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Результаты применения авторской мануальной методики вправления вывиха плеча

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Обоснование. Вывих плеча занимает первое место по частоте встречаемости среди всех вывихов. Существует много способов вправления вывиха плеча как в амбулаторных, так и в стационарных условиях. Консервативное лечение пациентов с такой травмой не всегда приводит к положительному результату.

Цель исследования — проанализировать результаты применения авторской мануальной методики вправления вывиха плеча.

Материалы и методы. Исследование проведено с 2013 по 2020 г. включительно со сплошной выборкой в травматологическом пункте Городской больницы № 1 им. Н.И. Пирогова. По критериям включения пациентов в исследование, таким как первичный вывих плечевого сустава и диагноз «закрытый травматический вывих плеча», включены 1968 человек. Критерием исключения стал вторичный вывих. В амбулаторных условиях успешное вправление плеча произведено у 1159 (58,9 %) пациентов, после неудачного вправления госпитализировано с вывихом плеча 809 (41,1 %) больных. Пациенты амбулатории были разделены случайным образом на две группы: в группе 1 (n = 1552) плечи вправляли традиционными методами с использованием местной анестезии, пациенты группы 2 (n = 416) получили лечение по авторской мануальной методике без местной анестезии. По полу, возрасту и виду вывиха пациенты обеих групп статистически значимо не различались.

Результаты. Применение мануальных техник оказалось эффективным в 85 % случаев (у 352 человек), госпитализированы 64 человека (15 %). Результативность использования традиционных методов с применением местной анестезии составила 52 % (плечи вправлены у 807 пациентов), остальным пациентам группы 1 помощь оказана в стационарных условиях.

Заключение. Использование авторской мануальной методики у пациентов с вывихом плеча в амбулаторных условиях более эффективно по сравнению с применением традиционных методов, поскольку позволяет оказать помощь большему количеству пациентов амбулаторно без анестезиологического пособия, что снижает затраты на лечение этой категории больных.

Ключевые слова: вывих плеча; вправление плеча; анестезиологическое пособие; мануальные техники.

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Results of applying author's manual method for repositioning shoulder dislocation

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BACKGROUND: Shoulder joint dislocation is the most frequent among all types of dislocations. There are many ways to correct a dislocation of the shoulder. There are many ways to reduce a dislocated shoulder in both outpatient and inpatient settings. The results of conservative treatment of patients with shoulder dislocation are not always positive.

AIM: To analyze the results of the author's manual technique for repositioning shoulder dislocation.

MATERIALS AND METHODS: The study was conducted from 2013 to 2020 inclusive with unselected sampling; the study base is the trauma center of the City Hospital No. 1 by N.I. Pirogov. Criteria for including the patients in the study — primary dislocation of the shoulder. Diagnosis: "Closed traumatic dislocation of the shoulder" in total — 1968 people. Non-inclusion criteria — secondary dislocation. In the outpatient setting, successful reduction of the shoulder was carried out in 1159 (58.9%) patients; after unsuccessful reduction, 809 (41.1%) patients were hospitalized with shoulder dislocation. The outpatient patients were randomly divided into two groups: in group 1 (n = 1552) the shoulders were adjusted using traditional methods with local anesthesia, the patients in group 2 (n = 416) received treatment according to the author's manual technique without local anesthesia. There were no statistically significant differences in gender, age, and type of dislocation in both groups.

RESULTS: The use of manual techniques was effective in 85% of the cases (352 people), 64 people were hospitalized (15%). The effectiveness of using traditional methods with the use of local anesthesia was 52% (dislocation was repositioned in 807 patients), the rest of the patients were treated in the inpatient setting.

CONCLUSIONS: The use of the author's manual technique in patients with shoulder dislocation in the outpatient setting has higher efficiency compared to traditional methods due to the fact that more patients receive assistance in the outpatient setting. In addition, this type of treatment is carried out without anesthesia, which also reduces the cost of treatment.

Keywords: shoulder dislocation; dislocation reduction; anesthesiological aid; manual techniques.

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ECO•VECTOR

BACKGROUND

Among joint dislocations, shoulder dislocations (SDs) rank first in terms of incidence and account for more than 50% [1, 2]. This is due to the anatomical and physiological characteristics of SD, such as the large size of the shoulder joint, significant volume and variety of movements, relatively small plane of the articular surface of the scapula, large head of the humerus, weakness of the wall of the anterior-posterior joint capsule, etc. [1, 3, 4].

The reduction of the shoulder immediately after dislocation is a basic measure for the successful treatment of SD [5].

SD is verified annually in 17 cases per 100,000 of the population, with the maximum rates noted among men aged 21–30 years and women aged 61–80 years [6, 7]. The incidence of SD recurrence is approximately 50% of cases [8, 9].

