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CHARACTERISTICS OF THE SURGICAL TREATMENT OF THE INTERNAL EPICONDYLE OF HEMERAL BONE IN CHILDREN

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RESUME

The aim: of the investigation was identification the characteristics of the treatment of the internal epicondyle of humeral bone in children. **To material:** of investigation included 30 children at the age of 2-18 years with fractures of the internal epicondyle of humeral bone with several severities. For the purpose of operation authors performed open reduction of internal epicondyle with fixation using K wires, and also authors are recommended the technique, developed in clinic of Republican specialized scientific and practical medical center of traumatology and orthopaedy, which is based on stable and functional osteosynthesis – SFO using Ilizarov's apparatus. **Results:** From all 30 patients in 27 (90%) results were good at postoperative long-term periods in cosmetic and functional aspects. The satisfactory results were in 3 (10%) with little limitation of elbow joint function, and also presence of periodical painful at elbow joint, but children with unsatisfactory results aren't. **In conclusion:** it should be noted that, the technique SFO at fractures of the internal epicondyle of humeral bone in children were most rational, which is provided the stable to fixed reposited bone fragments with availability of joint function saving to immobilization period. Appliance of the functional method with early movement of elbow joint prevented the joint contracture and rigidity.

KEYWORDS: fracture, internal epicondyle, children, stable and functional osteosynthesis.

Relevance of the topic

One of the urgent problems of modern pediatric traumatology is the treatment of fractures of the internal condyle of the humerus (VNPC) in children, which make up 25-30% of all fractures of the upper limb bones.[1,2]

Fractures of the medial part of the humerus are very diverse in the nature of the fracture and the severity of displacement of the bone fragment, which play a significant role in the development of indications and the scope of the operation.[3,4]

The lack of timely recognition of the VNPC fracture, its reposition and surgical treatment can lead to such serious complications as elbow contracture in 30.2-82% of cases [Begimov D. A. et al., 1988], the appearance of a false joint or non-junction of the fracture site in 4.5-9.6% [Sarkisyan O. A.,1991, Bairov G. A., 2000] in the remote postoperative period, which causes early disability of children, which is the social significance of this problem. Unsatisfactory results of treatment of VNPC fractures are due to the complexity of the nature of the fracture and the displacement of the fragment, the difficulty in anatomical adaptation and fixation of small-sized bone fragments to the maternal bed [Kuksov V. F., 2003].

Currently, we are searching for the most optimal tactics for surgical treatment of fractures of the VNPC in children. Developed in the clinic of Republican specialized scientific-practical medical center of traumatology and orthopedics, Ministry of health of the Republic of Uzbekistan successfully implemented the method in the clinic of Bukhara branch of rrcem and long-term results obtained.

The purpose of this study was to determine the features of treatment of VNPC fractures in children**.**

MATERIALS AND METHODS OF RESEARCH

The analysis was performed on 30 children aged from 2 years to 18 years, operated in the Department of surgery for combined damage to children of the Bukhara branch of the rncemp, for a fracture of the VNPC in the period from 2015 to 2019. By gender, 20 (67%) are boys and 10 (33%) are girls. Also, children are distributed by age according to the classification of L. A. Isaeva (1987) (table 1).

Table 1: Distribution of children by age and gender.

Sex	Age			Total n=30
	From one year to 6 years n=6	6 - 11 years n=14	11 - 14 years n=10	
	abc (%)	abc (%)	abc (%)	abc (%)
Boys	4 (13%)	10 (34%)	6 (20%)	20 (67%)
Girls	2 (7%)	4 (13%)	4 (13%)	10 (33%)

Из таблицы 1 видно, что переломы ВНПК в большинстве случаев регистрировались у детей мужского пола с отношением 2:1 к девушкам. Возрастной анализ показал место превалирования детей с переломами ВНПК по количеству во 2-ой возрастной группе в 14 (47%) случаев, против 6 (20%) в 1-ой и 10 (33%) случаев в 3-ей возрастных группах соответственно.

