

Romatolojide Tanı;
Görüntüleme
(spa hariç)

Dr.İlhan SEZER

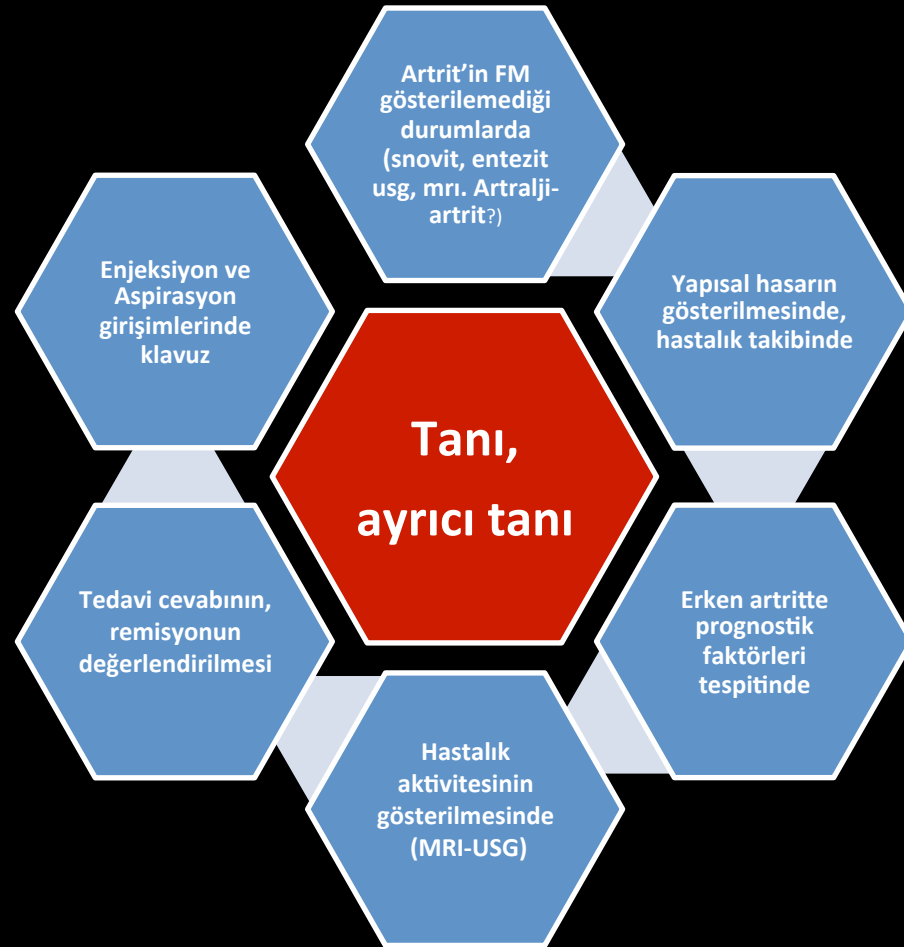
Antalya Eğitim ve Araştırma Hastanesi

Romatoloji & FTR

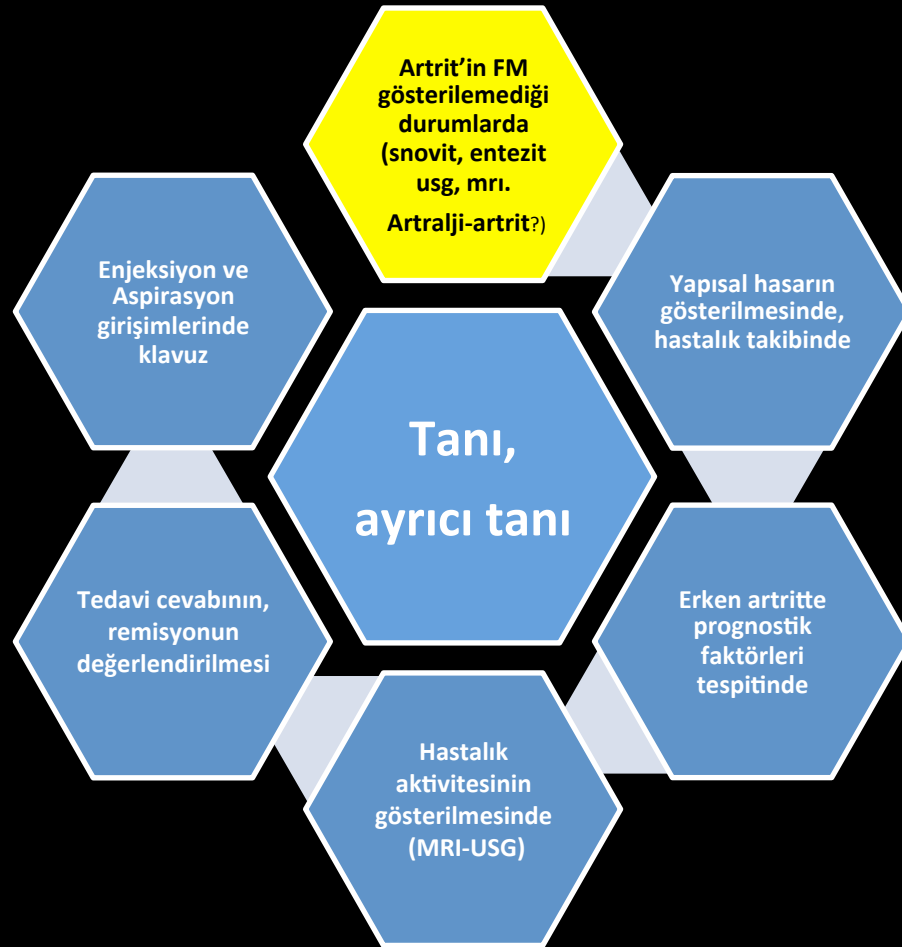
Sunum planı

- Romatolojik tanıda görüntüleme yöntemleri
 - Klasifikasyon – Tanı !!! kriterlerinde görüntülemenin yeri.
- Radyografik yöntemlerle tanı-ayrıcı tanı...

RA radyoloji



RA radyoloji



Görüntüleme yöntemleri

- Konvansiyonel radyografi
- Manyetik rezenons görüntüleme
- Ultrason
- Sintigrafi
- Pozitron Emisyon Tomografi (PET)
- Bilgisayarlı Tomografi
- Kapillereskopi

Konvansiyonel radyografi

Kas iskelet sistemi görüntülemesinde en yaygın ve ilk kullanılan görüntüleme yöntemi

Tanı, ayırıcı tanı, hastalık seyrini değerlendirmede kullanılır.

Erezyon, eklem aralığında daralma, osteopeni, subkondrol kistler, subluksasyon, osteofit, ankiloz, fraktür gibi değişiklikleri göstermede en uygun yöntem

Sinovyum, tendon kılıfları, bursa, küçük ve marjinal olmayan erozyonları göstermede yetersiz

Ultrasonografi

Eklem ve çevre dokuların (entezit vb) değerlendirilmesinde yaygın olarak kullanılan, dinamik inceleme imkanı ile birlikte girişimsel işlemlerde klavuz olarak kullanılır.

Bursa, tendon kılıfları, entezal bölgenin enflemasyonu hakkında bilgi verir.

Eklem içi effüzyon, sinovyal hipertrofi ve vaskülerite, sinovyal kistler, erozyonları değerlendirmede kullanılır. Sinovit -effüzyon ayırımında yardımcıdır.

Normal sinovyum sonografik olarak değerlendirilemez. Ancak kalınlaştığında sinovyal ödemin derecesine bağlı olarak intraartiküler yapılarda ekojenite farklılıkları ortaya çıkar.

Özellikle mkp, pif ve ayaklardaki erozyonları değerlendirmede x-r den üstün bulunmuştur

Kişiler arası uygulama farklılıkları, doğru değerlendirme için gereken doğru yeterli ekipman ve eğitime ihtiyaç duyulması !!!

MRI

**Sinovyumu deęerlendirmede en iyi yöntem
(eklem sıvısı? Sinovit ?)**

Sinovyum- kartilaj ayrımı yapılır !

**İnflamatuvar yumuşak doku deęişikliklerini, kemik ilięi deęişikliklerini
hastalığın erken döneminden itibaren gösterir
(tenosnovit, bursit, romatoid nodul, iskemik nekroz, fraktür!, tendon
rüptürleri vb)**

**Yüzeyel eklemlerdeki sinovyal kistlerin deęerlendirilmesinde usg eşit
etkinlik gösterirken derin eklemlerde MRI belirgin üstündür.**

**İlerde oluşabilecek erozyonların güçlü prediktörü olan kemik ilięi
ödemini göstermesi açısından deęerlidir.**

Yüksek maliyet, çekim zorlukları, eğitimli personel !!!

MRG kullanılan sekansların görüntü özellikleri

Sekans	Su	Yağ	İnflamasyon
T1 ağırlıklı	hipointens	hiperintens	hipointens
T2 ağırlıklı	hiperintens	hiperintens	hiperintens
STIR	hiperintens	hipointens	hiperintens
T2 ağırlıklı yağ baskılamalı	hipointens	hipointens	hiperintens
T1 kontrastlı yağ baskılamalı	hipointens	hipointens	hiperintens

Bilgisayarlı tomografi- HRCT

- Kemik morfolojisi ve yapısal deęişiklikleri ayrıntılı deęerlendirmede faydalanılır.
- Radyoaktivite maruziyeti, maliyet vb
- Akcięer interstisiyel hastalık görüntülemesinde altın standart...
- CT-Anjiografi

Sintigrafi

- Artmış kemik turnover ve kan akımının tespit edilmesinde kullanılır.
- Septik artrit, kemik neoplazmları, osteomyelitis, kemik iliği ödemi , sakroilitis ve paget gibi hastalıkların tanısının konulmasında yardımcıdır.

PET

Farklı romatizmal hastalıklardaki inflamasyonun (snovit-tenosnovit) tespitinde artiküler, ekstra artiküler tutulumların tespitinde kullanılır vaskülit, sarkoidoz, myozit vb. Nedeni bilinmeyen ateşin tespitinde yardımcıdır.

PET



Kapillereskopi

Raynaud fenomeni ayrıcı tanısında ve bađ doku hastalıklarının teşhisinde tanıya yardımcıdır.

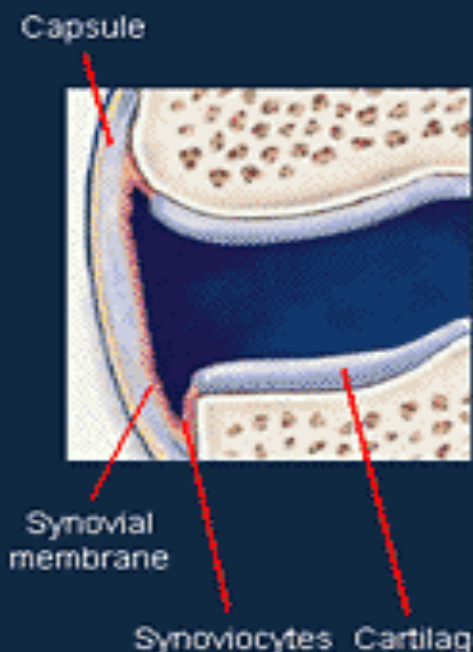


Rp ???



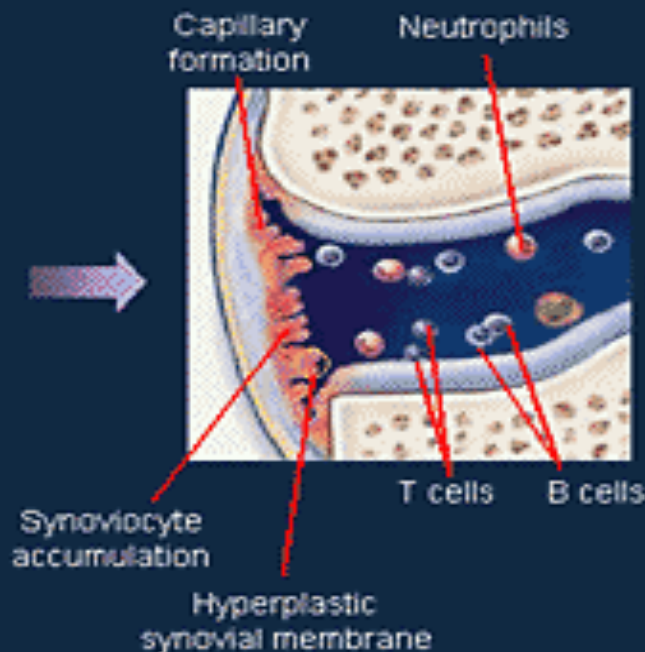
RA Pathophysiology

Normal Joint

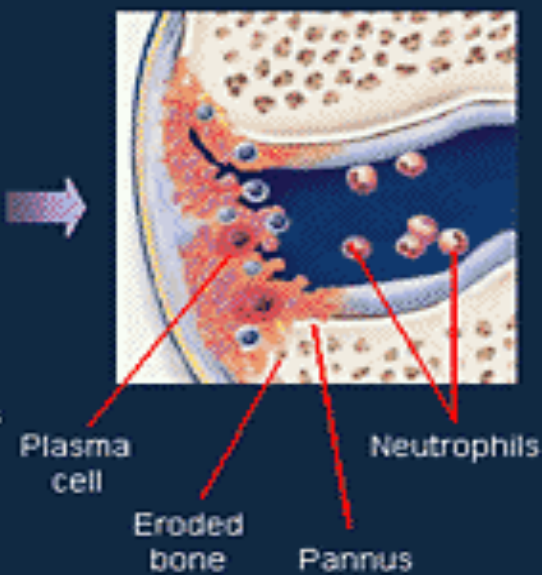


RA

Early



Established



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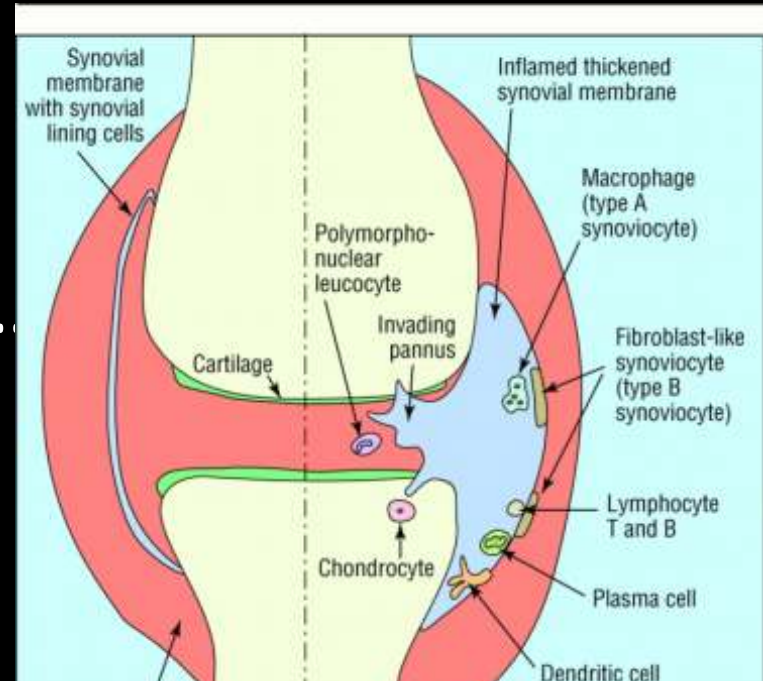
Sinovyal tutulum

ilk bulgu tutulan eklemdede şişlik;

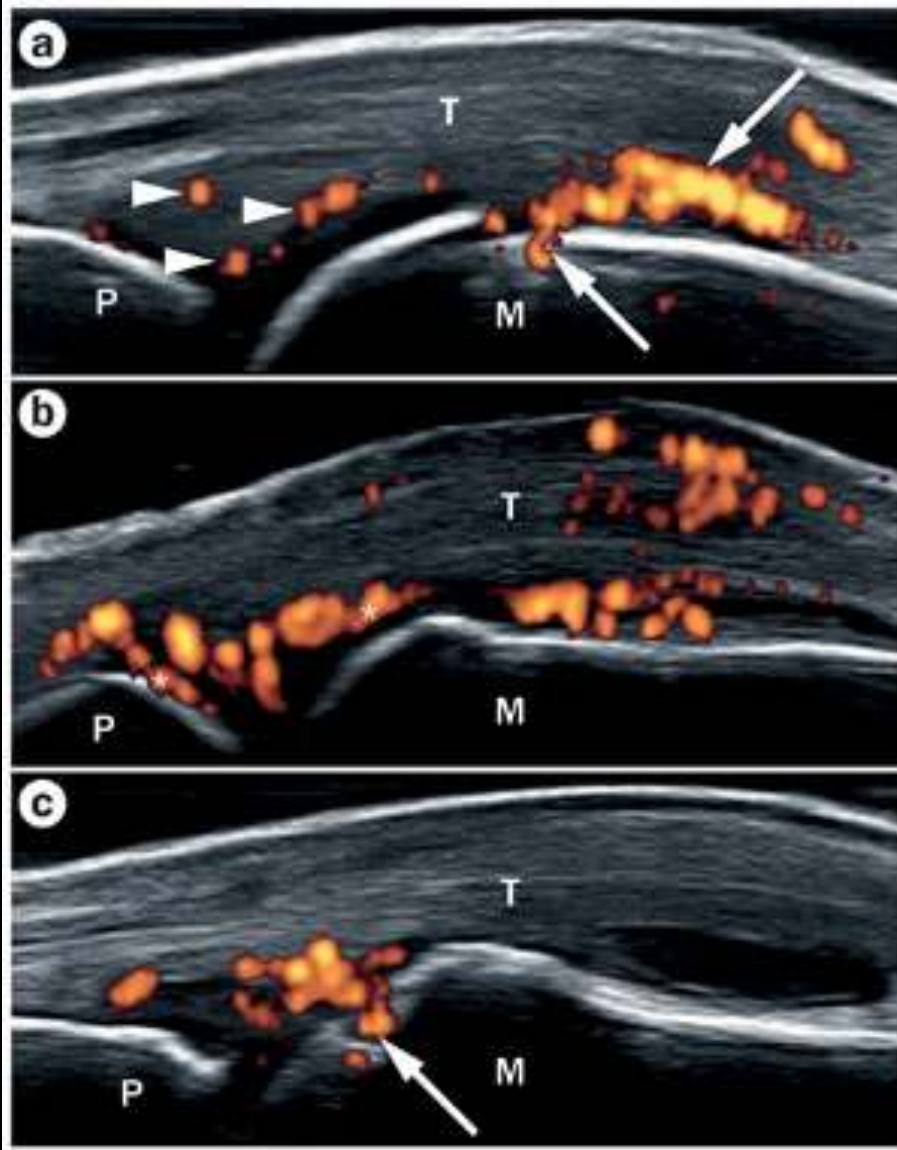
Effüzyon, sinovyal kalınlaşmaya bağılı olabilir...

