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Original Research Article

FUNCTIONAL RECOVERY AFTER OPEN CONGRUENT ARC LATARJET IN RECURRENT ANTERIOR SHOULDER DISLOCATION WITH GLENOID BONE LOSS

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ABSTRACT

Background: Recurrent anterior shoulder dislocation is common in young males specially in those doing manual work or sports. When glenoid bone loss is more than 20%, soft-tissue Bankart repairs fail. Latarjet procedure is used in such cases. Congruent arc modification rotates the coracoid 90 degree to match glenoid curve and increases contact area. This study was done to see functional outcome after open congruent arc Latarjet using subscapularis split approach in Indian hospitals with limited resources.

Materials and Methods: This was a prospective study done in multicentre tertiary hospitals. Total 40 patients with recurrent anterior dislocation and glenoid bone loss more than 20% were included. All underwent open congruent arc Latarjet using subscapularis split. Functional outcome was assessed by ROWE, ASES, VAS pain score and shoulder range of motion before and after surgery. Follow up was done up to 24 months. Data was analysed using paired t-test. p-value less than 0.05 taken as significant.

Results: ROWE score improved from 23.05 to 91.10, ASES score from 22.95 to 75.65. VAS pain reduced from 7.2 to 1.1. All changes were significant. Forward flexion reached 141.2 degree, external rotation 43.4 degree. Internal rotation upto L1-D12 in 80% patients. Based on ROWE, 72.5% had excellent result, 20% good, 7.5% fair. No patient had redislocation or required revision.

Conclusion: Open congruent arc Latarjet is a reliable and effective surgery for recurrent anterior shoulder dislocation with glenoid bone loss. It gives good pain relief, stability and function even in resource-limited hospitals if proper technique is followed.

Keywords: Anterior shoulder dislocation, Latarjet, Congruent arc, Glenoid bone loss, Functional outcome, Subscapularis split.

INTRODUCTION

Recurrent anterior shoulder dislocation is a common problem in young males especially those doing heavy manual work or sports. When glenoid bone loss is more than 20%, Bankart type soft-tissue repairs fail easily. These cases need a bone block surgery to stop repeated dislocation.[1] Latarjet operation is time-tested for this purpose.[1,2] It prevents dislocation by bony block effect, sling action of conjoined tendon and capsulolabral repair. In recent years, a newer version called congruent arc technique became popular. In this, coracoid bone is rotated 90 degree so that its curve matches native glenoid. This gives better joint stability and wider contact surface.[2]

Some studies showed that congruent arc version improves biomechanics and decreases failure even in contact athletes. It is especially useful when glenoid loss is more than 25% or when revision case is there.[2-4] Others found that shoulder movements also improve more when subscapularis split is used rather than complete tenotomy.[3,4]

Few reports even from resource poor setups showed good result with this technique. One such study done in Ethiopia found good recovery and function using open Latarjet even when rehab and implant facilities

were basic. This shows the technique is useful even in developing countries with low budget.[5] But some authors argue that both classical and congruent arc Latarjet work equally well if surgeon is trained and careful. So technique may not matter much if steps are done properly.[6]

In this background, a multicenter study was conducted across tertiary hospitals in low-resource settings. Total 40 patients with recurrent anterior dislocation and glenoid bone loss >20% were included. All underwent open congruent arc Latarjet using subscapularis split approach. Outcomes were evaluated using functional scores like ROWE, ASES, VAS and range of motion. This study adds multicenter evidence from real-world setup with limited infrastructure.

MATERIALS AND METHODS

This prospective observational study was done at three tertiary hospitals in India between January 2021 and December 2023. All centres had setups with limited resources and high patient load. The study was approved by local ethical committees of all participating institutions. Patients aged between 18 to 55 years with recurrent anterior shoulder dislocation and critical glenoid bone loss >20% were included. Diagnosis was confirmed using clinical tests CT scan and MRI. Patients with previous surgery active infection or associated rotator cuff tears were excluded. Written informed consent was taken from all patients. A total of 40 patients were enrolled and operated by experienced orthopaedic surgeons trained in shoulder surgery. All cases underwent open congruent arc Latarjet using subscapularis split approach. In this technique the coracoid graft was rotated 90 degrees and fixed flush with glenoid surface using two cannulated screws. Capsule and labrum were repaired when quality was good. Shoulder was immobilised in sling for 3 weeks then gradual physiotherapy was started.

