

# КЛИНИЧЕСКИЕ ДИСЦИПЛИНЫ

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## CURRENT TREATMENT OPTIONS FOR PATIENTS WITH FRACTURES OF FEMORAL NECK

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The article presents the tactics of treatment of elderly patients with fractures of the femoral neck. Depending on the nature of the fracture, the period from the date of injury presented by the selection of a method of surgical treatment of fractures of the proximal femur. with biomechanically favorable fractures of the femoral neck Pauwels type I—II with displacement of fragments of type Garden II—III up to 3 days after the injury we have produced a minimally invasive percutaneous osteosynthesis beam V-shaped spokes or AO cannulated screws. If after an injury took place over 3 days in patients older than 60 years at subcapital fractures type III of Pauwels, Garden IV of, patients produce primary hip arthroplasty. The article also describes the experience of doing pereoperatsionnogo elderly patients with femoral neck fractures in the preoperative and postoperative phases.

**Key words:** fracture of femoral neck, minimally invasive osteosynthesis of femoral neck, hip joint replacement, Doppler ultrasound, deep vein thrombosis, early activation

Fractures of femoral neck still remain an urgent problem and many researches considered the real epidemic. Only in 1990 in the world there are about 1,3 million of these fractures and to 2050 is expected to increase to 4,5 million [5, 6].

According to WHO, mortality among elderly patients with fracture of proximal femur reaches 12—15%. In the conservative treatment of fractures this localization mortality reaches 24—55%, to 33% patients die during the first 6 months after injury, and mortality progressively increases with age. [1, 7, 9].

K. Koval и J. Zuckerman [11] note that among the elderly patients with fractures of femoral neck in 20—50% become disabled. All this testifies to the enormous social significance of the problem.

In acute injuries the most actual is the problem of rapid relief of pain and motor activity recovery that equivalent to saving lives for elderly patients. We are convinced the older the patient the more selectivity and active treatment strategy of fractures of femoral neck should be. This provide the ability to self-serve and return to normal life.

This possibility reveals on urgent surgical treatment in all patients irrespective of age and comorbidities.

When the previously used method of conservative treatment of fractures of the proximal femur in 65% of patients formed bedsores despite the meticulous care, in 23% — hypostatic pneumonia. In 18% of cases revealed venous thrombosis of the lower limbs on the side of the fracture, most deep vein thrombosis of hip region and iliac region.

Unsatisfactory results of conservative treatment have led to the need to introduce active surgical tactics with individually differentiated approach.

According to WHO, the surgical treatment affected mortality of elderly patients received a fracture of the proximal femur is 12—15%, according to our data varies 5,9—10%. Therefore all over the world seek in these injuries to the active surgical tactic [7, 10, 11]. Osteosynthesis of femoral neck nonunion fracture is 33%, avascular necrosis is 16%, after osteosynthesis reoperation is required in 20—36% cases [2, 3].

In treatment of fracture of femoral neck some authors prefer different options of arthroplasty [6, 8], another prefer osteosynthesis. N.A. Shesternya with joint authors notes the high efficiency of percutaneous osteosynthesis and total arthroplasty by Tsvaymyuller depending on socio-economic factors [7]. V.M. Lirtsman with joint authors indicate the need for arthroplasty on failure of osteosynthesis and by limiting to primary arthroplasty strict conditions.

In our practice with biomechanically favorable fractures of femoral neck type Pauels I—II with displacement of bone fragment type Garden II—III in 3 ays after injury we have produced a minimally invasive percutaneous osteosynthesis beams of V-shaped spokes or cannulated screws AO.

Clinical example. Patient K. 50 years old was hospitalized with subcapital fracture of right femur type Pauels II, Garden II (Pic. 1). The next day after being hospitalized after an urgent survey in intensive care, after closed reduction under X-ray control performed percutaneous osteosynthesis of femoral neck by tns V-shaped spokes (Pic. 2).



**Pic. 1.** Subcapital fracture of right femur



**Pic. 2.** After osteosynthesis by V-shaped spokes



**Pic. 3.** Activation of the patient the next day after operation



**Pic. 4.** Fracture healing. 6 months after operation

The next day after the operation the patient could sit herself and walk with crutches without reliance on operated limb (Pic. 3).

