

The Prakash Technique for Reducing Anterior Shoulder Dislocation: Efficient, Safer, Time-Saving, and Needing no Assistance, Sedation, or Traction

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ABSTRACT

Objective: To evaluate the effectiveness and safety of the Prakash method of shoulder reduction in patients having anterior shoulder dislocation and presenting within the first twenty-four hours of injury. **Study Design:** Prospective interventional study. **Settings:** Mayo Hospital / King Edward Medical University, Lahore, Pakistan. **Duration:** Two years, from November 2021 to October 2023. **Methods:** In this study, the Prakash technique was attempted to reduce all anteriorly dislocated shoulders without anaesthesia, sedation, traction, or assistance. The outcomes were evaluated in terms of successful reduction (in the first attempt) and documentation of any post-reduction complications. **Results:** A total of 50 patients with mean age of 30.3 ± 11.8 years were included in this study. Males were 46(92%) and female 4(8%). The right shoulder was involved in 82% of the patients, while the left shoulder was dislocated in 18% of patients. The majority, 94% (n=47) of the shoulders were successfully reduced with the Prakash method. The mean time of reduction was 118 ± 32 seconds. There were no post-reduction complications observed related to the technique. The pain felt during the procedure, as per the Visual Analogue Scale, ranged from 4 to 7 with a mean of 4.58 ± 1.6 . Three cases (6%) could not be reduced and were relocated with other manoeuvres of shoulder reduction under sedation. **Conclusion:** Prakash's method can be used safely and effectively as a method of choice to reduce anterior shoulder dislocations without any sedation, assistance, or traction.

Keywords: Shoulder dislocation, Closed reduction, Prakash method.

INTRODUCTION

Because of its high mobility and instability, the shoulder joint is the most commonly dislocated joint in the human body.¹ In the orthopaedic emergency, the most commonly encountered trauma is a shoulder dislocation.² Its incidence is 2-8% in the general population³ and up to 24 per 100000 in developed countries.⁴ Male adolescents aged 15 to 20 years being most affected, primarily from sports activities.⁵ Shoulder dislocation may be anterior or posterior, with anterior being the most common (98% of traumatic

dislocations).^{6,7} The condition shows peaks in the second and sixth decades of life.⁸ Interestingly, the risk of recurrence is a significant concern, particularly in younger patients. About 19% of patients undergo repeated shoulder dislocations, with 41.7% of these cases occurring in individuals aged 20 years or younger.⁸ Risk factors for recurrence include male gender, younger age, and lower-income neighbourhoods. Conversely, older age, higher medical comorbidity scores, and initial reduction performed by an orthopaedic surgeon are associated with lower recurrence risks.⁸ In conclusion,

anterior shoulder dislocation is a common injury with a higher incidence in young males. The risk of recurrence is substantial, especially in younger patients. There are different causes of anterior shoulder dislocation, which include sports injuries (the most common cause), falling and road traffic accidents (RTA).⁹ It is a very painful condition and requires immediate reduction.

