



FUNCTIONAL OUTCOMES AFTER TEMPORARY KIRSCHNER-WIRE FIXATION VERSUS EARLY LATARJET PROCEDURE IN OLD UNREDUCED ANTERIOR SHOULDER DISLOCATION: A RETROSPECTIVE COHORT STUDY

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ABSTRACT

Old unreduced anterior shoulder dislocation (OUAD), defined as a dislocation unreduced for at least three weeks, is technically demanding because capsulolabral injury, glenoid bone loss, Hill-Sachs lesions, and capsular contracture may coexist. Open reduction with temporary K-wire fixation preserves the humeral head but does not reconstruct glenoid deficiency, while the Latarjet procedure provides an anterior bone block and sling effect. Objective to compare six-month functional outcomes after open reduction with temporary Kirschner-wire (K-wire) fixation and early Latarjet procedure in patients with old unreduced anterior shoulder dislocation (OUAD). This retrospective cohort included 34 adults with OUAD treated surgically between January 2022 and December 2025. Eighteen underwent open reduction with temporary K-wire fixation and 16 underwent early Latarjet stabilization. The primary outcome was the Constant-Murley Score (CMS) at six months. Baseline variables were compared using independent-samples tests or Fisher's exact test as appropriate; CMS subdomains were compared non-parametrically when distributional assumptions were not met. Mean age was 47.29 ± 16.96 years, and 21 patients (61.8%) were women. Dislocation duration was longer in the K-wire group than in the Latarjet group (19.83 ± 5.81 vs. 9.75 ± 6.10 weeks; $P < 0.001$), whereas glenoid bone loss $>25\%$ was more frequent in the Latarjet group ($P = 0.003$). Total CMS was comparable between groups (58.61 ± 11.09 vs. 60.93 ± 9.28 ; $P = 0.515$). The K-wire group had higher pain-domain scores, whereas the Latarjet group had higher activities-of-daily-living and range-of-motion scores. Motor strength was similar. At six months, temporary K-wire fixation and early Latarjet produced comparable total CMS in selected patients with OUAD, but the domain-level recovery profiles differed. These findings should be interpreted in light of baseline treatment-selection differences and the retrospective design.

Keywords: articular range of motion; internal fracture fixation; retrospective studies; shoulder dislocation; treatment outcome

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INTRODUCTION

Anterior shoulder dislocation is the most common direction of glenohumeral dislocation and remains clinically important because delayed reduction can lead to persistent instability, bone loss, pain, and functional limitation. Recurrent instability is associated with increasing prevalence of Hill-Sachs and Bankart lesions, further complicating later reconstruction (Patrick et al., 2023; Rutgers et al., 2022). Old unreduced anterior shoulder dislocation (OUAD) is generally used to describe a dislocation that remains unreduced for at least three weeks. Chronic cases are technically demanding because capsulolabral injury, glenoid bone loss, Hill-Sachs lesions, fibrosis, capsular contracture, and rotator-cuff changes may coexist (Bark & Lewis, 2023; Rai et al., 2022; Sahu & Gupta, 2024). Accordingly, management is individualized according to chronicity, bone loss, humeral-head viability, soft-tissue condition, and functional demand.

Open reduction with temporary K-wire fixation can preserve the humeral head and maintain reduction while soft tissues heal. However, it does not structurally reconstruct substantial anterior glenoid deficiency. The Latarjet procedure provides an anterior bone block and a dynamic sling effect from the conjoint tendon and is frequently used when clinically relevant glenoid bone loss or

recurrent anterior instability is present (Bhatia et al., 2014; Bliven & Parr, 2018; Prada et al., 2021). Direct comparative evidence between temporary K-wire fixation and early Latarjet for OUAD is limited. Many patients present late after failed traditional manipulation, and surgeons are presented with a difficult decision between a joint-preserving temporary fixation and a bone-block procedure with little guidance. Comparing both techniques within one institution and one follow-up period provides data to assess whether the added complexity of Latarjet results in better early function, or whether K-wire fixation gives acceptable results in selected patients. This study is aimed to compare six-month functional outcomes between these two strategies using the Constant-Murley Score (CMS), while describing the baseline clinical characteristics that influenced treatment selection (Constant & Murley, 1987; Lubis et al., 2025; Moeller et al., 2014).

