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Original Article

Analysis of postoperative monitoring of patients undergoing shoulder arthroscopy for anterior instability☆

Alexandre Almeida[a,*], *Samuel Millán Menegotto*[a], *Nayvaldo Couto de Almeida*[a], *Ana Paula Agostini*[b], *Letícia Agostini de Almeida*[c]

[a] *Hospital Pompeia, Departamento de Ortopedia e Traumatologia, Caxias do Sul, RS, Brazil*
[b] *Universidade de Caxias do Sul, Caxias do Sul, RS, Brazil*
[c] *Colégio São José de Caxias do Sul, Caxias do Sul, RS, Brazil*

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ABSTRACT

Objective: Analyze the postoperative follow-up of patients undergoing shoulder arthroscopy for treatment of anterior instability and correlate with the prevalence of recurrence.
Methods: A six-question survey was applied by phone and mail to 65 patients, seeking information on the current result of the surgical procedure. All patients were treated arthroscopically for anterior shoulder instability, with at least 12 months of postoperative time. Patients with associated posterior labial lesions and revision surgeries were not included.
Results: At the time of the survey the patients had a median of 56 (IQR: 34.5–110.5) postoperative months. The mean sample age was 24.6 years (maximum = 47, minimum = 12; SD = 7.3). Complaint of pain in the shoulder was observed in 20 patients (30.7%). Dislocation recurrence was observed in 10 patients (15.3%). Forty-four patients (67.6%) considered their shoulder normal, which was more frequent in non-recurrence patients ($p < 0.001$). Forty-three patients (66.1%) returned to their previous level of sport and there was no difference between recurrence and non-recurrence patients ($p = 0.456$). It was found that the prevalence of recurrence was 5.6 (95% CI: 1.30–24.46) times higher in individuals who abandoned monitoring before six months postoperatively ($p = 0.012$).
Conclusion: The abandonment of postoperative monitoring in the early stages, when the patients receive orientation for muscle strengthening, proprioceptive education, and dangerous movements to avoid, can increase the rates of recurrent shoulder dislocation in patients treated for anterior instability by arthroscopy.

☆ Study conducted at the Hospital Saúde, Caxias do Sul, RS; and in Hospital Pompeia, Serviço de Residência em Ortopedia, Caxias do Sul, RS, Brazil.

* *Corresponding author.*
E-mail: bone@visao.com.br (A. Almeida).

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Análise do monitoramento pós-operatório dos pacientes submetidos à artroscopia do ombro para tratamento de instabilidade anterior

Palavras-chave:
Articulação do ombro/cirurgia
Luxação do ombro/cirurgia
Artroscopia/métodos
Resultado do tratamento

RESUMO

Objetivo: Analisar o acompanhamento pós-operatório dos pacientes submetidos à artroscopia do ombro para tratamento de instabilidade anterior e correlacionar com a prevalência de recidiva.

Métodos: Foi aplicado em 65 pacientes, através de ligação telefônica, um questionário que buscava informações sobre a situação atual do resultado do procedimento cirúrgico. Todos os pacientes foram operados para corrigir uma instabilidade anterior do ombro por artroscopia e tinham pelo menos 12 meses de pós-operatório. Não foram incluídos pacientes com associação de lesão labral posterior e cirurgias de revisão.

Resultados: O questionário foi aplicado com uma mediana de 56 (IIQ: 34,5 a 110,5) meses. A média de idade da amostra foi de 24,6 anos (máxima de 47 e mínima de 12 – DP 7,3). Foi verificada queixa de dor em 20 pacientes (30,7%) e recidiva da luxação em dez (15,3%). 44 pacientes (67,6%) consideraram seu ombro normal e 43 (66,1%) retornaram ao esporte prévio. Foi verificado que os indivíduos que abandonaram o acompanhamento pós-operatório antes dos seis meses tiveram uma prevalência 5,6 (IC 95%: 1,30-24,46) vezes maior de recidiva (p = 0,012).

Conclusão: O abandono do acompanhamento pós-operatório na fase inicial, na qual o paciente recebe orientações para o reforço muscular e a educação proprioceptiva, pode colaborar no aumento do índice de recidiva da luxação nos pacientes tratados por artroscopia.

