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Developments in Bankart repair for treatment of anterior instability of the shoulder

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Abstract In the past 10 years, Bankart repair for operative treatment of recurrent luxation of the shoulder has become well established. Recently, the arthroscopic Bankart procedure has been developed. Since 1991, cannulated, bioabsorbable plugs are being used (Suretac; Acufex Microsurgical, Mansfield, Ma., USA). This investigation examines what the advantages of this micro-invasive technique are compared with the open Bankart procedure. From 1986 to 1995, 120 patients underwent Bankart repair of the shoulder in our hospital. Since 1993 we have preferred using arthroscopy, and since 1994 with Suretac. We were able to follow-up 93 patients. The results were assessed using the criteria of stability, range of motion, pain and functional results. The patients were evaluated using the Rowe score. The mean follow-up time was much shorter in the arthroscopic group. Nevertheless, we registered a higher reluxation rate (2 patients, 8%) in comparison with the group that underwent open surgery (3 patients, 4%). As postoperative pain and deterioration of range of motion are less, however, the mean Rowe score shows no significant difference. In conclusion, proper selection of patients has to be performed: arthroscopic Bankart repair is recommended for refixation of a detached anterior labrum. It is disadvantageous when the labrum is degenerated or the capsular tissue is attenuated. That is why, in our opinion, the open Bankart procedure with its capsulorrhaphy cannot be renounced completely.

Key words Shoulder instability · Suretac · Arthroscopic Bankart · Open Bankart · Arthroscopic access

Introduction

Bankart repair is accepted as an effective procedure for operative treatment of anterior shoulder instability. In our hospital this technique has been well established since 1985. In the beginning, we used sutures, but since 1990, we have preferred screws. The results are very satisfactory, as described in the literature [5, 13, 19, 23]. In 1987, arthroscopic techniques for Bankart repair were first described [7, 14]. As a consequence, since 1993, we have performed arthroscopic Bankart repair, initially using cannulated titanium screws. At first, technical problems occurred, for instance malfixation and loosening of screws or painful impingement. Since 1994, we have been using a bioabsorbable fixation device (Suretac; Acufex Microsurgical, Mansfield, Ma.).

This is a preliminary report on the results of the first 26 patients who underwent the arthroscopic Suretac procedure. We particularly wanted to compare our results with those of the open Bankart procedure.

Patients and methods

From 1986 to 1995, 120 patients underwent stabilisation surgery of the shoulder according to the Bankart procedure (Fig. 1). We were able to review 93 patients who were operated on with an

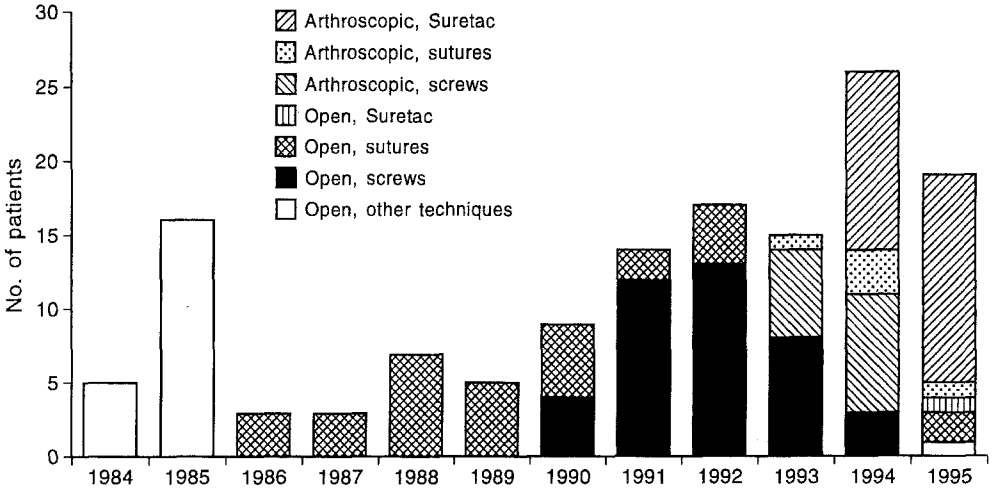

Fig. 1 Operative procedures for recurrent dislocation of shoulder from 1984 to 1995 ($n = 141$)

