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IAS NEWSLETTER

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Message from the President

Dear Colleagues,

It gives me great pleasure to welcome you to the relaunch of our vibrant monthly newsletter!

Amidst this dynamic phase of growth and transformation, it became clear that our Society needed a powerful and regular platform to share, educate, and inspire. This initiative aligns perfectly with our theme of "Bridging the Boundaries."

We are proud to be led by our newly elected office bearers, who bring fresh energy, innovative ideas, and a unified vision. As we move ahead, it is evident that the collective efforts of our members and leadership can take us farther than ever before.

The year 2025 marks an exciting chapter for us on the international front. Our collaborations with ESSKA and ESSMA are gaining momentum, offering new opportunities for global exposure and meaningful academic exchange—connecting Indian arthroscopy to the world stage.

This newsletter will be much more than just updates. It will be a dynamic platform:

- A chronicle of our achievements
- A voice for our aspirations
- A vibrant resource for education, inspiration, and growth

On behalf of the Indian Arthroscopy Society, I warmly invite each one of you to be an active part of this new journey. Let's make this newsletter a true reflection of the extraordinary energy, expertise, and enthusiasm that defines IAS.

Jai Hind!

Warm regards,

Prof. Arumugam S.

President, Indian Arthroscopy Society

Root of the Matter: HTO with Late Medial Meniscus Root Repair is Worth It — Even with Fixed-Angle Plate

Dr Debayan Sinha Roy
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Introduction

Medial meniscus posterior root tears have been shown to be functionally equivalent to total meniscectomies. They render the medial meniscus incapable of transferring the vertical compressive load into hoop stresses thereby leading to increased stress on the articular cartilage [1]. This leads to rapid progression of osteoarthrosis of the knee joint. Hence surgical repair of these tears, most commonly through a transtibial pullout technique is of paramount importance [2]. While repairing these root tears, care is to be taken to offload the medial compartment in case of pre-existing varus alignment for the repair to heal [3]. However in case of chronic meniscus tears, especially the complex type tears, the quality of the degenerated meniscus tissue often makes the repair unlikely to yield favourable outcomes [4]. Isolated high tibial osteotomy is performed in these cases showing no additional benefit of the root repair [5,6].

Case Presentation

Here we present the case of a 53 year old man who tripped while coming down a flight of stairs five months prior to presentation. There was a complaint of initial pain and swelling of the knee which was resolved on conservative management with rest, ice compression, and analgesics. At the presentation, there was no swelling. There was no complaint of instability, locking, or clicking. There was a complaint of persistent medial sided knee pain on prolonged walking for more than 15 minutes and on deep flexion. On examination, the anterior and posterior drawer tests, the Lachman test, and other tests for instability were negative. The McMurray's test was equivocal and the Payr's test was positive suggestive of a meniscal injury. The gait was examined to have a mild varus thrust. The medial sided knee pain was nearly obliterated on application of a varus unloader knee brace. The preoperative Oxford Knee Score was 28.

Standing radiographs revealed mild reduction of the medial joint space. The patellofemoral and lateral joint spaces looked normal. Rosenberg view did not reveal any significant osteoarthritic changes. MRI reported a Grade III radial tear or root avulsion of the posterior root of the medial meniscus with an intrasubstance horizontal tear. The medial meniscus was reported to be extruded but the amount of extrusion was not specified in the report. Subchondral fracture with marrow edema of the medial femoral condyle was also noted indicating the high stress on the bony interface due to the medial meniscus root tear. Mild cartilage loss on the medial compartment as well as the medial patellofemoral joint was also reported. The long-leg standing radiograph revealed mild varus alignment of the right knee with an mMPTA of 82°, mLDFA of 85°, JLCA of 2°, and HKA of 174° showing varus deformity with the Mikulicz line passing through the near the middle of the medial tibial plateau.

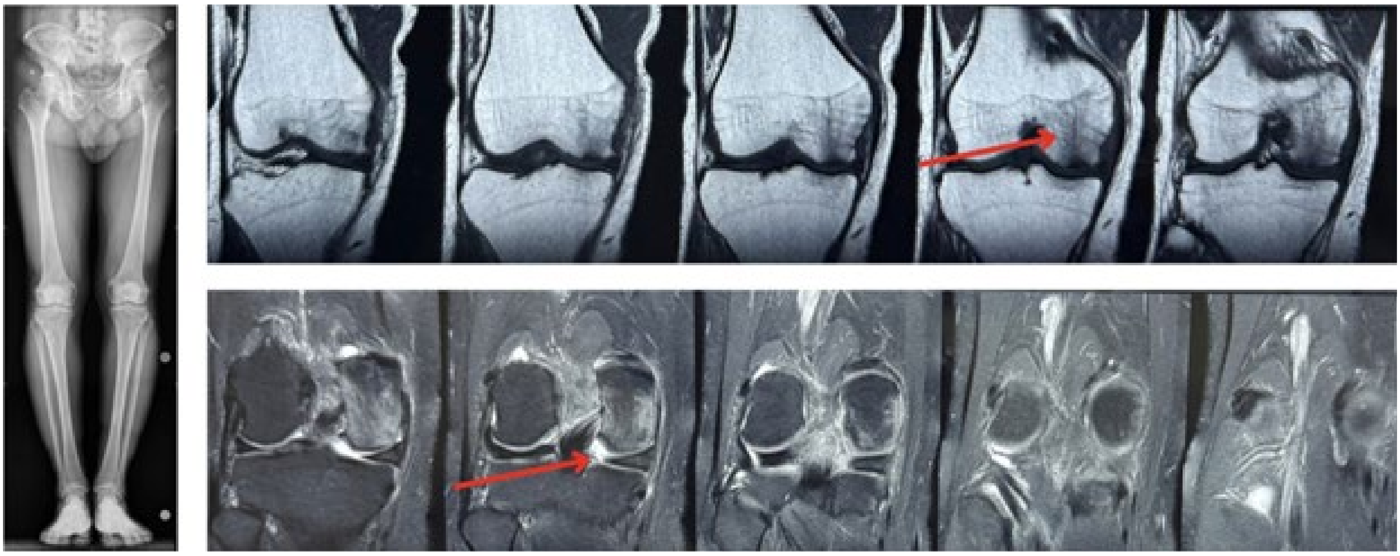

***Figure**: Long leg alignment film, medial condyle edema, possible Laprade Type 2 with complex meniscal tear*

Noting the chronic and complex nature of the tear, the primary plan was to do a medial opening wedge high tibial osteotomy with balancing of medial meniscus flaps, if any. Planning by the Miniaci method, a 8 mm opening wedge osteotomy was needed to bring the mechanical axis to around 54% of the tibial plateau width. Diagnostic arthroscopy revealed complete separation of the medial meniscus root from its attachment. However, the meniscus could be reduced to its anatomical root. And no horizontal cleavage pattern was noted in the meniscus as suggested on the MRI report. Following this, the bed of the meniscus attachment was prepared with a rasp till bleeding subcortical bone was reached. Two luggage-tag type simple cinch knots were made with UHMWPE sutures (Orthocord, Mitek) through relatively healthy meniscal tissue and the sutures were left in place through the anteromedial portal.

