

osteosynthesis with 3 Kirschner pins, and external plaster cast immobilization. After immobilization and removal of pins, the rehabilitation treatment was performed through physical therapy with independent forceless and painless movements. **Results.** Treatment outcomes depend on the duration after trauma, the quality of anatomical adaptation of fragments, protection of periarticular tissues, fine fixation of fragments with pins, prevention of hematomas and bone consolidations. The compliance with all the requirements of surgical treatment allowed to obtain good results in over 96% of operated children.

**Discussions.** Intraarticular fractures in children, regardless of their age and degree of fracture displacement, require surgical treatment in specialized clinics, conducted by highly qualified specialists. Pseudoarthrosis in intraarticular fractures develops after orthopedic treatment or poorly performed surgical treatment. Fine osteosynthesis with Kirschner pins ensures the necessary stability. Osteosynthesis with plates and bolts is inadmissible, while olecranon osteotomy is a major error. Any postoperative varus deformity should be considered as an unsatisfactory result. This deformation may trigger secondary distal humeral epiphysiolysis with irreversible disability. For this reason, we disagree with the views of some authors who consider varus deformity in children up to 20 degrees a good result and varus deformity up to 40 degrees is considered a satisfactory result, which, in fact is erroneous for child development.

**Conclusion.** In intraarticular fractures in children it is necessary to appreciate in detail the intricate anatomical and topographical changes. The surgical treatment of complicated fractures has to be performed in specialized clinics by highly qualified doctors in the field.

**Keywords:** intraarticular fractures, osteosynthesis.

## OSTEOSYNTHESIS IN MULTIPLE FRACTURES IN CHILDREN



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**Objective of study.** To estimate the surgical treatment tactics and technique in multiple fractures in children in order to improve results.

**Material and methods.** Over the past 25 years 131 children with multiple fractures of long bones received specialized treatment in the pediatric orthopedic clinic. There was prevalence of male patients (59.5%) aged over 10 years (65.6%). Of the total number of children, 294 fractures were assessed. Of them, 81 femoral fractures, 66 forearm fractures, 65 leg fractures, 60 arm fractures and others. Fractures due to road accidents prevailed (over 52%). After clinical and laboratory examinations carried out in intensive care unit and necessary preparation, the children were subjected to surgery under general anesthesia in order to appropriately reposition fragments and to perform osteosynthesis (except 29 fractures without displacement of fragments).

**Results.** In metaphyseal, epi-metaphyseal, epiphyseal, and metaphyseal-diaphyseal fractures osteosynthesis was performed with Kirschner pins through cross insertion. In all operated cases fragments were consolidated without complications. Intramedullary osteosynthesis with metal rods, especially elastic ones was used in transversal diaphyseal fractures of the femur and forearm; while in oblique and spiroid diaphyseal fractures, osteosynthesis was additionally associated with cerclage wiring. Stable osteosynthesis was performed with the external Ilizarov apparatus in diaphyseal fractures of the leg. In diaphyseal humeral fractures, osteosynthesis was performed with elastic rods or Ilizarov pins, using the principles of TEN method. In open fractures, after primary surgical wound treatment, osteosynthesis was performed with pins or external devices.

**Discussions.** The outcomes of surgical treatment in multiple fractures directly depend on the location of fractures, the quality of surgery, compliance with the requirements of biological osteosynthesis with endosteal and periosteal protection. We consider inadmissible to perform on children osteosynthesis with massive screwed plates as well as major removal of periosteum from bone.

**Conclusion.** The basic treatment in multiple fractures is the surgical one, being carried out in one stage in the following order: open fractures, intra-articular fractures, fractures of the femur, leg, upper arm, forearm; biological minitraumatic osteosynthesis.

**Keywords:** multiple fractures, osteosynthesis, baby.

## COMBINED FINE OSTEOSYNTHESIS OF COMPLICATED DIAPHYSEAL FRACTURES IN CHILDREN



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**Objective of study.** To implement the method of osteosynthesis in children in order to protect the bone regeneration structures.

