International Journal of Surgery Case Reports 95 (2022) 107149

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr

Case report

A rare case of synovial chondromatosis of distal radio-ulnar joint

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ARTICLE INFO

Keywords:
Synovial
Chondromatosis
Radio-ulnar
Joint
Surgery

ABSTRACT

Introduction: Synovial chondromatosis (SC) is a benign metaplastic proliferation of cartilaginous nodules within the synovial membrane that commonly manifests as "loose masses" in the joint space. Synovial chondromatosis affects 1.8 per 1 million individuals. The most common articulations affected are the knees, followed by the hip, elbows, and shoulder. The wrist, on the other hand, is rarely affected. Synovial chondromatosis occurs mostly in the third or fifth decade of life.

Presentation of case: A 30-year-old Saudi, non-married female patient presented to the outpatient orthopaedic clinic complaining of right wrist pain for 5 years. The pain started gradually with on and off pain episodes. Her magnetic resonance imagining was ordered which showed large radio ulnar joint effusion associated with synovitis with multiple low- intensity foci corresponding to subtle calcifications which are all consistent with synovial chondromatosis which was successfully treated with surgery. Eventually, the patient reported that her quality of life was hugely improved especially in terms of pain, stiffness, and range of motion.

Conclusion: Synovial chondromatosis in radio-ulnar joint is a very rare entity. Surgical exploration of the joint, removal of loose bodies alone or combined with synovectomy, is the recommended treatment.

1. Introduction

Synovial chondromatosis (SC) is a benign metaplastic proliferation of cartilaginous nodules within the synovial membrane that commonly manifests as "loose masses" in the joint space. SC affects about 1.8 per 1 million individuals. Though any particular region can be affected by SC, the literature suggests that the knee and hip are particularly vulnerable, with almost 90% of all occurrences of SC occurring at these locations [1–3]. The most common articulations implicated are the knees, followed by the hip, elbows, and shoulder. The wrist, on the other hand, is rarely affected. In one retrospective case series, the wrist was found to have a prevalence of 7.5%, compared to 74% in the knee. Swelling, discomfort, a palpable mass, tenderness, and restricted joint movement are the chief clinical signs of synovial osteochondromatosis, which can progress slowly over the years. Moreover, synovial chondromatosis affects the majority of people in their third or fifth decade of life. Furthermore, the incidence is 3 to 5 times higher in males than in females. In general, surgical removal of the diseased synovium and cartilaginous nodules is used to treat synovial osteochondromatosis, with a high rate of success [4].

2. Presentation of case

A 30-year-old Saudi, non-married female patient presented to the orthopedics outpatient complaining of right wrist pain for 5 years. The pain started gradually with on and off episodes. It was sudden without any triggering factors such as trauma or infection. The pain was described as an electrical sensation not radiated or referred to any other area. On further questioning, pain was noticed to be aggravated in the supination position of the forearm compared to the pronation position, however, the pain slightly declined with the use of analgesics and rest. The patient pain score was 4 out of 10 in severity, and it interrupted her daily activities. Her main complaint initially was not associated with any other symptoms. However, in the last 2 years, she reported an increase in pain intensity with new onset of tenderness.

In addition, there was mild wrist swelling, restricted range of motion due to pain, and a tingling-like sensation, especially with hand overuse w. The patient has no past medical or surgical history and no significant family history. Over the counter analgesics were used by her for about one and a half years with minimal improvement. Upon examination of both wrists and hands, there was right wrist joint swelling without evidence of deformity or discoloration. On palpation, there was palpable

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https://doi.org/10.1016/j.ijscr.2022.107149
Received 1 April 2022; Received in revised form 27 April 2022; Accepted 30 April 2022
Available online 4 May 2022

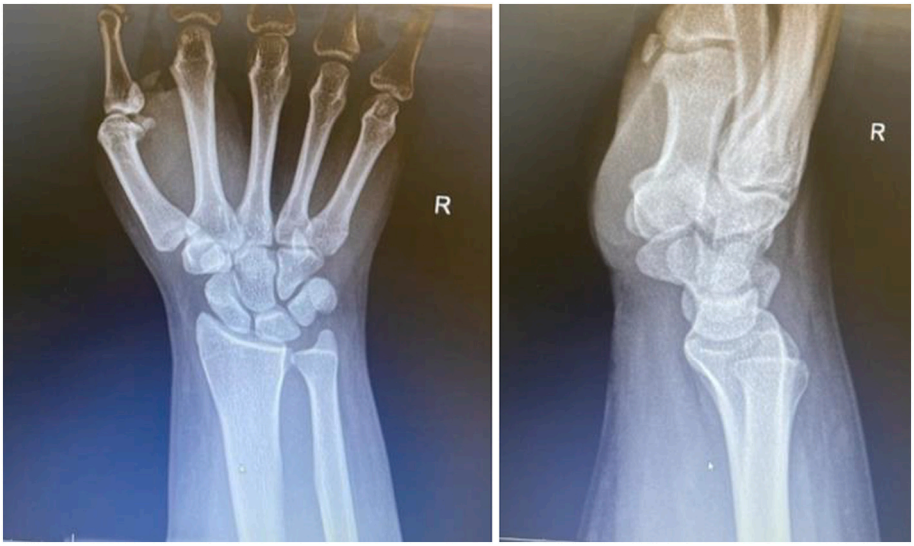

Fig. 1. Hand and wrist X-rays were inconclusive.

