

# *Sedative-free Reduction of Acute Anterior Shoulder Dislocation Saves Postreduction Service Time in the Emergency Room*

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## **Abstract**

**Background:** Emergency room service is a workload and congestion. Acute anterior shoulder dislocation is commonly encountered in emergency room and needs reduction of the dislocation. The reduction techniques such as traction-counter traction (TCT), Milch or traction, abduction and external rotation maneuver (TAE) are performed under either sedation or without sedation. However, the reduction under sedation needs postsedative recovery time which is a work load and makes long service time in emergency room.

**Objective:** To compare postreduction service time of acute anterior shoulder dislocation reduction under sedative-free and sedation.

**Patients and Methods:** We reviewed medical records and radiographs of 71 acute anterior shoulder dislocation patients. The reduction was successfully performed by TCT, Milch or TAE techniques. The patients were divided into two groups. In Group 1 and 2 the reduction was performed under sedative-free and sedation respectively. The sedation technique was intravenous pethidine or morphine or combination of either pethidine or morphine with diazepam. Time from post successful reduction until the patient was discharged from emergency room was recorded and statistically analyzed by using Student t-test. P value  $\leq 0.05$  is considered as significant difference.

**Results:** There were 38 patients in group 1 and 33 patients in group 2. The average time from post successful reduction until patient discharge from the emergency room (PD) of Group 1 was 45.08 minutes (SD, 22.99) and of Group 2 was 84.64 minutes (SD, 24.89). The statistical analysis showed that PD time of Group 1 was significantly 39.56 minutes lesser than of Group 2 ( $p < 0.001$ )

**Conclusions:** Reduction of acute anterior shoulder dislocation under sedative-free can save more postreduction service time than under sedation.

**Key words:** Acute anterior shoulder dislocation, emergency room, reduction, sedative-free, sedation, postsedative recovery, service time

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## INTRODUCTION

Medical service in Siriraj emergency room is a heavy workload. Acute anterior shoulder dislocation is one of common encountered service<sup>1,2</sup>. There are several effective reduction techniques of the dislocation in the emergency room such as traction-countertraction technique (TCT) which is performed under sedation or anesthesia permitting successful reduction. After reduction, the patient needs postsedative or post-anesthetic recovery time<sup>3-7</sup> and makes long service time. Another are gentral traction, abduction and external rotation technique (TAE) which had previously been reported by Harnroongroj et al.<sup>2</sup> and Milch et al, which was called Milch techniques<sup>2,8</sup>. The techniques apply for the reduction without using sedation or anesthesia and no assistant so that no need of recovery time of postsedation or postanesthesia and decrease workload. Saving service time is important for decreasing workload in emergency room. This study was designed to compare postreduction service time of acute anterior shoulder dislocation reduction between sedative-free and sedation.

## PATIENTS AND METHODS

In Siriraj emergency room, the patients who sustained acute anterior shoulder dislocation, were reduced by TCT, TAE or Milch techniques under sedation or without sedation. The technique of sedation is either intravenous injection of 0.1-0.2 mg/kg morphine or 1-2 mg/kg pethidine. The other sedative technique is combination of either intravenous 0.1-0.2 mg/kg morphine or 1-2 mg/kg pethidine with 5-10 mg diazepam.

Between 2008-2010, we reviewed medical records and radiographs of acute anterior shoulder dislocation patients by using inclusion criteria as follows: the successful reduction using TAE or Milch techniques without sedation and TCT, TAE or Milch techniques under any technique of sedation, all types of acute anterior shoulder dislocation including fracture greater tuberosity, one or more episodes of the dislocation, all ages, causes in term of sport and non-sport injuries, and both genders. The exclusion criteria were fracture-dislocation of the shoulder except fracture of greater tuberosity, dislocation caused by electric shock or epilepsy, neglected or old dislocation, reduction performing in operative room under general

anesthesia, the patient who had associated injuries and needed hospitalization, incomplete medical record and radiograph and the patient who was discharged from emergency room but delayed from non-medical problems such as financial or patients' relative problems. The patients were divided into 2 groups. Group 1, the reduction technique was performed by TAE or Milch techniques without sedation. Group 2, TCT, TAE or Milch techniques under sedation. Age, sex, sites, a cause of injury and episodes of the dislocation, complication of reduction in term of neurovascular injury or fracture were recorded. Time from postsuccessful reduction until patient discharge from the emergency room (PD) was recorded as a postreduction service time of acute anterior shoulder dislocation.

