NOV 2022 | VOL-2| ISSUE 8

IAS NEWSLETTER

Dr Sachin Tapasvi
President, IAS

Dr SR Sundararajan
General Secretary, IAS
Editor, IAS Newsletter

ARTICLES IN THIS ISSUE

IAS Academic Corner:

Citation for this newsletter: IAS Newsletter-16 Nov 2022, Vol-2, Issue-8, https://indianarthroscopy.co.in/pdf/IAS_Newsletter_Nov 2022.pdf

EXPERT TALK
ALGORITHM FOR SHOULDER INSTABILITY

Dr Ashish Babhulkar
Deenanth Mangeshkar Hospital
Pune

Highlights

- Follow a deficit-based approach- Assess glenoid bone loss, humeral bone loss & quality of the labrum.
- Latarjet is indicated with glenoid bone loss >15%.
- Non-operative management to be considered in: Multidirectional instability, uncontrolled epileptic, all first time dislocators(except <20 years), undisplaced bony bankart, >50 years, Axillary neuropathy(employ caution).
- No substitute for clinical examination: Mid-range instability during crank-jobes is suggestive of extensive glenoid bone loss, look out for ligament laxity!
- Imaging: Plain radiographs are a must(Loss of double cortical sign: indicative of glenoid bone loss). MRI for assessing the labrum and CT for assessing glenoid bone loss & Hill Sachs lesion(HS quotient).
- DAS procedure: Rerouting of biceps through subscapularis, can be considered in bone loss of 10-15%, Long term results awaited!

ANTERIOR TALOFIBULAR LIGAMENT RECONSTRUCTION AND AUGMENTATION WITH INTERNAL BRACING

Dr Shivam Shah
Consultant Orthopaedic Surgeon
Sunshine Global Hospital
Vadodara

Abstract:

Lateral ankle instability is a common pathological condition in recreational and professional athletes (1).
Most foot and ankle surgeons perform an open-modified Brostrom operation for the treatment of lateral ankle instability, and good-to-excellent results have been reported (2, 3).
Despite the value of the Brostrom procedure, limitations of this technique exist. Waldrop et al. (4) reported that both direct suture repair of the anterior talofibular ligament (ATFL) and the use of suture anchors in the fibula or talus had significantly inferior strength compared with the intact ATFL in a cadaveric model. As a result, the need for early protection of all three types of Brostrom procedures and cautious early rehabilitation was emphasized (4). Kirk et al. (5) also recommended protection to prevent ATFL elongation. Furthermore, in patients with long-standing lateral ankle instability with attenuated native tissue and in very large patients or athletes, both of whom are likely to place extra stress on their ankles, the adequacy of these repairs has been questioned (5, 6). To address situations such as these, the concept of using high-strength nonabsorbable suture tape has been proposed, as described in previous literature for rotator cuff repairs (7, 8). An internal brace is a ligament repair bridging concept using braided ultra-high-molecular-weight polyethene/polyester suture tape and knotless bone anchors to reinforce ligament strength as a secondary stabilizer after a repair which may help resist injury recurrence (9).

Case:

A 25-year-old male complaining of recurrent ankle instability presented to us after 8 months after an inversion injury to his ankle. Patient complained of recurrent internal rotation of the foot and ankle, pain and an unstable ankle. He had an episode of twisting injury 8 months back which was managed conservatively using a crepe bandage.
On examination, ankle and foot range of motion was good. There was a lateral joint line tenderness. On evaluating the stability of the ankle varus stress test and anterior drawer test was positive for the patient.
Radiological evaluation in the form of talar tilt angle and anterior talar translation as a part of stress x-rays were taken and were found to be more than the opposite side. After which an

Citation for this article: Shivam Shah. Anterior Talofibular ligament reconstruction and augmentation with internal bracing. IAS Newsletter-16,2022;2(8):3-6.
doi:https://doi.org/10.17613/wvbn-8472

Fig 1: Plain radiographs & MRI imaging. A: Positive talar tilt angle, B: Anterior drawer stress x-rays, C: ATFL tear(red circle)

MRI was done which revealed ATFL ligament tear(Fig 1). We planned an arthroscopic assisted Anterior talofibular ligament reconstruction with internal bracing for the patient.

