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Synovial Chondromatosis of Wrist Joint: A Rare Case Report

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ABSTRACT

Synovial chondromatosis is an uncommon and non-malignant transformation of the synovial membrane which leads to development of numerous cartilaginous bodies within the joint. Synovial chondromatosis occurs rarely in the wrist, and there have been a lack of reports of this occurrence in the literature. Hereby we reported a case of synovial chondromatosis occurred in the wrist joint treated with marginal excision.

A 52-year-old male complained lump on his right wrist accompanied by mild pain. On physical examination, there was lump on ulnar side of the right wrist with normal underlying skin, palpable hard and immobile. There was slight limitation on wrist flexion and extension, whereas radial – and ulnar deviation and pronation – supination range of motion were within normal limit. The plain x-ray of the right wrist showed multiple calcified intra-articular cartilaginous loose bodies in the distal radioulnar joint. Biopsy showed multilobulated cartilage tissue that contained chondrocytes without atypia, and some cartilage tissue accompanied with mild atypia. We diagnosed the patient as primary benign soft tissue tumor at right distal radio-ulnar joint due to synovial chondromatosis and we performed marginal excision. The clinical result was reported good, but complete data could not be obtained because the patient refused to do routine follow up.

The rarity of synovial chondromatosis involving the wrist joint could be an obstacle in performing diagnostic procedures and treatment for the case, but with the thoughtful application of resources and surgical principles, synovial chondromatosis of the wrist joint can be safely and effectively managed.

Keywords: Synovial chondromatosis, Wrist joint, Marginal excision

INTRODUCTION

Synovial chondromatosis is an uncommon and non-malignant transformation of the synovial membrane which leads to development of numerous cartilaginous bodies within the joint. This condition also had many synonyms such as articular chondrosis and synovial chondrosis.1 Synovial chondromatosis typically seen in individuals aged 30-60 years old and primarily affects diarthrodial and weight-bearing joints. The most common affected joints are the knee (70%), hip (20%), shoulder, elbow, ankle, and wrist. Generally, larger joints bearing more weight have a higher likelihood of developing synovial chondromatosis. However, temporomandibular joint, intervertebral facet joints, and various any other tenosynovial locations also can be involved, especially in the fifth decade of life. It rarely occurs before the age of 20 and is exceptionally rare in children. Although the precise incidence remains unknown, previous studies and reports suggest a rate of 1.8 cases per million individuals per year in England, with a 10% incidence of bilateral involvement.1,2 Synovial chondromatosis occurs rarely in the wrist,

and there have been a lack of reports of this occurrence in the literature.2 Hereby we reported a case of synovial chondromatosis occurred in the wrist joint treated with marginal excision.

CASE ILLUSTRATION

A 52-year-old male complained lump on his right wrist since 12 years prior to examination (2011). The lump was initially as size as a marble, then increased in size slowly over time. The lump was also accompanied by mild pain that aggravated by movement, but not disturbing. Patient also occasionally felt tingling sensation on all over his finger, but there was no weakness on his wrist or fingers. Patient still could use his wrist and hand normally for daily activities. Patient previously underwent excision procedure for the lump in a private hospital (2013), but the lump then reappeared in 2015. The patient then went to our clinic and open biopsy was performed (December 2022), the biopsy resulted in synovial chondromatosis. History of another lump in any other part of body, previous trauma, fever, prolonged cough, loss of appetite, and night sweat were denied. Patient also denied history of any other chronic disease and was not on regular medication. Similar complaint or any chronic disease or malignancy among his family members were denied. Patient was a farmer with right hand dominant.

On physical examination, we found lump on ulnar side of the right wrist with normal underlying skin, without any venectasis or shinny skin. The lump was palpable hard and immobile with diameter of approximately 19 cm, and with minimal tenderness. The neurovascular status of the distal part was otherwise normal without signs of any nerve palsy. Wrist extension was limited to 30° whereas wrist flexion limited to 35°. The range of motion of radial – and ulnar deviation and pronation – supination were within normal limit. The range of motion of all fingers were also normal (Figure 1 – 3).

