

IAS NEWSLETTER



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EXPERT TALK

ALGORITHM FOR SHOULDER INSTABILITY



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Highlights

- Position: Sloppy Lateral position with 20-degree posterior tilt-Ease of giving traction & distraction of the joint
- Main portals: Viewing(Anterior), Working(Anterior & Posterior)
- Cannulas: 8mm(Anterior), 6mm(Anterior Superior portal)
- Remplissage: View from AS portal, working via Posterior/Remplissage portal(1-2cm poster-lateral to the PL acromion) with slight Anterior thrust and External Rotation.
- Bankart: Freshen the anterior glenoid adequately, and place the anchor at the edge, Mason Allen stitch at the inferior anchor gives better inferior capsular shift, 3-4 anchors may be required for a complete repair
- Don't forget to look for associated lesions: HAGL/SLAP

FROZEN SHOULDER RELEASE : TEN STEP TECHNIQUE



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Abstract:

Frozen shoulder is a condition associated with painful restriction of shoulder joint movement. This condition has a prevalence of 2-5 % in general population, seen most often in females and diabetic population & is essentially a self limiting condition passing through stages of freezing, frozen & thawing.

It has been reported that upto 90% patients recover with conservative measures. Patients with more severe initial symptoms, younger age at the time of onset, and reduction in motion despite 4 months of compliance with therapy are most likely to require surgery.

Author presents ten step technique for frozen shoulder release in cases of failed conservative trial in management of frozen shoulder.

Introduction:

Frozen shoulder was first described by Duplay (1) as “periarthrititis scapohumeral” , though the term “Frozen shoulder” was first used by Codman (2) to describe non specific painful restriction of shoulder joint motion. Adhesive capsulitis was term coined by Neviaser (3) where he described this as an idiopathic condition associated with inflammation, fibrosis and capsular contracture causing frozen shoulder.

Frozen shoulder usually occurs in age group of 40-60 yrs & has a prevalence of 2-5% in general population with prevalence in diabetic population reaching upto 20%. Female population is four times more affected than males (4,5).

Primary frozen shoulder is idiopathic and is associated with diabetes mellitus, hypothyroidism, adrenal disease, hyperlipidemia, cardiopulmonary disease, inflammatory polyarthralgia. Secondary frozen shoulder is associated with

identifiable shoulder pathology such as rotator cuff tendinopathy, calcific tendinitis, fracture, dislocation (6)

Natural history of frozen shoulder involves four stages. stage 1: Stage of inflammation. Stage 2: stage of freezing. Stage 3: stage of frozen. Stage 4: stage of thawing (5,6).

Studies have shown that frozen shoulder is essentially self limiting condition wherein more than 90% population responds to conservative treatment. Levine reported that patients with more severe initial symptoms, younger age at the time of onset, and reduction in motion despite 4 months of compliance with therapy are most likely to require surgery (7).

Author presents ten comprehensive steps to perform adequate release of frozen shoulder release.

It is recommended to use Radio-frequency probe for performing frozen shoulder release. Arthroscopic shaver being aggressive device should be used less often.

Ten steps are as follows:

Surgery is performed under general anaesthesia in lateral position. Affected arm is put in traction with 5kg weight and abducted to 60 degrees. Shoulder Landmarks are marked.

Step 1-Shoulder entry:

Posterior portal is created: Thinner profile wissinger rod is kept as standby for entering into the joint space. Direction of entry is important so as not to damage humeral head cartilage. Little manipulation in form of forward flexion helps in entering shoulder joint.