Introduction

Traumatic shoulder instability is a pathology that affects mainly young adults and often leads to difficulty to perform some activities. It is an important cause of work absence and limitation of quality of life.[1] Anterior shoulder instability is the most common presentation, and is generally associated with a labral lesion or capsular laxity.[2–5] Dislocation recurrence leads to osteoarticular capsuloligamentous deterioration and, in most cases, surgery is required.[2]

Surgical treatment of anterior instability of the shoulder can be performed using either open or arthroscopic access. In recent years, a tendency to increase indications for arthroscopic treatment has been observed.[1,4,6–10] In the United States, between 2003 and 2005, 71.2% of all Bankart lesions were treated with arthroscopy, while between 2006 and 2008 this percentage increased to 87.7%.[2] The literature is controversial regarding which method achieves better results, especially when the prevalence of recurrence of dislocation after surgery is assessed.[1,4,6,7]

Open treatment advocates point to a more anatomical and secure repair as an advantage, with better orientation in the placement of anchors, and recurrence rates ranging from 3.5% to 23% in 4–6 years and from 10% to 22.6% in 11–29 years postoperatively.[1–3,11] Proponents of the arthroscopic treatment indicate the lower risk of infection and stiffness, less subscapularis injury, less postoperative pain, and faster recovery.[1–3,10–12] Recurrence rates are approximately 10% at 3.6 years postoperatively.[1,4,6,7] A study indicated a recurrence rate of 23% at 10.9 years of follow-up, suggesting a deterioration of surgical results in a longer follow-up.[11] More recent studies demonstrated that the standardization of the arthroscopic technique and careful selection of patients decreased the prevalence of recurrence, with rates similar to the open technique.[2,3,8,9]

This study aimed to analyze the postoperative follow-up of patients who underwent shoulder arthroscopy for treatment of anterior instability and to correlate with the prevalence of recurrence.

Methods

This was a retrospective and cross-sectional study.

From November 2002 to November 2013, 96 patients with traumatic anterior shoulder dislocation were treated through the arthroscopic technique.

All cases were operated by the same surgeon, head of the department.

Surgical technique consisted of general anesthesia preceded by interscalene blockade. Patients were placed in lateral decubitus with a slight posterior drop of the trunk while the upper limb (UL) was under 5 kg traction, with 20° flexion and 30° lateral abduction. Arthroscopy was performed with a 30° angle arthroscope. The labral suture was made with metallic screws until January 2005, and with absorbable screws from that date onwards. Glenoid labrum mobilization technique was defined in the intraoperative period, according to the alterations found. A capsuloplasty with reduction

Table 1 – Survey questionnaire.

1. Do you have pain in the operated shoulder?
2. Nowadays, do you feel your shoulder comes out of place?
3. Did you have any episodes of shoulder dislocation after surgery (completely out of place)?
4. Have you been reoperated by any other surgeon or other service for the same problem?
5. Did you return your original sport activity (which you performed before you started having your shoulder problem)?
6. Do you consider your shoulder to be normal?

Caption: questions numbered in order.

of the length of the anterior band of the glenohumeral ligament was routinely performed at the lowermost point of the labral suture.

Until December 2010, all patients were immobilized while still under anesthesia in the operating room, using a sling with abduction cushion; from that date onwards, patients were immobilized with a sling with neutral UL rotation.

Patients who underwent revision surgeries were excluded from the study, as well as those with posterior labral lesion associated with anterior shoulder instability; therefore, 77 patients were assessed.

A total of 57 patients were contacted by telephone and a questionnaire was applied to collect updated information about the state of the operated shoulder. Eight other patients answered the questionnaire during their clinics visit, after contact by letter. A total of 65 questionnaires were answered, resulting in a loss of 15.5%.

Questionnaires were answered at an average of 56 (IQR: 34.5–110.5) months postoperatively. At the time of contact, all patients were informed that the data collected would be used in a study regarding surgical technique and that their names would not be disclosed. This study was approved by the ethics committees of the institutions in which the patients were operated.

Mean age at time of surgical treatment of the 65 patients included in the study was 24.6 ± 7 years. Regarding sex, 56 were male (86.2%) and nine were female. Right side was affected in 36 cases (55.4%). Dominant side was affected in 37 cases (56.9%).

The questionnaire, which consisted of six objective questions with yes or no answers (Table 1), was applied by a person who was not aware of the surgical treatment used or the patient's evolution.

Variables studied were: age, sex, operated side, dominance, postoperative time, date of the last postoperative visit.

Regarding postoperative follow-up of patients, presence of pain, complaint of subluxation, dislocation recurrence, need for a new surgical procedure, return to the sport practiced before the injury, and patient's perception of having a normal shoulder were evaluated. Patients were analyzed in totality and separated, according to the prevalence of recurrence.

Data were analyzed using IBM SPSS 22.0 statistical package (IBM Corporation 1989–2013) for the answers of the applied questionnaire. In cases of normal data distribution, they were expressed by mean and standard deviation; in cases of asymmetrical distribution, the median and the interquartile range (IQR) were used. The Chi-squared test (Fisher's exact test) and the prevalence ratio and their respective 95% confidence intervals were used to compare the proportions found. Statistical tests were two-tailed, and a p-value ≤ 0.05 was considered statistically significant.