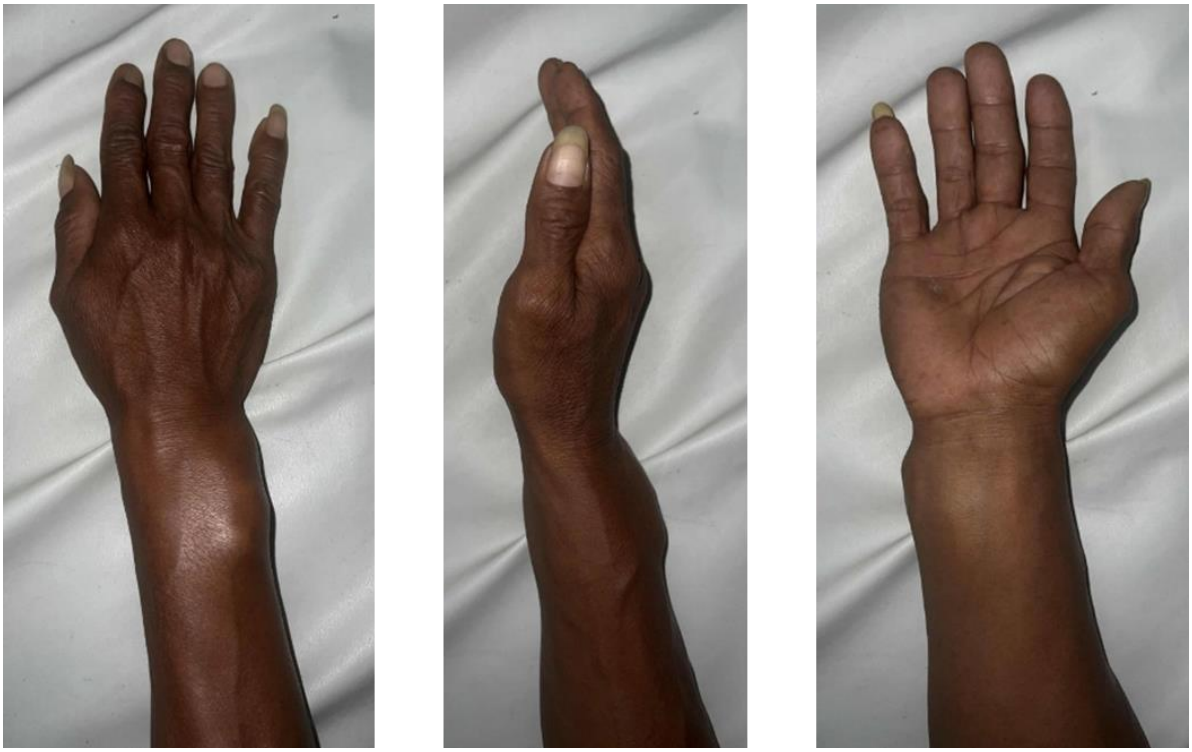

Figure 1. Clinical picture from dorsal, lateral, and volar view

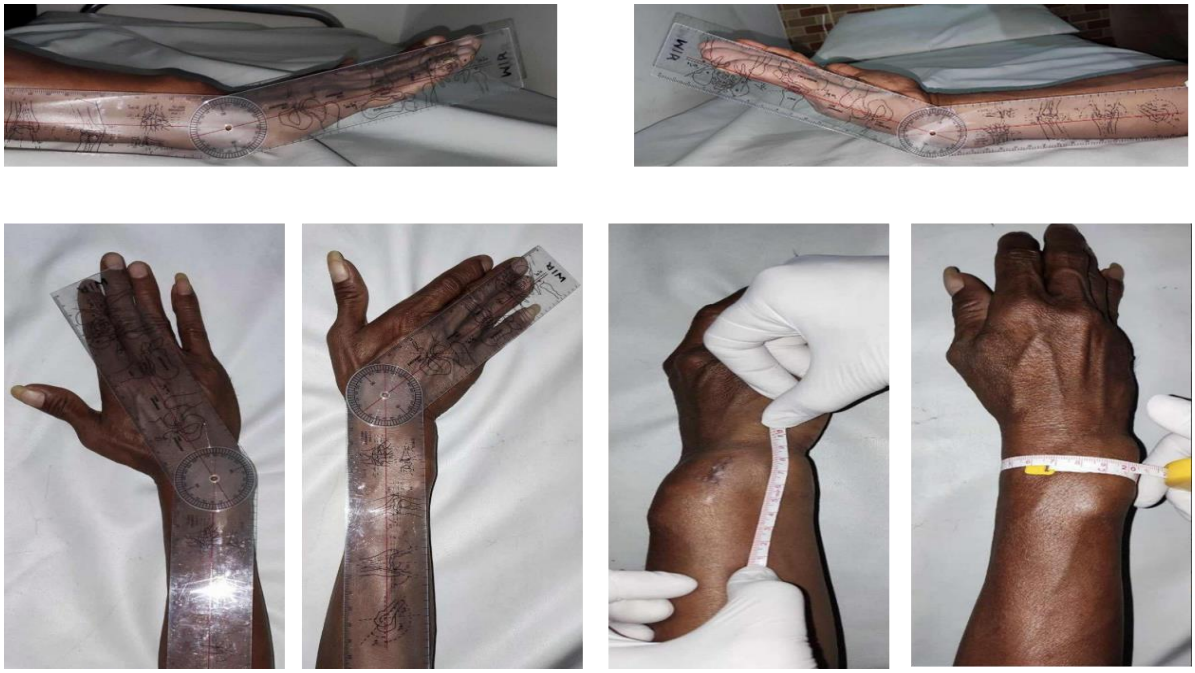

Figure 2. Measurement of the wrist's movement capability and lump's size

Figure 3. Grasping, pronation, and supination capability test.

The plain x ray of the right wrist showed multiple calcified intra-articular cartilaginous loose bodies in the distal radioulnar joint (Figure 4). Biopsy showed multilobulated cartilage tissue that contained chondrocytes without atypia, and some cartilage tissue accompanied with mild atypia. The specimen also showed endochondral ossification focus with calcification. There were several parts that showed hyalinized cartilage matrix.

