



## CASE REPORT

### ARTHROSCOPIC MANAGEMENT OF ELBOW SYNOVIAL CHONDROMATOSIS: CASE REPORT

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#### ABSTRACT

Synovial osteochondromatosis (SOC) is a mono-articular arthropathy rarely seen in diarthrodial joints. It occurs 3 times more in males than females and most often in those aged 30 to 50 years. It is a benign metaplastic proliferative disorder of the synovium characterised by the formation of multiple cartilagenous nodules in the synovium. With recent advances in arthroscopic techniques, the indications for arthroscopic treatment have been extended. We report a rare neglected case covering a 12-year period of a locally giant SOC of the elbow in a 30-year-old man. He was presenting a history of loss of range of motion and intermittent locking of the right elbow. Clinical examination revealed a significant increase in size of the right elbow compared to the contra-lateral. Magnetic Resonance images (MRI) showed many calcified bodies spread throughout the elbow joint on coronal and axial slices. Arthroscopy was applied to the right elbow with the patient in the lateral position under general anaesthesia. Approximately 43 free fragments were removed. Postoperatively, the elbow was supported in a sling for ten days and then was mobilized progressively. The clinical and radiological evaluation at 3 and 6 months postoperatively showed reduction in the volume of the elbow, improvement of extension to 10° and flexion to 130°. The advantages of this method include low morbidity, early rehabilitation and higher patient satisfaction. However, patients must be informed that recurrence could occur and should be followed up accordingly.

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## INTRODUCTION

Synovial osteochondromatosis (SOC) is a mono-articular arthropathy rarely seen in diarthrodial joints. It occurs 3 times more in males than females and most often in those aged 30 to 50 years (Ranalletta, 2009). Few cases of SOC of the elbow have been reported in the literature (Al-Najjim, 2013). Involvement in the joints is seen most in the knee, followed by the hip, elbow, wrist, ankle and least often in the shoulder; it is a benign metaplastic proliferative disorder of the synovium characterised by the formation of multiple cartilagenous nodules in the synovium, many of which detach and become loose bodies (Apte, 1992; Freund, 1937; Henderson, 1923). The elbow SOC was first reported by Henderson in 1918 (Henderson, 1918). The classic treatment for synovial chondromatosis is open arthrotomy, is excision of the synovium and complete removal of the loose bodies. With recent advances in arthroscopic techniques, the indications for arthroscopic treatment have been extended. We report a rare neglected case covering a 12-year period of a locally giant SOC of the elbow in a 30-year-old man.

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## MATERIAL AND METHODS

**Presentation of the case:** A 30-year old male presented with complaints of pain in the right elbow which had been ongoing for 12 years and for which no treatment had been received. He was presenting a history of loss of range of motion and intermittent locking of the right elbow. There was no history of trauma and no known additional medical problem. Clinical examination revealed a significant increase in size of the right elbow compared to the contralateral. Crepitation was determined on palpation with movement from flexion to extension. The elbow lacked 30° of full extension and 95° of flexion. Pronation and supination were substantially complete. Palpation of the elbow highlighted the presence of nodules in both deep and superficial planes of the right elbow joint. No vascular or neurologic compression symptoms were noted. On the radiological examination there were seen to be multiple calcified radio-opaque lesions filling all area of the elbow joint (Fig. 01). Magnetic Resonance images (MRI) showed many calcified bodies spread throughout the elbow joint on coronal and axial slices. Arthroscopy was applied to the right elbow with the patient in the lateral position under general anaesthesia (Fig. 02). Two anterior portals (lateral and medial) were opened for partial synovectomy, anterior capsulotomy and two posterior portals (standard posterior and posterolateral) in

order to remove the free nodules. The synovectomy was applied with a shaver. From the same portals, the free fragments within the joint were removed with an arthroscopic grasper. By changing the arthroscopy portal, the free fragments were completely removed.



**Figure 1. X-ray of the elbow demonstrates many calcifications in a patient with synovial osteochondromatosis**



**Figure 2. Perioperative images – Installation of the patient**

Approximately 43 free fragments, ranging in size from 0.5 to 1.3cm, were removed (Fig. 03). Postoperatively, the elbow was supported in a sling for ten days and then was mobilized progressively. The clinical and radiological evaluation at 3 and 6 months postoperatively showed reduction in the volume of the elbow, improvement of extension to 10° and flexion to 130°, no change in the preoperative pronation-supination of the elbow, and no peripheral neurological deficits. The patient was assessed using the Mayo elbow performance score (Dawson, 1996) before surgery and at 3 and 6 months postoperative, with an increase from 40 to 90 points.