Functional outcome was assessed pre-op and post-op using American Shoulder and Elbow Surgeons (ASES) score Visual Analog Scale (VAS) for pain and ROWE score. Active shoulder range of motion was measured using goniometer and compared with normal side. Follow-up was done at 1 3 6 12 and 24 months. Final evaluation was done at 24 months.

Data was analysed using SPSS version 26. Continuous variables were shown as mean ± SD and categorical variables as percentage. Preoperative and postoperative scores were compared using paired t-test. p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Basic profile of patients in study

Parameter	Value
Mean Age (years)	31.8 (Range: 19–55)
Gender	36 Males, 4 Females
Affected Dominant Side	29 Right, 11 Left
Side of Surgery	24 Right, 16 Left
Duration Since 1st Dislocation	Mean 20.2 months (Range: 4–72 months)
Initial Cause of Dislocation	Trauma/sports (92.5%), Epilepsy (5%), Unknown (2.5%)

Out of 40 patients 36 were males and 4 were females. Mean age was 31.8 years with range 19 to 55. Dominant side was affected in 29 cases. Surgery was done on right side in 24 and left in 16 cases. Trauma or sports was the cause in 92.5% patients while epilepsy was seen in 2 and unknown cause in 1. Mean delay since first dislocation was 20.2 months (Table 1).

Table 2: Functional scores before and after surgery

Score	Preoperative Mean ± SD (Range)	Postoperative Mean ± SD (Range)	p-value
ROWE Score	23.05 ± 8.31 (10–38)	91.10 ± 5.54 (80–100)	<0.001
ASES Score	22.95 ± 1.32 (20–25.4)	75.65 ± 6.91 (60.5–85.3)	<0.001
VAS Score	7.2 ± 0.8	1.1 ± 1.1	<0.001

Functional scores showed significant improvement after surgery. ROWE score improved from 23.05 ± 8.31 to 91.10 ± 5.54. ASES score improved from 22.95 ± 1.32 to 75.65 ± 6.91. VAS score reduced from 7.2 ± 0.8 to 1.1 ± 1.1. All values showed $p < 0.001$ (Table 2).

Table 3: Final range of motion after follow up

Movement	Mean Value (Post-op)	Comparison with Normal Side
Forward Flexion	141.2° ± 7.6°	Full in 85%, mild loss (<10°) in 15%
External Rotation	43.4° ± 11.9°	Mild restriction (5–15° loss) in 72%
Internal Rotation	L1–D12	Comparable in 80%, mildly restricted in 20%

At final 24-month follow-up forward flexion reached mean 141.2° ± 7.6°. It was full in 85% and mildly restricted in 15%. External rotation was 43.4° ± 11.9° with mild restriction in 72%. Internal rotation reached

L1–D12 level which was near normal in 80% cases (Table 3).

Table 4: Patient outcomes based on ROWE score

Outcome Grade	ROWE Score Range	No. of Patients	Percentage (%)
Excellent	90–100	29	72.5%
Good	75–89	8	20.0%
Fair	60–74	3	7.5%
Poor	<60	0	0%

Based on ROWE grading 29 patients (72.5%) had excellent outcome 8 had good and 3 had fair. None had poor score. There was no recurrence or dislocation reported (Table 4). Two cases developed mild stiffness early which resolved with rehab. No major complication or screw failure seen.