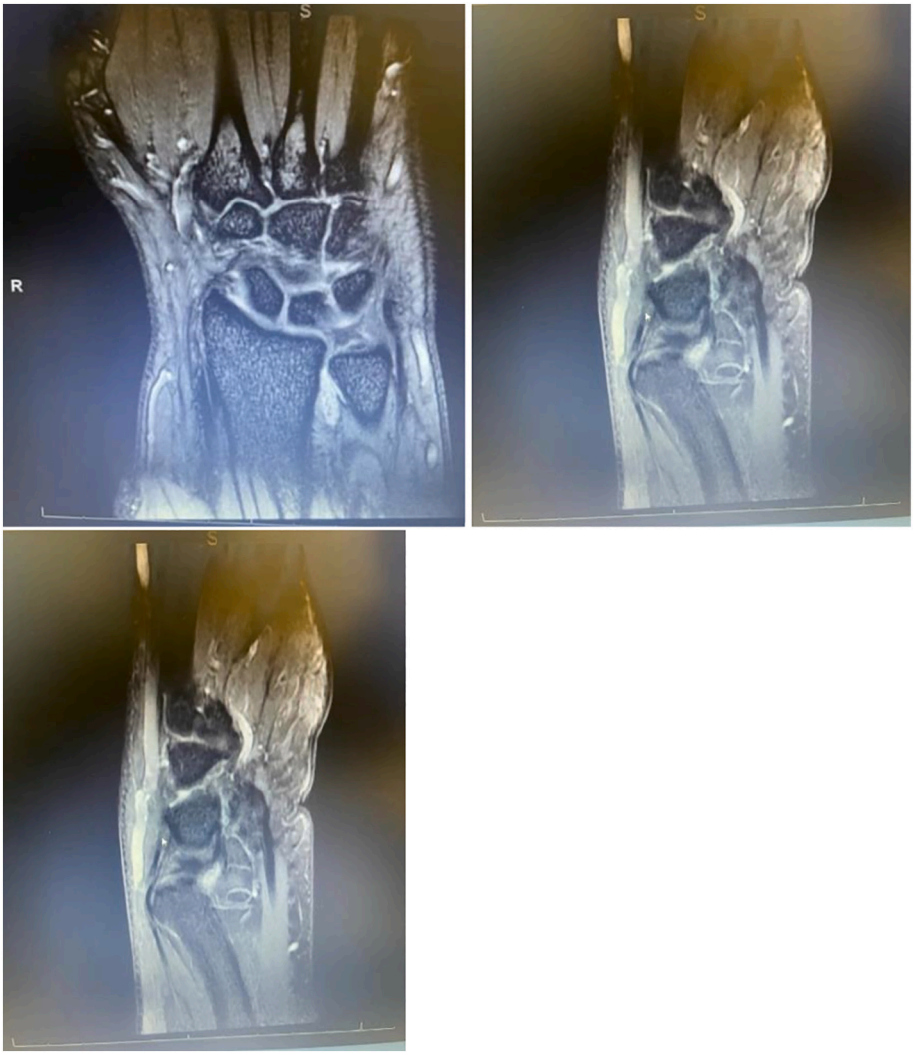

Fig. 2. Magnetic resonance imagining was ordered which shows large DRUJ effusion associated with synovitis with multiple low- intensity foci corresponding to subtle calcifications which are all consistent with synovial chondromatosis.

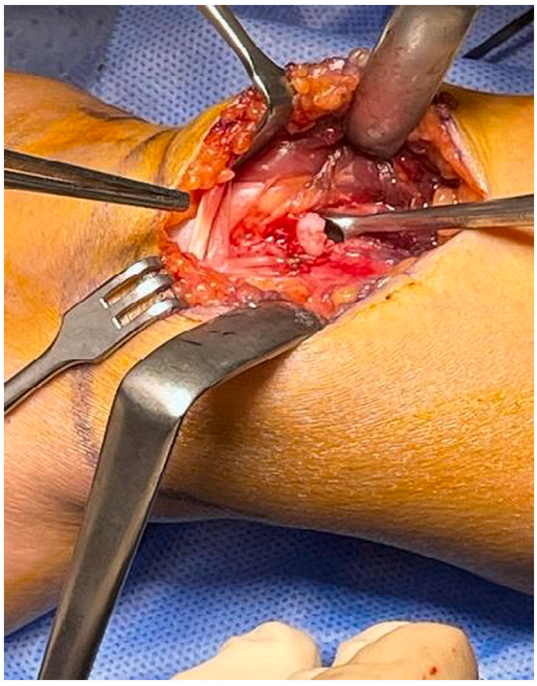

Fig. 3. Dorsal wrist approch of distal radioulnar joint with excisional biopsy of the lesions.