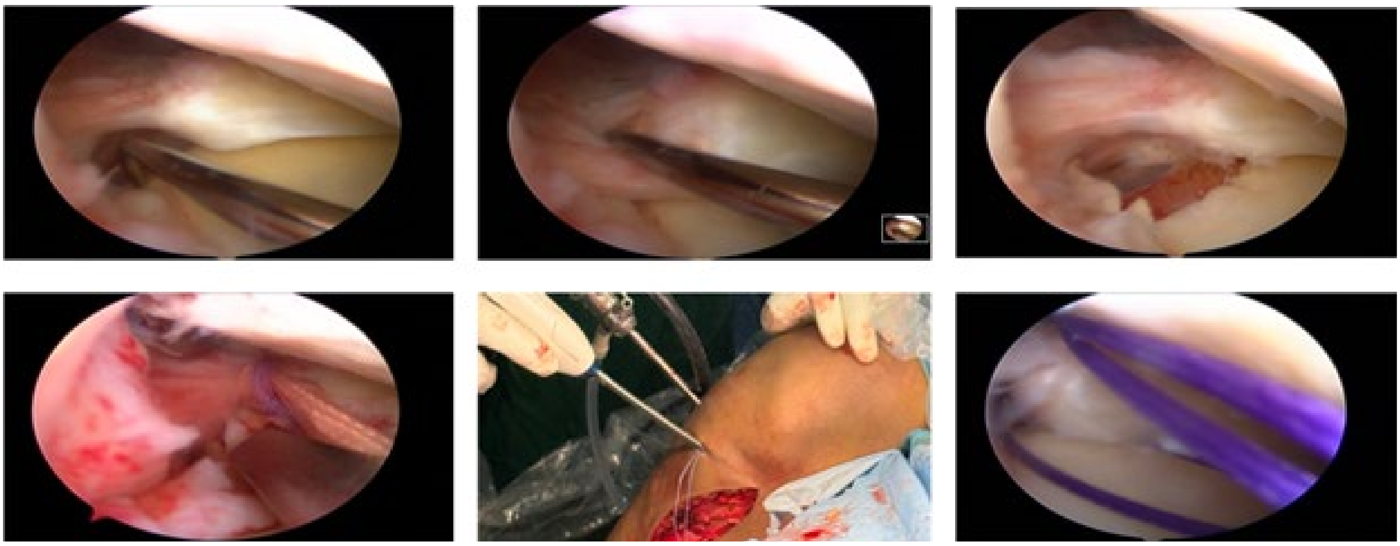

***Figure**: Identification of root tear, checking of reducibility, preparation of bed, suture bite and retrieval*

An ascending biplane medial opening wedge high tibial osteotomy was then performed with a posterior opening of 9 mm and about half of that opening on the anterior aspect. Alignment was checked intra-operatively with an alignment rod. A fixed angle angle stable titanium locking plate (size 2 plate, Newclip) was used and all the four proximal locking screws were applied. The ACL jig was then placed at the meniscus root attachment site and gentle reaming was done over a guidewire so as to feel any collision with the screws. The slight divergent nature of the proximal row of screws allows for the 4 mm cannulated reamer to pass through without colliding with the screws. A Beath pin was used in a retrograde manner to shuttle the sutures out near the elbow of the plate and they were tied over an endobutton to fix the root. Wound was closed in layers and postoperative distal pulses were checked.

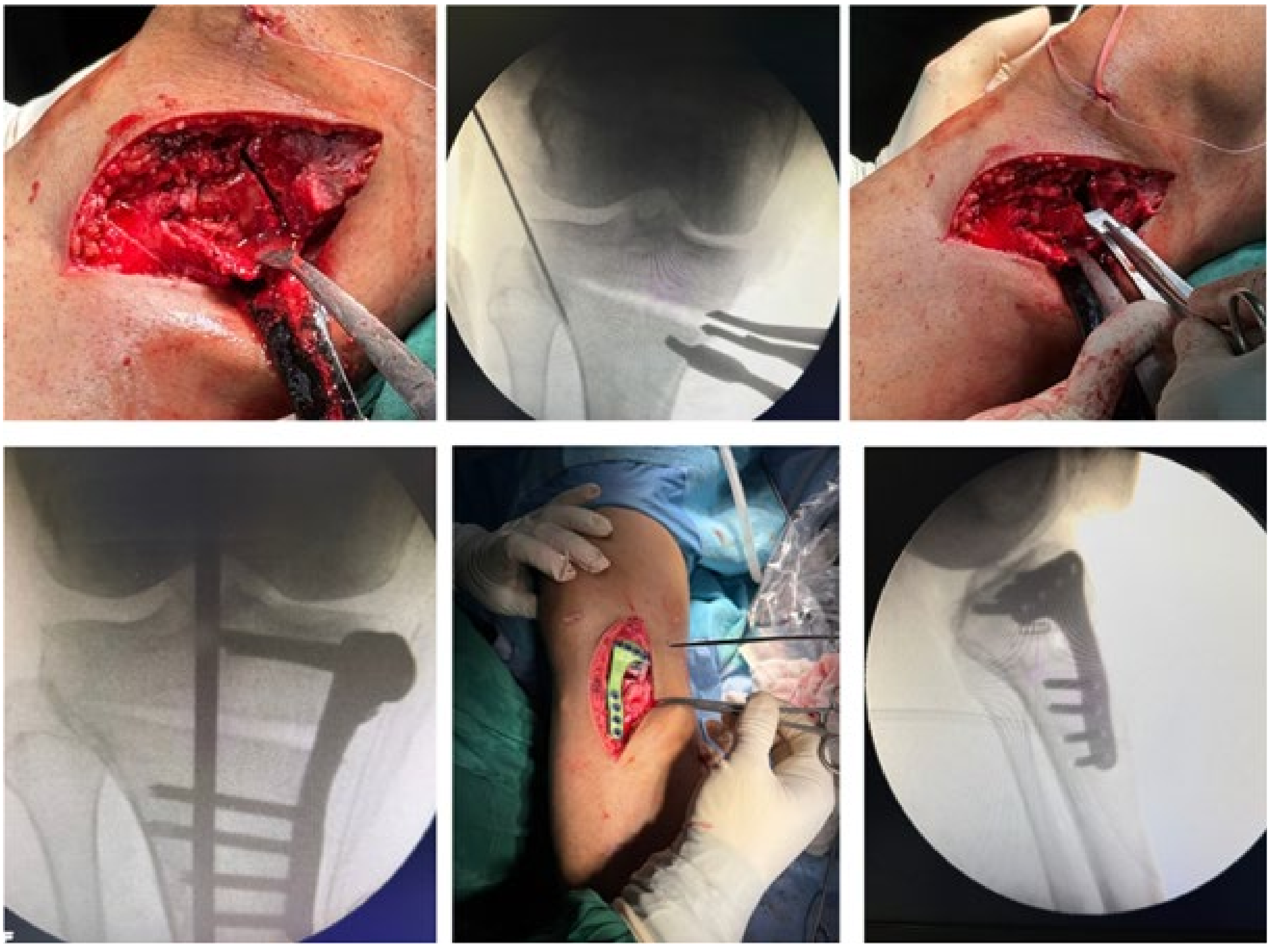

Figure: *Ascending biplane osteotomy with alignment check*

Patient was allowed immediate ROM exercises of the knee along with the quadriceps strengthening exercises. Toe-touch weight bearing was allowed after three weeks and full weight bearing after six weeks. Serial follow-up was done every month and the Oxford knee score improved to 42 in 3 months and 47 at one-year follow up.