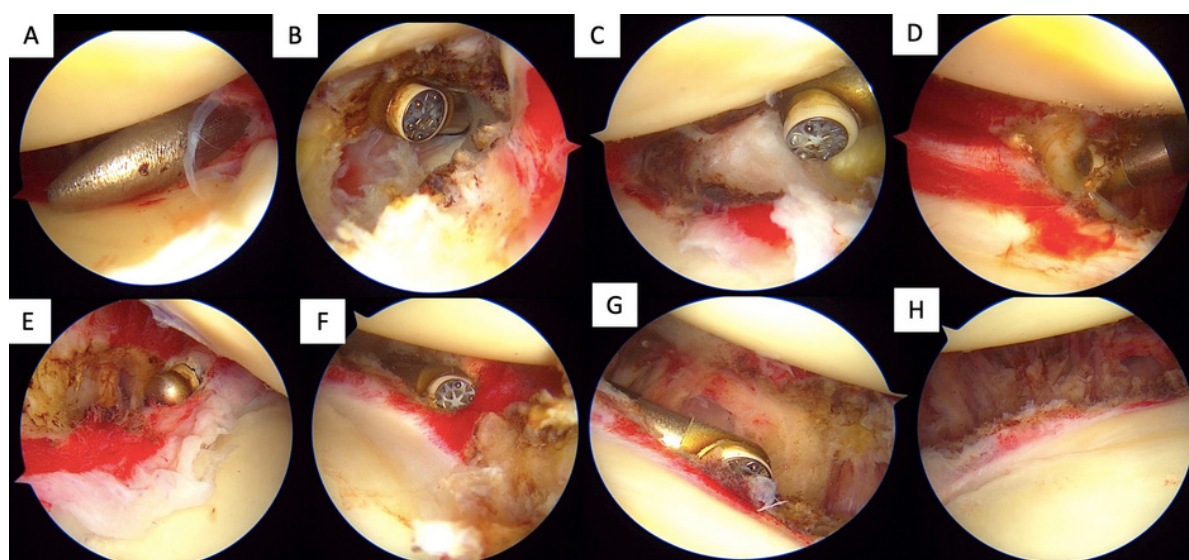


Fig 1: Surgical Technique. A: Anterior working portal, B: Anterior interval Release, C: MGHJ release, D: Anterior inferior release, E: Posterior Release, F: Posterior inferior release, G: Posterior inferior release confluence with anterior inferior release, H: Post release opening of joint

Step 2-Create working portal:

16 g needle is used to mark the trajectory of anterior portal (Fig 1a). Thinner profile wissinger rod is first used to create anterior track and dilator is used to enlarge the track. (Fig 1A)

Step 3- Anterior interval release:

Adequate anterior interval release is paramount. One needs to spend more time in releasing scar tissue from interval space. Radio-frequency Probe (RF Probe) keeps bleeding in check and so must be used during whole procedure. (Fig 1B)

Step 4-MGHL release:

Cord like MGHL should be released with punch or RF probe. (Fig 1C)

Step 5: Anterior capsule release:

Adequate anterior capsular release is ensured by visualising the muscle tissue after doing release. At this step joint space starts opening. Anterior capsular release is carried down into antero-inferior capsule. At this point portals are changed. (Fig 1D)

Step 6- Change portal :

Arthroscope is put into anterior portal and RF probe is put into posterior portal

Step 7- Posterior capsule release:

Adequate posterior capsular release is ensured by visualising the muscle tissue after doing release. Posterior capsular release is carried down into postero-inferior capsule. (Fig 1E)

Step 8- Inferior capsular release:

Care must be taken into releasing inferior capsule as scarring might pull axillary nerve close to rim. Keeping RF probe facing towards rim and working close to rim can avoid iatrogenic injury to axillary nerve. (Fig 1E)

Step 9- Fine tune release:

Removal of residual fibrous tissue to be done using shaver device (Fig 1F)

Step 10 - Confirm adequate release:

Putting traction to arm should open up the joint space allowing free movement of instruments. Also one should be able to visualise muscle tissue after release hinting towards adequacy of release. (Fig 1G, 1H)

Post Operative Regime:

Post-surgery shoulder is put in arm pouch. Post op day one, physiotherapy is started with passive range of motion exercises. Active assisted followed by Active Range of motion exercises are encouraged as soon post-surgical pain permits. Home physiotherapy is encouraged three times a day.

