treatment of the wound, osteosynthesis in fractures of metacarpal bones, phalanges of fingers and determination of the duration of the course of antibacterial therapy.

4. Posthoc analysis of disease management in the case of open injuries in children allows giving preferences to the perioperative antibiotic prophylaxis.

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USE OF FINE-GRAINED TITANIUM NICKELIDE FOR THE TREATMENT OF DYSTROPHIC BONE CYSTS IN CHILDREN

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ИСПОЛЬЗОВАНИЕ МЕЛКОГРАНУЛИРОВАННОГО НИКЕЛИДА ТИТАНА ДЛЯ ЛЕЧЕНИЯ ДИСТРОФИЧЕСКИХ КОСТНЫХ КИСТ У ДЕТЕЙ

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Fifty five patients with dystrophic bone cysts were included in the study, where 30 of them underwent an original operation of bone grafting with finely granulated titanium nickelide. Clinical and radiological effectiveness of this method of treatment in the early rehabilitation period and with remote monitoring was demonstrated. The clinical effect was characterized as good in 96.6 % of patients during the observation period. Clinical experience shows that the application of the method of treatment of dystrophic bone cysts through plastics with titanium nickelide granules gives more positive results in comparison with the traditional method.

Keywords: dystrophic bone cysts, titanium nickelide, plastics, children

В исследование включены 55 пациентов с дистрофическими костными кистами (ДКК), из них 30 больным была проведена оригинальная операция пластики костной полости мелкогранулированным никелидом титана. Продемонстрирована клинико-рентгенологическая эффективность данного метода лечения в раннем реабилитационном периоде и при отдаленном наблюдении. Клинический эффект характеризовался как хороший у 96,6 % больных в

течение срока наблюдения. Клинический опыт свидетельствует, что применение метода лечения ДКК с помощью пластики гранулами никелида титана дает большее количество положительных результатов в сравнении с традиционным методом.

Ключевые слова: дистрофические костные кисты, никелид титана, пластика, дети

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DBC – Dystrophic Bone Cysts

In childhood and adolescence, DBC can be a manifestation of the dysplastic process [1]. This disease develops slowly, more often affecting the metaphyseal part of the bone [2]. The manifestation is that patients begin to complain of localized pains in the limbs. The severity of the pain syndrome depends on the degree of bone damage. If the focus is located in the bones of the lower limbs, children may get lameness because of limb shaking. Curvature of the limb axis, slowing of bone growth in length, pathological fractures are local manifestations of the disease. From the timely and correct surgical treatment tactics depends on the prognosis of the disease and prevention of complications [3].

The use of artificial implants to replace bone defects has been widely used in surgical practice in recent years [4]; however, in pediatric surgery this method for filling bone defects has not found wide application because of the absence of osteoinductive and osteoconductive properties of these materials, frequent nonunions or the formation of fibrous cases around the implants.

The aim of the study was to evaluate the effectiveness of surgical treatment of patients with destructive bone cysts by applying a method of plasticizing the wrist cavity with finely granular porous nickel titanium.

Material and Methods. To realize the goal the results of reconstructive operations in patients with destructive bone cysts with the use of fine-grained nickel-plated titanium plastics were analyzed. 30 patients with destructive bone cysts aged 7 to 16 years were under control. 18 of them were boys and 12 girls. The plasticity of the wrist cavity with finely granular porous nickel titanium performed in 30 patients. It was a surveillance group. The comparison group included 25 children (13 boys and 12 girls). For their treatment the traditional method was used. Filling the bone cavities with an auto- or homotransplant. The study included the patients with destructive bone cysts at the age of 7 to 16 and they needed surgical treatment.

