

## Case Report

# Synovial Chondromatosis of Shoulder Treated by Arthroscopic Synovectomy and Removal of Loose Bodies: A Case Report

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## ABSTRACT

Synovial Chondromatosis of the shoulder is mentioned in literature as a rare case. It is a benign neoplastic condition of the synovial membrane. Multiple osteocartilaginous loose bodies inside the joint characterize this rare monoarticular disorder. This case report describes a 32-year-old man who presented with right shoulder pain for six months. He had painful abduction and internal rotation. The condition was diagnosed as synovial chondromatosis. The patient underwent arthroscopic removal of loose bodies and synovectomy. This case illustrates the investigation and treatment of synovial chondromatosis of the shoulder. The loose bodies in synovial chondromatosis of a shoulder joint can be retrieved by arthroscopy as it provides a broader field of vision, better accessible access to the loose bodies, synovectomy, reduced hospital stay, and better rehabilitation.

**Keywords:** Arthroscopy, Loose Bodies, Shoulder, Synovial Chondromatosis

## INTRODUCTION

Synovial chondromatosis is a benign neoplastic pathology of the synovial membrane. The synovial membrane undergoes proliferation and metaplasia, resulting in multiple cartilaginous or osteocartilaginous nodules within the joint, bursa, or tendon sheath.<sup>1</sup>

It typically results in pain and stiffness of the affected joint.<sup>1</sup> The most typical joint is the knee, while the shoulder joint is the least affected.<sup>2</sup> The incidence is more common in males.<sup>3</sup> In different studies done by Milgram et al. and Imhoff et al. involving almost a hundred patients of synovial chondromatosis of several joints, the shoulder joint was affected in only five patients.<sup>4,6</sup> Some cases are associated with degeneration of articular cartilage.<sup>7</sup>

Synovial chondromatosis is treated by synovectomy and retrieval of loose bodies.<sup>8</sup> This is accomplished through arthroscopy or open surgery. With the advancement of arthroscopy, this modality has been the gold standard. A more extensive range of vision provided by an arthroscopy allows for the synovectomy procedure and the retrieval of all intraarticular loose bodies.

## CASE PRESENTATION

A 32-year-old right-hand dominant male student complained

of three months of gradually developing dull aching discomfort over his right shoulder when he raised his limb. It was non-radiating. The pain was aggravated by elevating his right arm and reaching his hand on his back, while it was relieved by rest, medication, and physiotherapy. Once the drugs wore off, the pain returned. The pain was moderate and did not hamper his routine activities. He gave no history of trauma and other constitutional symptoms. There was no diurnal variation or other associated factors.

A local examination of his right shoulder revealed wasting of the deltoid muscle. His active and passive abduction was painful and restricted to 100 degrees. The dynamic and passive flexion was 0-120 degrees, extension 0-130 degrees, external rotation 0-45 degrees, and internal rotation to the L4 vertebra.

The clinical tests for rotator cuff, impingement syndrome, acromioclavicular joint, and cervical spine were regular. There was no distal neurovascular deficit. Other adjacent joints were normal.

## INVESTIGATIONS

A plain X-ray showed multiple calcified densities with typical "ring-and-arc" chondroid calcification in the glenohumeral joint (Figure 1). The MRI demonstrated a low signal in T1-weighted images. The T2-weighted MR images showed high signal intensities with hypointense calcifications. This showed multiple loose bodies in the shoulder joint, axillary pouch, bicipital groove, and subscapularis muscle (Figures 2 a and 2 b).

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Figure 1: Plain X-ray showing multiple osteochondral loose bodies in the shoulder joint

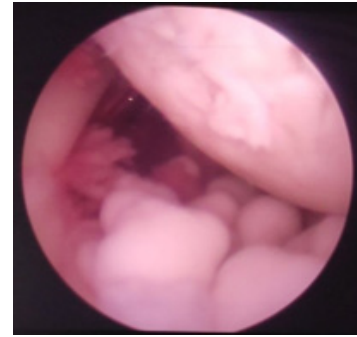


Figure 3: Arthroscopic view of operative loose bodies

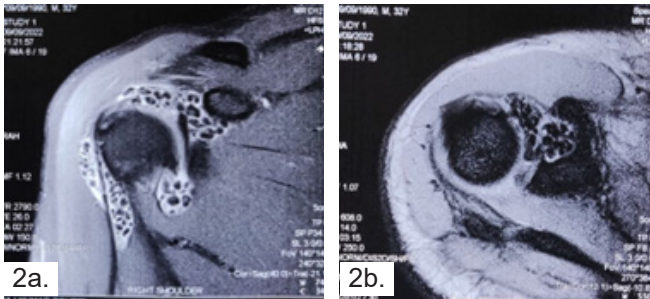


Figure 2(a and b): MRI showing multiple loose bodies in the shoulder joint.



