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ALGORITHM FOR SELECTING A TREATMENT METHOD FOR PROXIMAL HUMERUS FRACTURES

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Purpose of the study – optimization of approaches to surgical treatment of proximal humerus fractures and tactics of implant selection for various types of proximal humerus fractures.

Materials and methods. We conducted a comparative study of the treatment results of 62 patients with proximal humerus fractures patients with proximal humerus fractures treated with different surgical methods. undergoing inpatient treatment in the adult traumatology department of the Republican Specialized Scientific and Practical Medical Center for Traumatology and Orthopedics of the Republic of Uzbekistan for the period from 2019 to 2024, including archival data.

There were 39 men (63.8%) among the patients, 23 women (36.2%).

General data on the distribution of patients by age with proximal humerus fractures are provided. The bulk of patients in all three groups range from 45 to 70 years old (62%), since at this time patients lead an active lifestyle, and people over 50 years of age are at risk of fractures due to osteoporosis, especially women. At the age of 18 to 45 years (19%) patients. The smallest number of fractures of the proximal humerus in the age from 70 to 85 years (13%).

We compared the results of treatment of patients with fractures of the proximal humerus using three implants: an external device developed by us, intramedullary osteosynthesis with locking rods and a plate LCP (locking compression plate). and LPHP (locking proximal humerus plate).

Patients were divided into 3 groups, depending on the type of fracture based on the Neer classification and by the method of osteosynthesis with different implants depending on the number of fragments.

First group – patients with simple two-part (n=23) extra-articular fractures of the proximal iliac joint, which includes 23 patients with the simplest fractures, who used the extra-articular device developed by us **(FAP № 00608.22.02.2010).**

The second group of patients with 2-3 fragmentary extra-articular fractures of the proximal humerus were fixed (n = 15) with intramedullary locking pins.

The third group consists of 24 patients with the most complex four-fragment extra-articular fractures of the proximal humerus at the level of the surgical neck (n = 24) fixation was performed with an LCP, PHILOS plate; This type of fracture required fixation of all fragments.

We have developed an algorithm for treating patients with proximal pelvic fractures, which allows choosing the optimal method of surgical treatment depending on the nature of the fracture. (DGU No. 52604 of 04. 06.2025) based on the Neera classification. All patients were operated on according to the algorithm we developed. 23 patients had a 2-fragment fracture of the proximal humerus, 15 had a 3-fragment fracture, and 24 had a 4-fragment fracture (according to the Neer classification)

Group I - 23 patients, fixation of 2 and 3 fragmentary fractures of the proximal humerus with our plate.

Group II - 15 patients, intramedullary osteosynthesis of 2 fragmentary fractures of the humerus with a pin. performing osteosynthesis without exposing fragments under the control of an electron-optical converter (EOC) for a fracture at the level of the surgical neck. for the low invasiveness of the 30 method, it is minimally invasive, provides sufficient stability for fracture fusion. The use of a pin gives good anatomical and functional results Group III - 24 patients underwent fixation of 2, 3 and 4 fragmentary fractures of the humerus with an AO plate, a plate with angular stability LCP (locking compression plate).

Results and discussion

Six months after the operation, a clinical examination was performed using the Neer scale for two-, three-, and four-fragment fractures.

The best results were achieved in Group III - the average score was 97, since this group included patients with two-part fractures of the proximal humerus. These are the simplest fractures that do not require open reduction, cause minimal damage to soft tissues during access, and bone fragments are not isolated, which has a good effect on their further fusion.

In Group 2, 90 points were mainly obtained due to the complexity of four-part fractures of the proximal humerus, since these fractures require open reduction and internal fixation, more extensive visualization of the fracture during surgery, which leads to more massive damage to soft tissues.

The functional result in group 3 of 88 points was obtained mainly when fixing three-fragment fractures.

Complications

Results of complications in postoperative patients in all three groups.
In the first group, no complications were observed.
In the second group, one patient had a complication of impingement syndrome, which is associated with incomplete immersion of the pin into the medullary canal. During the operation, under EOP control, the pin position was correct. Postoperative radiographs showed incomplete immersion of the pin into the medullary canal. The patient was offered surgical treatment, which the patient refused, and shoulder joint development was started. It was possible to achieve 84 points on the Neer scale, with slight limitation of motion. In the third group, one patient (four-fragment fracture) developed adductor contracture of the shoulder joint due to the severity of the fracture and the severity of the postponing surgery, extensive visualization, and as a consequence, additional damage to soft tissues and no rehabilitation.

Conclusions

1. In the first group, with osteosynthesis using our plate, excellent results were achieved in 82% of patients, and satisfactory results were achieved in 13% of patients.
2. In the second group, with osteosynthesis of two-fragment fractures of the proximal humerus using a pin, excellent results were achieved in 86% of patients and satisfactory results were achieved in 12% of patients.
3. In the third group, with osteosynthesis using the AO plate, excellent results were achieved in 80% of patients and satisfactory results were achieved in 16% of patients.
Thus, based on our research, we wanted to show:
1. For each type of fracture, an individual choice of fixation method is desirable depending on the number of fragments and the quality of the bone.
• the most stable fixation for a two-fragment fracture is achieved with a pin for the proximal humerus.
• Three-part humeral fractures can be fixed with a plate with at least 4 holes in the proximal part to fix all fragments and hold them in the correct position under loads such as arm abduction and support on the arm.
• Four-part fractures should be fixed with a plate, which in the proximal part should have, as a rule, at least 7 locking screws. To fix and hold all fragments during early development of the shoulder joint, and also have holes for suturing the rotator cuff, since it is quite often damaged in multi-fragmentary extra-articular fractures of the proximal humerus.