Surgical technique:

With patient in supine position, using a standard anteromedial and anterolateral portal a diagnostic arthroscopy was done to look for osteochondral defects which was found normal. A lateral J shaped incision was employed over fibula & upper and lower flaps were raised. Lax ATFL ligament was identified and was split in two halves. Lower end of fibula was made raw and two 1.9 mm suture anchors were inserted over it. Inferior extensor retinaculum was identified and bites were taken through it to perform Gould modification. Brostrom repair was done using Pant over Waist technique.

After the repair two knotless anchor loaded with fibertape (internal brace) were used to augment the repair with one anchor in centre of talus and the other over fibula. Internal brace was tightened with ankle in neutral position and a mosquito forceps was kept below it to prevent overtightening of repair(Fig 2).

Following the procedure, a below knee slab was applied for 2 weeks followed by ankle rom exercises, Full weight bearing allowed after 4 weeks and return to sport allowed after 6 months.

Discussion:

To date, the open modified Brostrom operation has been the gold standard procedure, with good-to-excellent results (12, 13). Brostrom advocated a method of ankle ligament reconstruction in 1966 (2); however, Gould later modified this technique by reinforcing the ligament with the inferior extensor retinaculum (14). Theoretically, inferior extensor retinaculum reinforcement covers the calcaneofibular ligament vector. Furthermore, substantial initial stability was obtained using an anatomical reconstruction of the anterior talofibular ligament alone with inferior extensor retinaculum reinforcement (15).

Lee et al. [16] performed a review of simultaneous ankle joint pathologic entities for chronic lateral ankle instability. They reviewed 28 ankles that underwent ankle joint arthroscopy with concomitant open Brostrom–Gould stabilization and reported a frequency of 7–100 % for associated intra-articular pathologic features.

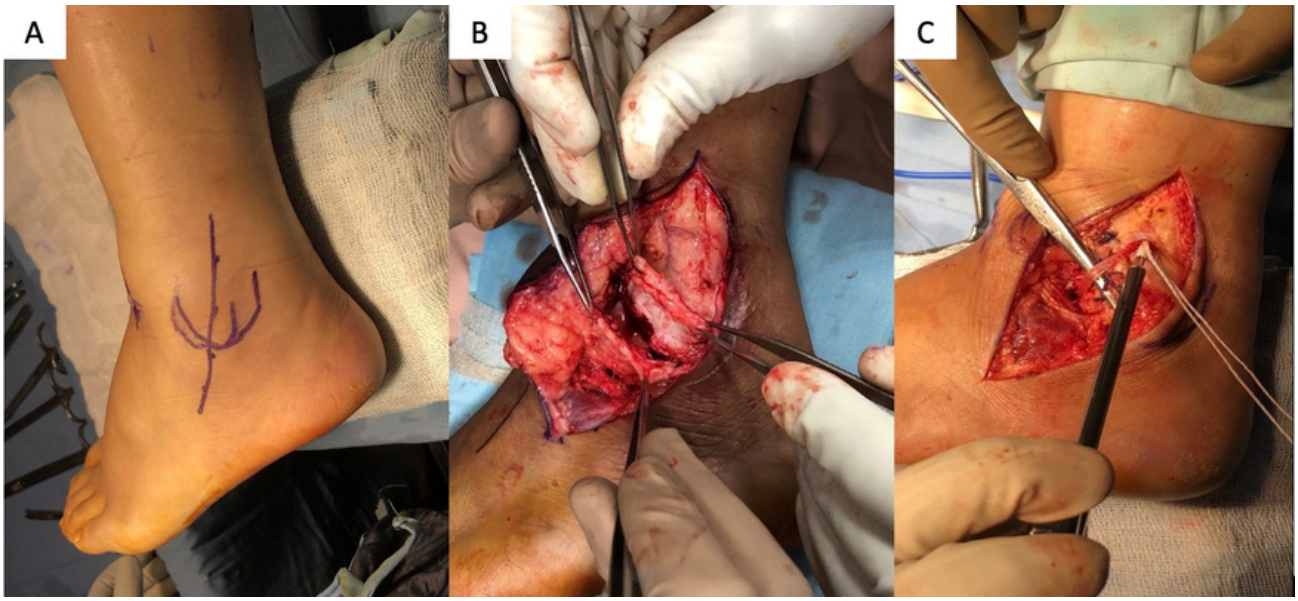


Fig 2: Intraoperative images. A: J shaped approach, B: Upper and lower flaps of ATFL, C: Augmentation with internal brace