Discussion

Medial meniscus posterior root tears (MMPRTs) critically compromise knee biomechanics, mimicking the effects of total meniscectomy by eliminating hoop stress transmission. This leads to meniscal extrusion, subchondral overload, and rapid osteoarthrosis progression. Repairing such tears, especially chronic or complex ones, can be challenging due to degenerative meniscal tissue and associated varus malalignment. High tibial osteotomy (HTO) has been advocated to offload the medial compartment and improve the biomechanical milieu for root healing.

In this case, despite the chronicity and MRI findings suggesting intrasubstance degeneration, the root was reducible and repairable at arthroscopy. Performing a medial opening wedge HTO concurrently with root repair not only restored alignment but also facilitated biological healing by decreasing medial compartment stress. The use of a fixed-angle locking plate posed a potential concern for tunnel collision, yet careful screw placement and the divergent trajectory of the proximal screws allowed for a safe transtibial tunnel. At one-year follow-up, the patient showed significant clinical improvement.

This case reinforces that even delayed MMPRT repair, when coupled with appropriate alignment correction and precise surgical planning, can yield excellent outcomes—even in the presence of chronic tears and rigid fixation systems.

Keywords: Medial meniscus posterior root tear, high tibial osteotomy, meniscus, osteotomy

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Long term functional outcomes and screw position analysis using safe zone technique of open classic latarjet using free hand technique : 100 cases

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Abstract

Introduction and Purpose

Latarjet procedure is commonly performed for recurrent anterior shoulder instability with glenoid side bone loss. Classic Latarjet procedure can be performed using specially designed drill guides, jigs, or by freehand technique. Here we have described a technical note on classic Latarjet procedure performed with **freehand technique** utilizing simple rulers and caliper. Also have described an **'6 Pane Window' Safe Zone** analysis for the Alpha-Beta Screw Entry-Exit . The functional and radiological outcomes of our patients have also been analysed.

Material and Methods

100 open classic Latarjet procedures were performed using Free Hand technique between March 2017 and July 2021. The functional outcome of the patients was measured using demographic variables , subjective(UCLA,OSIS,ASES), objective (CSS) scoring systems at 3 years of follow-up. Exclusion: Epilepsy, Multidirectional instability, Voluntary dislocation, sub clinical infection, inflammatory arthritis, sacpula and humerus fractures. Out of 100, Screw and graft positioning were studied in 24 consecutive patients with a postoperative computed tomography (CT) scan.

Results

There was no incidence of recurrent subluxation or dislocation post-surgery. Scoring (ASES , CSS , UCLA) increased from preoperative to postoperative at 3-year follow-up. Postoperative CT scan also showed satisfactory '6 Pane Window Safe Zone' screw placement in all patients.

Conclusion

Open Latarjet procedure performed using freehand technique provides good functional and radiological outcomes in patients with recurrent anterior shoulder instability with glenoid side bone loss.

Case Report

Introduction

Latarjet procedure has evoked renewed interest around the world in recent years, especially in patients with recurrent anterior shoulder instability with glenoid bone loss. The surgery was shunned due to the high rates of complications reported in the literature. The French have to be credited for popularising the procedure again and describing the correct technique thus minimizing the complications and giving good results. The success of Latarjet surgery comes from its 'triple blocking' effect [1].

'Triple blocking' is given by the bony effect, ligament effect, and muscular effect. **The bony effect** is given by the bone graft which enhances the glenoid width. **The muscular effect** is given by the conjoint tendon sling which reinforces the inferior subscapularis. **The ligament effect** is usually obtained by suturing the anterior capsule to the coracoacromial ligament (CAL). With increasing success reported in the literature, the Latarjet procedure is being preferred as a primary procedure for most cases of recurrent anterior shoulder instability. It is cost-effective, allows an easier return to play, and necessitates less strict postoperative immobilization.

The concept of "critical" bone loss has been highlighted in different studies as a predictive factor for failure of the arthroscopic bankart repair. 19–21% of glenoid side bone loss has been attributed to compromised arthroscopic Bankart repair outcomes . Glenoid side bone loss leads to a reduction in glenoid track width which may subsequently lead to off-tract Hill-Sachs lesion. Latarjet procedure is a preferred surgery for patients with bone loss.

Latarjet is a technically demanding procedure as the **incidence of complications is directly related to the position of the screws**. A lateral overhang of the graft of 1 mm can lead to osteoarthritis whereas medial placement by 2 mm can lead to failure and recurrence of instability. The invention of newer drilling guides for screw placement has shown to provide promising functional and biomechanical results. **However the drill guide may not be of use in small glenoid and coracoid dimensions** .

In this paper, we describe the classic Latarjet procedure performed with a simple freehand technique using caliper and rulers. We have also studied the accuracy of screw placement with this technique with computed tomography (CT) scans using the '6 Pane Window Safe Zone for Alpha-Beta Screw Entry-Exit' and analysed the functional outcome of our patients at 3 years of follow-up.

