

Reconstruction of the hip joint in case of pathological dislocation of the hip in children

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Annotation: Pathological hip dislocation is one of the most severe and frequent complications of acute hematogenous osteomyelitis of the femur, suffered in the first months of a child's life and occupies a significant place in the structure of orthopedic diseases of childhood and adolescence

Key words: osteomyelitis, hip joint, pathological dislocation of the hip, proximal end of the femur, treatment, cervical-diaphyseal angle.

Introduction. Pathological hip dislocation is one of the most severe and frequent complications of acute hematogenous osteomyelitis of the femur, suffered in the first months of a child's life and occupies a significant place in the structure of orthopedic diseases of childhood and adolescence. According to Kh. Z. Gafarov et al. pathological dislocation of the hip occurs with the consequences of hematogenous osteomyelitis in 24.6% - 50% of cases [3]. Acute hematogenous osteomyelitis of the bones that form the hip joint occupies a special place and is difficult in terms of diagnosis, management of these patients and a large number of unsatisfactory treatment outcomes. It accounts for 6-12.2% of purulent diseases and in 79.1-88.7% of cases affects long tubular bones, which contribute to the development of orthopedic complications. These complications develop in 22-71.2% of children and in 16.2-53.7% of patients lead to early disability [1,2,3]. With age, shortening increases, lameness intensifies, and due to static-dynamic disorders, conditions are created for the formation of secondary deformities on the part of the spine, pelvis, healthy and dislocated limbs, which in turn limits the ability to work and can cause disability. Surgical treatment of the consequences of hematogenous osteomyelitis should ensure the stability of the hip joint to improve the statics and gait of the patient, restore anatomical relationships, if possible, reduce shortening of the lower limb and maintain sufficient mobility [12]. Pediatric orthopedists experience special difficulties with a defect in the head and neck of the femur [8]. Currently, there is no single view on the nature and extent of surgical interventions for pathological hip dislocation, and therefore it is an extremely complex and not fully resolved problem in pediatric orthopedics [10]. One of the most common problems in the treatment of children with pathological hip dislocation is the formation of multiplanar deformities of the proximal femur, including hypertrophy of the greater trochanter - its high position relative to the femoral head (relative overgrowth of the greater trochanter). In the process of child growth, violations of the biomechanics of the hip joint occur due to the convergence of the points of attachment of the abductor muscles of the thigh, which leads to dysfunction of the gluteal muscles, limitation of movements in the hip joint, and Trendelenburg gait is possible [4,5,6,7]. The operation of choice for this deformity is intertrochanteric valgus osteotomy of the femur with "apophyseodesis" or "lowering the greater trochanter in the caudal direction" to correct the magnitude of the acting forces to physiological dimensions and restore normal gait. The polymorphism of the destruction of the proximal end of the femur requires a differentiated approach and the search for new methods of surgical treatment. In the surgical treatment of PVB, the primary task is to restore the support function of the limb while maintaining mobility in the joint, followed by solving the problems of eliminating secondary deformities and equalizing the length of the lower limbs [9,11,13]. Modern surgical treatment of residual deformities of purulent coxitis includes all the latest reconstructive and restorative interventions developed on the proximal end of the femur and pelvic bones. Despite the wide variety of surgical treatment methods, the prognosis for pathological hip dislocation in most cases

remains unfavorable. This is evidenced by a large number of residual deformities and a violation of the ratio of the femoral head and the acetabulum, joint instability leading to the development of shortening of the lower limb and coxarthrosis.

Material and research methods. The work is based on the results of observation and treatment of 97 patients with pathological hip dislocation treated in the Department of Pathology of the Hip Joints of the Republican Center for Pediatric Orthopedics of the Ministry of Health of the Republic of Uzbekistan from 2010 to 2022. Among these patients there were 59 boys and 38 girls, aged 4 to 14 years. In the work applied: clinical, x-ray and magnetic resonance imaging, multislice computed tomography and statistical research methods. The optimal age for surgical treatment of pathological dislocation of the hip, according to our data, is 4-5 years of age of the child, since by this time the process of ossification of the structures of the hip joint ends in most patients, when secondary deformities have not yet formed and regeneration processes are well expressed. The planning of surgical intervention in patients was based on an assessment of violations of the anatomical relationships in the hip joint, its function, deformities of the proximal end of the femur ("saddle-shaped", "pear-shaped" deformities, deformations in the form of a "mouse ear", in the form of a "shepherd's stick"), the state of the articular cavity, as well as violations of the size, shape and integrity of the bones, and was carried out taking into account the identified symptom complexes and the age of the patient. Indications for surgical treatment are violation of the anatomical relationships in the hip joint, violation of the spatial orientation of the proximal metaepiphysis of the femur: coxa breva (cranial position of the greater trochanter), coxa valga (caudal position of the greater trochanter) and antetorsia, vicious position of the lower limb, contracture of the hip joint, not eliminated conservatively and false joint. Contraindications to surgical treatment are the risk of latent infection in patients who had infectious coxitis 1.5–2 years ago and repeated manifestations of the inflammatory process. All surgical interventions were accompanied by revision of the hip joint. Extra-articular surgical interventions were not used by us. In all cases, we used open reduction or centering of the stump of the head and neck of the femur. In 5 cases, reduction was performed after intervention on the femoral component. Due to the recurrence of dislocation in 2 patients, open reposition was performed during a second intervention 2-3 months after the device was removed. In destructive dislocation of the hip, differentiated surgical tactics were used depending on the age of the patient, the severity of destruction of the proximal femur and acetabulum. We carried out the following complex reconstructive and restoration operations:

- open reduction of the stump of the head or neck of the femur with intertrochanteric detorsion-shortening and varus osteotomy of the femur in 44 children,
- open reduction of the stump of the head or neck of the femur with intertrochanteric detorsion-shortening and varus osteotomy of the femur with acetabular plasty according to Pemberton, Lance, rotational osteotomy of the pelvis according to Salter in 38 children,
- open reduction of the stump of the head and neck of the femur with intertrochanteric detorsion-shortening-valgus and lengthening the neck of the femur osteotomy, with "apophyseodesis" or "bringing down the greater trochanter in 15 children. All surgical interventions were supplemented with economical cartilage resection of the anterior or posterior edges of the stump of the femoral head and neck. The purpose of such operations is to improve the supporting and dynamic function of the affected limb, eliminate the vicious position of the limb and the most severe symptom of dislocation - the Trendelenburg symptom, reduce limb shortening and, if possible, increase the range of motion in the joint.

Results and its discussion. The results of treatment were evaluated in accordance with the achievement of anatomical and functional results. Surgical intervention is carried out as follows. The operation is performed under endotracheal anesthesia with controlled breathing. An anterolateral angular incision is made in the skin and subcutaneous fat in the upper third of the thigh from the middle of the distance between the anterior-upper spine and the greater trochanter. After dissection of the subcutaneous fat layer and scarred tissues, the gap between the gluteus medius muscle and the muscle straining the wide fascia of the thigh is bluntly stratified. The anterior surface of the capsule of the hip joint is exposed, the tendon-muscle part of m. Iliopsoas and its dissection is made from the place of attachment on the femur. The capsule is taken on clamps or holders and dissected. After dissection of the joint capsule, all scars are sharply

separated, preventing the mobilization of the head and neck of the femur. When approaching the acetabulum, numerous connective tissue strands repent, narrowing the entrance to the acetabulum and preventing the lowering and reduction of the thigh. Scars are removed from the acetabulum to the cartilaginous surface. After removal of all obstacles, an assessment of the state of the acetabulum is carried out: the bottom, its edges and the femoral head. Deformed in the form of a "saddle", "mouse ear", "pear-shaped", "shepherd's stick" stump of the head and neck of the femur is freed from scars. After the femoral neck stump is removed into the wound, it is given the shape of a head due to economical resection of the overgrown cartilaginous masses. Moreover, the formation of the head is carried out taking into account the excess torsion. With severe antetorsion, the anterior section of the head is resected, retrotorsion - the posterior one. After a T-shaped dissection of the lateral head of the quadriceps femoris, together with the periosteum, the anterior and posterior-outer surfaces of the femur in the upper third are exposed subperiosteally. Stepping back 2-3 cm from the top of the greater trochanter with the help of Gigli's wire saw, intertrochanteric corrective osteotomy of the femur is performed. The osteotomy angle corresponds to the age norm of the cervical-diaphyseal angle. Taking the proximal fragment of the femur on two-pronged hooks, a capsule of the hip joint 1.5-2 cm long is dissected from the proximal sawdust of the femur. The chisel produces an oblique resection of the sharp protruding part of the neck so that the resection line reaches 1/3 of the proximal sawdust. After suturing from the side of the proximal femoral file, the formed - elongated femoral neck remains inside the joint. Thus, the transverse osteotomy line acquires a "V" shape. The proximal sawdust of the femur is turned along its axis by 90°, followed by fixation of the bone fragments in the corrected position "L" with a shaped metal plate and three screws at the planned neck-diaphyseal angle of 125° and antetorsion angle of 10°. The newly formed head and elongated femoral neck are finally modeled according to the size of the acetabulum and set into the acetabulum. With secondary changes in the acetabulum, these surgical interventions were accompanied by Pemberton roof plasty and Salter rotational pelvic osteotomy. The joint capsule is sutured with three pairs of silk threads. The wound is sewn up tightly. In the postoperative period, external immobilization is carried out with a large hip plaster cast. In the postoperative period, with the growth of children, the lateralization of the femur gradually increased, which contributed to the restoration of the function of the middle and small gluteal muscles. Movement in the joint was achieved within the normal range of 80°, abduction remained significantly limited. Only in one case, after open reduction of the thigh, suppuration of the postoperative wound occurred, which did not affect the outcome of treatment.

Thus, the experience of surgical treatment of patients with pathological hip dislocations has shown that the most favorable outcomes are achieved with the use of open reduction of the stump of the head or neck of the femur with intertrochanteric-detorsion, shortening, varus osteotomy with rotational osteotomy of the pelvis according to Salter and acetabular plasty according to Pemberton. The result of operations was better in 38 children, in whom the open reduction of the dislocation was supplemented with acetabular roof plasty.

Findings. After hematogenous osteomyelitis of the proximal end of the femur, destruction of the head and neck of the femur is often observed, up to their complete destruction. Indications for one or another type of intra-articular surgery, according to our data, should be set strictly individually for each patient, depending on the age of the patient, the type and degree of deformation of the elements of the hip joint, and the magnitude of the shortening of the lower limb. Our observations indicate that reconstructive and restorative operations in most patients eliminate flexion-adductor and external rotation contracture, ensure stability of the hip joint and thereby improve the patient's gait and statics, reduce pelvic skew and eliminate Trendelenburg's symptom. Reconstruction of the hip joint in children with destructive pathological dislocations of the hip involves, at the first stage, stabilization of the hip joint and, at the second stage, restoration of the length of the lower limb. Recovery of range of motion in the hip joint depends on the degree of damage to the head and neck of the femur.

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