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EXPERIENCE IN THE SURGICAL TREATMENT OF COMMINUTED, INTRAARTICULAR FRACTURES OF THE DISTAL END OF THE HUMERUS

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ABSTRACT

The article presents the results of treatment of 56 patients with A3, CI, C2, NW (according to AO/ASIF classification) distal articular end fractures of humerus, who received treatment in 2019-2020. We found healing and restoration of joint function in 52 patients, non-healing of the fracture occurred in 4 (7.4%) patients. Good and satisfactory treatment results were obtained in 92.6% of patients

Keywords: humerus, comminuted fracture, osteosynthesis

INTRODUCTION

Fractures of the distal epimetaphysis of the humerus are a rather frequent pathology and, according to literature, reach 30% of fractures in the elbow joint [3,4,10]. According to some authors, comminuted fractures account for 25% of all fractures of the distal end of the humerus. In spite of certain successes achieved in the treatment of this category of patients, the percentage of unsatisfactory treatment outcomes remains rather high and is in the range of 40-50%. From 10 to 18% of

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complications are caused by the need for prolonged immobilization, leading to the development of contractures and ankylosis; in 20-29.9% of cases the victims are considered invalids [2,9,12,13]. Increasingly, fractures of the distal end take on a compound form: C1 (AO/ASIF) - complete intraarticular, articular simple, metaphyseal simple fracture (these fractures were formerly called T-, Y-maxillary fractures); C2 - complete intraarticular, metaphyseal comminuted fracture - like C1, but with metaphyseal bone fragments; C3 - complete intraarticular, articular comminuted fracture: These fractures are comminuted fractures of the epiphysis, directly to the articular end: block, condyle head, with bone fragments from the metaphysis, and also the presence of a "middle fracture" of the epiphysis.

Multiple comminuted fractures of the distal humerus are difficult to reposition due to the nature of the injury and require special attention during surgical treatment. The severity of the injury, the presence of multiple fragments, the intraarticular nature of the fracture, and in some cases, damage to the neurovascular bundle make repositioning of the bone fragments difficult and therefore increase the risk of adverse effects and complications. The existing conservative and surgical methods for the treatment of comminuted fractures of the distal humerus metaepiphysis are technically complex, time-consuming and are associated with the risk of complications (nerve damage during repositioning), as well as contractures due to the severity of damage to the musculocapsular apparatus of the elbow joint and long-term immobilization. The latter significantly affects the timing of the initiation of rehabilitation measures and the final result of treatment [5,8,11,14,15]. Currently, all patients with intraarticular fractures of the distal end of the shoulder, type B and C, depending on the presence of fragment displacement, and periarticular fractures of the distal end of the shoulder, type A, with displacement undergo open reduction and internal fixation; the operation is performed in the first 2-4 hours or after complete swelling subsides, on day 5-7; Accesses are used to ensure complete visualisation of the fracture and the possibility of revision of the LS: external, internal or paratricepical for type A and some type B fractures, transosseous for type C and some type B fractures with isolation of the ulnar nerve. Open anatomical repositioning and internal rigid fixation of the fracture are performed to avoid additional external immobilisation in the postoperative period [1,7,16].

To describe the results of combined osteosynthesis of intraarticular, multi-location fractures of the distal epimetaphysis of the humerus, with external and internal access, with internal fixation of bone fragments with spokes, external fixation with the Ilizarov apparatus.

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MATERIALS AND METHODS

Our report is based on the experience of 56 patients with A3, CI, C2, NW group (AO/ASIF classification) distal articular end fractures of humerus, who received treatment during 2019-2020. Males were -32(57%) and females were -24(43%). The age distribution was as follows: 18-29 years -16(28.5%), 30-49 years -24(43%), 50 years and above - 16(28.5%)**.**

Depending on the method of treatment, the patients were divided into the following groups: 1- treatment by repositioning under anaesthesia, taking into account the middle rotation of the shoulder, by means of vertical traction behind the ulnar process on the operating table, after successful fusion, confirmed by EOP examination, application of the Ilizarov device; 2- group: surgery - external and internal access: each, epimetaphyseal fracture is juxtaposed with the proximal fracture, fixed with spokes (two); the 3rd group of patients consisted of those in whom in order to accurately juxtapose the epiphyseal bone fragments with each other and then with the proximal fracture, the muscular pedicle of each fragment had to be dissected, the epiphysis fractures "collected", juxtaposed, then the epiphysis juxtaposed with the proximal fracture. This action, has usually been applied to C2, C3 comminuted fractures of the humerus. We dissected the muscular pedicle at a distance of 0.5-0.8 cm from the epicondyle to suture and repair it after the bone fragments were juxtaposed.

RESULTS AND DISCUSSION

Our analysis showed that 12 patients in group 1 had a distal end of shoulder fracture corresponding to A3 fracture group; 16 patients in group 2: C1; and 28 group 3 patients had C2, CÇ patients. In patients with CI, C2, and NW fractures (a total of 44 patients), 2 to 3 bone fragments of the epiphysis were first matched and fixed with 2 spokes (reconstructed or reconstructed), then the end of the central fragment was brought into the wound, the reconstructed epiphysis was matched to the end of the central fragment, and 2 spokes were fixed on each side of the epiphysis. Sometimes, a single bone fragment of the metaphysis had to be matched and fixed with one, two spokes. The strength and stability of the fixation was studied. The distal end of the shoulder was then repositioned. The dissected epiphyseal muscles were carefully sutured. Ilizarov apparatus of 2.5, 3.0 rings was additionally used for external fixation in 20 patients. The remaining 24 patients were immobilized externally with a plaster cast. The postoperative period proceeded well in 52 patients, in 4 patients we observed inflammatory phenomena near the spokes, which were managed

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superficially. In the follow-up of those patients whose muscles were dissected from the epiphysis and reattached, there were no radiological signs of disruption of bone fragment feeding. According to our observations, the healing time of multiaxial fractures of the distal articular end of the humerus is prolonged, on average up to 2-3 months. We found healing and restoration of joint function in 52 patients, non-healing of the fracture occurred in 4 (7.4%) patients. Good and satisfactory treatment results were obtained in 92.6% of patients.

CONCLUSIONS

In the treatment of fragmented metaphyseal fractures (A3 AO/ASIF) and some epimetaphyseal fractures (C2), closed repositioning with medial rotation of the shoulder, vertical skeletal traction, EOP control, and closed application of the Ilizarov apparatus may be used.

In the surgical treatment of group B fractures the lateral accesses on one side, group C fractures the lateral accesses on the external and medial side, with exposure of the ulnar nerve, allow to match and fix the fractures. Combined osteosynthesis: internal fixation and use of the Ilizarov apparatus significantly leads to successful results.

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