

Evaluation of Shoulder Dislocation in Emergency Department: Sedoanalgesia and Follow up ***Acil Serviste Omuz Çıkkılarının Değerlendirilmesi: Sedoanaljezi ve İzlem***

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Abstract: Glenohumoral joint is the most mobile joint in the body and its dislocation is the most frequently seen large joint dislocation in the emergency department. Pain relief and overcoming muscle resistance are keys to a successful reduction. Although a reduction with an appropriate sedoanalgesia prolongs the hospital stay, it improves the success of the procedure and the patient's comfort. The aims of this study are to investigate the lengths of stay at the emergency department for the patients, who had dislocation diagnosis and reduction procedure, and the success of emergency department physicians in reduction procedures. The cases of the patients, who admitted to Eskişehir Osmangazi University School of Medicine, department of emergency medicine between 01.03.2011 and 01.03.2013, were identified as S40-S49 pursuant to ICD 10 coding system, and were over 18 years of age, were browsed retrospectively. The epidemiologic data of the patients, the applied analgesia and the sedation types, the clinic which administered them and their success rates were recorded. The collected data were evaluated statistically. Of 103 patients included to the study, 85 patients (82.5%) were male and their average age was 37.62 ± 16.93 . Of 73 patients for whom the emergency physician tried closed reduction, the procedure was successful and there were no complications in 68 (93.1%). When the lengths of stay at the emergency department were compared in patients administered sedation and those not, it was detected that the patients who had sedation stayed significantly longer at the emergency department ($p=0.001$). It was detected that the patients stayed significantly shorter at the emergency department even though they had sedoanalgesia ($p<0.001$), when the reduction procedures were performed by the emergency physicians. Sedoanalgesia administered for shoulder reduction prolongs the patients' lengths of stay at the emergency department. However, the application of shoulder reduction with sedoanalgesia in a fitting patient group by emergency department physicians would improve success rate and decrease unnecessary consultations, pain and anxiety in patients, and their lengths of stay at the emergency department.

Key Words: shoulder dislocation, discharge time, sedoanalgesia, emergency department

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Özet: Glenohumoral eklem vücuttaki en hareketli eklemdir ve acil serviste en sık karşılaşılan büyük eklem çıkığıdır. Redüksiyon başarısında ağrının azaltılması ve kasların direncini yenmek anahtar rol oynar. Uygun bir sedoanaljezi ile redüksiyon hastanın acil serviste kalış süresini uzatırken işlem başarısı ve hasta konforunu olumlu yönde etkilemektedir. Bizde bu çalışmada acil serviste omuz dislokasyonu tespit edilen ve redüksiyon işlemi yapılan hastaların acil serviste kalış sürelerini ve acil tıp hekimlerinin redüksiyon işleminde başarısını araştırmayı amaçladık. Eskişehir Osmangazi Üniversitesi Tıp Fakültesi Acil Tıp kliniğine 01.03.2011-01.03.2013 tarihleri arasında başvuran, ICD 10 kodlamasına göre S40-S49 olarak tanımlanan 18 yaş üzerindeki vakalar geriye dönük olarak tarandı. Hastaların epidemiyolojik verileri, uygulanan analjezi ve sedasyon tipi, acil serviste kalış süresi, uygulayan klinik ve başarı oranları kaydedildi. Elde edilen veriler ile istatistiksel değerlendirmeler yapıldı. Çalışmaya alınan 103 hastanın 85'i (% 82.5) erkek ve yaş ortalamaları 37.62 ± 16.93 idi. Acil tıp doktorunun kapalı redüksiyon işlemi denediği 73 hastadan 68'inde (%93.1) başarılı olduğu ve komplikasyon gelişmediği tespit edildi. Sedasyon uygulanan ve uygulanmayan vakaların acil serviste kalış süreleri değerlendirildiğinde sedasyon alan hastaların acil serviste anlamlı olarak daha uzun süre kaldığı tespit edildi ($p=0.001$). Acil tıp hekiminin yaptığı redüksiyon işlemlerinde, hastalara sedoanaljezi uygulansa da anlamlı olarak daha kısa süre acil serviste kaldığı tespit edildi ($p<0.001$). Omuz redüksiyonu için uygulanan sedoanaljezi hastaların acil serviste kalış süresini uzatmaktadır. Ancak acil tıp hekimlerinin uygun hasta grubunda sedoanaljezi ile omuz redüksiyonu yapması başarı oranını arttıracak, gereksiz konsültasyonları, hasta ağrısını, anksiyetesini ve hastanın acil serviste kalış süresini azaltacaktır.