X-R,

- Yumuşak dokuda şişlik
- Eklem aralığında genişleme..



Sinovit; USG

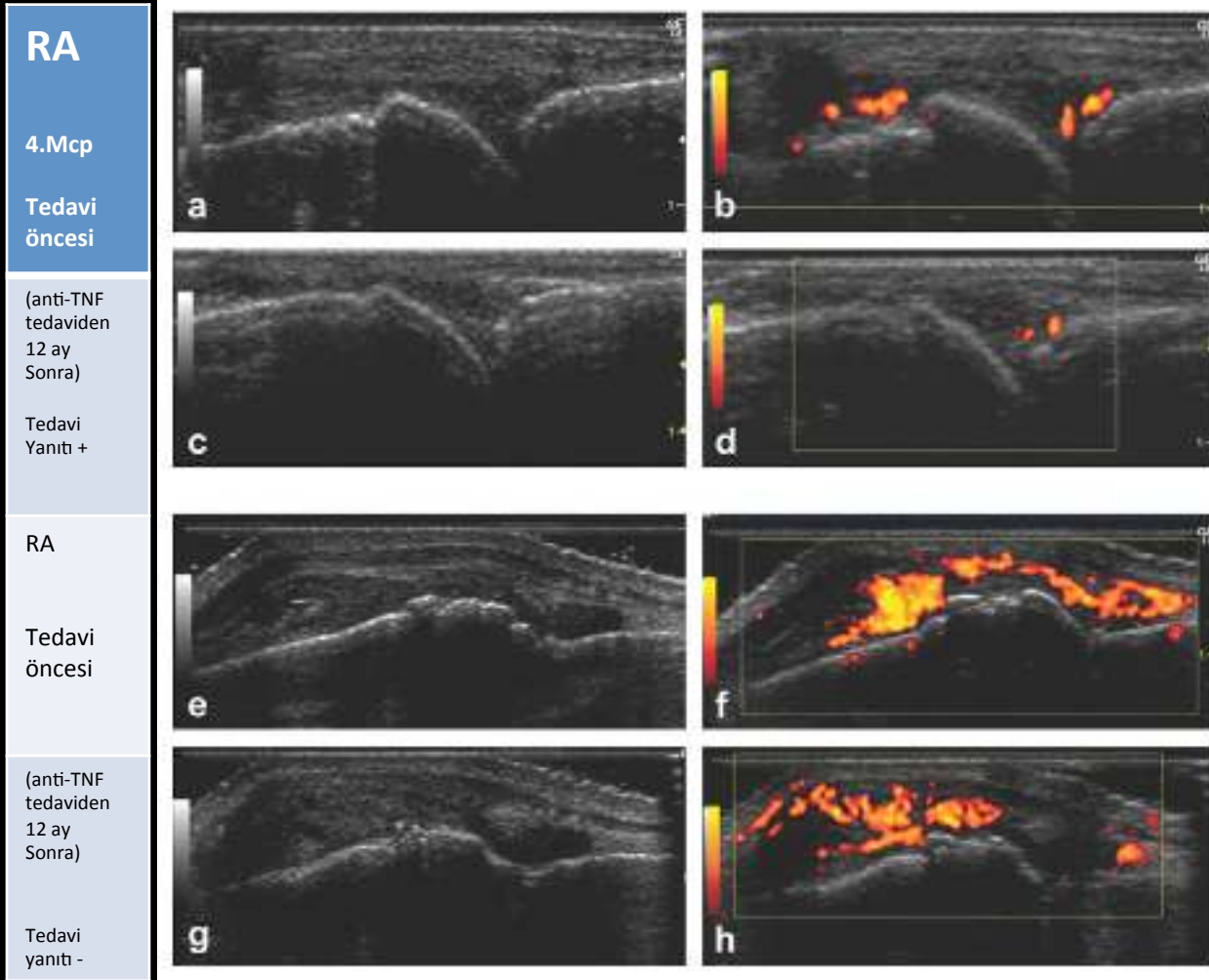


a. Erken artrit döneminde yağ yastıkçığı ve damarlar etrafında dopler aktivitesinde artış

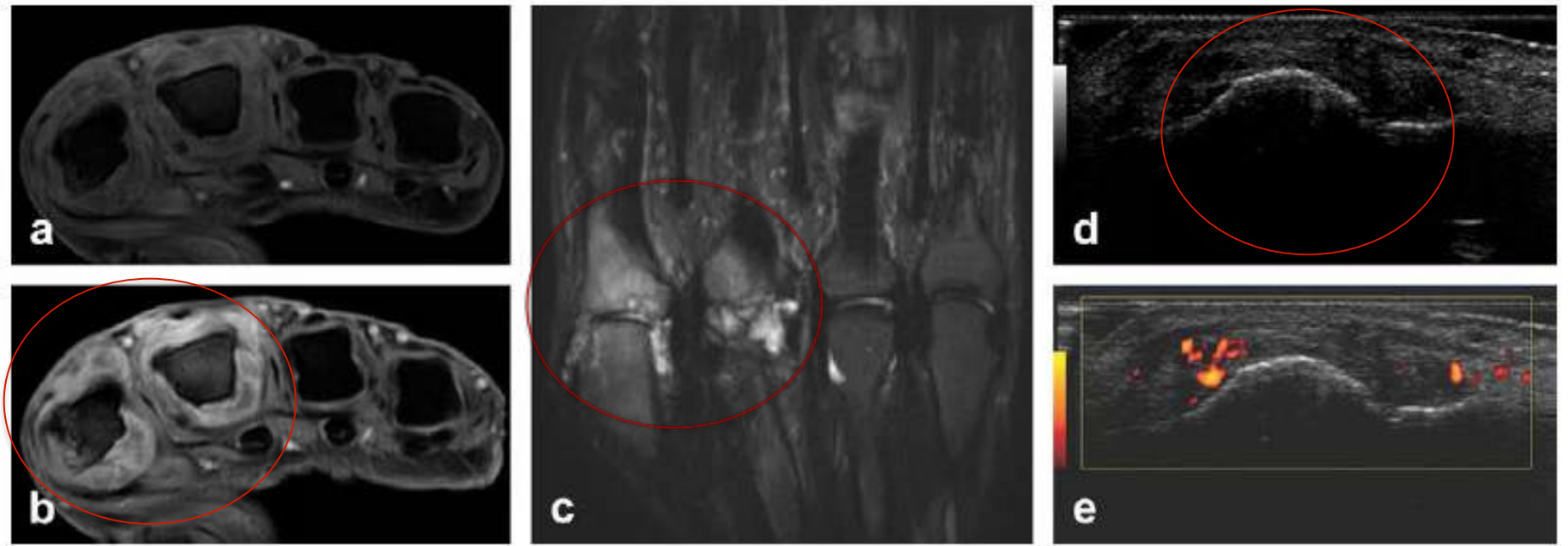
b. Yerleşmiş hastalıkta sinovyal proliferasyon kemik korteksi ve metekarpal başa yakın alanda

c. Uzun dönemde erozyon etrafında dopler aktivitesinde artış

Sinovit USG

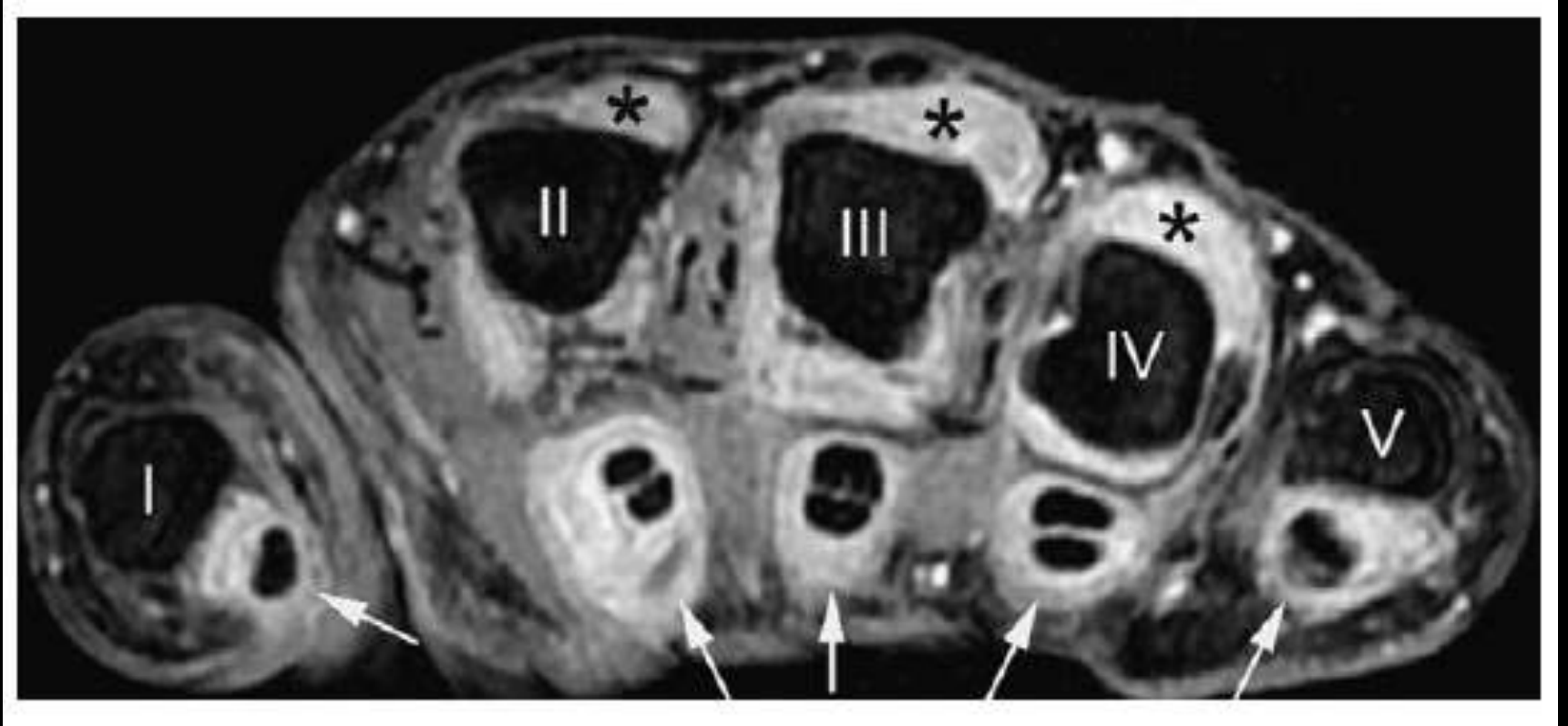


Sinovit MRI-USG



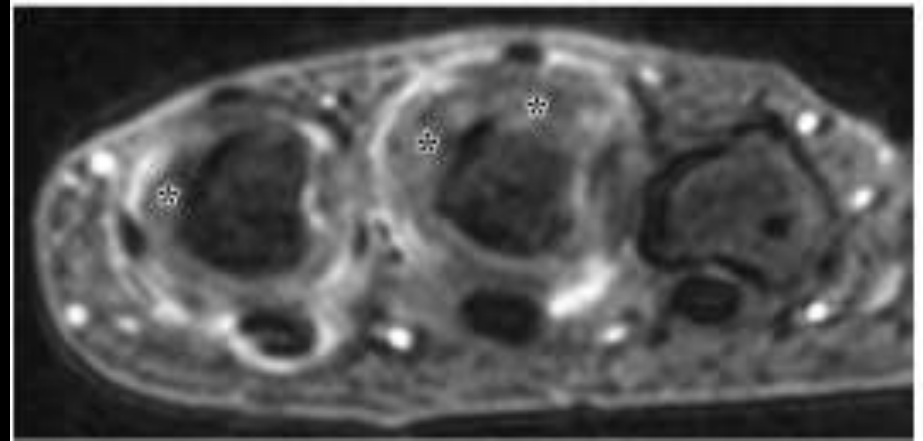
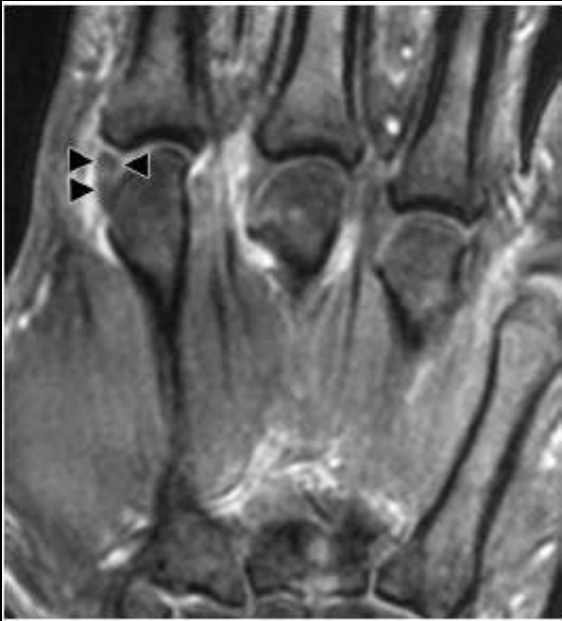
- a. Aksiyel T1Fs 2-3mcp
- b. Aksiyel T1FsC 2-3 mcp sinovit
- c. Koranal T1FsC 2-3 mcp sinovit
- d. Longitudinal 2.mcp effüzyon sinavyal hipertrofi
- e. Longitudinal 2.mcp dopler aktivitede artış

