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Safety and efficacy of the Prakash method in closed reduction of anterior shoulder dislocation

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ABSTRACT

Introduction: Shoulder dislocation is a frequently encountered injury in daily medical practice. Among various types of shoulder dislocations, anterior shoulder dislocation is the most prevalent. Numerous techniques have been proposed for reducing a dislocated shoulder. The objective of this study was to evaluate the efficacy and safety of the Prakash technique in treating patients with anterior shoulder dislocation who sought treatment at our hospital's emergency department.
Methods: This was a prospective study conducted from March 2023 to July 2023 in the Department of Orthopedics in Government Medical College & Associated group of Hospitals, Kota. 50 shoulders fulfilling the inclusion criteria were included in this study, and observations were noted.
Results: After conducting a statistical analysis, it was observed that the new reduction method proved highly effective, successfully reducing 98% of the shoulders without the need for anesthesia. The study included a total of 50 patients, among whom 8 (16%) had left-sided shoulder dislocation, and 42 (84%) had right-sided shoulder dislocation. Notably, the reduction could be accomplished on the first attempt in 45 patients (90%), while a second attempt was required in 4 patients (8%). Fortunately, no complications were observed during the course of the study.
Conclusion: The Prakash method for reducing anterior shoulder dislocation has proven to be a straightforward and effective technique based on our study findings. Due to its success rate and the fact that it doesn't necessitate anesthesia, we strongly recommend that both orthopedic surgeons and emergency care providers familiarize themselves with this method. It can be a valuable addition to their skill set and provide a safe and efficient option for treating patients with anteriorly dislocated shoulders.

Keywords: Prakash methods, Anterior shoulder dislocation, Medical practice

INTRODUCTION

The shoulder joint is known for its high mobility but is considered unstable in the human body. The incidence of shoulder joint dislocation varies from 2 to 8% among general populations 21 to 24 per 100,000 in developed countries.[1,2] The most common type of dislocation is anterior, and it can be caused by incidents like falling down, road traffic accidents, and sports injuries.[3] Shoulder dislocation is the most frequent orthopedic trauma observed in the emergency room.[4] Various reduction techniques are available to address shoulder joint dislocation, but many of them require sedation or anesthesia.[5] Although the choice of the reduction technique depends on the practitioner, most opt for simpler maneuvers that necessitate less sedation or anesthesia.[6] The success rate of the reduction technique also depends on the chosen method.[7,8]

The ideal reduction method would involve minimal assistance, high effectiveness, ease of performance, and minimal pain or complications.[9] However, it is noted in the

literature that commonly used techniques such as Hippocratic or Kocher do not fully meet these criteria.[10,11]

The recently developed technique by Prakash has shown promising results in addressing anterior shoulder dislocations without the need for sedation or causing pain. Prakash's method achieved a remarkable 100% success rate, and during his application of the technique to 147 dislocations, including both recent and old cases spanning from 19 days to 89 days, no complications were reported.[10]

Based on these positive outcomes, this study aims to assess the effectiveness and safety of Prakash's reduction method. The objective is to thoroughly evaluate how well this technique performs in reducing anterior shoulder dislocations and to determine its overall safety profile.

METHODS

This study was conducted prospectively from March 2023 to July 2023 at the Department of Orthopedics in Government Medical College & Associated group of Hospitals, Kota. It involved the examination of 50 shoulders that met the inclusion criteria, and relevant observations were made. Epi Info 2023 software was used for statistical analysis of data.

Inclusion criteria

It includes patient age 18 to 50 years. Patient presenting within 24 hours of the incident. Patient with only anterior shoulder dislocation. A well conscious patient who is compliant to procedure.

Exclusion criteria

Including those with concomitant fractures. Patients who presented more than 24 hours after the trauma, individuals with neurovascular trauma or any condition preventing them from assuming a sitting position, patients with multiple traumas, and those treated with other methods.

Ethical approval

Ethical Committee approval was taken from the Member Secretary Institutional Ethical Committee Government Medical College Kota.

The assessment of anterior shoulder dislocations was based on physical examination and anteroposterior radiography. Control radiographs were taken to evaluate the success of the reduction, which was confirmed through anteroposterior radiographs and physical examination. Additionally, a neuromuscular examination was conducted.

The forearm of patient is held at elbow and wrist by the surgeon the following sequence movements are done A. After proper holding elbow in 90-degree flexion the affected shoulder is externally rotated until full external rotation is achieved by side of body and no attempt of adduction or abduction is done. Slow and gentle performance of this step over period of 1 min is important.

This position is kept in same position for next 2-3 minute. Patients are engaged in conversion to distract to reduce pain and apprehension. This step is critical for successful outcome. Next step is to adduct the limb in same position till the elbow comes over the body. Then the limb is internally rotated such that finger touched the opposite shoulder.

