Arthroscopic removal of giant loose bodies in the glenohumeral joint

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ABSTRACT

INTRODUCTION: Loose bodies within the joint because of any cause have the potential for continued growth.
PRESENTATION OF CASE: A 41-year-old man had suffered multiple recurrent dislocations of his left shoulder, accompanied with pain. His anterior apprehension and relocation tests were positive, but no other sign was noted on physical examination. On magnetic resonance imaging and at arthroscopy, two giant loose bodies were seen. They were in the axillary recess and were removed arthroscopically.
DISCUSSION: Most authors recommend surgical removal of the cartilaginous loose bodies to ameliorate the symptoms. Furthermore, the majority of authors recommend a synovectomy to decrease the risk of recurrence. Depending on the size of the chondral loose bodies, removal can be performed via an arthrotomy, arthroscopy with mini-open arthrotomy, or arthroscopy.
CONCLUSION: The source of the loose body should be determined carefully. Other lesions may be associated with the loose body. Arthroscopic treatment is a good option for removing the loose body.

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1. Introduction

Milgram classified synovial osteochondromatosis into three categories: (1) loose bodies arising from osteochondral fractures; (2) degenerative arthritis or avascular necrosis (AVN) leading to fragmentation of the joint surface or fractured osteophytes; and (3) primary synovial osteochondromatosis. The latter is distinct from the other causes in that it arises from primary metaplasia of the synovial membrane, which produces cartilage-forming chondrocytes. Milgram described the metaplasia as having three phases: initially confined to the synovium; before progression to an active synovium with loose bodies; and a final late stage with an inactive synovium, but with residual intra-articular loose bodies.¹

Synovial osteochondromatosis is a condition that can affect any cavity lined with synovium. It is characterized by osteocartilaginous loose bodies, is typically monoarticular, and is reported in tendon sheaths, bursae, and numerous diarthrodial joints, most often affecting the knee. Around the shoulder, synovial chondromatosis has been described in the subacromial bursa, in patients with either an intact or ruptured rotator cuff, and in the acromioclavicular and glenohumeral joints. The involvement of the bicipital tendon sheath in patients with glenohumeral synovial osteochondromatosis has been reported in isolated cases.¹

Loose bodies within the joint from any cause have the potential for continued growth. In primary synovial chondromatosis, this results from the proliferation of chondrocytes. In secondary synovial chondromatosis arising from a central nidus, such as a fragment from an osteochondral fracture, enlargement is caused by the proliferation of connective-tissue cells and subsequent cartilaginous metaplasia.¹

2. Case presentation

A 41-year-old man had suffered multiple recurrent dislocations of his left shoulder, accompanied with pain. He had no idea on how many times his shoulder had been dislocated. The physical examination of the left shoulder revealed palpable crepitus in the glenohumeral joint. He had forward flexion to 160°, abduction to 140°, and a rotation arc of 90°, compared with 170°, 110°, and 100°, respectively, on the uninvolved side. His anterior apprehension and relocation tests were positive, but no other sign was noted on physical examination. The examination of the other joints was normal and he did not have comorbidities. On magnetic resonance imaging and at arthroscopy, two giant loose bodies were seen (Figs. 1 and 2). The bony deficiency at the anterior glenoid...
was less than 10%. At arthroscopy, the glenoid did not show obvious bone loss from the anterior margin. The loss was determined by measuring the anterior–posterior distance from the mid-glenoid point. The bony fragments might have originated from a Hill-Sachs lesion, the anterior glenoid, or synovial enchondromatosis. We believe that the fragments were old because they were rounded.

They were in the axillary recess and were removed arthroscopically (Fig. 3). We did not use extra portals for removing the loose bodies. There was no synovial hypertrophy in the shoulder. Then, an arthroscopic Bankart repair was performed and the procedure was completed.

The histological examination of the loose bodies and the synovial tissue confirmed the presence of cartilaginous synovial metaplasia consistent with synovial chondromatosis. The loose bodies were composed of cartilage at various stages of calcification and endochondral ossification. Postoperatively, the patient was managed with immobilization using a sling and discharged from the hospital.

