

RECOVERY DYNAMICS FUNCTIONS OF THE INJURED LIMB IN PATIENTS WITH DIAPHYSEAL FRACTURES OF THE SHOULDER.

<https://doi.org/10.5281/zenodo.7838831>

Doctor of Medical Sciences, Professor Khudayberdiyev K.T.,

Master of the 3rd course Rakhimjonov I.U.

Department of Traumatology and Orthopedics. A.S.M.I.

Fractures of the humerus, according to various authors, account for up to 13% of all skeletal injuries. Absolute indications for surgical treatment of these injuries are: open fractures, cases of polytrauma, fractures with damage to blood vessels and nerves, pathological fractures and pseudoarthrosis. A significant part of diaphyseal fractures of the humerus is subject to surgical treatment according to relative indications: ipsi- and bilateral fractures, transverse and, conversely, long spiral fractures, a combination of a fracture and some diseases, such as Alzheimer's disease. A relative indication for surgical treatment is the patient's desire to be quickly rehabilitated without the use of external uncomfortable immobilization. At the same time, if intramedullary osteosynthesis with blocking is the generally recognized "gold standard" for diaphyseal fractures of the bones of the lower extremities, then bone osteosynthesis is more often used for fractures of the humerus.

The aim of the work is to compare the results of intramedullary and bone osteosynthesis of diaphyseal fractures of the humerus and to determine the preferred indications for a particular method of osteosynthesis.

Materials and methods. During the period from 2021 to 2023, we operated 192 patients with 192 closed diaphyseal fractures of the humerus. Of these, 95 patients with intramedullary fixators (antegrade access — 83, retrograde access — 12) and 97 patients with fixation of the humerus fracture with plates (compressing - 30, blocked — 67). Choosing a retainer for osteosynthesis of the humerus, the type of fracture, the level of damage and the presence of neurological symptoms were determined. Intramedullary antegrade osteosynthesis was the method of choice in the treatment of diaphyseal fractures of the humerus without neurological symptoms. Retrograde intramedullary fixation technique was used in cases where it was impossible to perform "classical" antegrade osteosynthesis. With both methods of nail insertion, we tried to avoid the most typical complications, such as impingement syndrome due to incorrect determination of the length of the retainer, damage rotator cuff, fracture at the entrance of the nail, supracondylar fracture of the shoulder.

In case of fractures of the humerus, complicated by neurological symptoms, a revision of the radial nerve was performed, followed by bone fixation with a plate. To fix diaphyseal fractures of the shoulder in the distal third, we used LC DCP compression

plates and fixators with angular stability: narrow LC LCP with 4.5–5.0 mm screws and metaphysical LC LCP with screws 3,5–4,5–5,0 mm. These implants ensured the stability of osteosynthesis with a minimum number of screws fixing the distal bone fragment (at least 3 cortical layers for standard screws and 2 for blocked ones). In a number of cases, minimally invasive osteosynthesis was performed: tunneling of the plate with the elimination of rotational and angular displacements under the control of the EOP, and the blocked plate was used as an internal retainer. With this method of fixation, the contact of the radial nerve with the plate was monitored visually through an additional incision. For "low" fractures of the humerus, we used a posterior surgical approach.

For diaphyseal fractures localized closer to the middle third of the shoulder, a posterior or anterior approach was used (depending on the configuration of bone fragments). The fractures were fixed with a wide LC LCP with screws 4.5–5.0 mm.

Results and their discussion. Of 97 patients operated with the use of bone fixation, in 4 cases (4.12%) in the postoperative period, radial nerve paresis developed. Full restoration of function occurred within 2 to 8 weeks, which corresponds to the literature data. Neurological symptoms were absent in patients after intramedullary osteosynthesis. Restriction of movements in adjacent joints (shoulder or/and elbow) after 6 weeks was observed: after antegrade intramedullary osteosynthesis — 75%, after retrograde intramedullary osteosynthesis — 75%, after bone osteosynthesis — 53%. After 3 months — 34%, 58%, and 6%, respectively. After 6 months — 2%, 41%, 0%. After 12 months — 0%, 12%, 0%, respectively. There were no infectious complications. Delayed consolidation of fractures after intramedullary osteosynthesis was noted in 13.2%, after bone — in 3.1% of cases. These cases did not require special treatment. No false joints were observed. Thus, the function of the adjacent shoulder and elbow joints was restored at a faster rate after bone osteosynthesis. At the same time, some patients (4.12%) after bone osteosynthesis with complete restoration of the function of adjacent joints were forced to receive therapy aimed at the treatment of postoperative neuropathy of the radial nerve. However, after 6 months after surgery, statistically significant differences in the functional results of bone and intramedullary osteosynthesis from antegrade access were no longer observed. Retrograde intramedullary osteosynthesis in 12% of cases resulted in incomplete patient satisfaction with the function of the elbow joint (discomfort, restriction of extension to 170-175 degrees).

Conclusions.

1. The most rapid restoration of the function of adjacent joints occurs after bone osteosynthesis of diaphyseal fractures of the humerus. However, the inevitable contact with the radial nerve and the threat of neurological disorders (neuropathy of the radial nerve in 4.12% of cases), as well as the aesthetic consequences of surgery equate these data with the results of antegrade intramedullary osteosynthesis.

2. The known advantages of intramedullary fixation (low blood loss, good cosmetic effect) allow us to consider this method of osteosynthesis from antegrade access is most preferred for the treatment of diaphyseal fractures of the humerus in the proximal and middle third.

3. Retrograde technique of intramedullary osteosynthesis requires special attention and strict technological sequence in order to avoid violations of the function of the elbow joint in the long term.

LITERATURE:

1. Dulaev A.K., Borisov S.A., Bogdanov A.N. et al. Treatment of victims with fractures of the long bones of the extremities using intramedullary osteosynthesis with locking pins // Collection of abstracts of the 8th Congress of traumatologists-orthopedists 2006. — pp. 175-176.

2. Bhandari M., Devereaux P.J., McKee M.D., Schemitsch E.H. Compression plating versus intramedullary nailing of humeral shaft fractures--a meta-analysis // Acta Orthop. — 2006.— 77. — P. 279–284.

3. Chapman J.R., Henley M.B., Agel J., Benca P.J. Randomized prospective study of humeral shaft fracture fixation: intramedullary nails versus plates // J. Orthop. Trauma. — 2000. —14. — P. 162–166.