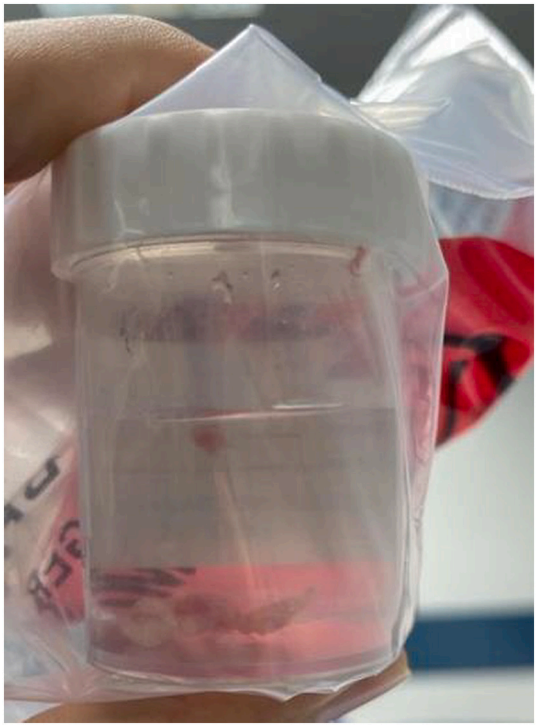

Fig. 4. (a) and (b): Excisional biopsy of multiple lesions from distal radioulnar joint of right wrist.

mass noted in the wrist joint with moderate tenderness over the distal radioulnar joint. The right wrist range of motion was limited on forearm supination while the wrist extension was limited on 50 degrees. Furthermore, the piano test was negative and other extremity examination was unremarkable. Meanwhile, her laboratory investigations were non-significant. Hand and wrist X-rays were inconclusive (Fig. 1) for which Magnetic Resonance Imaging (MRI) was ordered which

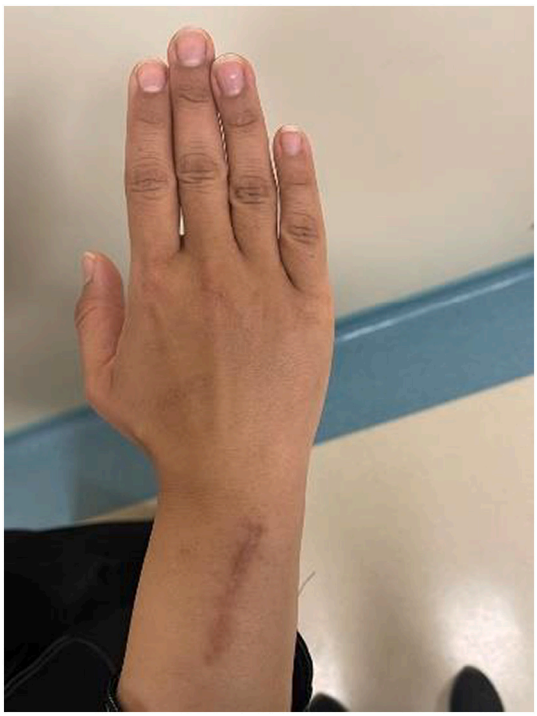

Fig. 5. Right wrist dorsal scar.

