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# Posterior shoulder instability: Prospective non-randomised comparison of operative and non-operative treatment in 51 patients

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## A B S T R A C T

**Background:** The management of posterior shoulder instability remains controversial. Consequently, for a symposium on this topic, the French Arthroscopy Society (SFA) conducted a prospective multicentre study comparing outcomes of operative and non-operative treatment.

**Objective:** To compare outcomes after operative versus non-operative treatment of posterior shoulder instability.

**Hypothesis:** The surgical treatment of posterior shoulder instability may achieve better clinical outcomes than non-operative treatment in selected patients.

**Material and methods:** Fifty-one patients were included prospectively then followed-up for 12 months. Three groups were defined based on the clinical presentation: recurrent dislocation or subluxation, involuntary instability or voluntary instability that had become involuntary, and shoulder pain with instability. Of the 51 patients, 19 received non-operative therapy involving a three-step rehabilitation programme and 32 underwent surgery with a posterior bone block, labral repair and/or capsule tightening, or bone defect filling. At inclusion and at last follow-up, the Subjective Shoulder Value (SSV), Rowe score, Walch-Duplay score, and Constant score were determined.

**Results:** The preliminary results after the first 12 months are reported here. In the non-operative and operative groups, the Constant score was 78 versus 87, the Rowe score 64 versus 88, and the Walch-Duplay score 69 versus 82, respectively. These differences were statistically significant ( $P < 0.05$ ).

**Discussion:** To our knowledge, this study is the first comparison of non-operative versus operative treatment in a cohort of patients with documented posterior shoulder instability. Outcomes were better with operative treatment. However, this finding remains preliminary given the short follow-up of only 1 year.

**Level of evidence:** III, case-control study.

### Keywords:

Shoulder  
Posterior instability  
Comparison  
Treatment  
Surgery

## 1. Introduction

The orthopaedic community remains deeply divided regarding the management of posterior shoulder instability (PSI), for which outcomes are inferior to those achieved in anterior shoulder instability [1]. The magnitude of the challenges

raised by PSI, from its diagnosis to its treatment [1,2], has prompted some surgeons to advocate non-operative treatment [3,4].

Given this uncertainty, the French Arthroscopy Society (*Société française d'arthroscopie* [SFA]) conducted a prospective multicentre non-randomised comparison of clinical outcomes of consecutive patients with PSI managed non-operatively or operatively. The working hypothesis was that surgical treatment of PSI may achieve better clinical outcomes than non-operative treatment in selected patients.

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**Table 1**  
Epidemiological and clinical features of the groups treated non-operatively and operatively.

Group	No. of patients	M/F(n)	Age (years) Mean (range)	Dominant arm n (%)	Traumatic antecedent n (%)	Laxity n (%)
Non-operative	19	15/4	26 (17–35)	8 (42%)	13 (68%)	13 (68%)
Operative	32	28/4	29 (16–48)	16 (50%)	28 (87.5%)	7 (22%)

M: males; F: females.

## 2. Material and methods

### 2.1. Design and patients

A prospective non-randomised study was performed in 51 patients with chronic PSI. Among them, 32 had surgery and 19 were managed non-operatively (Table 1). The preoperative data collection form is provided as an appendix. The research was carried out in accordance with the principles of the Helsinki Declaration and the design of the study was approved by the SFA'S Board. Inclusion criteria were unidirectional PSI documented by a clinical evaluation (Appendix A) and computed tomography-arthrography; prospective monitoring for more than 1 year after treatment; and determination before and after treatment of the Subjective Shoulder Value (SSV), Rowe score, Walch-Duplay score, and Constant score. Patients with previous surgery on the affected shoulder or multidirectional shoulder instability were excluded.

The 51 patients had a mean age of  $26 \pm 9$  years. They were divided into three groups based on the clinical presentation (Table 2): recurrent true dislocation or recurrent involuntary subluxation ( $n=43$ ), involuntary instability or voluntary instability that had become involuntary ( $n=6$ ), and shoulder pain with instability ( $n=2$ ).

