

Reproducibility of the Seated Reduction Technique for Anterior Shoulder Dislocation When Performed by Doctors with Minimal Experience in the Technique

Sadiq Jamali^{1*} and Stephen Edward Asha^{2,3}

¹Department of Emergency Medicine, Ryde Hospital, Sydney Australasian College for Emergency Medicine, Australia

²Department of Emergency, St George hospital, Sydney, Australia

³Faculty of Medicine, University of New South Wales, Sydney, Australia

Abstract

Background: A sedation-free seated reduction technique for shoulder dislocation was demonstrated safe and effective when performed by an experienced clinician. It is unclear if these results are reproducible in doctors with minimal experience of the technique.

Aim: To determine success of reduction in doctors with minimal experience

Method: Minimally experienced doctors performed reductions following an education session (group 2). Success and complications were compared to a retrospective cohort of reductions performed by an experienced clinician (group 1).

Results: There were 65 patients in group 1, 38 in group 2. Success in group 1 was 100% (95% CI 95-100) and 95% (95% CI 82-99) in group 2, $p = 0.06$. There were no complications. Median length of stay was 60 minutes (IQR 34-102) in group 1 versus 80 minutes (IQR 38-112) in group 2, $p = 0.35$.

Conclusion: The seated technique is an effective method of shoulder reduction that is reproducible in doctors with minimal experience.

Keywords: Orthopaedics; Sports medicine; Shoulder joint; Dislocations

Introduction

Anterior shoulder dislocation is a common presentation to the Emergency Department (ED) and accounts for 95-98% of all shoulder dislocations [1]. Most patients with anterior shoulder dislocation are within the 18-25 year age group and is commonly related to sporting activity [1]. There are many methods for reducing a shoulder dislocation [2-10]. Most techniques require sedation which entails transport to ED and treatment by staff experienced in managing potential airway complications. Further-more, length of stay is extended by the recovery times following sedation.

A novel seated method for the reduction of anterior shoulder dislocation was developed by the principal author [11]. This technique does not require the administration of sedation or analgesia. The technique has been described in detail previously [11]. In brief the technique involves the following steps:

1. The patient sits with the back-rest of a chair against their chest, or against the affected side.
2. A towel is placed on the back of the chair and the patient is assisted with the placement the axilla of the affected side on the towel whilst drawing the affected arm over the back of the chair.
3. Gentle continuous downward traction of the wrist or forearm is performed whilst reassuring the patient. There is no external rotation of the arm or scapular manipulation. The patient is continuously reassured to encourage relaxation until joint reduction occurs.

This study demonstrated that the seated reduction technique was comparable in terms of safety and efficacy to other techniques that involved patient sedation, but with the benefit of a large reduction in ED length of stay. However, in this study reductions performed using

the seated techniques were all done by the principal author or under the supervision of the principal author. As consequence it is not clear from this study that the high level of safety and efficacy achieved could be reproduced if performed by the broader community of doctors with minimal experience in the technique.

We hypothesised that the seated technique for reduction of anterior shoulder dislocation is safe and effective when performed by doctors with minimal experience in the technique. The aim of this study was to determine the success rate and complication rate of the seated reduction technique when performed by ED doctors with minimal experience and compare this to the success and complication rate when performed by the principal author.

Methodology

This study was conducted at three hospitals. The Prince of Wales hospital is an urban tertiary referral hospital with an adult ED (patients aged over 16 years) that was seeing over 45,000 patients annually at the time of data collection. Ryde and Canterbury are urban community hospitals with mixed adult and paediatric EDs that see approximately 21,000 and 34,000 presentations annually respectively.

Permission for this study was granted by the Northern Hospital

***Corresponding author:** Sadiq Jamali, Department of Emergency Medicine, Ryde Hospital, Sydney Australasian College for Emergency Medicine, Australia, E-mail: drjamali@hotmail.com

Received March 13, 2012; **Accepted** March 28, 2012 **Published** March 30, 2012

Citation: Jamali S, Asha SE (2012) Reproducibility of the Seated Reduction Technique for Anterior Shoulder Dislocation When Performed by Doctors with Minimal Experience in the Technique. *Emergency Medicine* 2:109. doi:10.4172/2165-7548.1000109

Copyright: © 2012 Jamali S, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Network Human Research Ethics Committee of the South Eastern Sydney and Illawarra Health Service.