For the purpose of diagnostics, clinical and radiological methods of research were conducted. On radiographs in 8 (27%) cases showed severe injury of the elbow joint with fracture VNPC on the background of the external and posterior dislocation of both bones of forearm with intra-articular mixture of torn over the internal condyle, and 4 (13,3) cases with WNPC located in the interarticular gap, which had the first step is to conduct relaksaciju bones of the forearm, pull the bone fragment, re-set the dislocated bones of the forearm, compare VNPC and to anchor the spokes. With such a severe type of damage to the VNPC, it is preferable to fix it with spokes with the imposition of a plaster spar for a certain period. In isolated apophyseolysis of the VNPC, extra-focal osteosynthesis with the Ilizarov apparatus was often recommended. Installation of the Ilizarov device with a minimum configuration consists of 2 half-rings, which allows to simultaneously create stability in the fracture area while preserving intact functions of the elbow joint, which was associated with the novelty of the method of stable functional osteosynthesis (SFO). When managing patients on a plaster cast, a functional treatment method with early development of the elbow joint is recommended to prevent complications such as tight mobility or joint contractures. The average inpatient period was 5.2±1.8 (M±m) days. The immobilization period lasted on average 34.2±4.1 (M±m) days.

RESULTS AND DISCUSSION

The effectiveness of operations for VNPC fractures depends on the choice of the correct treatment tactics, accurate comparison of the bone fragment with the early development in the elbow joint in children in the postoperative period. Keeping children on the Ilizarov device even during the period of immobilization gave them permission to move in the elbow joint.

The results of surgical treatment of VNPC fractures in children were studied in the early postoperative period (up to 6 months) and in the long-term postoperative period after a year. In all cases, the immobilization period was smooth. After removing the external apparatus and removing the spokes, in some cases, there was a slight stiffness of the elbow joint, which could be eliminated by conducting a course of physio-functional and physiotherapy procedures.

Long-term results were evaluated using a three-point rating system from "0", " 1 "to" 2 " points with summation of point scales. The criteria for evaluating the results of treatment were:
the presence of complaints from patients and their parents, their satisfaction with their results, collected data on distributed questionnaires;

- radiological indicators: the axis of the upper limb, the state of bone fusion in the fracture area;
- functional indicators: the amount of movement in the elbow joint, the presence of stiffness, contracture and ankylosis of the elbow joint;

When adding up the scoring scales, the maximum was 6 points, the minimum was " 0».
According to the results obtained, we divided all the examined patients into 3 groups.

1. Children with good long-term results when calculating 5-6 points. In children of this category, all indicators were within the normal range: the axis of the limb was smooth; the functions of the elbow joint were restored in full; radiologically with normal anatomy and shape of the elbow joint.
2. When calculating the amount of mark scales within 3-4 points of the results were evaluated as satisfactory. This group includes children with good bone fusion in the fracture area, however, their elbow joint function is slightly limited, and radiological evidence also confirms full bone fusion.
3. Unsatisfactory long-term results-below 3 to "0".This group includes children who had no bone fusion, with pain in the elbow joint and with impaired joint function from mild stiffness to contracture; the presence of a sign of axonotmesis of the ulnar nerve. Radiologically, the

absence or scant signs of bone consolidation are determined.

The functional results of the elbow joint were evaluated according to the normative values of V. O. Marx (1978) (table 2).

Table 2: Evaluation of the effectiveness of functional results of the elbow joint in children in the long-term postoperative period.

№	Limb functions n=30				
	Flexion	**Extension**	**Range of movement**	**Pronations**	**Supinations**
The patient's limb	37,2±3,1*	174,9±5,1	137,7±3,1	86,8±2,7	84,4±2,3
Healthy limb	31,9±1,3	180,1±3,4	148,1±1,2	90,1±3,2	89,2±1,8
p**	-	-	*<0,01*	-	-

Note* - joint functional indicators in arithmetic mean values (M±m). * * - p student's criteria-results are reliable at p-0.001-0.05

Table 2 shows that the postoperative functional indicators of the elbow joint have recovered to almost normal values with a small difference from the healthy limb, but there is no established reliability in many of the compared indicators.

As a result, out of all 30 patients, children with good long-term results accounted for 27 (90%) in cosmetic and functional terms. Satisfactory results were observed in the remaining 3 (10%) children associated with a slight restriction of the functional ability of the elbow joint, in addition, they retained periodic pain in the elbow joint for a short period of time. In many cases, there were complications in children whose injury was initially severe, often against the background of dislocation of the forearm bones with compression of the VNPC in the joint gap. After the operation, these children were under our supervision. No children with unsatisfactory results were registered in our cases.

Here is a clinical example.

