

Distal clavicular osteolysis in a bodybuilder

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Section: Musculoskeletal system

Area of Interest: Extremities Musculoskeletal bone

Musculoskeletal joint

Procedure: Diagnostic procedure

Imaging Technique: Conventional radiography

Imaging Technique: MR

Special Focus: Athletic injuries Case Type: Clinical Cases

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Patient: 33 years, male

Clinical History:

A 33-year-old amateur body-builder presents with left shoulder pain for about 5 months, without a history of preceding acute trauma. Palpation of the acromioclavicular joint is painful. Mobilisation of the left shoulder is normal and painless.

Imaging Findings:

Standard radiography showed cortical irregularity of the articular side of the distal clavicle (Fig. 1a, b). The acromion appeared to be normal. The patient underwent an MR arthrography because initially rotator cuff pathology was suspected. The rotator cuff tendons and capsulolabral system were normal. There was marked bone marrow oedema in the distal clavicle while the signal of the distal acromion was almost normal (Fig. 2a, b). The subchondral cortex of the distal clavicle appeared thinned and was irregularly delineated (Fig. 2a). A mild AC-joint effusion and hypertrophy of the joint capsule was present (Fig. 2a, c). Follow-up radiographs 2 months after the initial presentation showed a normal right AC joint (Fig. 3a), whereas residual osteolysis was seen at the superolateral aspect of the left clavicle (Fig. 3b).

Discussion:

Distal clavicular osteolysis (DCO) follows both chronic repetitive stress and single acromioclavicular trauma [1]. The exact aetiopathogenesis is unclear, but AC-joint trauma and subchondral microfractures seem to be involved [1, 2]. Subsequent attempts at repair are insufficient and the final result is osteolysis [1, 4]. It is unclear why changes predominate in the distal clavicle while the acromion is relatively spared [1].

DCO has been most frequently reported in weightlifters and bodybuilders [1, 2]. Overhead sports, especially when combined with supplemental weight training, are also at increased risk [4]. Professional activities requiring similar movements or exposure to chronic repetitive stress (e.g. pneumatic drill operation) can also cause DCO [5].

Clinical findings are often nonspecific and frequently overlap with those of labral or rotator cuff tears [5]. Patients experience pain in the AC-joint region, exacerbated by weight training and relieved by prolonged rest [2]. Targeted clinical examination reveals point tenderness over the AC-joint and painful cross-body adduction [2, 4].

Conventional radiographs may remain normal during the first months or years after the onset of training [1, 3]. A 15° cephalad inclination avoids superposition of the scapular spine with the AC-joint [2]. Radiographic changes include

cortical thinning, irregularity and microcysts in distal clavicle and mild AC–joint widening [1, 2]. A late finding is tapering of the distal clavicle [2]. MRI is far more sensitive to detect DCO in an early stage [1]. The most common MR-finding is bone marrow oedema in the distal clavicle, sometimes also in the articular part of the acromion, but less distinct [1, 3]. Often, a hypointense line is seen in this area of clavicular bone marrow oedema, representing a subchondral fracture [1, 4]. AC-joint abnormalities are common, and include effusion, mild widening, intra-articular bone fragments and capsule hypertrophy [2, 5]. Other MR-findings are similar to those seen on radiographs, as described above.

Treatment is essentially conservative, consisting of rest and nonsteroidal anti-inflammatory drugs (NSAID's), and is usually successful [2, 4]. In severe cases, resection of the distal clavicle is indicated [1, 2]. If left untreated, the process may cause progressive resorption of lateral aspect of the clavicle, erosions and cupping of the acromion and dystrophic calcifications [3].

DCO should be considered in the differential diagnosis of shoulder pain in the appropriate population. Therefore, analysis of MR arthrographic studies of the shoulder should not be restricted to evaluation of the rotator cuff and capsulolabral system, but the AC-joint should be scrutinised as well.