Data was collected on two groups of patients. Patients in group 1 had their dislocated shoulder reduced by the principal author or under the direct supervision of the principal author. Data on patients in group 1 were obtained retrospectively from a medical record review. These patients all presented to the ED of the Prince of Wales hospital between January, 2005 and December, 2007. Patient data was collected utilising the ED Information System (EDIS). Patients were identified through EDIS by searching the ICD code: 9 831.00 (shoulder dislocation). Medical records and x-rays were reviewed for inclusion and exclusion criteria. Patients were included if they were over the age of 16 years, anterior shoulder dislocation was confirmed on x-ray, their shoulder was reduced by the seated technique, had no other significant injuries and had documentation that the reduction was performed by the principal author or under the supervision of the principal author. Patients were excluded if they had previous surgery on the shoulder or had complications of shoulder dislocation prior to relocation such as a fracture or neurovascular injury. Age, gender and ED length of stay were determined from the EDIS database, while data on success and complications of reduction were abstracted onto a standardised data collection template. Complications that were specifically looked for were fractures on the post-reduction x-ray and documentation of clinical evidence of neurovascular injury.

Patients in group 2 had their dislocated shoulder reduced by doctors other than principal author and were not supervised by the principal author. Patients in Group 2 were enrolled prospectively from November 2010 until April 2011, from the EDs of Canterbury and Ryde hospitals. Patients were eligible for the study if they were over the age of 16 years, anterior shoulder dislocation was confirmed on x-ray, had no other significant injuries, had a Glasgow Coma Score of 15, were able to sit in a chair and were able to understand English. Patients were excluded if they had previous surgery on the shoulder or had complications of shoulder dislocation prior to relocation such as a fracture or neurovascular injury. Doctors at the participating EDs received an education session and a simulated demonstration of the technique. Consultants, registrars and junior medical officers all participated in shoulder reductions. A standardised data collection form was completed for each patient and included patient demographics, first or recurrent dislocation, ED length of stay, success of reduction and complications. Complications that were specifically looked for were fractures on the post-reduction x-ray and clinical evidence of neurovascular injury.

Outcomes between the two patient groups were compared. The primary outcome was the proportion of patients with a successful reduction in each group. Secondary outcomes were the proportion of patients with complications and the ED length of stay.

Data was analysed in SPSS statistical software v18 (SPSS Chicago, IL, USA). Confidence intervals (CI) of proportions were calculated using clinstat online software (www-users.york.ac.uk/~mb55/soft/soft.htm). Proportions were compared using Pearson's Chi-square statistic. As the data was non-normally distributed, continuous variables are reported as medians, with their inter-quartile range (IQR) and analysed using the non-parametric Mann-Whitney U test. The level of statistical significance was tested at $\alpha < 0.05$.

Results

There were 103 patients studied, 65 in group 1 and 38 in group 2. Demographics of the patients are presented in (Table 1). The primary

and secondary outcomes are presented in (Table 2). The success of reduction in group 1 was 100% (95% CI 95-100) compared to 95% (95% CI 82-99) in group 2. This difference was not statistically significance ($p = 0.06$). The two patients in group 2 who had a failed reduction by the seated technique were both first time dislocations. There were no complications in either group. The median length of stay was 60 minutes (IQR 34-102) in group 1 versus 80 minutes (IQR 38-112) in group 2. This difference was not statistically significant ($p = 0.35$).

Discussion

This study demonstrated that the seated technique for anterior shoulder reduction had a high level of success without complications when performed by doctors with minimal or no previous experience with the technique and following a single educational presentation. These results were very similar to those achieved by the principal author, demonstrating that the high success rate without complication can be reproduced amongst other doctors of varying experience level and with only minimal instruction. The length of stay in the ED was similar in both groups.

