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Dr. Yeshwanth Subash
D.N.B(Ortho), M.N.A.M.S,
Department of Orthopaedics,
Saveetha Medical College and
Hospital, Thandalam, Chennai,
Tamil Nadu, India

Dr. Kalanithi Ramanusan
D.Ortho, Department of
Orthopaedics, Saveetha Medical
College and Hospital,
Thandalam, Chennai,
Tamil Nadu, India

Dr. Sugumar Natarajan
M.B.B.S, Department of
Orthopaedics, Saveetha Medical
College and Hospital,
Thandalam, Chennai,
Tamil Nadu, India

Correspondence

Dr. Yeshwanth Subash
D.N.B(Ortho), M.N.A.M.S,
Department of Orthopaedics,
Saveetha Medical College and
Hospital, Thandalam, Chennai,
Tamil Nadu, India

Our experience with the external rotation method in the reduction of anterior dislocation of the shoulder

Dr. Yeshwanth Subash, Dr. Kalanithi Ramanusan and Dr. Sugumar Natarajan

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Abstract

Background: Dislocations of the shoulder are injuries frequently seen in the emergency department with the anterior type being the most common. Various methods are available in the reduction of these dislocations. The aim of this study was to evaluate the role of the External rotation method (ERM) in the reduction of these dislocations and to compare the results with that of other authors as available in literature.

Methods: 45 patients with anterior dislocation of the shoulder who presented between January 2013 to January 2015 reduced by the external rotation method were included in our study.

Results: There was a male preponderance seen in our study with the right side being most commonly affected. The most common mode of injury was slip and fall followed by sports injuries. There were 41 primary and 4 cases of recurrent shoulder dislocations. Sub coracoid type was the most common type seen. 3 patients had associated greater tuberosity fractures out of which one patient required fixation with cannulated cancellous screws. The time taken for reduction ranged from 1.5 to 5 mins with most of the cases reduced within 2 minutes. We had a success rate of 93.3% with no complications encountered in our study.

Conclusion: We conclude that the ERM is a simple, safe and easily reproducible procedure for the reduction of shoulder dislocations. It does not cause much discomfort to the patient and gives consistent reductions without the risk of iatrogenic complications associated with other methods of reduction.

Keywords: Shoulder, dislocation, closed reduction, ERM

Introduction

Dislocations of the shoulder are common injuries which are frequently seen in the emergency department with the anterior type being the most common [1, 2]. Based on the x rays subcoracoid and subglenoid are the common anatomic types seen. The mode of injury is usually due to road traffic accidents, slip and fall and sports injuries. These dislocations can either be primary or recurrent with the latter being associated with shoulder instability. Various reduction techniques are available in the management of these dislocations such as Kochers, Hippocrates, Chair, Spaso, Milch and the Matsens techniques with each having its own advantages and disadvantages [3-5]. Most of the common techniques of shoulder reduction employ traction with countertraction and hence considerable force is often required which can cause discomfort to the patient and the fact that the muscle spasm present would make it difficult to reduce the dislocation and would necessitate either analgesia or reduction under anaesthesia for the same [6-8]. Reduction under anaesthesia would require a period of hospital stay for the patient and is associated with its own risk of complications. Hence there is a need for a technique which is simple, rapid and safe causing minimum discomfort to the patient and gives good consistent reductions and is easily performed without the iatrogenic complications often associated with techniques of reduction and in this context the ERM would be an ideal reduction technique to employ. The aim of this study was to evaluate the effectiveness of the ERM in the management of dislocations of the shoulder and to compare the results with studies of other authors as available in literature.