STEPS	PEARLS & PITFALLS
Step 1	1. Keep thinner profile Wissinger rods 2. Direction of entry important not to damage humeral head cartilage 3. Manipulation before arthroscopy (forward flexion only)
Step 2	Not enough space to put cannulas Use RF probe for working
Step 3	Anterior interval release must be thorough
Step 4	MGHL release is important
Step 5 & 7	Must be able to visualise muscle tissue for adequacy of release
Step 8	1. Keep close to rim to avoid iatrogenic injury to axillary nerve 2. Face of RF facing rim
Step 9	Any residual band of fibrous tissue must be release
Step 10	Abduction of shoulder must open up joint space for instruments to move freely

Table 1. Steps and Associated Pearls & Pitfalls

Discussion:

Though frozen shoulder is self-limiting condition, some patients have inadequate outcomes with conservative management (8,9). Levine reported that patients with more severe initial symptoms, younger age at the time of onset, and reduction in motion despite 4 months of compliance with therapy are most likely to require surgery (7). Persistent painful restriction of motion despite 3 to 6 months of nonoperative management including medication, local injections, or physiotherapy are indications for surgery (8,9).

Various modality of management of frozen shoulder is being practised among surgeons based on personal experience and training ranging from Physiotherapy, Intraarticular injection, Manipulation under anaesthesia to Arthroscopic release (10). Arthroscopic release being more controlled as compared to MUA, with ability to address intraarticular and subacromial disease, has gained popularity as favoured surgical intervention in management of frozen shoulder (10,11). Le Lievere & Murrel

showed significant improvement in ROM, pain relief and function after 7 yrs of Arthroscopic capsular relief (12,13).

Performing Arthroscopy in early phase of frozen shoulder can be difficult as synovitis might obscure arthroscopic vision. However, Rizvi et al identified that patients who underwent arthroscopic capsular release during the early clinical phase (<10months) of idiopathic adhesive capsulitis demonstrated greater improvements in range of motion and strength 6 months after surgery (14)

There are variety of methods described in literature for frozen shoulder release ranging from partial release to 360 degree release.

Chen et al reported that although the addition of posterior release significantly improved ROM (abduction and internal rotation) within the first 3 months after ACR, it doesn't offer significant improvements in function or internal rotation at mean of 28 months after surgery (15)

Cvetanovich GL et al reported advantage of lateral decubitus position being improved ability to use traction to increase visualisation, particularly in the axillary recess and inferior glenohumeral joint, and improved cerebral perfusion (16). Moreover, Capsular tissues are under tension, facilitating selective release and visualisation of completed release due to capsular retraction after release.

It is imperative to get adequate capsular release. visualisation of underlying muscle tissue hints at adequacy of release. Tasto JP & Elias DW reported, 70% of the time, the underlying muscle tissue is seen, which also indicates complete capsular resection. A 90-degree device seems to be the most versatile one to perform the resection with(17).

The primary concern regarding the release of the inferior capsule is injury to the axillary nerve due to its close proximity to axillary nerve. Jerosch et al. reported that the axillary nerve is in close

relation to the capsule between the 5 and 7 o'clock positions (18). Kim YS & Lee HJ Reported that axillary nerve damage can be prevented if the electrocautery tip stays within 10 mm of the glenoid rim. Staying close to glenoid rim between 5 and 7 o'clock Keeping face of radio-frequency probe under vision and facing towards arthroscope helps in avoiding iatrogenic injury of axillary nerve(19).

The pearls & pitfalls of arthroscopic capsular release have been summarized in Table 1.

After surgery it is important to start postoperative rehabilitation as soon as possible. Arm pouch is given for few days to control pain. Some authors recommended the use of continuous inter-scalene catheter for anaesthetic infusion in the early postoperative period to improve pain relief and patient satisfaction(20). Patients are encouraged to performed three time a day home physiotherapy.

Conclusion:

- Arthroscopic release of frozen shoulder is a reliable treatment method, with a low complication rate, for restoring function and reducing pain.
- Patients should begin progressive ROM exercises as soon as possible under the supervision of a trained therapist.

