Case Report

MRI findings in intraosseous extension of calcific supraspinatus tendonitis

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A B S T R A C T

Calcific Tendinitis is a condition characterized by abnormal deposition of hydroxyapatite crystals in the tendons with secondary inflammation. However, complication like intraosseous migration is rare. Hereby we present a case of 58-year-old female patient who presented with pain in the right shoulder along with restricted movements. The MRI scan revealed features of intraosseous migration of calcification in addition to the detailed evaluation of calcific tendinitis. Furthermore, the patient was treated with ultrasound guided aspiration & percutaneous irrigation post which the pain subsided indicating promising therapeutic role of ultrasonography in such cases. Thus multimodality approach can help in complete diagnosis & treatment of this condition.

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Introduction

Calcific tendinitis involving body structure tendons can explain adjacent joint pain. Radiography and computed tomography scan help to diagnose calcific tendinitis but for rare complications like intraosseous and intramuscular migration of the calcification, magnetic resonance imaging (MRI) acts as a vital modality for diagnosis. Ultrasonography is helpful in knowing the calcific plaque morphology and ultrasound guided aspiration and percutaneous irrigation is helpful for removal of calcium.

Case

A 58-year-old female presented with on and off shoulder pain with restricted movements at the joint since last 1 year. Pain aggravated in last 2 months. There was no history of recent trauma, fall, or direct injury to the affected site. Patient underwent radiographic evaluation which showed calcific density in the region of supraspinatus insertion. There was no fracture in visualized bones. Rest of the soft tissues were unremarkable.

Patient was further evaluated with MRI which revealed lobulated T2 hypointense foci of calcification within the...
supraspinatus tendon near its insertion, largest measuring 1.0 × 0.7 cm in size. It was associated with moderate degree of adjoining soft tissue oedema and T2 hyperintensity within the supraspinatus tendon. Also the tendon appeared oedematous representing moderate to severe calcific tendinitis (Fig. 1).

A small fairly well-defined subcortical hypointense focus of calcification was detected in the region of greater tuberosity at supraspinatus enthesis, with moderate degree of disproportionate adjoining marrow edema in the humeral head suggesting subcortical migration of tendinous calcification. Mild glenohumeral joint effusion along with subacromial-subdeltoid bursitis was also seen.

Patient was taken up for ultrasound guided aspiration and percutaneous irrigation. Significant improvement was seen in clinical symptom and follow-up ultrasound after 3 months showed no traces of calcification (Fig. 2).

Discussion

Calcific tendinitis refers to the pathologic deposition of hydroxyapatite crystals in tendons, which can cause a limited range of motion restriction of the involved joint. Calcific tendinopathy and hydroxyapatite deposition disease are other names that are used to refer to this condition [1–3].

The calcific deposits may cause reactive inflammatory changes and may lead to excruciating pain. If the deposits are large enough, they will cause symptoms of impingement. This condition typically affects the shoulder, but other sites of involvement are also documented, such as the hip, elbow, wrist, and knee [2].

It can be found in asymptomatic individuals with a prevalence of around 3% and it has a predilection for women aged between 40 and 60 years [4]. The pathogenesis of calcific tendinitis is said to be related to a cell-mediated response. The tenocytes undergo a metaplastic transformation into chondrocytes, which ends up in calcium formation in the tendons. A decrease of intratendinous oxygen levels promotes fibrocartilaginous metaplasia and cellular necrosis resulting in calcium deposition [1,2,5].

Calcific tendinitis is assessed in three stages: precalcific, calcific, and postcalcific. The precalcific stage represents the fibrocartilaginous transformation of tendon tissue. The calcific stage is the stage of calcium deposition in tendon tissue. The resorptive phase begins with the vascular weaving of the affected area with subsequent macrophage phagocytosis of the calcium deposits [5].

Fig. 1 – (A) Coronal T2 weighted fat saturated image showing calcific supraspinatus tendinitis (white arrow) with intraosseus extension and marrow oedema (yellow arrow), (B) Coronal proton density image showing calcific supraspinatus tendinitis (white arrow) with intraosseous migration, (C) Sagittal proton density images showing intraosseous calcific migration (white arrow), (D) Axial proton density image showing intraosseous calcific migration (White arrow).
The post calcific phase includes remodeling of the tendon via fibroblasts and granulation connective tissue, which then ends up in complete healing of the involved tendon. This evolving process has distinct imaging findings [2].

Intraosseous and intramuscular migration of calcific tendinitis are rare complications that may lead to diagnostic difficulties [6].

The mechanism of cortical erosion and the subsequent intraosseous migration of calcific deposits can occur as enzymatic actions. This facilitates the lysis of the cortical bone and the subsequent dissemination of calcific deposits subcortically. These can occur as cortical erosion, subcortical calcium migration, and intramedullary diffusion [1,2].

Various imaging modalities used in the evaluation of this condition are radiography, ultrasonography, computed tomography, and MRI. The diagnosis of calcific tendinitis is made by the characteristic radiologic appearance of calcific deposits in the corresponding tendon. These calcifications can be a dense, amorphous, well-circumscribed area of soft tissue calcification [7].

MRI shows soft tissue in detail and shows calcifications as low signal intensity globular masses within the tendons on all sequences. These are usually surrounded by high signal changes within the tendon, secondary to edema and inflammation. The post-contrast evaluation shows T1 contrast enhancement secondary to perilesional inflammation. Articular cartilage involvement is not seen [6].

Ultrasound helps know the calcific plaque morphology [3].

Minimally invasive treatment option includes ultrasound-guided aspiration and percutaneous irrigation for the removal of calcium. It is a highly effective and less aggressive method of treatment [5].

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