



RETROSPECTIVE ANALYSIS OF LONG – TERM RESULTS OF BLOCKED INTRAMEDULLARY OSTEOSYNTHESIS IN PATIENTS WITH LONG TUBULAR BONES FRACTURES

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ABSTRACT

The current research work based to analysis of long-term results of application of Blocked Intramedullary Osteosynthesis (BIOS) in 276 patients with long tubular bones fractures. As purpose was used the intramedullary nails of ChM Company and also femoral GAMMA nails under roentgen navigation, that allowed nontraumatic introduction of nail into bone-marrow canal with closed reposition of bone fragments. The long-term results analysis of patients in 8-12 months, showed the good anatomic and functional results in 199 (72, 1%) cases, unsatisfactory results no registered. Thereby, the BIOS technique is the modern and noninvasive. is allowed to create the stable fixation at early postoperative period with preservation endosteal blood supply, which is providing the optimal bone reparative osteogenesis.

KEYWORDS: fracture, tubular bones, intramedullary osteosynthesis.

INTRODUCTION

Despite almost 80 years since G. Kuntcher first developed the technique of intramedullary osteosynthesis in 1939, this technique still does not lose its significance and is actively used for fractures of long tubular bones.^[1,4] The use of wider-sized intramedullary implants for osteosynthesis creates a condition for good stabilization in the fracture area, which is why the full-fledged fusion of broken bones is necessary.^[2]

Until recently, the opinions of many Russian authors have focused on the use of external fixation devices for fractures of long tubular bones, especially in severe and combined injuries.^[3,4] However, the results given in the literature of various authors have shown that in 57-71% of cases, osteosynthesis by external devices is not final, the treatment of fractures often takes a two-stage character with frequent inflammatory reactions from the soft tissues around the spokes and rods.^[5]

In the 80 - ies of the last century, a new direction was created with the development of new intramedullary rods that provide stable fixation of the system of blocked components and allow early activation of patients and functional rehabilitation with minimal postoperative complications.^[1,4,5,6] The technique itself is designated as "blocking intramedullary osteosynthesis" - (BIOS). Recently, in the countries of the near and far abroad, the

BIOS technique has been widely used in the treatment of diaphyseal and periarticular fractures, thanks to the development of femoral "GAMMA" rods by CHARFIX ® system. The undisputed advantage of this technique is that it is less traumatic due to the extra-focal insertion of the pin, which allows minimal disruption of periosteal vascularization and subsequently contributes to the consolidation of bone tissue.

The BIOS technique has also been successfully implemented in the practice of the clinic of the Bukhara branch of the Republican scientific center for emergency medical care (rscemp) and today we have long-term results of surgical treatment of patients with fractures of long tubular bones.

The purpose of this study was to analyze the long-term results of surgical treatment of patients with fractures of long tubular bones.

RESEARCH MATERIALS AND METHODS

In the period from 2012 to 2018, more than 276 operations of osteosynthesis of long tubular bones by blocking intramedullary osteosynthesis were performed in the Department of emergency traumatology at the Bukhara Branch of the rncemp. Were men and 155 (56, 1%) patients, women - 121 (43.9 per cent). According to age categories, patients were distributed as follows: 127

(46%) patients in the group of 20-40 years, 71 (25.7%) victims were observed from 40 to 60 years, and 78 (28.3%) above 60 years. At the time of admission of patients, the majority of 207 (75%) of the victims came in the first three days after trauma, in the period from 3 to 10 days turned 61 (22, 1 %) patients, within 10 days, we received only 8 (2.9 percent) of injured. Among skeletal injuries, periarticular and diaphyseal fractures of the humerus in 48 (17.4%) and femur prevailed and were found in 73 patients (26.5%), and diaphyseal fractures of the lower leg bones were noted in 136 (49.2%) patients. Multiple injuries of two and three segments were detected in 19 (6.9%) patients. All patients underwent thorough preoperative preparation, metal structures were selected according to the size of the damaged segment. The surgeries were performed at various times since the injury. The majority of 166 (60%) patients were operated on within 3 to 10 days from the moment of injury, in the early period on 1-3 days osteosynthesis was performed by 64 (23%) victims, and in the later period after 10 days or more in 46 (17%) patients.

The optimal timing for surgery and the method of primary fixation of fractures were selected based on the severity of the patient's General condition.

We used metal structures manufactured by ChM — CHARFIX® system of interlocked intramedullary rods, including femoral GAMMA rods. Nail implantation is performed using a closed antegrade method under the control of an EOP. It is important to correctly determine the point for inserting the metal structure, which allows for non-traumatic insertion of the rod through the bone marrow channel and the success of closed reposition of bone fragments.

RESULTS AND DISCUSSION

In the postoperative period, additional plaster immobilization was applied individually during the first month, and active movements in adjacent joints of the damaged segment were performed weeks after the operation. Walking with a partial load on the damaged limb was allowed immediately after removing the plaster cast, depending on the state of bone repair and after radiological control.

Dynamic radiological and clinical control was performed in all patients. Consolidation of fractures and restoration of supporting function of damaged limbs were achieved in 240 (86.9%) patients 8 months after surgery. From this group of patients, in 148 cases, the fixators were removed 14-16 months after the operation. 128 patients with different stages of fracture consolidation are currently being monitored on an outpatient basis.

In 46 patients with comminuted and fragmentary tibial fractures, the nail was dynamized 2-3 months after surgery by removing the static screw, which prevents deformation of the distal locking screws and makes it possible to create physiological compression in the fracture area without the risk of shortening the damaged segment. Complications in the postoperative period were not observed in any patient.

Long-term results were observed in 207 patients at the time of 8 to 12 months. Favorable anatomical and functional results were found in 189 (91.3 %) patients.



(a)

Fig. 1. a, x-ray picture of the patient: there is a comminuted femoral fracture of the right femur with displacement of bone fragments.



(b)



(c)

Fig. 1. b, C, x-ray picture of the same patient, SPO with the presence of a metal structure, the standing of the bones is satisfactory.

CONCLUSION

Thus, the technique used with the use of blocking pins for diaphyseal and periarticular fractures of tubular bones in adult patients is modern and appropriate, which allows for strong fixation during periods of immobilization with the preservation of endostal blood supply, which provides optimal conditions for reparative osteogenesis.

Clinical example

Patient sh. 42 years old. On 16/09/2018, he applied to our clinic with a diagnosis: "closed comminuted transvertebral fracture of the right femur with displacement of bone fragments. The diagnosis was confirmed radiologically (Fig. 1, a), and the skeletal traction system was applied urgently. 5 days after the local edema subsided, the patient underwent intramedullary osteosynthesis using a PFN pin under the EOP. The result was studied a month later-after removing the plaster spar (Fig. 1, b, C).

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