Sinovit-Tenosinovit



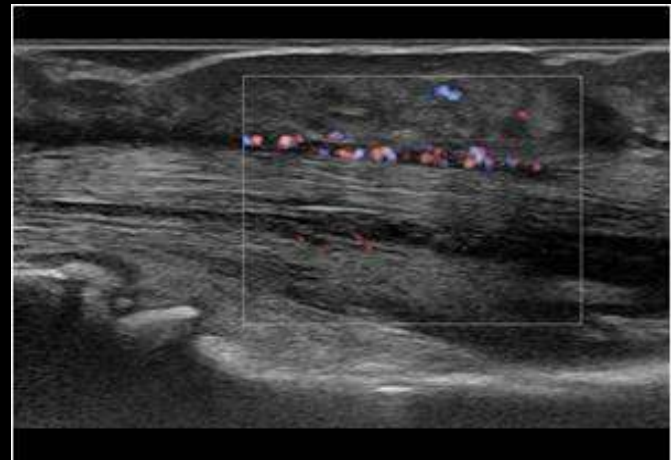
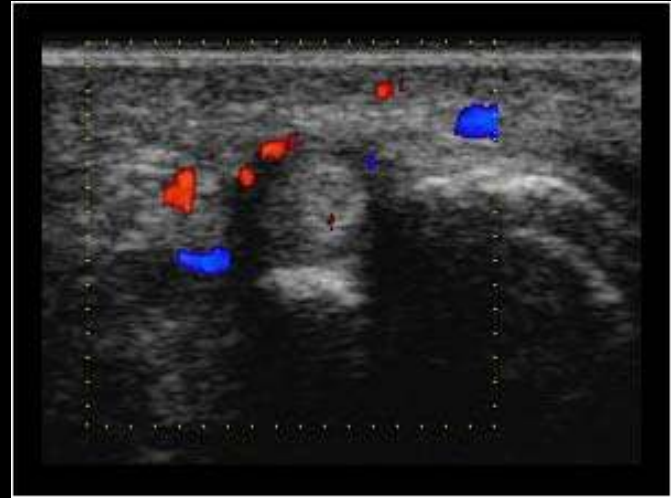
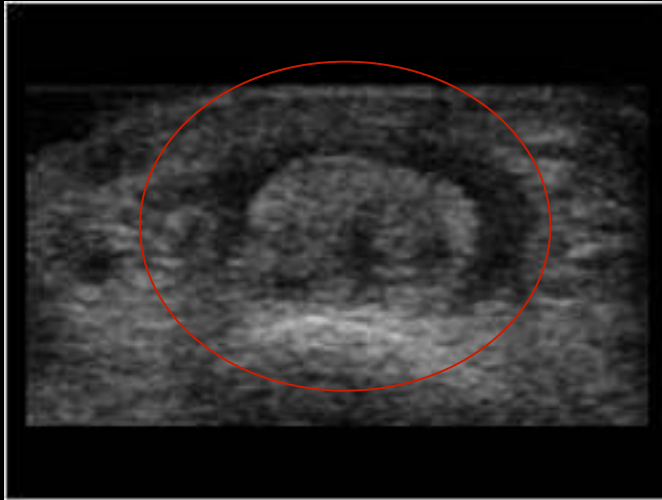
T1FsC Aksiyel kesitte sinovit*, ve fleksör tendonlarda tenosinovit

Sinovit-pannus



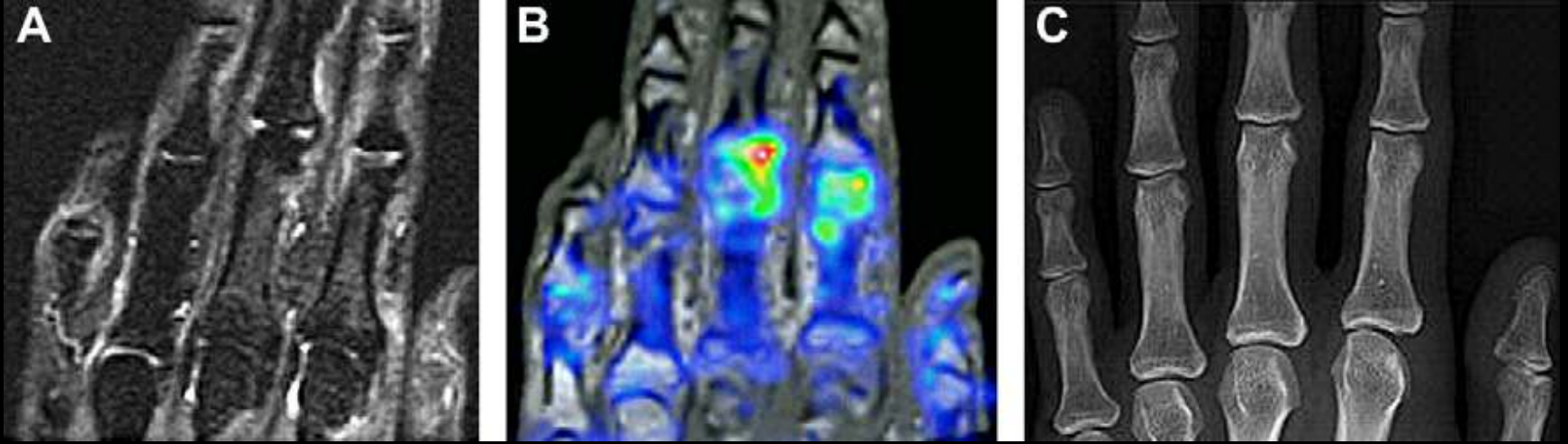
- A. T1FsC Koranal kesit 2-3 mcf eklemdede kalınlaşmış sinovya pannus dokusu ile uyumlu
- B. T1FsC Aksiyel kesit pannus kalınlaşmış sinovya

Tenosinovit





PET



Sinovitin metabolik aktivitesini deęerlendirebilen bir yntem,
alıřmalarda MRI VE USG korelasyonu gzlenmiř.

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

Table 2 Recommendation 3: Summary of included studies comparing imaging and CE in the detection of joint inflammation

Ultrasound 29 studies, mean no. of subjects (range): 40.7 (6–100)	MRI 16 studies, mean no. of subjects (range): 47.3 (6–318)	Scintigraphy 14 studies, mean no. of subjects (range): 22.6 (8–38)	
Ultrasound hand/wrist vs CE (article reference)	MRI hand/wrist vs CE (article reference)	Scintigraphy hand/wrist vs CE (article reference)	
	Detection rate, mean (range) Ultrasound vs CE	Detection rate, mean (range) MRI vs CE	Detection rate, mean (range) Scintigraphy vs CE
Synovitis ^{18–24}	2.18-fold (0.55–8.96-fold)	MRI synovitis, vs clinical synovitis ^{21–24 27–43}	vs tenderness/swelling ^{45–48}
		vs pain ⁴¹	vs tenderness ⁴¹
		vs swelling ⁴¹	vs swelling ⁴¹
	Correlation with DAS28 ⁴²	Correlation with DAS28 ⁴²	Coefficient of association ^{–0.16}
		Relative efficacy for tenosynovitis ²⁸	
Tenosynovitis ²⁵	1.06-fold	Relative efficacy of MRI synovitis vs TJC ²⁶	
Relative efficacy of Ultrasound at detecting any inflammation vs TJC ²⁶	0.61–1.33		
Ultrasound foot/ankle vs CE	MRI foot/ankle vs CE	Scintigraphy feet vs CE	
		vs tenderness/swelling ⁴⁵	
Effusion ^{27–28}		0.42-fold	
Inflammation ²⁹			
Synovitis ³⁰	Synovitis ^{30 34 35 36}		
Tenosynovitis ³¹	Tenosynovitis ³¹		
		1.71-fold (0.93–2.8-fold)	
		% agreement: 45.5–71%	
		% agreement: 54.5–90.9%	
Ultrasound knees vs CE	MRI knees vs CE	Scintigraphy knees vs histology	
		vs histology ⁴⁷	
Baker's cyst ^{31–33}		Swelling vs histology ⁴⁷	
Suprapatellar bursitis ³⁴	Synovitis vs clinical synovitis ⁴⁴	1.11-fold	
Effusion ³⁴		0.72-fold	
Synovitis vs clinical synovitis ^{35 36}			
vs DAS28	r 0.9, p 0.0001		
vs SJC	Strong correlation, p 0.006		
	Weak correlation, p 0.038		

CE, clinical examination; DAS28, disease activity score in 28 joints; TJC, tender joint count; SJC, swollen joint count.

Remission ? DAS28, CDAI, SDAI.....?

Table 5 Recommendation 10: Summary of included studies describing outcome in the presence of image-detected inflammation in clinical remission

Article year (reference)	No. of subjects	Duration of follow-up (months)	Baseline assessment modality	Outcome parameter assessed	Results
2008 ¹²⁷	102	12	Ultrasound SH, PD synovitis MRI synovitis	CR progression (Genant score)	SH: OR 2.31, p 0.032 PD synovitis: OR 12.21, p<0.001 OR 2.98, p 0.002
2011 ¹²⁸	94	12	Ultrasound SH, PD synovitis, remissions (no SH or PD synovitis)	Relapse rate	% patients having flare: in ultrasound remission: 20.0% With ultrasound PD activity: 47.1%, p 0.009
2009 ¹²⁹	106	24	Ultrasound joint count, PD synovitis	Relapse rate	Unsustained remission vs sustained remission: higher PD: OR 12.8, p<0.05 Higher ultrasound joint count: OR 4.6, p<0.05
2005 ¹³⁰	32	12	Ultrasound RI	Relapse rate	Relapse rate higher with low RI se 0.80, sp 1.0, acc 0.96, p<0.01
2007 ¹³¹	169	24	Sustained ACR/DAS remission	CR progression (Larsen score)	Increase in Larsen score in (unsustained vs sustained): ACR remission: p 0.017 DAS remission: p<0.001
2004 ¹³²	187	24	Sustained ACR/DAS remission	CR progression (SHS)	Increase in SHS score in (unsustained vs sustained): ACR remission: p 0.053 DAS remission: p 0.017
2012 ¹³³	535	24	Remission according to DAS, SDAI, CDAI, ACR/EULAR	CR progression (SHS)	% patients with CR progression with baseline remission: DAS: 30% SDAI: 24% CDAI: 19% ACR/EULAR: 20%

ACR, American College of Rheumatology; CDAI, clinical disease activity index; CR, conventional radiography; DAS, disease activity score; EULAR, European League Against Rheumatism; PD, power Doppler; RI, resistive index; SDAI, simplified disease activity index; SH, synovial hypertrophy; SHS, Sharp/van der Heijde score.

Hiperemi dönemi? Periartiküler osteopeni

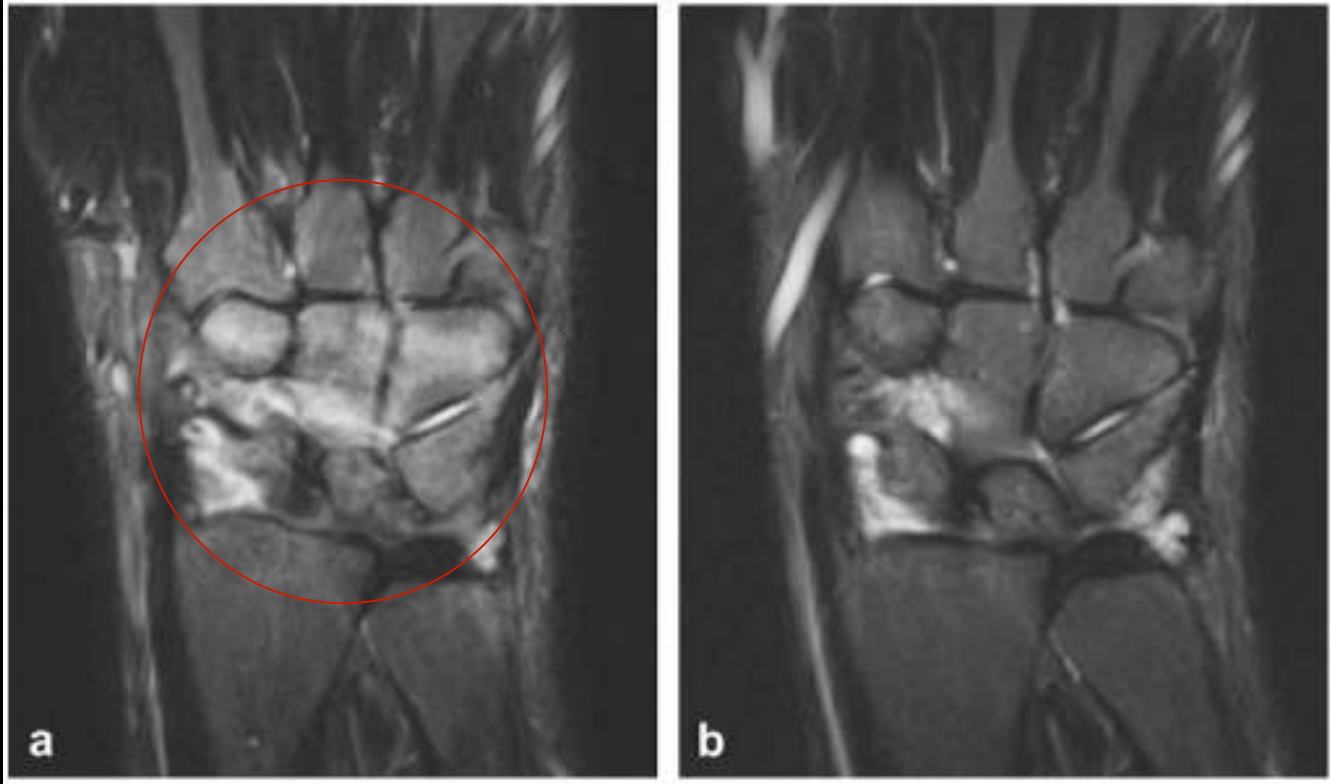


Kemik iliđi ödemi



T2 Fs Koronal el –el bileđi
Erken RA'da kemik iliđi ödemi
El bileđi, distal ulna,
II.MCF, el bileđi kemiklerinde

Kemik iliđi ödemi...



STIR-Yaygın kemik iliđi ödemi anti- TNF tedavi öncesi (a) ve 6 ay sonrası (b)

Kemik iliği ödemi

MRI bone oedema is the strongest predictor of subsequent radiographic progression in early rheumatoid arthritis. Results from a 2-year randomised controlled trial (CIMESTRA)

Table 2 Univariate regression analysis between candidate covariates and radiographic progression. All variables are baseline values

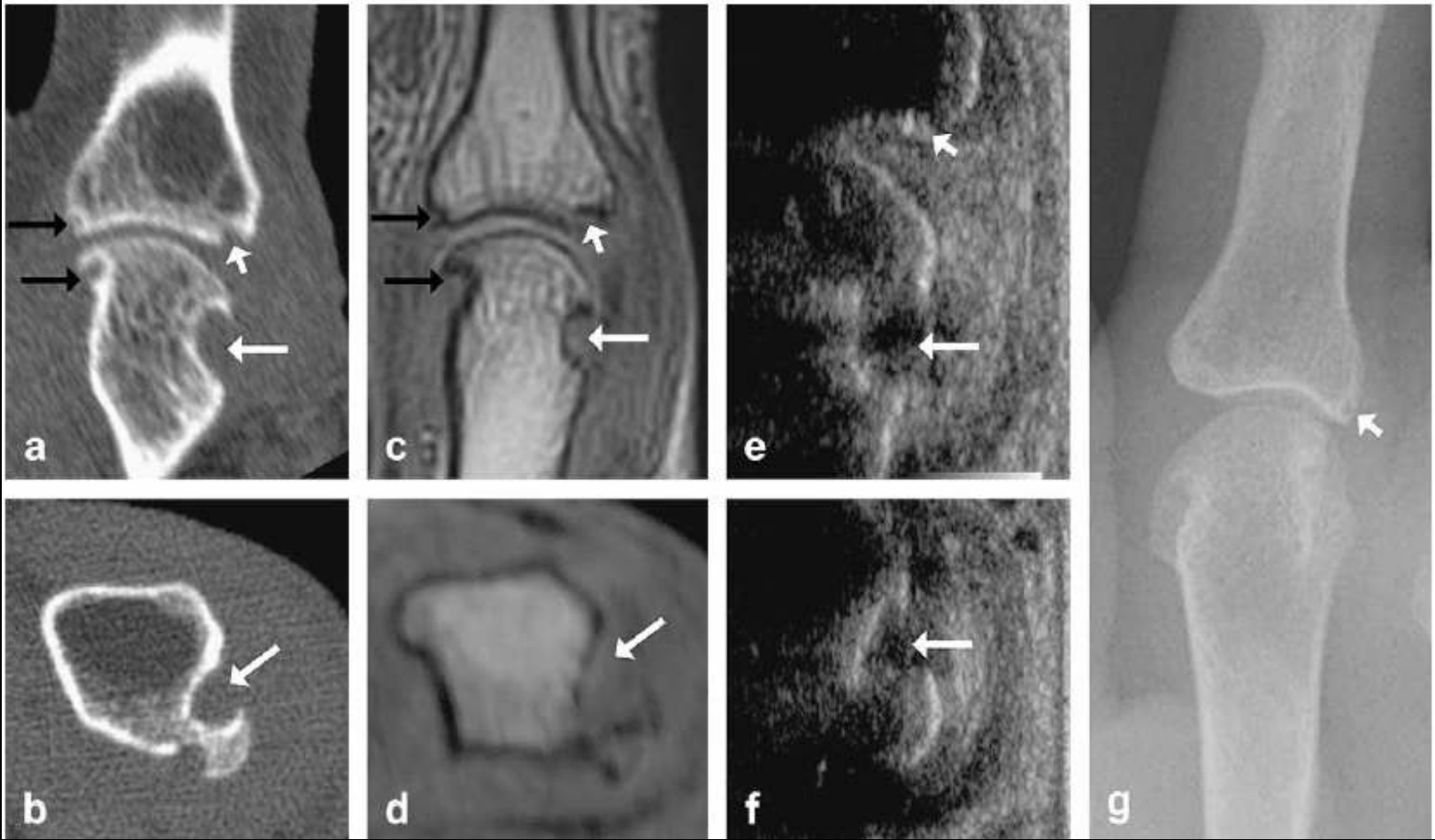
Variable	MRI of wrist – MCP group (n = 89)			MRI of wrist-only group (n = 130)		
	Coefficient	Confidence interval	p Value	Coefficient	Confidence interval	p Value
Gender	-0.77	-3.71 to 2.17	0.60	-0.03	-1.91 to 1.85	0.97
Age	0.03	-0.06 to 0.10	0.55	0.01	-0.07 to 0.09	0.81
DAS28	0.02	-0.08 to 0.12	0.96	0.05	-0.63 to 0.73	0.90
Disease duration	0.13	-0.07 to 0.33	0.21	0.11	-0.03 to 0.25	0.15
CRP	0.01	-0.39 to 0.41	0.45	0.01	-0.01 to 0.03	0.31
SJC	-0.04	-0.26 to 0.18	0.68	-0.03	-0.19 to 0.13	0.70
TJC	-0.10	-0.28 to 0.08	0.26	-0.08	-0.23 to 0.06	0.21
HAD	-0.42	-2.02 to 1.18	0.60	-0.07	-1.33 to 1.19	0.91
Patient global	0.00	-0.04 to 0.04	0.86	0.00	-0.04 to 0.04	0.82
Patient pain	0.01	-0.03 to 0.05	0.58	0.01	-0.03 to 0.05	0.58
Doctor global	-0.01	-0.07 to 0.05	0.71	-0.02	-0.06 to 0.02	0.47
ESR	0.04	-0.02 to 0.10	0.14	0.03	-0.01 to 0.07	0.11
Ever smoker	-0.39	-2.81 to 2.03	0.75	-0.10	-1.58 to 1.38	0.82
Anti-CCP	1.36	-1.08 to 3.80	0.27	1.53	-0.77 to 3.33	0.08
IgM RF	-1.06	-3.55 to 1.43	0.40	0.04	-1.98 to 1.96	0.96
IgA RF	-1.49	-3.85 to 0.87	0.21	-0.62	-2.42 to 1.18	0.49
HLA-DRB1-SE	1.29	-1.57 to 4.15	0.37	1.52	-0.72 to 3.76	0.18
Schoof	-0.50	-1.74 to 0.74	0.42	-0.40	-1.38 to 0.58	0.42
MRI erosion score	1.07	0.55 to 1.59	<0.001	0.74	0.28 to 1.20	0.001
MRI synovitis score	0.32	0.04 to 0.60	0.03	0.19	-0.19 to 0.57	0.31
MRI bone oedema	0.75	0.55 to 0.94	<0.001	0.59	0.40 to 0.77	<0.001
TSS	0.25	0.07 to 0.43	0.01	0.15	0.03 to 0.27	0.02



