Effectiveness of arthroscopic versus open surgical stabilisation for the management of traumatic anterior glenohumeral instability

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CRD summary
The authors concluded that arthroscopic surgery and open surgery appear equally effective for the treatment of traumatic anterior glenohumeral instability, but the studies were of limited quality and further research is required. The limitations of the included studies justify the authors' cautious conclusions.

Authors' objectives
To compare the effectiveness of arthroscopic versus open surgical stabilisation for the treatment of traumatic anterior glenohumeral (GH) instability.

Searching
EBM Reviews and the Joanna Briggs Institute website were searched for relevant reviews. MEDLINE, PubMed, CINAHL, AMED, ISI Web of Science, Expanded Academic ASAP, ProQuest Medical Library, EBM Reviews, PEDro, TRIP, ISI Current Contents Connect, ProQuest Digital Dissertation Abstracts, an Open Archives Initiative Search Engine (myOAI) and the Australian Digital Theses Program were searched for primary studies using the reported search strategies. No language restrictions were applied.

Study selection
Study designs of evaluations included in the review
Eligible study designs included randomised controlled trials (RCTs), quasi-RCTs and comparative (case-control and cohort) studies. Studies had to have a minimum follow-up duration of 2 years. Case series were excluded. In the included studies, the duration of follow-up ranged from 24 to 55 months.

Specific interventions included in the review
Studies that compared any method of arthroscopic GH stabilisation with open surgical stabilisation were eligible for inclusion. Studies that evaluated non-anatomical surgical GH stabilisation were excluded. The included arthroscopic studies evaluated methods using transglenoid sutures, bioabsorbable tacks and suture anchors. The studies used similar methods of open surgery, with most using a Bankart repair with suture anchors and/or sutures passed through drill holes.

Participants included in the review
Studies of adults with a diagnosis of traumatic anterior GH instability were eligible for inclusion if the diagnosis was confirmed by a history of precipitating anterior dislocation/subluxation, radiological findings, clinical examination, or examination under anaesthesia and arthroscopy. Studies that focused on patients over 40 years of age, or studies that were of patients with multidirectional instability or any other co-existing shoulder pathology, were excluded. In the included studies, the mean age of the participants ranged from 24.5 to 32 years. Studies differed with respect to the time from initial injury till surgery and the number of dislocation/subluxations before surgery.

Outcomes assessed in the review
Studies that assessed the rate of recurrent instability or reported results of at least one functional shoulder questionnaire were eligible for inclusion; these were the primary review outcomes. The secondary review outcomes were range of motion (especially GH joint external rotation in neutral and 90 degree abduction) and complication rates. In most of the included studies, the recurrent instability rate was based on the reported recurrence of dislocations/subluxations; some studies included cases with positive apprehension in the instability rate. All of the studies used the Rowe questionnaire to measure shoulder function; some studies used other questionnaires as well.

How were decisions on the relevance of primary studies made?
Two reviewers independently selected the studies and any disagreements were resolved through discussion with the aid of a third author.

**Assessment of study quality**

Two reviewers independently assessed study validity using the PEDro scale. Any disagreements were resolved through discussion with the aid of a third author. Scores for internal validity ranged from 0 to a maximum of 10 where all criteria were met. In addition, studies were graded using a hierarchy of study design based on the National Health and Medical Research Council's Hierarchy of Evidence.

**Data extraction**

The data were extracted onto a standardised form, but the authors did not state how many reviewers performed the selection. For each study, the number of patients with events of interest were extracted for each treatment group and used to calculate odds ratios (ORs) with 95% confidence intervals (CIs). For continuous data, the means or median were extracted where possible with the standard deviations.

**Methods of synthesis**

How were the studies combined?
Pooled ORs with 95% CIs were calculated using a random-effects model when significant heterogeneity was found and a fixed-effect model when it was not. Recurrent instability rates and functional shoulder questionnaire scores between surgical treatments were compared using independent t-tests or the Mann-Whitney U-test. Data that were not suitable for pooling were combined in a narrative.

How were differences between studies investigated?
Clinical homogeneity among studies was assessed by considering differences in the populations, interventions and outcomes. Statistical heterogeneity for recurrent instability rates was assessed using the Q statistic and 95% CIs. Data for the three different types of arthroscopic surgery were analysed separately.

**Results of the review**

Eleven studies (681 patients/shoulders) were included. These included 2 RCTs (116 patients/shoulders), 1 quasi-RCT (41 patients/shoulders) and 8 comparative studies (488 patients/shoulders).

The quality of the included studies was poor to fair; the mean quality score was 3.9 out of 10 (range: 1 to 5). Most studies reported point estimates and measures of variability, measured at least one key outcome from 85% or more of enrolled patients, and blinded outcome assessors. None of the studies blinded patients or surgeons, or used intention-to-treat analysis.

There was no statistically significant difference between arthroscopic and open surgery in the recurrent instability rate: 18% with arthroscopic surgery versus 12% with open surgery (OR 1.4, 95% CI: 0.86, 2.30). No statistically significant heterogeneity was detected (p>0.05).

There was no statistically significant difference between arthroscopic and open surgery in the positive apprehension rate (28% with arthroscopic surgery versus 26% with open surgery, p=0.9; based on 8 studies) or the Rowe shoulder function score (mean score 81 with arthroscopic surgery versus mean score 84 with open surgery, p=0.6; based on 6 studies).

There was no statistically significant difference between arthroscopic and open surgery in external rotation in neutral (based on 3 studies), external rotation with 90 degree abduction (based on 3 studies) or complication rate (4% with arthroscopic surgery versus 7% with open surgery; based on 9 studies) (p=0.8 for all analyses).

Subgroup analysis showed no significant difference between any of the arthroscopic techniques and open surgery in pooled recurrent instability rates.
Authors' conclusions
Arthroscopic surgery and open surgery appear to be equally effective for the treatment of traumatic anterior GH instability, but the studies were of limited quality and further research is required.

CRD commentary
The review addressed a clear question that was defined in terms of the participants, intervention and outcomes; the inclusion criteria for study design were broad. Numerous sources were searched and no language restrictions were applied, but no attempts were made to minimise publication bias. Validity was assessed using specified criteria and the results were fully reported and discussed. Methods were used to minimise reviewer error and bias in the study selection and validity assessment processes, but it was not clear whether similar steps were taken in the data extraction.

Adequate information was provided about the included studies. Data from RCTs and studies of other designs were pooled. The results from non-randomised studies might be biased given the differences between treatment groups; this may have introduced bias into the pooled results. The primary studies also varied in terms of whether data were reported for shoulders or patients, and all were judged to be of only poor to fair methodological quality. Overall, the limitations of the included studies justify the authors' cautious conclusions.

Implications of the review for practice and research
Practice: The authors stated that the surgical technique for treating traumatic GH instability should be selected on an individual and personal basis. Research: The authors stated that adequately powered, multicentre RCTs that use instability-specific questionnaires are needed to compare the effectiveness of arthroscopic versus open surgical stabilisation for the treatment of traumatic anterior GH instability. Studies should evaluate surgical techniques separately in different subgroups (including acute GH dislocation and contact/overhead sports athletes).

Bibliographic details

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Subject indexing assigned by CRD

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.