

Comparison between traction-countertraction and modified scapular manipulation for reduction of shoulder dislocation

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【Abstract】 Objective: One of the most common joint dislocations presented to the emergency department (ED) is anterior shoulder dislocation (ASD). Various techniques for the treatment of this abnormality have been suggested. In this study, we evaluated the efficacy and success rate of modified scapular manipulation (MSM) as a painless procedure compared to traction-countertraction (TCT) for reduction of ASD.

Methods: Patients with ASD who were presented to ED of Baqiyatallah Hospital, Tehran during 2011 were included. They were randomly divided into MSM group or TCT group and then pain at reduction, time of reduction, duration of hospitalization, and success rate were compared. In TCT group, reduction was performed using sedative and antipain medications.

Results: Ninety seven patients (81.6% male) with a

mean age of 34.15 years±13.48 years were studied. The reduction time between both groups showed a significant difference (470.88 seconds±227.59 seconds for TCT group, 79.35 seconds±82.49 seconds for MSM group, $P<0.001$). The success rate in MSM group in the first and second effort were 89% and 97% whereas 73% and 100% in the TCT group respectively ($P<0.001$).

Conclusion: It seems that the manipulation technique can be more successful than the TCT method at the first effort whilst the second effort has the opposite results. Also MSM can be safer, cheaper and more acceptable for patients than TCT as a standard traditional method.

Key words: *Manipulation, orthopedic; Traction; Shoulder reduction*

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Shoulder is the most mobile joint of the body that can rotate in different directions and this characteristic causes higher likelihood of joint dislocation compared to other joints.¹ Prevalence of shoulder dislocation is 17 per 100 000 individuals with two age peaks: first in youths aged 20-30 years and second in elderly women.² Reduction techniques shall be performed fast and effectively with least possible pain and even without pain if possible. These techniques should not cause doctor's fatigue and induce further injury to the joint. Traditional methods of reduction include traction-countertraction

(TCT) technique and Kocher's maneuver.³⁻⁷ These techniques might impose additional trauma which can induce nervous damage or vascular injury. Moreover, they are painful and application must be accompanied with prescription of sedative.

In most emergency departments (ED), intravenous narcotics and benzodiazepine are commonly used for reducing pain caused by reduction of shoulder dislocations. These drugs are often effective but also have side effects such as respiratory suppression and complications resulting from central nervous system suppression, which necessitate close and precise monitoring of patient such as cardiac and pulse monitoring, as well as oximetry.² Novel methods have been proposed and one of them is scapular manipulation technique (SMT) for anterior shoulder reduction initially reported by Bosley et al⁸. During the recent years, a couple of studies have been conducted on efficiency

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of this technique mainly in the United States but it has been less investigated in Europe and Asia. Furthermore, scarce researches have been carried out to comparatively analyze this technique with the standard technique, i.e. TCT technique. In this study we compared TCT versus modified scapular manipulation (MSM) in terms of efficacy and safety to declare which method is better in ED where more rapid and accurate procedures should be done.

METHODS

Study design and participants

This cohort study was conducted on patients with anterior shoulder dislocation (ASD) who referred to ED of Baqiyatallah Hospital during 2011. Sampling was performed with a simple census method. According to the description and clinical examination, patients suspected to suffer ASD were enrolled into the study after imaging. The patients who had following conditions were excluded from the study: 1) dislocation together with fracture except less than 5 mm displacement of great tubercle of humerus, 2) admitting more than 24 hours after the trauma, 3) severe neurovascular trauma, 4) contraindications for sedation due to cerebral trauma, poisoning, etc, 5) being unable to lie in prone position for any reasons, 6) age below 16 and above 60 years, 7) serious multiple traumas, 8) posterior dislocation, and 9) being not content with performing this technique.

Reduction protocol

Following confirmation of anterior dislocation, treatments procedures were explained to the patients and informed consent forms were filled by them or their family. The patients were divided into TCT (50 cases) and MSM (47 cases) groups with simple randomization. All procedures were carried out by a physician. Compared to routine manipulation technique, MSM was performed in prone position, by using a pillow under the shoulder, rotating head against the dislocated shoulder for more relaxation, hanging arm off the edge of the bed, finding the edge and spine of scapula and finally manipulating the scapular to treat the dislocation (Figure 1). The unsuccessful cases at the first MSM effort were then treated with TCT. In the case of failure in both treatments, the patient was referred to operation room for reduction. In TCT method, reduction was

performed using sedative and antipain medications (Figure 2). The sedative drugs included fentanyl with dosage of 2-2.5 mg/kg and 21 mg midazolam and morphine sulfate with dosage of 0.1 mg/kg, which were administered under cardiac monitoring.



Figure 1. MSM technique.



Figure 2. TCT technique.

Assessments

During the procedure and following the reduction, the patients were evaluated for vital signs and likelihood of trauma to neurovascular system. Numerical visual analogue scale (VAS) was applied to assess the pain severity. Also, the patients expressed their pain severity with scores ranging 1 to 10. Satisfaction level of each reduction was also assessed by means of questions which were filled by physicians and patients with scores ranging 1 to 4 (1=poor, 2=fair, 3=good, and 4=excellent). Ethic Committee of Baqiyatallah University of Medical Sciences approved the study plan.

Statistical analysis

The data were inserted into SPSS 16.0. The obtained continuous variables were reported as mean±standard deviation (SD). Descriptive statistics in qualitative variables were expressed in percentage. Primarily, univariate analyses were

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