



BLOCKING INTRAMEDULLARY OSTEOSYNTHESIS IN EXTRA-ARTICULAR FRACTURES OF THE DISTAL AND PROXIMAL METADIAPHYSIS OF THE TIBIA.

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Summary. There were analyzed the results of treatment outcome of patients with proximal and distal tibial metadiaphysis 41A2, A3, 43A1, A2, A3 fractures. These patients undergone locked intramedullary nailing. There were observed 45 patients; the evaluation of anatomic and functional results was done according to E.R. Mattis scales. Perfect and good results were obtained in all patients.

Key words: tibial fractures, locked intramedullary nailing, treatment outcome results.





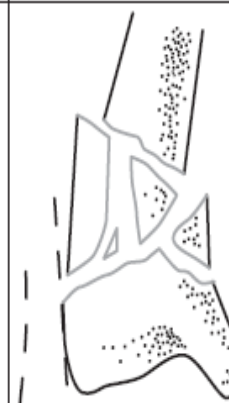
Fractures of the distal and proximal metadiaphysis of the tibia occur mainly in people of the able-bodied age group, which imposes strict requirements on the choice of treatment methods for patients. According to the literature, such injuries account for from 20 to 37% of injuries to the musculoskeletal system. Unsatisfactory treatment results reach 40-60% and are the cause of disability in 4.3–17.8%[1]. Taking into account the young age of patients (from 18 to 56 years), improving the results of treatment for these injuries is an urgent medical and social task [2, 3]. To date, many issues of diagnosis and treatment of these injuries have been duly reflected in the studies of domestic and foreign authors. Depending on the traditions of the scientific school, variants of either bone osteosynthesis or a hardware method of treatment dominate in a particular region. The last decade has been marked by an increase in the popularity of intramedullary osteosynthesis, which, in our opinion, is due to the desire to ensure the greatest biomechanical reliability of the fracture fixation performed. However, if blocking intramedullary osteosynthesis (BIOS) is currently the method of choice in the treatment of closed diaphyseal fractures, then the results of osteosynthesis of this pathology still remain modest in the treatment of distal and proximal tibial metadiaphysis.

Objective: to analyze the results of blocking intramedullary osteosynthesis of extra-articular fractures of the distal and proximal metadiaphysis of the tibia.

MATERIAL AND METHODS

The results of treatment of victims with tibial fractures from 2012 to 2021 were analyzed. 45 patients (27 women and 18 men) were under observation, the average age was 40 years (from 18 to 56 years). Of these, 23 patients were diagnosed with extra-articular tibial fractures in the 41-42 segment (according to the AO/ASIF classification)[4], 22 - respectively in the 43 segment. In the vast majority of cases — 37 (82.2%) — there was a direct mechanism of injury: as a result of an accident — 19 (42.2%) patients, falling from a height — 8 (17.7%); indirect — 8 (17.8%) cases, including 2 patients with pathological fractures with inadequate traumatic application of force. 23 (19.5%) patients had combined and multiple injuries. All fractures were closed. The distribution of victims by type of fracture according to the AO classification is presented in Table 1.

Таблица 1. Распределение пострадавших по типу перелома согласно классификации АО

41A2	41A3	43A1	43A2	43A3
				
8	7	10	14	11

Most of the operations were performed in the period from 2 to 5 days from the moment of injury. Upon admission to the clinic, all patients with fractures of the lower leg were subjected to skeletal traction with an appropriate load along the axis to eliminate excessive displacement of fragments along the length in the preoperative period. All the victims underwent the necessary clinical and laboratory examination, consultations of related specialists, correction of treatment of concomitant injuries and their complications. The lengthening of the preoperative period took place during the transfer of victims from other medical institutions, the temporary refusal of patients from surgery, as well as when

trying to use primarily a conservative method of treatment for social reasons in 9 cases. Operations for tibial fractures were performed in all cases without the use of an electron-optical converter (due to its absence), under spinal anesthesia. According to the closed method, without exposing the fracture zone, 16 (35.5%) patients were operated on, in 29 (64.5%) cases an open reposition of fracture fragments (type A2–3) was performed. In 35 (77.7%) patients, osteosynthesis was performed with preliminary drilling of the bone marrow canal. Active drainage of the postoperative wound was necessarily applied. Elastic bandaging of the limb was performed in all patients in the postoperative period. In five patients in the postoperative period, additional immobilization with plastic bandages was used.

