



COMPLEX TREATMENT OF YOUTH EPIPHYSEOLYSIS OF THE FEMORAL HEAD IN CHILDREN

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Article history:	Abstract:
<p>Received: October 28th 2021 Accepted: November 30th 2021 Published: January 13th 2021</p>	<p>The article provides an analysis of the results of treatment of 20 patients with SCFE. In the course of the disease, an acute course was observed in 10 patients and a chronic course in 10 patients. The duration of the disease is from 2 to 5 years. Patients were treated separately in groups: the 1st group was conservative, the 2nd group was traditional operative, and the 3rd group was modern percutaneous osteosynthesis. The results of the study show that the reduction of JEFH in skeletal traction and percutaneous osteosynthesis provide the best positive results in 88.8% of patients. According to the treatment of JEFH, it is indicated that in the treatment of juvenile epiphysiolysis there should be a skillful combination of both conservative and surgical methods of treatment.</p>

Keywords: Juvenile Epiphysis Of The Femoral Head, Skeletal Traction, Percutaneous Osteosynthesis.

INTRODUCTION.

Juvenile epiphysiolysis of the femoral head (JEHB) is a relatively rare and uncommon disorder occurring predominantly in adolescence and presenting as a latent or acute dislocation or even complete separation of the epiphysis at the level of the calcaneal plate. The prevalence is between 4-5 per 100,000 and patients with SEWGC represent 0.5-5% of all children with orthopaedic pathology. The ratio of males to females is 3:2. The disease usually begins at the age of 11-12 years in girls and 13-14 years in boys, which coincides with the beginning of puberty. However, EHEC can occur even at the age of 5 in girls and 7 in boys. Opinion differs as to whether the right or left hip joint is predominantly affected. Bilateral involvement occurs in 20% of patients. The second

joint is affected on average 10-12 months after the first joint shows signs of disease [4].

The etiology of juvenile femoral head epiphysiolysis (JSE) is unknown; mechanical, biological and hereditary factors play a role. Juvenile epiphysiolysis is based on the disruption of the anatomical connection between the epiphysis and the femoral neck due to damage to its proximal growth zone [1, 2]. As a result, the epiphysis is displaced posteriorly and downward, and the femoral neck is displaced anteriorly and upward. The magnitude of the displacement determines the severity of the disease, which is of great importance in the choice of treatment (3). To date, most researchers believe that surgical treatment is necessary in EHSCs [1, 5], but a number of authors have suggested that conservative treatment



is mandatory [1]. Currently, there is no evidence to support the superiority of one method over the other .

PURPOSE OF THE STUDY:

To study and describe the results of the combined treatment of Juvenile Epiphyseal Arthrosis, taking into account the historical approach and the modern minimally invasive technique - percutaneous osteosynthesis. To improve the methods of complex treatment and prevention of coxarthrosis in children after juvenile epiphysiodesis.

MATERIAL AND METHODS:

We treated 20 children with SEHBC during the period 2016-2021. The patients were distributed according to age as follows: up to 12 years old - 2 patients, 12-14 years old - 14 patients, over 14 years old - 4 patients; according to sex - 18 boys and 2 girls. According to the course of the disease 10 patients had an acute and 10 patients had a chronic course. The duration of the disease ranged from 2 to 5 years. In order to establish the diagnosis, direct and Lauenstein radiographs of the hip joint were performed, as well as MSCT examinations, and the degree of displacement in degrees was determined.

According to the degree of femoral head to femoral neck displacement, our patients were divided into 3 groups: Group 1 - mild 10 patients who had an angular displacement of 10-150; Group 2 - medium severity, 6 patients with a displacement of 15-200 and Group 3 - group of patients in whom we detected an angular displacement of over 200 - a severe degree of displacement which was detected in 4 patients.

Most children, upon careful questioning, had a history of trauma in the form of a contusion; violent excessive motion in the joint of flexion, extension, and abduction in the hip joint. Many children could not relate the onset of the disease to any trauma. The disease began gradually in them, at first they were disturbed by pain, then by limpness and posture disorders. On admission, the patients were found to have joint contracture along with pain and lameness.