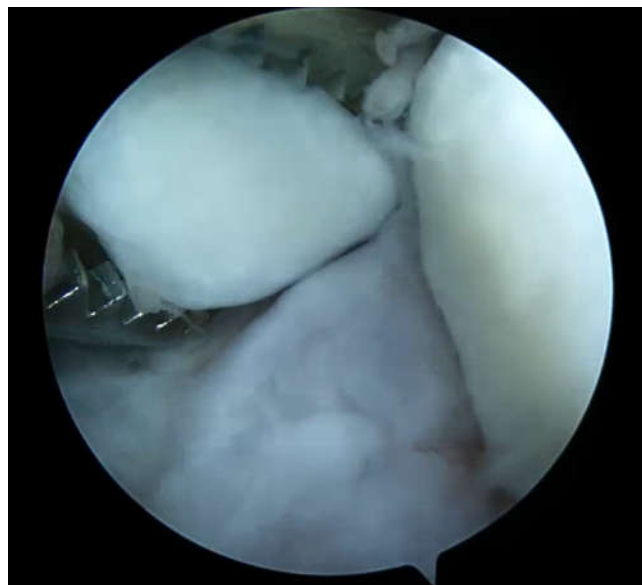
## RESULTS AND DISCUSSION

SOC is characterized by the formation of multiple nodules of hyaline cartilage within the sub-synovial connective tissue. Although the definitive etiology of SOC is not known, it can be classified as primary or secondary disease. Recently, clonal karyotypic abnormalities have been reported in chromosome 6 in patients with SOC, suggesting a neoplastic origin (Buddingh, 2003). Secondary reasons include osteochondritis dissecans, rheumatoid arthritis, tubercular arthritis, and mostly trauma. The consensus regarding its pathogenesis is that it is

due to hyperplastic metaplasia of the synovial connective tissue (Crotty, 1996 and Shanbhag, 2004). SOC is usually monoarticular; it is common in middle aged men. It involves the knee and the shoulder in more than 70% of cases (Shanbhag, 2004). However, SOC has been reported in 33 different locations in the body and can also occur in children (Davis, 1991).



**Figure 3. Free bodies removed**



**Figure 4. Arthroscopic image – Removing the free fragments within the joint with an arthroscopic grasper**

The definitive diagnosis of synovial chondromatosis of the elbow joint requires a comprehensive medical history, physical examination, radiographic investigation, and pathological evidence. Symptoms associated with elbow SOC are generally not specific. The more common symptoms include pain, swelling, loss of motion, and locking. The restrictions in the joint range of movement occur associated with the mechanical effect of the free fragments. The most common physical signs consist of soft-tissue swelling, crepitation and palpable loose bodies (Coles, 1997). However, cubital bursitis, ulnar nerve palsy, and posterior interosseous nerve palsy could be seen. Milgram (Milgram, 1977), defined 3 stages of synovial chondromatosis. At Stage 1, there is an active intra-synovial disease but no free fragments. At Stage 2, there is an active intra-synovial proliferation and lesions are seen in transition to free fragments, and at Stage 3, there are multiple osteochondral

free fragments, but active intra-synovial disease is not seen. The differential diagnosis includes osteoarthritis, chronic articular infection, mono-articular inflammatory arthritis, pigmented villonodular synovitis and periarticular neoplasms like synovial sarcoma (Shanbhag, 2004). As the visualisation of lesions which are not calcified would be difficult on direct radiographs or CT, examination with MRI is recommended in diagnosis (Aydoğan, 2013 and Urbach, 2008).



**Figure 5. Functional results 6 months after arthroscopic synovectomy and loose body removal**

It was reported by Lunn (Lunn, 2007), that osteoarthritic changes could be seen in patients with synovial osteochondromatosis. Therefore, even when the patient has no symptoms, removal of the free fragments was recommended to prevent joint degeneration. Both arthroscopic and open methods can be used in the treatment of SOC. Flury (Flury, 2008), reported that both open and arthroscopic techniques could give a satisfactory result, but the arthroscopic approach has many advantages, including a low morbidity, rapid healing, early rehabilitation and higher patient satisfaction (Fig. 04). The prognosis is good, but recurrence rate of SOC varies according to several studies. Disease recurrence is usually caused by incomplete synovectomy or if the removal of free bodies is incomplete. In their study, de Sa *et al.* (de, 2014). reported a recurrence rate of 7.1% of synovial SOC of the hip treated by hip arthroscopy. Zhu *et al.* (Zhu, 2018), found a recurrence in 2 of 11 cases. Galat (Galat, 2008), reported 8 cases of synovial chondromatosis of the foot and ankle and noted a recurrence in 3 cases (37.5%) patients with subsequent malignant transformation in 2 cases. Sachinis reported a rare case of aggressive elbow chondrosarcoma secondary to SOC in which the patient received a custom-made elbow arthroplasty (Sachinis, 2015). Although the advanced state of the disease in our patient, the symptoms presented were related to the progressive inflation in volume of the elbow, hard palpable loose bodies, locking of the elbow during flexion and extension movements. There were no other signs concerning nerve palsy or bursitis. The surgical synovectomy and removal of loose bodies has helped improve the range of motion of the elbow (Fig. 05).

## Conclusion

Arthroscopic surgery can be successfully applied in the treatment of SOC in the elbow joint. The advantages of this method include low morbidity, early rehabilitation and higher

patient satisfaction. However, patients must be informed that recurrence could occur and should be followed up accordingly.

**Conflicts of interest:** No conflict of interest was declared by the authors.

**Ethical Approval:** This is a case report. The patient was informed that the data concerning his case would be submitted for publication. Written informed consent was obtained from patient who participated in this case.

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