METHOD

Study design and participants

This retrospective observational cohort study reviewed patients with OUAD who underwent either open reduction with temporary K-wire fixation or early Latarjet procedure between January 2022 and December 2025. The study was prepared in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations. Patients were eligible if they were 18-60 years old, had an anterior shoulder dislocation that remained unreduced for at least three weeks after injury, underwent one of the two index procedures, and had complete medical-record, operative, radiologic, and six-month CMS data. Exclusion criteria were ipsilateral proximal humeral fracture, previous surgery on the affected shoulder, severe neurologic injury affecting shoulder function, active shoulder infection, or uncontrolled systemic inflammatory disease.

Treatment groups and outcome assessment

Treatment allocation reflected routine clinical decision-making and was not randomized. Group 1 comprised patients treated with open reduction and temporary K-wire fixation. Group 2 comprised patients treated with an early Latarjet procedure, defined as transfer of the coracoid process to the anterior glenoid for stabilization, particularly when chronic instability or substantial glenoid deficiency was documented (Bhatia et al., 2014; Bliven & Parr, 2018; Prada et al., 2021). The primary outcome was total CMS at six months. CMS evaluates pain, activities of daily living, range of motion, and motor strength on a 0-100 scale, with higher scores indicating better shoulder function (Constant & Murley, 1987; Lubis et al., 2025; Moeller et al., 2014). The recorded covariates were age, sex, smoking status, redislocation, duration of dislocation, glenoid bone loss, and avascular necrosis (AVN). Glenoid bone loss was categorized as <25% or >25% according to available preoperative imaging and clinical documentation. AVN was recorded when documented radiologically or in the medical record.

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics version 25 (IBM Corp., Armonk, NY, USA). Continuous variables were assessed for distributional assumptions and summarized as mean $\pm$ standard deviation. Between-group comparisons used an independent-samples t-test for approximately normally distributed continuous variables. Categorical variables were summarized as number and percentage and compared using Fisher's exact test when appropriate. CMS subdomains were compared using the Mann-Whitney U test when parametric assumptions were not met. All tests were two-sided, and $P < 0.05$ was considered statistically significant.

Ethics

The study was approved by the Health Research Ethics Committee, Universitas Sumatera Utara, Medan, Indonesia (Protocol No. 2303295-KEPK-USU; approval date: April 1, 2026; approval validity: April 1, 2026-April 1, 2027). The study used retrospective medical-record data. Patient-identifying information was excluded from the analytical dataset and manuscript. Consent requirements were handled in accordance with the ethics approval and local institutional requirements.

RESULT

Cohort characteristics

Thirty-four patients met the eligibility criteria. Mean age was 47.29 ± 16.96 years; 13 patients (38.2%) were men and 21 (61.8%) were women. Thirteen patients (38.2%) had a documented smoking history. Mean duration of unreduced dislocation was 15.08 ± 7.77 weeks. Glenoid bone loss $>25\%$ was documented in 23 patients (67.6%), and AVN was documented in 26 (76.5%) (Table 1). Open reduction with temporary K-wire fixation was performed in 18 patients (52.9%), whereas 16 (47.1%) underwent early Latarjet. Age, sex, smoking status, redislocation, and AVN did not differ significantly between groups. The K-wire group had a longer mean dislocation duration than the Latarjet group (19.83 ± 5.81 vs. 9.75 ± 6.10 weeks; $P < 0.001$). Glenoid bone loss $>25\%$ was more frequent in the Latarjet group (15/16, 93.8%) than in the K-wire group (8/18, 44.4%; $P = 0.003$) (Table 2).

