



Case report

Arthroscopic treatment of synovial chondromatosis of the shoulder: A case report



Tahir Mutlu Duymus^a, Bulent Yucel^a, Serhat Mutlu^{a,*}, Serkan Tuna^b, Harun Mutlu^c, Baran Komur^a

^a Department of Orthopaedics, Kanuni Sultan Suleyman Training and Research Hospital, Istanbul, Turkey

^b Department of Orthopaedics, Haydarpasa Numune Training and Research Hospital, Istanbul, Turkey

^c Department of Orthopaedics, Taksim Training and Research Hospital, Istanbul, Turkey

HIGHLIGHTS

- Synovial chondromatosis is a mono-articular arthropathy rarely seen in diarthrodial joints.
- Arthroscopic surgery can be successfully applied in the treatment of synovial chondromatosis in the glenohumeral joint.
- The advantages of the method include good visualisation during surgery, low morbidity and early healing.
- Patients must be informed that recurrence could occur and should be followed up accordingly.

ARTICLE INFO

Article history:

Received 7 February 2015

Received in revised form

5 May 2015

Accepted 6 May 2015

Keywords:

Arthroscopic treatment

Radio-opaque lesions

Shoulder

Synovial chondromatosis

ABSTRACT

Introduction: Synovial chondromatosis is a mono-articular arthropathy rarely seen in diarthrodial joints. The classic treatment for synovial chondromatosis is open arthrotomy, synovectomy and complete removal of the free fragments. With recent advances in arthroscopic techniques and methods, the indications for arthroscopic treatment have been extended.

Presentation of case: A 33-year old female presented with complaints of pain in the right shoulder. On the radiological examination, there were seen to be multiple calcified radio-opaque lesions filling all area of the glenohumeral joint. On computed tomography (CT) examination, again multiple radio-opaque free fragments were determined. Arthroscopy was applied to the right shoulder. The free fragments were completely removed. Approximately 33 free fragments, ranging in size from 0.5 to 1.3 cm, were removed.

Discussion: Cases of synovial chondromatosis in the shoulder have been rarely reported in literature. Generally the disease is self-limiting. Clinically, symptoms are generally not specific. Restrictions in the joint range of movement occur associated with the mechanical effect of the free fragments and in periods of active use, local pain and swelling may be seen in the shoulder. Simple removal of the free fragments, others have stated that removal with synovectomy is necessary to prevent recurrence of the cartilaginous metaplastic focus. Recurrence rates vary from 0 to 31%.

Conclusion: Arthroscopic surgery can be successfully applied in the treatment of synovial chondromatosis. The advantages of the method include good visualisation during surgery, low morbidity and early healing.

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1. Introduction

Synovial chondromatosis is a mono-articular arthropathy rarely seen in diarthrodial joints. It occurs most often in those aged 30–50 years and 3 times more in males than females [1]. Involvement in the joints is seen most in the knee, followed by the hip, elbow, wrist, ankle and least often in the shoulder. Other locations where

* Corresponding author. Department of Orthopedics, Kanuni Sultan Suleyman Education and Research Hospital, Atakent Mahallesi, Turgut Ozal Caddesi, No:1, 34303 Kucukcekmece, Istanbul, Turkey. Tel.: +90 532 762 76 16; fax: +90 212 571 47 90.

E-mail address: serhatmutlu@hotmail.com (S. Mutlu).

Table 1
Preoperative and postoperative joint range of movement.

Shoulder range of movement -degrees	Preoperative	Postoperative 3 months
Abduction	80 (N: 0–180)	170
Adduction	55(N: 0–75)	75
External rotation	35 (N: 0–90)	85
Internal rotation	30 (N: 0–90)	85
Flexion	100 (N: 0–180)	170
Extension	50 (N: 0–60)	60

the lesions may be seen include bursae and tendon sheaths in the hands and feet in particular. Although the reasons for development of synovial chondromatosis are not known, it has been suggested that in the pathogenesis, the synovial chondroid metaplastic focus becomes peduncular then by breaking off, becomes a free fragment within the joint. These free fragments may undergo endochondral ossification or cause erosive damage to the joint surface [2].