### 2.2. Treatment

The treatment indications were at the discretion of the surgeon, who relied on personal subjective criteria (clinical and imaging study findings).

#### 2.2.1. Non-operative treatment

The non-operative treatment sought to achieve two goals via a three-step programme. One goal was pain control. The other was the acquisition of motor stabilisation techniques for use during activities of daily living then, if relevant, during sports. The first step involved acquiring static proprioceptive control, to restore confidence to the patient, by performing very simple, closed-chain, kinetic movements and providing visual feedback. The second step was a dynamisation phase involving isokinetic balancing of the internal and lateral rotators of the humerus. The objective was to obtain global concentric muscle strengthening. The third step consisted in dynamic, proprioceptive, open-chain, kinetic exercises to allow the return to sports.

**Table 2**  
Treatments according to clinical presentation and type of lesion.

Clinical presentation	n	Bone block	Capsulorrhaphy	Non-operative treatment	Fracture of the glenoid	Reverse Hill-Sachs	Labral damage
D/SL	43	14	12	17	10	10	34
IV/V-to-IV	6	2	2	2	0	0	2
P+I	2	0	2	0	0	2	4

D/SL: recurrent dislocation or subluxation; IV/V-to-IV: voluntary or involuntary-to-voluntary instability; P+I: pain and instability.

### 2.2.2. Operative treatment

Three surgical techniques were used: bone block, soft-tissue repair (labral repair and/or tightening of the capsule), and bone defect filling.

### 2.2.3. Distribution of treatment options by clinical presentation

Of the 43 patients with recurrent dislocation/subluxation, 26 had surgery, which consisted of a bone block in 14 and in soft-tissue repair in 12 (Fig. 1). Surgery was also performed in 4 of the 6 patients with involuntary or voluntary-to-involuntary PSI; 2 of these patients had a bone block and the other 2 soft-tissue procedures. Soft-tissue procedures were performed in the 2 patients with shoulder pain and instability. Non-operative treatment was thus used in 17 patients with recurrent dislocation/subluxation and 2 patients with involuntary or voluntary-to-involuntary PSI.

### 2.3. Statistics

R version 3.3.2 was used for the statistical analyses. The operative and non-operative groups were compared using the Chi<sup>2</sup> and Mann-Whitney tests.

## 3. Results

Table 1 and Fig. 2 compare the groups treated operatively and non-operatively. There were no significant differences for gender, age, involvement of the dominant arm, or history of trauma. However, laxity was more common in the group managed non-operatively ( $P < 0.05$ ).

### 3.1. Within-group comparisons

Within the non-operative group (Fig. 3), between baseline and last follow-up, the Rowe score improved significantly, from 35 to 64. Similarly, the Walch-Duplay score improved by 29 points. The Constant score remained unchanged (75 and 78, respectively), although the pain sub-score changed by 3 points (from 7 to 10).

Within the operative group (Fig. 4), the Rowe and Walch-Duplay scores improved significantly from baseline to last follow-up, by 29 points (from 35 to 64 points) and 39 points (from 43 to 82), respectively. Constant's score improved by 12 points (from 75 to 87) with a 3-point change in the pain sub-score (from 9 to 12).

### 3.2. Between-group comparisons

Outcomes were significantly better in the operative than in the non-operative group for all three assessment scores: Rowe score, 88 versus 64 points; Walch-Duplay score, 82 versus 69 points; and Constant's score, 87 versus 78 points (Fig. 5).

## 4. Discussion

The data from this study remove some of the uncertainty surrounding the management of PSI, by showing that surgery provides better outcomes.