In Russia and other countries, the incidence of SD continues to increase [10, 11]. Doctors describe and use dozens of techniques to reduce a dislocated shoulder. Specialists from many countries continue to discuss issues of diagnostics, treatment, and rehabilitation of patients with SD [12–14].

All shoulder reduction methods can be divided into conservative and surgical. Modern traumatology includes approximately 50 methods, which are associated with the maximum relaxation of the patient's muscles. It cannot be achieved with severe pain; therefore, most methods involve preliminary anesthesia and muscle relaxation [1, 15, 16]. However, in recent years, studies have been conducted on SD reduction using manual techniques without anesthetics [17, 18]. This motivated authors to conduct a special study aimed at developing and testing the manual method of shoulder reduction without using anesthesia.

This study aimed to analyze the results of applying the author's manual technique for SD reduction.

MATERIALS AND METHODS

The study was performed from 2013 to 2020 and included a consecutive sample. It included 1968 patients with primary SD, who presented to the trauma center of the N.I. Pirogov City Hospital No. 1 and were diagnosed with closed traumatic SD. The exclusion criterion was secondary SD. A method for treating patients with a closed SD has been patented [19].

This method provides osteopathic effect on the musculofascial region of the shoulder joint with the patient in the sitting position. For this purpose, soft tissue techniques of simultaneous traction and inhibition were used. Traction was performed on the injured arm of the patient, abducted by the hand to the side to a horizontal position, followed by abduction backward at an angle of 3°–15°. Inhibition was performed in the armpit of the injured arm. No more than three attempts were made. In the supine position, the injured arm was only abducted to the side.

For this treatment, the patient leaned back on the back of the chair in a sitting position, the legs were bent at an angle of approximately 90° in the hip and knee joints, the distance between the knees and feet ranged from 10 to 50 cm, the head was located evenly, with forward gaze, and the shoulders were down and relaxed. If the patient cannot sit, a lying position was taken on the edge of the couch or manipulation table, providing the doctor access to the injured limb.

The doctor stood on the side of the injured limb facing the patient. With the dorsal (opposite to the injured side) hand, the doctor captured the wrist joint area without squeezing the bone, muscle, and neurovascular structures of the patient's forearm and hand and placed the fingertips of the ventral (homonymous to the damaged side) hand in the patient's armpit under the head of the dislocated bone.

Following the correction technique, the doctor abducted the injured arm of the patient by the hand to the side to a horizontal position and performed traction of the limb (osteopathic technique) with its abduction back at an angle of 3°–15° rhythmically with 10–15 cycles per minute. Simultaneously with traction, with the fingers of the hand located in the armpit, the doctor performed inhibition (osteopathic technique) of the shoulder joint muscles. Traction and inhibition were performed for 5–15 seconds.

The doctor performed the independent return of the humeral head to a congruent position with the glenoid cavity of the scapula, simultaneously relaxing the muscles. Moreover, the doctor adducted the injured limb to the torso. With the patient in the supine position, the injured limb should only be abducted to the side.

A complicated dislocation is a contraindication to this technique. Absolute contraindications include damage to the blood vessels of the limb, damage to the limb nerves, and neglected dislocation. Relative contraindications include shoulder joint fractures and partial damage (compression and compremation) of the structures involved in limb innervation.

A distinctive characteristic of the proposed method of humeral reduction is the restoration of the congruence of the humeral articular surfaces without force impact and anesthetic support. This method

- avoids the risks of humeral fractures, damage to the cartilaginous surfaces of the articular cavity of the scapula and humeral head, and damage to the vessels and nerves of the shoulder joint;
- provides the possibility of treating patients with SD as outpatients; and
- reduces the cost and duration of treatment for patients with SD.

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Table 1. Distribution of the patients with shoulder dislocation by sex and age using traditional methods (1) and manual techniques (2)
Таблица 1. Распределение пациентов с вывихом плеча по полу и возрасту в группах лечения традиционными методами (1) и с использованием мануальных техник (2)

Age, years	Group 1 (*n* = 1552)				Group 2 (*n* = 416)			
	men		women		men		women	
	n	proportion (%)	*n*	proportion (%)	*n*	proportion (%)	*n*	proportion (%)
18–29	145	9.3	16	1.0	18	4.3	6	1.4
30–44	240	15.5	44	2.8	58	13.9	41	9.9
45–59	198	12.8	117	7.5	63	15.1	9	2.2
60–74	224	14.4	197	12.7	54	13.0	48	11.5
75–89	193	12.4	149	9.6	71	17.1	41	9.9
>90	13	0.8	16	1.0	4	1.0	3	0.7
Total	**1013**	**65.3**	**539**	**34.7**	**268**	**64.4**	**148**	**35.6**

Table 2. Distribution of the patients with shoulder dislocation by dislocation type using traditional methods (1) and manual techniques (2)
Таблица 2. Распределение пациентов с вывихом плечевого сустава по виду вывиха в группах лечения традиционными методами (1) и с использованием мануальных техник (2)

