Kathmandu University Medical Journal (2004) Vol. 2, No. 1 pp. 13-17

Original Article

Reduction of Acute Anterior Shoulder Dislocations under Local Anaesthesia – A Prospective Study

Paudel K[1], **Pradhan RL**[2], **Rijal KP**[3],
[1]Medical officer, [2]Lecturer, [3]Assoc. Prof., Department of Orthopaedic Surgery, KMCTH

Abstract:
Objective: To evaluate the application of local anaesthesia for reduction of acute anterior shoulder dislocation
Design: A prospective study of patients coming with anterior dislocation of shoulder to KMCTH from July 2002 to Sep 2003.
Subjects: Patients of aged 15-55 years with no associated fractures of adjoining bones.
Results: A total of fifteen patients with anterior inferior shoulder dislocation were studied and all were reduced safely under local anaesthesia.
Conclusion: Use of intra-articular lignocaine for reduction of shoulder dislocation is safe and effective and is beneficial for countries like Nepal where health facilities are minimum in rural and suburban areas.

Key words: Shoulder dislocation, intra-articular injection, local anaesthesia, reduction.

The shoulder (glenohumeral) joint is most commonly dislocated joint in the body, accounting for nearly 50% of all dislocations.[1,2] It is a ball and socket joint where shoulder socket, the glenoid accommodate a relatively large ball, the humeral head. It has a remarkable range of mobility at the expense of stability. Among the shoulder dislocations, 80 % are of anterior types of which traumatic are 90 % and the rest atraumatic [1,2]

Various methods of reduction of shoulder dislocations have been tried that ranges from Hippocrates to new methods.[3] Most techniques of reduction of shoulder dislocation involve trying to manipulate the humeral head back into its position, in the glenoid. These techniques are of two basic types utilizing either traction or leverage of humerus, although often combinations of the two are employed.[3]

In the emergency department, acute anterior shoulder dislocations are commonly reduced with intravenous sedation or suprascapular nerve block.[4] Recently, intra-articular lignocaine has been advocated as a means of providing analgesia and subsequent relaxation to the patient.[5,6,7]

This study was done to show the efficiency of intra-articular lignocaine to reduce anterior shoulder dislocations in a set up like ours.

Materials and methods

The study population comprised of patients aged 17-55 years who attended Kathmandu Medical College Teaching Hospital (KMCTH) Emergency Department with acute anterior dislocation of shoulder. Patients with multiple trauma, associated fracture of the glenoid or tuberosities or below 17 and above 55 years are excluded from the study.

All patients with a glenohumeral joint trauma had radiographs and dislocations were confirmed clinically and radio-graphically (Figure 1). All patients were initially evaluated by an emergency medicine resident. The examiner documented neurovascular status. For each case, orthopaedic consultation was obtained to assist with the reduction as needed. The orthopaedic resident/surgeon on call then performed the reduction after discussing, with the patients, about the procedure. The resident/surgeon on call performing the reduction manoeuvre subjectively rated the difficulty of the manoeuvre. An easy reduction required very little physical effort. A tough reduction consisted of those reductions that required significant physical effort or

Correspondence
Dr Rabindra Lal Pradhan P.hD.
Lecturer, Department of Orthopedic Surgery
K MC Teaching Hospital, Sinamangal
E-mail: rpradhan@healthnet.org.np

time to perform or required reduction using an alternate manoeuvre. A very tough reduction was that required an extreme amount of physical exertion or alternate manoeuvres and was just short of requiring general anaesthesia.

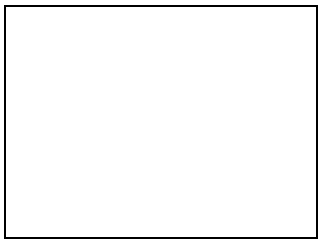

Fig. 1 Radiograph of rt. Shoulder joint before reduction.

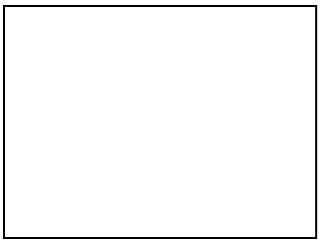

Fig.2 Procedure of giving intra-articular injection

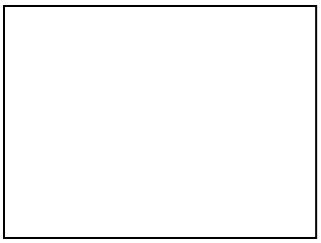

Fig.3 Radiograph of rt. Shoulder after reduction.