Table 1.
Baseline characteristics of the study cohort

Variable	n = 34
Age, mean $\pm$ SD, years	47.29 ± 16.96
Sex, f (%)	
Male	13 (38.2)
Female	21 (61.8)
Smoking status, f (%)	
Smoker	13 (38.2)
Non-smoker	21 (61.8)
Redislocation, f (%)	
Yes	0 (0.0)
No	34 (100)
Dislocation duration, mean $\pm$ SD, weeks	15.08 ± 7.77
Glenoid bone loss, f (%)	
$<25\%$	11 (32.4)
$>25\%$	23 (67.6)
AVN, (%)	
Present	26 (76.5)
Absent	8 (23.5)
CMS, mean $\pm$ SD	59.70 ± 10.19
Treatment, f (%)	
Temporary K-wire fixation	18 (52.9)
Early Latarjet	16 (47.1)

AVN: avascular necrosis; CMS: Constant-Murley Score; SD: standard deviation.

Table 2.
Comparison of baseline characteristics by treatment group

Variable	K-wire (n = 18)	Latarjet (n = 16)	P value
Age, mean $\pm$ SD, years	43.78 ± 19.14	51.25 ± 13.65	0.196
Male sex, f (%)	7 (38.9)	6 (37.5)	1.000
Smoker, f (%)	7 (38.9)	6 (37.5)	1.000
Redislocation, f (%)	0 (0.0)	0 (0.0)	1.000
Dislocation duration, mean $\pm$ SD, weeks	19.83 ± 5.81	9.75 ± 6.10	<0.001
Glenoid bone loss $>25\%$, f (%)	8 (44.4)	15 (93.8)	0.003
AVN present, f (%)	15 (83.3)	11 (68.8)	0.425

Values are within-group n (%) or mean $\pm$ SD. Continuous variables were compared with an independent-samples *t*-test where appropriate; categorical variables were compared with Fisher's exact test. AVN: avascular necrosis; SD: standard deviation.

Functional outcomes

For the full cohort, mean total CMS at six months was 59.70 ± 10.19 . Total CMS was 58.61 ± 11.09 in the K-wire group and 60.93 ± 9.28 in the Latarjet group, with no statistically significant between-group difference ($P = 0.515$) (Table 3). The unadjusted mean difference (Latarjet minus K-wire)

was 2.32 points; using the reported summary statistics, the approximate 95% confidence interval was -4.80 to 9.44 points. The CMS subdomains showed different recovery profiles. The K-wire group had a higher pain-domain score (9.89 ± 1.68 vs. 5.75 ± 1.06 ; $P < 0.001$). In contrast, the Latarjet group had higher activities-of-daily-living scores (17.56 ± 1.46 vs. 15.33 ± 1.28 ; $P = 0.002$) and range-of-motion scores (22.25 ± 1.88 vs. 18.00 ± 3.29 ; $P = 0.004$). Motor strength was similar between groups (15.39 ± 5.70 vs. 15.38 ± 5.58 ; $P = 0.906$) (Table 4).

Table 3.

Comparison of six-month Constant-Murley Score between treatment groups

Outcome	K-wire (n = 18)	Latarjet (n = 16)	P value
Total CMS, mean $\pm$ SD	58.61 ± 11.09	60.93 ± 9.28	0.515
Poor, n	7	5	
Fair, n	8	8	
Good, n	3	3	

Total CMS was compared using an independent-samples t-test. CMS: Constant-Murley Score; SD: standard deviation.

Table 4.

Comparison of six-month Constant-Murley Score components

CMS component	K-wire (n = 18)	Latarjet (n = 16)	P value
Pain	9.89 ± 1.68	5.75 ± 1.06	<0.001
Activities of daily living	15.33 ± 1.28	17.56 ± 1.46	0.002
Range of motion	18.00 ± 3.29	22.25 ± 1.88	0.004
Motor strength	15.39 ± 5.70	15.38 ± 5.58	0.906

Values are mean $\pm$ SD. P values are from between-group Mann-Whitney U tests, consistent with the prespecified non-parametric analysis for subdomains. CMS: Constant-Murley Score; SD: standard deviation.

