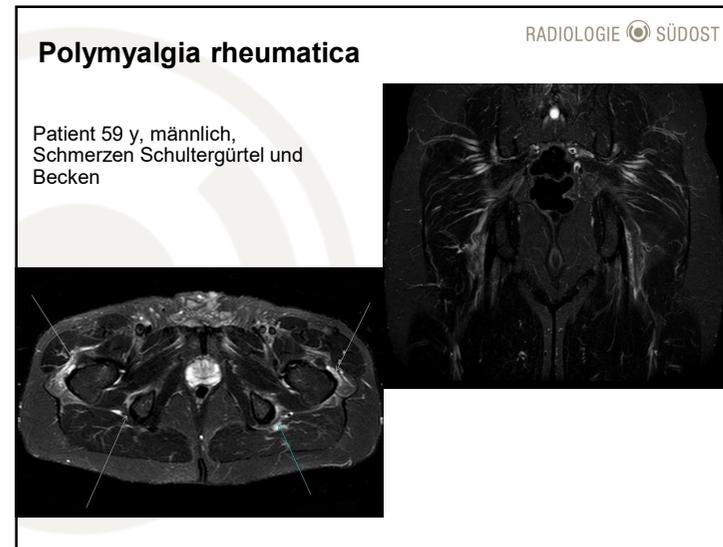




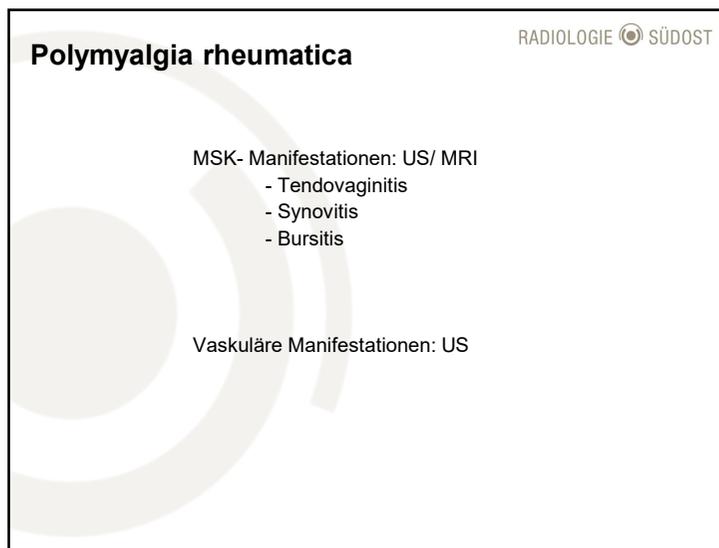
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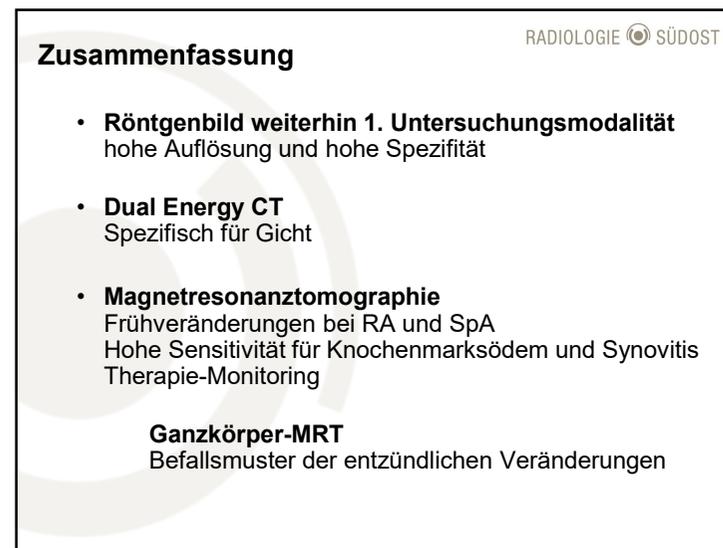
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**Vielen Dank für Ihre Aufmerksamkeit!**