

or limbs), in 4 children there was trauma as a result of a massive concrete construction fall over the lower limb. In a girl the disaster followed after inattention while working with an electric meat grinder; the right hand with fingers II-III-IV-V was stuck in the grinding space and broken in the "drum" with all finger and hand tendons. This was the only case where it was not possible to restore the affected segment. The rest of injured patients were subjected to primary surgical wound treatment with removal of non-viable tissue and washout with hydrogen peroxide, furacilin, aminocaproic acid, adaptation of fragments, fixation with pins or external devices, wound suturing or open wound treatment under the dressing. The follow-up treatment was lengthy; when indicated, the following measures were performed - staged necrectomy, skin plasty and bone reconstruction. No amputation was performed in any case.

**Conclusion.** Regardless of the extent of injury of the child's affected segment, specialists in the field should make maximum effort to save the segment and avoid amputation.

**Keywords:** extremely serious trauma, segment preservation.

## OSTEOSYNTHESIS PECULIARITIES IN THE TREATMENT OF POST-TRAUMATIC PSEUDOARTHROSIS IN CHILDREN



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**Objective of study.** To appreciate peculiarities of osteosynthesis in pseudoarthrosis in children in order to improve treatment outcomes.

**Material and methods.** For over 45 years we have treated 161 patients with pseudoarthrosis in various segments after the initial treatment of the fracture in other health-care settings. Children with pseudoarthrosis of clavicle, diaphyseal pseudoarthrosis of humerus, forearm, femur and leg, primarily underwent poor surgical treatment with fixation of fragments with plates and screws, or intramedullary osteosynthesis without proper immobilization. In the clinic pseudoarthrosis treatment was performed by the Ilizarov method concurrently with the removal of deformities and inflammatory processes without intervening in the region of pseudoarthrosis, except pseudoarthrosis of clavicle, where grafting was used. In intraarticular fractures pseudoarthrosis developed after orthopedic treatment with plaster cast splint for immobilisation of the segment. In the clinic these patients underwent operations of restoration or reconstruction depending on the duration after fracture.

**Results.** In all patients with post-traumatic diaphyseal pseudoarthrosis, the Ilizarov method allowed to obtain good results (consolidation of fragments, removal of deformities, resolution of the inflammatory process, function restoration). In patients with pseudoarthrosis after intraarticular fractures lasting over 2 years after trauma, reconstruction operations allowed to get satisfactory results.

**Discussions.** Post-traumatic pseudoarthrosis requires surgical treatment to be resolved. There is an opinion that pseudoarthrosis of the capitulum of the humerus may not require surgery. This hypothesis is erroneous because valgus deformity of the elbow in these cases causes chronic trauma of the ulnar nerve, regardless of age (child, teen, adult). The resolution of pseudoarthrosis relies on the operation of correction and prevention.

**Conclusion.** Post-traumatic pseudoarthrosis prevails in children after intra-articular fractures (71.16%) and diaphyseal fractures (28.84%), its causes being orthopedic treatment of intra-articular fractures and surgical treatment with massive fixators in diaphyseal fractures. "Fracture" of metal construction at the fracture level is an absolute sign of pseudoarthrosis. To prevent pseudoarthrosis in intra-articular fractures, it is urgently needed to perform an open reposition through some mild methods and maneuvers, fine osteosynthesis and immobilization until consolidation is achieved.

**Keywords:** post-traumatic pseudoarthrosis, treatment, prophylaxis.

## OSTEOSYNTHESIS COMPLICATIONS AND FAILURES IN CHILDREN WITH CLOSED LOCOMOTOR MONOFRACTURE



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**Introduction.** There is not any surgical method of treatment without failures and complications. The main cause of their increase is placement of massive metal fixators in the child, which are similar to those used in adults.