Anahtar Kelimeler: omuz çıkıkları, taburculuk zamanı, sedoanaljezi, acil tıp

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1. Introduction

Shoulder joint is one of the most mobile joints in the body and its dislocation is the most frequently seen one in large joint dislocations. It might be the result of sports activities, bicycle accidents and falls, but it might also be seen as recurrent dislocations caused by the specific movements due to the weakness which resulted from the shoulder instability following a dislocation (1). The most frequently occurring dislocations are anterior (97% of shoulder dislocations), but posterior (2-4%) and inferior (0.5%) dislocations might also occur (2). Recurrent dislocations might be seen in association with degenerative changes in the joint (3). Closed reduction is the most frequently used initial treatment method. A dislocated shoulder needs to be reduced as soon as possible with an appropriate sedoanalgesia at the emergency department (4, 5). Humeral head defect, rotator cuff tears and auxiliary nerve damage might come along with shoulder dislocations. It is a rare incident to have humeral shaft fracture in tandem with shoulder dislocations (6). In case of shoulder dislocations without fracture or nerve damage, a reduction can be done with appropriate sedoanalgesia at the emergency department. Pain relief and overcoming shoulder muscles' resistance are essential for a successful reduction (7). However, in recurrent dislocations with continuous pain and dysfunction or shoulder instability, surgical methods might be required (8). In closed reduction applications, pain management can be executed via intravascular sedation and analgesia as well as intra-articular anesthesia. Even though it is indicated that intra-articular injections last longer and are safer, and IV sedation produces more hypoventilation, the evidence based studies did not reveal one's superiority over the other in both pain relief and reduction success (9). IV sedation is a frequently used procedure in the present-day emergency departments for it improves patient compliance as well as it eases patients' pain and anxiety (10). Prolonged lengths of stay at the emergency department for the cases with sedation, development of complications due to

the administered medicine are undesirable results for an emergency physician. Besides, the fear for possible complications in the course of reduction discourages the emergency physician to reduce the dislocated shoulders.

In this study, we aim to investigate the effect of the administered sedation on the length of stay at the emergency department for the patients who came to the emergency department with shoulder pain and were diagnosed for shoulder dislocation, and to compare success rates of reductions performed by the emergency department physicians and the orthopedists.

2. Material and Method

Following the approval of the local ethics committee, the cases of the patients, who came to Eskisehir Osmangazi University Medical School Emergency Medicine Clinic between 01.03.2011 and 01.03.2013, were identified as S40-S49 pursuant to ICD 10 coding system and were over 18 years of age, were browsed retrospectively. The clinical data of 317 detected cases were acquired from the computer records. Among them, only 103 patients diagnosed with shoulder dislocation were included in the study. The patients were evaluated in terms of age, sex, direction of the dislocation, sedation applications, applied reduction method, clinic which reduced the shoulder, and lengths of stay at the emergency department.

The acquired data were analyzed with IBM SPSS statistics, version 21.0. In the descriptive statistics of the continuous variables, the mean was indicated with \pm standard deviation; the categorical variables were indicated with numbers (%). The compatibility of the continuous variables with the normal distribution was evaluated with the Shapiro-Wilk test. The significance of difference among the continuous variables was evaluated with the Mann Whitney-U test in the two-group comparisons and with the Kruskal Wallis H test (with the Bonferroni

correction) in the comparisons of three or more groups. The significance of difference among the categorical variables was evaluated with the chi-square test. The value of $p < 0.05$ was acknowledged as statistically significant.

3. Results

Of 103 patients included in the study, 85 (82.5%) were male and the average age of all patients was 37.62 ± 16.93 . It was seen that 74 (71.8%) patients were administered sedoanalgesia or NSAID for the reduction of the diagnosed dislocations. When we evaluated the data in terms of the administered medication, it was detected that in 40 patients (38.8%) fentanyl and dormicum, in 11 patients (10.7%) etomidate, in 22 patients (21.4%) only NSAID was used. In 2 patients (1.9%) administered fentanyl and dormicum no complication was observed other than hypotension. All inferior and posterior dislocations were reduced with the application of sedoanalgesia, but of 94 patients diagnosed with anterior dislocation, only 65 (69.14%) were reduced with the use of sedoanalgesia.

The emergency medicine assistant was successful in 68 (93.1%) of 73 patients for whom he tried closed reduction. 5 unsuccessful cases were consulted with the Department of Orthopedics. The orthopedics assistants tried to reduce these patients' shoulders, however only one case was successful. The remaining 4 patients were undergone reductions successfully in the conditions of an operating room by the Department of Orthopedics.

