

# Reduction of the Separated Shoulder: A Primer for Emergency Physicians

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## **Abstract**

The reduction of a separated shoulder is a skill that all emergency physicians should develop. Many techniques are available that are safe and effective. This article reviews the approach and procedures that have been most successful in the author's practice.

## **Introduction**

In Israel, emergency medicine in the past was compartmentalized. Only orthopedists reduced shoulder separations. In 1998, emergency medicine was approved as a specialty in this country (1) and now many physicians, who are not orthopedists, will be expected to reduce dislocated shoulders. This article reviews the approach to this very common problem.

Anterior shoulder dislocation is the most common dislocation (2). It is the dislocation in the largest joint that emergency physicians are expected to treat themselves (other dislocations are a lot less common and are beyond the scope of this article). The fact that this joint is so loose - it allows flexion, extension, abduction, adduction and circumflexion to occur - makes dislocation so common. It is commonly recurrent and is most frequently seen in athletes in falls on an outstretched arm. While often patients tell you that they know their shoulder is dislocated and occasionally one can feel the empty socket, a radiograph is still recommended as often fractures may accompany the dislocation. Physical examination should test sensation over the lateral aspect of the shoulder and motor function, the patient attempting abduction and feeling the deltoid contract (2).

Once dislocation is identified, reduction should proceed as soon as possible. The longer a joint is out, the more difficult it will be to reduce. Within twenty four hours changes in the joint are evident. These may prevent relocation (personal communication, Dr. R. P.).

It is agreed that control of pain and spasm are the keys to reducing any dislocation. However, there are some techniques that can be used without any sedation at all. We will begin with these and then we will review principles of pain and spasm control before proceeding to techniques that require sedation.

## **The Hennepin Technique**

This is the author's favorite technique and it usually works within minutes without any sedation. The patient sits opposite the physician and rests his elbow on the surface of a table. Without touching the patient, the patient is asked to sit with the elbow flexed at 90 degree from the shoulder and the humerus should rest flat on the table. The physician then holds the patient's hand as in arm wrestling. That is, he clutches the

palm of the hand of the patient with his own hand. The elbow is flexed at 90 degrees with the humerus, the latter flat on the table. Then very slowly and pausing when the patient feels pain, he attempts to pin the patient's arm, that is to adduct it until it rests on the table. If the patient remains sitting in the usual position and does not lean with the doctor, then reduction usually occurs in this position as the humeral head is disengaged from under the glenoid. See **figures 1, 2.**



*figure 1*



*figure 2*

### **The Stimson Technique**

This technique is the easiest for the physician but it takes a while. The patient lies prone with the arm over the side of the gurney. Weights or sandbags are tied to the hand at the wrist but must not rest on the floor. The theory is that this will exhaust the muscles and end the spasm thus leading to reduction. In truth this takes a while but it can often be hastened when combined with scapular manipulation (see below) or with sedation (see below).

### **The Scapular Manipulation Technique**

This technique is unique for two reasons. Firstly, instead of trying to manipulate the humerus up into position, the scapula is manipulated downward to meet the humerus. Another innovation is that it was discovered and first described by an emergency physician (3), and initially published in the *Annals of Emergency Medicine*. Thus it is unlikely that your orthopedists know of this technique. The author has had much success with this but it requires some degree of physical strength and requires some traction on the arm at the same time, either by pulling on the arm or by attaching weights as with the Stimson technique. Sedation is not generally necessary, but it may help. The technique involves having the patient lie prone. The scapular tip, that is the point of the triangle, is identified and is pushed medially, forcing the glenoid downward to meet the humeral head. See **figure 3**.

