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IAS NEWSLETTER

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ARTICLES IN THIS ISSUE

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INDIAN ARTHROSCOPY SOCIETY

CME

in association with

PIMS SUPER SPECIALITY International Healthcare Madurai

Preethi HOSPITALS Madurai

TAMIL NADU ARTHROSCOPY SOCIETY

As a part of the outreach Initiative, IAS Conducted CME Programme on ACL, Meniscus & Multi Ligamentous Knee injury on 17th April 2022 @ Preethi Hospitals, Madurai

IAS CME 2 Madurai- Faculty

Dr. Sachin Tapasvi

Dr. S.R.Sundararajan

Dr. K.N. Subramanian

Dr. Palanivel rajan

Dr. K.P. Saravana kumar

Dr. Mukesh Laddha

Dr. Santhosh Sahanand

Dr. Prahalad Kumar Singhi

Dr. Ramakanth Rajagopalakrishnan

Dr. Rejith Mathews

Dr. Jyothiprasanth

- There were two live Surgeries - ACL Reconstruction using hamstring and BPTB performed by IAS President Dr Sachin Tapasvi & IAS Secretary Dr S.R. Sundararajan followed by Numerous talks by National Faculty.
- There were two didactic sessions and workshops on meniscus repair demonstrating all the techniques with the latest implants
- This Programme was well received and was attended by over 100 delegates in person from Tamilnadu, Kerala and Karnataka and over 700 delegates online on the IAS youtube channel
- Feedback from faculty and delegates was excellent and motivating.

Journal of Arthroscopic Surgery and Sports Medicine
Official Publication of Indian Arthroscopy Society

Recent publications in JASSM

1. Patel S, Kumar V, Kumar R, Sharma S, Sharma R, Kaur R, et al. Trends of the publications of platelet-rich plasma use in osteoarthritis knee – A PubMed and Scopus bibliometric analysis. J Arthrosc Surg Sports Med, doi: 10.25259/JASSM_34_2021

- Patel et al. presented a bibliometric study to assess the quantity and quality of scientific research output of the articles in the field of platelet-rich plasma (PRP) use in osteoarthritis (OA) knee.
- They found that there has been a rapid increase in scientific research productivity in the past 10 years and this topic has gained attention in the recent past. Total publications on this topic were 1309 in Scopus and 921 in PubMed, and the yearly average of publication numbers has seen a steady increase over the past 10 years.
- The top journal in terms of the number of articles and citations was Arthroscopy and AJSM. Osteoarthritis and Cartilage published the maximum preclinical studies. Kon E emerges to be the leading author in both databases.
- Original clinical research articles (15.31% and 22.15%) are less compared to review articles (34.6% and 28.3%) in both PubMed and Scopus, respectively. The largest number of articles in this field was from the USA and six of the top 10 productive universities were also from the USA.

2. Mbogori MJ, King'ori JK, Museve GK. Prevalence and factors associated with symptomatic knee osteoarthritis in golfers: A cross-sectional study among professional golfers in Kenya. J Arthrosc Surg Sports Med, doi: 10.25259/JASSM_5_2022

- Golf is associated with abnormal loading conditions to the knee joint due to the repetitiveness and biomechanical requirements of the golf swing. Mbogori et al. studied 50 professional golfers in Kenya above 18 years to evaluate the prevalence and factors attributing to symptomatic knee osteoarthritis amongst them.
- Duration of active golf involvement (OR – 1.114) and BMI above 25 kg/m2 (OR – 1.107) were found to be positively associated with symptomatic knee osteoarthritis although not statistically significant (P = 0.289 and 0.3481).
- The authors concluded that golf presents a prevalence of symptomatic knee osteoarthritis of 18% comparable to high-impact sports.

Journal of Arthroscopic Surgery and Sports Medicine
Official Publication of Indian Arthroscopy Society

3. Soni K, Nayak S. Autologous chondrocyte implantation for huge patellar cartilage defect. J Arthrosc Surg Sports Med doi: 10.25259/JASSM_35_2021

- Soni & Nayak reported an interesting case of 24 years old male with a large patellar cartilage defect. It was successfully treated Autologous chondrocyte implantation (ACI).ACI has been reported to provide excellent long-term outcomes for isolated patellar chondral defects.
- Annual outcome scale showed excellent scores in all the outcomes scales at 2 years. The patient's MOCART score demonstrated complete fill of the defect, integration to the border, no hypertrophy, and no effusion.