Differential Diagnosis List: Distal clavicular osteolysis, Septic arthritis, Rheumatoid arthritis, Hyperparathyroidism, Gout, Corticosteroid induced arthropathy, Scleroderma, Primary or metastatic neoplasm (including multiple myeloma)

Final Diagnosis: Distal clavicular osteolysis

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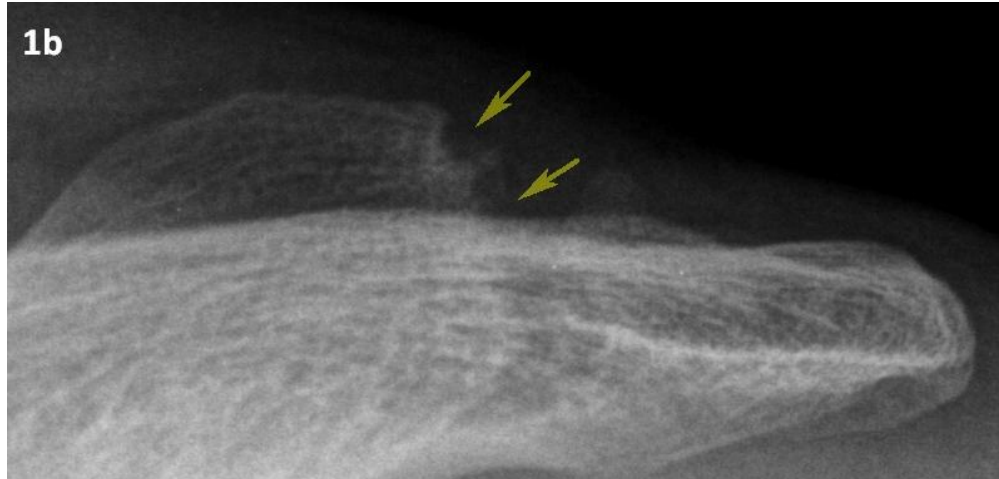
Figure 1

a



Description: Yellow arrows: irregular delineation of the articular cortex of the acromial end of the clavicle. **Origin:** Department of Radiology, AZ Sint-Maarten, Mechelen, Belgium