Surgical Technique

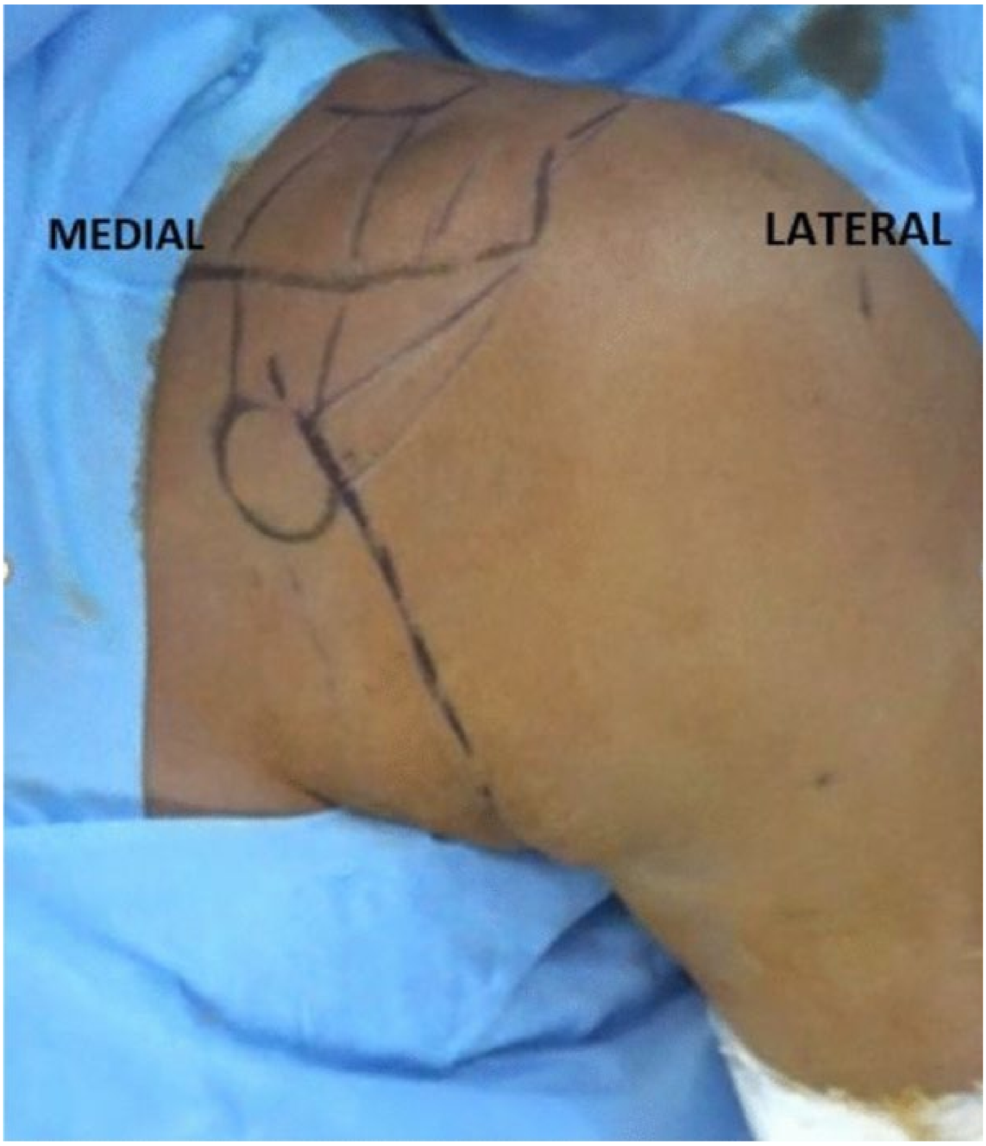
Patient Positioning and Anaesthesia

We perform the procedure under interscalene block. Patient is placed in beach-chair position with appropriate padding of bony prominences. The shoulder is prepared and draped in a sterile fashion. The arm should remain draped free to allow for intraoperative manipulation of the upper extremity.

Surgical Approach

A 6–7 cm axillary crease incision is given, medial to the traditional deltopectoral incision (Fig. 1). Subcutaneous tissue dissection is done and then the clavipectoral fascia is identified and incised. The cephalic vein is found in the medial part of the flap. The cephalic vein is retracted along with the deltoid laterally. Deltopectoral interval is developed and self-retaining Gelpi retractors are inserted in the interval. Hohmann retractor is placed at the base of the coracoid to help improve visualization. Often, the branches of the deltoid artery are found to cross anterior to the coracoid and can cause bleeding if injured during retraction. These vessels can be ligated or cauterized as needed.

Figure 1



Skin incision marking from coracoid process to anterior axillary fold

Coracoid Exposure

A good exposure of the coracoid process is obtained with the Hohmann at the base of the coracoid. Coracoacromial ligament (CAL) is identified with the arm in abduction and external rotation and transected with 1 cm stump attached to the coracoid. This remnant CAL would be later sutured to the shoulder capsule. Pectoralis minor tendon is sharply released from the medial aspect of the coracoid process using diathermy. Routine identification of axillary or musculocutaneous nerve is not needed. But a thorough knowledge of their location is necessary to avoid inadvertent damage.

Coracoid Graft Harvest

We generally use a 1-inch curved osteotome for graft harvest. The osteotomy is done just at the base of the coracoid (Fig. 2). During the osteotomy, it is made sure that coracoclavicular ligaments are not disturbed. An instrument is placed underneath the coracoid to avoid inadvertent neurovascular injury. A paper ruler is used to measure the appropriate graft length. After the osteotomy is completed, the coracoid graft is held with a Kochers or Sponge Holding forceps. Specific coracoid graspers are available. An oscillating saw and a nibbler are used to freshen and decorticate the undersurface of the coracoid graft. A burr can also be used to perform decortication. Next, a caliper is used to measure the dimensions of the graft (Fig. 3). Pre-drilling is performed with a solid drill bit of size 2.5 mm for the inferior screw. Then, the distance between the drill hole and lateral margin of the coracoid is measured. The graft thickness helps us decide the length of the screw. The second drill hole is not made at this stage.

Fig. 2.

Coracoid osteotomy using osteotome

Fig. 3.