Erozyon



a. Illustration of synovial joint shows joint fluid (*f*) and articular cartilage (*c*). b. Illustration and c. radiograph show inflammatory arthritis, synovitis causing cartilage destruction. Marginal erosions (arrows) are seen where subchondral bone plate is exposed to intraarticular synovitis. *f* = Fluid.



Erozyonun CT-MRI-USG-XR tarafından karşılaştırmalı değerlendirilmesi
2.MCP;falanks bazisi radial taraftaki erozyon tüm mod +,
metekarp başındaki x-r dışındaki diğer mod +
Ulnar taraftaki erozyonlar sadece MRI, CT'de +, USG girmesinin imkansız olduğu bir bölge

Erozyyon -MRI



68 yaş. 8 aydır RA.

XR: Radius başında minimal hipodens alan

T1; radius başı, skafoid, lunatumda erozyon,

T2; lunatumda kemik iliği ödemi, hamatumda erozyon

Erozyonun şekli

- **Well defined**

Düzgün kenarlı etrafı skleroze-iyileşmiş, yada yavaş seyirli bir hastalık göstergesi

Gut, iyileşmiş RA, OA, basınç etkisi skleroderma

- **ill defined,**

Sınırları net olmayan yeni erozyonlar... Birden fazla olmalı, yeni kemik oluşumu eşlik edip etmediğine dikkat edilmeli, mri, usg de aktivite +

Erozyon



Erozyon tespiti

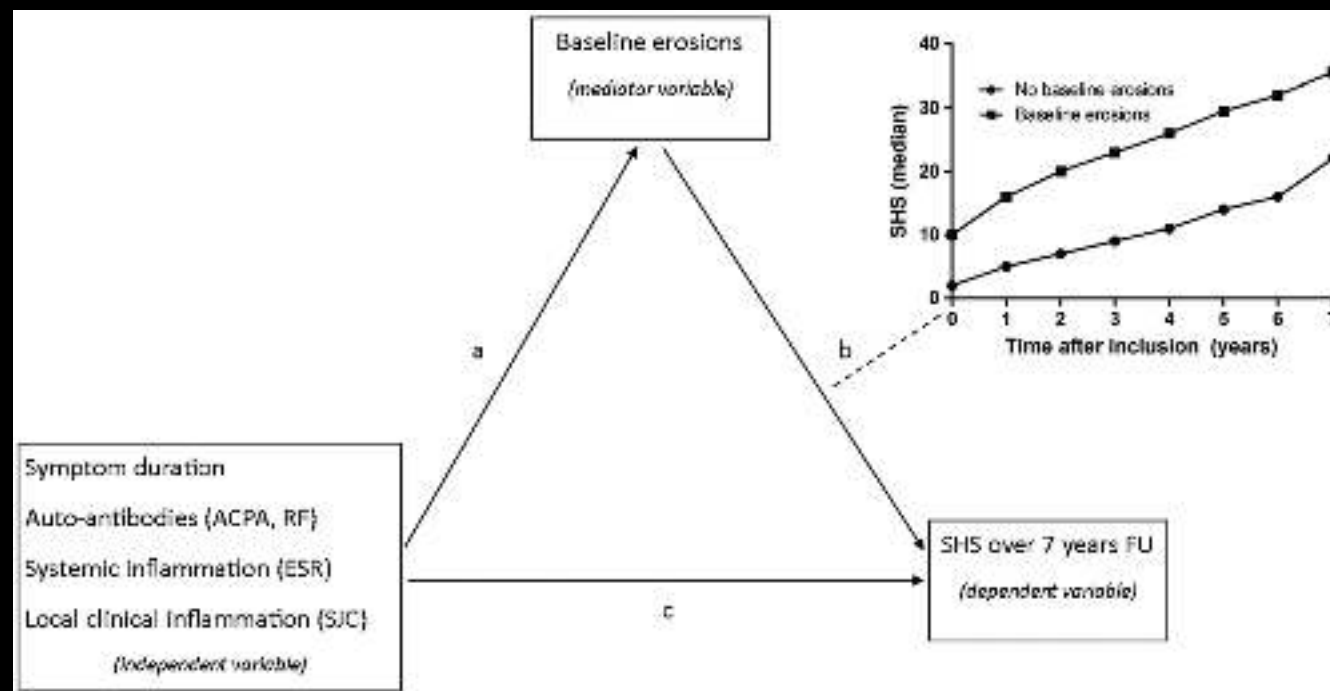
Table 3 Recommendation 8: Summary of included studies comparing imaging in the detection of erosions

Comparator vs reference technique (article reference)	Sensitivity	Specificity	Accuracy	κ	Detection rate, mean (range)
Hand/wrist erosions:					
MRI vs CT ^{52 83 85-87}	0.61-0.68	0.92-0.96	0.77-0.89	0.63	0.71-fold (0.60-0.81-fold)
Ultrasound vs CT ^{52 83}	0.42-0.44	0.91-0.95	0.80-0.84	0.44	
CR vs CT ^{52 83 85-88}	0.14-0.54	0.92-1.0	0.63-0.81	0.29	0.34-fold (0.16-0.60-fold)
CR vs MRI ^{24 26 39 58 75 89 90-100}	0.0-0.55	0.5-1.0	0.23-0.92		0.38-fold (0.06-0.80-fold)
CR vs ultrasound ^{24 58 97-101}	0.48	1.0			0.60-fold (0.18-1.21-fold)
Ultrasound vs MRI ^{24 58 97-100}	0.33-0.87	0.68-1.0	correlation coefficient 0.68-0.9	$p < 0.0005$ - < 0.001	0.77-fold (0.35-1.51-fold)
Low vs high-field MRI ^{75 76 91 95}	0.46-0.94	0.93-0.94	0.55-0.94		0.94-fold (0.46-1.16-fold)
Feet erosions:					
CR vs MRI ^{29 43}	0.32-0.80	0.85-0.98		0.65 p 0.002	1.19-fold (0.55-1.83-fold)
CR vs ultrasound ^{29 102}					0.53-fold (0.42-0.64-fold)
Ultrasound vs MRI ²⁹	0.79	0.97	0.96		1.3-fold

CR, conventional radiography..

Evaluating processes underlying the predictive value of baseline erosions for future radiological damage in early rheumatoid arthritis

Jessica A B van Nies,¹ Hanna W van Steenberghe,¹ Annemarie Krabben,¹ Wouter Stomp,² Tom W J Huizinga,¹ Monique Reijnerse,² Annette H M van der Helm-van Mil¹



Subkondral kist

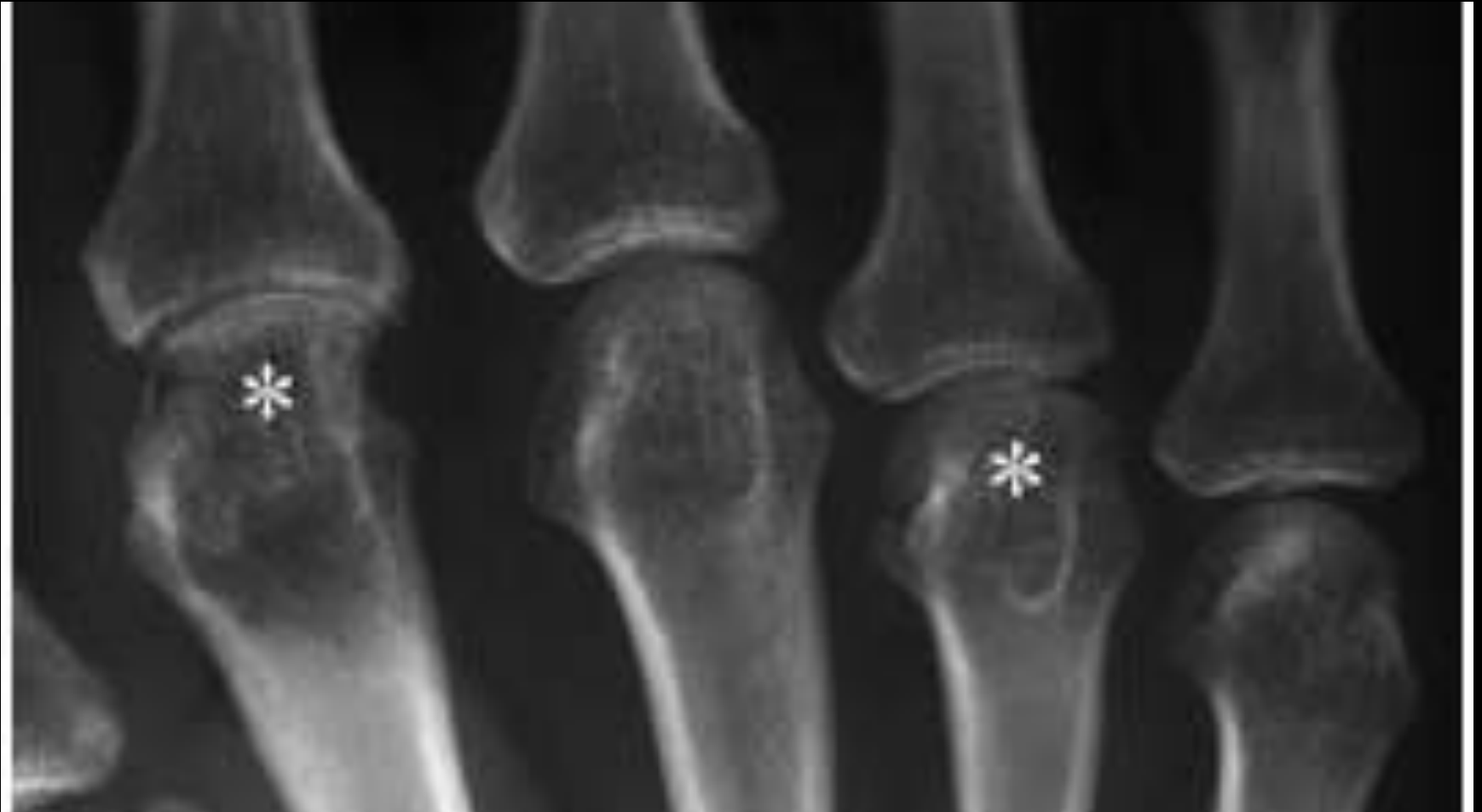


İnflamatuvar kist



- 3 den fazla
- Silik kenarlı
- Farklı şekilli

Eklem aralığında daralma



Ankiloz, deformite



2010 ACR/EULAR Classification Criteria for RA

JOINT DISTRIBUTION (0-5)

1 large joint	0
2-10 large joints	1
1-3 small joints (large joints not counted)	2
4-10 small joints (large joints not counted)	3
>10 joints (at least one small joint)	5

SEROLOGY (0-3)

Negative RF <u>AND</u> negative ACPA	0
Low positive RF <u>OR</u> low positive ACPA	2
High positive RF <u>OR</u> high positive ACPA	3

SYMPTOM DURATION (0-1)

<6 weeks	0
≥6 weeks	1

ACUTE PHASE REACTANTS (0-1)

Normal CRP <u>AND</u> normal ESR	0
Abnormal CRP <u>OR</u> abnormal ESR	1

≥6 = definite RA

What if the score is <6?

Patient might fulfill the criteria...

→ **Prospectively** over time
(cumulatively)

→ **Retrospectively** if data on all
four domains have been
adequately recorded in the past

Definitions

JOINT DISTRIBUTION (0-5)

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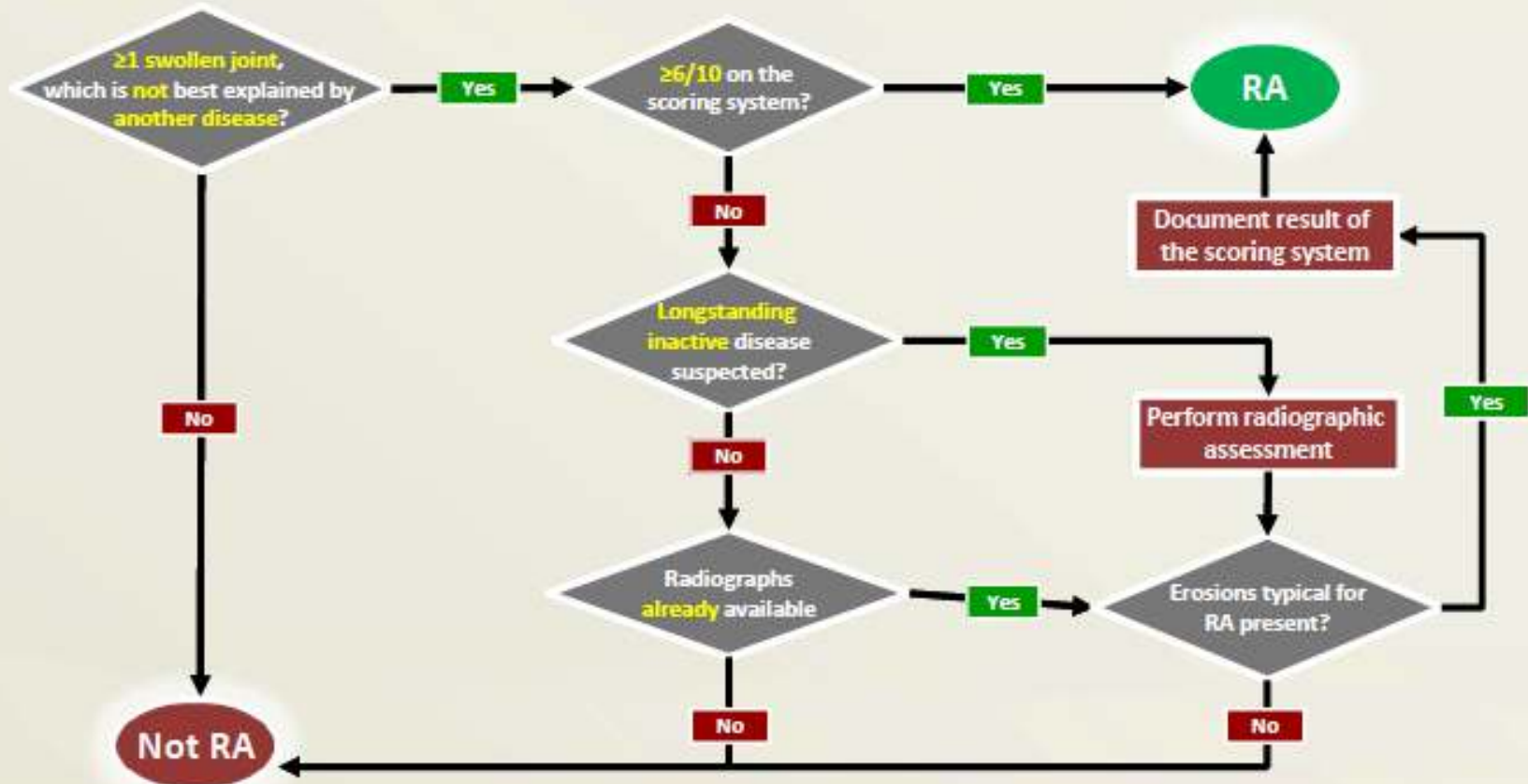
≥6 = definite RA