b

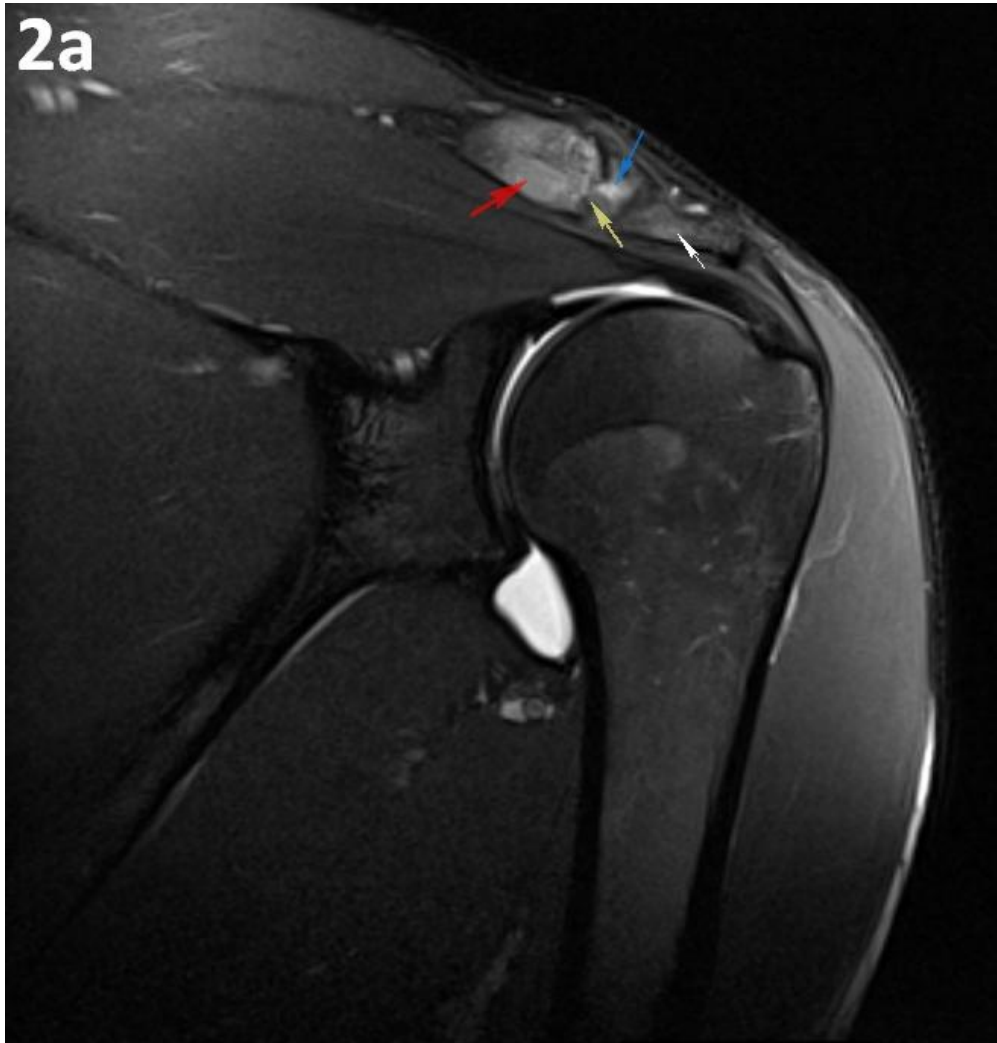


Description: Enlarged view of the AC-joint.

Yellow arrows: irregular delineation of the articular cortex of the acromial end of the clavicle. **Origin:** Department of Radiology, AZ Sint-Maarten, Mechelen, Belgium

Figure 2

a



Description: MRI T2 fs, coronal image.

Red arrow: bone marrow oedema in distal clavicle.

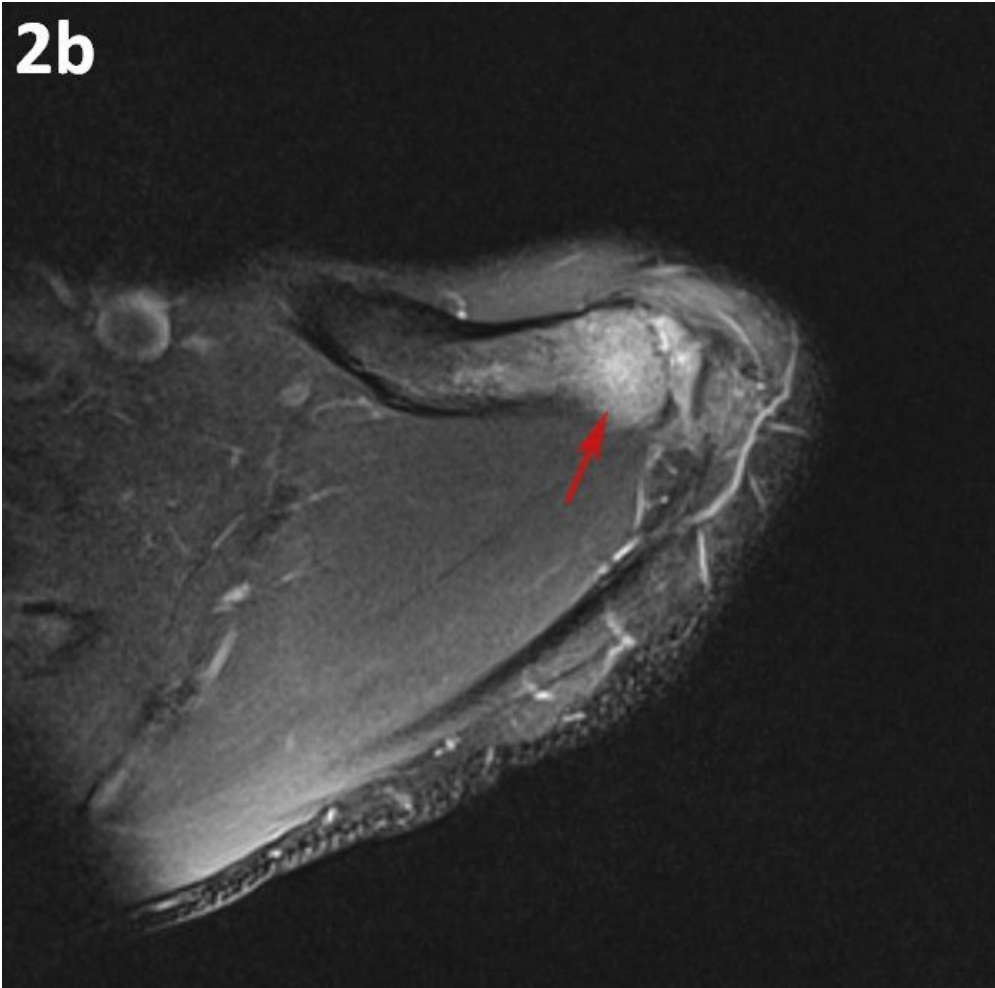
White arrow: very subtle bone marrow oedema in acromion.

Yellow arrow: subchondral cortical irregularity in the distal clavicle.