RESULTS AND THEIR DISCUSSION

One of the options for surgical treatment of diaphyseal fractures of the lower leg is osteosynthesis with plates. However, a standard open reposition with wide surgical access and isolation of fracture fragments is associated with the danger of devascularization of bone fragments and subsequent infectious complications, consolidation disorders, especially in complex multi-fragmented fractures [5]. In order to reduce the frequency of such complications, methods of minimally invasive bone osteosynthesis with plates are proposed, however, the refusal to isolate bone fragments makes it more difficult to control the reposition during surgery: the lack of visual control of the location of fragments requires the use of X-ray methods (with known risks). After minimally invasive osteosynthesis with a plate, there is a higher risk of axial deviations and especially rotational deformities [6, 7]. Such deformations can be associated both with errors in the reposition of the fracture itself, and with inadequate modeling of the fixing plate. Since when using plates without locking screws (DCP, LC-DCP), fixation is based on mutual pressing of the implant and bone fragments, incomplete correspondence of the shape of the fixator to the natural curvature of the bone in the area of its installation leads to deformation. This problem is eliminated by the use of plates with locking screws, the principle of operation of which no longer depends on the force of pressing the retainer to the bone. Other advantages of this type of implants are less disturbance of local blood circulation, as well as higher reliability of fixation in osteoporosis compared to conventional plates [8]. However, this type of osteosynthesis does not allow for early axial loading and requires significant surgical approaches. Accordingly, we came to the conclusion about the possibility of BIOS fractures of the metadiaphyseal zone of the tibia. Its advantages over traditional methods of osteosynthesis are: low traumatism of the operation and insignificant intraoperative blood loss, low frequency of postoperative purulent complications, strong fixation of fragments with the exception of

their dislocations in the postoperative period, the possibility of using the method with unfavorable skin, early mobilization of the patient and rapid restoration of limb function. Blocking osteosynthesis also has cosmetic advantages, since the operation is performed through small incisions.

In our clinic, a wide arsenal of surgical methods of treating victims is used, the advantage is given to those methods that allow: 1) to obtain the best anatomical and radiological, cosmetic and functional results of treatment; 2) to protect the patient from possible complications; 3) to ensure early verticalization of the patient, the ability to take a shower and drive a car independently. In all the victims, postoperative wounds at the sites of the rod insertion and above the fracture zone healed by primary tension. The stitches were removed on the 10th-12th day after the operation. Patients became more active on the 2nd - 3rd day (walking on crutches), in the absence of contraindications, active physical therapy of the operated limb was carried out. Patients were monitored radiologically every 3 months with appropriate individual recommendations for axial load. All 15 patients in whom the technique was performed in a dynamic compression variant had signs of consolidation, no additional dynamization of the structure was required. The latter was applied in 30 cases in terms of 8-12 weeks, in two — with fibular osteotomy. In the remaining patients with the use of the static blocking option, the radiological signs of fracture consolidation correspond to the time parameters. Implants were removed in 32 patients, 8-14 months after osteosynthesis surgery, in the presence of radiological data of fracture consolidation. At the time of implant removal, anatomical and functional results were evaluated according to Mattis [9] with a score assessment of pain, anatomical and radiological data, working capacity, joint function. Everyone got a good result. Of the complications, the following should be noted: 1) three cases of thrombophlebitis of the lower limb — all resolved against the background of conservative therapy; 2) in two patients, 3 weeks after the operation, there was a small inflammation of the postoperative wound — ligature fistulas, the expanded toilet of the wound led to the relief of inflammation; 3) sequestration formed in one victim on the 50th day after the operation, because the bone fragment was partially devitalized at the time of the operation. A fistulosequestrnectomy was performed with the removal of the rod, while there were initial signs of consolidation due to a paraossal callus, the wound healed by secondary tension. The patient returned to the pre-traumatic level of physical activity 6 months after the operation. Thus, the use of BIOS meets our requirements for osteosynthesis techniques.

conclusions

Blocking intramedullary osteosynthesis may be the method of choice for extra-articular metadiaphyseal tibial fractures of type 41A2, A3, 43A1, A2, A3. The use of the technique provides early rehabilitation with good anatomical and functional results in the victims.

List of literature

1. Selitsky A.V., Kezlya O.P. The choice of optimal tactics for the treatment of patients with complex segmental (C2) and complex irregular (C3) fractures of the tibia // *Ags. Medisa.* — 2010. — № 7(27). — P. 87-90.
2. Buryanov A.A., Kvasha V.P., Muayad Mohammad Al-Hajj Hussein. Optimization of methods of treatment of fractures of the distal epimetaphysis of the tibia // *Injury.* - 2008. — Vol. 9, No. 4.
3. Litvinov I.I., Klyuchevsky V.V. Bone minimally invasive osteosynthesis in closed fractures of the lower third of the tibia // *Bulletin of Traumatology and Orthopedics named after N.N. Priorov.* — 2006. — № 1.
4. Muller V.E., Nazaryan S.F., Koch T.S. The comprehensive classification of fractures of long bones. — New York: Springer, 1990. — P. 375.13-17.
5. Campbell's operative orthopaedics / S. Terry Canale, James H. Beaty. — 11th ed. — 2008.
6. Maffulli N., Toms A., McMurtie A., Oliva F. Percutaneous plating of distal tibial fractures // *International. Orthopaedics (SICOT).* — 2004. — 28. — 159-162.



7. Nikolaou V., Efstathopoulos N., Papakostidis C., Kanakaris N., Giannoudis P. Minimally invasive plate osteosynthesis — an update // *Current. Orthopaedics.* — 2008. — 22. — 202-207.

8. Williams T., Schenk W. Bridging-minimally invasive locking plate osteosynthesis (Bridging-MILPO): Technique description with prospective series of 20 tibial fractures // *Injury, Int. J. Care Injured.* — 2008. — 39. — 1198-1203.

Mattis E.R. A system for assessing the outcomes of bone fractures of the musculoskeletal system and their consequences: Abstract. dis... Doctor of Medical Sciences.