### **Sedation**

Sedation requires both an analgesic and a muscle relaxant. Both should be short acting and reversible, if possible. The author has had much success with aliquots of 2mg of midazolam (Dormicum) and 2 mg of morphine. The author gives both together until some degree of sedation is obtained. This is cautious, short acting and reversible, but the synergy between the two medications may cause oversedation. It is for this reason



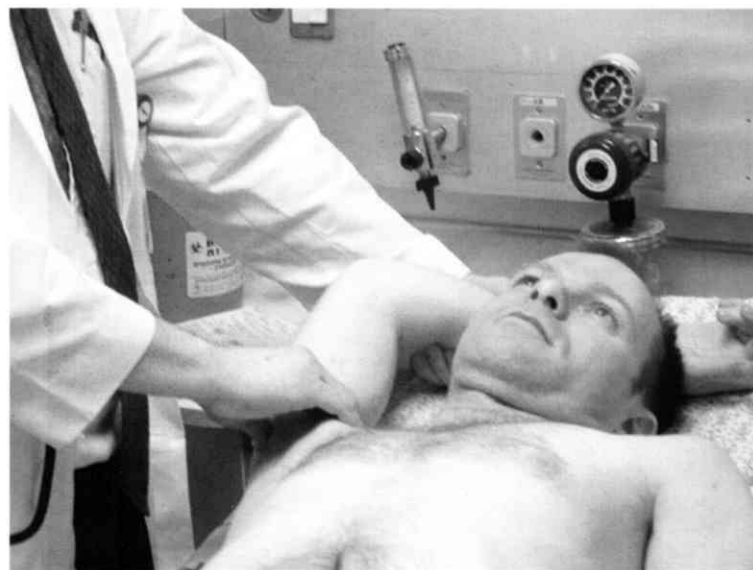
*figure 3*



*figure 4*



*figure 5*



*figure 6*

that some prefer ketamine (Ketalar) 2mg/kg IV plus a small amount of midazolam but this is, of course, irreversible until it wears off. It is safe and usually lasts for 20 minutes. Fentanyl is a short acting analgesic that can take the place of morphine. It is less available, expensive and is expressed as micrograms per kilogram, which the author has always found cumbersome. Propofol and methohexital can give deep sedation and wear off quickly but the former can cause sudden apnea and the latter, in my opinion, requires experience in handling barbiturates. Neither has analgesic effects. There are techniques (5) described in the literature using lidocaine anesthesia injected into the joint but these techniques are cumbersome and require some degree of skill. They are beyond the scope of this article. Basically, adequate analgesia and muscle relaxation is crucial if initial attempts to return a dislocated shoulder are unsuccessful.

### ***Traction-Countertraction Method***

This technique is safe but it requires an assistant, some sedation and some degree of strength. The two methods that are most commonly used are as follows. A sheet is inserted under the affected shoulder and an assistant stands on the other side of the body pulling both ends of the sheet caudally. The physician applies traction to the arm. Alternatively, a sheet is tied around the patient. It is put under both arms and pulled from behind by an assistant. Another sheet is tied around the physician and the patient flexes his arm at the elbow and inserts it in between the physician's abdomen and the sheet. As the patient is pulled from behind by the assistant, the physician walks backwards. In both these techniques patience and ample sedation are necessary. See **figure 4**.

### ***The Milch Technique***

The author has less experience with this technique, but it is supposed to be safe and easy to perform. The patient attempts to lift his arm until it is overhead. At that point, rotation and traction are applied and as the head of the humerus pulls out from under the glenoid rim, it reduces. See **figure 5, 6**.

### ***Techniques to Avoid***

The old fashioned Hippocratic technique, which was the insertion of a foot into the axilla with traction on the arm and the Kocher technique - leverage, adduction and internal rotation - are dangerous. There is a high incidence of brachial plexus injuries and fractures of the humeral head. It is best to realize that there are some shoulders that you just can't reduce and these are best treated in the operating theater under general anesthesia.

### ***After Reduction***

Often, but not always, the physician will feel the shoulder relocate, or the patient will know. In any case, a post reduction x-ray is necessary to rule out a fracture (the Hill Sachs Lesion, which results from impingement of the humeral head against the socket). Afterwards, the shoulder is immobilized. Current thought is that six weeks of immobilization is necessary.

### ***Conclusion***

Shoulder reduction is a technique with which all physicians practicing emergency medicine should be familiar. One should master at least two techniques so as to have a back up if one is unsuccessful. One should also be well versed in sedation. The author's own personal experience is, that in ten years, he was unsuccessful in the reduction of only two separated shoulders, both of which were taken to the operating suite for reduction. The use of these techniques should yield similar results for the reader.