

Synovial Chondromatosis of Wrist: A Case Report

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Abstract

Introduction: Synovial chondromatosis is a benign metaplasia of the synovial membrane resulting in proliferation of multiple intraarticular cartilaginous loose bodies. The disease can involve any joint and presentation in radio-ulnar distal joint is rare.

Case Presentation: A 16-year-old girl presented with a history of progressive pain in her right wrist in absence of trauma. Patient's symptoms were insidious in onset and have gradually progressed in its severity. The patient first noticed swelling over the dorsal followed by volar and DRUJ swelling, which were accompanied by pain and progressive deformity and reduction in range of motion. A dorsal synovial cyst was first diagnosed with indication of surgical excision but after multiple presentation MRI and histological examination were carried out and diagnosis of chondromatosis was made. The patient underwent a surgical extended resection of the the calcified deposits. Presently, the patient is free of pain. She returned to her original sport activities soon after surgery and she was well satisfied with the clinical outcome.

Conclusion: Open excision of synovial chondromatosis of the wrist was an effective and safe therapeutic method. After the surgery, immediate pain relief and improvement of wrist function can be expected.

Keywords: *Synovial Chondromatosis; Wrist Chondromatosis; Ganglion Cysts; Wrist Pain*

Abbreviations

SC: Synovial Chondromatosis; MRI:- Magnetic Resonance Images; DRUJ: Distal Radio-Ulnar Joint; FCU: Flexor Carpi Ulnar; OA: Osteoarthritis; OD: Osteochondritis Dissecans

Introduction

Synovial chondromatosis (SC) is an uncommon, benign, proliferative disorder characterized by metaplasia of numerous cartilaginous or osteocartilaginous nodules in the connective tissue in the synovial membrane of joints, tendon sheaths or bursae [1]. The lesion usually is monoarticular and it tends to involve large joints, such as knee and hip. It has also been described in the shoulder and elbow [2-5], however it can develop in the wrist joint [6] with a 17% of recurrence rate [7]. SC mostly affects male aged 30 - 40 years. Major symptoms are pain, swelling and decreased range of motion in the involved joint. The disease is commonly self-limiting, but it may recur, and rarely malignant change has been reported [8,9].

Case Presentation

A 16-year-old athletic girl presented with a six-months history of progressive pain in her right wrist. She had no history of trauma. Patient's symptoms were insidious in onset and have gradually progressed in its severity. She reported increasing but light wrist pain aggravated by playing sports (volleyball) and swelling started from the radial dorsal aspects of the wrist and extended to the volar and ulnar ones. The patient referred progressive decrease in range of motion of the involved wrist. Local treatment didn't give relief from symptoms. So, at the first consultation the specialist made suspicion of articular ganglion cyst.

During second look physical examination different palpable and tender masses were detected over the dorsal and volar aspects of the wrist. Active range of motion at the wrist was reduced by 25% relative to the contralateral side both in flexion-extension and in prono-supination with pain at maximum degrees of motion. No neurovascular deficits or any signs of infection were present.

Radiographs demonstrated good wrist aspect with no degenerative changes and normal static intercarpal ligaments aspect with radio-opaque loose bodies around the dorsal and volar side of the distal radioulnar joint. An MRI identified plurilobulated cysts around DRUJ, volar and dorsal radio carpal joint, with SC typical appearance (Figure 1 and 2). MRI showed cysts reach in fluid and a lot of small round bodies which is characteristic of chondromatosis. Before undergoing diagnostic wrist arthroscopy, blood tests for rheumatologic diseases were carried out and they were all negative. During arthroscopy many loose bodies were removed (Figure 3) or washed out, an evaluation of intra-articular cartilage and ligaments condition was performed and Histologic examination which confirmed synovial chondromatosis was carried out. Arthroscopic assessment showed a stable and not degenerated wrist and the patient was informed about pathology, risk of recurrence and scheduled for open surgery.



Figure 1: Frontal image of right wrist magnetic resonance imaging (MRI) showing ossified bodies overlying the ulno-carpal and radio-carpal joints.