Results

Analysis of the applied questionnaire indicated that 20 patients (30.7%) had complained of pain. Subluxation complaints (symptomatic translation of the humeral head into the glenoid cavity) were observed in only five patients (7.6%).

The prevalence of recurrence of dislocation was 15.3%. All 10 patients who presented recurrence had undergone a second surgery by the time of application of questionnaire.

The answer to the question about pain in the operated shoulder showed a tendency to pain complaints among patients who presented recurrence. Shoulder pain was observed in five patients who had recurrence (50%) and 27.3% of those who did not ($p = 0.262$). The difference was not considered to be statistically significant.

A total of 43 patients returned to the sport practiced before injury (66.1%). Six of those who had recurrence (60%) and 67.3% of those who did not were able to return to their sport. No statistical significance was observed regarding a higher return to sport between the two groups ($p = 0.456$).

When asked whether they considered their shoulder to be normal, 44 patients (67.6%) responded positively, while 21 (32.3%) responded negatively. Two patients who had recurrence (20%) and 76.4% of those who did not considered their shoulder to be normal. Patients who did not present dislocation recurrence during follow-up were more likely to consider their shoulders to be normal, with a statistically significant difference ($p < 0.001$).

The date of the last postoperative follow-up visit was a minimum of two months and a maximum of 137 (IQR-12 [4–27 months]). It was observed that individuals who left the postoperative follow-up before six months had a 5.6 times higher prevalence (95% CI: 1.30–24.46) of dislocation recurrence ($p = 0.012$).

Discussion

Surgical treatment of recurrent anterior shoulder dislocations has improved in recent decades. Studies have compared the results and the prevalence of dislocation recurrence between open and arthroscopic surgery.[1,3,4,6,7,12,13] Increase in the success rates of arthroscopic surgery is associated with improvement of surgical technique and material used, as well as to the careful selection of patients by identifying recurrence risk factors.[8,14] Even genetic studies, in the early stages, are being conducted in order to improve treatment outcomes.[15]

Chalmers et al.[3] evaluated eight meta-analyses (evidence level four) and compared the results and prevalence of treatment failure between the open and arthroscopic techniques in recurrent shoulder dislocation. In the two studies conducted before 2007, a lower prevalence of relapse was observed in open surgery. The studies conducted after 2008 showed an equivalence between open and arthroscopic techniques.[3] Hobby et al.,[12] in a systematic review of 62 studies performed

from 1985 to 2006, showed that evolution of surgical technique with the use of mounted anchors had attained postoperative arthroscopic results similar to open technique.[12] Similar findings were observed by Harris et al.[13]

The main objective of arthroscopic treatment is to restore capsulolabral insertion and tension with the aid of anchors fixated in the glenoid or to reincorporate torn bone fragments.[16] The technique is perfectly reproducible, with a relatively easy learning curve.

Prevalence of dislocation recurrence after arthroscopic surgery is approximately 10%, increasing with time of postoperative follow-up; it can reach around 25% in longer follow-ups.[11] Mohtadi et al.[1] found a recurrence rate of 23% in a follow-up of two years. van der Linde et al.[11] found a recurrence rate of 35% in a follow-up ranging from eight to ten years; of these, 15% were observed in the first two years.[11] Boileau et al.[17] indicated a dislocation recurrence rate of 15.3%, with a mean follow-up of three years. Waterman et al.,[18] in a follow-up of two to seven years, observed a dislocation recurrence rate of 13.8%, but with no distinction between open or arthroscopic procedure, although the arthroscopic procedure had been performed in 84% of cases. In the present study, a 15.3% rate of dislocation recurrence was observed, with a mean follow-up of more than four years, similar to the reports in the literature.

The presence of pain in the operated joint is subjective and varies greatly among individuals. Stein et al.[19] conducted a study in athletes who used the shoulder in their activity. They divided the athletes into four groups, depending on their sport modality. All groups presented residual pain with progressive decrease that did not prevent sports practice, even after 32 months of follow-up.[19] The sample recurrence rate was 10%, but most athletes presented pain complaints even without recurrence, especially when doing activities that required excessive effort shoulder.[19] Miyazaki et al.[9] observed a rate of 8% for persistence of postoperative pain without a plausible explanation for patients with good result at the end of treatment. Those authors did not include in the analysis cases that presented recurrence.[9] In the present study, presence of shoulder pain complaints was observed in 30% of the sample. Presence of pain does not appear to be related to treatment success or failure. Half of the patients who had dislocation recurrence and were reoperated presented shoulder pain. Similarly, approximately one-third of patients who did not experience dislocation recurrence also had shoulder pain.

