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EXPERIENCE IN THE SURGICAL TREATMENT OF COMMINUTED FRACTURES OF THE DISTAL END OF THE FEMUR

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Abstract:

Background: According to different authors, the frequency of fractures of the distal femur ranges from 6 to 25% of all femoral fractures. The most severe of them are intercondylar and supracondylar fractures, which account for up to 42% of all hip fractures, among which type C fractures account for up to 50%. the nature and severity of the fracture. In recent decades, there has been an increase in injuries in general and in particular due to medical disasters. Since these fractures often occur at working age, and the share of this population in the population is increasing. The aim of the study was to improve the results of treatment of patients with comminuted fractures of the distal end of the femur using the plate with the Liss system. Material and methods of research: in the period from 2018 to 2021, 69 patients aged 20 to 60 years with comminuted fractures of the distal end of the femur were under our observation. Distribution of patients by age: 20-25 years old – 15 patients (21.7%), 26-45 years old – 35 patients (50.7%) and 46-60 years old – 19 patients (27.6%). By gender: men – 51 (73.9%), women – 18 (26.1%). Conclusions: the analyses showed that in patients of groups 1-2, therapeutic measures and restoration of patients' ability to work lasted a long time. In the 3rd group of patients (34 patients) the time of therapeutic measures decreased, the patients' ability to work was restored within 3-4 months and there were no complications after surgery.

Keywords: Femur, screw, skeletal traction, Liss plate.

Introduction

Topicality. According to different authors, the frequency of distal femoral fractures ranges from 6 to 25% of all femoral fractures [1]. The most severe of them are intercondylar and supracondylar fractures, which account for up to 42% of all hip fractures, among which type C fractures account for up to 50% [2]. the nature and severity of the fracture. In recent decades, there has been an increase in injuries in general and in particular due to medical disasters. Since

these fractures often occur at working age, and the share of this population in the population is increasing. In young people, severe comminuted and intra-articular fractures predominate, in the elderly - simple periarticular fractures with an oblique or transverse fracture line [5]. The following trends are determined in the approaches to the treatment of intra-articular fractures of the distal femur: the desire for ideal repositioning, reliable and controlled fixation, early function of the knee joint, dosed, gradually increasing, load on the limb [3]. Results of treatment of patients with distal fractures of the femur largely depend on how quickly and to what extent the movements in the knee joint are resumed. The results of treatment, despite good anatomical correction, do not always satisfy surgeons and patients in a functional sense. Forced long-term immobilization of the knee joint in fractures of the lower third of the femur leads to the development of persistent extensor contracture [4, 6]. Moreover, the more distal the fracture of the femur, the more severe the contracture of the knee joint.

The aim of the study was to improve the results of treatment of patients with comminuted fractures of the distal end of the femur using the Liss plate.

Materials and methods of research: in the period from 2022 to 2025, 69 patients aged 20 to 60 years with comminuted fractures of the distal end of the femur were under our observation. Distribution of patients by age: 20-25 years old – 15 patients (21.7%), 26-45 years old – 35 patients (50.7%) and 46-60 years old – 19 patients (27.6%). By gender: men – 51 (73.9%), women – 18 (26.1%). All patients underwent clinical and X-ray examinations. On the basis of the X-ray, methods of surgical treatment were determined. To study the effectiveness of the selected method of surgical treatment, the patients were divided into 3 groups. In Group I, 13 (18.8%) patients underwent surgery to compare fragments, fix them with Ilizarov wires, and external immobilization with a plaster bandage. In Group II, 22 (31.9%) patients underwent an open comparison of bone fragments with fixation with plates and external fixation with a plaster bandage. In Group III, 34 (49.3%) patients were subjected to an open comparison of bone fragments using the Liss stabilizing plate, which fixes on the lateral side of the femur.

Surgical treatment using the Liss stabilizing plate consists in stable fixation of a multifragmented intra-articular fracture of the distal end of the femur. In this case, the knee joint is exposed by external access. Bone fragment repositioning is carried out in an open way, temporarily fixed with wires and the anatomical integrity of the distal end of the femur is restored. Next, the bone is fixed from the outside with a Liss plate, which covers up to the middle third of the femoral diaphysis. The plate is fixed with stabilizing screws. After hemostasis with a revision of the stability of the fixation of bone fragments on the operating table, X-ray is performed in 2 projections. At the same time, the passive movement of the knee joint of the operated limb is checked. The surgical wound is sutured in layers, aseptic dressing and external fixation with a plaster bandage.

Clinical example 1. Bol-ya Sh., born in 1989, diagnosed with a closed oblique-spiral fracture of the distal end of the right femur.

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Figure 1. X-ray of the patient Sh., born in 1989, a-diagnostic before surgery, b-after surgery, fixation with a Liss plate.

Clinical example 2. Bol-oy S., born in 1993, diagnosed with an open comminuted fracture of the distal end of the right femur.

Figure 2. X-ray of the patient S., born in 1993, a, b-diagnostic before surgery, c-after surgery, fixation with a Liss plate.

Results:

When studying the results, a comparative analysis of surgical treatments of patients of 3 groups was carried out, paying attention to the following: duration of treatment and postoperative complications. In group I, 13 patients who had fixation of fragments with Ilizarov wires, fusion of bone fragments lasted up to 8 months. Due to prolonged immobilization of the limb, contractures of the knee joint and atrophy of the muscles of the operated limb were observed. for a long time they received physiofunctional treatment. In Group II, there were 22 patients who underwent open comparison of fragments and fixation with plates, external fixation with a plaster bandage. Reparative regeneration of bone fragments lasted at least 6 months. After removing the plaster bandage, all patients had persistent flexion-extensor contractures. These patients underwent physiofunctional treatment for a considerable time. In group III, 34 patients in whom the Liss plate was used for fixation, after the operation, the limb is fixed with a derotation plaster boot, which prevents contractures of the knee and hip joints and atrophy of the limb muscles. After 2.5-3 months, a control X-ray was performed, it showed good regeneration of bone tissues and no complications were observed after surgery.

Findings

The analyses showed that the patients of groups I and II had been treated for a long time, the method of fixation with wires and simple non-compressive screws did not sufficiently hold the bone fragments, micro-movements were observed. Because of this, the results of treatment did not satisfy the patients and the attending physicians. In the III group of patients, in whom bone fragments were fixed with Liss plates, it showed very successful results. muscle atrophy was rarely observed; inflammation was not observed in soft and bone tissues. 3-4 months after the operation, the ability to work was restored and no disability was observed after the operation.

Conclusion

In comminuted intra-articular fracture of the distal end of the femur, most cases fail: closed reduction or insufficient external fixation complicates conservative treatment methods. The use of the Liss plate, which provides rigid fixation of fragments and the possibility of early and active joint mobilization. Liss plates are conditioned to achieve normal bone fusion and restore the correct axial ratios and congruence of the articular surfaces, as well as to ensure early mobilization of the joint and limb as a whole.

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