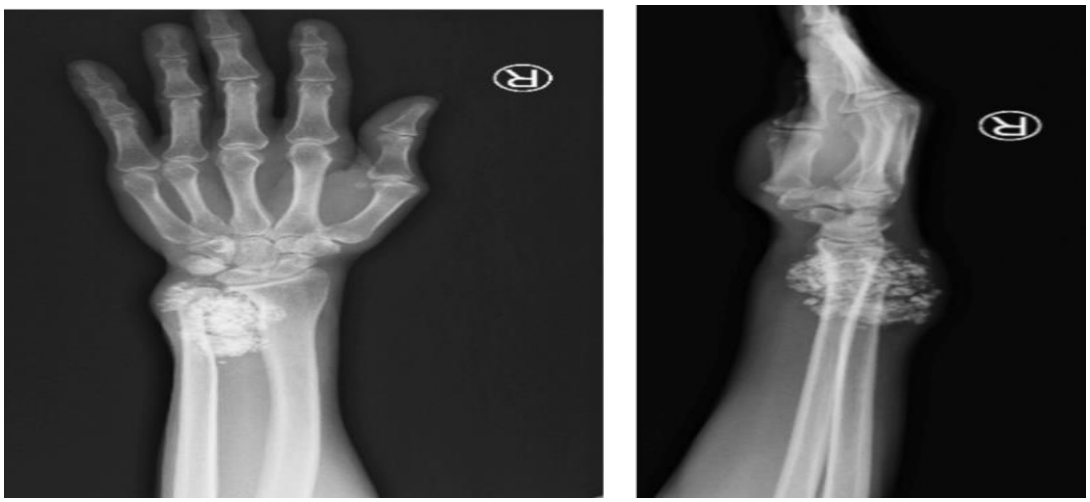

Figure 4. Pre-operative x-ray of wrist from anterior and lateral view

Patient was diagnosed with primary benign soft tissue tumor at right distal radio-ulnar joint due to synovial chondromatosis and we performed marginal excision. Subcutaneous incision of ulnar approach was made. We did dissection using cauterization to expose the tumor on the distal ulna and distal radio-ulnar joint. We evaluated the tumor margin and do the marginal excision by preserving the distal radioulnar joint and close the incision by subcutaneous suture (Figure 7). From the post-operative x-ray, nearly all tumor had been removed, but there were small portion of the tumor left on the distal ulna (Figure 8). Post-operative clinical evaluation showed no neurovascular problem. The patient was discharged after 2 days of post operative admission. The macroscopic and microscopic appearance of the tumor depicted in figure 5 and 6 respectively.

After 3 months post operative, we contacted the patient and ask him to do routine follow up on our clinic, the patient said there were no complaint / problem and he could use his right wrist and hand normally, but unfortunately the patient refused to came to our clinic due to his business.