Return to sports activity also varied in the literature. Brophy[5] observed a rate of 80% for return to sport after arthroscopic treatment of anterior shoulder instability. They demonstrated that this index was different depending on the type of sport. Throwing athletes had a rate of 68% for return to sport, while other athletes had a rate of 90%.[5] Park et al.[4] indicated a rate of 67.7% for return to the sport with the arthroscopic treatment, and 51.6% reached the same sporting level pre-injury. Privitera et al.[7] assessed non-professional athletes and found a rate of 40% for return without limitations to the sport practiced prior to injury and of 30% for return to the sport with limitations. Return to sports does not appear to be associated with treatment success or failure. In the present study, the rate of return to sports activity was 67% in patients who did not present a recurrence of the dislocation. Similarly, 60% of the patients who had dislocation recurrence and were reoperated were also able to return to their previous sports. The present sample did not evaluate professional athletes.

The perception that the operated joint returned to normality is also very subjective. In the present study, patients were asked a yes or no question regarding the normality of their shoulder. Most studies in the literature used quality of life scores to try to answer this question. The main scores used are: Disability of the Arm, Shoulder and Hand Score (DASH); Shoulder Pain and Disability Index (SPADI); Modified Rowe Score; and Western Ontario Shoulder Instability Index (WOSI).

Mohtadi et al.[1] used the WOSI score (scale of 0–100) as primary endpoint, showing a progressive increase in the scores of the patients in a follow-up of two years. They found no statistically significant difference between open (mean WOSI score: 85.2) and arthroscopic treatment (mean WOSI score: 81.9).[1]

Privitera et al.[7] also assessed their patients with the WOSI score. The mean score of all operated shoulders was 80%, on a scale of 0–100%. They compared the operated shoulder with the normal contralateral shoulder and found a statistically significant difference in the WOSI score. This analysis showed that although surgical treatment was successful, the patient does not always perceive the joint as normal.

In a subjective assessment, 73% of the patients in the study by Boileau et al.[17] were very satisfied or satisfied and 23% were dissatisfied or very dissatisfied. However, only 15% of the patients presented treatment failure due to recurrence, which again suggests that even if treatment is successful in relation to recurrences, not all patients become fully satisfied with the surgical result.[17]

In the present study, a significant difference in patient's perception of a normal shoulder was observed. One-third (32.3%) of the patients in this sample who presented good results and who were satisfied with the results did not consider their shoulder to be normal. The difference was considered significant when comparing patients with and without recurrence in their postoperative follow-up. Only 20% of patients who had relapses and underwent revision surgery considered their shoulder to be normal. This finding brings light to the importance of the first surgical treatment for the final result.

Postoperative management varied among authors. Immobilization time, initiation of mobility recovery, initiation of muscle strengthening, and proprioceptive work focusing on the original sport activity should be individualized among patients.

Park et al.[4] suggested that the rehabilitation scheme should feature immobilization with a sling for six weeks. After this period, gentle passive anterior flexion movements should be performed for three weeks, followed by three more weeks of external rotation exercises. Muscular strengthening should be initiated approximately 12 weeks after surgery; sport activities should be delayed for six to nine months, depending on the sport practiced by the patient.[4]

Privitera et al.[7] suggested sling immobilization for four to six weeks. In the first four weeks, pendular movements and

active elbow and wrist movements were stimulated. After the fourth week, passive flexion, abduction up to 90°, and external rotation to 0° were initiated; isometric movements of the deltoid and periscapular muscles were authorized. After the sixth week, the total range of active movements was practiced, and after 12 weeks, muscle strengthening exercises were initiated. Return to sport was authorized after four or six months, depending on the type of activity.[7]

Studies indicate that there is a loss of external rotation and a decrease in abduction force even after rehabilitation.[2,7] Even with a proper rehabilitation program and medical monitoring, postoperative limitations may occur; they should guide the orientation for a safe return to sports activity.

The present study demonstrated the importance of postoperative follow-up when evaluating recurrences. A much higher rate of recurrence was observed in patients who abandoned follow-up before receiving appropriate guidelines for their return to daily life and sports activity. The prevalence of dislocation recurrence was 5.6 higher in these patients. It is possible that ignorance of risky movements, insufficient recovery of muscle strength, and inadequate proprioceptive recovery may make the patient vulnerable to future relapses.

The authors consider the continuous and progressive evolution of the author's learning curve in the arthroscopic surgical procedure since 2002 to be a bias of the present study, as well as the use of different types of sling for immobilization in the immediate postoperative.

Conclusion

Individuals who abandoned post-operative follow-up after arthroscopic stabilization of recurrent shoulder dislocation before six months presented a 5.6-fold higher prevalence of dislocation recurrence.

Conflicts of interest

The authors declare no conflicts of interest.

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