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Optimization of Treatment for Proximal Hip Fractures

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Abstract: The problem of treatment of femoral fractures remains relevant today due to the constant increase in the frequency and severity of open and closed fractures of this localization and the frequent development of various complications during their treatment. As a rule, femoral bone fractures are characterized by the presence of a large number of bone fragments and bone tissue defects that arise due to the inability to accurately compare small bone fragments or when removing free-lying bone fragments during primary surgical Unsatisfactory results when using conservative methods of hip fractures treatment (fixation method, skeletal traction method), you need to develop a technique for operative restoration of bone integrity (8). The main principles of internal fixation developed by the International Association of Osteosynthesis are anatomical reposition, stable fixation, preservation of blood supply and early functional mobilization. Analysis of the experience of long-term use of internal fixation led to the conclusion that the main condition for optimal reparative bone regeneration is the preservation of the supply of bone fragments, depending on the state of periosteal and periosteal tissue structures. Since the disruption of blood circulation of soft tissues and bone in fractures always takes place, it is extremely important to create biological prerequisites for bone healing and regeneration (1, 11).

Plates with angular stability LCP (Locking Compression Plate) together with LISS plates are representatives of a new generation of plates that require adapted surgical techniques and new thinking in in relation to the generally accepted concepts of bone osteosynthesis (15).

The LCP plate uses combined holes, one half of which (smooth) is designed for the introduction of standard screws, the other half - with a thread is designed for the introduction of locking screws. Locking the screws in the plate is possible due to the threaded connection of the screw head with the plate hole, which ensures the angular and axial stability of the paste-bone system. Locking screws provide the possibility of monocortical fixation, which reduces damage to the endosteal blood supply. With this fixation, the plate plays the role of a second cortical. The manufacturer sets the intentional direction of the locking screws in the bone at different angles, which increases the rigidity of fixation.

Unlike traditional osteo- synthesis in plates with angular stability, the strength of fixation does not depend on the quality of the bone, since the forces of stretching and compression are transferred through screws to the plate- the contact of the plate with the periosteal layer is point-like, spacers are inserted into the holes of the plate to preserve the gap between the bone and the plate during fixation ("space holders") are special screws that are removed after the plate is installed. The absence of plate pressure on the bone eliminates the development of bedsores of bone tissue on the area of attachment of the structure, sharply reduces the trauma of the supra-bone, which plays an important role in osteogenesis, plates with angular stability are also used anatomically modeled for the distal femur LISS-DF (Less invasive stabilization system Distal femur). In them, the screws in the metaphysical



zone are fixed in the walking position for a better grip of the bone in osteoporosis. It is important to note that the installation of these plates can be made both from standard wide access and from low-traumatic multiple accesses at different levels of plate attachment. The main indications for the use of LCP and LISS plates in hip fractures are multi-splintered fractures of the diaphysis, metaphysis, including with a defect of bone tissue, fractures in combination with osteoporosis, intra-articular distal metaepiphyseal femoral fractures (12, 14).

Advantages – limited surgical trauma, less blood loss, shorter duration of surgery, preservation of segment biomechanics, with the possibility of early functional recovery, no need for additional cementing or the use of bone grafts to compensate for bone loss, preservation of tissue physiology (3IN recent years in traumatology began to use drugs based on hydroxy apatite (6). Great interest has been shown in composite materials based on HAP and collagen, such as the domestic biocompositional bone-plastic material – "collapan".

This drug belongs to the implantation materials of a new generation. The drug is produced in the form of granules, plates, gel in a sterile syringe container (sterilization by gamma radiation), contains a homogeneous composition of a particularly pure ultrafine hydroxyapatite powder in a matrix of especially pure collagen of type 2 special treatment with the introduction of anti-microbial agents (gentamicin, claforan, monomycin or lincomycin). The artificial hydroxyapatite contained in the collapse is chemically identical to the main mineral component of bone tissue - biological hydroxyapatite. The main advantage of this plastic material in comparison with others is that all the components of the collapse are disposed of in the patient's body, i.e. biodegraded. The drug is completely replaced by bone tissue without the formation of a fibrous layer, actively stimulates osteogenesis, significantly enhances reparative processes in damaged tissues, promotes rapid healing and restoration of bone structure [7, 10]. The antibiotic included in the composition of "collapan" creates an antimicrobial background in the area of administration due to prolonged release of the drug for 20 days, has an anti-inflammatory effect, which ensures a calmer course of the postoperative period, a lower severity of temperature reaction, pain syndrome, postoperative edema than after operations in the traditional version. As the studies have shown, the "collapse", in fact, is a matrix for the formation of newly formed bone tissue. Compared with al-lotransplants, collapan has a number of serious advantages, the main of which is the absence of the risk of rejection, allergic reactions and infection with HIV and hepatitis.

In this work, a clinical and radiological assessment of the experience of using the angular stability plate system (LCP), the LISS plate system and the bio-composite drug collapan was carried out in order to optimize the treatment of diaphyseal and metaepiphyseal femoral fractures, and to reduce the frequency of complications.

For the period from 2002 to 2005 on the basis of the traumatological and orthopedic department

No. 1 of the Stavropol Regional Clinical Center for the provision of specialized types of medical care, osteosynthesis with plates with locking screws was performed in 16 patients with comminuted femoral fractures. Of these, men

➤ 12 (75%), women – 4 (25%). The age of the sufferers ranged from 17 to 56 years. In 15 cases, the cause of the injury was a traffic accident, in 1 – the injury was of an industrial nature. In three cases, fractures were of a secondary open nature, in the rest – closed.

For diaphyseal fractures in 7 (43.8%) patients, the LCP diaphyseal plate was used, metadiaphyseal os-annular intraarticular fractures of the distal femur in 9 (56.2%) cases were synthesized by the LISS-DF plate. In 13 cases, bone osteosynthesis was performed from a standard wide access, in 3 cases, minimally invasive tunnel subcutaneous osteosynthesis was performed with diaphyseal fractures of the femur in the lower and middle third.

In order to optimize the reparative regeneration of bone tissue, eliminate the defect of bone tissue, improve the results of treatment of comminuted fractures of long tubular bones in the postoperative period, we used the drug collapan in the form of a gel. The drug was injected into the zone of residual interfragmental



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