The classic treatment for synovial chondromatosis is open arthrotomy, synovectomy and complete removal of the free fragments. With recent advances in arthroscopic techniques and methods, the indications for arthroscopic treatment have been extended. In this paper, the place of arthroscopic treatment is discussed in the treatment of synovial chondromatosis in the shoulder joint.

2. Presentation of case

A 33-year old female presented with complaints of pain in the right shoulder which had been ongoing for 4 years and for which no treatment had been received. There was no history of trauma and no known additional medical problem. In the physical examination, shoulder movements were seen to be limited and painful in all directions (Table 1). Crepitation was determined on palpation with movement. On the radiological examination, there were seen to be multiple calcified radio-opaque lesions filling all area of the glenohumeral joint (Fig. 1A). On computed tomography (CT) examination, again multiple radio-opaque free fragments were determined on coronal and axial slices (Fig. 1B, C).

Arthroscopy was applied to the right shoulder with the patient in the beach-chair position under general anaesthesia. A routine posterior portal entrance was made and multiple free fragments were seen filling the glenohumeral joint (Fig. 2A). Using antero-superior and antero-inferior portals, a partial 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. Approximately 33 free fragments, ranging in size from 0.5 to 1.3 cm, were removed (Fig. 2B).

The histological examination of the free fragments reported cartilaginous synovial metaplasia as synovial chondromatosis.

Varying rates of calcification and endochondral ossification were determined in the free fragments.

The complete removal of all the free fragments was confirmed on the postoperative direct radiograph (Fig. 1D). Passive and active-assisted range of motion exercises were initiated immediately postoperatively. In the 1st week postoperatively, active range of motion exercises and strengthening exercises were started. At postoperative 1 year follow-up, there was no symptoms and range of motion was normal. The patient was called for radiographic controls every six months.

The patient was informed that the data concerning his case would be submitted for publication.

3. Discussion

Cases of synovial chondromatosis in the shoulder have been rarely reported in literature. Generally the disease is self-limiting. Although the definitive aetiology of synovial chondromatosis is not known, it can be classified as primary or secondary. Secondary reasons include primarily trauma, then osteochondritis dissecans, rheumatoid arthritis and tubercular arthritis. Clinically, symptoms are generally not specific. Restrictions in the joint range of movement occur associated with the mechanical effect of the free fragments and in periods of active use, local pain and swelling may be seen in the shoulder. As the visualisation of lesions which are not calcified would be difficult on direct radiographs, examination with magnetic resonance imaging is recommended in diagnosis [3–5]. Milgram defined 3 stages of synovial chondromatosis. At Stage 1, there is active intrasynovial disease but no free fragments. At Stage 2, there is active intrasynovial proliferation and lesions are seen in transition to free fragments, and at Stage 3, there are multiple osteochondral free fragments, but active intrasynovial disease is not seen. Although Milgram recommended simple removal of the free fragments, others have stated that removal with synovectomy is necessary to prevent recurrence of the cartilaginous metaplastic focus. In literature, recurrence rates vary from 0 to 31% [2,6,7].

In a study by Lunn et al., it was reported that osteoarthritic changes could be seen in patients with synovial chondromatosis. Therefore, even when the patient has no symptoms, removal of the free fragments was recommended to prevent joint degeneration. In

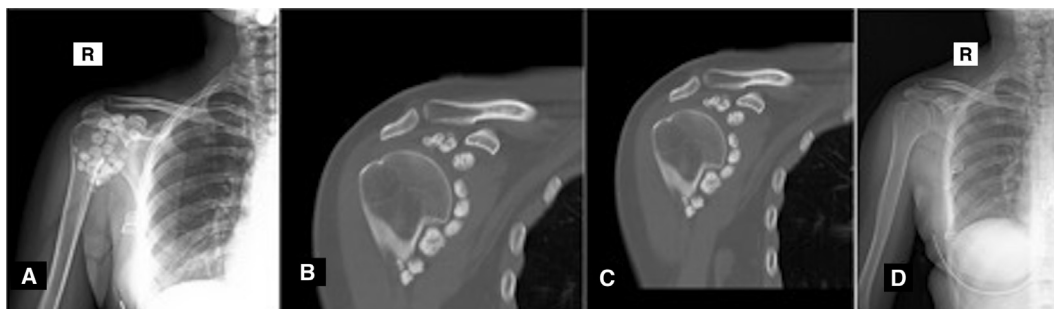


Fig. 1. (A) preoperative X-ray, (B, C) Ct and (D) postoperative X-ray.