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AUTOLOGOUS MINCED CARTILAGE IMPLANTATION ALONG WITH MPFC ADVANCEMENT FOR RECURRENT DISLOCATION OF THE PATELLA WITH CHONDRAL DEFECT OF THE MEDIAL PATELLAR FACET. A NOVEL TECHNIQUE.



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Abstract:

Recurrent patellar dislocation often requires surgical intervention. It is often associated with chondral defects of the Patella. Even a small cartilage lesion of the patella of 1 cm² dimension will lead to rapid onset of arthrosis. Minced cartilage has a strong biologic potential since autologous, activated non-differentiated cartilage cells are utilized. MPFC advancement is an isometric procedure. Good knowledge of the layers of the knee on the medial side helps in proper

advancement of the layer. It can be combined with the cartilaginous procedures on the patella.

Introduction:

Recurrent patellar subluxation or dislocation is a disabling condition occurring in young adults. In the presence of a normal bony anatomy, the instability can be attributed to medial soft tissue laxity. Many times patellar dislocation is associated with chondral defects of the medial patellar facet. It is essential to address both for the symptomatic relief. Cartilage defects can be treated by microfracture, OATS, ACI or Scaffold based procedures like hyalofast C, chondrogide etc. However we chose autologous minced cartilage procedure as it is a single stage and affordable option. It will lead to hyaline cartilage formation. It is combined with MPFC advancement because we want to avoid excessive pressures over the medial patellar facet which is seen in MPFL reconstruction. Also MPFL reconstruction has got technicality issues. We have performed MPFC advancement with Autologous minced cartilage implantation in the patient.

Case:

A 29-year-old zonal badminton player presented to us with a complaint of anterior knee pain. He had 2 episodes of patellar dislocations. The first episode was 10 years back and it was associated with a patellar fracture. It was treated with a conservative method. The second episode was 6 years back. At the beginning of this year, he had 2 episodes of subluxation. It was treated by physiotherapy and muscle-strengthening exercises. On examination, the patient had a positive apprehension sign at 30 degrees of knee flexion.

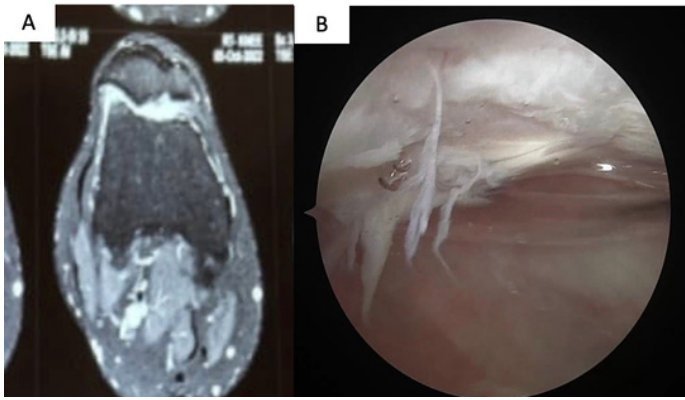


Fig 1: Patellar cartilage defect: A: MRI axial cuts, B: Arthroscopic image

Mediolateral patellar glide was increased indicating to medial soft tissue laxity. J sign was negative. The alignment and rotational profile of the lower limbs were normal.

AP and lateral X-rays were taken at 30 degrees of knee flexion along with merchant view. Scanogram showed normal alignment. MRI knee showed full-thickness focal cartilage defect of the medial patellar facet along with fraying of the surrounding cartilage. (Fig 1). MPFL was seen in its entirety in all the sections. However, it appeared a little stretched. TT-TG distance was 16 mm, trochlear depth was 4 mm. CT scan showed cortical irregularity with a united fracture of the medial facet.

Surgical technique:

The procedure is performed under spinal anaesthesia with the patient supine on the OT table.

Tourniquet was applied. The diagnostic arthroscopy done showed full thickness cartilage defect of the medial patellar facet along with fraying of the surrounding cartilage. The medial patellofemoral complex advancement procedure was undertaken. A medial parapatellar incision is given and three key structures are identified i.e. quadriceps tendon, Vastus medialis oblique muscle and medial retinaculum.

