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

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ABSTRACT:

The incidence of fractures of the distal femur ranges from 6 to 25% of all fractures of the femur, according to different authors. The most severe of these are intertarsal and supracondylar fractures, which account for up to 42% of all hip fractures, of which type C fractures account for up to 50%. The complex anatomical structure of the distal femur, the condition of the bone tissue, and the mechanogenesis of the injury determine the location, nature, and severity of the fracture. In recent decades, there has been an increase in trauma in general and this localisation in particular due to medical disasters. Because these fractures often occur at working age, the proportion of this population in the population is increasing.

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

RELEVANCE:

The incidence of fractures of the distal femur ranges from 6 to 25% of all fractures of the femur, according to different authors. The most severe of these are intertrochanteric and supracondylar fractures, which account for up to 42% of all hip fractures, of which type C fractures account for up to 50%. The complex anatomical structure of the distal femur, bone condition, and mechanogenesis of injury determine the localisation, nature, and severity

of the fracture. In recent decades, there has been an increase in trauma in general and this localisation in particular due to medical disasters. Because these fractures often occur at working age, the proportion of this population in the population is increasing. Severe comminuted and intraarticular fractures predominate in the young, while simple periarticular fractures with oblique or transverse fracture lines predominate in the elderly. Approaches to the treatment of intraarticular fractures of the distal femur are defined by the following trends: striving for perfect repositioning, secure and controlled fixation, early function of the knee joint, and dosed, gradually increasing, load on the limb. The results of treatment of patients with distal femur fractures largely depend on how quickly and to what extent movement in the knee joint is resumed. Despite good anatomical correction, the results are not always functionally satisfactory for surgeons and patients. Forced prolonged immobilization of the knee joint for fractures of the lower third of the femur leads to the development of a permanent extensor contracture. The more distal the fracture of the femur, the more severe the contracture of the knee joint.

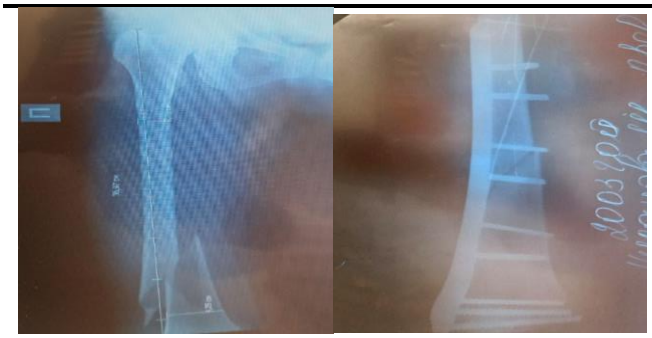
PURPOSE OF THE STUDY:

To improve the treatment of patients with distal femoral end comminuted fractures using the Liss plate.

MATERIALS AND METHODS OF STUDY:

Between 2018 and 2021, we followed up 69 patients with comminuted fractures of the distal end of the femur between the ages of 20 and 60 years. Distribution of patients by age: 20-25 years - 15 patients (21.7%), 26-45 years - 35 patients (50.7%) and 46-60 years - 19 patients (27.6%). By sex: 51 (73.9%) men and 18 (26.1%) women. All patients underwent clinical and radiological examination. On the basis of the radiographs, surgical treatment methods were determined. The patients were divided into 3 groups to study the effectiveness of the selected surgical treatment. In Group I 13 (18.8%) patients underwent fracture matching surgery, Ilizarov fixation and external immobilization with plaster casts. In Group II, 22 (31.9%) patients underwent open fracture matching with plate fixation and external fixation with a plaster cast. In Group III, 34 (49.3%) patients underwent open bone fracture fixation using the Liss stabilisation plate, which fixes on the lateral side of the femur. The surgical treatment with the Liss stabilisation plate consists of stable fixation of a multi-articular intra-articular fracture of the distal end of the femur. This involves exposing the knee joint through the external access. The bone fragments are repositioned openly, temporarily held in place with spokes and the anatomical integrity of the distal end of the femur is restored. The bone is then secured on the external side with the Liss plate, which extends to the middle third of the diaphysis of the femur. The plate is fixed with stabilisation screws. After hemostasis with revision of the fixation stability of the bone fragments on the operating table, an X-ray is taken in 2 projections. At the same time, passive motion of the knee joint of the operated limb is checked. The surgical wound is sutured layer by layer, aseptic dressing and external fixation with a plaster cast.

Clinical example 1. Patient Sh. born in 1989. Diagnosis of a closed oblique - spiral fracture of the distal end of the right femur.

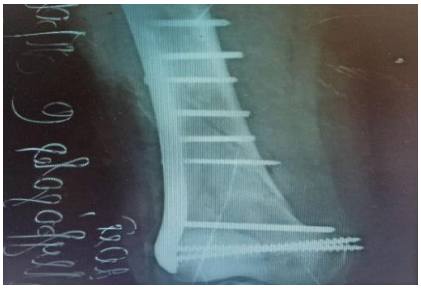


a. b.

Fig. 1. Radiograph of patient Sh., born in 1989. a-diagnostic before surgery, b-after surgery, Liss fixation.

Clinical example 2. Patient C., born 1993. Diagnosis open comminuted fracture of the distal end of the right femur.

a. b.



c.

Fig. 2. Radiograph of patient C., born 1993. a,b-diagnostic before surgery, c-after surgery, fixation with Liss.

RESULTS OF THE STUDY:

A comparative analysis of the surgical treatment of patients in the 3 groups was performed, with attention paid to the following: duration of treatment and postoperative complications. In Group I, 13 patients who underwent fixation with Ilizarov spokes, bone fracture healing lasted up to 8 months. Due to the long immobilization of the limb, contractures of the knee joint and atrophy of the muscles of the operated limb were observed. As a result, the patients had to undergo physiofunctional treatment for a long time. Group II consisted of 22 patients who underwent open fracture fusion and fixation with plates and an external fixation with a plaster cast. Reparative regeneration of the bone fragments lasted at least 6 months. After removal of the plaster cast, all patients had persistent flexion-extensor contractures. These patients received a considerable amount of physiofunctional treatment. In group III of 34 patients in whom the Liss plate was used for fixation, the limb was fixed after surgery with a derotational plaster boot, which prevented contractures of the knee and hip joints and atrophy of the limb muscles. Control radiographs were taken 2.5-3 months later and showed good bone regeneration and no postoperative complications.

CONCLUSIONS:

The analyses showed that Group I and II patients were treated for a long time, the fixation technique with pins and simple non-compression screws did not sufficiently retain the bone fragments and micro-movements were observed. As a result, the results of treatment were not satisfactory for the patients and the treating physicians. Group III patients in whom bone fragments were fixed with Liss plates showed very successful results. Function of the knee joint was restored in 1.5-2 months, muscle atrophy was rarely observed, and no inflammation was observed in the soft and bone tissues. Three to four months after surgery, the ability to work was restored and no postoperative disability was observed. For intra-articular calcaneal fractures of the distal femur, most cases fail closed repositioning or insufficient external fixation makes conservative treatment difficult. The use of the

Liss plate, which provides rigid fixation of the fracture and enables early and active mobilisation of the joint. The Liss plate is used to achieve normal bone fusion and restore the correct axial alignment and congruence of the articular surfaces, as well as to ensure early mobilisation of the joint and the limb as a whole.

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