Child S., 14 years old. in 1.05.2018, he entered the Department of "surgery of combined damage of childhood" of the BF rncemp with the diagnosis "closed apophysiolysis of the left humerus WITH displacement of the bone fragment". When received at the time of examination, there is a swelling in the medial surface of the elbow joint in the absence of a functional defect on the part of the radial artery, median, radial and ulnar nerves (Fig. 1. a). On the x-ray there is a place of apophyseolysis of the left humerus WITH a mixture of bone fragments (Fig. 1. b).

Fig. 1. a, b. patient C.

a. Appearance of the patient's elbow joint.

b. the x-ray shows apophyseolysis of the left humerus with displacement of the bone fragment into the joint.

In the emergency Department, the patient was given first aid, the dislocation of the bones of the left forearm was set under General anesthesia, but it was not possible to reponse the VNPC and a plaster splint was applied. On the control radiograph, the standing of bone fragments is unsatisfactory. The patient in the hospital received preparatory conservative treatment. After mitigation of local edema in 5.05.2018, an open reposition of the VNPC was performed with the imposition of the Ilizarov

apparatus by the method of the RSNPMTSTO clinic with a minimum set of 2 half-rings (Fig. 1. C, g).

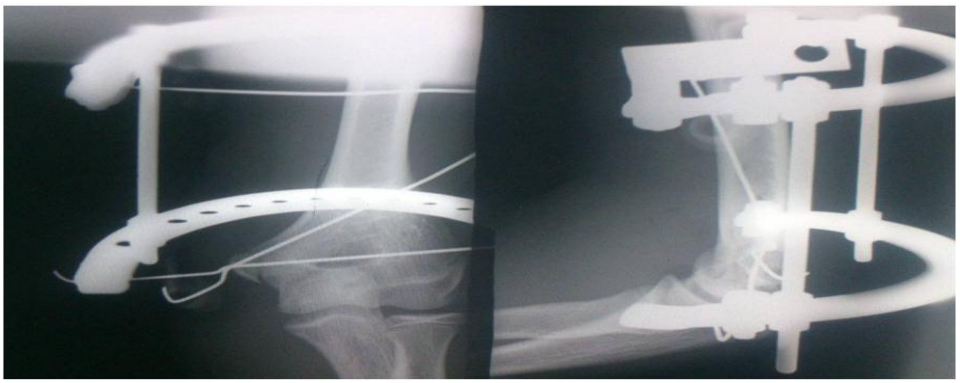

Fig. 1. V., G. Radiographs of the left elbow joint in two projections, there is a satisfactory standing of the bone fragment with the presence of the Ilizarov apparatus.

The patient was discharged for outpatient treatment in a satisfactory condition 2 days after the operation. Also, the patient was re-examined a month after the initial intervention. On the control radiograph, the bone fusion is good. After a month and a half, the external retainer is removed (Fig. 1. D. E,J.*)*.

Fig. 1. d, e, j. condition after removal of the external device, functions in the left elbow joint are normal.

DISCUSSION

In the literature, there are conflicting opinions about the treatment of VNPC in children.[5,6,7] One group of doctors put forward the opinion that fractures of the VNPC with a satisfactory standing of bone fragments can be treated conservatively and in the long term it is possible to achieve better final results. This is due to minimal damage to the joint capsule with minimal intra-articular hematoma. Another group of doctors points out that, despite the severity of damage to the VNPC in 78% of cases, contractures or stiffness of the elbow joint appear and suggest that the joint should be evacuated from the hematoma a few days after the injury, compare the VNPC and fix it, and allow patients to develop the joint early.[8] Therefore, in our opinion to have to define individual tactics of treatment in each case from the perspective of the severity of the injury VNPC and the nature of his mixing with the most minimally invasive surgeries for the prevention of such grave complications as contracture and tugopodvizhnostju elbow. Early joint development can also provide prevention of joint contracture.

CONCLUSION

1. in conclusion, it should be noted that fractures in the NPC are characterized by a variety of severity of damage and the type of displacement of the bone fragment.
2. the Optimal method of treating fractures of the VNPC in children is surgical, which consists in an open comparison of the bone fragment and fixation in any way.
3. we Recommend a functional treatment method with early development in the joint, which prevents contracture and joint stiffness.
4. Method – SFO, developed in the RSNPMTSTO MH RUz is really the method of choice for fractures of the VNPC in children, which provides stable fixation of reponted broken fragments at the same time with the possibility of preserving the function of the elbow joint for the entire immobilization period.

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