Definition of "JOINT INVOLVEMENT"

- Any swollen or tender joint (excluding DIP of hand and feet, 1st MTP, 1st CMC)
- Additional evidence from MRI / US may be used for confirmation of the clinical findings



Algorithm to Classification of RA Including Radiographs



Summary:

Radiographic Assessment

WHEN TO PERFORM

GENERAL PRINCIPLES

- Radiographs are **not required** in the ACR/EULAR 2010 classification criteria

- Radiographs **should not be taken** for the mere purpose of classification

EXCEPTIONS

1. Radiographs **should be taken** in the **unclassified** patient in whom **longstanding inactive** disease is suspected (likely failed classification falsely)

2. If radiographs **are already available** in an early arthritis patient, their information can be used for classification purposes. (e.g., radiographs taken by GP before referral)

HOW TO USE

- The presence of typical erosions allow classification of RA even without fulfillment of the scoring system
- The scoring result should nevertheless be documented in clinical studies/trials
- Currently, there is no exact definition of “typical erosions”
- There is work in progress to develop the respective definitions

EXTENDED REPORT

Should oligoarthritis be reclassified? Ultrasound reveals a high prevalence of subclinical disease

R J Wakefield, M J Green, H Marzo-Ortega, P G Conaghan, W W Gibbon, D McGonagle, S Proudman, P Emery

Ann Rheum Dis 2004;63:382-385. doi: 10.1136/ard.2003.007062

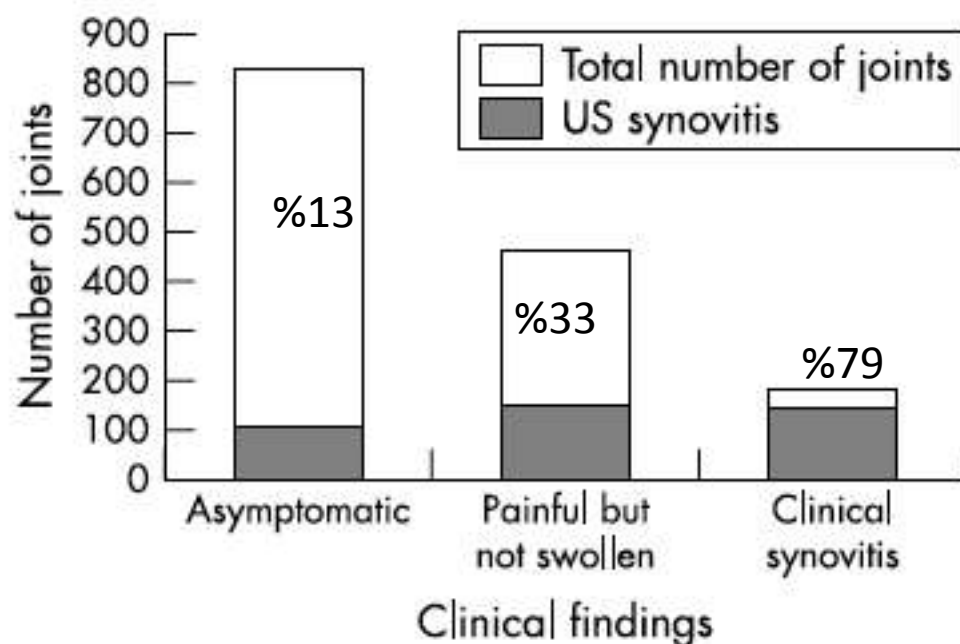


Figure 3 Prevalence of US detected synovitis in joints which were asymptomatic (n = 826), clinically painful but not swollen (n = 425), and clinically synovitic joints (n = 185).

EXTENDED REPORT

Should oligoarthritis be reclassified? Ultrasound reveals a high prevalence of subclinical disease

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Ann Rheum Dis 2004;63:382-385. doi: 10.1136/ard.2003.007062

Table 2 Comparison of demographic and laboratory data between patients with or without subclinical disease

	Subclinical disease (n = 51)	No subclinical disease (n = 29)	Significance
Female sex, No (%)	19/51 (37)	20/29 (67)	NS
Age (years), mean	36	38	NS
CRP >100 g/l, No (% of tested)	34/51 (67)	20/29 (67)	NS
RF >40 IU/l, No (% of tested)	10/51 (20)	2/29 (7)	NS
DR4 and/or DR1, No (%)	26/51 (51)	21/29 (72)	NS
HLA-B27, No (%)	15/51 (29)	3/29 (10)	NS

Usefulness of Magnetic Resonance
Imaging of the Hand versus Anticyclic Citrullinated
Peptide Antibody Testing to Confirm the Diagnosis of
Clinically Suspected Early Rheumatoid Arthritis in the
Absence of Rheumatoid Factor and Radiographic Erosions

Javier Narvaez, MD, PhD,^a Elena Sirevat, MD,^a
José Antonio Narvaez, MD,^a Jordi Bar, MD,^a
Carmen Gómez Viqueiro, MD, PhD,^a Delia Reina, MD,^a
Juan M. Nolla, MD, PhD,^b and José Valverde, MD, PhD^b

Table 3 Sensitivity and Specificity of MRI of the Hand versus Anti-CCP Antibody Testing to Confirm the Diagnosis of Clinically Suspected Early RA in the Absence of RF and Radiographic Erosions

Anti-CCP Antibody Testing	
Patients with Rheumatoid arthritis	
True positive	False positive
7	0
False negative	True negative
24	9
Sensitivity	Specificity
23%	100%
Magnetic Resonance Imaging	
Patients with rheumatoid arthritis	
True positive	False positive
31	2
False negative	True negative
0	7
Sensitivity	Specificity
100%	78%

The OMERACT MRI in Arthritis Working Group — Update on Status and Future Research Priorities

Mikkel Østergaard, Paul Bird, Frédérique Gandjbakhch, Iris Eshed, Ida K. Haugen, Espen A. Haavardsholm, Siri Lillegraven, Violaine Foltz, Daniel Glinatsi, Charles Peterfy, Bo Ejbjerg, Pernille Bøyesen, Philip J. Mease, Kay-Geert Hermann, Paul Emery, Harry K. Genant, and Philip G. Conaghan

ABSTRACT. *Objective.* To provide an update on the status and future research priorities of the Outcome Measures in Rheumatology (OMERACT) magnetic resonance imaging (MRI) in arthritis working group.

Methods. A summary is provided of the activities of the group within rheumatoid arthritis (RA), psoriatic arthritis (PsA), and osteoarthritis (OA), and its research priorities.

Results. The OMERACT RA MRI score (RAMRIS) evaluating bone erosion, bone edema (osteitis), and synovitis is now the standard method of quantifying articular pathology in RA trials. Cartilage loss is another important part of joint damage, and at the OMERACT 12 conference, we provided longitudinal data demonstrating reliability and sensitivity to change of the RAMRIS JSN component score, supporting its use in future clinical trials. The MRI group has previously developed a PsA MRI score (PsAMRIS). At OMERACT 12, PsAMRIS was evaluated in a randomized placebo-controlled trial of patients with PsA, demonstrating the responsiveness and discriminatory ability of applying the PsAMRIS to hands and feet. A hand OA MRI score (HOAMRIS) was introduced at OMERACT 11, and has subsequently been further validated. At OMERACT 12, good cross-sectional interreader reliability, but variable reliability of change scores, were reported. Potential future research areas were identified at the MRI session at OMERACT 12 including assessment of tenosynovitis in RA and enthesitis in PsA and focusing on alternative MRI techniques.

Conclusion. MRI has been further developed and validated as an outcome measure in RA, PsA, and OA. The group will continue its efforts to optimize the value of MRI as a robust biomarker in rheumatology clinical trials. (First Release Feb 15, 2015; J Rheumatol 2015;42:2470–2; doi:10.3899/jrheum.141248)



2012 provisional classification criteria for polymyalgia rheumatica: a European League Against Rheumatism/ American College of Rheumatology collaborative initiative

Table 6 PMR classification criteria scoring algorithm—required criteria: age 50 years or older, bilateral shoulder aching and abnormal CRP and/or ESR*

	Points without US (0–6)	Points with US† (0–8)
Morning stiffness duration >45 min	2	2
Hip pain or limited range of motion	1	1
Absence of RF or ACPA	2	2
Absence of other joint involvement	1	1
At least one shoulder with subdeltoid bursitis and/or biceps tenosynovitis and/or glenohumeral synovitis (either posterior or axillary) and at least one hip with synovitis and/or trochanteric bursitis	Not applicable	1
Both shoulders with subdeltoid bursitis, biceps tenosynovitis or glenohumeral synovitis	Not applicable	1

*A score of 4 or more is categorised as PMR in the algorithm without US and a score of 5 or more is categorised as PMR in the algorithm with US.

†Optional ultrasound criteria.

ACPA, anticitrullinated protein antibody; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; PMR, polymyalgia rheumatica; RF, rheumatoid factor; US, ultrasound.

Shoulder Ultrasonography in the Diagnosis of Polymyalgia Rheumatica: A Case-Control Study

FABRIZIO CANTINI, CARLO SALVARANI, IGNAZIO OLIVIERI, LAURA NICCOLI, ANGELA PADULA, LUIGI MACCHIONI, LUIGI BOIARDI, GIOVANNI CIANCIO, MARTANO MASTROROSATO, FABRIZIO RUBINI, ALESSANDRO BOZZA, and GIANNA ZANFRANCESCO (J Rheumatol 2001;28:1049-55)

Table 3. Demographic, clinical, US and MRI shoulder findings in 24 patients with active polymyalgia rheumatica and shoulder girdle involvement.

Patient	Sex/ Age, yrs	Disease Duration at Diagnosis, mo	ESR, mm/h	CRP, mg/dl	Subacromial and Subdeltoid Bursitis*		Glenohumeral Joint Synovitis*		Tenosynovitis of Long Biceps Head*	
					MRI l/r	US l/r	MRI l/r	US l/r	MRI l/r	US l/r
1	F/76	5	87	8.6	3/3	2/3	1/1	1/1	0/1	0/1
2	F/72	8	78	4.6	3/2	3/2	1/2	1/1	2/2	1/1
3	F/78	3	96	8.5	2/3	3/2	1/1	1/1	2/0	2/0
4	F/67	4	80	4.9	1/1	2/2	0/0	0/0	1/2	1/1
5	F/71	3	106	6.7	2/2	2/2	1/1	1/1	0/0	0/0
6	M/70	2	78	8.1	1/1	0/2	0/0	0/0	0/1	0/1
7	F/69	4	98	9.2	3/1	3/1	1/0	1/0	1/2	2/1
8	F/75	2	72	6.3	1/2	0/2	1/1	0/1	1/1	1/1
9	F/80	3	88	9.8	2/2	2/2	1/1	1/1	0/0	0/0
10	F/70	2	74	6.4	3/2	3/1	1/1	1/0	2/1	1/1
11	F/66	1	67	5.8	1/2	1/3	1/1	1/1	1/1	1/1
12	F/70	4	81	5.2	3/2	3/2	0/1	0/0	1/1	1/1
13	M/69	4	65	4.7	2/3	3/3	1/1	1/1	2/2	1/1
14	F/70	6	42	2.6	2/1	1/1	1/1	0/0	1/0	1/0
15	F/76	3	52	1.8	2/1	2/1	1/0	1/0	1/1	1/1
16	M/70	1	72	5.2	2/1	1/1	1/0	1/0	2/1	1/1
17	M/69	4	80	3.1	3/2	3/2	1/0	1/0	0/0	0/0
18	M/71	4	84	6.3	1/2	1/2	0/0	0/0	1/2	1/2
19	F/64	5	102	5.9	1/3	1/2	1/1	0/1	1/2	1/2
20	F/76	3	96	4.9	2/2	2/1	1/1	0/1	1/0	1/0
21	F/76	5	60	0.9	2/1	2/1	1/0	1/0	2/1	1/1
22	F/64	3	88	8.2	2/1	2/1	1/0	2/0	0/1	0/1
23	F/66	4	84	5.4	3/1	2/0	0/1	0/0	1/1	1/1
24	F/76	3	78	8.4	3/2	2/2	1/0	1/1	2/1	1/1

F: female; M: male; ESR: erythrocyte sedimentation rate; CRP: C-reactive protein; MRI: magnetic resonance imaging; US: ultrasonography; l: left shoulder; r: right shoulder.

*Fluid collection was graded with a semiquantitative scale ranging from 0 to 3 (see Materials and Methods).

Inflamed Shoulder Structures in Polymyalgia Rheumatica With Normal Erythrocyte Sedimentation Rate

Fabrizio Cantini,¹ Carlo Salvarani,² Ignazio Olivieri,³ Laura Niccoli,¹ Pierluigi Macchioni,² Luigi Boiardi,² Mariano Mastrorosato,⁴ Giovanni Ciancio,³ Angela Padula,³ Alessandro Bozza,⁴ and Fabrizio Rubini¹

Reumatismo, 2009; 61(4):290-297

LAVORO ORIGINALE

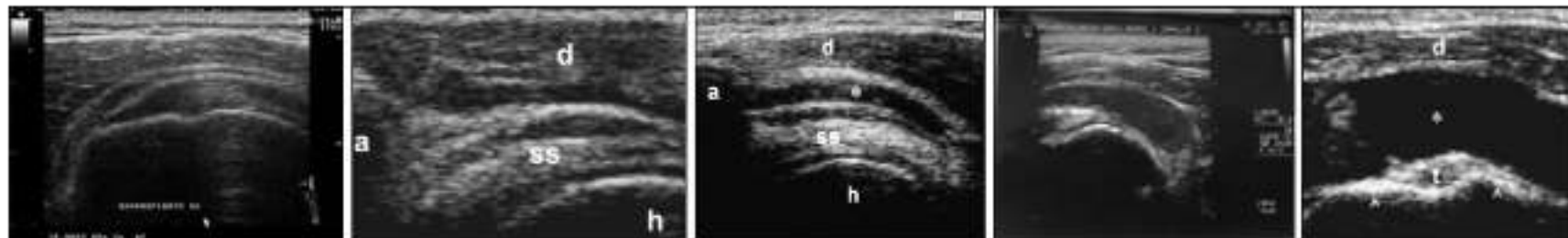
L'ausilio dell'ecografia della spalla nella diagnosi della polimialgia reumatica con velocità di eritrosedimentazione normale

The support of the ultrasonography of the shoulder in the diagnosis of polymyalgia rheumatica with normal erythrocyte sedimentation rate

A. Zaccaria, G. Latinakis, M. Oliveri, T. Maio, G. Frisone, F. Versace
Struttura Complessa (Unità Operativa) di Reumatologia, Ospedale San Paolo, Savona

Inflamed Shoulder Structures in Polymyalgia Rheumatica With Normal Erythrocyte Sedimentation Rate

Fabrizio Cantini,¹ Carlo Salvarani,² Ignazio Olivieri,³ Laura Niccoli,⁴ Pierluigi Macchioni,² Luigi Buiardi,² Mariano Mastroruscato,⁴ Giovanni Ciancio,⁵ Angela Padula,⁵ Alessandro Bozza,⁴ and Fabrizio Rubini¹



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Table 1. Comparison of the findings of magnetic resonance imaging (MRI) and ultrasonography (US) of the shoulder in polymyalgia rheumatica (PMR) patients with a normal erythrocyte sedimentation rate (ESR) (case patients) and in PMR patients with a high ESR (controls)*

Shoulder lesion	MRI			US		
	Case patients	Controls	<i>P</i>	Case patients	Controls	<i>P</i>
Bilateral bursitis	6/6	11/12	NS	6/6	11/12	NS
Grade 1†	5/12	11/24	NS	4/12	13/24	NS
Grade 2†	6/12	9/24	NS	7/12	6/24	NS
Grade 3†	1/12	3/24	NS	1/12	4/24	NS
Glenohumeral synovitis	4/6	8/12	NS	3/6	7/12	NS
Bilateral	2/6	4/12	NS	1/6	4/12	NS
Unilateral	2/6	4/12	NS	2/6	3/12	NS
Biceps tenosynovitis	5/6	8/12	NS	5/6	8/12	NS
Bilateral	3/6	6/12	NS	3/6	6/12	NS
Unilateral	2/6	2/12	NS	2/6	2/12	NS

* Except where indicated otherwise, values are the number/total number of case patients or controls.