**Material and methods.** The failure of surgical technique was recorded in 12 children, including one with the fracture of the clavicle fixed with screwed plate and pins—with pin fracture and migration of the distal end forward into mediastinum. The

Ilizarov apparatus was incorrectly fixed in 2 patients with diaphyseal humeral fracture; wrong technique in osteosynthesis of intraarticular fractures of the elbow was recorded in 6 patients. Some mistakes in diagnosis were recorded in 3 children with forearm fractures-dislocations. Postoperative osteitis was present in 11 children at various sites after osteosynthesis (clavicle, humerus, femur, leg, astragalus). Pseudoarthrosis following osteosynthesis developed in 38 patients, in the majority after diaphyseal fractures and osteosynthesis with screwed plates, intramedullary rods, and bolts. There was found fracture of the metal fixator at the level of the primary fracture in 8 cases, which certainly proves the presence of post-traumatic pseudoarthrosis.

**Discussions.** All cases of pseudoarthrosis developed after performing metal osteosynthesis. Also, purulent complications occur after osteosynthesis, being life-threatening complications (damage to subclavian vessels during surgery with a fatal outcome, migration of the pin end into the mediastinum, aorta and pericardium, etc.). In this regard, the indications for surgical treatment should be strictly selected and surgery has to be performed by the specialist who will avoid possible complications. In diaphyseal fractures of the humerus, forearm, femur and leg, it is necessary to comply with osteosynthesis requirements in order to avoid major removal of periosteum from the bone, endosteal trauma, therefore osteosynthesis has to be performed with fine and relatively stable devices. Osteosynthesis of elbow fractures must be made through an anatomical-functional approach, neither muscles and tendons sections, nor olecranon osteotomy. Delicate surgical technique, protection of the tissues adjacent to the joint, maximum possible limitation of wound exposure are among the factors of preventing complications.

**Keywords:** osteosynthesis, complications and failures, prophylaxis.

## OSTEOSYNTHESIS IN METAPHYSEAL FRACTURES IN CHILDREN



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**Objective of study.** To implement the method of fine osteosynthesis in the metaphyseal open fracture, fractures with neurovascular disturbances, intraarticular fractures.

**Material and methods.** During 5 years in the Clinic of Orthopedics and Traumatology of the Mother's and Child's Institute 547 children with metaphyseal fractures were treated surgically: 75 children had proximal metaphyseal fractures of the shoulder, 290 children suffered from distal metaphyseal fractures of the arm, 35 kids were with distal metaphyseal fractures of the hip and 147 children had proximal and distal metaphyseal fractures of the thigh. The osteosynthesis was performed with Ilizarov and Kirschner pins.

**Results.** Postoperatively plaster casts were applied for the 4-8 weeks depending on the age of the patient and of the fractured segment. Unsatisfactory results were observed in patients from vulnerable families, possibly because of not respecting the orthopedic regimen, and consisted from angular deformities after repeated traumas and inflammation around pins.

**Discussion.** The majority of metaphyseal fractures are treated conservatively. In some cases surgery is absolutely indicated. In our clinic metaphyseal fractures are treated surgically using fine and minimally invasive osteosynthesis with pins. Osteosynthesis with pins allows adequate stabilization of the bone fragments. In children with metaphyseal fractures the osteosynthesis with Ilizarov and Kirschner pins was used, 2-4 pins depending on fractured segment, age of the patient and fracture complexity. The pins are introduced crisscross, transcutaneously and transosteally. The tactics and techniques of the surgical intervention is individualized in each case, depending on the fractured segment, type of the fracture, character of displacement, and age of patient. The external immobilization – plaster casting is applied for 4-8 weeks depending on the fractured segment and the patient's age, and the orthopedic regimen should be strictly respected.

**Conclusions.**

1. In metaphyseal fractures osteosynthesis should be fine and minimally invasive.
2. Using of huge metallic plates compromises the fractured segments grow.
3. The tactics and technique of surgical intervention should be individualized depending on level and type of fracture, displacement of fragments and kid's age.
4. External cast provides perfect stability of the osteosynthesized fragments.

**Keywords:** osteosynthesis, metaphyseal fractures, children

## TRANSPEDICULARY OSTEOSYNTHESIS AND PARTICULARITIES OF CORRECTION OF CHILDREN WITH SEVERE AND VERY SEVERE SCOLIOSIS



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