

SHOULDER CHONDROMATOSIS WITH MULTIPLE LOOSE BODIES AND GLENOID EROSION- MANAGED BY ARTHROSCOPIC LOOSE BODY REMOVAL AND BMAC



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Abstract:

Chondromatosis is a rare, benign condition of the joints with metaplasia of synovium into cartilage leading to the formation of loose bodies. Involvement of the shoulder joint is uncommon. Symptomatic individuals require removal of the loose bodies. Here we describe a case report of a

patient with synovial chondromatosis of the shoulder with multiple loose bodies causing glenoid cartilage erosions and loss. This required not only loose body removal but cartilage regenerative procedure- bone marrow aspirate concentrate (BMAC) application. Post-surgery, he had rapid resolution of symptoms.

Introduction:

Synovial chondromatosis or osteochondromatosis is a rare, typically monoarticular, benign condition of uncertain aetiology which manifests as multiple cartilaginous or osteocartilaginous nodules within a joint, and is thought to arise as a result of synovial metaplasia into cartilage which sometimes may ossify(1)(2)(3). These often detach from the synovium and become intra-articular loose bodies. Typically occurring in joints, it can also be encountered in other parts of the body lined by synovium such as bursae or tendon sheaths. The involvement of the shoulder joint is uncommon(4)(5). These can be asymptomatic but sometimes cause pain, swelling or episodes of locking. The treatment involves removal of all loose bodies, either by open or arthroscopic techniques(6)(7). In addition, any concomitant problem such as instability or muscle injury must be addressed(8). In this case, it was wear of the glenoid cartilage which resulted in a full thickness cartilage loss anteriorly involving about 25% of the glenoid which we repaired using BMAC with fibrin glue.

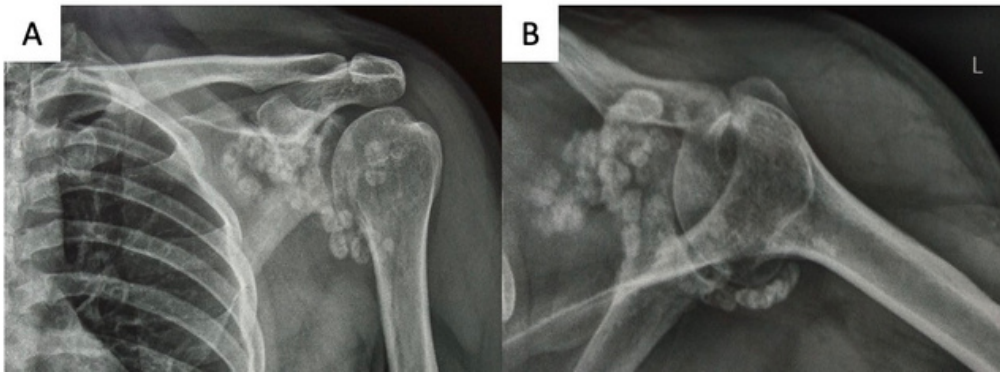


Figure 1: Plain radiographs. (A) AP view, (B) Axillary view

Use of BMAC combined with fibrin glue in the repair of cartilage loss in the shoulder has not been previously reported.

Case report:

A 34 year old male presented to the outpatient department with history of severe left shoulder pain from 2 days. The pain was severe and he was unable to lift arm or do any activities with left upper limb. He had a similar painful episode one year back which was resolved with a local injection (may have been a corticosteroid injection) elsewhere without any evaluation. He was a regular gym goer and used to do heavy workouts till one year back. He had no comorbidities, was right hand dominant and a businessman by occupation.

Physical examination revealed a minimal diffuse tenderness, restricted range of movements with flexion of 70°, passive abduction of 60°, no active abduction,

external rotation of 20° and internal rotation to level of lumbar spine only. All movements were painful.

Impingement tests were negative but there was gross weakness of supraspinatus with drop arm sign present. Moderate weakness of subscapularis and infraspinatus were also noted. Speed's and Yergason's tests were negative.

X-rays revealed the presence of numerous osteochondral loose bodies in the shoulder (Figure 1), while an MRI scan confirmed the same, also identifying a loose body causing mechanical block to movements (Figure 2). The MRI also confirmed that the rotator cuff was intact, but revealed presence of glenoid erosions.

He soon underwent surgery- left shoulder arthroscopy, loose body removal, debridement and repair of the glenoid cartilage loss by BMAC (Figure 3). While the loose body removal was done by the standard arthroscopy technique in the beach chair position, the BMAC needed a dry