A total of 13 (12.6%) patients (9 patients with fracture and 4 patients whose shoulders could not be reduced by conventional methods) had shoulder reduction in the conditions of an operating room. There is no significant difference between the reduction methods applied to the patients and their lengths of stay in the emergency room ($p = 0.12$). The average length of stay for the patients administered sedation was calculated as 163.16 ± 150.85 min. and for the patients, who was not administered sedation, was calculated as 102.59 ± 111.68 min. When we evaluated the

lengths of stay in the emergency department for cases with and without sedation, we detected that those who had sedation stayed at the emergency department significantly longer ($p = 0.001$). 35 (34.0%) of all reduction procedures were performed by the orthopedists and 68 (66.0%) were performed by the emergency department assistants. The length of stay for patients, who were consulted with the orthopedics and applied reduction by the orthopedics assistants, was detected as 232.77 ± 190.88 min. The length of stay for patients, who were applied reduction by the emergency department assistants and discharged, was detected as 101.50 ± 81.95 min. When we compared the patients' lengths of stay in the emergency department, we found out that the cases consulted with the Department of Orthopedics and applied reduction by the same department stayed at the emergency department significantly longer ($p < 0.001$).

4. Discussion

At the emergency department, when a shoulder dislocation was seen, it should be reduced as soon as possible to relieve the pain and also to increase the success of reduction (11). The application of a painful reduction procedure would affect the patient and the success of the procedure unfavorably. As the pain remains, it would become harder to overcome the shoulder muscles resistance and it would increase the risk of complications (7, 12). The studies demonstrate that the nerve blocks decrease the discharge time, yet sedoanalgesia was more successful in pain relief (13). There were no patients administered nerve blocks among the patient group included in our study. However, it was revealed that the lengths of stay at the emergency department for the patients administered sedation were significantly longer than those who were not given any medication.

Although the group, who did not have analgesia, was not provided with a sufficient pain management, no orthopedics related complications were observed. Presumably, the number of patients might be low or the patients included in the study group might be

easy cases for reduction. Even though the patients' prolonged stays at the crowded emergency departments are not preferred, providing patient comfort and the sufficient muscle relaxation might decrease the possible complications. In the literature, proper monitorization and airway management together with the application of intravenous analgesia and a sedative agent were recommended as a proper method for sufficient sedation in shoulder dislocations (14, 15).

In our study, there were patients whose shoulders could not be reduced despite sedoanalgesia. Only after a deeper muscle relaxation was achieved under the general anesthesia, the application of reduction was carried out successfully. In our study, on what grounds some patients were not given any medication could not be found in the records. Presumably, the patient groups might be selected from those who were assumed to be easily reducible due to their non-traumatic quality, those who came to hospital in a shorter period of time after dislocation or those who had a previous dislocation history.

In our study, we found out that the patients, who had both a fracture and a shoulder dislocation, were consulted with the Department of Orthopedics, but we could not detect why some patients were consulted with the Department of Orthopedics before the application of any procedure although they had no additional problems. The reasons of the direct consultation with the Department of Orthopedics for such patients might be the additional factors such as the emergency department overcrowding and the patient's age. However, the application was unsuccessful only in a few cases where the patient's shoulder was reduced directly without consultation. Of 5 unsuccessful cases, only one patient had a successful reduction procedure performed by the orthopedics. The remaining 4 patients had their shoulders

reduced under the conditions of an operating room as a result of a deeper anesthesia and muscle relaxation. In the literature, while an exact failure rate was not provided, 5-10% failure rate for the cases with anterior dislocations or a minimal failure rate for the closed reductions was reported (16-18). In our study, in the patients whose shoulders were reduced without a consultation with the Department of Orthopedics, no complication was seen following the reduction. This might be related to the small number of patients and the application of the reduction procedure only to the selected patients. Medical exam at the orthopedics outpatient clinic was recommended to these patients after their discharge. When the patients' lengths of stay at the emergency department were checked, it was detected that the patients consulted with the Department of Orthopedics stayed significantly longer than those whose shoulder reductions were performed by the emergency department assistants. Although there was no exact data to explain this situation in the records, the reasons, such as the unavailability of the doctor due to an ongoing surgery, the late arrival of the doctor due to a problem with his/her other patients at his/her department or the unavailability of the consulting doctor due to an ongoing surgery, were encountered.

5. Conclusion

Today, the emergency medicine physicians have become more successful in the application of sedoanalgesia and the management of reduction due to their accumulating experiences. Although the sedoanalgesia administered for shoulder reduction prolongs the patients' lengths of stay at the emergency department, the shoulder reduction with sedoanalgesia applied to a fitting patient group by the emergency department physician would improve the patient comfort and also decrease the patient's length of stay at the emergency department.

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