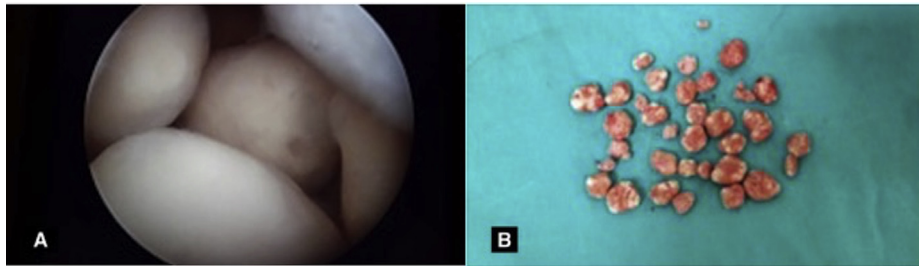


Fig. 2. (A) Mixed small and large multiple free fragments within the joint; (B) seen after arthroscopic removal.

the same study, it was also reported that by damaging the tendon of the biceps long head, free fragments in the bicipital groove could cause tendinitis and pain [7].

In addition, even though the disease is rare, it displays the possibility of malignant transformation. In the differential diagnosis, degenerative joint disease, osteochondritis dissecans, synovial sarcoma, chondrosarcoma and rheumatoid arthritis should be considered [3]. Free fragments have been reported to have been seen in lesions accompanying chronic shoulder instability [8].

Both open and closed arthroscopic methods can be used in the treatment of synovial chondromatosis. To reach the joint in the open method, a subscapular tenotomy is necessary and there are reports that associated with this there are disadvantages such as inadequate tendon repair and attachment site [9]. This situation extends the healing period and delays rehabilitation. However, the advantages of arthroscopic treatment include good visualisation, low morbidity, rapid healing and early rehabilitation [3,6]. Arthroscopic or other classic treatments decision is totally dependent on the surgeon's experience. In our case intra articular free fragments are all in anterior, posterior and axillary etc. For clear vision of fragments and effective early postoperative rehabilitation we preferred arthroscopic treatment. In the case presented here, the patient, who had shoulder pain and an advanced degree of limited joint movement preoperatively, showed rapid recovery and the pain was completely resolved. However, synovectomy is limited in arthroscopic treatment and there are disadvantages such as potentially restricted access to regions such as the axillary recess and biceps sheath [1,3,4,10,11]. Bruggemann et al. reported that the placement of a wide cannula from the anterior portal could be useful for arthroscopic removal of the free fragments from the glenohumeral joint [12]. In the current case, technical difficulties were experienced during the removal of 3 fragments from the axillary recess. This can be thought to be associated with the anatomical depth of the recess and the length of the standard portals and when this dilemma arises it may be necessary to open additional portals. Although the majority of lesions are removed from the anterior cannula, moving the site of the arthroscope enables removal of the free fragments from the posterior portal. In the current case, as the diameter of the 8 largest fragments was greater than that of the cannula, they could not pass into the cannula so it was removed and with the loosening of soft tissue, the lesions were then able to be completely removed. Measuring the diameters of all the lesions on CT in preoperative planning would ensure planning the use of a cannula of sufficient diameter and would avoid the technical difficulties experienced during surgery in the current case.

4. Conclusion

Arthroscopic surgery can be successfully applied in the treatment of synovial chondromatosis in the glenohumeral joint. The

advantages of the method include good visualisation during surgery, low morbidity and early healing. 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.

Funding

The authors declared that this study has received no financial support.

Ethical approval

This is a case report. The patient was informed that the data concerning his case would be submitted for publication.

Consent

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

Author contribution

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

Guarantor

Tahir Mutlu Duymus; Serhat Mutlu; Serkan Tuna; Baran Komur

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