



Shoulder Stabilization vs. Immobilization for First-Time Anterior Shoulder Dislocation

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Introduction

Anterior shoulder dislocations (ASDs) are among the most common shoulder injuries in adolescent athletes^{3,4,11}. They occur most frequently in young males as a result of sporting activities, and they are most likely to recur in this demographic group as well^{1,9}.

The recurrence rate of ASDs has been reported between 19% and 88%, with the majority of re-dislocations occurring within the first year after the initial dislocation^{5,7,10}. Multiple studies have compared re-dislocation rates following shoulder stabilization and shoulder immobilization for patients experiencing a traumatic, first-time anterior shoulder dislocation (ASD).

Historically, nonoperative treatment has been the most common method of managing first-time dislocations, but within the last 10 years, surgical management has emerged as the optimal treatment for ASDs^{2,4,5}.

Purpose

To systematically review the literature in order to compare the rates of recurrent instability and subsequent instability surgery in patients undergoing treatment for a first-time ASD with surgical stabilization versus shoulder immobilization.

Methods

A systematic review was performed by searching PubMed, the Cochrane Library, and Embase to identify Level I randomized controlled trials that compared the outcomes of surgical stabilization versus shoulder immobilization for treatment of primary ASD.

The search phrase used was: *(glenohumeral OR anterior shoulder) AND (conservative OR nonoperative OR nonsurgical OR physiotherapy) AND (Bankart OR repair OR stabilization OR surgical OR surgery OR arthroscopic OR arthroscopy) AND (instability OR dislocation)*.

Patients were assessed based on rates of recurrent instability and subsequent instability surgery, the Western Ontario Shoulder Instability (WOSI) Index, and range of motion (ROM).

Only outcomes reported by three or more studies were included in this review. A meta-analysis was performed to compare differences in recurrent instability and subsequent instability surgery rates

Results

Five studies met inclusion criteria, including 126 patients undergoing a surgical stabilization procedure (mean age 23.6 years) and 133 patients undergoing nonoperative treatment with sling immobilization only (mean age 23.1 years, range). The mean follow-up was 59.7 months.

Overall, 6.3% of operative patients experienced recurrent instability at latest follow-up compared to 46.6% of nonoperative patients ($p < 0.001$). Similarly, 4.0% of operative patients underwent a subsequent instability surgery compared to 30.8% of nonoperative patients ($p < 0.001$).

These same trends were demonstrated when data was isolated to nonoperative patients immobilized in internal rotation.

Table 1. Included Studies

Study	n (op, non-op)	Patient age, y (op)	Patient age, y (non-op)	Follow-up, mo	Sex, % male (op, non-op)
Bottoni et al, 2002 [*]	9, 12	21.6 (19.0 – 26.0)	23.0 (19.0 – 26.0)	36.0 (16.0 – 56.0)	100, 100
Jakobsen et al, 2007 [*]	37, 39	23.0 (15.0 – 39.0)	20.0 (15.0 – 31.0)	120.0	81.1, 82.1
Kirkley et al, 2005 [*]	16, 15	23.3	22.7	79.0	93.8, 93.3
Minkus et al, 2021 [*]	44, 47	25.7 ± 6.2	26.7 ± 5.8	24.0	91.5, 90.1
Pougès et al, 2021 [*]	20, 20	21.5	21.3	24.0	75.0, 90.0
Total	126, 133*	23.6	23.1	59.7	86.9, 89.0

Patient age and follow-up are reported as mean ± standard deviation (range) (when reported), with the “Total” row reported as a weighted mean. *Represents the total non-overlapping sample sizes of each group. op = operative, non-op = nonoperative

Table 2. Recurrent Instability

Study	Operative	Nonoperative	Total	p-value
Bottoni et al, 2002 [*]	1/9 (11.1%)	9/12 (75.0%)	10/21 (47.6%)	0.004
Jakobsen et al, 2007 [*]	1/37 (2.7%)	21/39 (53.8%)	22/76 (28.9%)	< 0.001
Kirkley et al, 2005 [*]	3/16 (18.8%)	9/15 (60.0%)	12/31 (38.7%)	0.02
Minkus et al, 2021 [*]	1/44 (2.3%)	9/47 (19.1%)	10/91 (11.0%)	0.01
Pougès et al, 2021 [*]	2/20 (10.0%)	14/20 (70.0%)	16/40 (40.0%)	0.0001
Total	8/126 (6.3%)	62/133 (46.6%)	70/259 (27.0%)	< 0.001

Values are reported as number of patients experiencing a recurrent instability episode/total number of patients (%) at latest follow-up. The “Total” column is reported as an overall percentage of patients experiencing a recurrent instability episode.