About twenty effective methods for reducing anterior shoulder dislocations have been reported in the literature, with varying success rates and advantages.² These include the traction-counter traction method, the Hippocratic method, Kocker's method, the Spaso technique, the scapular manipulation technique, the external rotation method and the recently described Prakash method.¹⁰ The Spaso technique, performed by junior emergency medicine residents, demonstrated 87.5% success rate in a small study.¹⁰ This method is simple, effective, and can be performed by a single operator. Similarly, the scapular manipulation technique described by Bosley and Miles showed a high success rate of 92% (47 out of 51 patients) when used as the initial reduction method.¹¹ Interestingly, different techniques have shown comparable success rates. The external rotation method achieved an 80% success rate on the first attempt when performed by relatively inexperienced practitioners.¹² Another study reported a 90% success rate (36 out of 40 patients) for the external rotation method, with most reductions performed without premedication and in less than two minutes.¹³ The scapular manipulation technique demonstrated a 96% success rate (46 out of 48 cases) with an average reduction time of 6.05 minutes.¹⁴ The FARES (Fast, Reliable, and Safe) method showed promising results in terms of efficacy, speed, and patient comfort compared to the Hippocratic and Kocher methods.¹⁵ In conclusion, while various methods have proven effective for reducing anterior shoulder dislocations, no single technique has been identified as universally superior. The Prakash method recently gained popularity due to lack of traction and sedation.¹⁶ However most of these methods require assistance and sedation.¹⁷ The ideal method would be the one that does not need any sedation or assistance and is still effective and minimally painful.¹⁸ The literature shows that the traction-counter traction method, Hippocratic method, and Kocker's method are associated with pain, dependency for assistance, require proper set-up and sedation, and still a significant percentage of failure to reduce the joint and hence are done under general anaesthesia, which is associated complications and burden on hospitals.¹⁹ The Prakash method, as documented and described by Parkash, was 100% effective, does not require assistance or sedation, is time-saving, and is least painful.²⁰ The choice of method may depend on factors such as the practitioner's experience, patient characteristics, and specific circumstances.

However, further research is needed to determine the optimal approach for different clinical scenarios.

Our primary objective was to evaluate the effectiveness of Prakash method in terms of successful reduction in the first attempt and its safety in reducing anteriorly dislocated shoulder joints. Secondary objectives were to record time and pain felt by the patients during the procedure.

METHODS

This prospective interventional study was carried out at the emergency room of the department of orthopaedic surgery, Mayo hospital Lahore, from November 2021 to October 2023. Approval was taken from the institutional review board of the hospital vide letter no.190/RC/KEMU dated 20.03.2024.

All patients with anterior shoulder dislocation diagnosed on history, clinical examination, and radiographs were included in the study. Patients presented after 24 hours of injury, associated fracture of any limb or spine, recurrent dislocations, posterior dislocations, patients with neurovascular injury, and unconscious patients were excluded from the study. Patients' biodata, including age, gender, occupation, and side of dislocation, were recorded. The cause of injury and time since injury were also noted. The procedure was explained in detail to each patient, and informed written consent was obtained from all the patients.

Prakash Method: As described by Prakash,²⁰ the following steps of the technique were followed.

- i. The patient was made to sit on an armless chair with his/her scapulae fixed against the back of the chair.
- ii. The elbow of the affected side was flexed to 90 degrees and held in position by the doctor.
- iii. With the second hand, the doctor held the patient's hand (just like shaking hands).
- iv. Then the arm was gently externally rotated, keeping it in the position of deformity till full external rotation was achieved (the arm became parallel to the side of the body). Neither traction nor adduction or abduction was performed. What done was a full external rotation of the arm. This is the most important and sometimes painful step of the procedure, so the patients were engaged in some conversation.
- v. The arm was kept externally rotated for at least one minute (sometimes up to two or three minutes).
- vi. Then, the arm was adducted till the elbow came in front of the trunk.

- vii. Finally, the arm was internally rotated till the hand of the affected side touched the opposite shoulder.

A total of 50 patients were treated in this study. The sample size was calculated while taking reference to the previous study² and using the World Health Organization (WHO) sample size calculator 1.1 (Estimating a population proportion with specified absolute precision), keeping the confidence level at 95%, the anticipated population proportion at 0.96, and absolute precision at 0.05. The results were analysed in terms of successful reduction, time consumed in reduction, the intensity of pain felt during the reduction technique according to the Visual Analog Scale (VAS), the need for assistance or sedation, and any iatrogenic injury after the reduction procedure. The same team of orthopaedic surgeons and residents performed the technique on all patients without sedating the patients or applying traction. After successful treatment, the reduction was confirmed by anteroposterior (AP) and axillary view radiographs of the affected shoulder, and neurovascular status was reevaluated for any iatrogenic injury. After completion of the procedure, a poly-sling was applied to all patients, and patients were advised to keep the poly-sling in position for at least three to four weeks. More than one attempt and the need for sedation or assistance in reducing the joint was considered a failure of the procedure. In such cases where the joint could not be reduced in the first attempt without traction and sedation, other methods of shoulder reduction with sedation or traction were used to reduce the joint. In the majority of the cases, the shoulder was reduced before the final step and after sustained external rotation.