Patients were treated using the following methods: 1 group of patients received skeletal traction, followed by immobilization in a hip plaster

cast in 7 patients; 2 group of patients received surgical treatment in 4 patients; 3 group of patients - in whom we used a new technique of SSGCT reposition in skeletal traction and transfixed osteosynthesis with a bundle of spokes, in 9 patients.

In 7 children in the 1st group, conservative treatment was performed, i.e. upon admission to the hospital, patients were placed on skeletal traction at the tuberosity of the tibia with 2.5-3.0 kg of weight and internal rotation of the limb for 3-4 weeks. Control radiographs were taken (direct and axial). If the epiphysis was well repositioned, a coxial plaster cast was applied for 2 months. Subsequently, the patient was treated in a sanatorium. These patients were monitored periodically until the growth zone of the femoral epiphysis was closed. The average follow-up period was 5 to 6 years.

Treatment of patients in Group 2 with the traditional surgical method. It is indicated if the femoral head is displaced more than 1/3 of the diameter of the femoral neck or the epiphysis is displaced at an angle of 300 in the sagittal plane. Such a pathology then causes poor hip joint function due to the decentralisation of the femoral head to the acetabulum. Reconstructive surgery is recommended in such cases. These surgeries take into account the preservation of the proximal growth plate and the age of the patient. In 1 patient, the epiphysis was set openly and fixed with Ilizarov pins with crossed spokes. In 3 patients, a corrective subiliac osteotomy with fixation of fragments with an endplate was performed.

In 3 patients percutaneous osteosynthesis was performed. The treatment of the patients consisted of the following stages: the first stage was skeletal traction SAGD repositioning. In our practice, on average, the displaced epiphysis is juxtaposed within 7-10 days; the second stage is the performance of percutaneous metal osteosynthesis. In order to perform the percutaneous osteosynthesis technique it will be necessary to know: the location of the head, neck based on the landmarks - anterior superior axis of the iliac bone, symphysis, projection of the popliteal ligament, pulsation of the femoral artery (Fig. 1,2).



Fig. 1. - To determine the location of the femoral head, lines are drawn on the skin - projection of the poupartular ligament, projection of the femoral artery. The femoral head is located at the level of the point below the poupartular ligament and to the outside of the femoral artery



Fig. 2 - To determine the location of the femoral head, lines are drawn on the skin percutaneously and a few spokes are drawn from the subjacent area to the femoral head.

Under general anesthesia, observing the rules of asepsis, the spokes are guided from the lateral surface of the proximal end of the femur to the neck and femoral head. The neck and head should be anteverted forward by 15-20° in relation to the horizontal plane. X-ray control under the EOP, or radiographs in 2 projections. Then 3 spokes are

performed. Movement in the hip joint is checked to exclude transarticular passage of the spokes. The bent ends of the spokes are placed under the skin. A plaster cast is applied for up to 2 months. Walking with crutches for 6 months. Physiotherapeutic treatment, massage after removal of spokes (4-5 months after surgery).

Clinical example, patient K. 10 years old, treated with a diagnosis of EHEC. On admission, he complained of a chroma and pain in the right hip joint. The patient presented with limb shortening up to 2 cm, positive Hofmeister and Trendelenburg symptoms, atrophy of the lower limb muscles as well as high trochanter's

foot and joint stiffness. The duration of the disease was 5 months. The patient was treated according to the treatment method of patient group 3: epiphysis reduction with skeletal traction (8 days) and percutaneous osteosynthesis with spokes

