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Shoulder Dislocation in the Emergency Department: Experience within a Large District General Hospital

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ABSTRACT

Objectives: To evaluate the incidence of shoulder dislocation, age and gender distribution, success and failure rate following attempts at reduction in the ED and factors associated with failed reduction. Secondary outcome measures include type and number of medications required for successful reduction and complications associated with reductions attempts.

Methodology: A retrospective chart review of all patients presenting to the Emergency department with shoulder dislocation within the study period was undertaken. The study was undertaken over a one-year period from 1st December 2018 to 30th November 2019 within the ED of a large DGH that receives approximately 100,000 attendances per annum. Data was extracted on to a proforma including patient demographics, type of dislocation, number of attempts at reduction and complications. The data was reviewed and analysed by two of the study authors.

Results: We found an incidence of shoulder dislocation of 16.5 per 100,000 attendances (less that 1% of ED) presentations per annum. The mean age was 58.8 years. There was a male preponderance in terms of gender distribution with males making up 67% and females 33%. There was a peak incidence in men within the age range 21-30 years. There was a 76% (n=25) successful reduction rate in the ED.

Attempts at reduction failed in 8 cases (24%). The mean age of the failed reduction group was 46.5 years (95% CI, 24.96-58.79). It was 61.6 years (95% CI, 57.3-75.2) in the successful reduction group. The use of morphine, paracetamol and sedation were associated with successful reduction. All failed reduction attempts required general anaesthesia to achieve reduction.

Keywords: Shoulder, Dislocation, Joint reduction, Manipulation

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Introduction

Dislocation of the shoulder joint (glenohumeral joint) is one of the most common joint dislocation seen in the emergency department[1,2]. 80% of shoulder dislocation are of the "anterior type" [3,4] Shoulder dislocations usually occur following traumatic incidents such as road traffic accidents, sports injuries and falls. It can result in damage to surrounding and supporting structures such as Bankert and Hills Sach lesions.[5,6,7] It can also result in injuries to the trunks of the brachial plexus[8] In Edinburgh UK, a study of 252 patients aged 15-35 years noted that 86% of shoulder dislocations were the result of contact sports.[1] Previous studies have reported a high incidence of shoulder dislocation in military personnel and athletes with young men being at a greatest risk.[6,10,11,12]

Zachilli and Owens in 2010 examined the incidence of shoulder dislocations in all ages in the USA. They reported and incidence ranging from 11.2 to 26.2 per 100,000

person years for shoulder dislocation in a random sample of 100 emergency departments across the US.[10]

Lia Vaag et al in their 2011 study found an overall incidence of 56.3 per 100,000 with rates higher in men than women.[11] In 2014, Leroux et al in their study of shoulder dislocation in those aged 16-20 years found an incidence similar to that reported by Zachilli et al.[12,13]

Shah et al in their recent population-based study of 16–70-year-old patients in the UK with shoulder dislocation in 2017, found an overall incidence rate of 40.4 per 100,000 in men and 15.5 per 100,000 in women. The highest incidence was noted in men aged 16-20 years. This is similar to the finding by Leroux at al.[12-16]

Methodology

A retrospective chart review of all patients presenting to the Emergency department within the study period was undertaken. The study was undertaken over a one-year period from 1st December 2018 to 30th November 2019. The study was conducted within the Emergency department of a large district general hospital that sees approximately 100,000 attendances per annum.

The exclusion criteria included patients who have sustained multiple traumatic injuries necessitating transfer to a major trauma centre, those who have sustained shoulder fracture or dislocation requiring open reduction and internal fixation in theatre, patient sustained open fractures associated with shoulder dislocation.

Following the chart review, data was extracted for the primary outcome measures of incidence of shoulder dislocation, age and gender distribution, success and failure rate following attempts at reduction in the ED and factors associated with failed reduction. Secondary outcome measures include type and number of medications required for successful reduction and complications associated with reductions attempts.

Data and statistical analysis were undertaken with Microsoft excel data analysis tool.

Results

Our results showed that a total of 33 shoulder dislocations presenting to the ED during the study period met the inclusion criteria. The represents an incidence of 16.5 per 100,000 attendances less that 1% of ED presentations per annum.

The mean age was 58.8 years. The gender distribution was found to be Male -22 (67%) and Female 11 (33%). There was a peak incidence in young men in the age range 21-30 years. Thereafter the incidence in both male and females followed a similar pattern.

In 25 cases (76%) there was successful in the ED. Attempts at reduction failed in 8 cases (24%). 19 cases were reduced in the ED following a first attempt. All successful reductions were achieved following a maximum of 2 attempts. There appears to be a correlation between the number of attempts and the likelihood of success. The mean age of the failed reduction group was 46.5 years (95% CI, 24.96-58.79). It was 61.6 years (95% CI, 57.3-75.2) in the successful reduction group.

