

# OPERATIVE TREATMENT OF DYSPLASTIC DISLOCATION OF COXOFEMORAL JOINT IN CHILDREN AND ADOLESCENTS BY CREATING EXTENDED CANOPY OVER OF THE FEMORAL HEAD

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**Abstract:** operative treatment of congenital dislocation of the hip in elder children and adolescents represents one of the most difficult problems of modern orthopedics, due to significant variability of anatomical changes and the degree of dislocation.

Compared to other operative interventions for the last time, an extra-articular surgery on the pelvic and femoral bones in this group of patients received wide prevalence and recognition. The principle of operation is based on prevention of adaptive-retaining mechanisms developed by the body in intactness of blood supply hip joint elements and, at the same time, obtaining a vertical stability to the femoral head.

**Keywords:** congenital dislocation, orthopedics, hip joint, femoral head, children.

## ОПЕРАТИВНОЕ ЛЕЧЕНИЕ ДИСПЛАСТИЧЕСКОЙ НЕСТАБИЛЬНОСТИ ТАЗОБЕДРЕННОГО СУСТАВА У ДЕТЕЙ СТАРШЕГО ВОЗРАСТА И ПОДРОСТКОВ ПУТЕМ СОЗДАНИЯ НАВЕСА НАД ГОЛОВКОЙ БЕДРЕННОЙ КОСТИ

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**Аннотация:** оперативное лечение врожденного вывиха бедра у детей старшего возраста и подростков представляет собой одну из наиболее сложных проблем современной ортопедии, обусловленную значительной вариабельностью анатомических изменений и степенью вывиха.

По сравнению с другими оперативными вмешательствами в последнее время внесуставные операции на тазовой и бедренной костях в этой группе пациентов получили широкое распространение и признание. Принцип действия основан на предотвращении выработанных организмом адаптивно-удерживающих механизмов при сохранности элементов тазобедренного сустава и кровотока, в то же время, при достижении вертикальной устойчивости головки бедренной кости.

**Ключевые слова:** врожденный вывих, ортопедия, тазобедренный сустав, головка бедренной кости, дети.

**Actuality:** Operative treatment of congenital dislocation of the hip in elder children and adolescents represents one of the most difficult problems of modern orthopedics, due to significant variability of anatomical changes and the degree of dislocation [1].

Compared to other operative interventions for the last time, an extra-articular surgery on the pelvic and femoral bones in this group of patients received wide prevalence and recognition. The principle of operation is based on prevention of adaptive-retaining mechanisms developed by the body in intactness of blood supply hip joint elements and, at the same time, obtaining a vertical stability to the femoral head [10].

Existing reconstructive operations on the body or on the wing of the ilium, providing for the creation of a canopy over the head of the femur, exclude the probability of affecting the shape of the pelvic ring, damage blood vessels and nerves that pass near the isciac incisures [2]. However, these interventions, in some cases accompanied by resorption of the graft, the displacement of the femoral head in the cranial direction, defective distribution of pressure on the femoral head and the surface of the created overhang leads to transplant failure [3].

All this indicates the need for further research a more optimal variants of early recovery support ability of the limb, with congenital dislocation of the hip in elder children and adolescents. The problem of eliminating the instability of the coxofemoral joint in children and adolescents, despite a century of history to date has not found its final decision [9]. Podiatrists still continue to develop more optimal methods for the solution of this issue.

**The aim of our study:** Our clinical experience based on the analysis results, our performed surgical procedures in order to restore the vertical stability of the dysplastic coxofemoral joint by creating a canopy over the head of the femur in children and adolescents with congenital hip dislocation.

**Material and methods of the research.** to evaluate the effectiveness of our method of creating a canopy over the head to remove the femur dysplastic hip dislocation, revealing its weaknesses and complications.

For the period 2010 to 2016 there were 70 patients with congenital hip dislocation, aged from 13 to 18 years (57 girls, 13 boys) under our supervision. Distribution of patients according to the degree of violation of the anatomical relations of the femoral head and acetabulum.