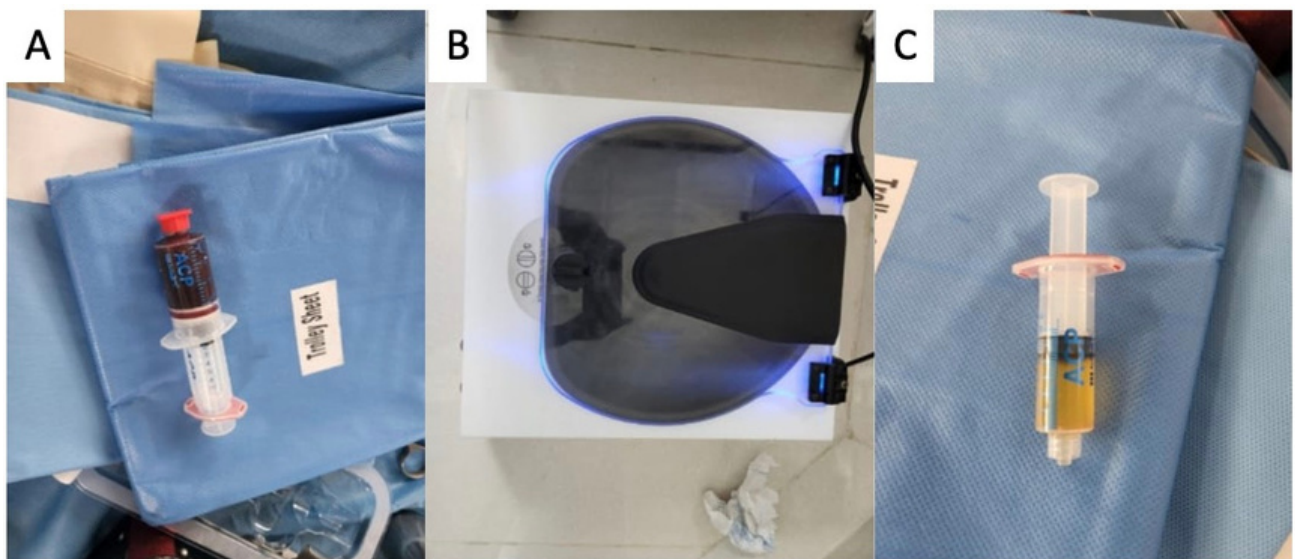


Fig 2: Preparation of Autologous conditioned plasma: A: Patient blood in double syringe, B: Centrifugation, C: Inner syringe containing plasma

Next step is to elevate the medial retinaculum from underlying capsuloligamentous layer. It is always better to start the dissection inferiorly and proceed superiorly as there is potential space between the layers here. It leads to the separation of Musculo-retinacular layer from the underlying capsuloligamentous layer. The superficial layer is tagged with number 1 Vicryl for a later closure(Fig 3A).

The capsuloligamentous layer is cut close to the patella and knee joint visualised. The patellar defect is located and the boundaries of the lesion prepared by number 15 blade.

The base of the lesion is curetted with a curette. Microfracture should not be done here as it will lead to contamination by blood. We need hyaline cartilage from the minced cartilage procedure

and not the fibrocartilage from the microfracture.

Few cartilage chips are taken from medial and lateral borders of lateral femoral condyle using a knife and curette. They are put into saline containing steel glass. They are minced by using a shaver and collected by a graft net device.

Autologous conditioned plasma is prepared by collecting 16 ml of patients blood in a double syringe. It is spun for 5 mins at 1500 rpm. Inner syringe containing plasma is taken. Few ml of ACP is mixed with minced cartilage(Fig 2)

Autologous minced cartilage is applied to the lesion using an applicator. Fibrin thrombin glue is applied to the lesion and setting time of 10 mins is allowed.