Nevertheless, previously published data are conflicting. Pollock et al. [5] reported good outcomes after non-operative treatment,

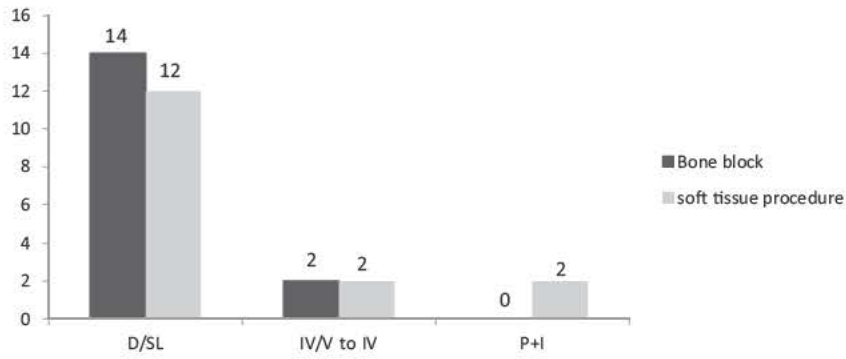


Fig. 1. Surgical technique according to clinical presentation. D/SL: recurrent dislocation or subluxation; IV/V-to-IV: voluntary or involuntary-to-voluntary instability; P+I: pain and instability.

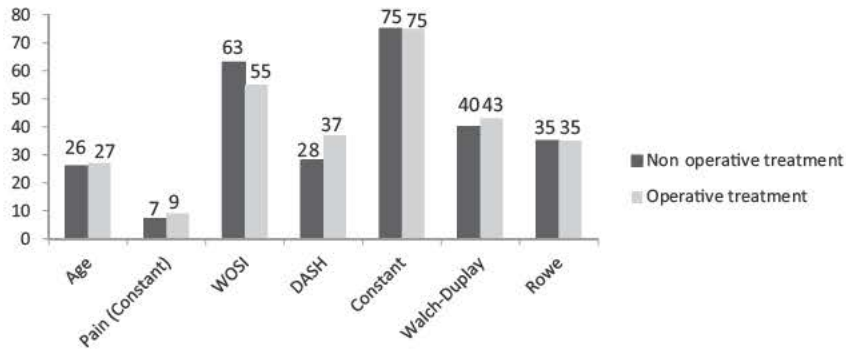


Fig. 2. Comparison at baseline of the groups treated operatively (dark grey bars) and non-operatively (light grey bars). WOSI: Western Ontario Shoulder Instability index; DASH: Disabilities of the Arm, Shoulder, and Hand score.

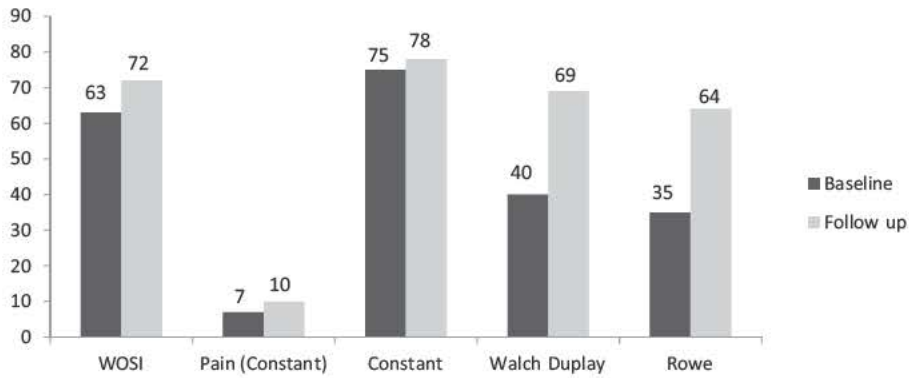


Fig. 3. Clinical score values in the non-operative treatment group at baseline and at last follow-up. WOSI: Western Ontario Shoulder Instability index.

