



# Which technique is better for reduction of anterior shoulder dislocation? External rotation or Milch method. A review of literature

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### ABSTRACT

Anterior shoulder dislocation is the most common joint dislocation in human body. Many methods are traditionally described for reduction of shoulder dislocation. Most of these techniques are painful to patients and may be associated with further injury. An ideal method should be easy, effective, and less painful, not associated with iatrogenic complications and should be easy to teach and learn. Among different methods of reduction, external rotation and Milch methods are more popular. Both methods are found to be atraumatic, relatively painless and can be performed without anesthesia. In this article, we aimed to review the literatures regarding these two methods of reduction and comparing their success rate and outcome. We reviewed the literature to find articles related to reduction of anterior shoulder dislocations applying one of two techniques described above. We searched PubMed and Google Scholar. In total, 46 articles were found, of them 17 articles -which mainly focused on anterior shoulder dislocation reduction by means of two above methods-were included in this review. The results showed that both techniques were effective, safe, relatively painless, and were well tolerated with no complications, but the external rotation method was superior.

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## Introduction

The shoulder joint is a complex joint and has the largest range of motion of any appendicular joint (1). Shoulder dislocation is the most common joint dislocation that occurs in our body. It includes more than 50% of all joint dislocations, and the most common form is anterior shoulder dislocation (90-95%) (2).

Most of reduction techniques for shoulder dislocation are painful and may be associated with complications. An ideal method of shoulder dislocation reduction should be easy to perform, and effective. It should also be less painful than other methods, easy to teach and learn, and without complications. Such as fractures and neurovascular injuries.

Among different methods of reduction, external rotation and Milch methods are more popular. External rotation method is a safe and reliable method, which can be performed without sedation and anesthesia. It can be performed with less pain in anterior shoulder dislocation. In Milch method, position of humerus helps to reduce the muscle force, making reduction easy and relatively painless, safe and free of complication. Both methods are found to be atraumatic, relatively painless and can be performed without anesthesia (3).

This narrative review was aimed to review the relevant literatures that compare these two methods of reduction regarding their success rate and

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outcome and finally determine which one is better.

### **External Rotation method**

This method of reduction is an acceptable reduction technique that can be frequently applied. The patient should lie down in a supine position. The operator adducts the arm gently and while the elbow is in 90 degrees flexion, tries to rotate externally slowly until the shoulder is reduced (1).

### **Milch technique**

In this technique, the patient is placed supine on the gurney and the head of the bed is elevated 20 to 30 degrees. Then, abduction and external rotation of the dislocated shoulder is performed in a slow and gentle manner. The operator stops whenever resistance to motion is encountered and continues when the patient is relaxed. If the humerus has not reduced till, 90 degrees of abduction and 90 degrees of external rotation have been reached, gentle longitudinal traction is applied along the humerus while the free hand is used to exert lateral and superior pressure on the humeral head to complete the maneuver.

### **Literature review**

We reviewed the literature to find articles related to reduction of anterior shoulder dislocations using either External rotation or Milch method. Articles that mainly focused on anterior shoulder dislocation reduction by means of two above methods were reviewed in this survey. These reduction techniques were performed without anesthesia or local anesthetic in all of reviewed articles.

External rotation method and Milch method for reduction of acute anterior shoulder dislocation have been previously compared. It was shown that the mean time required for external rotation method was 2.5 min, while it was 3.76 min for Milch method of reduction. Success rate is also reported 88.46% in external rotation method and 69.23% in Milch method. Findings suggested that there is no statistically significant difference in success rate between two methods of reduction. Findings have also shown that the external rotation method was easier, less painful, causing minimum discomfort to patients and required single doctor to perform it. There was no short term complication in both methods (3).

Another study, was performed to compare four different reduction methods for anterior dislocation of the shoulder. It was shown that all four reduction techniques provided high success rates with no statistically significant difference among them and with 92.5% success rate for external rotation method. Additionally, no new fracture was observed in post-reduction radiographies. Reduc-

tion time for external rotation method was  $4.9 \pm 1.4$  min (4).

In addition, the result of studies have shown that external rotation method for shoulder dislocations was successful in 90.7% of patients, of them 81.3% were in the first attempt and 9.4% in the second attempt. Mean reduction time was 1.5 (range: 0 to 5) minutes. Severe pain occurred in 8.6% of patients during reduction and these patients received analgesia(5).

In a study by Singh S, et al, the reduction of shoulder with Milch method was successful in 83.9% of cases. In this study, 4 patients had fracture of greater tuberosity; after exclusion of these patients the success rate reached 96.3%. The pain reduction during the procedure was 2.07 (29%) on the numeric rating scale, and became 34% after the exclusion of 4 patients with fracture of greater tuberosity. There were no fractures or neurovascular complications after the reduction (6).

In a prospective randomised clinical trial, FARES (fast, reliable, and safe) method was compared with the external rotation method for reduction of acute anterior dislocation of shoulder. The results showed that no post-reduction complications were observed in any of the patients following either methods. For external rotation method, reduction time was  $3.24 \pm 1.13$  min, pain felt during reduction on Visual Analog Scale (VAS) pain scale (0–100) was  $33.87 \pm 16.11$ , and the number of attempts taken during reduction was  $1.46 \pm 0.5$ . Successful reduction of shoulder dislocation was achieved with the external rotation method in 91.25% of patients (7).

In another study, a comparison was made between Milch and Stimson methods of reduction. The success rate of Milch technique in the first attempt was 82.5%, and average time of reduction was 4.68 minutes (8).

In a case-control study on external rotation procedure, manipulation time of the external rotation method ranged from 0.5 to 2 minutes with a mean of ( $1.3 \pm 0.7$ ) minutes. No complications were occurred in this method (9).

Findings of a study on the external rotation method of reduction in acute anterior shoulder dislocations showed that in 64.5% of cases the reduction time was less than 5 minutes, and in 25.8% of cases it was less than 10 minutes. The mean reduction time in all of the cases was 3 minutes. In 80.6% of cases, no sedation and analgesia was necessary. There were no complications after reduction. In this study, 24% of patients with successfully reduced dislocations experienced severe pain during the procedure (10).

In addition, the results of other studies demonstrated that reduction of the shoulder dislocation

with use of the external rotation method was achieved within two minutes in 56% and within five minutes in 25% of patients, and total success rate was 81%. No short-term complications were also noted for this method (11). The success rate was reported 86.25% to 91% for Milch and about 90% for external rotation method in other studies (12-14). Also, it was reported that in the Milch technique reduction was easy, produced minimal pain and discomfort for the patient, and the success rate was as high as 94.5%(15). In a study by Riebel, the primary success rate was shown 72% for external rotation method and 70% for Milch's technique(16). Moreover, in another study the success rate for external rotation method was 82% and for Milch's method was 80% (17). Also, reduction on first attempt using the Milch technique was 89.4% in Russel study. There were no complications attributable to the technique itself (18). On the other hand, external rotation method was successful in 81% of patients in another study. No complications were also attributable to the method of reduction (19).

## Conclusion

In this review, we found that success rates in articles were different. Average success rate of all articles was 86.2% (Min: 72%, Max: 92.5%) for external rotation method and 84.5% (Min: 69.23%, Max: 96.3%) for Milch technique. The mean time of reduction was 2.85 minutes for external rotation method and 3.76 minutes for Milch method. The results showed that both techniques were effective, safe, relatively painless, and were well tolerated with no complications. But the external rotation method was superior. As all of these articles were performed without anesthesia, it seems reasonable to do other studies under local or general anesthesia.

## Conflict of Interest

The authors declare no conflict of interest.

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