

SHORT REPORTS AND NOTES FROM PRACTICE

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Treatment of neglected complex dislocations in the elbow joint (clinical case)

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Neglected complex dislocations of the elbow joint are not often pathology, but its treatment is serious problem and demand an individual tactic of treatment. Objective. To present a clinical case of consecutive treatment the neglected complex dislocations of the elbow. Methods. The clinical case of neglected complex dislocations to the back with coronoid process fracture II type (by Regan, Morrey) with displacement to a 60-year old man, who could not get medical care within 6 months. At the moment of examination patient had formed steadfast interrelations of displaced elbow joint structures with loosening of limb functionality. At the first stage, the forearm was distracted by using an external fixation device end retraction in the shoulder-elbow joint was achieved. At another stage arthrolysis, open retraction of the radial head, restoration of the lateral ligamentous apparatus was completed. In three weeks restoration of movements in the elbow joint has begun, ensuring movements close to the natural axis of the forearm rotation, which was provided by the external fixation device. Results. In 6 months the patient noted moderate pain only after intense physical load, he doesn't take painkillers, volume of rotational movements: s/p — 20/0/25 (45°), extension-flexion movements: e/f — 0/15/118 (103°). The patient actively uses the limb for self-care and in work activities. According to the Mayo Elbow Performance Score the sum of points is 75, this means — the result is good. Conclusions. In cases of neglected complex dislocations for significant periods of existence (more than 3–4 months) staged treatment tactics is appropriate with using external fixation devices, by perforce perform open and closed manipulations, which depends on the specific clinical situation.

Застарілі переломовивихи у ліктьовому суглобі, хоча досить рідка патологія, але являє собою серйозну проблему в лікуванні й потребує індивідуального підходу щодо вибору лікувальної тактики. Мета. Поділитися варіантом етапного лікування застарілого переломовивиху в ліктьовому суглобі. Матеріал і методи. Наведено клінічний випадок застарілого заднього вивиху правого передпліччя поєднаного з відламковим переломом вінецьового відростка II-го типу (за Regan, Morrey) зі зміщенням у 60-річного пацієнта, який не мав можливості отримувати медичну допомогу протягом 6 міс. На момент звернення: стійке патологічне співвідношення зміщених утворень суглоба зі значним обмеженням рухів у ньому та втратою функціональних можливостей кінцівки. На першому етапі проведено спробу закритого усунення зміщення кісток суглоба за допомогою апарата зовнішньої фіксації, досягнуто вправлення в плечо-ліктьовому зчленуванні. На другому — виконано артроліз, відкрите вправлення головки променевої кістки, відновлення латерального зв'язкового апарата. Розробка рухів у суглобі з їхньою орієнтацією навколо природньої осі обертання, що забезпечував апарат зовнішньої фіксації, розпочата через три тижні після відкритого втручання. Результати. Через шість місяців больові відчуття помірної інтенсивності, пацієнт скаржиться лише після інтенсивного фізичного навантаження, знеболюючі препарати не використовує, обсяг ротаційних рухів — 20/0/25 (45°), розгинально/згинальних — 0/15/118 (103°). Хворий активно використовує кінцівку, повне самообслуговування, а також господарська діяльність. За шкалою Mayo Elbow Performance Score сума балів складає 75, тобто результат оцінюємо як добрий. Висновки. У випадку застарілих переломовивихів зі значними строками існування (більш ніж 3–4 міс.) доцільна етапна лікувальна тактика з використанням апаратів зовнішньої фіксації, за необхідності виконують як закриті, так і відкриті маніпуляції, характер яких залежить від конкретної клінічної ситуації. Ключові слова. Ліктьовий суглоб, застарілий переломовивих.

Keywords. Elbow joint, neglected complex dislocations

Introduction

Traumatic dislocations include «simple dislocations», which are simple dislocations without accompanying fractures, and «complex dislocations» — fracture-dislocations, observed less often than «simple dislocations» [5]. In addition, according to the time of occurrence of dislocations, there can be «recent» dislocations — up to 3 days, «non-recent» dislocations — up to 14 days, «chronic dislocations» with a long history of injury, according to different authors, 14–21 days or more [1, 2]. Chronic dislocations in the elbow joint, in most cases, are observed in countries with an underdeveloped health care system and are mostly the result of medical errors [7, 10]. Unfortunately, large-scale military actions cause an increase in the frequency of detection of old dislocations and fracture dislocations. We have recorded a clinical case under such conditions.

Purpose: to report an experience of staged treatment of chronic fracture-dislocation in the elbow joint.