Methods

This was a prospective study of 45 patients with anterior dislocation of the shoulder reduced by the ERM between January 2013 to January 2015. All skeletally mature patients presenting with anterior dislocation of the shoulder with or without an associated greater tuberosity fracture were included in our study while skeletally immature patients, polytrauma, haemodynamically unstable patients and patients with complex proximal humeral and glenoid fractures were excluded. The patients were seen in the emergency department and on arrival a thorough neurovascular examination was carried out and a broad arm sling was applied for shoulder support. Details regarding mode of injury, whether the dislocation was primary or recurrent were elicited from the patient and were documented in the case records. The patients were then evaluated radiologically with standard AP, scapular Y and axillary views of the affected shoulder were taken and any associated greater tuberosity fractures were noted and documented. The reduction was performed with the patient in the supine position with the arm in adduction, elbow in 90 degrees of flexion and the shoulder in 20 degrees of flexion in order to relax the anterior capsule. One hand was placed on the posterior aspect of the elbow while the other hand was placed on the wrist and the shoulder was externally rotated with sustained force till the dislocation was reduced. Care was taken to ensure that the procedure was done gently without undue force being given in order to overcome the resistance of the shoulder muscles. Neither analgesia or anaesthesia were used routinely. Post reduction another neurovascular examination was performed and shoulder strapping and broad arm sling was applied and the patient was shifted for a post reduction x ray. The patients were then asked to review after 2 weeks when a clinical assessment was done for shoulder stability and when found to be satisfactory, shoulder mobilization was started and the patient was asked to do shoulder girdle strengthening exercises and to resume work and regular activity according to their comfort level. In cases of dislocations with an associated fracture of the greater tuberosity which were managed conservatively, shoulder mobilization was done at the end of the 3rd week. The patients were not asked to review for further follow up unless required. All the patient data collected were analyzed using IBM SPSS Version 22.0. Armonk, NY:IBM Corp. Chi square test was used in the comparison of categorical variables. A P value of less than 0.05 was considered to be statistically significant.

Results

45 patients with anterior dislocation of the shoulder reduced by the ERM were studied between January 2013 to January 2015. There were 37 males and 8 females in our study.

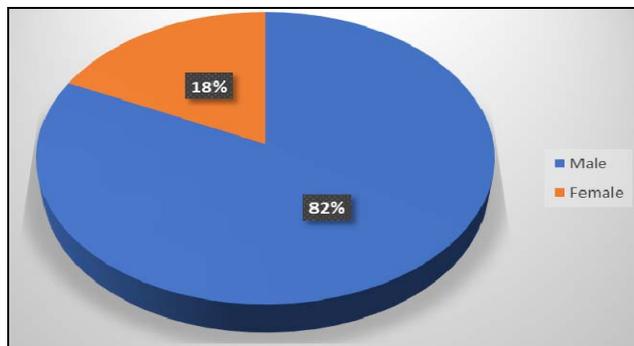


Fig 1: Sex incidence

The right shoulder being more commonly affected as seen in 32 patients

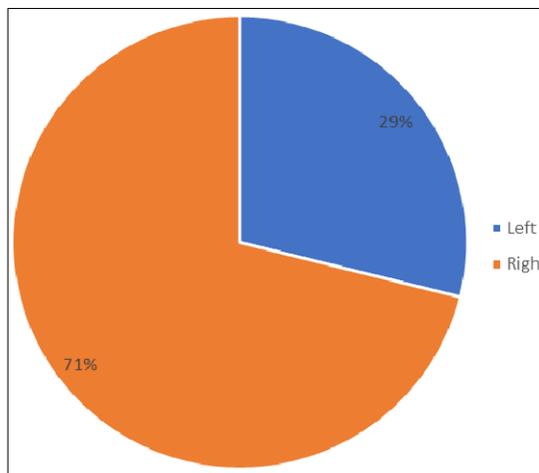


Fig 2: Side incidence

The most common mode of injury was a slip and fall followed by sports injuries.

Table 1: Mode of injury

Mode of injury	Number of patients	Percentage
Slip and fall	34	75.5
Sports injury	5	11.1
Fall from height	2	4.4
Road traffic accident	4	8.8

Subcoracoid dislocation was seen in 38 patients while 7 patients had the subglenoid type.