According to this classification, I degree dislocation (marginal) was observed in 9 patients, dislocation of II degree (acetabular) in 17, dislocation of III degree (supraacetabular) was observed in 28 patients, and in 16 IV degree of dislocation was determined (iliac).

For a more thorough analysis of the clinical and radiographic showings on the degree of dislocation of the patients were divided into two groups. The first group consisted of children and adolescents with high supraacetabular and iliac dislocation of III-IV degree in 44 patients. The second group consisted of children and adolescents with preluxation and subluxation of the hip with I-II degree in 26 patients.

Of the total number of investigations, in 34 previously conducted conservative reduction of congenital dislocation of the hip. In these patients as a rule, observed signs of early coxarthrosis. On being admitted all patients complained of pain in the coxofemoral joint, gait disturbance. Fatigue was in 53 patients age 3-18. Lameness and Duchenne-Trendelenburg symptom was observed in almost all patients, lowering the value of forward - the upper spine pelvis were from 1 to 5cm. One of the causes of violations of the support reactions of patients with dislocation was shortening of extremities. Patients of the first group with a dislocation of III-IV degree, shortening of extremities reached to 4-6 cm in 24 patients, and from 6 to 10 cm in 20 patients.

Dislocation shortening in patients with dislocation of the second group of I-II degree was up to 2 cm in 12 patients and the other 14 the shortening reached to 4 cm. In 28 patients of the first group (with a high degree of III-IV dislocation) observed severe flexion contracture, resulting in limb. Internal rotation was possible up to 15-20 °, the outer 20-25 °.

It should be noted that structure in the coxofemoral joint, in some cases resulted in a shortening of the limbs and the projection adverse compensatory adaptations as tilt of the pelvis, and the development of scoliosis installation to the vertebral lordosis. Compensation limb shortening is most often carried out bending of healthy limb at the hip and knee joints or lateroversion pelvic tilt in the direction of the affected limb.

The need for operations causes a pain growing in the coxofemoral joint, the growing of fatigue which is connected with the dislocation of coxofemoral joining. In the case of the femoral head deformation, bone covering it in 1/3, pathological antetorsy more than 40-45 ° and valgus position of neck over 140-145 ° operation, to create a canopy supplementation detorsion- varus intertrochanteric osteotomy, given the iliac-lumbar muscles, after detorsion osteotomy cut off tendon of this muscles at the attachment points to the small trochanter. In severe flexion contracture of the hip joint also produced tendon tenotomy rectus muscle at the attachment points to anteroinferior iliac spine.

**Technique create the canopy;** endotracheal anesthesia. The patient on the operating table is placed on the healthy side. The skin incision is performed from the posterior third of the iliac crest to the anterior superior spines, then turning downwards and outwards to the base of the greater trochanter. Stepping on 0,5 cm from the iliac crest, the fascia is dissected and separated the front portion of medium and small gluteal muscles. Rasp subperiosteal skeletonize anterior-exteriorly of the wing of the ilium to the insertion of the joint capsule.

Adherent capsule separated from the wing of the ilium is separated to the level of the femoral head without opening the joint. Stepping back about 0,5 cm from the insertion of the joint capsule just above the femoral head in the wing of the ilium, chisel Kornev, is formed an arched groove, the depth of which reaches the inner cortical layer.

Then cuts out three autograft trapezius, the form of the outer coating of the cortical crest and the wing of the ilium closer to its rear - upper spine size (3x4x0,5cm). Autotransplantants, with cortical layer turned to the joint capsule imbricate implement in elliptical splitting, directly above the head of the femur, thus, autostransplantants completely blocked the bent segment of the ilium, and the femoral head.

The strength of the introduction of autografts checks rocking motion. If you have a defective lock, we additionally cut autotransplantat from the same area of the iliac crest, which is being implemented over a trapezoidal autotransplantant in splitting.

Then formed a cortical - cancellous allograft as a three-sided pyramid of the condyles of the tibia, canned in low (0.05%) formalin solution by Kuldashveva D.R, Lavresheva G.I. and Torbenko V.R methods (1982).