open procedure and 26 patients who were operated on arthroscopically with the Suretac device. In 17 cases, two suretacs were used, in 4 cases only one and in 2 cases three. In 2 cases this was combined with sutures. All of the shoulders were treated with physiotherapy several days after surgery, except for abduction, flexion greater than 60 deg and external rotation for 6 weeks. Each patient was given an antiphlogistic drug (mostly diclofenac) for about 1 week. Some patients treated with an open procedure required opioid drugs on the day of the operation. In no case were other analgesic devices necessary. We excluded patients who received screws, undergone only capsulorraphy or had had previous surgical procedures. The average age was similar in both groups (open, 32 years; arthroscopy, 33 years), as well as the ratio of men to women (open, 42:24; arthroscopy, 16:6). The group treated with an open procedure was followed up for an average of 53 months (range 19–110 months). The follow-up was much shorter in the arthroscopic group (average 14 months, range 6–25 months). The Rowe functional grading system [19] was used to evaluate each patient clinically based on stability, pain, range of motion and function at the time of follow-up.

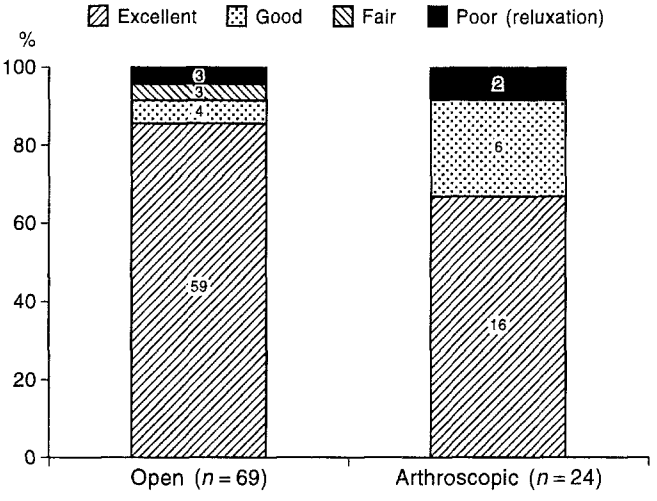

Fig. 2 Postoperative Rowe score

Results

Clinical evaluation using the Rowe functional grading system (Fig. 2) showed an average postoperative score of 94 in the open group, versus 90 in the arthroscopic group. This difference is not statistically significant (Student's *t*-test).

In two arthroscopically treated patients redislocation occurred, and two patients complained of recurrent subluxations (Fig. 3). This is a higher rate than in the open group (three redislocations, one recurrent subluxation), although the follow-up is markedly shorter. The patients who dislocated after arthroscopic surgery had already requested re-operation because they were suffering from recurrent dislocations. The second-look demonstrated a well-refixed anterior labrum, but a widened capsule. A capsular shift was carried out.

None of the patients treated with open surgery has been re-operated, as none of them complained of recurrent dislocation of the shoulder.