Of the 28 ankles reviewed, 100 % were found to have some degree of synovitis, which was frequently identified in the anterolateral aspect of the joint. Other associated pathologic features were talar dome osteochondral defects in two ankles (7 %), talar dome fibrillation in seven (30 %), loose bodies in three (11 %), Bassett's lesion in two (7 %), anterolateral impingement in four (14 %), and distal anterior tibial spurring in four (14 %). Ferkel and Chams (10) reported on 21 ankles that underwent ankle arthroscopic evaluation before a Brostrom–Gould procedure. They identified pathologic intra-articular findings in 95 % of their patients. Therefore, an arthroscopic inspection is almost mandatory because of the high incidence of concomitant intra-articular lesion (17). A reliable arthroscopic method for treating ankle instability without the need for open surgery would be ideal (18).

Many studies have been reported on the strength and the clinical results of the arthroscopic modified Brostrom operation. Lee et al. (19) reported that there was no significant difference in torque to failure between the open and arthroscopic modified Brostrom operation through a biomechanical study of 11 human cadaveric specimens. In 2011, Nery et al. (17) reported the long-term results of an arthroscopic modified Brostrom operation in 38 patients with a mean follow-up of 9.8 years. The mean AOFAS score was 90 and only one patient required soft-tissue debridement for anterior impingement postoperatively. Corte-Real and Moreira (18) reported a similar technique but differed in that only one anchor was placed into the fibula, and only one distal location was used for the sutures to exit through an accessory portal. They followed up 31 patients for a mean 24.5 months and found an average postoperative AOFAS score of 94.4.

Moreover, Viens et al. (20) reported that the strength and stiffness of the Brostrom repair with suture tape augmentation were not significantly different from those of the intact ATFL in a cadaveric model. Prior research has reported ATFL with the standard Brostrom repair to be at least 50 % weaker than native ATFL at time zero (4); the results of this study also show that suture tape augmentation techniques produce stronger and stiffer results than those of the standard Brostrom repair.

Conclusion:

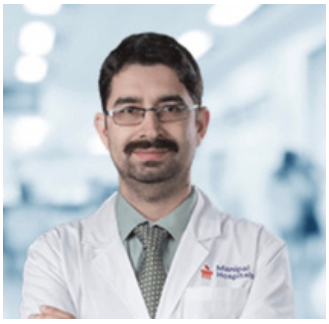
- Clinical and radiographic outcomes using a suture tape augmentation for lateral ankle instability are excellent and are equivalent to standard Bostrom repair.
- There is evidence to suggest earlier return to sports and lower recurrence rates with suture tape augmentation

References:

1.Ferran NA, Oliva F, Maffulli N (2009) Ankle instability. Sports Med Arthrosc 17(2):139–145. doi:10.1097/JSA.0b013e3181a3d790
2.Brostrom L (1966) Sprained ankles. VI. Surgical treatment of "chronic" ligament ruptures. Acta Chir Scand 132(5):551–565
3.Hamilton WG, Thompson FM, Snow SW (1993) The modified Brostrom procedure for lateral ankle instability. Foot Ankle 14(1):1–7
4.Waldrop NE 3rd, Wijdicks CA, Jansson KS, LaPrade RF, Clanton TO (2012) Anatomic suture anchor versus the Brostrom technique for anterior talofibular ligament repair: a biomechanical comparison. Am J Sports Med 40(11):2590–2596. doi:10.1177/0363546512458420
5.Girard P, Anderson RB, Davis WH, Isear JA, Kiebzak GM (1999) Clinical evaluation of the modified Brostrom-Evans procedure to restore ankle stability. Foot Ankle Int 20(4):246–252
6.Schenck RC Jr, Coughlin MJ (2009) Lateral ankle instability and revision surgery alternatives in the athlete. Foot Ankle Clin 14(2):205–214. doi:10.1016/j.fcl.2009.01.002
7.Bisson LJ, Manohar LM (2010) A biomechanical comparison of the pullout strength of No. 2 FiberWire suture and 2-mm FiberWire tape in bovine rotator cuff tendons. Arthroscopy 26(11):1463–1468. doi:10.1016/j.arthro.2010.04.075
8.De Carli A, Lanzetti RM, Monaco E, Labianca L, Mossa L, Ferretti A (2012) The failure mode of two reabsorbable fixation systems: Swivelock with Fibertape versus Bio-Corkscrew with Fiberwire in bovine rotator cuff. J Orthop Sci 17(6):789–795. doi:10.1007/s00776-012-0275-z
9.Lubowitz JH, MacKay G, Gilmer B (2014) Knee medial collateral ligament and posteromedial corner anatomic repair with internal bracing. Arthrosc Tech 3(4):e505–e508. doi:10.1016/j.eats.2014.05.008
10.Ferkel RD, Chams RN (2007) Chronic lateral instability: arthroscopic findings and long-term results. Foot Ankle Int 28(1):24–31. doi:10.3113/FAI.2007.0005
11.Hua Y, Chen S, Li Y, Chen J, Li H (2010) Combination of modified Brostrom procedure with ankle arthroscopy for chronic ankle instability accompanied by intra-articular symptoms. Arthroscopy 26(4):524–528. doi:10.1016/j.arthro.2010.02.002
12.Cox JS (1985) Surgical and nonsurgical treatment of acute ankle sprains. Clin Orthop Relat Res 198:118–126
13.Gould N, Seligson D, Gassman J (1980) Early and late repair of lateral ligament of the ankle. Foot Ankle 1(2):84–89
14.Lee KT, Lee JI, Sung KS, Kim JY, Kim ES, Lee SH, Wang JH (2008) Biomechanical evaluation against calcaneofibular ligament repair in the Brostrom procedure: a cadaveric study. Knee Surg Sports Traumatol Arthrosc 16(8):781–786. doi:10.1007/s00167-008-0557-3
15.Lee J, Hamilton G, Ford L (2011) Associated intra-articular ankle pathologies in patients with chronic lateral ankle instability: arthroscopic findings at the time of lateral ankle reconstruction. Foot Ankle Spec 4(5):284–289. doi:10.1177/1938640011416355
16.Wasserman LR, Saltzman CL, Amendola A (2004) Minimally invasive ankle reconstruction: current scope and indications. Orthop Clin North Am 35(2):247–253. doi:10.1016/S0030-5898(03)00117-2
17.Corte-Real NM, Moreira RM (2009) Arthroscopic repair of chronic lateral ankle instability. Foot Ankle Int 30(3):213–217. doi:10.3113/FAI.2009.0213
18.Lee DW, Kim MK, Jang HS, Ha JK, Kim JG (2014) Clinical and radiologic evaluation of arthroscopic medial meniscus root tear refixation: comparison of the modified Mason-Allen stitch and simple stitches. Arthroscopy 30(11):1439–1446. doi:10.1016/j.arthro.2014.05.029
19.Nery C, Raduan F, Del Buono A, Asaumi ID, Cohen M, Maffulli N (2011) Arthroscopic-assisted Brostrom-Gould for chronic ankle instability: a long-term follow-up. Am J Sports Med 39(11):2381–2388. doi:10.1177/0363546511416069
20. Viens NA, Wijdicks CA, Campbell KJ, Laprade RF, Clanton TO (2014) Anterior talofibular ligament ruptures, part 1: biomechanical comparison of augmented Brostrom repair techniques with the intact anterior talofibular ligament. Am J Sports Med 42(2):405–411. doi:10.1177/0363546513510141

Citation for this article: Shivam Shah. Anterior Talofibular ligament reconstruction and augmentation with internal bracing. IAS Newsletter-16,2022;2(8):3-6. doi:https://doi.org/10.17613/wvbn-8472

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



Dr. Karan Kukreja,
Dr. Ayyappan V Nair.

