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Case report

Tenosynovial chondromatosis of the wrist presenting with acute carpal tunnel syndrome: A case report

Chondromatose ténosynoviale du poignet révélée par un syndrome du canal carpien : à propos d'un cas

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ABSTRACT

We report a case of synovial chondromatosis of the wrist that manifested as acute carpal tunnel syndrome. The patient successfully underwent carpal tunnel release, tenosynovectomy and resection of dorsal and volar ossified bodies embedded in the tenosynovium overlying the wrist. Final histopathology confirmed the diagnosis of synovial chondromatosis. The patient's symptoms of pain, numbness, and paresthesia in a median nerve distribution resolved completely and the patient resumed full-time work in the service industry 4-weeks postoperatively with no functional limitations. This case highlights the importance of maintaining a broad differential in the approach to wrist pain and the role of magnetic resonance imaging in the diagnosis of synovial chondromatosis given its variable degree of ossification.
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RÉSUMÉ

Nous rapportons un cas de chondromatose synoviale du poignet qui s'est révélée par un syndrome de canal carpien. Le patient a subi une libération du canal carpien, une ténosynovectomie et une résection des corps ossiformes dorsaux et palmaires inclus dans la ténosynovite entourant le poignet. Le diagnostic de chondromatose synoviale fut confirmé par l'histopathologie. Les symptômes du patient qui comprenaient de la douleur, de l'engourdissement et des paresthésies dans le territoire du nerf médian furent entièrement résolus. Le patient a pu reprendre son travail dans le secteur des services 4 semaines après la chirurgie sans limitation fonctionnelle. Ce cas souligne l'importance de maintenir un large éventail de diagnostics différentiels pour les douleurs au poignet et du rôle de l'imagerie par résonance magnétique dans le diagnostic de la chondromatose synoviale, étant donné son degré variable d'ossification.
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1. Introduction

Originally described by Laennec in 1813 [1], synovial chondromatosis (SC) is a rare, benign, proliferative disorder in which cartilaginous or osteocartilaginous metaplasia creates foci of cartilage in the synovial membrane of tendon sheaths, bursae, or joints [2,3,4]. SC most commonly affects large joints such as the knee and hip, but it can develop in the wrist in rare cases [5]. Patients with SC typically present with monoarticular pain, swelling, and limited range of motion [2]. Presentation with acute compressive neuropathy is uncommon. We report a case of SC presenting with acute carpal tunnel syndrome.

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2. Case report

A 58-year-old, otherwise healthy, right-hand dominant female presented to the emergency department with a 6-week history of progressive pain in her left hand and wrist that had acutely worsened in the past week in the absence of trauma. The patient also reported worsening paresthesia in her thumb, index, long and ring fingers. Radiographs demonstrated well-corticated ossified densities overlying the dorsal and volar wrist concerning for synovial osteochondromatosis (Fig. 1).

The patient was seen in consultation on an outpatient basis the following week. On physical examination there was no evidence of atrophic changes of the abductor pollicis brevis (APB) or the remainder of the intrinsic hand musculature. A palpable protrusion was detected over the dorsal and volar aspects of the wrist; both masses were tender to palpation. Active range of motion at the wrist was reduced by 25% relative to the contralateral side. The patient reported subjective numbness in a median nerve distribution. Power of the APB, first dorsal interosseous, and extensor pollicis longus were Medical Research Council (MRC) 5/5. With provocative testing, Tinel's sign was positive.

A magnetic resonance imaging (MRI) examination was performed to assess for the presence of sarcomatous features and the degree of soft tissue involvement. The MRI showed ossified bodies overlying the volar (1.0 cm × 1.5 cm × 0.8 cm) and dorsal aspects of the wrist (0.9 cm × 0.6 cm × 1.0 cm) in keeping with primary synovial osteochondromatosis (Fig. 2). There was also evidence of a partial tear of the flexor pollicis longus (FPL) tendon at the myotendinous junction as well as reactive median nerve neuritis in close proximity to the volar ossified body. Aside from an incidental finding of a torn scapholunate ligament, the remainder of the MRI was unremarkable.

