



ROLE OF MRI IN EARLY RHEUMATOID ARTHRITIS

Clinical History:

A 53 years old male presented with over 8 months history of:

1. Pain in the both wrist joints, more marked on the right side.
2. Compromised movements of hand (more on right side) while typing, driving and riding.
3. Minimal swelling seen in the right wrist joint.
4. No h/o trauma, fever noted.
5. X-Ray investigations normal.
6. Family h/o of rheumatoid arthritis noted.

Imaging Findings:

Patient referred for plain MR Imaging of the wrist joint.

- **Small early erosive changes were noted at the radial aspect of base of first metacarpal, in the periphery of scaphoid bone, triquetral bone and capitate bone. Few of these showed mild enhancement on post contrast scan.**
- **Small chondral erosion was also seen in the anterior part of the articular cartilage over the radius.**
- **Synovial thickening around the carpal bones.**
- **Fluid was noted along the flexor and extensor tendons.**
- **Complete tear noted in the dorsal, membranous and volar fibres of scapho-lunate ligament with scapho-lunate dissociation.**
- **No evidence of marrow edema noted.**

Final Diagnosis:

Inflammatory Arthritis- Early Rheumatoid Arthritis



Fig 1



Fig 2

Fig1:T1Wi Sag: Erosions seen along periphery of the scaphoid.
 Fig2: Post contrast T1Wi Cor: Enhancement in the erosion in the capitate bone.

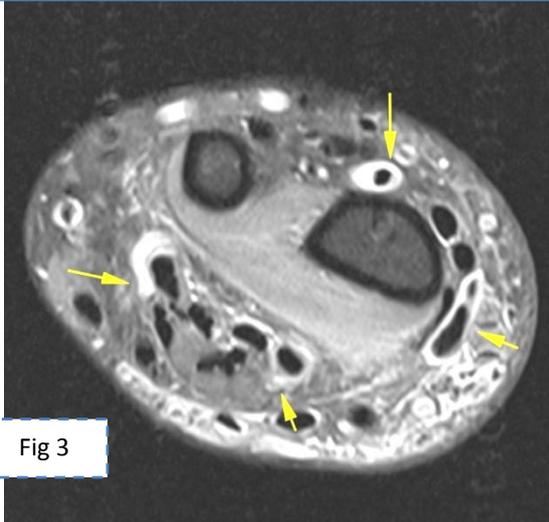


Fig 3

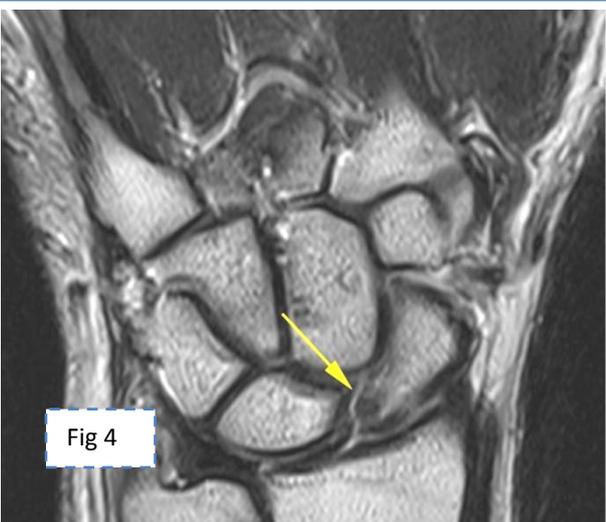


Fig 4

PDFS Axial: Fluid noted along the flexor and extensor tendons.
 T2Wi Cor: Scapho-lunate ligament tear with scapho-lunate dissociation.



Discussion:

Rheumatoid Arthritis (RA) is the most common inflammatory arthritis affecting approx 1% of world population. Early diagnosis and treatment is essential for improving clinical outcomes in patients with early RA.