Material and methods

The research material was reviewed and approved by the bioethics committee at the State Institution Professor M. I. Sytenko Institute of Spine and Joint Pathology of the National Academy of Sciences of Ukraine (Protocol No. 235 of 18.09.2023).

A 60-year-old patient S. Received an injury at home as a result of a fall with a landing on the hand of the straightened right arm. Immediately there was a sharp pain, pronounced deformation in the area of the elbow joint, attempts to move the forearm sharply increased pain sensations. Due to the unavailability of medical care at that time and for the next several months, the patient took available painkillers

and spared the injured limb. Over time, the intensity of the pain decreased and at the time of a visit to the State Institution Professor M. I. Sytenko Institute of Spine and Joint Pathology of the National Academy of Sciences of Ukraine 6 months after the injury, the patient was mostly concerned about the limitation of movements in the elbow joint and a significant loss of the functional capacity of the hand. Clinical examination, X-ray and CT studies showed chronic dislocation of the right forearm backwards, type II fragmentary fracture of the coronal process (according to Regan, Morrey [9]) with displacement. No neurological disorders of the ulnar, median or radial nerves were found. Passive and active movements of the forearm in relation to the shoulder in the sagittal plane were within 36° (r/z 0/20/56), the contours of the elbow joint were changed: the ulnar process was backward under the soft tissues (Fig. 1). The functional state of the elbow joint, according to the *Mayo Elbow Performance Score* scale [8] — 30, was found to be unsatisfactory. X-ray of the elbow joint (Fig. 2) determined a displacement of the bones of the forearm proximally and backwards with the encroachment of the coronal process (more precisely, its preserved part) into the area of the ulnar fossa. Fragments of the coronal process were located in front of and below the epiphysis of the humerus. In addition, X-ray images in the lateral projection made it possible to assume the presence of a displacement of the head of the radius bone back in relation to the ulna, but this was not confirmed by CT data — the ratio of the head of the radius bone and the notch of the ulna bone was preserved (Fig. 3).

The relationships between the bones of the forearm and shoulder that have formed were stable, and attempts to change them by manual effort have

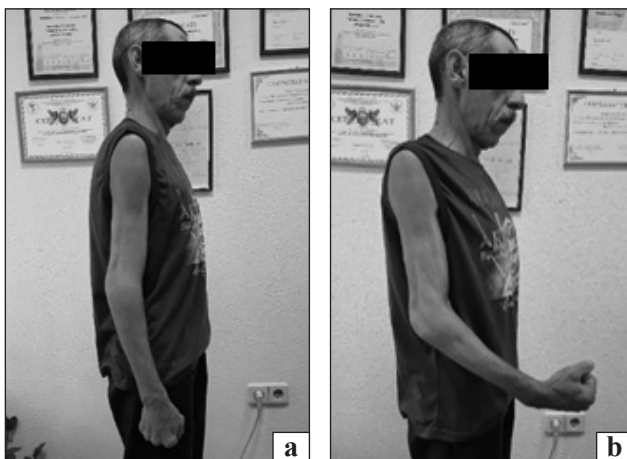


Fig. 1. General appearance (a) and range of motion of the injured limb (b) of patient S.



Fig. 2. Radiographs of the right forearm of patient S. in direct (a) and lateral (b) projections at the time of consultation

proven futile. Considering these circumstances, it was decided to use an external fixation device at the first stage of treatment. A device using Ilizarov's apparatus designs was assembled, while two rods and a needle were used on the shoulder, and two rods in the ulna were used on the forearm. The shoulder and forearm parts of the device were connected by a hinged structure, located behind and distal to the level of the elbow joint (Fig. 4).

In the postoperative period, distraction was performed on the rods connecting the shoulder part of the device with the hinges, i. e., the forearm was moved downwards, the rate of distraction was 2–3 mm per day. After reaching the gap between the coronal process and the epiphysis of the humerus, the distraction zone was transferred to the rod between the hinges and the forearm part of the apparatus. Next, after reaching the position in which the forearm was moved forward and the articular part of the ulna has reached the position of opposition to the epiphysis of the humerus, the space between these structures was gradually reduced by reducing the distance between the shoulder part of the apparatus and the hinges. The reduction process was completed

within two weeks, a satisfactory ratio was achieved in the shoulder-ulnar joint in the absence of such a ratio in the shoulder-radial joint (Fig. 5).

