CLASIC VERSUS NOVEL IN REDUCTION OF ACUTE ANTERIOR DISLOCATION OF THE SHOULDER: A COMPARISON OF FOUR REDUCTION TECHNIQUES

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CLASIC VERSUS NOVEL IN REDUCTION OF ACUTE ANTERIOR DISLOCATION OF THE SHOULDER: A COMPARISON OF FOUR REDUCTION TECHNIQUES (Abstract)  
Aim: The purpose of our study is to compare four different techniques for reduction shoulder dislocation in term of efficacy, duration until reduction and pain felt by patient during the procedure.  
Material and methods: During 2015 year, we conducted a study on 50 chronological patients with anterior shoulder dislocation. After exclusion of four patients, the remaining 46 (74% males, mean age 44.6±20.03 years, range 18 to 89) were randomly assigned in four groups and reduced by Cunningham (C), Kocher (K), Mothes (M) and Hipocrat (H) techniques. All the patients were sedated using Midazolam (2 mg) and Fentanyl (1μg/kgbw) except patients who underwent Cunningham technique.  
Results: The success rate was 76.9% in C group, 98.4% in K group, 90.2% in M group and 87.96% in H group (p>0.05). The level of pain in C group was similar to the other groups in the absence of pain medication (p<0.05)  
Conclusions: Cunningham technique is a simple, single person technique, drug free, less painful and safer, comparable with other “classical” methods.  
Keywords: ANTERIOR SHOULDER DISLOCATION, CLOSED REDUCTION, SCAPULAR MANIPULATION.

Due to particularly high mobility, shoulder is the most dislocated joint, with a prevalence of 17 per 100,000 individuals; approximately 95% of these dislocations are anterior (1). Various reduction techniques have been described with different rates of success and complications. Most of them are variants of what we consider “classic techniques” described by Kocher (2, 3), Mothes (4), Hipocrat (5, 6, 7) which include traction-counter traction and leverage maneuvers, some are considered “novel techniques” such scapular manipulation (8) and Cunningham (9) based principles of static and dynamic obstruction on the humeral head. The ideal technique should be quick, effective, painless and not cause further injury (10).  
Although not all the dislocated shoulder need pain medication, for ethical and legal reasons, the reduction technique should be performed under local or general anesthesia, as soon as possible (11, 12). In the Emergency Department, intravenous administration of opioids and benzodiazepine is commonly used. Although it ensure painless reduction, these drugs have important side effects such as respiratory distress,
hypotension, bronchospasm, which need close respiratory and cardiac monitoring of patients.

There are some clinical trials regarding reduction of scapular dislocation especially in the United States but none of our knowledge about compared efficacy of these four reduction techniques.

The aim of our study is to compare the efficacy of four reduction techniques for anterior shoulder dislocation: Cunningham, Kocher, Mothes and Hipocrat, in terms of time until reduction, post reduction pain and complications.

MATERIAL AND METHODS

We conducted a study in the Emergency Department of “Saint Spyridon” Clinical Emergency Hospital during 2015, according to the guidelines of ”Grigore T. Popa” University Committee for Research and Ethical Issues, on 50 consecutive patients with anterior shoulder dislocation. Two polytrauma patients and two Neer III fracture-dislocation patients were excluded.

All the patients were examined before and after the reduction for vascular and neurological lesions. After clinical and radiological diagnosis (anteroposterior view), patients were randomized by drawing envelopes to undergo reduction of the dislocation with one of the four methods used in the study by a single team of orthopedic surgeons.

Inclusion criteria: anterior shoulder dislocation with or without fracture of the great tuberosity, same reduction team, age above 18 and below 90 years.

Exclusion criteria: polytrauma patients, three or four part fracture dislocation, admitting more than 24 hours after the trauma, hypersensitivity to Midazolam or Fentanyl, severe cardiovascular or pulmonary disease, intake of food or fluid during last 4 hours; presence of airway difficulty; sensory problems; motor problems, vascular problems, and consumption of alcohol or other recreational drugs.

The patients undergoing Kocher (K), Mothes (M) and Hipocrat (H) techniques were sedated using Midazolam (2 mg) and Fentanyl (1μg/kgc). For Cunningham (C) technique, all the patients were informed about the procedure and express their consent for reduction. All subjects remained verbally responsive during the procedure.

All methods of reduction were performed as described by their authors. The unsuccessful cases were treated by Kocher reduction. In case of failure, patients were treated close reduction in operating room under general anesthesia.

All patients were cardiac and oxygen saturation monitored during the procedure. After reduction all the patients were immobilized in Velpeau bandage.

The quality of reduction was radiological evaluated (anteroposterior view). The patients were assessed by term of pain during reduction by visual analog scale (VAS) after they became fully oriented.

The patients were discharged after they had fully recovered orientation of time and space with vital signs within the normal range.