There are a wide variety of techniques available to the clinician for shoulder dislocation (2-10). The advantage of the seated reduction technique is that it can be performed without the need for analgesia or sedation, without the need for specialised equipment and skills, it can be performed with one operator and the technique is very simple which means it is easy to learn and remember for practitioners who infrequently perform shoulder reductions.

Limitations

There are a number of limitations to this study. This is a part retrospective chart review. Not all eligible patients may have been identified using the search function in the EDIS database as this relies on the correct diagnosis having been entered when the patient was discharged. The accuracy of abstracted data is dependent on the quality of documentation in the medical record and complications may have occurred that were not recorded falsely improving the apparent safety of the procedure. Also, given the small sample size this study would not have enough power to detect infrequent complications.

ED length of stay is subject to multiple potential confounders. ED length of stay is dependent on many variables, with treatment time being only one small component. As the two groups were from different hospitals, ED length of stay may be influenced largely by factors such as time waiting to be seen and time waiting for x-rays. Both these times tend to be longer in tertiary centres as is the case for patients in group 1 but not for patients in group 2.

	Group 1	Group 2
Patients (n)	65	38
Median age in yrs (IQR)	31 (22-50)	25 (19-41)
Male (95% CI)	80.0% (70.3-89.7)	84.2% (72.6-95.8)
Reduction done by author	36	—
Reduction supervised by author	29	—
Previous dislocation (95% CI)	—	50% (33-67)

Table 1: Patient demographics.

	Group 1	Group 2	p
Successful reduction (95% CI)	100% (95-100)	95% (82-99)	0.062
Complications(95% CI)	0% (0.0-5.5)	0% (0.0-9.3%)	— ‡
ED LOS in minutes (IQR)	60 (34-102)	80 (38-112)	0.354

‡ Chi-sqaure cannot be calculated when no events occurred.

Table 2: Outcomes.

Conclusion

The seated technique is a safe and effective method for shoulder reduction which can be performed without the need for sedation and without specialised skills and equipment. We have demonstrated that the technique can be reproduced amongst practitioners of varying experience level and with a minimum of training.

Competing Interests

None.

References

1. Wilson SR (2011) Shoulder dislocation in emergency medicine.
2. Kuah DE (2000) An alternative slump reduction technique of anterior shoulder dislocations: a 3-year prospective study. *Clin J Sport Med* 10: 158-161.
3. McNamara RM (1993) Reduction of Anterior Shoulder Dislocations by Scapular Manipulation. *Ann Emerg Med* 22: 1140-1144.
4. Matsumoto K, Itoh Y, Fukuta M, Itokazu M, Shimizu K (2009) Anterior dislocation of the shoulder: a simple and sitting method for reduction. *Curr Orthop Pract* 20: 281-284.
5. McKinley M (2009) Anterior shoulder reductions revisited. *CJEM* 11: 385-386.
6. Dyck DD, Porter NW, Dunbar BD (2008) Legg reduction maneuver for patients with anterior shoulder dislocation. *J Am Osteopath Assoc* 108: 571-573.
7. Oza MN (2004) Direct humeral head manipulation (Oza Maneuver) for anterior shoulder dislocations. *Ann Emerg Med* 44: 282.
8. Ashton HR, Hassan Z (2006) Kocher's or Milch's technique for reduction of anterior shoulder dislocations. *Emerg Med J* 23: 570-571.
9. Fernandez-Valencia JA, Cune J, Casulleres JM, Carreno A, Prat S (2009) The Spaso technique: a prospective study of 34 dislocations. *Am J Emerg Med* 27: 466-469.
10. Cunningham N (2003) A new drug free technique for reducing anterior shoulder dislocations. *Emerg Med (Fremantle)* 15: 521-524.
11. Jamali S (2011) Anterior shoulder dislocation - seated versus traditional reduction technique. *Aust Fam Physician* 40: 133-137.