Consultant Shoulder specialists,
Manipal hospital, Whitefield,
Bengaluru.

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.

Citation for this article: Karan Kukreja, Ayyappan V Nair. Shoulder chondromatosis with multiple loose bodies and glenoid erosion- managed by arthroscopic loose body removal and BMAC. IAS Newsletter-16, 2022;2(8):7-11.doi: https://doi.org/10.17613/jyxv-p275

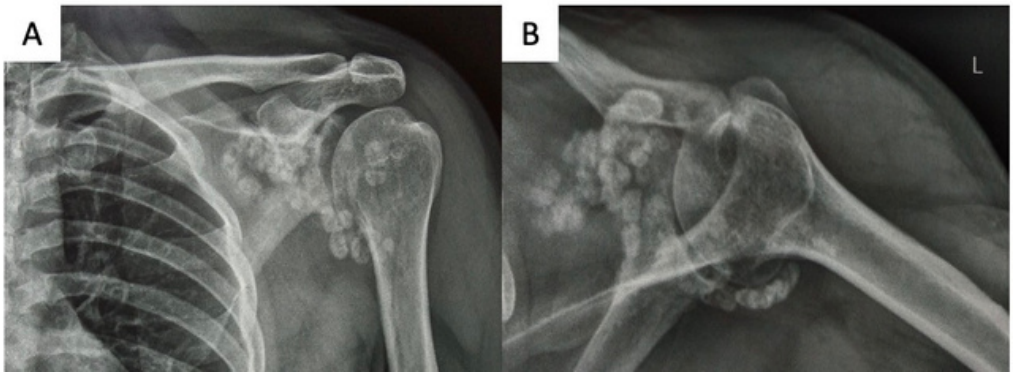


Figure 1: Plain radiographs. (A) AP view, (B) Axillary view

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

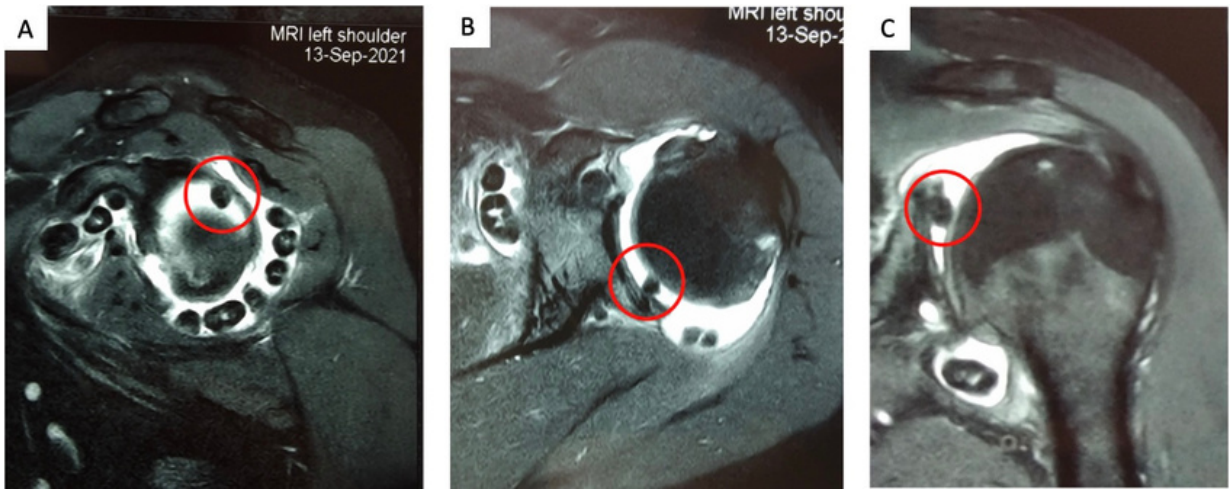


Figure 2: MRI images showing loose fragments likely to be the cause of symptoms (red circle). (A) Sagittal cuts (B) Axial cuts (C) Coronal cuts

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 gentle 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.