The demographic data of both groups were analyzed by Chi-square test or Fisher's exact test for categorical data and Student's t test for continuous data and  $p \leq 0.05$  is considered as significant difference of PD time.

## RESULTS

There were 38 patients in group 1 and 33 patients in group 2. The demographic data of both groups were showed in Table 1. There is no complication of the reduction of both groups. The average PD time of group 1 was 45.08 minutes (SD, 22.99) and of group 2 was 84.64 minutes (SD, 24.89). The statistical analysis showed that PD time of group 1 was significantly 39.56 minutes lesser than of groups 2 ( $p < 0.001$ ).

## DISCUSSION

Many medical problems are service as emergency definitive treatment and might cause time consumption in emergency room. The emergency medical treatment which is effectively done in short period can save time and decrease workload in emergency room. Acute anterior shoulder dislocation is common encounter in emergency room and needs definite treatment by reduction of the dislocation<sup>1,2</sup>. Many techniques of reduction such as traction-countertraction is simple and commonly used in emergency room. However, the reduction uses excessive traction force and is performed under sedation or general anesthesia<sup>9</sup>. The patient needs recovery time for postsedation or

Table 1. The data of patients

	Group 1 (n = 38)	Group 2 (n = 33)	p-value
Sex			0.875
Male	26 (68.42%)	22 (66.67%)	
Female	12 (31.58%)	11 (33.33%)	
Age (yrs.)	40.63 ± 19.73 (17-83 yrs.)	47.91 ± 19.26 (19-85 yrs.)	0.069
Dislocation			0.618
No fracture	35 (92.11%)	32 (96.97%)	
Grater tuberosity fracture	3 (7.89%)	1 (3.03%)	
Mechanism of injury			0.676
Sports	18 (47.37%)	14 (42.42%)	
Non-sports	20 (52.63%)	19 (57.58%)	
Episode of dislocation			0.742
I	32 (84.21%)	29 (87.88%)	
>I	6 (15.79%)	4 (12.12%)	
Technique			---
TAE	38 (100%)	---	
Milch	---	18 (54.55%)	
TCT	---	15 (45.45%)	
Complication			
PD time (min)			< 0.001
Mean ± SD	45.08 ± 22.99	84.64 ± 24.89	
Min-Max	13-92	45-172	
95% CI	37.52-52.64	75.81-93.46	

postanesthesia, thus significantly increases service time and causes congestion of emergency room.

There are many reports about reduction of acute anterior shoulder dislocation under sedative-free techniques such as Milch, Stimson, scapular manipulation and Oxford Chair technique<sup>1,2,8,9</sup>. The sedative-free technique can save amount of service time. However, the successful rate of reduction has important impact on service time saving. Oxford Chair technique provides successful reduction of 62% of cases<sup>9,10</sup>. Kocher's maneuver is the technique which requires intensed force and exhibits high complication rate of fracture of humerus and neurovascular injury. The surgeon hesitates to perform the reduction by using this technique<sup>9</sup>. Stimson's technique performs the reduction at lateral position of patient and applied weight on the wrist and waits till spontaneous reduction<sup>11</sup>. The reduction is successful by gravity effect and time-consuming. Scapular manipulation maneuver is fixation of humeral head in position and rotate scapular in order to put the humeral head into glenoid cavity. This technique has 74-86% success of

reduction<sup>1</sup>. In Siriraj emergency room, we use TAE or Milch technique for reduction of acute anterior shoulder dislocation under sedative-free which need no time for postsedative recovery. The technique is simple, requires no excessive force of traction and needs no assistant. The success rate of reduction is 90.3 and 83%, respectively<sup>2,8,9</sup>. The PD time of Group 1 cover all postreduction managements whereas postsedative recovery time is additionally demanded for Group 2. In our study, the PD time of Group 1 and 2 were 45.08 and 84.64 minutes respectively. So, the service time in emergency room was 39.56 minutes saved which is obviously profitable for emergency room service.

In conclusion, under sedative-free reduction of acute anterior shoulder dislocation can save significantly postreduction service time in emergency room.

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