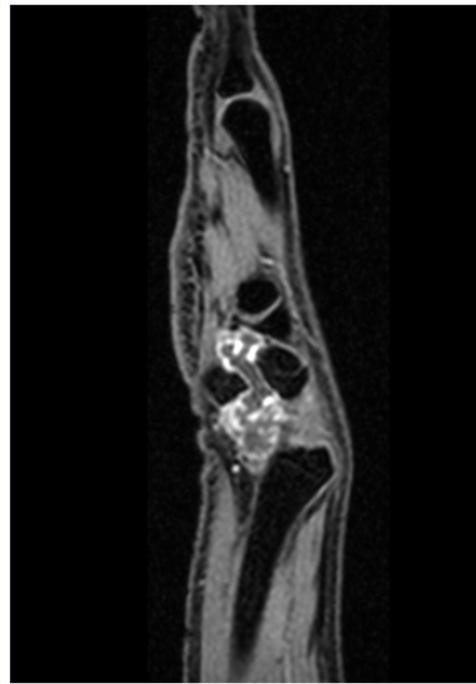


Figure 2: Lateral magnetic resonance image shows a cyst composed by multiple free ossified bodies overlying ulnocarpal and piso-triquetum (volar) joints.

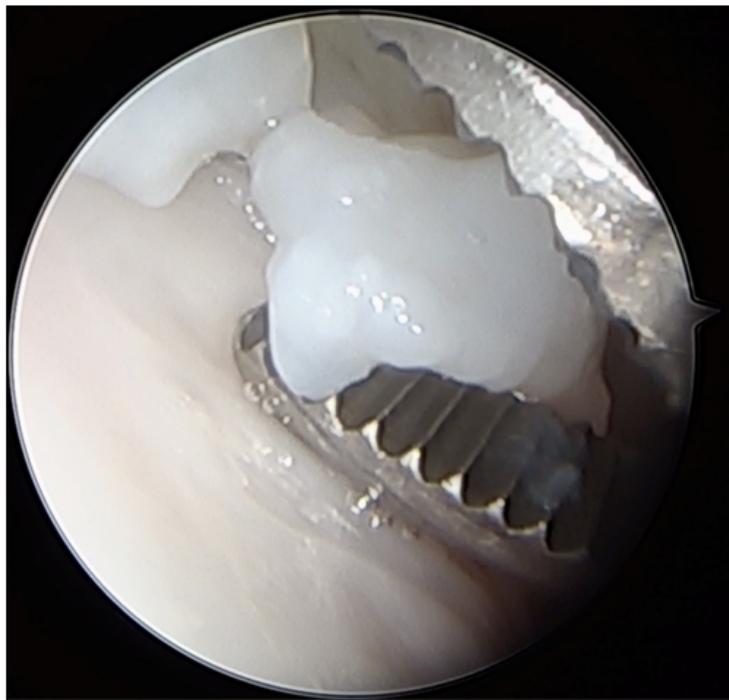


Figure 3: An arthroscopic view of radio-carpal joint shows chondral loose bodies.

Synovectomy and removal of the extra-articular ossified cysts and numerous loose bodies were performed. Double volar approaches (radial and ulnar) and dorsal were used. On the volar wrist, a longitudinal incision was performed over the ulnar side. An ossified tissue was visible immediately deep to flexor carpi ulnaris (FCU) and around the ulnar head; FCU, ulnar nerve and artery were retracted radially and, once pathological capsular solid tissue was removed, numerous loose bodies were softly taken out helping with water lavages through capsulotomy access. The volar radial ossified body and adjacent synovial reaction were excised by volar longitudinal access after isolating radial artery. On the dorsal wrist, a longitudinal incision was made over the palpable mass. Radical dissection was undertaken down to the wrist extensor tendons, which were protected and retracted to identify the ossified body. The dorsal ossified body and adjacent reactive synovial tissue were resected widely. A lot of loose bodies were equally taken out by aspiration and lavage. The joint capsular ligaments were preserved both dorsally and volarly. Biopsies were taken and histology results confirmed the diagnosis of SC. To be sure to be the most radical as possible a lot of washing and a second arthroscopic look were performed. Some remaining loose bodies were detected and wrist confirmed no signs of ligament lesion or cartilage degeneration.