Stabilization for a week did not lead to retraction of the head of the radial bone. Therefore, due to the presence of incongruence in the brachioradial joint, a second surgical intervention was performed: arthrolysis, removal of scars from the cavity of the elbow joint, reduction of the head of the radius, transarticular fixation with a needle, plasticity of the lateral collateral ligament apparatus with local tissues, re-mounting of the external fixation apparatus — a needle was removed from the distal metaphysis of the humerus and a new needle was inserted in the area of the humerus epicondyles in the direction closest to the axis of rotation of the forearm bones in the elbow joint. A control X-ray after the operation confirmed the restoration of the ratio of the bones of the elbow joint (Fig. 6).

After three weeks, the needle that fixed the head of the radius was removed, the joints were transferred to the needle in order to develop extensor-flexion movements against the background of their hardware security (Fig. 7).

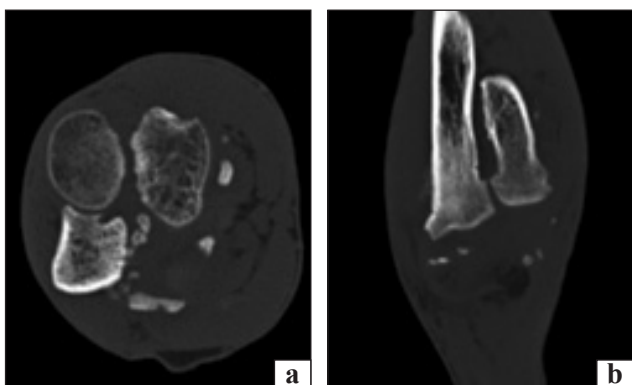


Fig. 3. Horizontal (a) and frontal (b) CT sections at the level of the proximal radioulnar joint

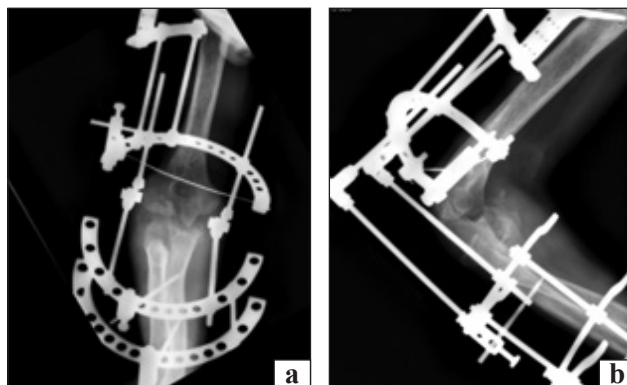


Fig. 5. Radiographs in direct (a) and lateral (b) projections after completion of the stage of hardware reduction of the forearm

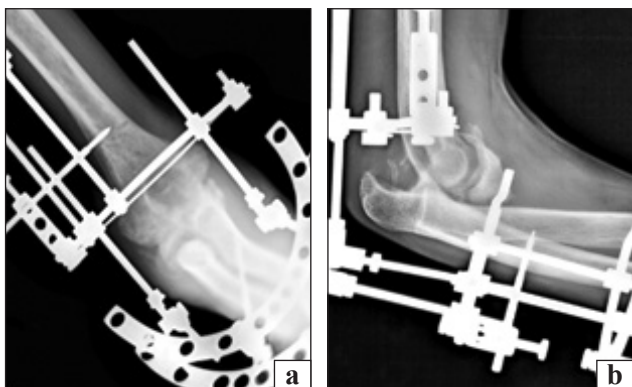


Fig. 4. Radiographs in direct (a) and lateral (b) projections of the elbow joint after the first surgical intervention

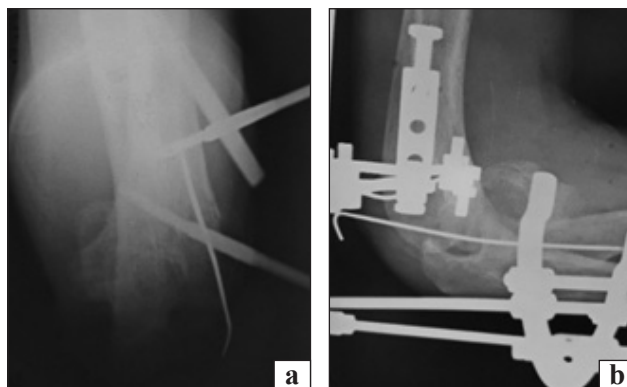


Fig. 6. Radiographs in direct (a) and lateral (b) projections of the elbow joint after the second surgical intervention

After three weeks, the device was dismantled, the development of movements and the gradual increase of functional loads of the limb continued.