Type of dislocation	Group 1 (*n* = 1552)				Group 2 (*n* = 416)			
	men		women		men		women	
	n	proportion (%)	*n*	proportion (%)	*n*	proportion (%)	*n*	proportion (%)
Anterior	915	59.0	466	30.0	236	56.7	134	32.2
Inferior	73	4.7	67	4.3	26	6.3	12	2.9
Posterior	25	1.6	6	0.4	6	1.4	2	0.5
Total	**1013**	**65.3**	**539**	**34.7**	**236**	**56.7**	**134**	**32.2**

Patients were randomly distributed into two groups. Humeral reduction was performed in an outpatient setting in group 1 (*n* = 1552) using traditional methods with local anesthesia, and in group 2 (*n* = 416), manual techniques were used without local anesthesia.

Table 1 presents the distribution of groups 1 and 2 patients by sex and age, and Table 2 presents the dislocation type.

No significant difference was found between groups 1 and 2 by sex, age, and dislocation type.

RESULTS AND DISCUSSION

Patients diagnosed with closed traumatic SD in Sevastopol are treated in the Traumatology Center and Department of Traumatology and Orthopedics of the N.I. Pirogov City Hospital No. 1. Cases of humeral reduction in other medical institutions of the city are rare, and their indicators are not considered in this study.

Humeral reduction on an outpatient setting was performed in 1159 (58.9%) patients, of which 809 (41.1%) patients were hospitalized due to SD and received inpatient treatment (Table 3).

The author's osteopathic technique for providing emergency care was used in 416 of 1968 patients. In 85% (*n* = 352) of the cases, the dislocation was reduced on an outpatient basis using osteopathic techniques without anesthesia. Moreover, 64 (15%) patients were hospitalized. In 1552 patients, traditional methods of SD reduction were used under local anesthesia, which enabled SD reduction in 807 (52%) patients. The remaining 745 (48%) patients were hospitalized for surgery under general anesthesia.

Most traumatologists consider the duration from the moment of injury to the shoulder reduction as the main factor of the efficiency of treatment of patients with SD, as the dislocated segment must be reduced immediately after diagnostics. According to most experts, pain relief is mandatory when reducing a dislocated shoulder. Anesthesia can be either general or local. Some authors prefer general anesthesia [20]. Other researchers consider local anesthesia a priority with the administration of 1% procaine (novocaine) or another anesthetic at a dose of 20–40 mL into the joint cavity [21, 22]. Some specialists recommend using conduction anesthesia [23, 24].

Many authors consider humeral reduction without anesthesia as erroneous [25–27]. These researchers suggest

Table 3. Conditions of medical care provision for patients with shoulder dislocation
Таблица 3. Условия оказания медицинской помощи пациентам с вывихом плеча

Humeral reduction	Number of cases, *n* (%)
Outpatient	1159 (58.9)
• Using osteopathic techniques	352 (17.9)
• Traditional methods (using local anesthesia)	807 (41.0)
Inpatient (using general anesthesia)	809 (41.1)
• After unsuccessful application of osteopathic methods	64 (3.3)
• As a result of inefficiency of traditional methods	745 (37.8)
Total	1968 (100)

communicating with the patient before SD reduction to calm him/her down, determine behavior at the stages of reduction, and achieve the maximum relaxation of the muscles. Humeral reduction is started only after anesthesia is achieved [25, 28]. Despite the vast majority of such works, publications began to appear with the opposite exact view, which included recommendations to reduce SD without anesthesia. For example, in 2016, Stafylakis et al. determined that 18% of patients with SD can be treated without using anesthesia [29]. The number of such studies has been increasing in recent years [30–32].

CONCLUSION

Comparison of traditional methods and the author's manual technique of SD reduction in outpatient emergency care demonstrates a higher (1.6 times) efficiency of the latter because it provides sufficient care in the outpatient clinic without requiring inpatient care. In addition, manual techniques are used without anesthesia; therefore, the elimination of uncomplicated SD on an outpatient basis using this technique can reduce significantly the treatment cost.

Thus, the efficiency of the author's manual technique for SD exceeds significantly the efficiency of inpatient treatment, as well as standard examination and reduction of the shoulder under local anesthesia on an outpatient basis.

ADDITIONAL INFORMATION

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Conflict of interest. The authors declare no conflict of interest.

Ethics approval. The research was approved by the Ethics Committee of the I.I. Mechnikov NWSMU and conducted in accordance with the ethical standards set out in the Helsinki Declaration. All patients received informational consent to conduct the study.

Author contributions. *M.A. Slabospitskii* — selection of clinical material, collection, and analysis of literature sources; *D.E. Mokhov* — collection and analysis of literature sources and text writing; *A.N. Tkachenko* — ideological concept of the work and article editing.

All authors made significant contributions to the study and article preparation and have read and approved the final version before its publication.

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