4. Varughese AA, Sahanand SK, Rajan DV. Implant free techniques in surgeries for sports-related injuries of the knee. J Arthrosc Surg Sports Med, doi: 10.25259/JASSM_14_2021

- Varughese et al. reported excellent arthroscopic surgeries can be made cost-effective by avoiding the use of implants whenever possible.
- Usage of confluent tunnels, suture bridges, bone bridges, and modifications in standard arthroscopic procedures will help us in achieving comparable mechanical as well as functional outcome and at the same time have technical advantages and cause less financial burden to the patient.
- On this technical note, we propose the use of various implant-free techniques in arthroscopic and other sports-related surgeries on the knee.

5. Khetan V, Thakkar S, Usman S, Sabnis B, Joshi A. J arch: A contemporary soft-tissue landmark for anatomic placement of femoral tunnel in remnant-preserving anterior cruciate ligament (ACL) reconstruction. J Arthrosc Surg Sports Med, doi.10.25259/JASSM_5_2021

- In a retrospective analysis of prospectively collected data from 40 consecutive patients who underwent primary ACL reconstruction, Khetan et al. identified an inverse J-shaped tissue arch that was used as a soft tissue landmark for anatomic placement of femoral tunnel. This arch was a part of the femoral ACL remnant.
- Postoperatively, MRIs of these patients were reviewed to evaluate the femoral tunnel position in terms of depth and height from the proximal condylar surface and notch roof, respectively. The center of the femoral tunnel was found to be at a mean depth of 27.12 ± 2.2% from the proximal condylar surface (parallel to Blumensaat's line) and a mean height of 30.96 ± 2.75% from the notch roof (perpendicular to Blumensaat's line), which is at par with previously defined data given by various studies.
- The authors concluded that the J arch can be used as a dependable soft tissue landmark and a guide for the anatomic placement of femoral tunnel in biological ACL Reconstruction.

EXPERT TALK- FROM KNEE TO SHOULDER SCOPY

Dr Clement Joseph
Senior Consultant
AJRI, SIMS hospital
Chennai

Highlights:

Good understanding of shoulder pathology

Systematic training and updating- Short term observership, cadaveric skill lab training & long term fellowships

Become a member of professional associations

Invest in instruments and team

Convert into open procedures in case of need

For surgeons with a primary interest in shoulder-undergoing knee training may not be required.

SINGLE-STAGE HIGH TIBIAL OSTEOTOMY AND ACL RECONSTRUCTION: INSIGHTS INTO THE INTRICACY

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MRCS,FAOA(Newzealand),
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Coimbatore, T.N

Abstract:

Knee instability due to chronic complete anterior cruciate ligament(ACL) tear can be really debilitating and an additional deformity in the lower limb may worsen the scenario further by the transmission of abnormal stresses over the joint surfaces. We report a case of 38 years female with chronic complete tear of left ACL along with clinically significant varus deformity. She was managed by single stage biplanar single stage medial open wedge high tibial osteotomy (MOWHTO) along with ACL reconstruction(ACLR) using hamstring autograft.

Introduction:

Chronic ACL tears have been routinely reconstructed and most results can be rewarding. One important aspect to be considered in all such cases during preoperative planning is associated deformity in the lower limb, especially the coronal plane which can have an impact on the reconstruction. High tibial osteotomy in combination with ACL reconstruction has been demonstrated to improve the alignment, restore anterior knee stability and help to slow the advancement of arthritis [1]. In our patient, we did a single-stage combined biplanar MOWHTO with ACL reconstruction.

CASE:

A 38years female presented with left knee pain and instability for about 1 year after an initial trauma, which was managed conservatively. The instability was progressive and associated with ongoing pain. Clinical examination findings included a positive anterior drawer test, Lachman test +3, McMurray test positive for lateral meniscus, with full knee range of movement along with a clinically significant varus deformity in bilateral knee joints.

She was evaluated radiologically. Weight-bearing anteroposterior and lateral radiographs of bilateral knee joints were done which showed significantly reduced medial joint space, lateral joint opening and varus deformity. Radiological varus was found to be around 15 degrees. MRI of the left knee showed a complete ACL tear

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(chronic), bucket handle tear in body and posterior horn of lateral meniscus, osteoarthritic changes present in the medial and lateral femoral condyle, baker cyst and multiple loose bodies.
We planned a single-stage biplanar MOWHTO with ACL reconstruction in our patient.