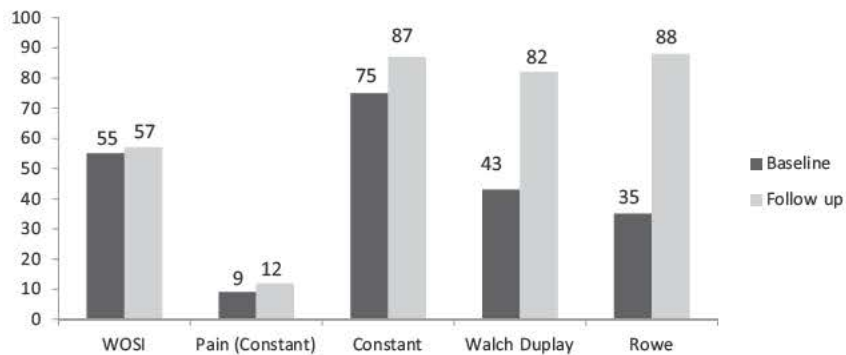


Fig. 4. Clinical score values in the operative treatment group at baseline and at last follow-up. WOSI: Western Ontario Shoulder Instability index.

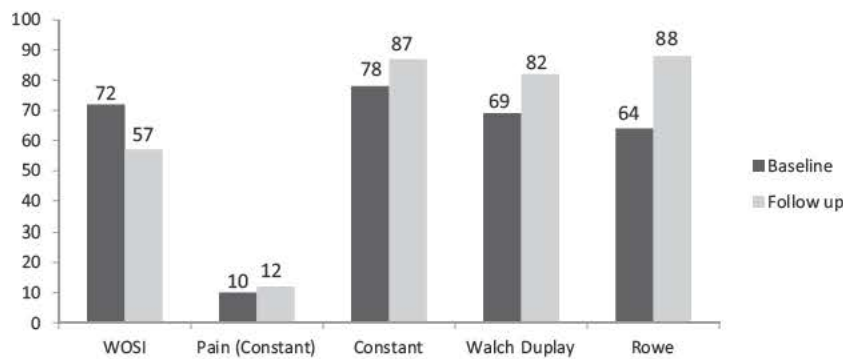


Fig. 5. Comparison of the operative and non-operative treatment groups at last follow-up. WOSI: Western Ontario Shoulder Instability index.

although this approach seemed confined to patients with a low level of physical activity. Also with non-operative treatment, Blacknall et al. [6] obtained a substantial 37.2% improvement in the Western Ontario Shoulder Instability index in a population with atraumatic PSI and suggested a role for neuromuscular abnormalities involving scapular dyskinesia. Tannenbaum et al. [1] reported that data from a meta-analysis of 107 studies supported surgery after no more than 6 months of non-operative treatment, particularly in athletes. Similarly, in two other studies, surgery was indicated in 75% and 78% of patients, respectively [7,8].

Data on selection of the surgical technique can be found in a meta-analysis by DeLong et al. [9]. Arthroscopy was superior over open surgery in terms of the recurrence rate (8% versus 19%), likelihood of returning to sports at any level (92% versus 66%), subjective impression of stability (91% versus 80%), and subjective satisfaction (94% versus 86%).

One limitation of this study is the short follow-up of 12 months. Thus, the results reported here are preliminary, as the recurrence rate may increase over time. Other limitations are related to the low incidence of PSI, diagnostic challenges raised by this condition, and uncertainties surrounding its management. A multicentre design was required to prospectively include 51 patients. Furthermore, the two groups were not identical at baseline, with greater laxity and pain severity in the non-operative group. These characteristics may have influenced treatment selection by the surgeons. Management decisions are inevitably affected by cognitive bias due to personal clinical and surgical experience. The absence of clear published recommendations may lend strength to confirmation bias.

## 5. Conclusion

The 1-year outcomes in our prospective study of 51 patients with PSI suggest superiority of operative over non-operative treatment. However, the baseline differences between the two groups

deserve consideration. Furthermore, these results should be taken as preliminary given the limited follow-up.

No consensus exists about the best surgical option. Other studies in larger patient populations without baseline differences between treatment options would be welcome in order to define surgical indications.

## Disclosure of interest

The authors declare that they have no competing interest.

## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.otsr.2017.08.004>.

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