Results and their discussion

Examination of the patient 3 weeks after dismantling the device (6 weeks after mobilization of the joint) and X-ray examination showed preservation of the achieved ratio of the bones of the joint, movement exercises without pain, the range of rotational movements — 15/0/15 (30°), the range of extensor-flexion movements — 0/50/115, i. e. 65° (Fig. 8). Evaluating the functional state of the elbow joint, using the *Mayo Elbow Performance Score* scale, the sum of points was 60, we came to the conclusion that it was satisfactory.

Control examination after 6 months demonstrated the following: pain sensations of moderate intensity occurred only after intense physical exertion, the patient did not use painkillers, the range of rotational movements was 20/0/25 (45°), extensor-flexion move-

ments were 0/15/118, they amounted to 103°. The patient actively used the limb to the full extent, during activities in the village. According to the *Mayo Elbow Performance Score* scale, the sum of points was 75, that is, the result was considered good.

Discussion

During the treatment of fractures and dislocations, in most cases, there is a need to intervene on the damaged bone structure to ensure bone stabilization of the joint [3]. In our case, analysis of X-rays and CT scans of the elbow joint showed that fragments of the coronal process were «scattered» in the soft tissues of the front surface of the elbow joint. Taking into account the duration of the pathological condition, the location of fragments of the coronal process, it was possible to predict that the procedure of removing fragments would be accompanied by difficulties, significant traumatization of tissues, problematic osteosynthesis and doubts about the quality of the results of such an intervention. Therefore, it was decided to abandon this option of the operation, and to choose the tactics of closed reduction with the help of an external fixation device with gradual stretching of the shortened tissues and elimination of displacement of the bones of the forearm.

External fixation devices are often used in combination with open manipulation of the bones of the forearm, after its implementation, in order to maintain the ratio of the bones of the elbow joint during the restoration of movements in the joint [4, 6]. In addition to open reduction, the soft tissue structures of the joint are also restored and, if necessary, the ulnar nerve is moved.

Worthy of attention is the experience of R. Ivo et al. (2009), who use a two-stage strategy for the treat-

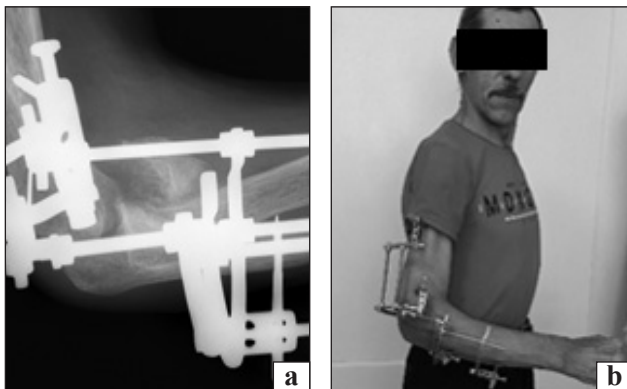


Fig. 7. Radiograph of the elbow joint (a) and the appearance of patient S. (b) after the completion of the preparation procedure for the development of movements in the joint



Fig. 8. X-ray of the elbow joint and appearance of patient S. 3 weeks after dismantling the external fixation device (6 weeks after mobilization of the joint)

ment of chronic fractures and dislocations [3]. At the first stage, a neurolysis of the ulnar nerve is performed, then the displacement of the forearm is eliminated due to intensive distraction with an external fixation device in the mode of 15 mm in one session with an interval of 10 minutes between the next distraction session. Previously carried out neurolysis of the ulnar nerve prevents its damage during further intensive distraction. After 10 days, the second stage is performed, namely an open repositioning and osteosynthesis of fragments of the coronal process. After the second intervention, movements in the joint are blocked for 4 days, and in the future, extension is limited for 3 weeks. In the case of using an external fixation device, the method of mounting the device is used, taking into account the axis of rotation in the shoulder-elbow joint, which was previously used for the treatment of «recent» fracture dislocations [11].

In our case, after the procedures for the reduction of the bones of the forearm, the external fixation device during the restoration of movements in the joint also ensured their performance in the natural axis of rotation of the forearm. Restrictions on the directions of movements or their coercion were not applied. In our opinion, passive tactics regarding fragments of the coronal process in the given clinical example are justified.

Conclusions

In the case of chronic fractures and dislocations with significant periods of duration (more than 3–4 months), staged treatment tactics using external fixation devices are advisable, if necessary, both closed and open manipulations should be performed, the nature of which depends on the specific clinical situation.

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

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TREATMENT OF NEGLECTED COMPLEX DISLOCATIONS IN THE ELBOW JOINT (CLINICAL CASE)

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