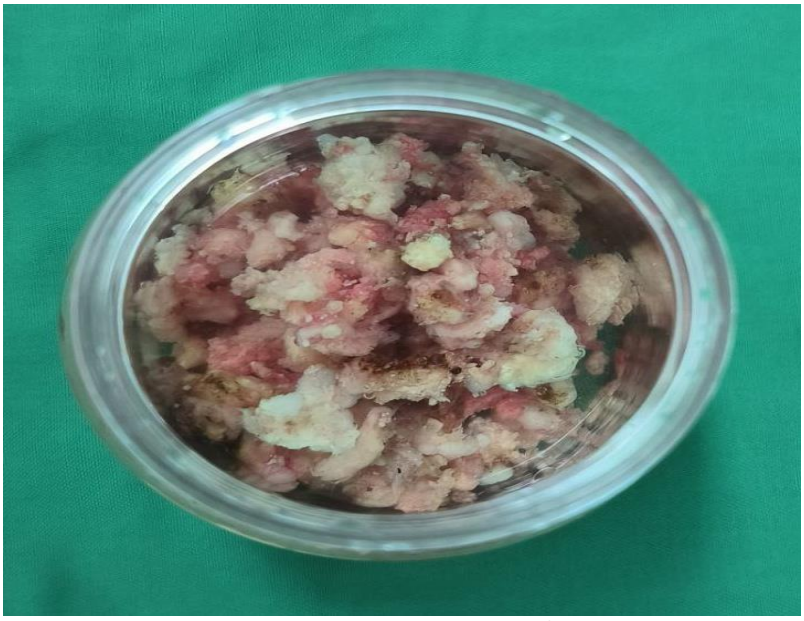

Figure 5. Gross macroscopic appearance of the tumor

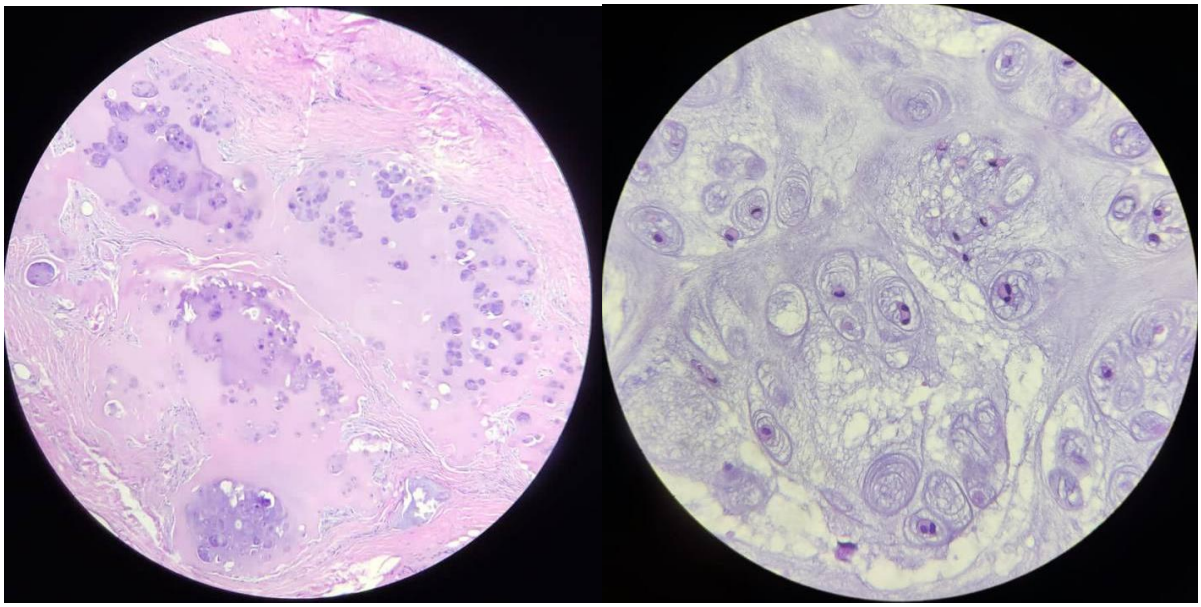

Figure 6. Microscopic appearance of the tumor

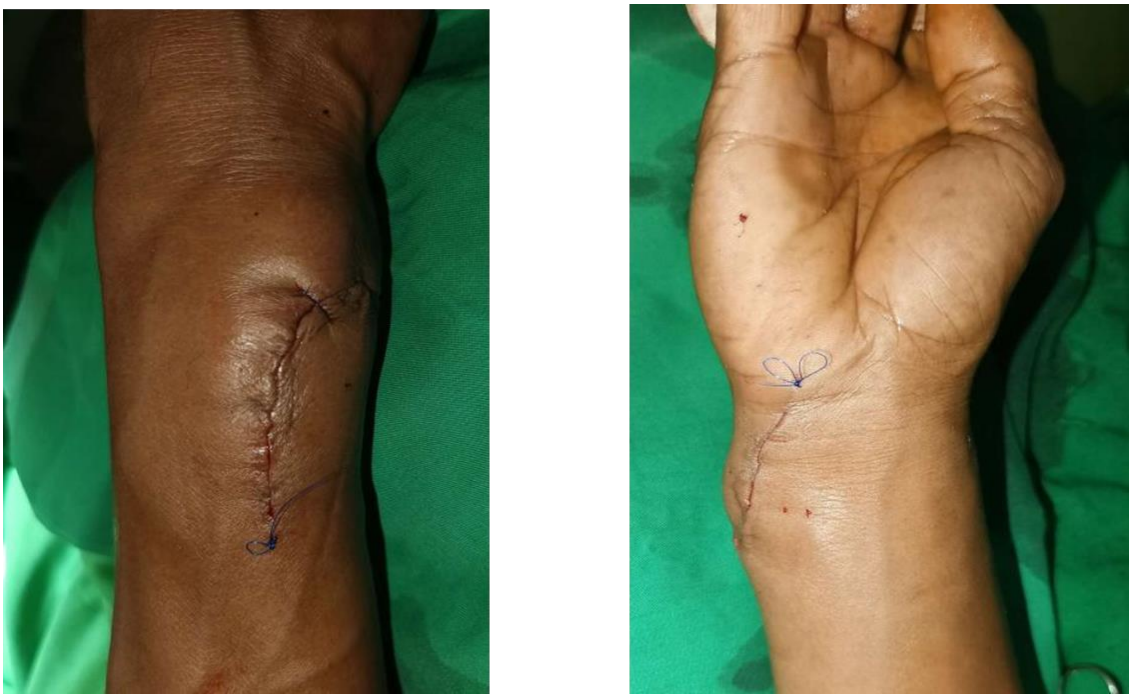

Figure 7. Post operative clinical picture

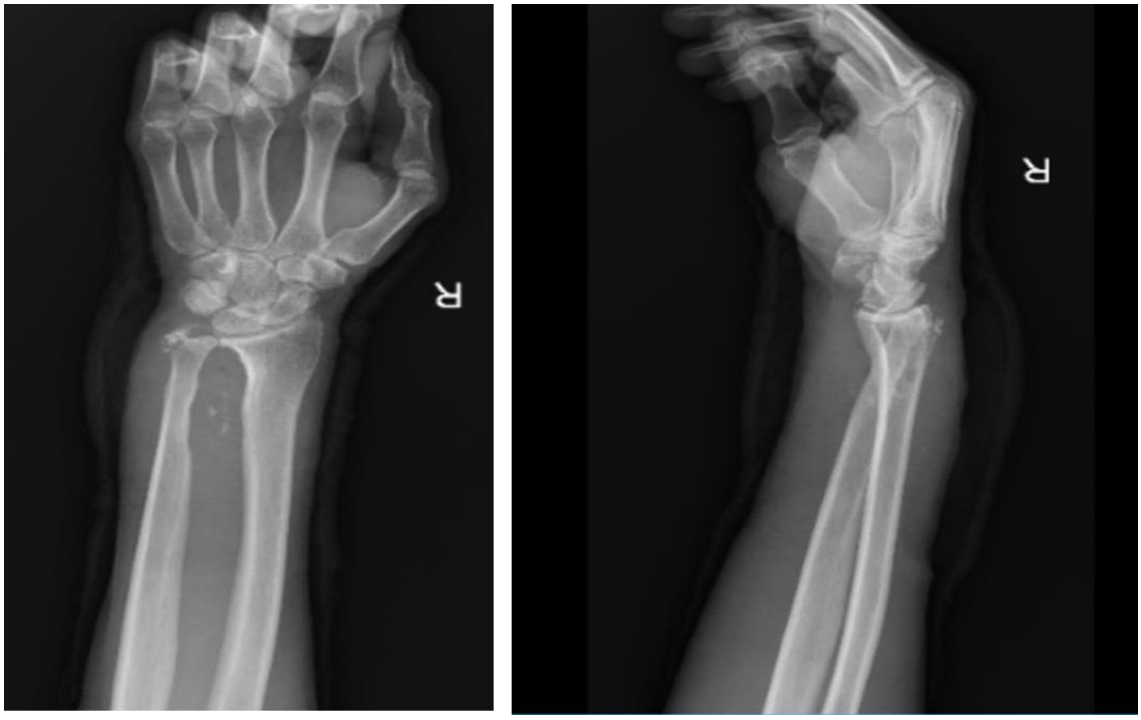

Figure 8. Post-operative right wrist X-ray from anterior and lateral view

DISCUSSION

Synovial chondromatosis is a condition involves transformation of the native synovial tissue resulting in the development of cartilaginous bodies within the synovium of impacted joints. The distinct stages of this condition involved metaplasia, synovitis, and the formation of loose bodies. The prevalent symptoms include swelling, pain, and limitations in the movement of the affected joint. Advanced disease will result in joint damage, but spontaneous regressions have also been documented.3 This patient had a rare synovial chondromatosis in his right wrist. Synovial chondromatosis usually affects large joints (knee, hip, shoulder or elbow). This was a rare case because after we searched relevant

publication and articles, the only published case of synovial chondromatosis of wrist joint was in 2016.2

In 1977, Milgram introduced a three-class classification for synovial chondromatosis. Early stage (Class I) is identified by synovial symptoms without detectable loose bodies on x-rays. Intermediate stage (Class II) encompasses both clinical symptoms and the presence of calcified loose bodies within the synovial membrane. Final stage (Class III) is characterized by calcified loose bodies with any involvement of the synovial tissue. This case was categorized as the final stage supported by the biopsy result.4