Surgical technique:

With a properly planned operative setup inside the theatre, the patient was placed in a supine position with the operative limb(left) over the operation table and the opposite limb(right) in the lithotomy position. The C-arm machine was placed over the left side of the patient and the arthroscopy tower over the right side (Fig 1). This setup facilitated the surgeon to perform an arthroscopic procedure standing on the foot end and high tibial osteotomy standing on the right side in between the operative limb and non-operative limb placed in the lithotomy position.
Initially, diagnostic arthroscopy of the left knee was done and found to have a complete tear of the ACL with a tear in the body and posterior horn of lateral meniscus, Intrasubstance tear of medial meniscus posterior horn and osteoarthritic changes in medial femoral and tibial condyles. All inside repair of the lateral meniscal tear was done.

Fig 1: Patient positioning. The C-arm machine is placed over the left side of the patient and the arthroscopy tower over the right side. Non operative limb is placed over a leg holder.

Right iliac crest bone graft was harvested for placing in the osteotomy site. Through a vertical incision over the anteromedial aspect left leg, the hamstring grafts (semitendinosus and gracilis) were harvested, quadrupled and prepared accordingly. The femoral socket was drilled and serially reamed as per appropriate length. Later, biplanar MOWHTO was performed and the osteotomy site was opened using a graduated device up to 15degrees noting that the lateral cortex was maintained intact. Iliac crest wedge was placed posteriorly in the osteotomy site to avoid increasing the posterior tibial slope and the HTO plate with screws was fixed over it, except for the proximal anterior screw. A tibial tunnel was prepared and tunnel scopy was done to confirm that no screw was penetrating the tibial tunnel(Fig 2). Finally, the graft was passed across the tunnel and suspensory fixation is done on either side. Intraoperative correction of varus deformity was noted clinically and measured with an alignment rod. ACL reconstruction was found satisfactorily stable as evaluated by the Lachman test. Postoperatively, ACL rehabilitation and knee ROM exercises were taught as per standard protocols and non-weight bearing ambulation using walker support was advised for up to 6 week's time. Radiographs and clinical improvement has been depicted in Fig 3.

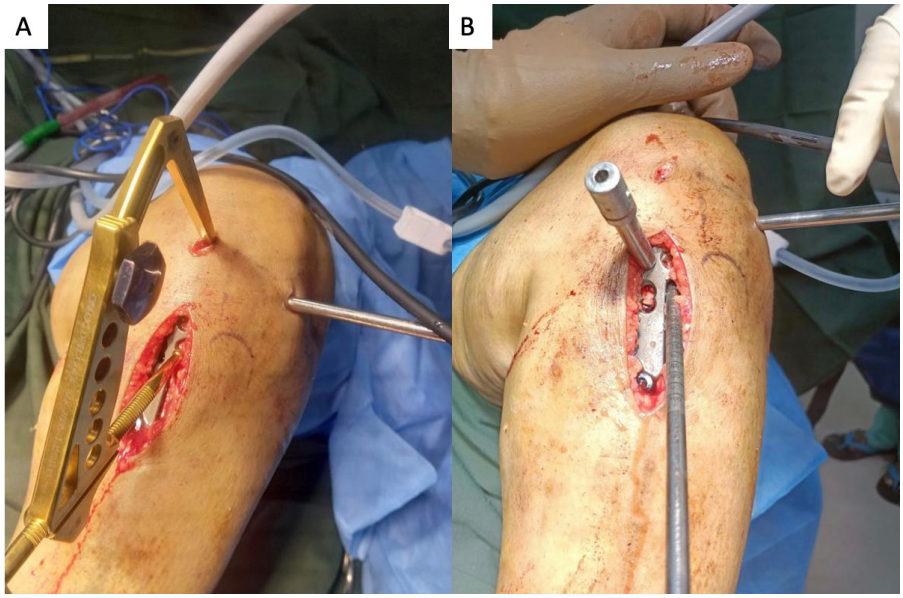

Figure 2: Intraoperative images. A: HTO plate in situ with Tibial ACL jig. B: Demonstrating the position of the tibial tunnel and empty proximal anterior screw slot of the HTO plate

Discussion:

The preoperative planning, operative setup and order of surgical steps followed have a significant role in the overall ease of performing the surgery more precisely. The need for correction of bony deformities before soft tissue procedures is the dictum and applied here too, hence MOWHTO was performed prior to ACL reconstruction. The meticulous interplay between tibial tunnel drilling and placement of proximal screws in the HTO plate was a challenge dealt with caution. There have been two schools of thought pertaining to doing this surgery, in a staged or combined manner. Stride and associates found that combined ACL reconstruction and high tibial osteotomy surgery results in improvements in post-operative functional outcomes along with low complication rates, re-rupture and revision rates [2]. The proponents of two-stage procedures like Noyes et al in their series found statistically significant improvements in pain, swelling, and giving way in patients who had undergone a staged procedure to first correct the varus malalignment and subsequently reconstructed the ACL [3]. There is a lack of literature pertaining to the comparison between single and two-stage procedures in terms of long-term outcome, which needs further evaluation.

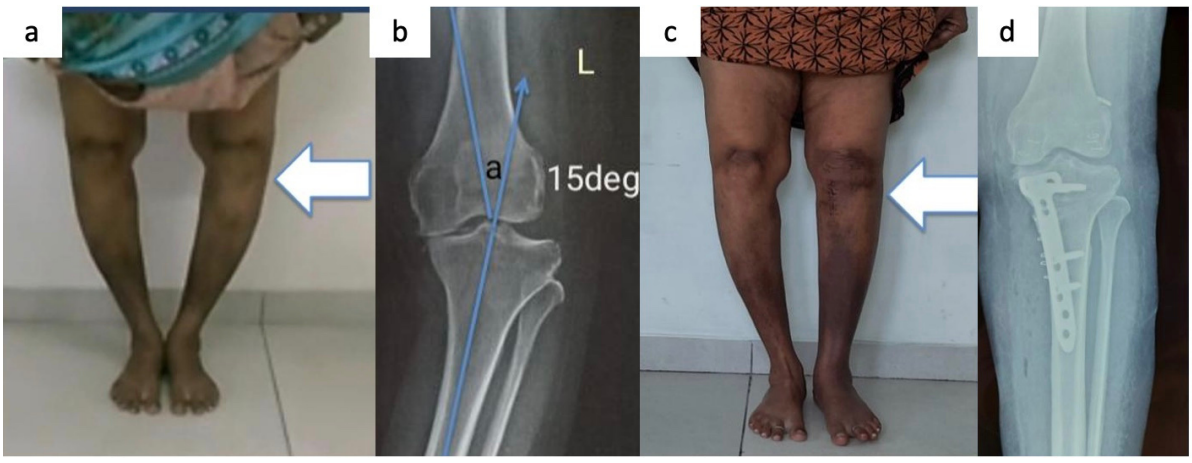

Figure 3: Pre-operative & post-operative images. A & B: Pre-operative clinical image & Alignment radiographs B: Post-operative clinical image & Alignment radiographs

Conclusion:

Single-stage MOWHTO with ACL reconstruction gives overall good results functionally and delays the progression of medial knee joint osteoarthritis and also prevents rupture of the reconstructed ACL graft.

More elaborate studies on long term outcomes of combined procedure and comparison between single and two-stage surgery is needed.

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LONG HEAD OF BICEPS(LHB) AS A PROTECTOR OF ROTATOR CUFF REPAIR- A NEW TECHNIQUE. CASE REPORT AND REVIEW OF LITERATURE

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Abstract:

Arthroscopic repair of massive rotator cuff tear remains a difficult task in Orthopaedic practice. Chronic cases have retraction of the rotator cuff tendons, which makes a tension free repair a difficult task to achieve. In addition, poor quality of muscle tissue due to fatty infiltration of the muscles increases the chances of failure. Superior migration of head of humerus due to superior capsular deficiency in chronic cases would put the repaired cuff under tension postoperatively and increase the chances of failure. Therefore, superior migration of head should be prevented to maintain the antero-posterior force couples and stability of the shoulder joint. Many procedures have been described for massive rotator cuff tears in younger age group and/or in the absence of arthritis including debridement, partial/ complete repairs, tendon transfers, balloon spacers and superior capsular reconstruction. The present article describes a new technique where we used the long head of biceps as a superior checkrein in addition to the repair of rotator cuff tendons. In our technique, the intraarticular attachment of long head of biceps at the supraglenoid tubercle is left intact. The biceps tendon is then fixed to the supraspinatus footprint behind the bicipital groove. A biceps tenotomy is then performed 1 cm lateral to the repair point. This technique not only prevents superior migration of head of humerus but also protects the repaired rotator cuff, resulting in better healing rates.