Usually after operation imposed 1—2 sutures on cutting and patient was discharged to outpatient treatment in 10—12 days after osteosynthesis. We haven't seen any complications inflammatory in postoperative period. Fracture healing occurred in 6 months after osteosynthesis (Pic. 4).



**Pic. 5.** X-ray after removal of metal structures.  
The appearance of the patient

Removal of metal structures are usually produced in a year after operation. It should be noted that removal can be done even under local anesthesia. Very important moment was to preserve the blood supply in hip joint region and complete absence of additional traumatic bone at osteosynthesis (Pic. 5).

Osteosynthesis was performed urgently — in 1<sup>st</sup> day of hospitalization because the delay is directly proportional to the risk of developing complications. At patients there wasn't hypostatic complications, bedsore, pneumonia or pulmonary embolism so DTV of the lower extremities was 8% only. Through prevention hypostatic complications total mortality of patients has decreased by 3 times — to 5%.

According to our data the use of such gentle operations on hip joint as the osteosynthesis is limited to the terms of survival caput after fracture, degree of violation of perfusion due to damage to the vasculature.

If more than 3 days passed after injury at patients older than 60 years with subcapital fractures type Pauels III, Garden IV made primary arthroplasty of hip joint.

Clinical example. Patient P. 64 years old, was hospitalized with subcapital fracture of left femur type Pauels III, Garden IV (Pic. 6). Taking into account the patient's age, biomechanically unfavorable nature of fracture so after surgery in intensive care was made total arthroplasty of left hip joint by endoprosthesis Striker at the next day after hospitalization (Pic. 7) it should be noted that last time in arthroplasty we use large heads 32 и 36 mm it is prevention of dislocation of the implant after operation.

From a social point of view constitute a special group working pensioners nursing one or two families — in this situation very important early start of work even with crutches. But this can be only with implant. So arthroplasty is the most appropriate form of medical care in these patients.



**Fig. 6.** Subcapital fracture of left femur type Pauels III, Garden IV



**Fig. 7.** X-ray after arthroplasty

Treatment analysis of fractures of femoral neck at 140 patients showed that in 96% cases we have seen a lot of comorbides so at the same time noted some diseases of system and organs. When deciding question about choose treatment method and finding volume of possible interference to most patients needed complex survery and fast correction functions of important organs and systems.

For maximal reduce and preparing to operation all elder patients with fracture of femoral neck was hospitalized to intensive care regardless the state at the time of admission. In the survery revealed that 70% of patients suffered pathology of cardiovascular system, 23% of patients had respiratory deseases, 23% of patients was hospitalized with cerebrovascular disorders, 3% had deseases of the urinary system, at 13% was found pathology of the endocrine system, in 10% found pathology of the gastrointestinal tract.



On the classification of the American Society of Anesthesiologists (ASA), 80% of patients according to the degree of risk of anesthetic assigned to 3—4 class physical condition. To assess the condition of compensatory abilities and tension compensation systems all participants underwent monitoring of key systems, which allowed to determine the degree of correction of the available violations and the most important somatic and psychological komplaens to conducted and intended treatment. Preoperative preparation required correction fluid and electrolyte and metabolic disorders was aimed at the prevention of cardiovascular and respiratory complications. Bone fracture, pain, lack of exercise lead to worsening hypovolemia, hypoproteinemia and anemia in elderly persons. Correction of these faults was carried out infusion therapy. The volume of infusion therapy ranged from 250 to 1750 ml. In the infusion therapy included antihypoxants, electrolyte solutions, a mixture of potassium-glucose, amino acids, rheological solutions, 19% of patients with hypoproteinemia due transfused blood protein preparations (albumin 10%, 20%). In terms of hemoglobin below 100 g/l produced transfusion of red cells (10% of patients).