The etiology of synovial chondromatosis remain unclear. Suspected causes can be categorized into primary and secondary lesion. Primary lesions is a condition which the origin and development mechanisms are not well understood. One hypothesis involves the cartilaginous transformation of fibroblasts, potentially leading to primary lesions. However, specific genetic or risk factors haven't been clearly identified. Secondary lesion is a synovial chondromatosis which may occur following factors such as infection, embryological irregularities, or trauma such as repetitive mild trauma, internal joint issues, parafunctions, or degeneration.5 This case is suspected to be secondary lesion due to repetitive hard movement of the patient as a farmer.

Radiographic findings play a crucial role in distinguishing between primary and secondary types of synovial chondromatosis. The primary type can be identified when radiographs reveal no underlying joint abnormalities. Additionally, MRI contribute to the diagnostic process by aiding in the differentiation of the disease and identifying bursal extensions. In cases of hip involvement, bursal extension into the iliopsoas and obturator externus has been observed in up to 71% of cases. When evaluating patients with indications of secondary synovial chondromatosis, any underlying arthritic conditions must be evaluated. X-ray will exhibit characteristic features such as multifocal, rounded, articular, or periarticular calcific densities, which are indicative of synovial chondromatosis. However, it is important to not solely relying on radiographs for diagnosis. As in 20% of cases, calcification and mineralization may be delayed. Non-mineralized nodules might obscure the joint or bursa which is resembling an effusion. Furthermore, patients may experience symptoms for months to years before the development of calcifications, underscoring the importance of considering clinical factors in the diagnostic process.1 In this patient, the radiological appearance of multiple calcified intra-articular cartilaginous loose bodies quite suggestive for synovial chondromatosis of the wrist joint, and had been confirmed by biopsy result.

For the treatment of synovial chondromatosis, in the initial stages of the condition, conservative approaches are involving non-steroid anti-inflammatory drugs and intra-articular steroid injections. Surgical intervention becomes necessary when persistent swelling and limited joint movement are evident. While the removal of loose bodies alone can alleviate symptoms, there is a risk of recurrence. The preferred treatment, with the lowest recurrence rate, involves the removal of loose bodies combined with anterior and posterior synovectomy.6 Additionally, whether to perform the synovectomy arthroscopically or through an open approach is controversial. Open synovectomy offers better visualization of the joint surfaces. Whereas arthroscopic management has lower morbidity, quicker return to function, shorter hospital stay, reduced postoperative pain, and quicker rehabilitation.1 In this case, we performed marginal excision through extended subcutaneous ulnar approach by preserving the distal radioulnar joint. We remove nearly all tumor, except small amount of the tumor that still found on the distal ulna (detected on post-operative wrist x-ray).

Patient reported there were no complaint on 3 months post-operative, but unfortunately, we could not obtain detailed condition of the patient because the patient refused to do routine follow up on our clinic for his condition. The rarity of synovial chondromatosis involving the wrist joint could be an obstacle in performing diagnostic procedures and treatment for this case, but with the thoughtful application of resources and surgical principles, synovial chondromatosis of the wrist joint can be safely and effectively managed.

CONCLUSION

Synovial chondromatosis is an uncommon and non-malignant transformation of the synovial membrane which leads to development of numerous cartilaginous bodies within the joint. This condition rarely affect wrist joint and the literature and reported cases of synovial chondromatosis affecting wrist joint is very limited. We presented a rare case of synovial chondromatosis arising from the wrist joint's synovium. The diagnosis was based on clinical features, imaging characteristics, and histopathologic result. We performed marginal excision by preserving distal radioulnar joint. The clinical result was reported good, but complete data could not be obtained because the patient refused to do routine follow up. The rarity of synovial chondromatosis involving the wrist joint could be an obstacle in performing diagnostic procedures and treatment, but with the thoughtful application of resources and surgical principles, synovial chondromatosis of the wrist joint can be safely and effectively managed.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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