Citation for this article: Varun Joshi, Harjoban Singh, Shekar Srivastava. Long Head of Biceps(LHB) as a protector of Rotator cuff repair- A New Technique. Case report and review of literature.IAS Newsletter-13, 2022;2(5): 11-16. doi:https://doi.org/10.17613/ebda-6b09

Introduction:

Repair of massive rotator cuff tear remains a challenging task in Orthopaedic practice. Achieving tendon repair at its footprint is desirable but sometimes becomes difficult due to tear size, retraction of torn tendons, fatty infiltration of muscles and degenerative changes [1-5]. In patients having rotator cuff arthropathy, reverse total shoulder arthroplasty has now become a widely accepted treatment with good clinical and functional outcome [6-7]. For patients with massive rotator cuff tears who are relatively younger and don't have any degenerative changes in the joint, multiple treatment strategies have been advised by different authors [8-14]. These include debridement with or without biceps tenotomy, interval slide, partial rotator cuff repair, patch augmentation, tendon transfers and more recently superior capsular reconstruction.

In chronic massive rotator cuff tears, it is impossible to oppose the torn ends without causing undue tension on the repaired tissue. Restoration of the antero-posterior force couple and preventing superior migration is the key to the glenohumeral stability after the repair procedure.

Fascia Lata autograft for superior capsular reconstruction was described by Mihata et al in younger patients with decreased acromiohumeral distance, without excessive arthritic changes [15]. We used the same principle of superior capsular reconstruction to augment the repair in massive rotator cuff tears. In our technique, a portion of long head of biceps was used as an additional restraint to superior migration of humeral head.

This article describes a new technique in which the long head of biceps attachment at the supraglenoid tubercle is left intact. The biceps tendon is incorporated in the repair at the anterior part of the cuff footprint just posterior to the bicipital groove. The portion of the tendon between glenoid and footprint will then act as a superior restraint to the proximal migration of the humeral head and would also protect the repair. The tenotomy of the long head of biceps tendon is done 5-10 mm lateral to the footprint fixation over the greater tuberosity of the humerus.

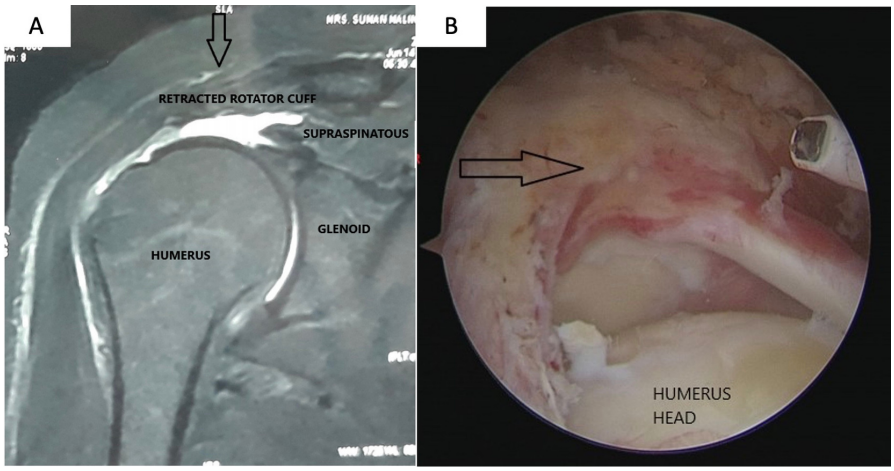

Fig 1: Pre-operative retracted cuff. A: Coronal MRI cuts showing the retracted cuff. B: Arthroscopic images showing retracted cuff(Arrow)

Operative technique:

We use general anaesthesia & interscalene block for these patients. The patient is positioned in a lateral decubitus position. A standard posterior portal is used for initial diagnostic arthroscopy. Assessment of glenohumeral cartilage, long head of biceps and rotator cuff is done. For this technique to be considered, the long head of the biceps should be intact. Then scope is moved to the subacromial space and bursa is debrided and the rotator cuff is again assessed for retraction and mobility(Fig 1). The scope is now moved to the posterolateral portal which serves as a viewing portal for the rest of the procedure. Additional working portals are made laterally and anterolaterally as per requirement. Adequate release of the rotator cuff is done by using a radiofrequency probe. Rotator cuff mobility is again assessed by using a grasper and pulling it towards the footprint.The ability to bring the torn ends of the cuff to the footprint without much tension would be desirable but not always possible.