Most of the dislocations were of the anterior dislocation type. There was only one case of a superior dislocation. The most commonly used medications inhaled methoxyflurane (Penthrox C)(39%), paracetamol (33%) and morphine (iv or oral) (33%). 7 patients (21%) required general anaesthesia and all were in the failed reduction group.

Table II: Age difference.

	Mean	95% CI
Successful	61.6 (SD =19)	57.1-75.2
Failed	41.60 (SD=17.6)	24.96-58.79

Table I: Summary of Findings (n = 33)

	Failed reduction (n=8) 24%	Successful Reduction (n=25) 76%
Mean age (years)	41.6 (SD=17.6)	61.6 (SD=19)
Gender	M=6, F=2	M=16, F=9
Type of dislocation	Anterior=8	Anterior=24, Superior=1
Number of attempts at reduction	1 attempt=4 2 attempts=2 3 attempts=1	1 attempt=16 2 attempts=6 3 attempts=0
Side of dislocation	Right=6 Left=2	Right=19 Left=6
Nerve injury	Axillary nerve = 2	No nerve injury
GA use	7	0
Destination from the ED	Admitted = 8 Discharge = 0	Admitted= 16 Discharge =9

There were 2 (6%) cases of axillary nerve damage associated with the dislocation. They were both found in the failed reduction group. There were no complications associated with the reduction attempts.

Table III: Type and frequency of medication administered (n=33)

Type of Medication	Frequency (failed) n=8	(%)	Frequency (successful) n=25	(%)
Methoxyflurane (penthrox)	3	35.5	11	44
Paracetamol	0	0	11	44
Morphine	1	12.5	10	40
General Anaesthesia	7	87.5	0	0
Codeine	2	25	5	20
Midazolam	1	5	3	12
Propofol	0	0	3	12
Ketorolac	0	0	1	4
Fentanyl	0	0	1	4
Entonox	0	0	1	4
Nerve block (suprascapular)	1	12.5	0	0
Oxycodone	0	0	1	4
Nil Medication	0	0	1	4

Discussion

This study has shown that isolated shoulder dislocation is an uncommon presentation to the emergency department. The incidence is approximately 16.5 per 100,000 ED attendances. This is similar to that found by Zachilli et al[10] (11.2-26.2 per 100,000 person years) and Shah et al[13] (28 per 100,000 overall). It is noted that these are population-based studies as opposed to our study which is based on a select sample of emergency department attendees.

It is more common in males than females with a peak incidence in males in the 21-30 years age bracket. It is also more common in males who tend to be very active and engaged in traumatic activities[4,7,10,12]

Our study showed that following this initial peak the incidence in both genders tended to follow a similar pattern rising to a second peak after the age of 70 years. mean age of patients in our study is 58.8 years. Majority of case (74%) were successfully reduced within the ED after at least 2 attempts at reduction.

In the subgroup of those with failed reduction, they are more likely to be male with a mean age of 46.5 years. They are also more likely to have general anaesthesia and to be admitted to hospital following their injuries or procedure. A higher percentage of patients who achieved successful reduction in the emergency department, received morphine and paracetamol as part of their procedural medication. With regards to sedation, only two types of sedatives were used in our study; midazolam and propofol. The outcome was similar in those patients given midazolam. Successful reduction was achieved in the three patients who were administered propofol. It would therefore appear that the use of paracetamol, morphine and propofol is more likely to lead to a successful reduction within the emergency department. This is presumably because morphine provides satisfactory analgesia while propofol provides good muscle relaxation. It is to be noted that the use of propofol in the ED is usually restricted to those skilled and familiar with its use. It is also more likely to be utilised more experienced and senior clinicians. These are the very clinicians who are also more likely to achieve a successful reduction of dislocated shoulders in the ED.

Limitation: This study is limited by the small numbers and being single centre. It also excluded patient who had open injuries, complex injuries and those transferred to other higher level trauma facilities on account of their injurie. Furthermore, we did not explore the individual anatomical variations and factors (such as duration of dislocation and soft tissue interposition) that may have made attempts at reduction in the emergency department difficult.

More large-scale multicentre cohort studies will be required in order to confidently understand the factors associated with a failed reduction in the emergency department

Conclusion

The study shows that there is a high rate of successful reduction of dislocated shoulders in the emergency department.

There appears to be a correlation between the number of attempts and the likelihood of success. Most of the dislocations were of the anterior dislocation type.

Patients with failed reduction attempts are likely to require GA. Nerve damage is uncommon and likely to be associated with failed reduction attempt. It is however unclear if the nerve damage was present prior to the reduction attempt or as a result if the reduction attempt.

Highlights

- There are 2 peaks in the incidence of shoulder dislocation, 21-30 year age group and >70 years.