Early rheumatoid arthritis is not defined precisely in the literature and has become a “moving target” as more tests for early diagnosis become available. Most authors use the term to describe only disease duration of less than 1 year from the first episode of clinically detectable joint inflammation, although the duration of early rheumatoid arthritis varies widely in the literature

MRI is increasingly being used in the assessment of RA due to its capacity to help identify the key pathologic features of this disease entity at presentation.

MR Imaging has demonstrated greater sensitivity for detection of synovitis and erosions than either clinical examination or conventional radiology and can help establish an early diagnosis of RA.

MR Imaging : In early rheumatoid arthritis, wrist and hand involvement is usually bilateral. However, we prefer to study the dominant or more painful wrist, on the assumption that joint involvement will be lower (or at least not greater) on the contralateral side.

- **Synovitis:** It is the earliest abnormality to appear in rheumatoid arthritis. MR imaging signs of synovitis include increased synovial volume, increased water content & contrast enhancement.
- **Effusions:** Occurs early in RA and is commonly associated with synovitis. Contrast enhanced TIWI images and heavily weighted T2WI help differentiate synovitis and effusions.
- **Bone Marrow Edema:** It is reported to be distinctive MR imaging finding in patients with RA, especially in the earlier phases of the disease. In early rheumatoid arthritis, bone marrow edema is usually located in the subchondral bone. This is well seen in the metacarpophalangeal or proximal interphalangeal joints; however, in carpal bones, which have several articular surfaces, bone marrow edema changes may involve a great proportion of bone at some distance from the subchondral regions . Bone marrow edema may be seen alone or surrounding bone erosions and is considered to be a potentially reversible phenomenon.
- **Erosions:** Detection of erosions in patients with early RA is key imaging finding, since it indicates irreversible joint damage. MR imaging helps detect more bone erosions in the wrist and hand in early RA than does radiography. The contrast enhancement of erosions implies the presence inflamed synovium within the defect and is useful in differentiating them from fluid filled cystic lesions. Early erosions start in the “bare areas” (cartilaginous void) of the joint as a result of synovial proliferation. This is best seen in the metacarpophalangeal joints , where there is an increased



likelihood of both synovitis and bone erosion formation on the radial side in early rheumatoid arthritis

- **Tenosynovitis:** MR Imaging signs of tenosynovitis include fluid in the tendon sheath, increased thickness or contrast enhancement of the tendon sheath synovium. Dorsal tenosynovitis of the wrist is associated with tendon rupture. Ligament tears may also be noted. Rupture or tears have been related to invasion of the tendon by tendon sheath synovitis and to fraying of the tendon against eroded bone margins. Tendonitis may also be frequently seen adjacent to regions of tenosynovitis. In addition MR Imaging can help differentiate RA for clinical subsets of peripheral spondyloarthropathies by allowing identification of enthesitis.

Message: There are several clinical situations in which MR imaging could be of use in the evaluation of inflammatory joint disease.

1. In cases of suspected but unconfirmed inflammatory joint disease, to determine the presence or absence of synovitis, tenosynovitis, bone marrow edema, or erosions.
2. In patients with early unclassified arthritis, to assist in developing the differential diagnosis (detection of enthesitis, suggest the diagnosis of seronegative spondyloarthropathy).
3. In early rheumatoid arthritis, for prognostic purposes and for establishing baseline values for joint damage to ensure accurate diagnosis and classification in patients who present with rheumatoid arthritis.

Regards,

Dr.Deepa S.Nadkarni / Dr.Shaikh M.Mazhar

Reference: MR Imaging of Early Rheumatoid Arthritis, Radiographics-José A. Narvaez, MD, Javier Narváez, PhD, Eugenia De Lama, MD and Matías De Albert, MD ; MRI in Orthopedics & Sports Medicine –David W.Stoller

N.B: This case is authentic and from the archives of Radiance Diagnostics. For any queries / suggestions/feedback write to us at radiance@radiancediagnostics.in