Table 3. Subsequent Instability Surgery

Study	Operative	Nonoperative	Total	p-value
Bottoni et al, 2002 [*]	1/9 (11.1%)	6/12 (50.0%)	7/21 (33.3%)	0.06
Jakobsen et al, 2007 [*]	1/37 (2.7%)	19/39 (48.7%)	20/76 (26.3%)	< 0.0001
Kirkley et al, 2005 [*]	2/16 (12.5%)	7/15 (46.7%)	9/31 (29.0%)	0.04
Minkus et al, 2021 [*]	0/44 (0%)	5/47 (10.6%)	5/91 (5.5%)	0.026
Pougès et al, 2021 [*]	1/20 (5.0%)	4/20 (20.0%)	5/40 (12.5%)	0.15
Total	5/126 (4.0%)	41/133 (30.8%)	46/259 (17.8%)	< 0.001

Values are reported as number of patients undergoing a subsequent stabilization procedure/total number of patients (%) at latest follow-up. The “Total” column is reported as an overall percentage of patients undergoing a subsequent stabilization procedure.

Discussion

Patients and physicians often struggle to decide whether operative or nonoperative treatment is best, as both future shoulder functionality and return to work or sport timelines must be considered. Because surgical stabilization requires significant recovery and time off from desired activities, conservative treatment with sling immobilization has remained popular despite many studies demonstrating better outcomes with surgery^{2,6,8}.

The current systematic review and meta-analysis is, to our knowledge, the first review limited to Level I evidence studies which compares rates of recurrent instability and subsequent surgery in patients undergoing treatment for first-time ASD with either surgical stabilization or sling immobilization only.

Overall, patients in both groups performed similarly in range of motion assessments and WOSI Index scores. However, in accordance with previous systematic reviews on the same topic, we identified a significantly higher rate of recurrent instability (6.3% versus 46.6%) and a significantly increased need for a subsequent instability procedure (4.0% versus 30.8%) among patients initially treated with immobilization only. These results suggest that, for patients at high risk of recurrent dislocations, initial treatment consisting of surgical stabilization effectively reduces the risk of future instability episodes compared to conservative treatment.

When deciding which patients are candidates for nonoperative management, physicians should consider important risk factors for recurrence such as age, level of activity, and timing within the season if involved in sports^{3,4}. Conservative management is still often considered first-line treatment due to the decreased time required to return to sport or work despite the higher rates of recurrent instability.

Conclusion

Patients, particularly active males in their 20s and 30s, undergoing treatment for a first-time ASD with a surgical stabilization procedure can be expected to experience significantly lower rates of recurrent instability and a significantly decreased need for a future stabilization procedure when compared to patients treated nonoperatively.

References

- [1] Hovelius L. The natural history of primary anterior dislocation of the shoulder in the young. *J Orthop Sci.* 1999;4(4):307-317. PMID: 10436280
- [2] Hurley ET, Manjunath AK, Bloom DA, et al. Arthroscopic bankart repair versus conservative management for first-time traumatic anterior shoulder instability: a systematic review and meta-analysis. *Arthroscopy.* 2020;36(9):2526-2532. PMID: 32389771
- [3] Kraeutler MJ, Belk JW, Carver TJ, McCarty EC, Khodae M. Traumatic primary anterior glenohumeral joint dislocation in sports: a systematic review of operative versus nonoperative management. *Curr Sports Med Rep.* 2020;19(11):468-478. PMID: 33156033
- [4] Kraeutler MJ, McCarty EC, Belk JW, et al. Descriptive epidemiology of the MOON shoulder instability cohort. *Am J Sports Med.* 2018;46(5):1064-1069. PMID: 29505730
- [5] Longo UG, Loppini M, Rizzello G, Ciuffreda M, Maffulli N, Denaro V. Management of primary acute anterior shoulder dislocation: systematic review and quantitative synthesis of the literature. *Arthroscopy.* 2014;30(4):506-522. PMID: 24680311
- [6] Minkus M, Königshausen M, Maier D, et al. Immobilization in external rotation and abduction versus arthroscopic stabilization after first-time anterior shoulder dislocation: a multicenter randomized controlled trial. *Am J Sports Med.* 2021;49(4):857-865. PMID: 33596092
- [7] Olds M, Ellis R, Donaldson K, Parmar P, Kersten P. Risk factors which predispose first-time traumatic anterior shoulder dislocations to recurrent instability in adults: a systematic review and meta-analysis. *Br J Sports Med.* 2015;49(14):913-922. PMID: 25900943
- [8] Pougès C, Hardy A, Vervoort T, et al. Arthroscopic bankart repair versus immobilization for first episode of anterior shoulder dislocation before the age of 25: a randomized controlled trial. *Am J Sports Med.* 2021;49(5):1166-1174. PMID: 33705240
- [9] Taneja AK, Neto LP, Skaf A. Bilateral anterior glenohumeral dislocation and coracoid processes fracture after seizure: acute MRI findings of this rare association. *Clin Imaging.* 2013;37(6):1131-1134. PMID: 24050938
- [10] Wasserstein DN, Sheth U, Colbenson K, Henry PD, Chahal J, Dwyer T, Kukn JE. The true recurrence rate and factors predicting recurrent instability after nonsurgical management of traumatic primary anterior shoulder dislocation: a systematic review. *Arthroscopy.* 2016;32(12):2616-2625. PMID: 27487737
- [11] Yapp LZ, Nicholson JA, Robinson CM. Primary arthroscopic stabilization for a first-time anterior dislocation of the shoulder: long-term follow-up of a randomized, double-blinded trial. *J Bone Joint Surg Am.* 2020;102(6):460-467. PMID: 31895236