Data collection

Data collected from hospital records included patients' age, gender, trauma mechanism, side of the shoulder dislocation, presence of a history of previous shoulder dislocation, reduction success, and post-reduction complications. Prior to participation, patients were informed about the study, and only those who volunteered were included. Sociodemographic data, information about the side of the dislocation (left or right), and history of previous dislocation were gathered from the patients. The reduction method, complications, success rate, and reduction time were evaluated during the application of Prakash's method. The reduction procedure was carried out once by the same physician, and no sedatives or myorelaxants were administered before or during the procedure. Furthermore, no traction was applied during the reduction procedure.

RESULTS

This study was performed based on the data of 50 patients. The mean age of the patients was 36.1±13 years. Among them, 40% (n=20) were female and 60% (30) were male.

Table 1: Gender.

Gender	No. of patient
Male	20
Female	30
Total	50
Mean age	36.1±13

Table 2: Distribution of cases according to lesion side.

Lesion side	No. of patient	%
Right	42	84
Left	8	16
Total	50	100

Table 3: Number of attempts needed to reduce the dislocated shoulder.

No. of attempts	No. of patients	%
1st attempt	45	90
2nd attempt	4	8
Total	49	98

Out of 50 patients 8 (16%) had left-sided shoulder dislocation, and 42 (84%) had right-sided shoulder dislocation. In the present study 80% of the patients (n=40) presented themselves with a first-time shoulder dislocation.

In Table 3, we found that the reduction could be accomplished on the first attempt in 45 patients (90%), while a second attempt was required in 4 patients (8%).

In Table 4, no fracture concomitant with shoulder dislocation was noted in patients. No sedation or traction was applied to patients during reduction. The success rate of the method was 95% (n=49). Reduction could not be performed in only one patient.

Table 4: Reduction related data.

Reduction related data	No. of patients	%
Fracture after reduction	0	0
Sedation	0	0
Traction	0	0
Reduction success rate	49	98

DISCUSSION

The glenohumeral joint, where dislocation is most common, presents a challenge due to the large humeral head articulating with the relatively shallow glenoid fossa, allowing for extensive mobility in various directions.[12] Hippocrates was the first to propose a conservative method for shoulder dislocation reduction.[13] Despite its historical significance, the Hippocratic method is no longer widely used due to associated complications.[14]

Over 20 methods have been suggested for shoulder dislocation reduction, yet none have achieved optimal success.[15] While a consensus on the best reduction method is lacking, it should ideally be easy to execute, require no external assistance, avoid sedation or traction, exhibit a high success rate with minimal complications, and be swift in application. Regrettably, reported reduction techniques fall short of these ideal criteria.

Prakash's method, introduced in 2016, has gained recognition for successfully reducing anterior shoulder dislocations across various regions. In 2018, a report documented its complication- free application in 147 patients with a 100% success rate.[16] Prakash's method boasts several key advantages, including high success rates, minimal to no complications, rapid application, absence of sedation or traction, and independence from external aid.

Comparatively, the scapular manipulation, traction countertraction, and chair methods exhibit superior success rates for shoulder reduction. The Chair method requires ACTIVE patient involvement, yielding successful outcomes in most patients in studies by Guler et al and Chung et al.[17,18]

However, previous research showed reduced success rates with a similar Chair method. Conversely, traction poses neurovascular risks, with Baykal et al noting the need for sedation in some cases and recommending the attachment of weights to the affected arm for traction-based methods.

Adhikari et al reported lower success rates for scapular manipulation. In the context of the traction countertraction method, Ghane et al, reported initial success rates of 73%, later increasing to 100%, but all traction countertraction cases required sedation.[19-21]

Authors also noted that the success rate was initially lower compared to the modified scapular method, and Prakash's method was faster. In a recent systematic review by Alkaduhimi et al, the scapular manipulation method emerged as the fastest (1.75 min), followed by "Fast, Reliable, and Safe" (FARES) (2.24 min), and the traction countertraction method (6.05 min).[22]

Prakash's method was not included, though it may potentially yield better results and offer unique advantages such as low complication rates, autonomy from assistance, and swift reduction time.

Further comprehensive research could provide more insights by comparing successful techniques for anterior shoulder dislocation reduction, including Prakash's method.

The limitations of our study are sample size which included only 50 patients and our technique could not be performed on polytrauma patients and patients with concomitant fractures and neurovascular injury

CONCLUSION

Prakash's method demonstrates a remarkable rate of success in the conservative treatment of acute anterior shoulder dislocations. The significance of Prakash's approach becomes evident when considering its notable advantages, including rapid application, independence from external assistance, minimal or absent complications, avoidance of traction-related complications, and the absence of a requirement for sedatives or similar medications, given the relatively low discomfort experienced by patients during its application. Given these strengths, both orthopedic surgeons and emergency physicians could regard Prakash's method as an ideal choice for addressing acute shoulder dislocations in emergency department settings.

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