Statistical analyses were performed on SPSS 20.0 version (SPSS Inc., Chicago, Illinois, USA). Patient characteristics were expressed as the mean standard deviation or as a number and percentage. Variables were compared by paired t test. A p value of less than 0.05 was considered statistically significant.

RESULTS

There were no statistically significant
Clasic versus novel in reduction of acute anterior dislocation of the shoulder: a comparison of four reduction techniques

differences between the four groups in terms of age, sex, primary-to-recurrent dislocations ratio, the mechanism of dislocation, the presence or absence of a coexisting fracture of the greater tuberosity, the mean time interval between the injury and the first attempt at reduction, and the reduction time (tab. I)

<table>
<thead>
<tr>
<th>TABLE I</th>
<th>Clinical characteristic of patients in the four groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td>K (n=13)</td>
</tr>
<tr>
<td>Age (years) (Mean±SD)</td>
<td>35.8 ±18.7</td>
</tr>
<tr>
<td>Sex (%)</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Origin</td>
<td>Urban</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
</tr>
<tr>
<td>Mechanism</td>
<td>Sport activity</td>
</tr>
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<td></td>
<td>Fall</td>
</tr>
<tr>
<td>Type</td>
<td>Primary</td>
</tr>
<tr>
<td></td>
<td>Recurrent</td>
</tr>
<tr>
<td>Associated fracture</td>
<td>1</td>
</tr>
</tbody>
</table>

There was no vascular or neurological deficits pre or post reduction. Four patients (8.69%) had a great tuberosity fracture which was reduced orthopedic and did not required surgical reduction and fixation.

One patient necessitates reduction under general anesthesia in operating room.

The duration of reduction was significantly different between the four groups (tab. II).

<table>
<thead>
<tr>
<th>TABLE II</th>
<th>Efficacy, time needed for reduction and level of pain felt during the reduction</th>
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</thead>
<tbody>
<tr>
<td>Groups</td>
<td>Reduction success rate</td>
</tr>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>K</td>
<td>12</td>
</tr>
<tr>
<td>M</td>
<td>7</td>
</tr>
<tr>
<td>H</td>
<td>11</td>
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<tr>
<td>C</td>
<td>11</td>
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<tr>
<td>p value</td>
<td></td>
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</table>

**DISCUSSION**

To our knowledge this is the first study that compares these four techniques. Although it is traditionally belief that the reduction of shoulder dislocation necessitates traction and counter traction in term of force to overcome muscle contracture, there are techniques that do not imply force with...
similar success rates (9, 13, 14, 15, 17, 19).

The lower success rate in our study with Cunningham technique and longer time until reduction compared with other technique, it’s probably motivated by a longer learning curve.

While the “classical” techniques of shoulder reduction require pain medication for the reduction to be achieved in terms of patient safety, we obtained significant comparative pain levels without sedation. Cunningham technique has the advantage of being less painful without the health risks (9).

In our study we did not evaluate time spent in the emergency department but it’s evidently shorter in Cunningham group.

Our study has some limitations. We included a small number of patients and the study was unblinded. We must consider that Midazolam has the side effect of anterograde amnesia and it becomes difficult to assess lever of pain on these patients.

Compared to others “classical” techniques, Cunningham have lower rates of mechanical complications (9). Although Kocher technique had a 98.4% success rate in our study it’s known as unphysiological, brutal, and dangerous because of its association with fractures of the surgical neck of the humerus and neurovascular complications (11, 17, 18).

CONCLUSIONS

Although larger patient studies are necessary for confirmation, Cunningham technique should be considered because it’s single person, drug free, less painful and safer, comparable with other “classical” methods.

REFERENCES

Clasic versus novel in reduction of acute anterior dislocation of the shoulder: a comparison of four reduction techniques


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**IS THERE ANY SUCH THING AS “NO EVIDENCE OF DISEASE ACTIVITY IN MULTIPLE SCLEROSIS”?**

No evidence of disease activity (NEDA) in Multiple Sclerosis (MS) is a concept that has emerged throughout the last years as a result to new and effective therapies. The concept includes parameters such as freedom of relapse, stability on the Expanded Disability Status Scale (EDSS) – no sign of clinically worsening, as well as a stop of dissemination in time and space of demyelinating lesions on the MRI. Nevertheless, this is not enough to appreciate NEDA, as bedside relapse rate, disability progression and neuropsychological aspects such as cognitive status, depression, fatigue and quality of life are parameters also to be considered in the attempt of a better definition of the phenomenon. For all that, a multiple sclerosis decision model (MSDM) that would include all of these items to be evaluated, promises to support early treatment decisions. However, prospective studies are still required (Stangel M, Penner IK, Kallmann BA et al, Towards the implementation of ‘no evidence of disease activity’ in multiple sclerosis treatment: the multiple sclerosis decision model, *The Adv Neurol Disord.* 2015 Jan; 8(1): 3–13).

*Dan Trofin*