All the data were collected, compiled, and finally analysed using the computer software Statistical Package for Social Sciences (SPSS) version 26. For quantitative variables like age and time consumed in reducing the joint, means and standard deviations (SD) were calculated, while for qualitative variables like gender and side of the limb, frequencies and percentages were calculated.

RESULTS

A total of fifty patients were included in the study. Neither assistance nor sedation, nor traction was used. Reduction on the first attempt was labelled as the success of the procedure. Table 1 shows the basic demographic data of the patients included in the study.

The mean age of the patients was 30.3 ± 11.8 years (15 to 58 years). Out of them, 46 (92%) were male patients and 4 (8%) were female. Regarding the side of the limb, the right shoulder was dislocated in 41 (82%) of cases, while the left shoulder was dislocated in 9 (18%) of cases. The most

common cause leading to dislocation was Road Traffic accidents (RTAs) in 31 patients (62%). The second most prevalent cause observed was sports-related activities in 14 patients (28%), followed by physical assault in 3 cases (6%) and falls in 2 cases (4%). As far as occupation is concerned, 17 patients (34%) had white-collar jobs, while 13 (26%) were students, and 20 (40%) were unemployed. Time elapsed since injury was widely different among the patients. 18 patients (36%) presented within the first hour, while 32 (64%) presented within 8 hours of injury. Table 2 summarizes the results of our study.

Table 1: Basic demographic data

Mean age in years ($\pm$ SD)		30.3 $\pm$ 11.8
Gender (%)	Male	46 (92%)
	Female	4 (8%)
Dislocation side n (%)	Right	41 (82%)
	Left	9 (18%)
Aetiology	RTA	31 (62%)
	Sports	14 (28%)
	Physical assault	3 (6%)
	Falls	2 (4%)

Table 2: Procedure-related data

Success Rate	Successful	47 (94%)
	Failed	3(6%)
Average time in seconds $\pm$ SD		118 $\pm$ 32
Pain as per the VAS scale $\pm$ SD		4.58 $\pm$ 1.6
Post-reduction complication		0%

The procedure was successful in 47 (94%) of cases. The mean time of reduction was 118 ± 32 seconds (62-154 seconds). No post-reduction iatrogenic injury was observed in any patient. The pain felt during the procedure, as recorded according to the Visual Analogue Scale (VAS), ranged from 4 to 7 with a mean of 4.58 ± 1.6 . Three cases (6%) could not be reduced using the Prakash method, 2 cases (4%) were reduced using the traction-counter traction method under sedation, while one case was reduced with Kocker's method for reducing anterior shoulder dislocation.

DISCUSSION

Anterior shoulder dislocation is most commonly reduced with the traditional Hippocratic technique. However, it has many post-reduction complications. There are more than twenty techniques described for the reduction of shoulder dislocation, but the choice of technique to reduce an anteriorly dislocated shoulder is a matter of debate.

We used the Prakash technique for reducing the anterior shoulder dislocation and obtained 94% successful results. Our success rate is better than other techniques of shoulder reduction reported in the literature. Additionally, no anaesthesia, no traction, and no assistance were needed, and there were no complications noted after the procedure in our study. The procedure was easily performed in less time, and patients were discharged within one hour after the procedure. The mean time taken to reduce the joint was 118 ± 32 seconds, and there were no post-reduction complications.