Base of the pyramid is shaped correspondingly convex surface autograft, tapered top of the pyramid. Before installing allograft, on the wing of the ilium, the length of the face of the pyramid, respectively, is formed three notches above the trapezoidal shaped autograft. Narrow chisel at the edge nickscm folded cortical bone of the wing of the ilium to a maximum of 0.3 cm.

Pyramid of allograft with long pointed blade is embedded in a notch formed. Faces of the pyramid covered with bent cortical plate of the ilium. The base of the pyramid is set firmly on the spongy surface of the trapezoidal autograft. Such an arrangement creates a strong enough allotransplant canopy covers the bearing surface of the femoral head and prevents possible mixing head upwards and backwards. Thus, one allograft is installed above middle autograft, and the other two on the hooks. It should be noted that the majority (89.9%) of our patients from this group marked pathological antitorty more than  $40^{\circ}$  and valgus deformity more than  $145^{\circ}$ . At the same time the creation of a canopy over the femoral head subtrochanteric supplemented detorsion-varus osteotomy of the femur. The femoral head is centered; the fixation of bone fragments was carried out with the help of the L-shaped plate of our design.

Detachment portion of small and medium gluteal muscles taut filed to the crest of the ilium. Fixing coxoid limb plaster cast covering the upper third of the thigh of a healthy with the term for 8-9 weeks. At the expiration of this period cast were taken off and after X-ray monitoring began a course of physio-functional rehabilitation.

In 10-12 weeks after the operation of forming an extended canopy proceeded to the second stage of treatment - erasion limbs.

All of our patients as we have already noted dislocation of shortening from 4cm and more. Eliminating limb shortening was carried out by extending the leg bones in the Ilizarov apparatus.

**Results and discussion.** The results of surgical procedures were followed in the period from 1 to 6 years. When analyzing the results of the treatment revealed the cessation of pain in the hip joint in 33 patients observed before operation improved the supporting limbs, increased duration of walk without fatigue. For some patients of the 11 group there was no sign of Duchenne-Trendelenburg, 'dislocation shortening the majority of operated patients, both the I and the II group decreased significantly, but remained in the range from 1 to 1.5 cm.

Analysis of treatment results showed that none of the patient's recovery continuity of Shenton line did not occur. However, X-ray examination of the coxofemoral joint in the load was observed mixing it up, which indicates the stability of the coxofemoral joint.

Thus, the total number of operated patients good results were obtained in 27 (38.5%), satisfactory in 34 (48.5%), unsatisfactory in 9 (13.8%) patients.

When comparing the outcomes of surgical intervention, the establishment of an extended canopy over the head of the hip identified certain patterns in children and adolescents of I and II groups. With a good result were the most children and adolescents with 1<sup>st</sup> degree of dislocation (II group interest). A satisfactory outcome is most often observed in children and adolescents with stage III-IV dislocation (I group of patients), and unsatisfactory results were the same frequency in each group.

For patients of group II (dislocation of I and II degree), good results were obtained in 17 patients (65.4%) of the total number of patients in this group, satisfactory in 7 (26.9%), unsatisfactory in 2 (7.7%). Group I patients with a high dislocation of III-IV degree of good results were obtained in 16 (36.4%) of total patients in this group of patients, satisfactory in 21 (47.7%), unsatisfactory results from this group of patients are ascertained in 7 (15.9%).

Negative results were observed in operation of 9 patients, from them 2 is from I group, 7 from II group.

### Conclusions

1. Patients with dysplastic instability of the hip stabilizing accomplishments need surgical interventions that can prevent the progression of deforming coxarthrosis with all its consequences

2. For the centration of the femoral head into the cavity and created a canopy over the head of the hip in the shown cases interventions should be combined with the implementation of intertrochanteric varus osteotomy of the hip.

3. The alignment of the lower limb length, largely contributes to a uniform distribution of load forces to set up a canopy over the head of the hip, improves musculoskeletal lower limb and so improves the patient's gait.

4. The intervention to create a canopy over the head of the hip developed by us is purely palliative and retains the advantages of extra-articular surgery, which provides most of a favorable outcome.

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