Coracoid graft measurement using callipers. a-length, b-breadth, c-thickness

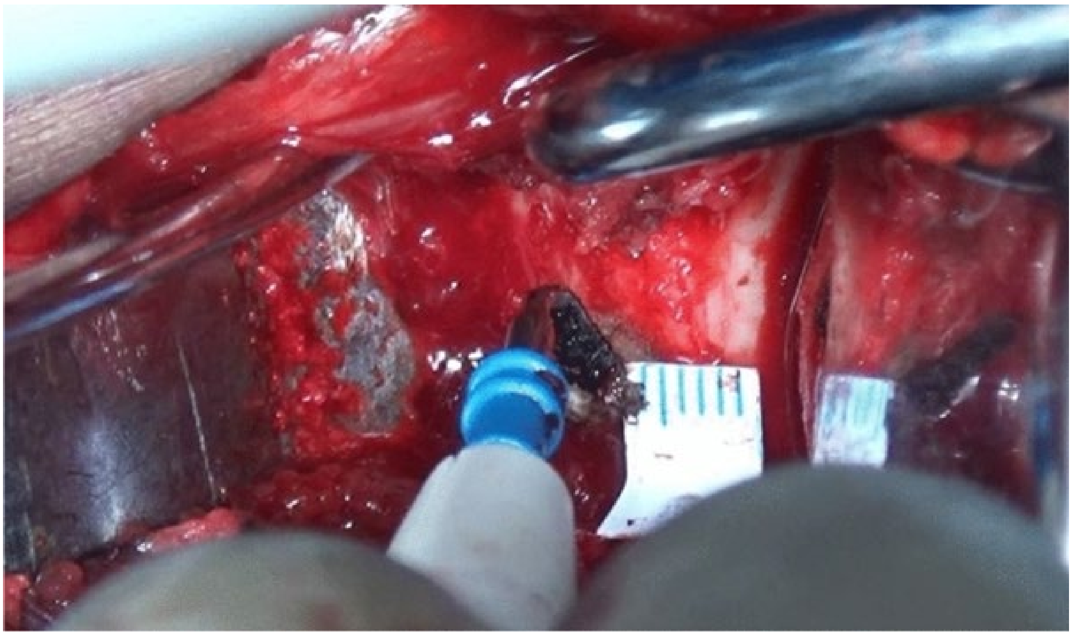
Glenoid Exposure

Adduction and external rotation of the shoulder help us visualise the subscapularis. The subscapularis muscle is then sharply split with a curved Metzenbaum scissors at the junction of the upper half and lower half. The division need not extend to the tendon. Once the muscle is split, the white shiny capsule comes into view. The plane between the subscapularis and the anterior glenohumeral capsule is developed. A Gelpi retractor can be inserted in the subscapularis split to help in retraction. A longitudinal skin incision is given over the shoulder capsule to expose the joint. The capsule is then tagged with Vicryl suture to facilitate identification during the subsequent capsular repair. A Fukuda humeral head retractor is now inserted to retract the humeral head. An anterior glenoid retractor is used to expose the glenoid. The anterior-inferior glenoid labrum is dissected using electrocautery and elevator. A burr is used to prepare the anterior neck of the glenoid.

Coracoid Graft Transfer

The Coracoid graft should be flush with the articular surface of the glenoid. The longitudinal axis of the coracoid graft is positioned in the superior-inferior direction along the anterior glenoid neck with the lateral aspect of the graft flush with the articular surface in the classic Latarjet procedure. Having pre drilled the inferior screw hole on the coracoid, the screw hole on the gleoid has to be drilled at the appropriate site. Place a ruler scale on the anterior aspect of the glenoid and make a mark at the same distance from the glenoid articular surface so that after placement of the graft, the graft will be flush with the glenoid without lateral overhang (Fig. 4). The distance is usually between 6 mm to 8 mm from the glenoid articular surface. Now drill the glenoid at the marked site parallel to the surface of the glenoid. Measure the depth of the glenoid hole using a depth gauge and this can be added to the previously measured coracoid thickness to get the appropriate screw length. A guidewire is inserted from the coracoid graft inferior drill hole into the glenoid drill hole and then fixation is done with a 4 mm cancellous screw (Fig. 5). Do not fully tighten the inferior screw now. The second drill hole is made at the mark on the coracoid graft. If needed, at this time minor adjustments in the graft placement can be done, by rotating the graft. At the end tighten both screws alternatively to get the coracoid graft flush with the glenoid (Fig. 6).

Fig. 4.

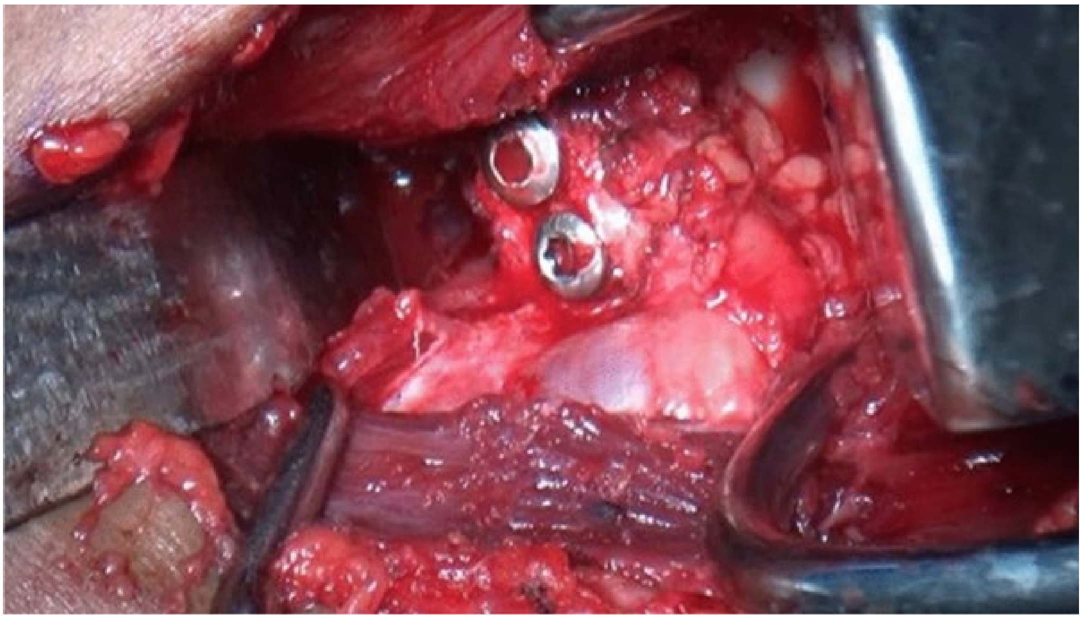


Marking for inferior screw guide hole on the glenoid. A ruler scale is used to mark the guide hole on the glenoid. The mark is made at a distance equal to the distance of the inferior screw guide hole on the coracoid graft from its lateral margin

Fig. 5.

Inferior screw placement

Fig. 6.



Final view of the coracoid graft fixed to anterior glenoid with attached coracoacromial ligament

Capsular Closure

The previously tagged capsule remnant is now repaired to the CAL to make the graft partly intraarticular. The subscapularis split is not repaired and the conjoint tendon exiting through the split in the subscapularis provides the muscular effect as described by Patte. Now the wound is closed in a standard layered fashion.

Post-Operative Care

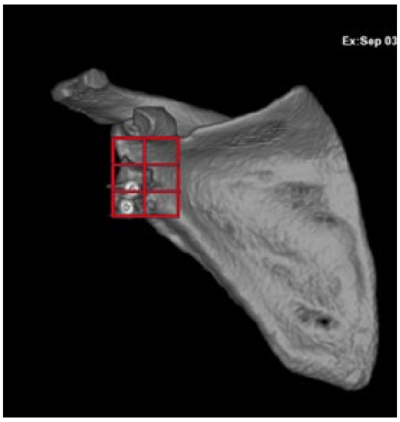
The arm is kept in a sling for 3 weeks. The sling can be taken off for having food from day 1. Active assisted movements usually start at 4 weeks and strengthening exercises start at 8 weeks. The Patient is fit to return to [8] sports usually by around 4-6 months.

' 6 Pane Window Safe Zone for Alpha-Beta Screw Entry-Exit '
Safe Zones : Mid Lateral & InfraLateral

This Safe Zone Concept comes into Play for the ideal screw head and tip placements with three bony landmarks : glenoid superior rim, glenoid inferior rim, deepest point of the suprascapular notch.

