REVIEW ARTICLE: IMMOBILIZATION AFTER ANTERIOR SHOULDER DISLOCATIONS

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Shoulder dislocation is a common injury in contact sports. It can also be a recurrent injury in the athlete. In a study of 105 patients with acute primary dislocations of the glenohumeral joint, 34% of the injury occurred during sports. The bias toward sport was even greater in patients less than 40 years of age and in men(1). The glenohumeral joint sacrifices stability to achieve its range of motion. Stability of the joint is dependent on several factors, which may be classified into static and dynamic restraints. Static stabilizers are the articular surface of the glenoid, the labrum, negative intra-articular pressure and the joint capsule with the superior, middle and inferior glenohumeral ligaments. The dynamic stabilizers are the rotator cuff muscles, biceps, pectoralis major, latissimus dorsi and the periscapular muscles(2).

Acute dislocations should be reduced as quickly and atraumatically as possible. Multiple techniques of reduction have been described. However, many are variations of classic techniques by Kocher, Milch, Stimson and Bosley. The techniques may be classified as traction, leverage, scapular manipulation or combinations thereof(3). A review of reduction techniques was performed by John Kuhn in 2006(4). His review of the literature found only one randomized trial comparing the Kocher and Milch techniques. In this study by Beattie et al., 111 patients were randomized by day of presentation (odd or even) to reduction of shoulder dislocation by the Milch or modified Kocher technique(5). If one technique was not successful, the other was used. This study did not show any statistically significant differences in success rates for the 2 techniques.

The other studies in the literature on reduction techniques were descriptions of techniques reported without results, case series, or prospective cohort studies of a particular technique with no comparison. The differences in variables, such as different methods of premedication and analgesia, practitioners of different experience performing the reduction and presence or
absence of fractures also make it difficult to make conclusions based on these studies. From this review, the evidence is not strong enough to make recommendations for a particular reduction technique.

After reduction of the dislocated shoulder, patients have traditionally been placed in an arm sling in the position of adduction and internal rotation for variable periods of immobilization. This is followed by rehabilitation focused on restoration of active motion and periscapular muscle strengthening(2). However, a number of studies of non-operative treatment for anterior shoulder instability have been unable to show that any treatment is better than another, and all have been unable to reduce the rate of recurrence(6).

A prospective multicentre study in Sweden with 255 patients followed for two, five, 10 and 25 years has been performed by Hovelius et al(7-10). The patients were randomized into two groups. Group 1 patients had shoulders immobilized with the arm tied to the torso for a minimum of 21 days to four weeks. The other patients were placed in a sling until the patient was comfortable (Group 2). The duration of immobilization in this group ranged from one day to two weeks. Patients from group 1 who did not complete the entire of duration of immobilization were followed as a separate group. At two year follow-up, the groups showed an equal rate of recurrence of 29%. The recurrence rate increased at five year follow-up for both groups but the duration of immobilization did not affect the rate – 44% for Group 1 and 45% for Group 2. This pattern was repeated at the 10 year follow-up, with 48% recurrence in Group 1 and 49% in Group 2. Results at 25 year follow-up showed that immobilization after the primary dislocation did not change the prognosis. Overall, 43% of shoulders had not redislocated, and 7% had redislocated once. 14.4% of the cohort had recurrent dislocations that had become stable over time, while 7.9% were still considered to be recurrent. 27% had undergone surgery for the treatment of recurrent instability.

The study by Hovelius et al. also showed that age was a significant factor for recurrence. The risk of two or more recurrent dislocations in patients who were 23 to 29 years old at the time of original injury was 0.5 in comparison with the risk in those who had been 12 to 22 years old. The risk was reduced to 0.15 when patients who had been 30 to 40 years old at the time of the injury were compared with those who had been 12 to 22 years old. A later prospective study in Greece followed 308 patients for an average of 5.9 years(11). This study showed similar results with the overall recurrence rate in all ages being 50% but rising to 88.9% in the 14 to 20 year age group. The duration of immobilization did not affect the rate of re-dislocation of the humeral head.

Another study of 538 patients was performed in the United Kingdom from 1996 to 1999(12). This was a prospective, observational cohort study of consecutive patients with a first-time anterior dislocation of the shoulder. The cohort was nonselective with all patients during the study period presenting to
the emergency department providing the only acute musculoskeletal trauma service for the local adult population. All patients were instructed to wear a sling for six weeks after dislocation. The aim of the study was to clarify the risk factors leading to early redislocation within the first six weeks after a first-time anterior traumatic dislocation. 17 (3.2%) of the 538 patients in the cohort sustained an acute redislocation. With the exception of one patient who had discarded his sling, all redislocations occurred despite sling immobilization.

Handoll et al. performed a Cochrane review of the conservative management following closed reduction of traumatic anterior dislocation of the shoulder in 2006(13). This Cochrane review searched for randomized or quasi-randomized controlled trials but very few potentially eligible studies were found and only one study was included. This was a preliminary report by Itoi in 2003(14). The trial by Hovelius was excluded because overall, the study was considered neither randomized nor quasi-randomized. The trial had involved 27 centres and while in the six main centres, allocation to the two different durations of immobilization was based on date of shoulder dislocation; in the other 21 centres, treatment was according to customary practice. The Cochrane review concluded that there is a lack of evidence from randomized controlled trials to inform the choice of conservative management following closed reduction of traumatic dislocation of the shoulder.

Itoi et al. noted that although several studies have been performed to assess different durations and methods of immobilization, no experimental data had been found to support immobilization of the arm to the trunk(15). They observed that the Bankart lesion occurs in 94 to 97% of shoulders after an initial dislocation and hypothesized that healing of the Bankart lesion accounts for the 52 to 80% of patients who do not redislocate and for the spontaneous cessation of dislocations in 20% of patients with recurrent dislocations(16). They suggest that lack of effectiveness of shoulder immobilization and duration of immobilization on recurrence rates, may be explained by the Bankart lesion not reducing well in the conventional position of immobilization in internal rotation. They performed cadaveric and magnetic resonance imaging studies, which showed that the Bankart lesion edges were coapted in an adducted and externally rotated shoulder position(15-17). Cadaveric studies were also performed by Miller et al. in Australia and it was found that external rotation significantly increased the labrum-glenoid contact force(18). No detectable contact force was found with the arm in internal rotation and the contact force increased as the arm passed through neutral rotation and reached a maximum at 45 degrees of external rotation.

A randomized prospective study was subsequently performed by Ito et al. and published in 2007(16). 198 patients with an initial anterior dislocation of the shoulder were randomly assigned to be treated with immobilization in
internal rotation or ten degrees external rotation for three weeks. The outcome measure was a recurrent dislocation or subluxation, and the minimum follow-up period was two years. The recurrence rate in the external rotation group was 26%, compared to 42% in the internal rotation group. This provided for a relative risk reduction of 38.2%. The relative risk reduction was even greater in patients aged 30 or younger, at 46.1%.

These results appear promising but further clinical studies are needed to show that this is a reproducible result. In summary, the literature does not provide evidence to recommend any particular reduction technique over others. Neither immobilization in internal rotation nor the duration of immobilization in internal rotation affects recurrence rate. One clinical study and some cadaveric and imaging studies suggest that recurrence rate may be reduced by immobilization in external rotation.

REFERENCES