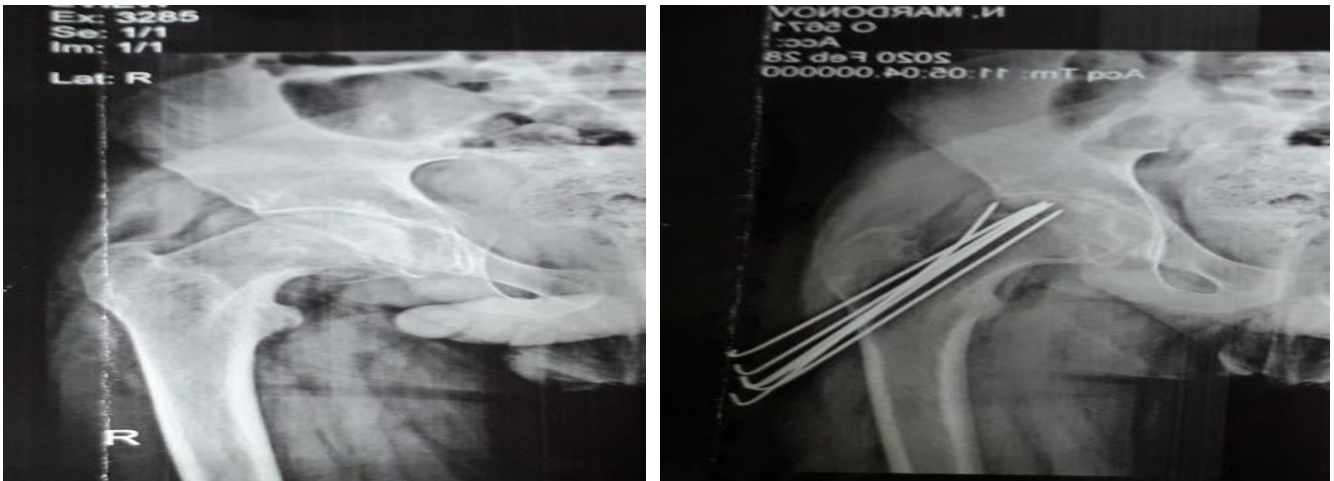


Fig. 3. Radiograph of patient K., 10 years old. Diagnosis: EHEC. Before and after percutaneous osteosynthesis surgery.



Fig. 4. X-ray of the hip joints of b. K. 10 years old. 8 months after surgery.



Fig. 7. Photo of patient K., 10 years old. Joint function 8 months after surgery.

RESULTS OF TREATMENT AND DISCUSSION:

In the immediate post-treatment period (up to 6 months), we evaluated the correct position of the epiphysis - femoral head and femoral neck, the absence of renewed displacement of the epiphysis, the presence of signs of bone fusion, and the absence of dystrophic changes in the femoral head. In the longer term, the length of the limb, shape of the hip joint, movement in it, the patient's posture and the character of the patient's gait were studied.

The study of treatment results in patients of the 1st group showed that in 2 (28.5%) among 7 patients during the period of plaster immobilization, the state of interposition of the femoral head and femoral neck worsened and the displacement of the epiphysis resumed in permissible values. In another two patients on skeletal traction, full epiphyseal alignment was not achieved; the epiphysis was aligned in acceptable, satisfactory values.

Treatment results of the 2nd group of patients. Analysis of the results of operations in 4 patients showed that in 1 patient in whom open osteosynthesis was performed, we subsequently observed a disturbance of blood supply, the development of dystrophy and aseptic necrosis of the femoral head. In

3 patients where corrective osteotomy of the proximal femur was performed, we obtained good results.

Treatment results of patients in the 3rd group. Results of treatment in 9 patients with skeletal traction reposition and percutaneous spokes osteosynthesis showed the effectiveness of this method; positive, good results were obtained in 8 patients. One patient had an ischaemic condition of the femoral head. In one more patient, the skeletal traction did not achieve full epiphysis juxtaposition; the epiphysis was juxtaposed in acceptable values.

Analyses of the results of our patients' treatment of Juvenile Epiphysiolysis suggest that both conservative and operative treatment methods should be skillfully combined in the treatment of Juvenile Epiphysiolysis. We focused on surgical treatment for femoral head displacement of one-third of the width and angular displacement greater than 300 to the back and downward in cases where the correct anatomical relationship of the femoral head and neck must be restored. In these patients, the age of injury ranged from 6 months to 5 years.

CONCLUSIONS:

1. The use of skeletal traction for the purpose of femoral head reduction in pediatric patients in our



observations ensured reduction of the epiphysis in 89.1% of cases, in 10.9% of patients the condition of the fragments improved, in 1/3 of patients the condition of the comminuted fragments during the period of plaster immobilization was observed to worsen.

2. open reduction of the femoral head in patients with UEBBC is fraught with risks in the form of complication of development of ischaemia of the femoral head, the subcutaneous corrective osteotomy contributes to positive results.

3. Skeletal traction repair and percutaneous osteosynthesis provide the best positive results in 88.8% of patients. The nutritional disorder of the femoral head may occur in a few patients.

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