NS = not significant.

† Number/total number of shoulders examined.



OPEN ACCESS

2015 Gout classification criteria: an American College of Rheumatology/European League Against Rheumatism collaborative initiative

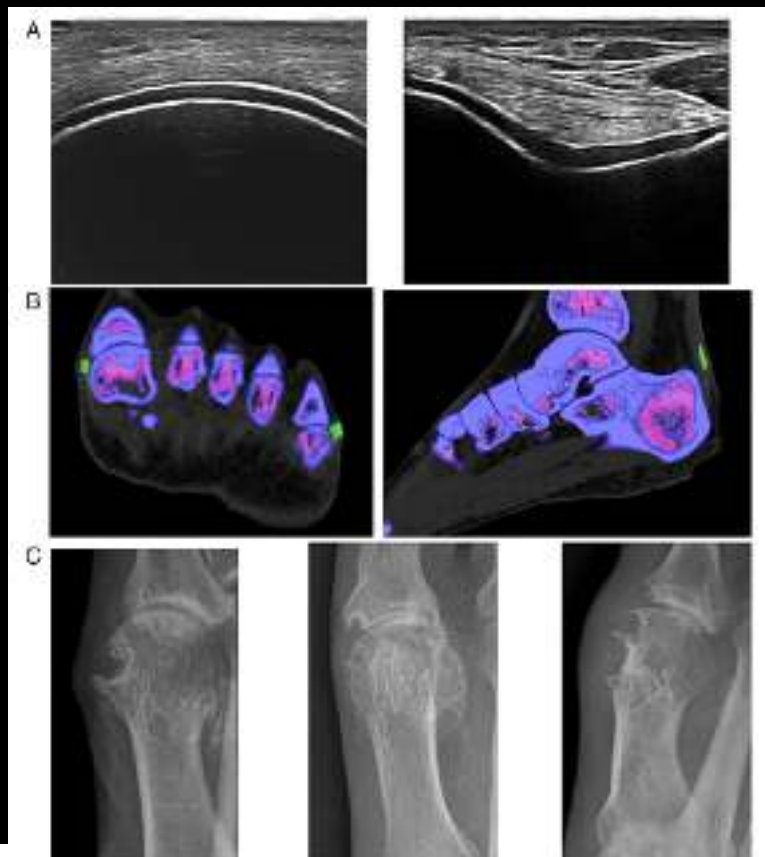
Table 2 The ACR/EULAR gout classification criteria*

	Categories	Scores
Step 1: Entry criterion (only apply criteria below to those meeting this entry criterion)	At least 1 episode of swelling, pain, or tenderness in a peripheral joint or bursa	
Step 2: Sufficient criterion (if met, can classify as gout without applying criteria below)	Presence of MSU crystals in a symptomatic joint or bursa (ie, in synovial fluid) or tophus	
Step 3: Criteria (to be used if sufficient criterion not met)		
Clinical		
Pattern of joint/bursa involvement during symptomatic episode(s) ever	Arkle or mid-foot (as part of monoarticular or oligoarticular episode without involvement of the first metatarsophalangeal joint)	1
	Involvement of the first metatarsophalangeal joint (as part of monoarticular or oligoarticular episode)	2
Characteristics of symptomatic episode(s) ever		
▶ Erythema overlying affected joint (patient reported or physician-observed)	One characteristic	1
▶ Can't bear touch or pressure to affected joint	Two characteristics	2
▶ Great difficulty with walking or inability to use affected joint	Three characteristics	3
Time course of episode(s) ever		
Presence (ever) of ≥2, irrespective of anti-inflammatory treatment		
▶ Time to maximal pain <24 h	One typical episode	1
▶ Resolution of symptoms in ≤14 days	Recurrent typical episodes	2
▶ Complete resolution (to baseline level) between symptomatic episodes		
Clinical evidence of tophus		
Draining or chalk-like subcutaneous nodule under transparent skin, often with overlying vascularity, located in typical locations: joints, ears, olecranon bursae, finger pads, tendons (eg, Achilles)	Present	4
Laboratory		
Serum urate: Measured by the uricase method. Ideally should be scored at a time when the patient was not receiving urate-lowering treatment and it was >4 weeks from the start of an episode (ie, during the intercritical period); if practicable, repeat under those conditions. The highest value irrespective of timing should be scored	<4 mg/dL (<0.24 mmol/L)	-4
	6-8 mg/dL (0.36-0.48 mmol/L)	2
	8-10 mg/dL (0.48-0.60 mmol/L)	3
	≥10 mg/dL (≥0.60 mmol/L)	4
Synovial fluid analysis of a symptomatic (ever) joint or bursa (should be assessed by a trained observer)†	MSU negative	-2
Imaging‡		
Imaging evidence of urate deposition in symptomatic (ever) joint or bursa: ultrasound evidence of double contour sign§ or DECT demonstrating urate deposition**	Present (either modality)	4
Imaging evidence of gout-related joint damage: conventional radiography of the hands and/or feet demonstrates at least 1 erosive††	Present	4



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2015 Gout classification criteria: an American College of Rheumatology/European League Against Rheumatism collaborative initiative



Imaging§

Imaging evidence of urate deposition in symptomatic (ever) joint or bursa: ultrasound evidence of double-contour sign¶ or DECT demonstrating urate deposition**

Present (either modality)

4

Imaging evidence of gout-related joint damage: conventional radiography of the hands and/or feet demonstrates at least 1 erosion††

Present

4

Gut



İkasyon kriterleri

Classification Criteria for Psoriatic Arthritis: CASPAR

June 14, 2012 | [Psoriatic Arthritis](#) [1], [Arthritis](#) [2], [Rheumatic Diseases](#) [3]
By [Jaya Philipose, MD](#) [4] and [Atul Doodhar, MD](#) [5]

Table. The CASPAR classification criteria for PsA

To be classified as having PsA, a patient must have inflammatory articular disease (joint, spine, enthesal) with ≥ 3 of the following 5 points:

Criterion	Description
1. Evidence of psoriasis (one of a, b, c): (a) Current psoriasis*	Psoriatic skin or scalp disease currently present, as judged by a rheumatologist or a dermatologist
(b) Personal history of psoriasis	A history of psoriasis obtained from patient or family physician, dermatologist, rheumatologist, or other qualified health care professional
(c) Family history of psoriasis	A history of psoriasis in a first- or second-degree relative by patient report
2. Psoriatic nail dystrophy	Typical psoriatic nail dystrophy, including onycholysis, pitting, and hyperkeratosis observed on current physical examination
3. Negative test result for RF	By any method except latex but preferably by ELISA or nephelometry, according to the local laboratory reference range
4. Dactylitis (one of a, b): (a) Current	Swelling of an entire digit
(b) History	A history of dactylitis recorded by a rheumatologist
5. Radiological evidence of juxta-articular new bone formation	II-defined ossification near joint margins (excluding osteophyte formation) on plain x-ray films of hand or foot

CASPAR, Classification Criteria for Psoriatic Arthritis; PsA, psoriatic arthritis; RF, rheumatoid factor; ELISA, enzyme-linked immunosorbent assay

*Current psoriasis scores 2, all other items score 1.

Psöriatik artrit



a.



b.

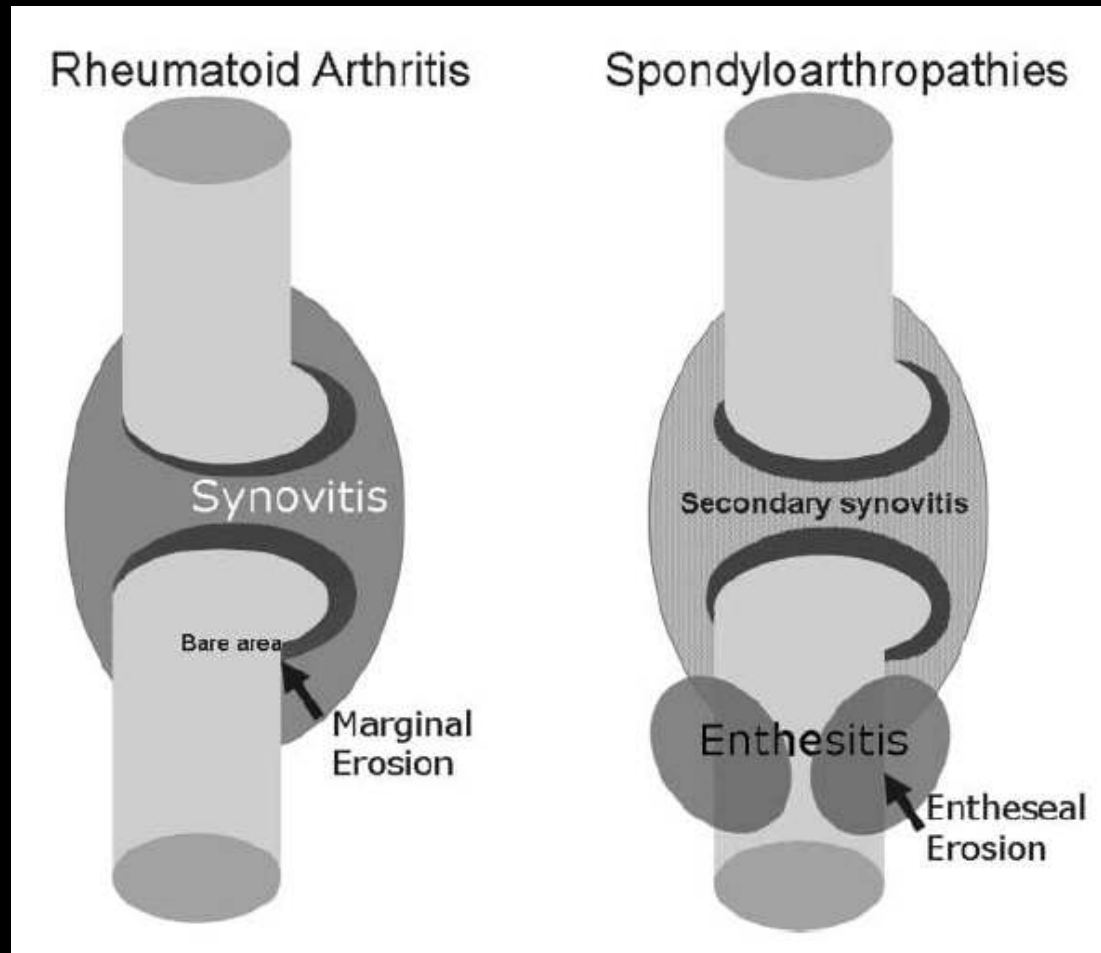
Psöriatik artrit



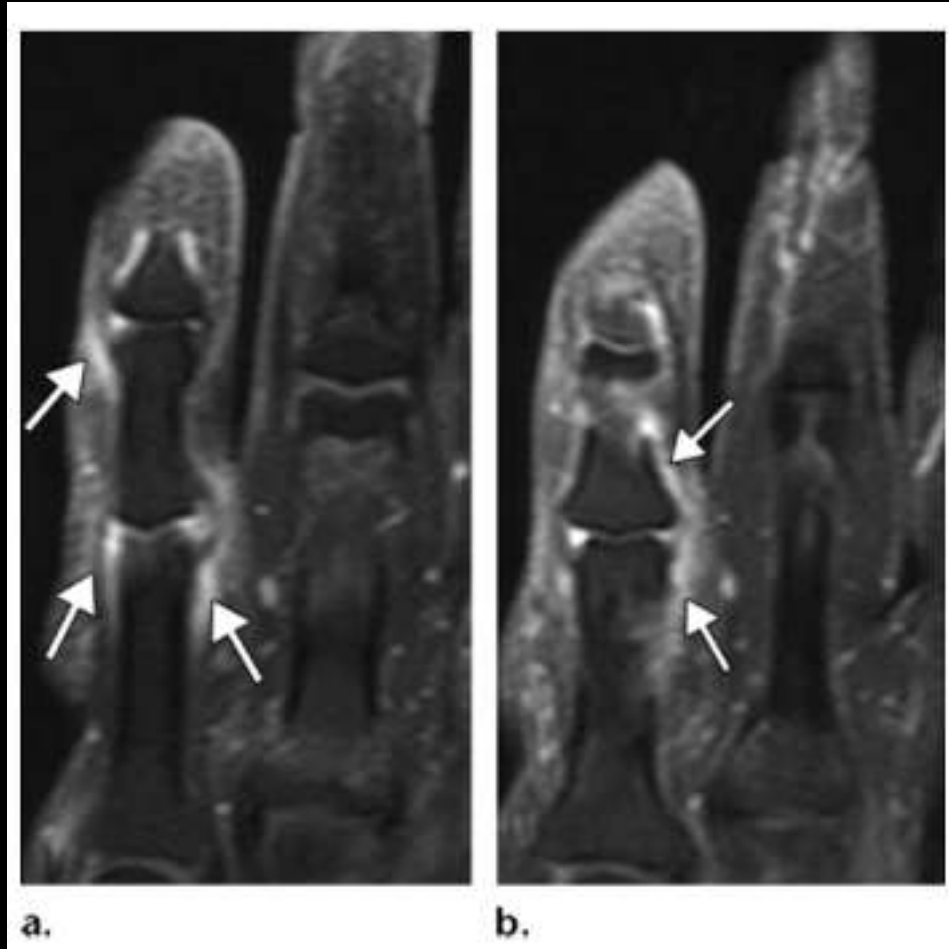
Psöriatik artrit



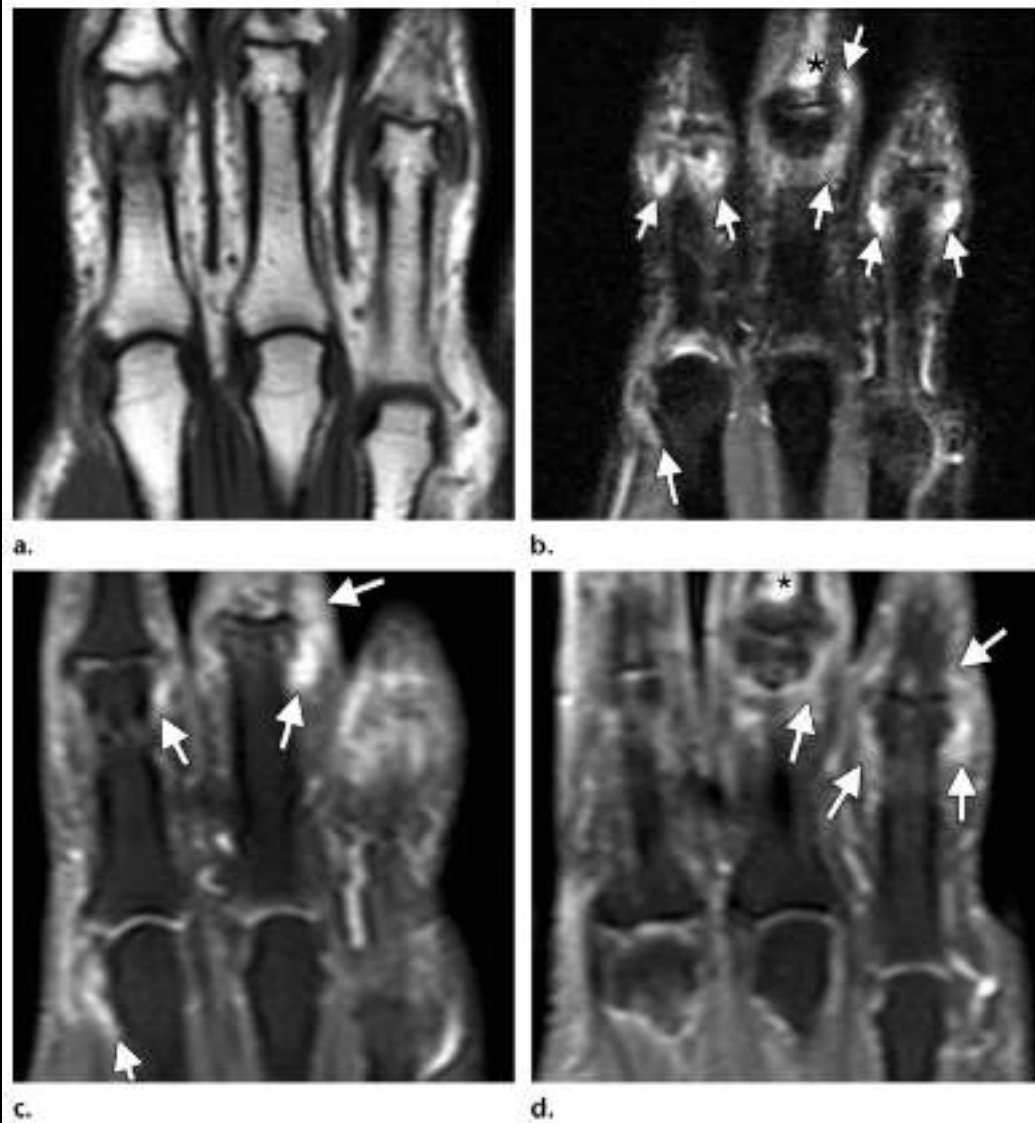
Ayrıcı tanı



Psoriatik artrit



Psoriatik artrit



Review

Early rheumatoid arthritis and its differentiation from other joint abnormalities

Nathalie Boutry^{2,*}, Clarissa Canella Moraes do Carmo², René-Marc Flipo¹, Anne Cotten²

¹ Department of Musculoskeletal Radiology, France

² Department of Rheumatology, France

Sinovit, tenosnovit; BDH, RA, PSA, SPA...