The mean age of the patients recorded in our study population was 30.3 years. This younger age is due to an active lifestyle and involvement in sports-related activities in the age-group below 40 years. In our society, men of working age are responsible for earning their living; therefore, the majority of cases were from younger age groups. Schurr *et al*²¹ concluded in their study of 716 cases that anterior shoulder dislocation occurs at a young age in a wide majority of patients. Cutts *et al*²² also reported similar findings. The male-to-female ratio was observed to be more than 9:1. The high male dominance is because more males are involved in sports activities and RTAs, as males travel more than females, that is why males have more shoulder dislocations than females. Secondly, the most common cause was RTA in our study, and the majority of them were motorbike accidents. Almost all bikes are driven by males, and most of them violate traffic rules either due to over-speeding or due to wrong overtaking; that is why male patients have more prevalent shoulder dislocations. Also, females have more ligamentous laxity as compared to males because of hormonal differences (mainly due to oestrogen in pre-menopausal women), which may play a protective role against dislocations. Twomey-Kozak *et al*²³ also found in their study that the majority of the sufferers of anterior shoulder dislocation were males. The same was reported by Makaram *et al*²⁴ in their research. We found that the right shoulder was dislocated in 82% of the patients, while the left shoulder in 18 % of the cases. This may be attributed to right-hand dominance in the majority of the patients. In sports and recreational activities, the dominant hand is often utilized, and in activities involving overhead contact, such as smashing in volleyball, there may be an increased risk of dislocating that shoulder. Laik *et al*²⁵ also stated in their study that 85 out of 102 patients (83%) sustained dislocations of the right shoulder.

The leading cause in our study was found to be traffic accidents in almost two-thirds of cases, while sports injuries were the second most common reason (28%). As discussed earlier, the majority of the earning age-group males travel on motorbikes, which is the leading cause of accidents in big cities like Lahore. Dong *et al*¹⁹ and

Provencher *et al*²⁶ also found that the most common cause of anterior shoulder dislocation was traumatic. Patrick *et al*²⁷ observed in their 10-year epidemiological study that sports and recreational activities were responsible for 44% of the patients who experienced anterior shoulder dislocation. We observed in our study that about one-third of the patients presented to the hospital within the first hour after sustaining the injury, while the remaining two-thirds presented later than that. The majority of the patients who presented within one hour of the injury were from the urban population and were educated. Those patients who presented later to the hospital were from peripheral areas, and a significant proportion of them were illiterate and visited the local bone setters. Interestingly, few of the patients were advised to undergo X-rays by the bone setters to confirm their unsuccessful attempts of reducing the glenohumeral joint.

As far as the success rate of our study is concerned, it was successful in 94% of the patients. Kishore *et al*²⁸ also reported a 98.4 % success rate of this procedure, which is comparable to our result. Our results were very close to Saqlain *et al*,² who treated 100 patients with a mean age of 32.5 ± 8.3 years and reported successful reduction in 96 out of 100 (96%) patients in the first attempt, while the remaining 4 shoulders were reduced under anaesthesia using other methods. Kuru *et al*³ reduced 19 shoulders using the Prakash method and reported successful results in 18(94%) with no complications. Anjum *et al*¹⁶ treated 30 patients and reported a success rate in 27(90%) of them and did not report any complications.

The average time to reduce the joint in our study was observed to be nearly 2 minutes. Kishore *et al*²⁸ reported an average time of 3 to 4 minutes in reducing anterior shoulder dislocation using the Prakash method. Kabir *et al*²⁹ also took nearly the same time as observed in our study to reduce anterior shoulder dislocations in patients. The average pain experienced by patients during the procedure, as observed on the visual analogue scale, was nearly 5 (ranging from mild to moderate in intensity). This amount of pain is quite bearable in orthopaedic procedures and emergency conditions.

CONCLUSION

Prakash's method of shoulder reduction is easy to perform. It is less time-consuming and does not need sedation, analgesia, or any assistance and having the highest success rate without any complications. We suggest the Prakash method as the technique of choice for reducing anterior shoulder dislocations.

LIMITATIONS

The main limitations of our study were the small sample size and the study at a single centre.

SUGGESTIONS / RECOMMENDATIONS

We suggest studies with larger sample sizes and from multiple centres to further evaluate the safety and effectiveness of this procedure.

CONFLICT OF INTEREST / DISCLOSURE

All the authors declare no conflict of interest during this study.

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