DISCUSSION

The principal finding of this cohort is that six-month total CMS was statistically comparable between patients treated with temporary K-wire fixation and those treated with early Latarjet. However, the similar composite score did not represent identical recovery. The K-wire group had a more favorable pain-domain score, whereas the Latarjet group had better activities of daily living and range of motion. Because CMS aggregates pain, activity, motion, and strength, improvement in one domain can offset a lower score in another (Constant & Murley, 1987; Lubis et al., 2025; Moeller et al., 2014).

The baseline imbalance between groups is central to interpretation. Patients treated with K-wire fixation had substantially longer dislocation duration, whereas the Latarjet group more frequently had glenoid bone loss >25%. This pattern is consistent with treatment selection in clinical practice: temporary fixation may be used to maintain reduction while preserving the humeral head, whereas Latarjet is favored when anterior glenoid deficiency requires structural augmentation and a dynamic stabilizing effect (Bhatia et al., 2014; Bliven & Parr, 2018; Prada et al., 2021). Consequently, the present data should not be interpreted as evidence that the procedures are interchangeable or that one is superior to the other.

The higher activities-of-daily-living and range-of-motion scores in the Latarjet group may relate to restoration of anterior stability through the combined bone-block and sling mechanisms. Studies of chronic anterior dislocation and anterior instability have reported clinically useful recovery after coracoid transfer, particularly when bone loss is an important component of instability (Boileau et al., 2014; Rai et al., 2022; Yang et al., 2020). Long-term literature also supports durable stability after Latarjet, although the procedure has graft- and hardware-related complications that remain relevant during follow-up (Buda et al., 2021; Davey et al., 2024; Hurley et al., 2019; Tanaka et al., 2022).

The higher CMS pain-domain score observed in the K-wire group may reflect a different periarticular burden of surgery; temporary fixation avoids coracoid osteotomy, graft transfer, and screw fixation. Conversely, persistent pain after Latarjet can arise from graft position, screw irritation, nonunion, malunion, or altered anterior shoulder biomechanics (Buda et al., 2021; Hurley et al., 2019; Tanaka et al., 2022). This explanation remains hypothetical because the present dataset did not include detailed pain etiology, hardware symptoms, or imaging-based graft-position variables.

Motor strength was similar between groups. Strength recovery after chronic unreduced dislocation is likely influenced by multiple factors beyond the stabilization procedure, including rotator-cuff condition, deltoid function, neurologic status, duration of dislocation, rehabilitation adherence, and chronic soft-tissue remodeling. Previous reports of neglected anterior dislocation show that humeral-head preservation can improve function, although residual subluxation, cuff degeneration, greater tuberosity pathology, and superior migration may limit recovery (Babalola et al., 2015; Sahu & Gupta, 2024).

This study has several limitations. Its retrospective design is susceptible to selection and information bias. The sample was small, limiting precision and precluding robust multivariable adjustment. Treatment was not randomized, and the marked differences in dislocation duration and glenoid bone loss create confounding by indication. Baseline CMS was unavailable, so change from preoperative function could not be compared. Follow-up was limited to six months, and the study did not systematically assess recurrent instability, graft union, degenerative change, or additional patient-reported outcome measures. These limitations mean that the findings are best viewed as hypothesis-generating comparative clinical data rather than proof of treatment equivalence or superiority. Despite these limitations, the study provides a direct real-world comparison of two operative strategies used for OUAD. Future prospective multicenter studies should standardize three-dimensional glenoid bone-loss measurement, record baseline and serial postoperative scores, document rehabilitation exposure, and use longer follow-up with recurrence and structural imaging outcomes (Rai et al., 2022; Sahu & Gupta, 2024; Yang et al., 2020).

CONCLUSION

Among surgically treated patients with OUAD, temporary K-wire fixation and early Latarjet were associated with comparable six-month total CMS. Latarjet showed higher activities-of-daily-living and range-of-motion domain scores, whereas temporary K-wire fixation showed a higher pain-domain score. Because treatment groups differed substantially in chronicity and glenoid bone loss, procedure selection should remain individualized and the present unadjusted comparison should not be interpreted as causal evidence of procedural superiority.

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