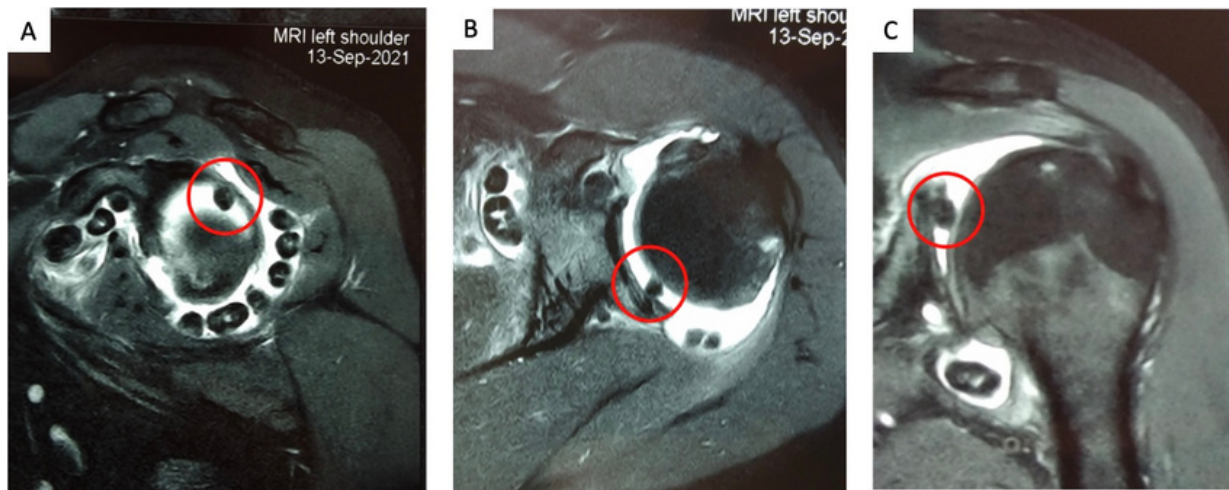


Figure 2: MRI images showing loose fragments likely to be the cause of symptoms (red circle).
(A) Sagittal cuts (B) Axial cuts (C) Coronal cuts

bony bed. For this, saline infusion was replaced with a standard CO₂ insufflator used in laparoscopy surgeries. In addition, dry gauze was used to absorb all the residual moisture from the joint.

Meanwhile, 60 ml of bone marrow was aspirated from the left anterior iliac crest, prepared with the BMAC machine (Arthrex Angel system). One ml of BMAC was loaded onto a double barrel syringe for use with fibrin glue. Once a dry bed was obtained, multiple drill holes were made to anchor the fibrin glue-BMAC composite. The BMAC-fibrin glue composite was slowly injected into the defect using an epidural needle and allowed to set. As it solidified, it was gently moulded into the shape of the glenoid. Once set, wound closure was done by the standard technique.

Difficulties encountered were few, such as repeated mopping over a long time needed to dry out the glenoid bony bed and to achieve accurate moulding of the fibrin glue against gravity on the vertically oriented glenoid.

Post-operatively, he was on an arm pouch for 10 days, isometric exercises and gentle passive range of movement exercises were started. Active movements including abduction started by 2 weeks with resumption of all light activities by 3 months. Rotator cuff strengthening using resistance bands were also started at 3 months.

At one year follow-up, he has no pain, full range of movements, full function and near complete recovery of rotator cuff strength. There was no recurrence of the chondromatosis.

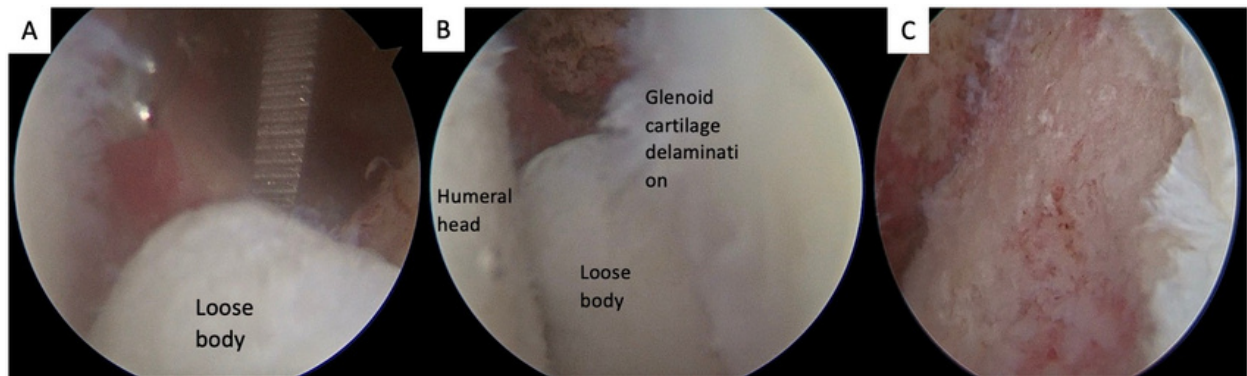


Figure 3: Arthroscopy images. (A) Loose body (B) Cartilage delamination & loose body (c) glenoid after debridement of the unstable cartilage

Discussion:

Synovial chondromatosis is a rare, benign condition with literature on the same limited to individual case reports or small case series. Some of the reports emphasise the need to treat associated problems such as instability or cuff tears at the same time as loose body removal(8). In this situation, there was glenoid cartilage erosion and loss which was treated in the same sitting.

BMAC for cartilage defects in the knee joint has been used at our institution for a few years now with consistent results. It is used by either open technique or dry arthroscopy technique using a double barrel syringe, thrombin and fibrinogen, forming a fibrin glue scaffold which can be shaped to fill the defect precisely and hold the stem cells in place for reliable healing of the defect. There are reports showing that this results in the formation of hyaline cartilage filling the defect(9). This is important since techniques such as microfracture result in formation of fibrocartilage which is mechanically inferior to hyaline cartilage in resisting the typical compression and shear forces encountered.

Autologous chondrocyte implantation (ACI), when used to fill such defects achieves formation of hyaline cartilage but has the main drawback of being a two-stage procedure(9).

The use of BMAC in this technique in the shoulder has not been previously documented. There are some studies using intra-articular BMAC injections for primary osteoarthritis and supraspinatus tendinopathies, but not with its use along with fibrin glue for cartilage defects(10).

Conclusion:

- Synovial chondromatosis is a rare, benign condition characterised by development of intra-articular cartilaginous loose bodies which typically need removal.
- Associated problems also need to be addressed, and in this situation, cartilage loss in the glenoid was managed by BMAC-fibrin glue insertion.
- The use of BMAC-fibrin glue has become commonplace in the management of cartilage loss in the knee, but this case demonstrates use of the same in the shoulder.

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