Figure 4: More than a hundred loose bodies retrieved

## TREATMENT

An arthroscopic procedure for synovectomy and removal of loose bodies under anesthesia was planned. After administering general anesthesia, the patient was placed in a floppy left lateral position. The posterior portal was set approximately 2 cm inferior and 1.5 cm medial to the posterolateral angle of the acromion process. Diagnostic arthroscopy was done. Multiple loose bodies were noted inside the glenohumeral joint and bicipital groove (Figure 3). With the use of spinal needle localization, an anterosuperior portal was placed. Using a grasper, the loose bodies were extracted from the anterior and posterior portals simultaneously. A partial synovectomy was performed with a shaver. The joint was irrigated with normal saline. The loose bodies, numbered in the hundreds, were between 2 mm by 2 mm to 10 mm by 10 mm in size. (Figure 4). A sample of synovium was sent for biopsy.

The patient was discharged on the second postoperative day on an arm pouch and asked to follow up in a week. The arm pouch was removed after a week, and physiotherapy was recommended. Physiotherapy included a gradual increase in range of motion as pain tolerated and isometric exercises of rotator cuff muscles. After two weeks, the active abduction and internal rotation range improved to 0 to 120 degrees and L2 level, respectively. The pain was also significantly improved. The histopathological report showed synovial tissue lined by synoviocytes and clusters of chondrocytes without cellular atypia. A post-operative x-ray revealed a few loose bodies left behind (Figure 5). These were the ones embedded in the subscapularis muscle.



Figure 5: Post-operative X-ray

Till three months of follow-up, there was no evidence of recurrence clinically and radiologically. The range of active abduction was 0-130 degrees, and internal rotation was up to the D12 level at the end of three months.

## DISCUSSION

Synovial chondromatosis is monoarticular and commonly affects knee and hip joints.<sup>9</sup> Synovial chondromatosis of the shoulder is a very uncommon condition. Synovial chondromatosis can be either primary (idiopathic) or secondary. The secondary causes are traumatic osteochondral defect, rheumatoid arthritis, and tubercular arthritis.<sup>6</sup> An arthroscopic removal is considered superior to an open method. During an arthroscopy, access to the entire joint is achieved, while an open method requires division of the subscapularis muscle, provides limited access to the joint, and delays rehabilitation.<sup>3</sup> Milgram has identified three stages of this disease: Stage 1: Active intrasynovial disease but no free fragments; Stage 2: Active intrasynovial proliferation, and lesions are in transition to free fragments; Stage 3: Multiple osteochondral fragments, but active intrasynovial disease is absent.<sup>4</sup> Histological evidence shows that synovial cells undergo metaplastic changes to

chondrocytes which become peduncular and break into loose bodies. These loose bodies undergo endochondral ossification to form osteochondral loose bodies.<sup>10</sup>

The rate of recurrence is 3.2%-22.3%.<sup>11</sup> The malignant transformation into synovial chondrosarcoma is characterized by early recurrence, rapid progression of symptoms, and the presence of loose bodies in the muscle. The incidence of malignant transformation is 1%-10%.<sup>12</sup>

The strength of this case report is the arthroscopic removal of loose bodies and synovectomy. The arthroscopic procedure offers improved joint visibility and the ability almost to remove intraarticular loose bodies entirely.

The limitation of this case is shorter follow-up. We need a longer follow-up to evaluate the recurrence.

## CONCLUSION

Synovial chondromatosis of the shoulder is a very uncommon disorder. The shoulder joint is the least frequently affected by this condition. Arthroscopy provides a thorough visualization of the joint, enabling simultaneous synovectomy and removal of several loose bodies inside the joint.

## FINANCIAL SUPPORT AND SPONSORSHIP

None

## PATIENT CONSENT

Obtained

## CONFLICTS OF INTEREST

None

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