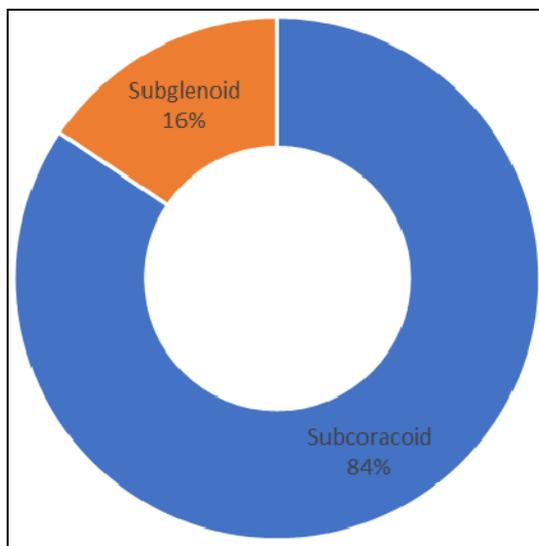


Fig 3: Type of dislocation

The dislocation was primary in 41 cases while 4 of them had a recurrent dislocation. Associated greater tuberosity fractures were seen in 3 patients and 2 of them were undisplaced and were managed conservatively while it was grossly displaced in 1 patient who underwent fixation with percutaneous 4mm cannulated cancellous screw fixation. The time of presentation to the hospital following the injury ranged from 30 minutes to 3 hours with the average being 75 minutes. The time taken for reduction ranged from 1.5 to 5 minutes with the

average being 2 minutes. Most of the dislocations were reduced within 2 minutes. Out of the 45 patients in our study, 42 were reduced in the emergency department while 3 patients were reduced in the operation theatre under short GA due to the fact that there was a lot of muscle spasm and the patients could not tolerate the procedure due to the pain. Out of the 42 cases reduced in the emergency department, only 3 patients required analgesics pre-reduction due to decreased pain tolerance. The average duration of hospital stay ranged from 35 to 85 minutes with the average being 51 minutes. One patient was admitted for the fixation of the displaced greater tuberosity fracture and he was discharged after 48 hours. We had a 93.3% success rate in our series with no iatrogenic complications encountered.

Discussion

Dislocations of the shoulder are common injuries which are frequently seen in the emergency department with the anterior type being the most common. Various techniques are available for the reduction of these dislocations with each technique associated with its own advantages and complications. Most techniques of shoulder reduction require traction for which considerable force is required causing discomfort to the patient and the muscle spasm can also make the reduction difficult often requiring analgesia or anaesthesia. Sustained traction is necessary to overcome the resistance of the muscles and there is the risk of causing an iatrogenic fracture of the proximal humerus especially in elderly patients with poor bone stock. Reduction under anaesthesia can be either under regional or general anaesthesia which results in a longer stay in the hospital and the patient is also subjected to the risks associated with anaesthesia. A study of literature of the various reduction techniques revealed the association of complications such as proximal humeral and shaft fractures, injury to the brachial plexus and the axillary vessels. Hence in this scenario the ERM is a method which is simple and effective and not associated with the iatrogenic complications seen in the other techniques of reduction^[9-12]. Marinelli *et al.* studied 31 patients over a 1 year period and reported a successful reduction in 29 patients. The average time taken for reduction was less than 2 minutes. No premedication was required in 25 of the patients while the reduction was performed under narcosis in 2 patients because of extreme pain. They had a success rate of 89%^[13]. In Eachampatti *et al.* study of 40 patients, 36 had a successful reduction with 29 patients requiring no premedication. The average time taken for reduction was less than 2 minutes with 4 patients reporting pain during the reduction and there was failure of reduction in 4 patients out of which 2 patients had displaced greater tuberosity fractures^[14]. In Mirrick *et al.* series of 85 patients, a success rate of 80% was reported with no iatrogenic complications encountered^[15]. In our series of 45 patients we had a successful reduction in 42 patients (93.3%) with 39 patients requiring no premedication. Most of the cases were reduced within 2 minutes. There was failure of reduction in 3 patients with 1 patient who had a displaced greater tuberosity fracture requiring fixation with cannulated cancellous screws. We conclude that ERM is a simple, safe and easily reproducible method of reduction which does not cause much discomfort to the patient and gives good consistent reductions. It is not associated with the iatrogenic complications associated with the other forms of reduction and can be performed without premedication or anaesthesia and thereby avoiding the potential complications associated

with them.

Conclusion

We conclude that the ERM is a simple, safe and easily reproducible procedure for the reduction of shoulder dislocations. It does not cause much discomfort to the patient and gives consistent reductions without the risk of iatrogenic complications associated with other methods of reduction.

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