- Successful reduction is achieved in the vast majority of cases after at least 2 attempts in the Emergency department.
- The use of potent analgesia such as morphine and sedation with midazolam or propofol is associated with a successful reduction in the Emergency department.

References

1 Robison CM, Howes J, Murdoch H, Willian E, Graham C. Functional outcome and risk of recurrent instability after primary traumatic anterior shoulder dislocation in young patients. Journal of Bone and Joint Surgery Am. 2006;88:2326-36 https://doi.org/10.2106/JBJS.E.01327

2. Cutts S, Prempeh M, Drew S. Anterior shoulder dislocation. Ann of the Royal College of Surgeons England.2009;91:2-7 https://doi.org/10.1308/003588409X359123

3. Kroner K, Lind T, Jensen J. The epidemiology of shoulder dislocations. Arch Ortho Trauma Surgery 1989;108:288-90 https://doi.org/10.1007/BF00932317

4. Owens BD, Dawson L, Burks R, Cameron K. Incidence of shoulder dislocation in the United States Military: demographic considerations from a high risk population. Journal of Bone and Joint Surgery Am. 2009:91:761-6 https://doi.org/10.2106/JBJS.H.00514

5. Hill HA, Sachs MD. The grooved defect of the humeral head. Radiology. 1940;35:690-700 https://doi.org/10.1148/35.6.690

6. Bankert ASB. Recurrent or Habitual dislocation of the shoulder joint. British Medical Journal (bmj). 1923;2:1132-3 https://doi.org/10.1136/bmj.2.3285.1132

7. Owens BD, Agel J, Mountcastle SB, Kenneth LC, Bradley JN. Incidence of glenohumeral instability in college athletes. American journal of sports medicine. 2009;37:1750-4 https://doi.org/10.1177/0363546509334591

8. Rhee YG, Cho NS, Cho SH. Traumatic anterior dislocation of the shoulder: factors affecting the progress of the traumatic anterior dislocation. Clin Ortho Surg. 2009;1:188-93 https://doi.org/10.4055/cios.2009.1.4.188

9. Ameh V, Crane S. Nerve Injury Following Shoulder Dislocation - The Emergency Physician's Perspective. European Journal of Emergency Medicine. 2006;13 (4):233-5. https://doi.org/10.1097/01.mej.0000206190.62201.ad

10. Zachilli MA, Owens BD. Epidemiology of shoulder dislocations presenting to emergency departments in the Unites States. Am Journal of Bone and Joint Surgery.2010;92:542-9 https://doi.org/10.2106/JBJS.I.00450

11. Liavaag S, Svenningden S, Reikeras O, Enger M, Fjalestad T, Pripp H et al. Epidemiology of Shoulder dislocation in Oslo. Scandinavian Journal of Med Sci Sports. 2011;21:e334-e340. doi:10.1111/j.1600-0838.2011.01300 https://doi.org/10.1111/j.1600-0838.2011.01300.x

12. Leroux T, Wasserstein D, Veillette C, Khoshbin A, Henry P, Chahal J et al. Epidemiology of primary anterior shoulder dislocation requiring closed reduction in Ontario, Canada. American Journal of Sports Medicine. 2014;42:442-50 https://doi.org/10.1177/0363546513510391

13. Shah A, Judge A, Delmestri A, Edwards K, Arden NK, Prieto-Alhambra D et al. Incidence of Shoulder dislocation in the UK, 1995-2015. A population-based Cohort Study. British Medical Journal (open). 2017;7:e016112. https://doi.org/10.1136/bmjopen-2017-016112

14. Hovelius L. Incidence of shoulder dislocation in sweden. Clin Orthop Relat Res 1982;166:127-31. https://doi.org/10.1097/00003086-198206000-00021

15. Hovelius L, Olofsson A, Sandström B, et al. Nonoperative treatment of primary anterior shoulder dislocation in patients forty years of age and younger. A prospective twenty-five-year follow-up. J Bone Joint Surg Am. 2008;90:945-52. https://doi.org/10.2106/JBJS.G.00070

16. Owens BD, Duffey ML, Nelson BJ, et al. The incidence and characteristics of shoulder instability at the United States Military Academy. Am J Sports Med.2007;35:1168-73. https://doi.org/10.1177/0363546506295179

17. Milgrom C, Mann G, Finestone A. A prevalence study of recurrent shoulder dislocations in young adults. J Shoulder Elbow Surg.1998;7:621-4. https://doi.org/10.1016/S1058-2746(98)90011-8

18. Rhee YG, Cho NS, Cho SH. Traumatic anterior dislocation of the shoulder: factors affecting the progress of the traumatic anterior dislocation. Clin Orthop Surg. 2009;1:188-93. https://doi.org/10.4055/cios.2009.1.4.188