The next step is to prepare the cuff footprint on the greater tuberosity by using a burr to make it raw for better tendon to bone healing. We use double-loaded 5.5mm suture anchors (Healix Advance BR/ PEEK) for our cuff repairs. An antegrade suture passing device (Expressew III Autocapture + Suture Passer) is used to pass two sutures of each anchor through the cuff to achieve a Mason-Allen configuration (Fig 2). 2-3 anchors are usually required to cover the footprint on the greater tuberosity.

Long head of biceps(LHB) is visualised and sutures from the anterior most anchor are used to fix it by using 2 simple knots. The position of anterior anchor is at the footprint of supraspinatus tendon posterior to the bicipital groove. Biceps tendon is then tenotomised 1cm lateral to its fixation on the greater tuberosity. Side to side repair of biceps tendon with anterior margin of cuff can be considered to cover the leftover gap. We prefer not to do it to avoid causing more damage to the tendon.

At the end, subacromial decompression is done to remove any bony spur or osteophytes from undersurface of acromion. Final construct is evaluated from both subacromial and intraarticular side.

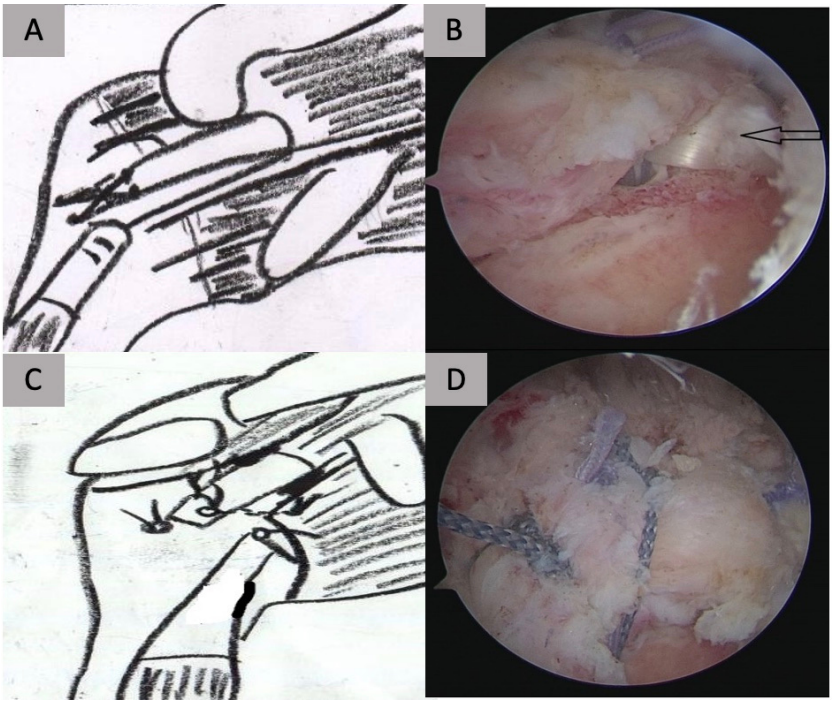

Fig 2: Surgical technique. A& B: Schematic diagram & Arthroscopic image of biceps interposition. C& D: Schematic diagram & Arthroscopic image final construct of the repaired massive rotator cuff tear with tenotomy of the tendon distal to fixation

Post-op Rehabilitation:

Arm is placed in 30° abduction with an abduction pillow for 6 weeks. Active hand, elbow and wrist exercises are allowed from postoperative day one. Only gentle pendular exercises of the shoulder are allowed for 4 weeks. Passive shoulder mobilization is started at 4 weeks followed by active-assisted exercises and withdrawal of abduction pillow at 6 weeks. Progressive capsular stretching and range of motion exercises are allowed to achieve active shoulder movements required for doing day to day routine activities. Strengthening or resistance exercises are started only after 5-6 months.

Cases:

Case 1:

A 54-year-old female presented in outpatient department with pain and an inability to move her right shoulder. She gave a history of injury 6 months back. Now she presented with painful movements and weakness of the right shoulder. The radiograph showed proximal migration of the humeral head on AP view. MRI showed a massive rotator cuff tear with the size of 5 cm involving supraspinatus and infraspinatus with stage 3 retraction according to Patte classification of rotator cuff retraction.

