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

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ARTICLE INFO
Article history:
Received 19 May 2016
Accepted 31 May 2016
Available online 22 June 2017

Keywords:
Shoulder dislocation/surgery,
Shoulder joint/surgery,
Arthroscopy/methods
Treatment outcome

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.

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http://dx.doi.org/10.1016/j.rboe.2017.06.006
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Análise do monitoramento pós-operatório dos pacientes submetidos à artroscopia do ombro para tratamento de instabilidade anterior

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 (IQR: 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 sua 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.
of the length of the anterior band of the glenohumeral liga-
ment 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 ques-
tions 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% confi-
dence intervals were used to compare the proportions found.
Statistical tests were two-tailed, and a p-value < 0.05 was con-
sidered statistically significant.

Results

Analysis of the applied questionnaire indicated that 20
patients (30.7%) had complained of pain. Subluxation com-
plaints (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 oper-
ated 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 con-
sidered 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 statisti-
cal 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 recur-
rence (20%) and 76.4% of those who did not considered their
shoulder to be normal. Patients who did not present dislo-
ca tion 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 recur-
rence (p = 0.012).

Discussion

Surgical treatment of recurrent anterior shoulder disloca-
tions has improved in recent decades. Studies have compared
the results and the prevalence of dislocation recurrence
between open and arthroscopic surgery.1,3,5,6,7,12,13 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.5,14 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 treat-
ment failure between the open and arthroscopic techniques
in recurrent shoulder dislocation. In the two studies con-
ducted 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

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.
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. 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 fixed 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.15 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.13 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.5 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. Brophy5 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. Imobilization 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.5

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 post-operative 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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