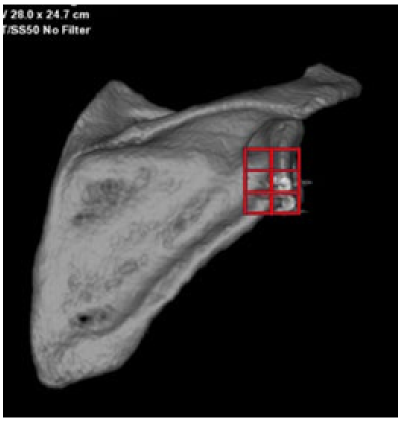
1. Anterior:

6 pane window is drawn On 3D CT construct
- drawing a horizontal line connecting deepest point of suprascapular notch and glenoid superior rim (**line A**) .
- connecting vertical line descending from the deepest point of suprascapular notch (parallel to the glenoid) (**line B**) and horizontal line from the glenoid inferior rim (parallel to line A) (**line C**)
- Dividing the rectangle formed into 6 equal boxes
- Mid Lateral & InfroLateral Boxes : Safe Zones
- Supromedial , Mid Medial , Infromedial prone to SSN injury



1. Posterior:

6 pane window is drawn On 3D CT construct
- drawing a horizontal line connecting deepest point of suprascapular notch perpendicular to the glenoid margin (**line A**).
- connecting vertical line descending from the deepest point of suprascapular notch (parallel to the glenoid) (**line B**) and horizontal line from the glenoid inferior rim (parallel to line A) (**line C**)
- Dividing the rectangle formed into 6 equal boxes
- Mid Lateral & InfraLateral Boxes : Safe Zones
- Supramedial , Mid Medial , Inframedial prone to SSN injury



Results

From March 2017 to July 2021, 100 open classic Latarjet procedures were performed by 2 surgeons of our institution.

From the 24 patients, 20 patients had the graft flush to glenoid in the axial plane and 2 had lateral overhang of 1 mm and 2 had medially placed graft of 1 mm. All 24 patients had Alpha-Beta Entry Exit screws in the Safe zones – Anteriorly : Mid Lateral and Inferolateral, Posteriorly: Mid Lateral and Inferolateral.

Age distribution

Age	Frequency	Percent
<20	13	13
21-30	34	34
31-40	35	35
>40	18	18
Total	100	100

The study population consisted of 100 individuals with an average age of 31.4 ± 10 years, ranging from 14 to 72 years. The age distribution revealed that the largest groups were in the 21–30 and 31–40 age brackets, each accounting for 34% and 35% of the participants, respectively. Only 13% were under 20, and 18% were older than 40. These findings highlight that the procedure predominantly targeted younger adults, potentially indicating its relevance for an active demographic susceptible to shoulder instability.

Gender distribution

Gender	Frequency	Percent
Male	96	96
Female	4	4
Total	100	100

The majority of participants were male, accounting for 96%, while only 4% were female. This marked gender disparity suggests that the condition or activity requiring the Latarjet procedure is significantly more common or severe among males, possibly due to higher participation in contact sports or labor-intensive occupations.

Number of Dislocations

The number of shoulder dislocations prior to surgery averaged 5.6 ± 5, ranging widely from 1 to 50 dislocations. Most participants (55%) reported five or fewer dislocations, while 43% experienced between 6 and 10. A small subset (2%) had more than 11 dislocations, indicating the extreme end of the spectrum. The variability underscores the diverse severity of cases handled in the study.

Number of Dislocation	Frequency	Percent
≤ 5	55	55
6-10	43	43
>10	2	2
Total	100	100

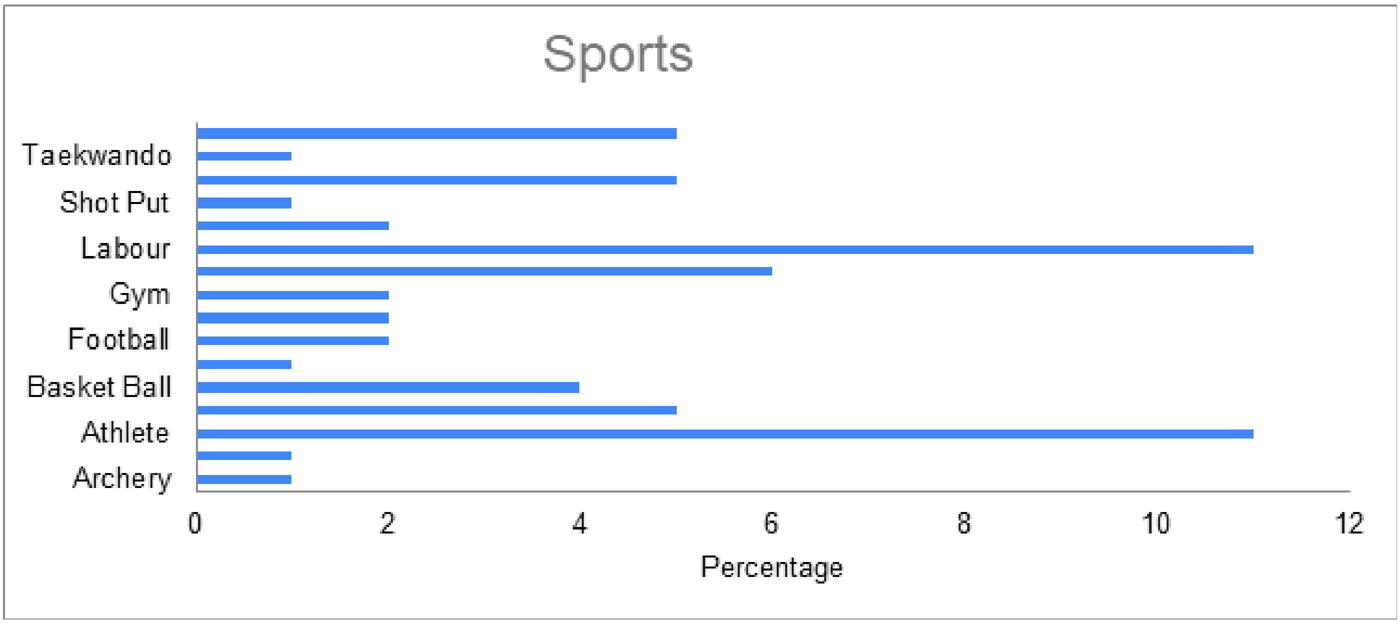
Physical Demand Level

High physical demand was a common characteristic among participants, with 59% categorized as high demand and another 38% as high-demand occupational workers. Only 3% fell into the low-demand category, suggesting that the procedure is primarily sought by individuals engaging in intense physical activities, further substantiating its association with athletic and labor-intensive lifestyles.

Demand	Frequency	Percent
High	59	59
Moderate	38	38
Low	3	3
Total	100	100

Sports Involvement

Sports participation varied widely, with no singular sport dominating. 40% of participants were not involved in sports, while the remaining 60% reported participation in sports ranging from common ones like football (2%) and badminton (5%) to more niche activities like archery (1%) and shooting (2%). Labor-intensive roles accounted for 11%, emphasizing the occupational dimension of shoulder injuries.



Duration of Symptoms

The average duration of symptoms was 2.33 ± 2.89 years, ranging from 0.03 to 13 years. The median duration was 1 year, with an interquartile range (IQR) of 0.75 to 3 years, showing a skewed distribution where most participants sought intervention within a few years of onset.