The patient resumed her activities in eight-weeks postoperatively. Histology confirmed synovial chondromatosis. At final follow-up at nine months, she had no post-operative complications no signs of recurrence and all of her symptoms had resolved with full range of movement and normal wrist function. The patient showed strength recovery of 90% of contralateral side.

Discussion

Synovial chondromatosis is a rare metaplastic condition which is characterized by the development of numerous cartilaginous bodies within the synovial membrane of joints, tendon sheaths or bursae. The presentation is typically unilateral, but bilateral involvement has also been seen. SC most commonly affects large joints such as the knee and hip, but it can develop in the wrist in rare cases [7]. Patients with SC mostly present with monoarticular swelling, pain, and reduction of range of movements. Occasionally it can carry out to compressive neuropathy [10]. SC commonly occurs in young adults aged 30 - 40 years and it is twice more common in males than in females [1].

Milgram described the temporal sequence of SC progression describing the changes into three degree. Stage I consists of active synovitis and absence of loose bodies. Stage II consists of a transitional stage where there is active synovial disease with formation of loose bodies, which are still cartilaginous, in the synovial tissue. Stage III consists of a dormant stage, in which there are multiple osteochondral loose bodies which tend to calcify without active intrasynovial disease [11].

Pathophysiologically, SC can be divided into primary and secondary [12]. In primary SC, the synovial membrane presents chondroid metaplasia with cytological atypia, features that recalling cancer nature. This type of SC may have the capacity to transform into malignant chondrosarcoma. Due to the risk for malignant transformation, it is important to provide a long-term follow-up in patients with primary SC. In secondary SC there is no cytological atypia and the chondral bodies become included in the synovial membrane as a result of osteoarthritis, osteochondral fracture, or osteochondritis dissecans. The histology result showed secondary SC without atypia in the case described here.

The importance of having a long-term follow-up is also due to the fact that SC can recur. Loonen and Schuurman [13] reported the case of a 35-year-old man with synovial chondromatosis of the left wrist with an 8-year follow-up. In literature, recurrence rate after surgical treatment varies from 0 [14] to 15% [1]. Recurrence may result from non complete resection at the time of surgery. Longer follow-up would have shown more frequent recurrences. Multiple cavities of the wrist and their difficult inspection especially by open surgery can avoid complete synovectomy and evacuation of loose bodies and can be considered a concause of recurrence.

Other causes of loose bodies and intra-articular soft tissue masses must be considered, such as bone tumours, synovial sarcoma or chondrosarcoma, calcifying aponeurotic fibroma, hydroxyapatite deposition, pigmented villonodular synovitis, haemangiomas of the synovium or joint capsule, post-septic arthritis and rheumatoid arthritis and fragmented osteophytes in osteoarthritis (OA), osteochondritis dissecans (OD), however the loose bodies in OA and OD would be smaller and fewer [7].

According to Muramatsu and Milgram we described a case of Primary SC Stage III. Our follow-up was about 18 months with good clinical outcome and no clinical signs of recurrence and patient came back to her activities. Wide excision with definitive arthroscopic check probably allowed good functional recovery but we suggested MRI control every 24 months because of possible future recurrence and malignant transformation.

Conclusion

Synovial chondromatosis is an uncommon disease, especially in the wrist, and should be kept as a possible differential diagnosis for a painful swelling in the distal radioulnar joint. The diagnosis may be difficult and further to x-rays especially in first stages, MRI helps the surgeon for detecting cartilaginous loose bodies. Open excision of synovial chondromatosis and evacuation of loose bodies of the wrist is an effective and safe therapeutic method. It's difficult to be sure of complete evacuation of loose bodies because of number of potential cavity of the wrist which should be accurately explored. After the surgery, immediate pain relief and improvement of wrist function can be expected. If complete resection is made at the time of surgery, risk for local recurrence is minimal, but long term follow-up is necessary to keep tabs on the potential of malignant transformation of this rare condition.

Conflict of Interest

The authors declare that they have no competing interests.

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