

MILWAUKEE SHOULDER SYNDROME

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Milwaukee shoulder syndrome or rapid destructive arthropathy of the shoulder is a rare form of arthropathy that mainly affects elderly women. It is characterized by a rapid destruction of the glenohumeral joint and the rotator cuff and by an important noninflammatory joint effusion containing hydroxyapatite crystals.

Radiography plays an important role in the evaluation of patients with articular disease. However, magnetic resonance imaging is the method of choice for assessing the full extent of osseous, chondral, and soft-tissue involvement.

Key-words: Shoulder, arthritis.

Case report

An 84-year-old woman presented to her physician with right shoulder pain and a restricted active and passive range of motion of the affected shoulder. Swelling of the shoulder was absent and there was no history of recent trauma. Her medical history was unremarkable.

Radiography of the right shoulder (Fig. 1) showed a destruction and cranial subluxation of the humeral head with intra-articular calcifications. A chest radiograph taken six months earlier (Fig. 2) showed none of these findings.

CT scan (Fig. 3A, B) revealed a deformed humeral head with intra-articular and peri-articular calcifications and a large joint effusion.

MRI (Fig. 4 A,B) also demonstrated an effusion, destruction and subluxation of the humeral head, thinning and destruction of the cartilage and subchondral bone. There was some synovial thickening and abnormal bone marrow signal (arrow). A partial undersurface tear of the supraspinatus tendon was demonstrated.

Synovial fluid contained no leucocytes and culture was negative.

Based on these imaging findings and the rapid destruction of the glenohumeral joint over a short period of the time, the diagnosis of Milwaukee shoulder or rapid destructive arthropathy of the shoulder was made.

Discussion

Milwaukee shoulder syndrome is a relatively uncommon entity first described by McCarty et al. in 1981 in Milwaukee, Wisconsin.



Fig. 1. — Radiograph of the right shoulder. Partial destruction of the humeral head with cranial subluxation and intra-articular calcifications (arrow).



Fig. 2. — Normal glenohumeral joint on a spot film of the right shoulder taken six months earlier.

Rapid destructive arthropathy mainly affects elderly woman with an age ranging from 50 to 90 years old.

Both shoulders are affected in 64% with preferential involvement of the dominant side (1).

The knees are affected in 50% (2).

Symptoms include joint pain and tenderness, restricted range of motion or less frequently excessively mobile glenohumeral joints. Swelling due to an effusion is seen in most of the cases. Analysis of the synovial fluid reveals a high number of erythrocytes, a low leukocyte count and large concentrations of

calcium hydroxyapatite. In 10% admixture of calcium pyrophosphate crystals can occur (2).

It is believed that calcium hydroxyapatite and calcium pyrophosphate crystals develop in degenerative cartilage and in altered synovium and are released into the joint.

These crystals, phagocytosed by synovial cells, then stimulate the release of collagenase and active protease. The release of these proteolytic enzymes results in joint and rotator cuff destruction with further release of additional crystals into the joint and thereby creating a vicious cycle and aggravating the destructive process (3).

Predisposing factors are recent trauma (most often fall on an outstretched hand) or joint overuse, associated pyrophosphate deposition, neuroarthropathy, dialysis and hyperparathyroidism (1, 4).

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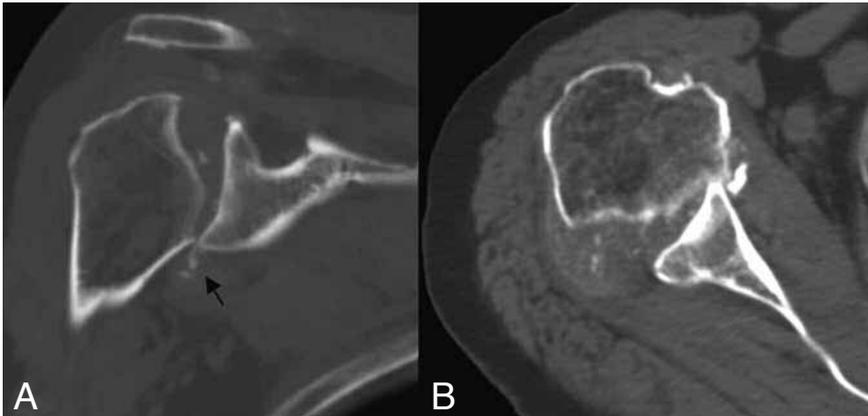


Fig. 3. — Coronal (A) and axial (B) CT image. Deformity and subluxation of the humeral head with intra-articular effusion, calcifications (arrow) and subchondral sclerosis.

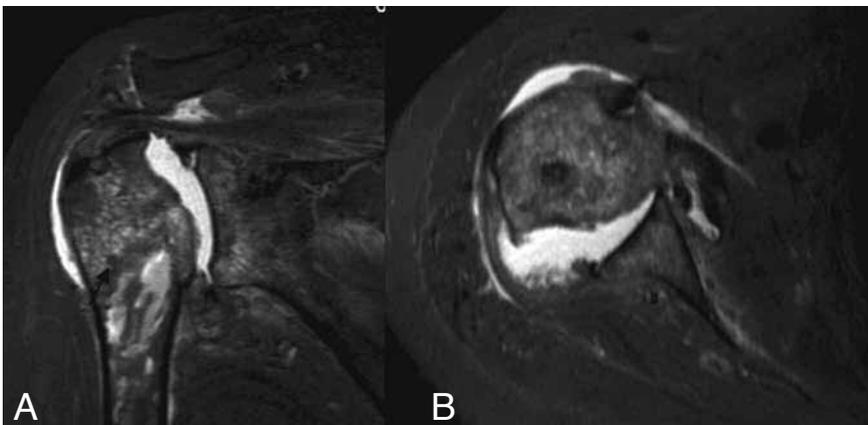


Fig. 4. — Coronal (A) and axial (B) STIR MRI image. Deformity of the humeral head with cartilage destruction. Intra-articular effusion and a partial tear of the rotator cuff.

Radiography and MR imaging play a major role in evaluation and differential diagnosis of suspected arthropathy. However, due to its superior soft-tissue contrast resolution and nonreformatted multiplanar imaging capability, MR imaging has become the imaging modality of choice.

On plain radiographs, Milwaukee shoulder manifests as glenohumeral joint space narrowing with little or no osteophytosis, cranial subluxation of the humeral head with often

formation of a pseudoarthrosis with the acromion and distal clavicle, subchondral sclerosis with cyst formation in the humeral head, destruction of subchondral bone with partial bony collapse of the head, intra- and peri-articular calcifications and soft tissue swelling and intra-articular loose bodies.

CT findings are similar to the radiographic characteristics.

MR findings consist of a large joint effusion, a (large) tear of the rotator cuff, narrowing of the

glenohumeral joint, thinning of the cartilage and destruction of the subchondral bone (5).

Ultrasound may show calcific foci, joint effusion and an absent rotator cuff but it has no added diagnostic value.

In the differential diagnosis we must consider neuropathic arthropathy of the shoulder (frequently associated with syringomyelia), avascular necrosis, dialysis arthropathy, rheumatoid arthritis and septic arthritis (2).

Treatment is symptomatic and includes physical therapy, non-steroidal anti-inflammatory drugs and intra-articular injection of steroids. Joint replacement by a shoulder prosthesis is a theoretical option but is technically challenging without the stabilizing effect of the rotator cuff.

Tidal irrigation followed by intra-articular injection of steroids and tranexamic acid could affect the long term outcome of some patients with mild Milwaukee shoulder syndrome but is still controversial (6).

References

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