Description of technique

The method was performed with the patient in a sitting position. The injection site was below the anterolateral acromial edge with a posterolateral approach under standard sterile conditions (Figure 2).[6] The direction of the needle was toward the glenoid cavity, and after penetration of the capsule, aspiration of blood indicated the intra-articular position.[7] Twenty ml of 1% lignocaine was injected into the glenohumeral joint through a 20 gauge, 35-mm needle. Approximately fifteen minutes was allowed for the local anaesthetic to take effect before any manipulation of the shoulder was attempted. The patient was asked to rate the pain on a scale of 1 to 10 (1 with minimum pain and 10 being the worst pain). The choice of the manipulative reduction was free, but most of the reduction was done by Rockwood's traction and counter traction method using two sheets. Post-reduction X-rays were performed to confirm the proper anatomic position of the humeral head (Figure 3). The patients were discharged in a position of adduction and internal rotation and immobilized for three weeks in a universal shoulder immobilizer. Gradual movements (pendulum and range of motion) were begun thereafter but combined motion of abduction and external rotation was avoided for 3 weeks.

Results

Fifteen patients were included in the study between July 2002 to September 2003 who were within the inclusion criteria. Average age was 27.2 yrs (ranging from 19 to 42 yrs-Table -1). Ten patients were between the ages 21 to 30 and 9 (60 %) were male (Table-2). Among fifteen patients studied 11 (73.3 %) had primary dislocation (Table-3) and 10 patients (66.6 %) had their dominant shoulder dislocated (Table-4). The duration elapsed to reach the hospital ranged from 15 minutes to 6 hours (Average 2.5 hrs.). Eight patients (53.3%) visited to hospital between 1-2 hours of injury and only 2 visited less than 1 hour of injury and 3 patients visited emergency department after 3 hours of injury (Table-5). Patients reporting less than 3 hours after the injury were easy to reduce while one patient reporting 5 hours after was touch and reduction was successfully performed with Hippocrates method.

Table 1. Age distribution

Age Group(yrs)	No of Patients	Percentage
=< 20	2	13.3%
21-30	10	66.7%
31-40	2	13.3%
=>41	1	6.7%

Table 2. Sex distribution

Sex	No of Patients	Percentage
Male	9	40%
Female	6	60%

Table 3. Frequency of episodes

No of Episodes	No of Patients	Percentage
Primary	11	73.3%
Second	3	20.0%
Third	1	6.7%

Table 4. Dominancy of dislocated shoulder

Dominance	No of Patients	Percentage
(1) Dominant	10	66.7%
(2) Non dominant	5	33.3%

Table 5. Time elapsed to attend hospital

Time taken to attend hospital (hours)	No of Patients	Percentage
=<1	2	13.3%
1-2	8	53.7%
2-3	2	13.3%
3-4	1	6.7%
=>4	2	13.3%

The dislocation was successfully reduced in all patients with no systemic or local side effects. During an observation period of 3 weeks we did not notice any superficial or deep infection. None of the patients in our study were admitted to the hospital.

Discussion

In this study we evaluated a new method (in Nepal) for anaesthesia to reduce acute anterior shoulder dislocations. An ideal reduction should be easily performed, effective, relatively painless, safe and allow for early discharge of the patient. We agree that some acute dislocations can be reduced without any form of analgesic or sedative. However this situation is not always the case and parenteral medication is often indicated.[8]

Parenteral morphine/pethidine and benzodiazepam have been excellent forms of analgesia and sedation for many years. Even though this combination is relatively safe, there are some significant side effects and contraindications.[7] Nausea, central nervous system depression, respiratory depression, and deleterious effects on cardiac function can require antidotal treatment and continued monitoring as well as nursing care.[7] These medications are also contraindicated in some patients because of particular medical situations: pregnancy and serial examinations of the central nervous system and intra-abdominal organs.

Muscle spasm after the dislocation is the principal problem to come across when performing a reduction.[1] Lignocaine injected exerts its anaesthetic effect both intra-articularly and extra-articularly by

stabilizing the membrane of the nerve cells. Both the generation and conduction of pain impulses are inhibited.[6]

Lippit et al[5] introduced intra-articular lignocaine as an analgesic for reduction of anterior shoulder dislocation and reported excellent results when comparing a retrospective review and a prospective study.