Blue arrow: AC-joint effusion. **Origin:** Department of Radiology, AZ Sint-Maarten, Mechelen, Belgium

b

2b



Description: MRI T2 fs, axial image.

Red arrow: bone marrow oedema in the distal clavicle. **Origin:** Department of Radiology, AZ Sint-Maarten, Mechelen, Belgium

c

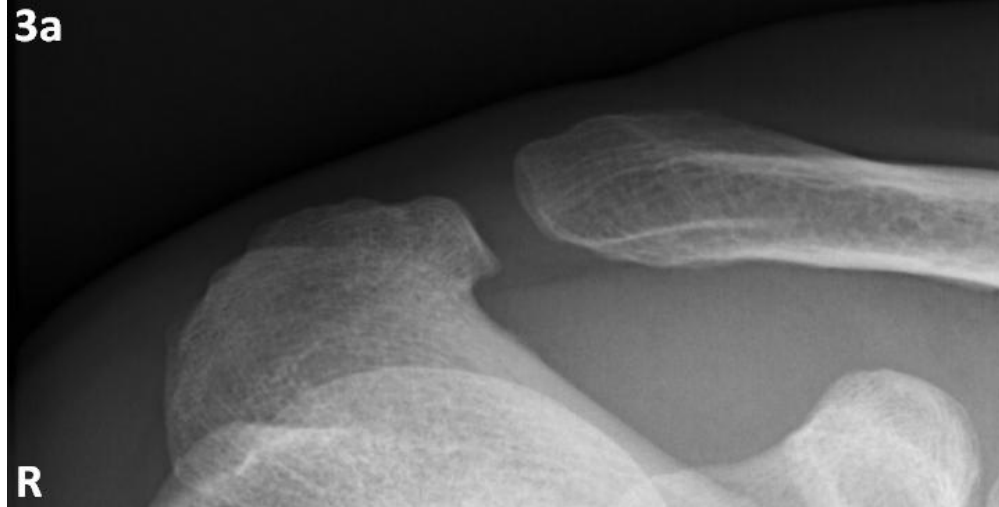


Description: MRI T1 fs, coronal image.

Green arrows: hypertrophy of the AC-joint capsule. **Origin:** Department of Radiology, AZ Sint-Maarten, Mechelen, Belgium

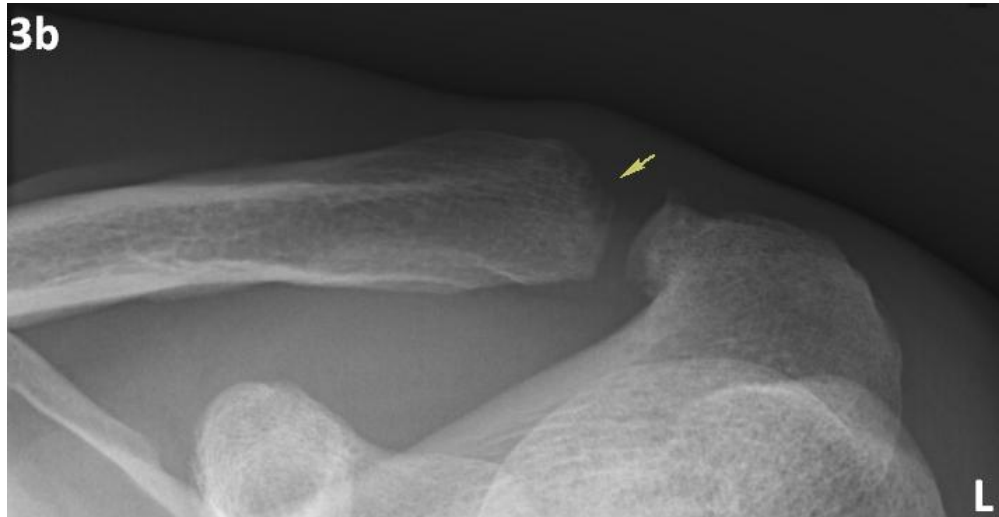
Figure 3

a



Description: Right AC joint with 15° cephalad inclination 2 months later. Normal delineation of the AC joint. **Origin:** Department of Radiology, AZ Sint-Maarten, Mechelen, Belgium

b



Description: Left AC joint with 15° cephalad inclination 2 months later. Yellow arrow: there is still irregular delineation and osteolysis of the superolateral aspect of the left clavicle. **Origin:** Department of Radiology, AZ Sint-Maarten, Mechelen, Belgium