Two 5.5 mm fully threaded double loaded corkscrew anchors are inserted on the medial border of patella(Fig 3C). The threads are passed through the capsulo-ligamentous layer at a distance of 2 cms from the cut end in a mattress manner. The sutures are tied from inferior to superior direction. After tying single sutures are passed through the anterior soft tissue of the patella and tied with the respective sutures. Next, retinacular layer

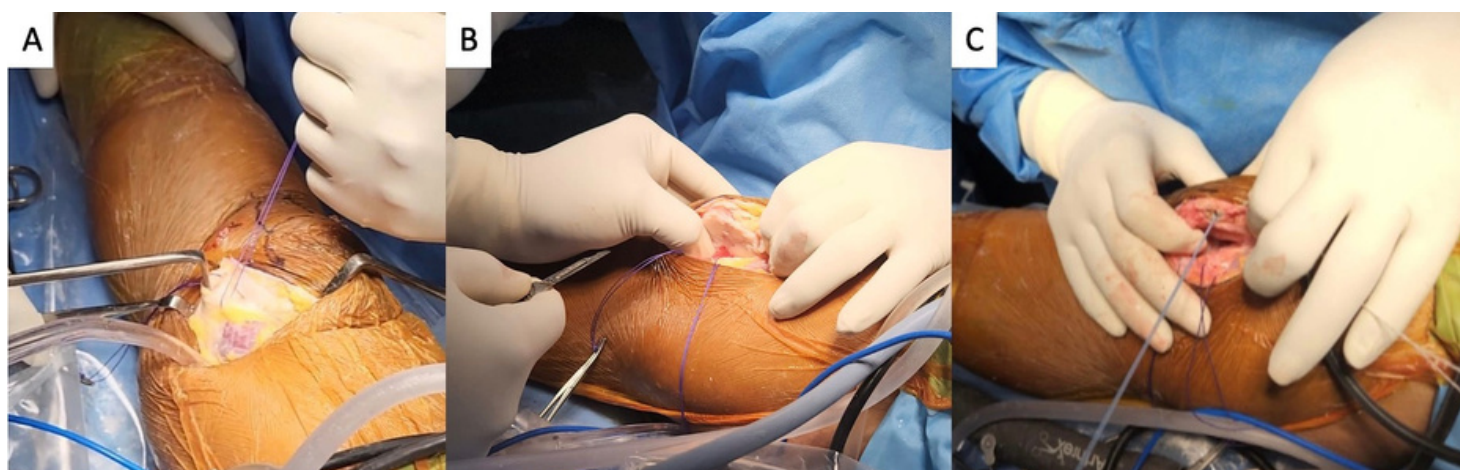


Fig 3: Intraoperative images: A: Musculo retinacular layer separation, B: Chondral defect, C: After anchor insertion

is tied in a routine manner. The subcutaneous layer and skin are closed.

Postoperatively patient is kept on partial weight bearing for 6 weeks. First 2 weeks, 0-30 degrees, 2 to 4 weeks 30 to 60 degrees, and 4 to 6 weeks 60 to 90 degrees of knee movement is allowed.

Discussion:

MPFC advancement is a novel procedure. It will yield optimum results if the correct indications are met. One of the contraindications for advancement is MPFL tear at femoral site or bifocal tear of MPFL. Severely attenuated and flimsy MPFL is also a contraindication for advancement. However advantages are it is biologic, doesn't require graft as a result graft related complications are not there. It can be used in adolescents with open physis. The combined procedures on the medial patellar chondral defect can be done as it will also not lead to excessive stresses on the medial patellar facet. It does not require technicalities of MPFL reconstruction.

Minced cartilage procedure is a single stage and affordable solution to hyaline cartilage regeneration. 1 cm² of the lesion can be filled with 250 chips containing approximately 1 million chondrocytes. Addition of PRP leads to proliferation of chondrocytes.

Conclusion:

- For addressing chondral injuries, it is always better to follow cartilage repair algorithm.
- Ala carte approach is ideal. Always avoid MPFL reconstruction with cartilage procedures of the patella as it leads to excessive pressures on the patella.
- MPFC advancement is biologic procedure with its own advantages.

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