Injury and related pain, forced immobility, transportation, invasive manipulation, fear and anxiety in anticipation of operation to physical and mental discomfort and exhaustion, negatively affect the condition of the central nervous system, cardiovascular and respiratory systems. Sedation and pain relief improved psychosomatic condition and reduced the number of complications. For the treatment of pain in all patients used NSAIDs: ketoprofen 200—300 mg/day, ketorol 60—90 mg/day, Ksefokam 16 mg/day intramuscularly. Only 50% of patients due to severe pain were administered non-opioid analgesics (Tramal, Stadol), narcotic analgesics series is not used either before or after surgery.

For anesthesia and surgery is the most important condition of the cardiovascular and respiratory systems, due to the fact that 70% of patients suffered from coronary heart disease, stable angina, hypertension, arrhythmias. 50% of patients received kardiotropnyh therapy, which included the appointment of the testimony of nitrates,  $\beta$ -blockers, anti-hypertensive and antiarrhythmic agents.

Analysis showed that 23% of patients suffering from chronic respiratory diseases. The pain, hypovolemia, lack of exercise lead to hypoventilation, increased sputum viscosity and delay, and as a consequence — pneumonia. Oxygen therapy, chest massage, breathing exercises, inhalation of bronchodilators, mucolytics appointment allowed to approach the reduction of pulmonary complications.

All patients before and after surgery was performed Doppler ultrasound of the lower limbs. Drug prevention of thromboembolic complications begin in the preoperative period of receipt — fraxiparine 0.3—0.6 ml per day, the treatment — 0.6 ml 2 times a day.

In intensive care as a result of an intense period of observation (20 hours) and an adequate treatment determines the type of anesthesia, the volume and timing of surgical intervention, taking into account the compensatory capacity of the organism, comorbidity and planned blood loss. The vast majority of patients were operated on the first morning after arrival at CITO.

In a series of 140 observations hip replacement after fracture of femoral neck dynamic research vessels of the lower extremities (328 Doppler ultrasound) were conducted

82 patients. Deep vein thrombosis during the early periods (up to 3 days) was identified in 3.6% of cases prior to surgery. In cases of emergency surgery until 5 days after the injury DVT rate was 14.6%.

The average number of thrombosis was documented in 28% of cases, due to the late arrival and surgery in 45% of cases (after 2 weeks from the date of injury). Our observations show that in spite of the use of anticoagulants, the incidence of thrombosis is directly proportional to the terms of physical activity limitations.

With equal opportunities for osteosynthesis with recovery function, the main advantage of arthroplasty for fractures of the femoral neck is the possibility of early mobilization and walking with a support on the operated limb that has important medical and social importance. From a medical point of view — the prevention of complications, and social — early recovery of physical activity, self-service, reducing the time of disability, which is important for working pensioners

All patients after arthroplasty sit down with their pants legs (in elastic stockings or bandages) in the first day after the operation, put the bed and trained walking with a walker or crutches already on the 2nd day after the operation, 80% of them went to the uncontrolled load on the operated limb.

Eventually to discharge — two weeks after the replacement, the vast majority of patients go with a full load on the operated limb with two crutches, 50% of them could move to one crutch or cane, and 30% — with little or no additional support and assistance to outsiders.

Early activation of patients after joint replacement has a huge impact directly on the outcomes of hip fracture, only realized she was not willful decision or the operating ward doctor, and the sequence (step by step) active logistical various stages of treatment in general and in each particular case.

The first step to successful treatment of patients with fractures of the femoral neck is hospitalized in RAO, the second — an adequate low-impact operational *vmeshatel'tvo*, third — max ca ure early activation and restoration of motor activity in the premorbid level.

Feature of the endoprosthesis with femoral neck fractures is the fact that the operation takes place against the background of post-traumatic changes in homeostasis, namely — a hypercoagulable syndrome, a protective and adaptive reactions of the organism. The main factors influencing the hemostasis system are blood loss and tissue elements entering into the bloodstream of traumatic foci of damage, such as tissue thromboplastin, etc.

The patient's condition at the time of surgery may be satisfactory, compensated and *subkompensirovannym*. Risk level increases from satisfactory to subcompensated that requires reducing the morbidity of the intervention.