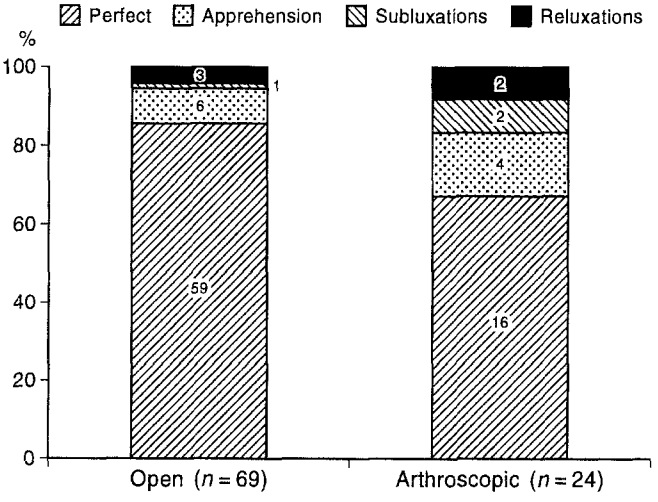

Fig. 3 Stability results

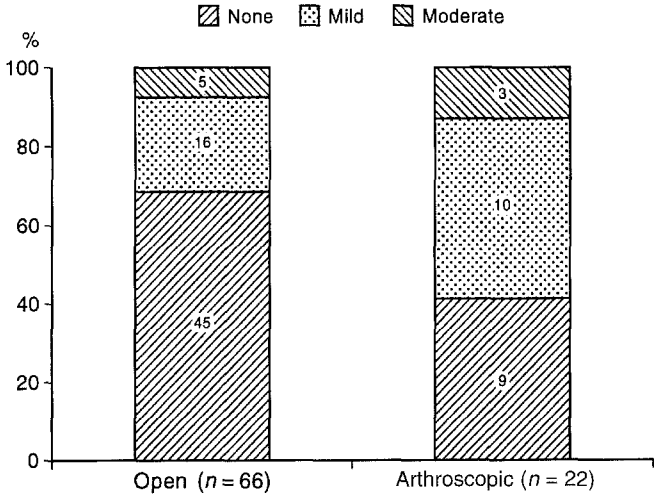

Fig. 4 Limitation of function

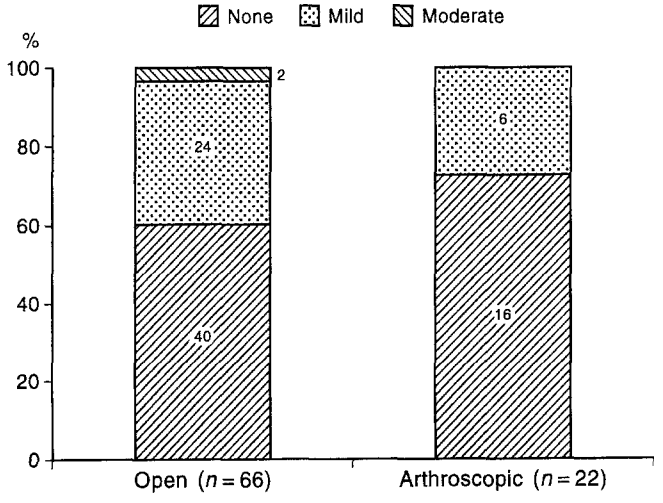

Fig. 5 Pain felt at follow-up

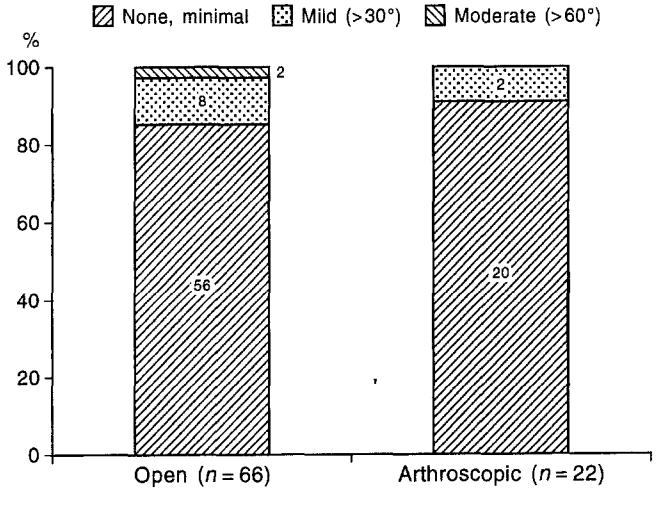

Fig. 6 Restriction of range of motion

The higher rate of instability with the arthroscopically operated shoulders led to a greater proportion of patients with moderate or mild limitation of function (Fig. 4).