showed a large Distal Radio Ulnar Joint (DRUJ) effusion associated with synovitis with multiple low- intensity foci corresponding to subtle calcifications which are all consistent with synovial chondromatosis (Fig. 2). After full evaluation and assessment, the patient was started on non-operative treatment with analgesics and physiotherapy for 2 months. Upon patient follow up in the clinic, there was no improvement in her clinical assessment and surgery was performed. She underwent an open synovectomy for an excision of the nodules which was sent for histopathology. The operation was performed by an orthopaedic team of consultant, specialist and resident. Intra-operatively, the operation was performed under general anaesthesia with tourniquet application. The point of incision was addressed through the dorsal wrist approach between the 4th and 5th compartments. After that, the retinaculum was incised until the DRUJ was visualized and incised between ulna and radius. Afterwards, the mass was visualized (Fig. 3) and an excision of the swelling was done revealing multiple white nodules measuring in aggregate 1.5 × 1.0 × 0.5 cm (Fig. 4). Histopathology results revealed a lesion of the sub-synovial multinodular cartilaginous proliferation of hyaline cartilage with focal variable cytologic atypia. It was embedded in a myxomatous-focally fibrous stroma with foci of endochondral ossification and no features of malignancy. Postoperatively, the patient was examined and showed no neurovascular compromise. The patient was followed 2 weeks later in which stitches were removed and instructed on rehabilitation. Two months follow up, the patient had no active complaints and upon examination, the surgical scar showed no signs of swelling. There was mild tenderness over the right wrist with no palpable mass. In addition, the patient showed flexion up to 90 degrees, no pain on extension of 80 degrees with stable DRUJ. Also, supination and pronation were painless, full range of motion and normal distal neovascularity was found. Six months postoperatively, the patient was doing fine with no active complaints. The surgical scar was noted with no tenderness or palpable masses. The patient showed full range of motion of the wrist joint with full pronation and supination of the forearm and a stable DRUJ. To ensure a thorough follow-up, the patient was seen 9 months post-operatively she did not have any complaints and was symptom free on examination. The scar showed healthy tissue with no redness, swelling or tenderness. Wrist examination showed 90

Fig. 6. (a) wrist flexion and (b) wrist extension in 2 months post operative. Two months follow up.

degrees flexion and extension with no limitation compared to the other side. Forearm supination and pronation were full and free of pain. DRUJ tests were negative and distal neurovascular examination was intact. Eventually, the patient reported that her quality of life was improved especially in terms of pain, stiffness, and range of motion. This case has been reported in line with the Surgical CAse REport (SCARE 2020) [5] (Figs. 5 and 6).

3. Discussion

Synovial chondromatosis is a proliferative condition with no recognized cause. It can be cartilaginous or osteocartilaginous in origin, developing from joint synovium or tendon sheaths and resulting in a build-up of cartilaginous nodules within the joint. The specific cause of SC is unknown, but it is considered to be caused by the metaplasia of synovial pluripotent cells into chondrocytes. Limb amputation is normally reserved for SC progression to chondrosarcoma, which is an uncommon occurrence. This malignant transition is extremely uncommon, with about 40 occurrences of histologically verified transformation in the literature. Cases involving the hand and wrist are quite uncommon. The chance of acquiring this problem in the DRUJ does not appear to be increased by previous wrist injuries [6–8]. We reported a rare case of synovial chondromatosis in the radio-ulnar joint of a 30-year-old woman. Similarly in 2021, Botros D et al. reported a case of a 52-year-old man who appeared with a big lump on his left wrist's ulnar aspect. SC of the distal radio-ulnar joint was discovered during a biopsy and workup. However, the patient was treated by surgical amputation due to recurrence [9]. In 2018, Laios et al. reported a case of a 45-year-old right-handed man with a 3-year history of wrist pain and no history of trauma. He described a lump around the right DRUJ that fluctuated in size and was accompanied by discomfort, weakness, and a popping sound, as well as periodic wrist locking. A painful lobulated swelling over the right DRUJ was found on clinical examination, along with crepitus at the lateral stress of the joint. Multiple coarse calcific densities were found around the DRUJ on X-rays and MRI. The patient underwent surgery to remove the calcified loose bodies caused by the DRUJ. The results of the biopsy confirmed synovial chondromatosis [10]. Gu et al. reported another case of a 33-year-old man admitted in 2014 with a two-year history of edema of the left wrist joint. Over the course of two months, the swelling increased. An x-ray, computed tomography, and MRI imaging of the left wrist revealed a mass on the volar radial side of the joint with no evidence of bone degradation. The lesion was surgically removed and osteochondromatosis was diagnosed by histological examination. During the subsequent four months of postoperative follow-up, there was no sign of recurrence [4]. Similarly, recurrence was not observed in our patient at the ninth month follow-up. The current standard of care for synovial chondromatosis is to remove any nodules or loose bodies from the synovial cavity, as well as excision of the diseased synovium. Additional surgery is frequently required in cases of recurrence [11].

4. Conclusion

Synovial chondromatosis in radio-ulnar joint is a very rare entity however, in a patient with discomfort and swelling in the distal radio-ulnar joint, synovial chondromatosis should be investigated in the differential diagnosis. Surgical exploration of the joint, removal of loose bodies alone or combined with synovectomy, is the recommended treatment.

Sources of funding

No funding was granted.

Ethical approval

The patient provided a written consent to publish this report and was archived by the ethical committee board.

Consent

The patient provided a written consent to publish this report.

Registration of research studies

N/A.

Guarantor

N/A.

Provenance and peer review

Not commissioned, externally peer-reviewed.

CRediT authorship contribution statement

All authors contributed in writing, treatment and follow up of the patient.

Declaration of competing interest

The authors declare no conflict of interest.

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