	N	mean ± SD	Range	Median	IQR
Duration in years	99	2.33 ± 2.89	0.03 - 13	1	0.75 - 3

MRI Glenoid Index

	N	mean ± SD	Range	Median	IQR
MRI : Glenoid index	100	0.824 ± 0.043	0.76 - 0.91	0.82	0.79 - 0.85

The MRI Glenoid Index showed an average of 0.824 ± 0.043, ranging between 0.76 and 0.91. The median value was 0.82, with an IQR of 0.79 to 0.85. These values provide a precise quantification of glenoid bone loss, crucial in determining the need for surgical intervention.

UCLA Scores

The UCLA score improved significantly from 21.2 ± 3.2 preoperatively to 33.4 ± 1.5 postoperatively ($p < 0.001$). The median score improved from 20 (IQR: 19–24) preoperatively to 33 (IQR: 32–35) postoperatively. This substantial improvement underscores the procedure's effectiveness in restoring shoulder stability and function.

		UCLA				Paired t test	
	N	mean ± SD	Range	Median	IQR	t	p
Pre	100	21.2 ± 3.2	17 - 28	20	19 - 24	36.162	0.001
Post	100	33.4 ± 1.5	31 - 35	33	32 - 35		

Oxford Scores

The Oxford score showed a marked improvement postoperatively, increasing from 39.3 ± 3.4 preoperatively to 45.7 ± 2.1 ($p < 0.001$). The median scores rose from 40 (IQR: 36–42) to 46 (IQR: 44–48), demonstrating enhanced subjective shoulder functionality.

		Oxford Score				Paired t test	
	N	mean ± SD	Range	Median	IQR	t	p
Pre	100	39.3 ± 3.4	32 - 44	40	36 - 42	17.633	0.001
Post	100	45.7 ± 2.1	42 - 48	46	44 - 48		

		Oxford Score			
	N	mean ± SD	Range	Median	IQR
ASES	100	93.4 ± 3.5	88 - 100	95	89 - 96
Constant	100	6.3 ± 3.4	2 - 11	5	4 - 10

The American Shoulder and Elbow Surgeons (ASES) score averaged 93.4 ± 3.5, ranging from 88 to 100. The median score was 95, with an IQR of 89 to 96, reflecting excellent postoperative outcomes across the cohort

Constant Score

The Constant score, assessing shoulder function, averaged 6.3 ± 3.4 with a range of 2 to 11. The median score was 5, with an IQR of 4 to 10, suggesting varied but generally favorable functional restoration.

This detailed interpretation covers all the variables systematically, contextualizing the results and emphasizing the implications of each dataset.

Discussion

In both clinical and biomechanical studies, the open Latarjet procedure has demonstrated consistent results in providing glenohumeral stability. Recent literature has swayed towards better outcomes and lesser or equal long-term complications with the latarjet procedure compared to the Bankart repair.

Hovelius et al. in a prospective study performed in 118 patients reported a 3.4% recurrence rate and 98% success rate after 15 years of follow up [8]. Mizuno et al. in a long-term retrospective analysis of 68 latarjet procedures reported a recurrence rate of 5.9% after a mean follow-up of 20 years [9]. In a systematic study involving ten clinical studies, Bhatia et al. reported recurrent instability in 0–8% of cases [10].

Gartsman et al. in their case series of 416 latarjet procedures reported a complication rate of only 5%. They reported 13 cases of neurologic complications, of which 11 cases recovered without any deficit at final follow-up [11]. Shah et al. in their study of 48 shoulders described a 10% incidence of neurologic injuries [12]. In a systematic review with a meta-analysis of eight comparative case series between bankart repair and Latarjet procedure, Vincent et al. concluded that the Latarjet procedure was associated with less chance of re-dislocation and recurrence [13]. They found that the Latarjet procedure was associated with higher Rowe scores and lower loss of external rotation compared to the Bankart repair procedure.

Precise placement of the coracoid graft over the glenoid is of utmost importance. Excessive lateralization of the coracoid graft has led to abnormal glenohumeral contact pressures and glenohumeral arthropathy in cadaveric biomechanical studies [14]. Barth et al. compared the accuracy of screw placement in patients who underwent the Latarjet procedure using the freehand technique with those who underwent the same procedure using drill guides [4]. Using drill guide, the coracoid graft was placed flush in 85.2% and 88.9% of cases in the inferior and middle quartiles of the glenoid. The study also reported in 85.2% of cases, 60% of the graft was inferior to the equator of the glenoid. These results are comparable to our results where 83% of patients had the graft flush with the glenoid and all 24 patients had 60% of their length below the equator.

The Freehand technique also provides several advantages. Screw diameter size can be changed according to the size of the graft in our technique which is not possible with a drill guide. We can readjust the position of the graft while drilling for the second screw. Drill orientation also can be manipulated in patients with severe glenoid side bone loss. The main disadvantage of the technique is that it could be cumbersome on part of the surgeon initially to measure with scale and rulers in each step from graft harvest to graft positioning. Nevertheless, the technique can be easily mastered.

Age:

The study's demographic profile showed a mean age of 31.4 years, The concentration of participants in the 21-40 age range, accounting for 69% of the study group, underscores the need for effective surgical interventions in this demographic to restore stability and function. The small representation of older adults suggests that while the procedure can be applied across age groups, its primary benefit is seen in those with more demanding physical activities.

Gender:

The overwhelming male dominance (96%) in the study reflects a higher incidence of shoulder instability issues among men

Number of Dislocations:

Participants reported an average of 5.6 dislocations prior to surgery, with some experiencing as many as 50 dislocations. This wide range illustrates the varying severity of shoulder instability cases managed in the study. The high incidence of multiple dislocations before seeking surgical intervention suggests that patients often endure significant discomfort and functional impairment before opting for surgery. The results emphasize the need for early intervention to prevent recurrent dislocations and associated complications, such as cartilage damage and joint degeneration.

Side of Injury:
The right shoulder was affected in 96% of cases, aligning with the fact that most individuals are right-handed. This prevalence indicates that the dominant shoulder is more prone to injury due to its frequent use and exposure to mechanical stress.

Smoking Status:
The study noted that 93% of participants were nonsmokers. This relatively low prevalence of smokers might suggest a health-conscious cohort, although the impact of smoking on surgical outcomes for shoulder procedures remains an area for further investigation. Smoking has been linked to poorer surgical outcomes and delayed healing, so the predominantly nonsmoking population in this study might have experienced fewer complications and better recovery.

Physical Demand Level:
High physical demand was a characteristic of 59% of participants, with an additional 38% engaged in high-demand occupational roles. This high physical demand level underscores the procedure's effectiveness in individuals whose daily activities require robust shoulder functionality. The association with labor-intensive lifestyles further illustrates the need for durable surgical solutions that can withstand significant physical stress, ensuring long-term shoulder stability and function.

Sports Involvement:
Sports participation was diverse, with 60% of participants engaged in various sports. This diversity demonstrates the broad applicability of the Latarjet procedure across different athletic disciplines. The notable percentage of participants not involved in sports (40%) highlights that shoulder instability is not exclusive to athletes but also affects those in physically demanding occupations.