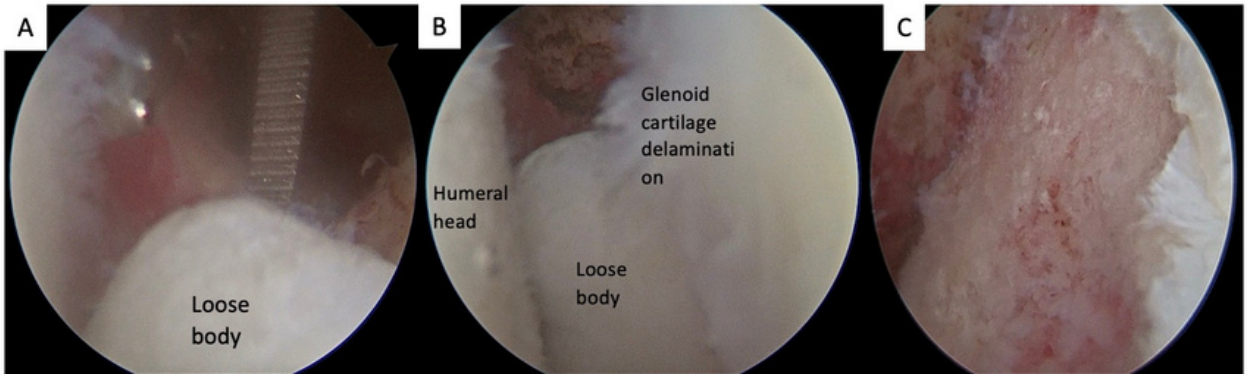


Figure 3: Arthroscopy images. (A) Loose body (B) Cartilage delamination & loose body (c) glenoid after debridement of the unstable cartilage

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.

References:

1. Emma Poyser, Rhys Morris, Hemang Mehta. Primary synovial osteochondromatosis of the shoulder: a rare cause of shoulder pain. BMJ Case Rep. 2018 Nov 28;11(1).
2. Aki Fukuda et al. Arthroscopic Treatment of Primary Synovial Chondromatosis of the Subscapular Bursa: A Case Report. J Orthop Case Rep. 2020;9(6):40-43.
3. Pradyumna Raval, Ashish Vijayan, Arpit Jariwala. Arthroscopic Retrieval of over 100 Loose Bodies in Shoulder Synovial Chondromatosis: A Case Report and Review of Literature. Orthop Surg 2016 Nov;8(4):511-515.
4. Jiménez-Martín A et al. Arthroscopic treatment of synovial chondromatosis, an unusual cause of shoulder pain. Reumatol Clin. 2014;10:416-7.
5. Chillemi C, Marinelli M, de Cupis V. Primary synovial chondromatosis of the shoulder: Clinical, arthroscopic and histopathological aspects. Knee Surg Sports Traumatol Arthrosc. 2005;13:483-8.
6. Fowble VA, Levy HJ. Arthroscopic treatment for synovial chondromatosis of the shoulder. Arthroscopy. 2003;19:E2.
7. Tor Erik Gudmundsen & Per Barm Siewers. Synovial chondromatosis of the shoulder: A case report, Acta Orthopaedica Scandinavica, 58:4, 419-420
8. Francesca T et al. Primary Synovial Chondromatosis of the Shoulder With Concomitant Intra-Articular and Extra-Articular Involvement: More Than a Simple Removal of Loose Bodies. Techniques in Shoulder & Elbow Surgery: March 2018 - Volume 19 - Issue 1 - p 18-23
9. Christian Hwee Yee Heng, Martyn Snow, Lee Yee Han Dave. Single-Stage Arthroscopic Cartilage Repair With Injectable Scaffold and BMAC. Arthroscopy Techniques, Vol 10, No 3 (March), 2021: pp e751-e756
10. Sang Jun Kim et al. Effects of bone marrow aspirate concentrate and platelet-rich plasma on patients with partial tear of the rotator cuff tendon. J Orthop Surg Res. 2018; 13: 1.

Citation for this article: Karan Kukreja, Ayyappan V Nair. Shoulder chondromatosis with multiple loose bodies and glenoid erosion- managed by arthroscopic loose body removal and BMAC. IAS Newsletter-16, 2022;2(8):7-11.doi: https://doi.org/10.17613/jyxv-p275

Thank you all for making IASCON 2022 a grand success!!