



UNIVERSITY of  
**ROCHESTER**  
MEDICAL CENTER

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DEPARTMENT OF IMAGING SCIENCES

## Imaging Sciences Interesting Cases

### CASE 43

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**CLINICAL PRESENTATION:** Patient with advanced rheumatoid arthritis and hand pain.

**IMAGING FINDINGS:** There is diffuse osteopenia of the visualized bones of the hand and wrist. There are significant destructive changes in the wrist with extensive bony fusion. There is significant destruction of all visualized metacarpophalangeal joints which demonstrate postsurgical changes of previous joint replacement. No evidence of acute fracture.



**Figure 1A-C.** PA, lateral, and oblique images demonstrate extensive osteopenia, advanced bony fusion at the wrist, soft tissue swelling, and bony destruction at multiple joints. In addition, postoperative changes of failed joint replacements are seen.

## **DIAGNOSIS: Rheumatoid Arthritis**

**DISCUSSION:** Rheumatoid arthritis is a chronic systemic inflammatory process of unknown etiology, which affects the articular structures and synovial membranes of multiple joints. In the upper extremity, rheumatoid arthritis is most often characterized by bilateral, symmetrical joint involvement; frequently involving the carpal joints, MCP joints, and PIP joints. When these structures are involved, typical radiographic findings include bony erosions, cysts, joint space/soft tissue swelling, calcifications, narrowed joint space, deformities, separations, and fractures. One of the early radiographic signs is ulnar styloid tip erosion. Erosions are also common at the distal radius and ulna. Another key radiographic feature is juxta-articular osteopenia. Joints are typically affected by pannus formation, a synovial mass which results in marginal erosions at the junction of articular cartilage and bare areas of bone.

Rheumatoid arthritis usually has an insidious onset, although in rare cases the onset can be abrupt. The diagnosis can be made when 4 of 7 qualifying criteria established by the American Rheumatism Association are met. These qualifying criteria include:

- \* Morning stiffness lasting longer than 1 hour before improvement
- \* Arthritis involving 3 or more joints
- \* Arthritis of the hand, particularly involvement of the proximal interphalangeal (PIP) joints, metacarpophalangeal (MCP) joints, or wrist joints
- \* Bilateral involvement of joint areas (ie, both wrists, symmetric PIP and MCP joints)
- \* Positive serum rheumatoid factor (RF) (30% of patients with rheumatoid arthritis are Rh factor negative)
- \* Rheumatoid nodules
- \* Radiographic evidence of RA

Top differential diagnoses include osteoarthritis, autoimmune chronic polyarthritis, psoriatic arthritis, infectious arthritis, juvenile chronic arthritis, crystal deposition disease, and reflex sympathetic dystrophy (Sudeck's).

## **REFERENCES:**

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