Tenosnovit; elde flexör tenosnovit PSA daha sık ve sosis parmak oluşumunda önemli-RA ext ts ?

Subkutan dokuda inflamasyon PSA ile uyumlu

Ekstrakapsüler inflamasyon PSA ile uyumlu

Eroziv lezyonlar tek başına ayırıcı tanıda yetersiz, eşlik eden proliferatif cevap, periostit; PSA , SPA

Kemik iliği ödemi hepsinde görülsede daha çok RA'yı düşündürür.

Tutulan eklemler DİF vb

Kas iskelet sisteminde Radyolojinin 'ABC' si...

Alignment

Bone mineralization

Cartilage space

Calcifications

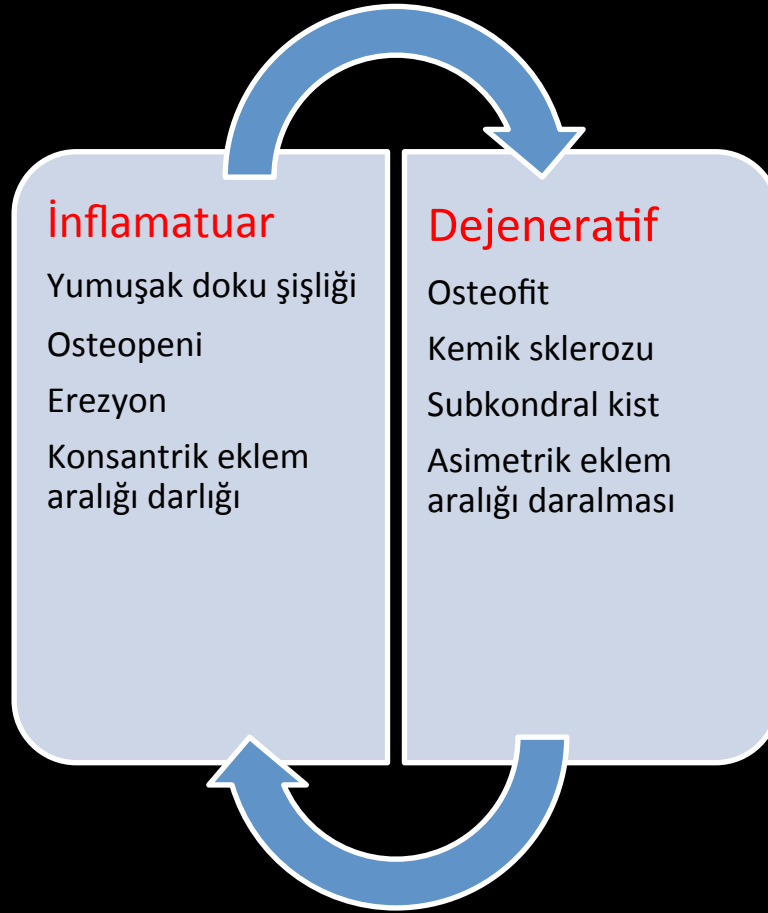
Distribution of joints

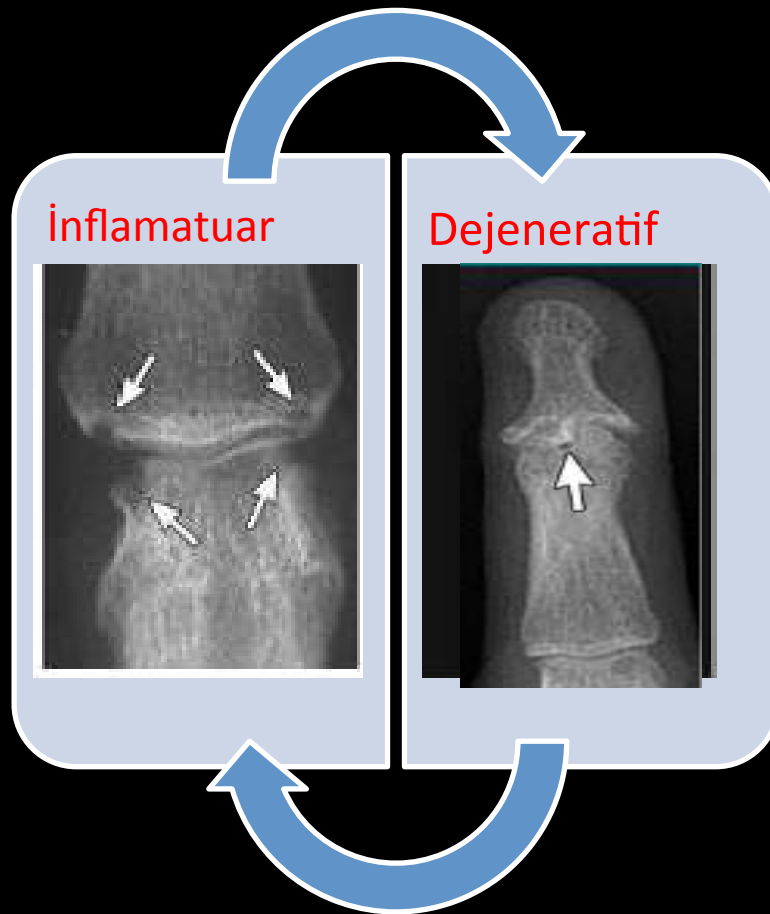
Erosions

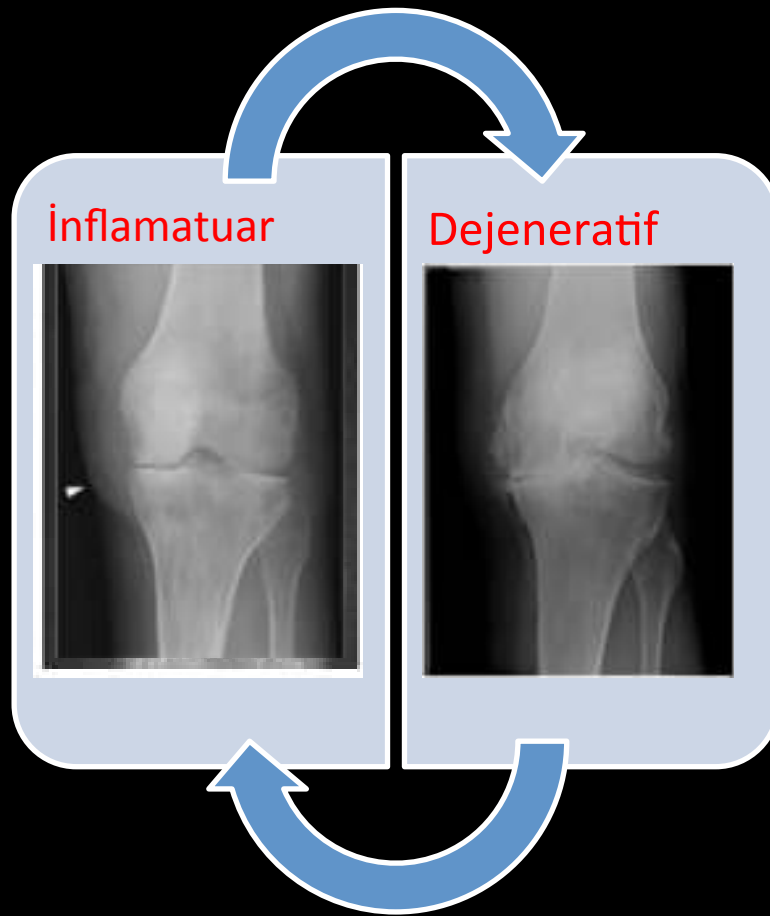
Soft tissue

Speed of development
of changes









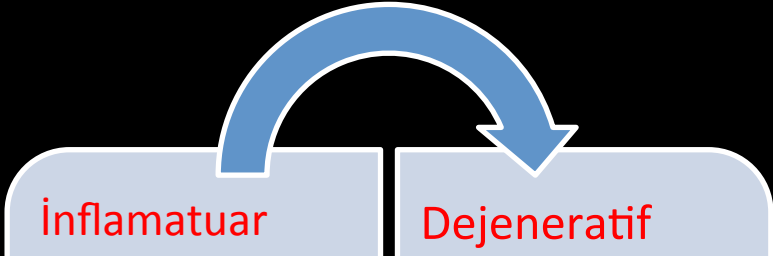


Figure 1

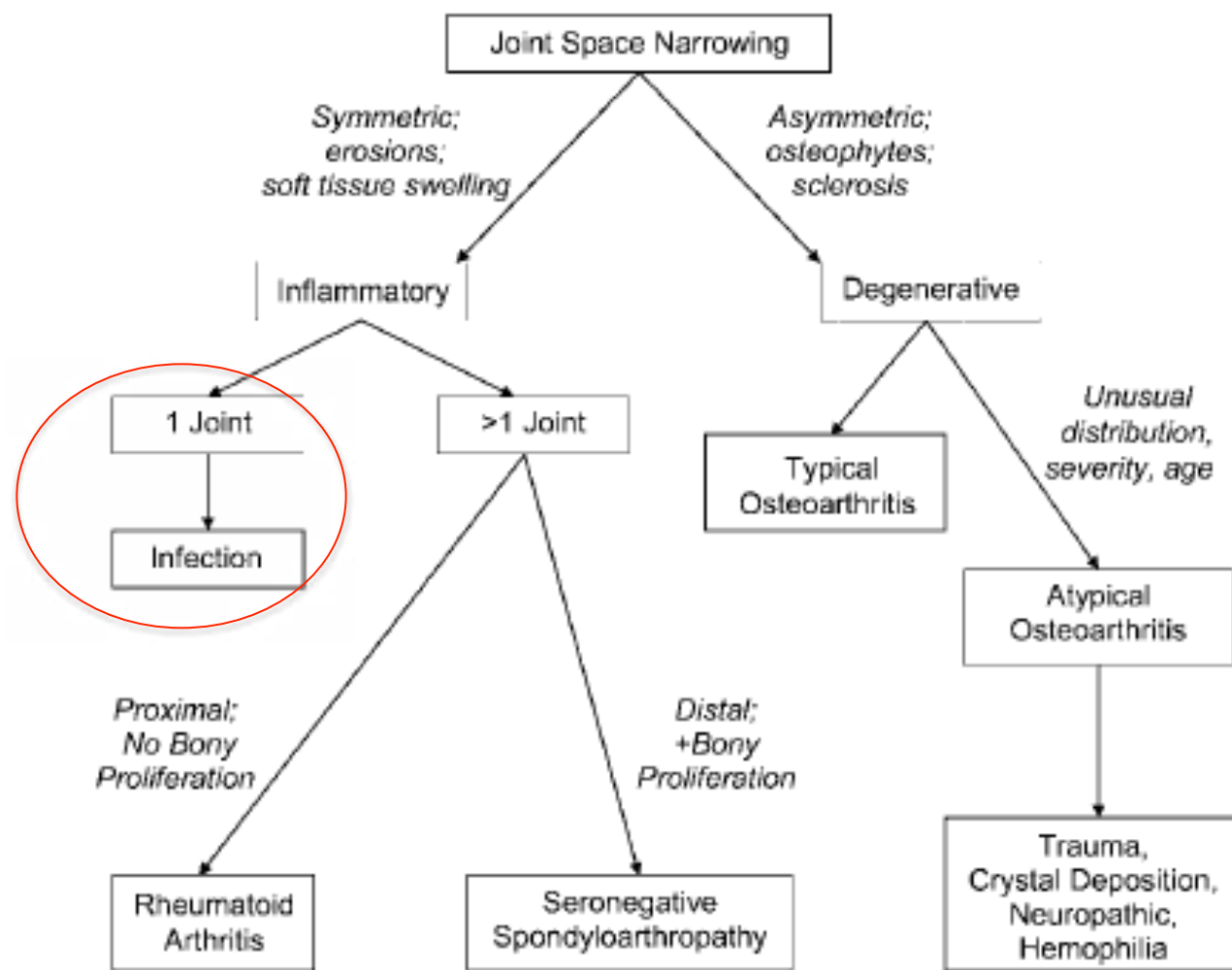


Figure 1: Flow chart shows approach to radiographic evaluation of arthritis. Algorithm begins with joint space narrowing and initially uses differentiation between inflammatory and degenerative findings to reach the final diagnosis. (Reprinted, with permission, from reference 1.)

Septik artrit



Figure 1

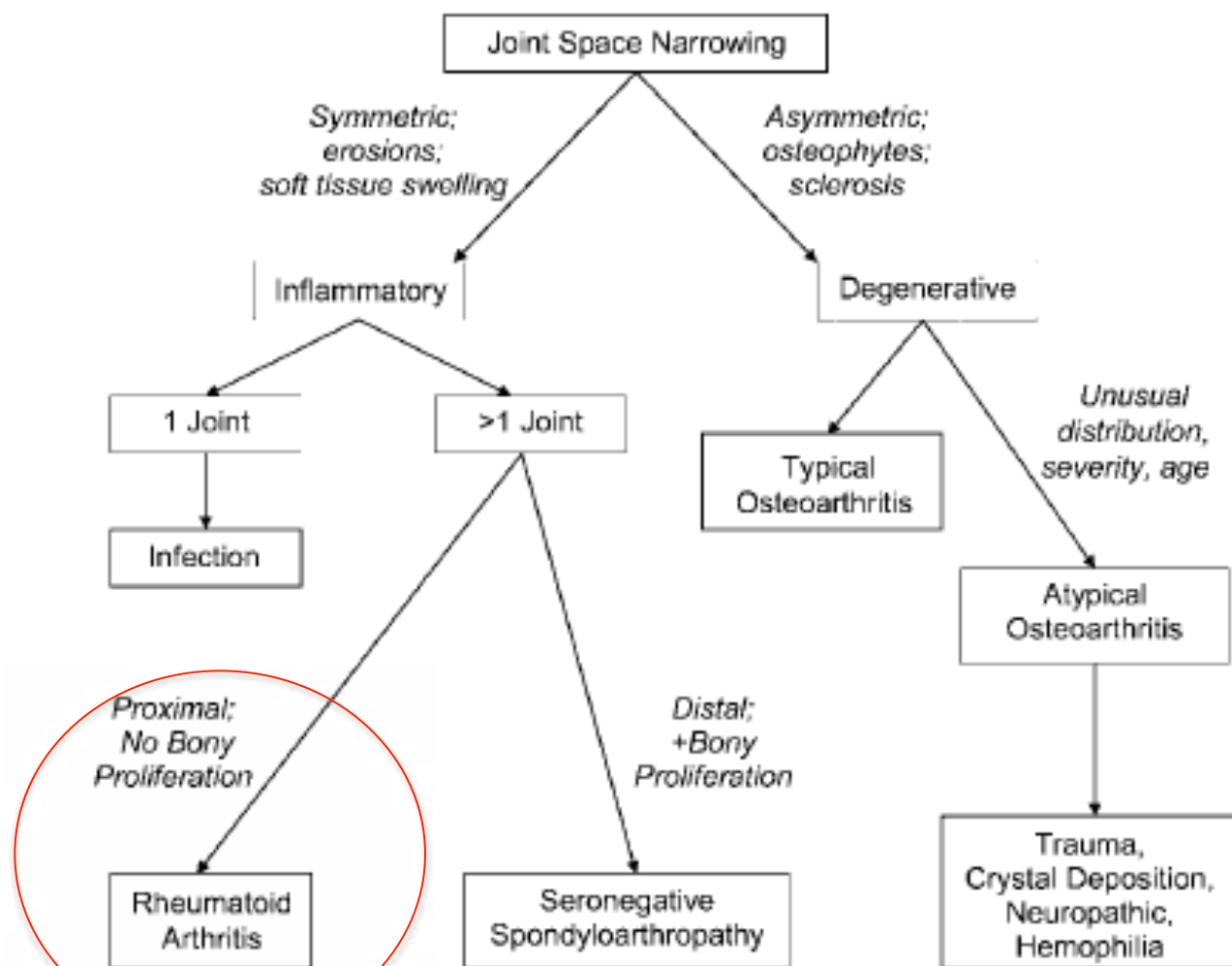


Figure 1: Flow chart shows approach to radiographic evaluation of arthritis. Algorithm begins with joint space narrowing and initially uses differentiation between inflammatory and degenerative findings to reach the final diagnosis. (Reprinted, with permission, from reference 1.)