On arthroscopy, the tendon margins were freshened and the cuff was released both on bursal and articular side to increase the excursion for attachment at the footprint. Interval slide was done to improve the cuff excursion. The long head of biceps was used to reinforce the repair construct after the anterior and the posterior limb of the cuff tear was attached to the footprint with the anchor suture. The long head of biceps tendon was tenotomised at 1 cm distal to its attachment over the footprint. The distal end of tendon was left free without tenodesis.

Case 2:

A 40 year old male presented to out patient department with 7 months old post traumatic massive rotator cuff tear. MRI showed massive rotator cuff tear involving supraspinatus and infraspinatus ith stage 3 retraction and tear of subscapularis involving its upper half. Subscapularis tendon repair was done using a 5.5mm Fastfix double-loaded suture anchor followed by supraspinatus and infraspinatus repair as per the above
mentioned technique. A long head of biceps was used to reinforce the repair construct in this patient also and tenotomy was done 1 cm distal to its fixation over the footprint.

Discussion:

The superior capsule is a key static stabilizer of the shoulder joint. Burkhart et al described the role of the superior capsule in rotator cuff pathologies [16]. In recent years, superior capsular reconstruction (SCR) with fascia Lata autograft has found wide acceptance in younger patients with irreparable rotator cuff tears with promising clinical results [15]. SCR restores the shoulder function by recentering the humeral head and improving glenohumeral kinematics. Recently, many authors have tried to avoid the conventional techniques of biceps tenotomy/ tenodesis while dealing with massive rotator cuff tears. Instead, they have proposed to use the long head of biceps as a locally available autograft in many different ways to either augment the rotator cuff repair or to act as a static superior stabilizer. This might also provide additional vascular supply from the intact proximal end. Sano et al used LHB as a tendon patch

graft for massive irreparable rotator cuff tears. He performed tenodesis and then resected the intraarticular part of LHB and used it as a tendon patch graft between the remnant cuff tendons and the footprint [17]. Hermanowicz et al described a Biceps patch technique for irreparable rotator cuff tears. He placed 2-3 mattress sutures passing through supraspinatus, infraspinatus and LHB simultaneously. These mattress sutures provide more strength for whole complex and avoid untying of knots. In this way, the rotator cuff remnants are transferred onto the LHB tendon. Next, the LHB tendon is tendered to the center of greater tuberosity using the lasso-loop technique [18].

The most recent literature has few cadaveric studies on superior capsular reconstruction with an LHB autograft [19,20,21]. They have shown LHB to be biomechanically equivalent to the TFL autograft in the prevention of superior humeral migration by providing a basic static ligamentous support superiorly. Some other authors have described similar techniques based on principles of superior capsular reconstruction [22,23,24]. But to our knowledge, there is no study or case report showing clinical results of these techniques in patients with massive rotator cuff tears.

In principle, our technique of using LHB as a superior stabilizer of humeral head has technical resemblance to some of these cadaveric studies and technical descriptions. This technique has some advantages over the convention superior capsular reconstruction with fascia Lata graft. No extra incisions are required and there is no donor site morbidity. In addition, the superior stabilization with LHB protects the rotator cuff repairduring the healing phase by providing static ligamentous support superiorly(Table I).

There are some concerns related to this technique. LHB is considered a major pain generator in the shoulder[25] and its use as a superior stabilizer can potentially lead to a painful shoulder. Moreover, Biceps attachment to the glenoid can also develop degenerative changes later on and can lead to a painful shoulder. Another concern is that this technique cannot be employed in the absence of the biceps tendon or anatomical variations of the biceps or if degenerative changes are present in the tendon [26]. Popeye's sign when present is more of a cosmetic concern rather than any functional disability. Further studies with a large sample size and a longer follow up are needed to establish the long-term benefits of this technique.

Table I: Advantages & disadvantages of this technique

Advantages	Disadvantages
• No donor site morbidity • Increased healing potential due to increased vascularity • Protects the rotator cuff repair by preventing superior migration • No anchor on glenoid site • Technically easier than SCR with TFL graft • Cost effective	• Popeye sign in some patients • Pain from Biceps anchor • Cannot be done in case of torn/absent LHB or presence of degenerative changes

Table I: Advantages and disadvantages of this technique

Conclusion:

Repair of massive rotator cuff tears with long head of biceps reinforcement prevents the superior migration of the humeral head and provides better clinical outcomes with significant improvement in muscle strength by avoiding undue tension.

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Conclusion:
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