Dominant Side:
The dominant right side was predominantly affected, reflecting 93% of cases.

Duration of Symptoms:
The average duration of symptoms was 2.33 years, with a median duration of 1 year. This indicates that many patients tolerate symptoms for extended periods before seeking surgical intervention. Early diagnosis and intervention could potentially reduce the duration of symptoms and improve outcomes. The skewed distribution, with some participants experiencing symptoms for over a decade, highlights the variability in patient experiences and the need for personalized treatment plans.

MRI Glenoid Index:
The MRI Glenoid Index, with a mean value of 0.824, provides a quantitative assessment of glenoid bone loss, crucial in surgical planning. The relatively narrow range (0.76 to 0.91) and the median value (0.82) indicate that most participants had moderate glenoid bone loss. Accurate measurement of the Glenoid Index is essential for determining the necessity and type of surgical intervention, emphasizing the role of precise imaging in preoperative planning.

UCLA Scores:
The significant improvement in UCLA scores from 21.2 preoperatively to 33.4 postoperatively underscores the procedure's success in enhancing shoulder stability and function. This improvement reflects the patient's satisfaction with the surgery and highlights the Latarjet procedure's effectiveness in restoring shoulder performance. The statistical significance ($p < 0.001$) strengthens the validity of these findings, emphasizing the substantial functional benefits

gained from the surgery.

Oxford Scores:
Postoperative Oxford scores showed a notable increase from 39.3 to 45.7, indicating enhanced subjective shoulder functionality. This improvement reflects the patients' perception of their shoulder function and quality of life post-surgery. The significant rise in scores ($p < 0.001$) suggests that the Latarjet procedure effectively addresses the functional impairments associated with shoulder instability, improving overall patient outcomes.

ASES Score:
The ASES score, averaging 93.4 postoperatively, indicates excellent functional outcomes across the cohort. The high median score (95) suggests that most patients achieved near-optimal shoulder function following the procedure. This finding underscores the procedure's efficacy in restoring functional capability, allowing patients to resume their normal activities without significant limitations.

Constant Score:
The Constant score averaged 6.3, reflecting varied but generally favorable functional restoration. The range of scores (2 to 11) indicates that while some patients achieved excellent outcomes, others may have experienced residual functional limitations. This variability highlights the importance of individualized postoperative rehabilitation programs to optimize outcomes for each patient.

Beighton Score:
The Beighton score, with an average of 3.9, indicates mild hypermobility among participants. This factor is relevant in shoulder instability cases, as hyperlaxity can contribute to recurrent dislocations. Understanding the role of hypermobility can help tailor surgical and rehabilitation strategies to address this underlying issue, ensuring more stable and long-lasting results.

Conclusion

Open Latarjet procedure performed using freehand technique provides good functional and radiological outcomes in patients with recurrent anterior shoulder instability. Precise measurement of the graft and accurate marking of screw entry points over the graft and glenoid as described in our technical note will help to prevent graft mal-positioning. Graft and screw position was found to be optimal in 28% of our cases who underwent post operative CT scan.

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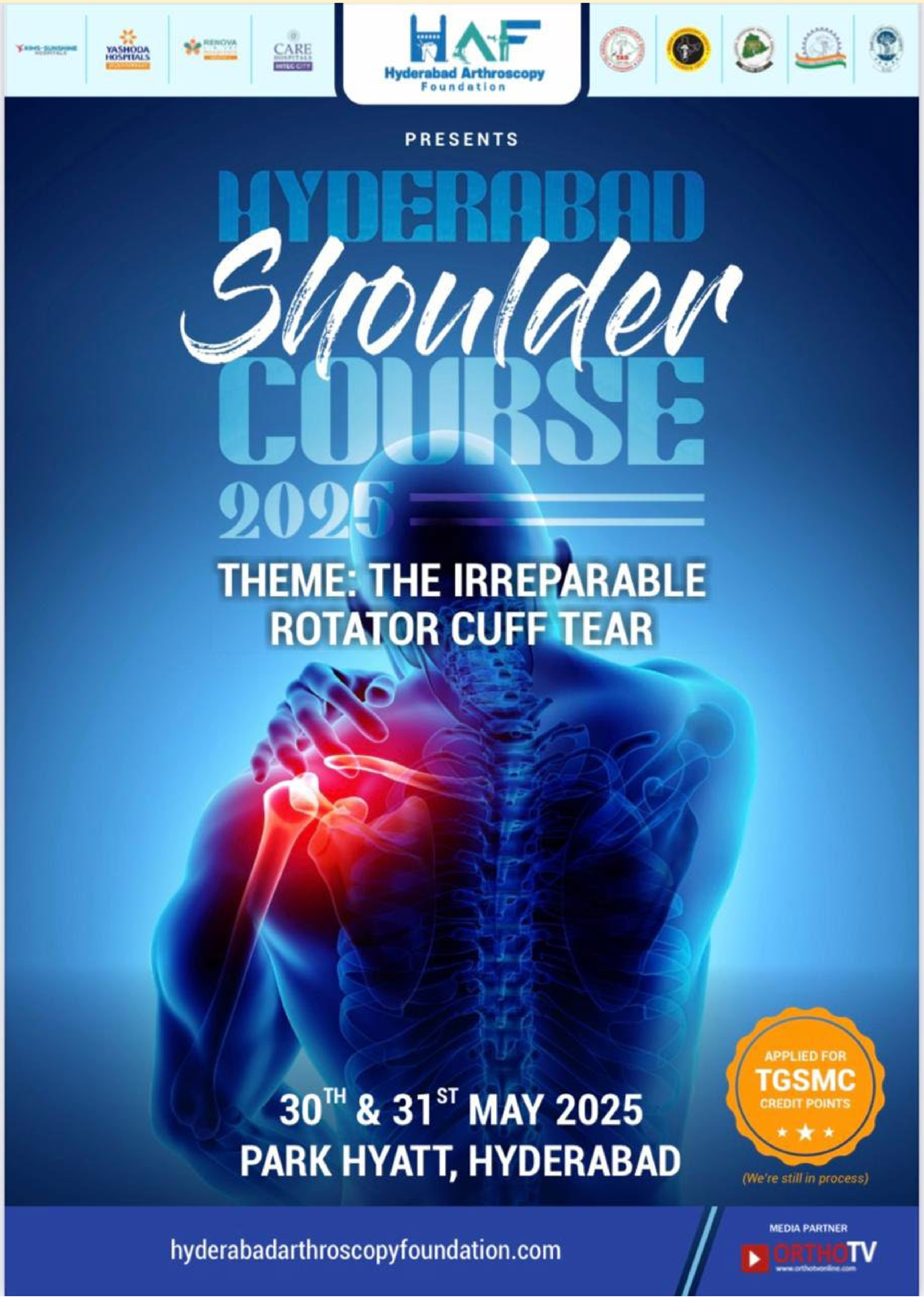
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