After arthroscopic surgery the amount of pain is markedly less (Fig. 5) as well as the extent of restriction of range of motion (Fig. 6). These are the expected advantages of micro-invasive surgery.

Apart from the reluxations and subluxations we did not see any complications after arthroscopic Bankart repair. In the open group, there was one infection and one frozen shoulder. One deep haematoma required re-operation. No neural lesion was noted.

Discussion

Since 1987, arthroscopic techniques for Bankart repair have been developed [7, 14]. Postoperative morbidity was less than after open surgery, which is why the short-term results were encouraging. However, Rockwood [18] soon cautioned against too much euphoria. In fact, as more and more surgeons gained experience with this technique, a rise in the failure rate was noted. As a consequence, a large number of surgical variations were developed.

Screws were used as the fixation device [16, 17, 20] but often caused perforation of the capsule or painful impingement, and after loosening or malposition an adverse searching procedure might become necessary. Suture techniques were modified [6, 8], and procedures were developed that even enabled capsulorrhaphy [5, 11, 21]. However, the disadvantage of sutures is the knot: an indirectly tied knot causes less pressure on the tissue compared with a screw or a staple [20].

Therefore, a cannulated, biodegradable staple (Suretac, Acufex) was considered as it combines the advantage of a pressure-exerting device with that of being resorbable. Its disadvantages may include bigger drill holes and the price.

Our early results show a rather good clinical outcome in comparison with some recent studies [10, 12, 17, 24]. Although up to now the rate of redislocations (8%) is higher than after an open Bankart procedure (our results, 4%; in the literature, 3%–6% [13, 19]), we consider this acceptable when the low postoperative morbidity is taken into account. Of course, these are preliminary results, and a longer follow-up is necessary. One special technical problem is the angle of approach to the glenoid rim, which has to be rather acute to achieve adequate fixation, but also has to avoid the adjacent neurovascular structures. That is why arthroscopic Bankart repair is a difficult surgical procedure.

We agree with many authors that the role of the capsule and the glenohumeral ligaments is as important as the labrum, which often is degenerated [1, 2, 22]. Both of our redislocations support this idea. Usually the capsule has to be refixed to the glenoid rim.

The best results can be expected when a traumatic luxation detaches the anterior capsule from the glenoid rim as

well as from the scapular neck (Broca and Hartmann already described this lesion in 1890 [4]). The capsule itself may be relatively uninjured, so that restitution of anatomical conditions is achievable by refixation.

But what is the correct way of treatment, when the capsule is lax and attenuated? We do not trust techniques involving gathering up the capsule, when it is enlarged [3, 11, 21]. Shortening of the capsule does not reinforce it. That is why reluxations have to be expected, although the refixation of the capsule is stable.

In those cases we prefer an open capsular shift [15]. This is an indispensable secure method for the treatment of atraumatic or chronic anterior instability of the shoulder.

In conclusion, we assume that our results of arthroscopic Bankart repair could be improved by a proper selection of patients for this technique: the original luxation is due to a major trauma, this trauma must not have happened long ago, and arthroscopy must reveal a detached anterior labrum and a nearly uninjured capsule. The results are worse when the original luxation is atraumatic, when it happened in early adolescence, when the glenohumeral ligaments are weak and the anterior capsule is attenuated. Then we prefer a refixation of capsule and labrum in an open procedure several days after arthroscopy, combined with a capsular shift.

Our concept of treatment after first luxation of the shoulder is as follows: primary immobilization for about 10 days, then physiotherapy with gradual increase of abduction and external rotation up to 28 days after the trauma. For reluxation or marked apprehension, surgical treatment is recommended, i.e. arthroscopical stabilisation or an open procedure several days after arthroscopy.

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