3. Discussion

Synovial chondromatosis is rare, but its exact incidence is unknown. It has been reported in 33 locations of the body. The knee is the joint most commonly affected by synovial chondromatosis, followed by the hip, elbow, wrist, and shoulder. Most authors recommend surgical removal of the cartilaginous loose bodies to ameliorate the symptoms. Furthermore, the majority of authors recommend a synovectomy to decrease the risk of recurrence. Depending on the size of the chondral loose bodies, removal can be performed via an arthrotomy, arthroscopy with mini-open arthroscopy, or arthroscopy. The arthroscopic approach is an effective alternative for treating synovial chondromatosis of the shoulder; it is minimally invasive, and has many advantages over traditional open surgery. While performing a shoulder arthroscopy, all pathologies and treatment methods should not be missed by an orthopedic surgeon. After the treatment, immediate, lasting improvement of shoulder function is expected. Although there is extensive literature on the treatment of synovial chondromatosis of the knee, it is unclear to what extent this can be extrapolated to the treatment of synovial chondromatosis of the shoulder. Given its infrequency, there are only a few isolated case reports of synovial chondromatosis of the shoulder.

Milgram described 30 cases of synovial osteochondromatosis identifying three stages of the disease: (1) active intrasynovial disease, with no loose bodies; (2) transitional lesions with both active intrasynovial proliferation and free loose bodies; and (3) multiple osteochondral loose bodies with no active intrasynovial disease. Although Milgram advocated the simple removal of loose bodies, especially for stage 3 disease, other authors have stressed the need for a synovectomy to remove the source of the cartilaginous metaplastic foci.
The surgical treatment of synovial osteochondromatosis by open arthrotonomy potentially requires longer postoperative rehabilitation. Full visualization of the entire joint space is often difficult, requiring a maneuver to “milk” the loose bodies from the posterior aspect of the joint. In comparison, arthroscopic techniques have fewer comorbidities and a shorter course of rehabilitation. In the two reported cases of arthroscopic treatment for synovial osteochondromatosis of the shoulder, the patients returned to work shortly after their procedures. The key to the arthroscopic technique was the use of multiple portals that allow complete visualization of the glenohumeral joint and associated recesses, along with easy retrieval of the loose bodies.

A loose body or chondral or osteochondral lesion may be seen with acute or recurrent shoulder instability. Yiannakopoulos et al. reported loose bodies or chondral and osteochondral lesions in 13–16% of acute and chronic shoulder instability.

In a meta-analysis, Bloom et al. found 191 cases of primary synovial chondromatosis, of which only 10 involved the shoulder. The diagnosis should not be confused with other disorders giving rise to loose bodies (secondary synovial chondromatosis), which include degenerative joint disease, osteochondritis dissecans, neurotrophic arthritis, tuberculous arthritis, and osteochondral fractures. In secondary synovial chondromatosis, cartilaginous nodules are seen either attached to the synovial membrane or free within the joint. With osteochondral fractures, loose bodies might be classified as secondary synovial chondromatosis and are easily diagnosed from a history of trauma, the presence of solitary loose bodies in typical cases, and specific radiographic features.

4. Conclusion

Loose bodies of the shoulder are rare. The source of the loose body should be determined carefully. Other lesions may be associated with the loose body. Arthroscopic treatment is a good option for removing the loose body. A synovectomy can be performed to reduce the risk of recurrence.

Conflict of interest

No conflict of interest was declared by the authors.

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Ethical approval

Written informed consent was obtained from the patient who participated in this case.

Author contributions

BY, SM, BK, and HM were involved in the conception, design and interpretation. BY and SM wrote the manuscript. BK, SM and HM collected data, reviewed relevant published reports and provided the images. All authors read and approved the final manuscript.

Key learning points

- The arthroscopic approach is an effective alternative for treating synovial chondromatosis of the shoulder; it is minimally invasive, and has many advantages over traditional open surgery.
- A loose body or chondral or osteochondral lesion may be seen with acute or recurrent shoulder instability.

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