Suder[6] randomized patients with traumatic dislocation of the shoulder to local intra-articular lignocaine and intravenous anaesthesia with pethidine and diazepam. Thirty-five patients were randomized into intravenous anaesthesia and 33 patients received local anaesthesia. Ten patients treated with intravenous method had respiratory distress and required antidote. No systemic or local side effects and neuro-vascular injuries were recorded with the use of lignocaine. They concluded that local anaesthesia used to reduce acute primary dislocation of shoulder as a simple, safe and well accepted method with significantly fever respiratory complications.

Matthews and Roberts[7] reported excellent results in providing adequate anaesthesia and relief of muscle spasm in 15 of 15 patients (100%) and noted that when compared with intravenous sedation group, the lignocaine group showed no significant difference in time for reduction manoeuvre, difficulty of reduction or subjective pain.

Kosnik and co-workers[8] randomized non blinded clinical trial was undertaken to evaluate the effectiveness of local intra –articular lignocaine injection as compared to intravenous anaesthesia and sedation. With reduction rate evaluated as a function of time delay in seeking treatment, patients presenting with 5.5 hours after dislocation were more likely to fail treatment with intra-articular lignocaine group.

Miller and co-workers[9] randomized skeletally mature thirty patients with an isolated glenohumeral joints dislocations with no associated fracture were received either intravenous sedation or intra-articular injection of lignocaine to facilitate reduction. The reduction was performed with the modified Stimson method. The two groups were compared with regard to the rate of successful reduction, pain as rated on a visual analogue scale, time required for reduction, time from reduction until discharge from the hospital. They noted that the lignocaine group spent significantly less time in the emergency department, There was no significant difference between the two groups with regard to pain, successful of the Stimson technique or time required to reduce the shoulder.

In our study among fifteen patients receiving intra-articular lignocaine all were successfully reduced with minimal pain to no pain perception. One patient had a tough reduction and the first manoeuvre technique had to be changed. The concerned patient presented about 5.5 hours after the injury.
The advantages of this method are, no requirement for the intravenous access and monitoring of the patient after reduction of the shoulder. The cost of the procedure is less and can be carried out with minimum facilities with shorter hospital stay as compared to intravenous sedation group. We believe that intra-articular lignocaine can be safely practiced to reduce dislocation up to 6 hours after the dislocation of shoulder. We observed that intra-articular injection of lignocaine is a safe, easy method to reduce acute shoulder dislocation, which is especially valuable for countries where health facilities are minimum.

References

1. Bucholz RW, Heckman JD(eds). Subluxations and Dislocations about the glenohumeral joint. Rockwood and Green's fractures in Adults. 5th ed. vol-2. Philadelphia: Lippincott Williams and Wilkins. 2001; 1109-1201.
2. Canale ST (ed). Recurrent Dislocations: Shoulder: Campbell's operative Orthopedics. 9th ed.vol-2. Missouri: Mosby. 1998; 1354-1398.
3. Mattick A, Wyatt JP, Historical review: From Hippocrates to the Eskimo – a history of techniques used to reduce interior dislocation of the shoulder. J.R. Coll. Surg. Edin. 2000; 45: 312-316.
4. Gleeson AP, Graham CA, Jones I et al. Comparison of intra-articular lignocaine and a suprascapular nerve block for acute anterior shoulder dislocation. Injury. 1997 Mar; 28 (2): 141-142.
5. Lippitt SB, Kenndy JP, Thompson TR. Intra-articular lignocaine verses intravenous analgesia in the reduction of dislocated shoulders. Ortho trans 1991; 15: 804
6. Suder PA, Mikkelsen JB, Hougaard K, Jensen PE. Reduction of traumatic, primary anterior shoulder dislocations with local anaesthesia. JSES 1994; 3: 288-294.
7. Matthews DE, Roberts T. Intra-articular lignocaine versus intravenous analgesic for reduction for acute anterior shoulder dislocations. A prospective randomized

study. Am J Sports Med. Jan-Feb1995 23; (1): 54-58

8. Kosnik J, Shamsa F, Raphael E, Huang R, Malachias Z, Georgiadis GM. Anesthetic methods for reduction of acute shoulder dislocations: a prospective randomized study comparing intra-articular lignocaine with intravenous analgesia and sedation. Am J Emerg Med. 1999; 17(6): 566 –70.
9. 9. Miller SL, Cleeman E, Auerbach J, Flatow El. Comparison of intra-articular lignocaine and intravenous sedation for reduction of shoulder dislocations: a randomized prospective study. J Bone Joint Surg Am. 2002; 84-A (12): 2135-9