**Material and methods.** In the last five years combined fine osteosynthesis was performed in 29 children aged between 3 and 15 years. The following fractures were determined: complicated humeral fractures - 5 children, femoral fractures - 18 patients, leg fractures - 4 patients, and clavicle fractures - 2 patients. In diaphyseal forearm fractures with indications for surgical treatment, osteosynthesis was performed with pins or elastic Bogdanov rods. Combined osteosynthesis was performed in children with diaphyseal humeral fractures (spiral, oblique, comminuted with major fragments and displacement) with pins inserted from the distal (lateral and medial) metaphyseal side through the bone canal, across the fracture level and up to the upper part of the humerus. Thus pins have three support points (introduction, crossing and the inner part opposite to the upper one). The stability was ensured by osteosynthesis performed with cerclage wiring. In complicated diaphyseal femoral fractures, combined osteosynthesis was performed with antegrade elastic intramedullary rod and cerclage wiring. In diaphyseal distal femoral fractures, osteosynthesis was performed analogously to that in humeral fractures. In complicated diaphyseal fractures of the leg, combined osteosynthesis was performed with pins inserted distally and cerclage wiring.

**Results.** Fragments were consolidated in all operated children. No cases of pseudoarthrosis or post-traumatic deformity were recorded. The usual treatment for recovery allowed to restore the movements in the immobilized joints.

**Discussions.** The method of combined osteosynthesis in complicated diaphyseal fractures in children has a major priority, protecting periosteal and endosteal tissues that are severely affected in osteosynthesis with screwed plates or massive locked intramedullary rods. Biomechanical researches (Muleret al., 2011) have objectified the priorities of cerclage wiring. Intramedullary osteosynthesis with thin elastic rods or thick pins protects the endosteum; the pins are crossed through the bone canal mechanically but not electrically.

**Conclusion.** Combined osteosynthesis of comminuted complicated diaphyseal fractures of the humerus, femur and tibia in children have led to good results, with absence of complications. There were used modern, fine and elastic fixators associated with cerclage wiring, thus protecting the periosteum, endosteum and cortical bone.

**Keywords:** complicated fractures, fine osteosynthesis.

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## ECHOCARDIOGRAPHY CRITERIA FOR THE COMPRESSION OF THE HEART IN CHILDREN WITH FUNNEL CHEST



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Echocardiography performed in 30 children aged 4 to 18 years, with funnel chest of the second and third degree. The study was conducted by standard methods. The survey found changes of heart. In 12 children changed the shape of the right ventricle. In two cases observed change in the geometry of the right atrium. Changed the kinetics of the interventricular septum. In 5 cases revealed hypokinesia in 2 cases of hyperkinesia and in 2 cases asynchronism reduce the interventricular septum. In 7 children recorded an increase in speed characteristics of diastolic flow through the tricuspid valve.

**Keywords:** funneled deformation of a thorax, echocardiography, Doppler effect

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## CONDUCT TREATMENT OF JUVENILE SLIPPED EPIPHYSES



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**Introduction:** mostly occurs in young adulthood. The disease occurs with frequency of 4-5 cases per 100 000 inhabitants, and patients with juvenile slipped epiphyses (JE) represent 0.5-5% of children with orthopedic pathology. The ratio of boys and girls - 3:2. Bilateral involvement is described in 20% of patients.

**Discussions:** JE was described for the first time in 1572. Due to the relative rarity of the disease, many physicians are not aware of the existence of it. Until now the vast majority of children with JE were getting treatment lately.

JE etiology is still far from being fully disclosed. The factors are well established: hormonal disorders, genetic predisposition, as well as hard exercises and micro traumas. Endocrine-orthopedic symptom of the disease is the breaking the correlation between sex hormones and growth hormones. Those two groups of hormones play an important role in the development and delayed puberty of the epiphyseal plates. According to some authors the obesity, anteversion on proximal femoral and bones immaturity are the causes of JE.

The disease pathogenesis is a slow displacement of proximal femoral epiphysis down and dorsal. With JE the head of the femur remains acetabular fossa, so both femoral neck and femur lose contact with him. This balance is rotating around its longitudinal axis, "flips" to exterior and positions member in the position of external rotation.