Carpal tunnel release, tenosynovectomy, and resection of the two ossified bodies were performed with a tourniquet under general anesthesia. Volar and dorsal approaches were used. On the volar wrist, an extended carpal tunnel incision was used to facilitate access to the volar ossified body. Dissection was carried out downstream to the transverse carpal ligament, which was sharply divided; care was taken to ensure complete division distally to the palmar fat pad and proximally to include the antebrachial fascia. The ossified body was visible immediately deep to FPL and there was evidence of moderate attrition of the tendon at the myotendinous junction; however, the tendon was in continuity and did not require repair or reinforcement. The median nerve and flexor tendons were retracted ulnarly to locate the ossified body. The volar ossified body (Fig. 3) and adjacent synovial reaction were sharply excised. On the dorsal wrist, a longitudinal incision was made over the palpable lesion. Sharp dissection was carried out down to the extensor tendons, which were retracted ulnarly to locate the ossified body. The dorsal ossified body and adjacent reactive synovial tissue were sharply excised (Fig. 3). The joint capsule was preserved both dorsally and volarly. Removal of the ossified bodies was confirmed with intraoperative radiographs. The skin was closed following irrigation and meticulous hemostasis.

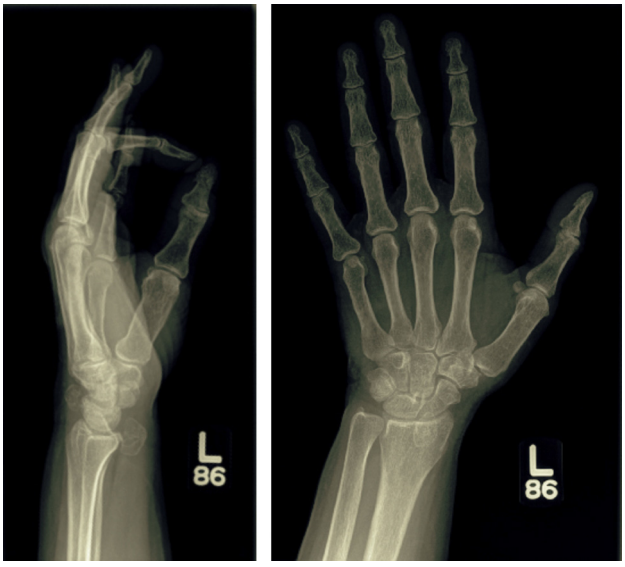

Fig. 1. Lateral (left image) and posteroanterior (right image) left hand radiographs showing well-corticated ossified densities overlying the midcarpal (dorsal) and radiocarpal (volar) joints.

Final histopathology of the tenosynovium showed fibroadipose tissue with synovial lining and mild chronic inflammation. The volar (1.5 cm × 1.4 cm × 0.9 cm) and dorsal (1.2 cm × 0.8 cm × 0.5 cm) ossified bodies were consistent with SC with ossification. The dorsal body demonstrated complete ossification and the volar body demonstrated incomplete ossification.

Postoperatively, the patient's symptoms of pain as well as numbness and paresthesia in a median nerve distribution resolved completely. The patient resumed full-time work in the service industry 4-weeks postoperatively with no functional limitations.

3. Discussion

We report a case of SC of the wrist that manifested as acute carpal tunnel syndrome. SC is a benign synovial metaplasia that results in the formation of cartilaginous bodies in the synovial membranes of tendon sheaths, bursae, or joints [6]. Some authors identify tenosynovial chondromatosis as a separate entity in reference to chondromatosis specifically of the synovial lining of a tendon sheath [7]. The degree to which the cartilaginous bodies of SC undergo ossification is variable [8]. In a series of 53 SC cases (all joints), Davis et al. reported that ossification was absent in 23 cases and that complete ossification — as was present in the dorsal ossified body of the case present here — was only present in 2 cases [8]. Once endochondral ossification occurs the disease process is referred to as synovial osteochondromatosis (SOC) [9]. Practically however, 'synovial chondromatosis' and 'synovial osteochondromatosis' are often used interchangeably in the literature.

Milgram described the temporal sequence of SOC relative to changes in the degree of intrasynovial diseases and the presence of loose bodies:

1. active intrasynovial disease without loose bodies;
2. active intrasynovial disease and loose bodies;
3. loose bodies without intrasynovial disease [10].

Milgram postulated that if the disease appeared to be in the third phase on gross examination at the time of surgery, synovectomy may not be necessary, whereas it would be indicated for the first and second phases [10].

An important distinction in the pathophysiology of SC is the delineation between primary and secondary disease processes. In primary SC, the synovium displays cytological atypia and chondroid metaplasia [2]. In secondary SC, chondral bodies become embedded in the synovium — for example, secondary to osteoarthritis, osteochondral fracture, or osteochondritis dissecans — and there is no cytological atypia [2]. The clinical implication is that only primary SC is thought to have malignant transformation potential [2]. Given the risk for malignant transformation, it is prudent to have long-term follow-up of patients with primary SC.

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