DISCUSSION

This study demonstrates that the congruent arc Latarjet procedure significantly improves functional outcomes in young adults with recurrent anterior shoulder instability and glenoid bone loss. Postoperative ROWE and ASES scores showed statistically significant improvement from baseline, similar to findings in earlier series by Musa et al and Mekky et al.[7,8] Our data show a postoperative ROWE score mean of 91.1, close to the 90+ range seen in multiple recent prospective series.[9,10] The ASES scores also improved from 22.9 preoperatively to 75.6 postoperatively which matches the trend seen in Indian data reported by Joshi et al and Lingayat et al.[9,11]

Forward flexion and external rotation showed mild restriction compared to the normal side, similar to what was reported by Pasqualini et al and Rossi et al.[2,12] Internal rotation recovered to L1-D12 levels in most patients, which supports the concept that the congruent arc technique provides stability without major compromise in range.[6,13] Our finding that 72.5% of patients achieved an "excellent" grade based on ROWE scoring aligns with values from Ballal et al (74%) and Lubitz et al (70%).[4,10]

In terms of pain control, the postoperative VAS reduction from 7.2 to 1.1 reflects the trend seen in other resource-limited settings like Ethiopia and parts of India, where open techniques are still widely practiced and remain effective.[5,14] The patients had a mean age of 31.8 years, close to the demographic commonly reported in regional and global data [6, 9 ,13]. Duration from first dislocation to surgery averaged 20.2 months, slightly longer than western cohorts but comparable to public health systems in Asia and Africa.[5,10] Most cases (92.5%) were trauma-related, matching the trend reported by Park et al and McHale et al, where contact sports and road traffic trauma dominate.[3,15]

A majority of our cases were non-athletes, which adds to the growing evidence that Latarjet works well even outside high-demand athletic populations.[5,11] Return to work and daily activity was satisfactory in most cases, consistent with recovery timelines reported by Lingayat et al and Fares et al.[9,13]

This study's findings support the concept that the congruent arc configuration increases graft contact surface and compression strength, as described by Rossi et al in their biomechanical models.[12] Clinical translation of this technique appears favorable as shown by similar ROM and stability results reported by studies.[2,4] A multicenter African study by Tariku et al reported good outcomes using the classic Latarjet even in non-athlete groups, with mean postoperative ROWE around 87.5 and complication rate below 10%.[5]

Our complication rate was low, and no patient required revision. However on long-term follow-up is needed to detect subtle graft-related failures or hardware irritation which is not uncommon as per the AAOS Global Review.[16] CT-based evaluation of graft union or lysis was not done in this study, which remains a limitation, as such radiological follow-up is recommended in recent reviews to evaluate long-term success.[15,16]

Although we did not compare with arthroscopic Bankart repair, multiple studies including Rabinowitz et al and Khalid et al have shown that Bankart repairs tend to fail more frequently in presence of critical or subcritical glenoid bone loss, where Latarjet offers better outcomes.[14,16] Subcritical defects >13.5% are also functionally significant, which underlines the role of bony augmentation even in borderline cases.[15,16]

The learning curve of this procedure is moderate. Adequate exposure, graft orientation, screw placement and neurovascular protection remain key technical demands as highlighted in recent biomechanical and clinical papers.[6,12] This is more important in resource-limited setups where arthroscopy is unavailable and open techniques must be done reliably.

Van der Linde et al had emphasized the historical value of the original coracoid transfer, and our results support that the principles still hold, even when using modern adaptations like the congruent arc method.[1]

Open congruent arc Latarjet remains a robust, reproducible and safe procedure even in low-resource setups, especially where arthroscopy is not feasible. The present findings offer strong support to the continued use of this procedure in selected patients with recurrent anterior instability and glenoid bone loss.

CONCLUSION

Open congruent arc Latarjet gives good functional recovery in patients with recurrent anterior shoulder dislocation having glenoid bone loss more than 20%. In this study, significant improvement was seen in ROWE, ASES scores and VAS pain after surgery. Shoulder range of motion was preserved with minor restriction in external rotation but daily activities were not affected. No redislocation or major complication occurred which shows this technique is safe when done properly. The procedure can be done in resource-limited hospitals without need of arthroscopy or advanced implants. Congruent arc Latarjet remains a reliable surgery for neglected shoulder instability cases in young adults with bone loss

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