In serious condition and state of moderate severity arthroplasty is contraindicated. In such a situation it is possible to perform minimally invasive percutaneous osteosynthesis — as the first stage of surgery and a method for preventing hypostatic complications.

In hip arthroplasty, we reserve the joint capsule, which not only contributes to the passive and active stabilization, but also can significantly reduce blood loss during sur-

gery and in the early postoperative period. This technique as tamponade hemostatic sponge space between the leg prosthesis and sawdust of the proximal end of the femur, has allowed us to reduce the amount of postoperative blood loss by drainage and 200—300.0 ml.

Preservation of blood parameters within normal limits gives the possibility to intensify patients 1st day after operation. At the level of hemoglobin < 100 g/l are some patients can stand beside the bed, and the majority — just sit down for a short time. Reduction of hemoglobin sharply breaks activity and the general condition of the patient. To make up for loss of blood we use odnogrupoynoy transfusion of donor red blood cell mass during the first 3 days after surgery before the hemoglobin content in the blood indicators of 100 g/L or more. Significantly increased activity, health and desire to move patients when the normal level of hemoglobin in the blood. Further indications for erythropoietin assign (2000 IU/day) together with iron preparations for 7—10 days

All patients compulsorily carried postoperative medical therapy of impaired bone remodeling due to diagnosed osteoporosis patients assigned Alpha D3 Teva at a dose of 1.5 mg per day, osteogenon PA2 tab. 3p. per day (two months). Calcium nikomed 1500 mg 3 times a day (two months.). We conducted bone quality research method of X-ray densitometry at the beginning of treatment and at six months showed the ability to increase BMD and 3.2% during this period.

On the 1st day sick in bed seated with drooping feet, after wearing elastic stockings. Then, taking into account the patients being put on the feet with a full load on the operated leg. In the future, patients are taught the correct walking, doing isometric exercises with the impact on the muscles of the operated limb, breathing exercises in bed. Traveled with crutches or a walker for 20—30 minutes. Full load allowed immediately after surgery. Throughout the subsequent stationary observation (approximately 2 weeks) and up to 2—3 months after discharge from the hospital (on an outpatient basis), patients continued to engage in rehabilitation aimed at restoring movements in the lower limbs.

Thus, as a result of the work we have come to the following conclusion:

1. All patients with fractures of the proximal femur, regardless of age and severity of comorbidities necessary surgery.
2. Option of surgical treatment (osteosynthesis or arthroplasty type) is chosen strictly differentiated depending on the nature of fracture, degree of displacement, time since injury and hip biomechanical features.
3. Surgical treatment should be performed urgently, but all patients in need of intensive medical preoperative preparation in a intensive care unit.
4. All patients in the postoperative period require mandatory drug treatment for osteoporosis is to prevent occurrence of proximal femur fractures in the future and improve the survival rate of implants.

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## СОВРЕМЕННЫЕ ВОЗМОЖНОСТИ ЛЕЧЕНИЯ БОЛЬНЫХ ПРИ ПЕРЕЛОМАХ ШЕЙКИ БЕДРЕННОЙ КОСТИ

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В статье представлена тактика лечения пожилых больных с переломами шейки бедренной кости. В зависимости от характера перелома, срока с момента травмы представлен алгоритм выбора способа оперативного лечения переломов проксимального отдела бедренной кости. При биомеханически благоприятных переломах шейки бедренной кости типа Пауэлс I—II со смещением отломков типа Гарден II—III в сроки до 3 дней после травмы мы производили малоинвазивный перкутанный остеосинтез пучками V-образных спиц или канюлированными винтами АО. В случае, если после травмы проходило более 3 суток, у больных старше 60 лет при субкапитальных переломах типа Пауэлс III, Гарден IV, пациентам производили первичное эндопротезирование тазобедренного сустава. Также в статье представлен опыт переоперационного ведения пожилых больных с переломами шейки бедра на дооперационном и послеоперационном этапах.

**Ключевые слова:** перелом шейки бедра, малоинвазивный остеосинтез шейки бедра, эндопротезирование тазобедренного сустава, ультразвуковая доплерография, тромбоз глубоких вен, ранняя активизация

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