Figure 1

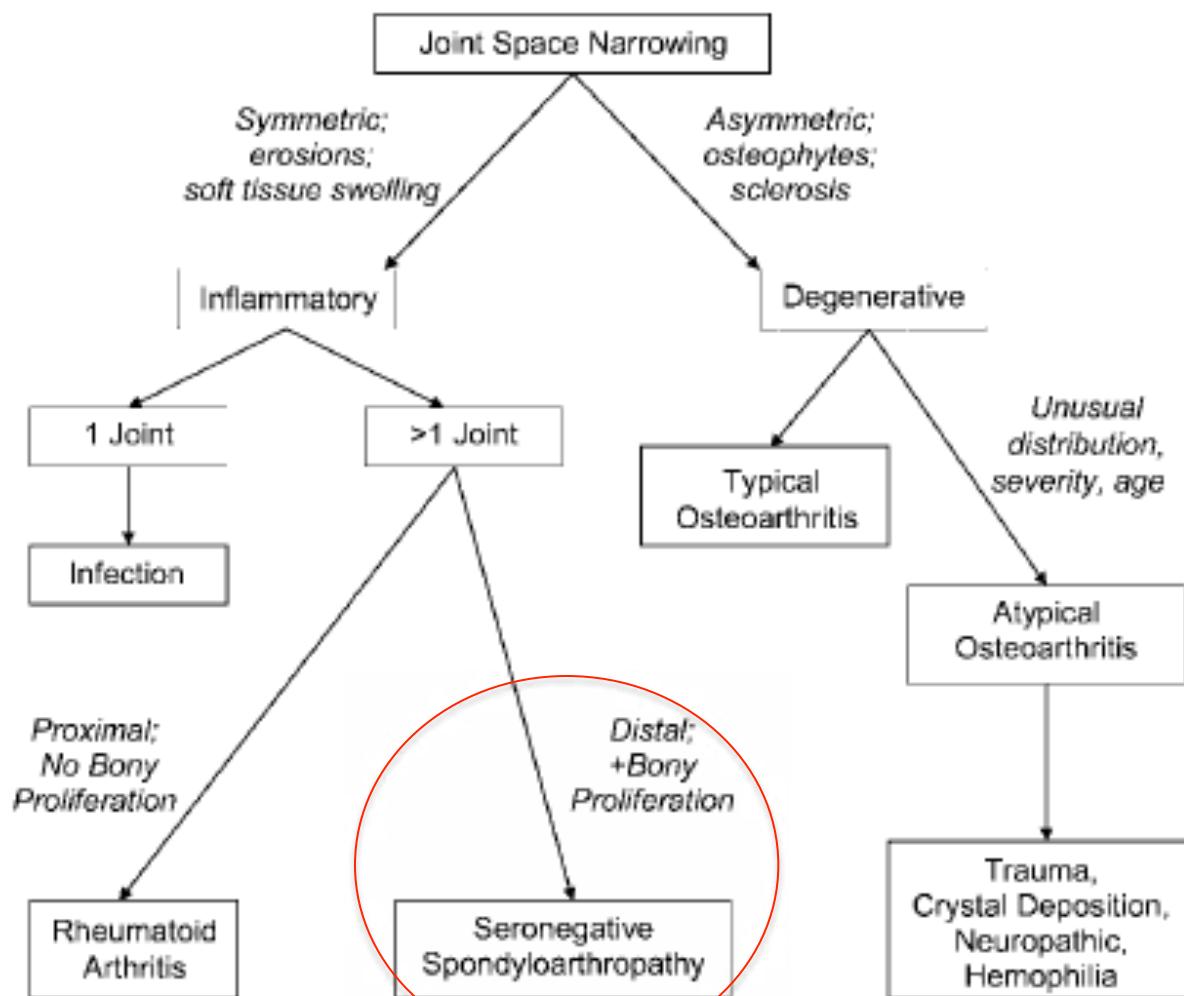


Figure 1: Flow chart shows approach to radiographic evaluation of arthritis. Algorithm begins with joint space narrowing and initially uses differentiation between inflammatory and degenerative findings to reach the final diagnosis. (Reprinted, with permission, from reference 1.)

Figure 1

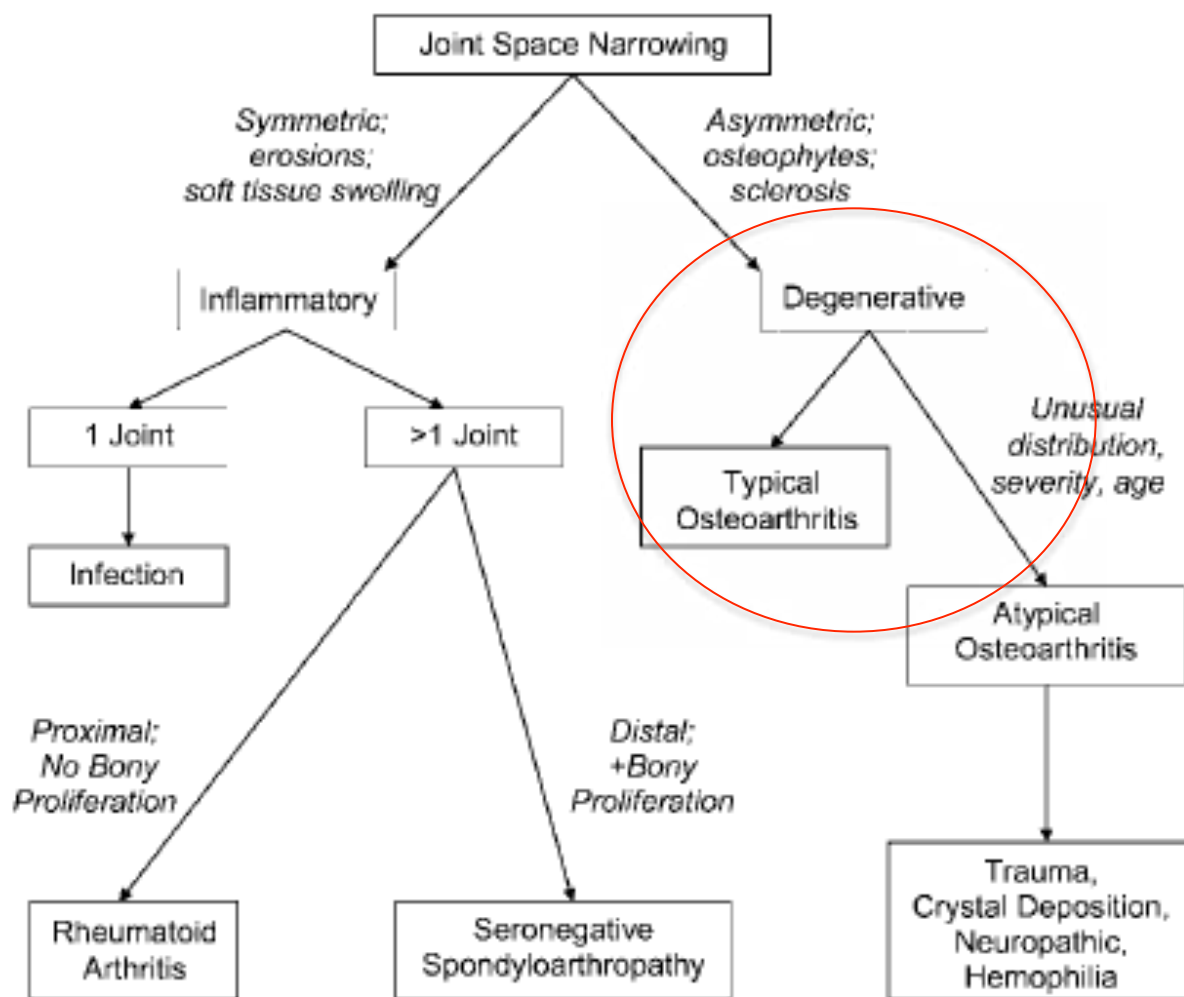


Figure 1: Flow chart shows approach to radiographic evaluation of arthritis. Algorithm begins with joint space narrowing and initially uses differentiation between inflammatory and degenerative findings to reach the final diagnosis. (Reprinted, with permission, from reference 1.)

Figure 1

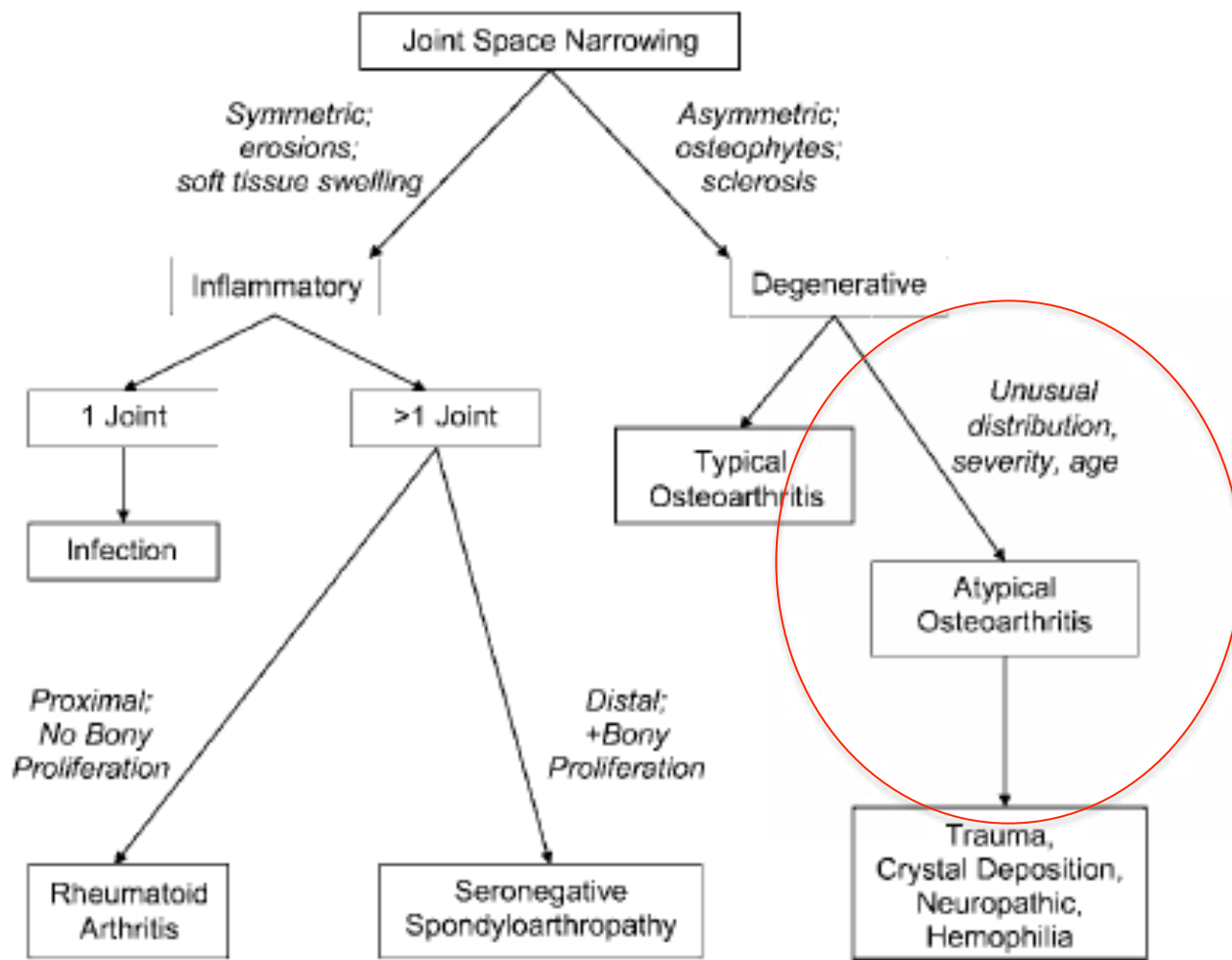


Figure 1: Flow chart shows approach to radiographic evaluation of arthritis. Algorithm begins with joint space narrowing and initially uses differentiation between inflammatory and degenerative findings to reach the final diagnosis. (Reprinted, with permission, from reference 1.)

Atipik osteoartrit

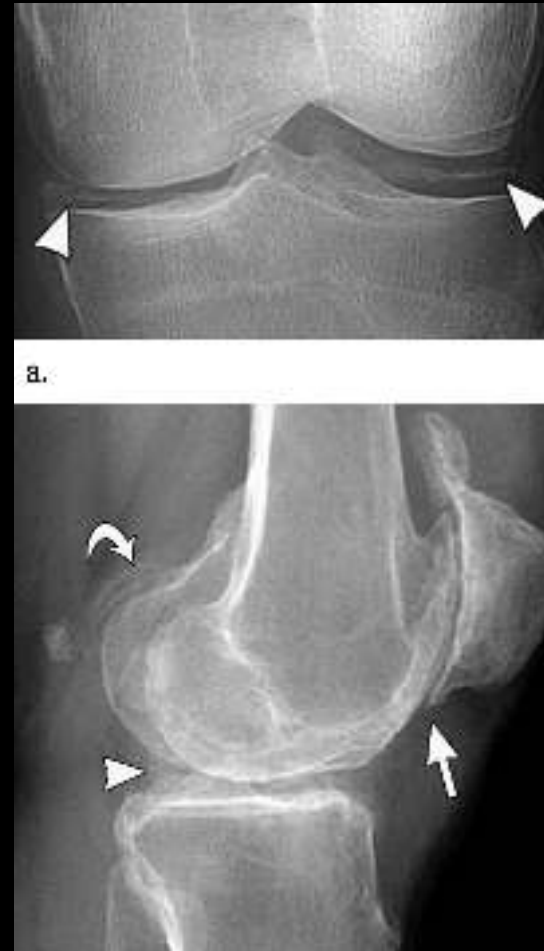
Etkilenen eklem sık etkilenmeyen bir eklem

Hastalık şiddeti ve bulguları beklenenden abartılı

Hastanın beklenen yaş ve cinsiyet ile uyumsuz , asimetric



Kondrokalsinosis CPPD



Hemokromatozis



PSODOGUT (CPPDH)

2-3 MCP eklem aralığında daralma,
Sinovyal kalsifikasyon , kapsüller
kalsifikasyon, skleroze kist ve erozyon



Hemokromatozis, 2-5 MCP eklem aralığında
daralma,
Çengel şekilli osteofitler

Nöropatik eklem, chorcot



Hemofilik artropati



Juvenil Kronik Artrit



Juvenil Kronik Artrit



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

Ann Rheum Dis 2013;

Eklem hasarının gösterilmesinde başta X-R, yetersiz kalırsa özellikle erken artritlerde USG-MRI kullanılmalıdır.

MRI aracılığıyla kemik iliği ödeminin gösterilmesi progresif hastalığın güçlü göstergesidir.

Hastalık aktivitesinin takibinde MRI ve USG faydalanılabilir.

Tedavi cevabını belirlemede İnflamasyonun görüntüleme ile gösterilmesi, hastalığın klinik özelliklerinden daha üstündür.

Servikal vertabrada instabiliteyi belirlemede boyun nötral ve leteral flexionda grafler alınmalı. Radyografinin pozitif olduğu yada spesifik nörolojik yakınma durumunda MRI ile değerlendirilmeli.

Klinik remisyon durumlarında bile, inflamasyonun MRI –USG İLE gösterilen inflamasyon gelişecek hasarın göstergesidir.

Klinik şüphe durumlarında xr, usg, mri faydalanılması tek başına klinik kriterlerin kullanılmasından üstündür.

Pierre Auguste Renoir



Teşekkürler