Analysis of hospital cards showed that in the comparison group, the proximal osteal humerus was predominantly affected in 12 children (48 %), tibia in 6 children (24 %) and femur in 7 children (28 %). The bone was subjected to a pathological fracture of the affected area in 20 patients with destructive bone cysts (80 %), and in 5 children (20 %) the cyst appeared as pain syndrome at the site of localization. All patients under general anesthesia underwent in the form of segmental resection of the affected bone segment, replacing its defect with an auto-transplant in 19 patients and homogenous graft in the form of «bone crushed stone» in 6 children. The limb was fixed with gypsum in the postoperative period. Staged rehabilitation began after the removal of the plaster bandage. Initially, the dosed load was assigned and the development of movements in the joints within 2–4 months. Then, the full functional load on the operated limb after 5–6 months. For sports, children were allowed 1.5 years after surgery, that is after biodegradation of the function of initial bone reconstruction. Immediate results of treatment were assessed on a three-point system: good, satisfactory and unsatisfactory. Good results were those in which a biocomposite was formed with a complete reorganization of bone tissue and restoration of the anatomical structure of the affected segment. Satisfactory results included the complete restoration of the anatomical structure of the bone in the presence of residual cavities, unsatisfactory mean replase oh the desease.

Results and Discussion. Analysis of treatment of children with DBC according to conventional methods of bone plastic surgery showed the following results: 25 patients (100 %) had no complications.

Within 5 years, complete bone restructuring of the structures with cyst closure occurred in 11 (44 %) patients, in 10 (40 %) children the bone cavities were closed one-third, without affecting bone strength and not having a tendency to progress, in 4 (16 %) of children there was a resorption of the material, which required a postoperative operation. The use of auto- and homogeneity in these patients did not lead to good results in the treatment of dystrophic bone cysts. This served as an occasion for the use of an improved bioinert porous material from titanium nickelide in the treatment of bone cavities in the conditions of the diluting organism. The nucleation and growth of bone tissue in the porous structure of the material occurs in many pores in the form of separate nuclei, which then spread out and connect to the tissue system, not breaking the growth of the bone structure.

In recent decades, a new class of porous superelastic materials based on titanium nickelide has been developed. They have unique properties: biochemical compatibility (bioinertness), physicochemical properties close to bone tissue parameters, good anticorrosive properties [5]. In addition, they are not carcinogenic, non-toxic, well sterilized; have a predetermined porous structure, permeability, wettability. Live tissues easily germinate in the pores of titanium nickelide, with a direct bond between the bone and the implant [6, 7, 8]. This allows them to function for a long time in the tissues of the body without tearing away, which ensures a stable regeneration.

In this study, the clinical application of porous material in the form of microgranules for filling bone dystrophic cavities was evaluated.

Surgical treatment is performed under the tourniquet, on the operated limb. Periosteum is dissected all over, the

chisel is used for marginal resection of the cortical plate, then is made by scraping the cavity to a healthy bone with the treatment of the cyst walls with the help of a bone spoon and filling it with granules of titanium nickelide (the volume of the material is determined before the operation and on average is 2–3 sm^3 in depending on the size of the cavity). Layer wound suturing with gypsum fixation is performed. Gypsum immobilization up to 1 month. After the removal of the plaster bandage, a course of restorative treatment is conducted according to the generally accepted procedure.

When the control radiographs were performed in a group of good results of treatment, the formed biocomposite «bone-granules» was traced after 6 to 8 months after plasty. In the long term, 1.5–2 years after the operation, the formed biocomposite was determined, no residual cavities were detected.

When analyzing, in the dynamics of the X-ray picture of the cavity of the cyst, filled with dystrophic bone cysts with granules of titanium nickelide, it seems that biocompatible granules from porous titanium nickelide possess a high osteoconductive potential. This manifested itself in the thickening of the cortical layer of the bone and reducing the «swelling» in the cyst zone within 3 to 6 months after surgery.

Complications in the early postoperative period with the use of this method of surgical treatment of dystrophic cysts in children have not been revealed.

The use of this method for filling bone cysts in conditions of a growing organism is justified, since materials from titanium nickelide possess mechanical stability, optimize regeneration due to osteoconductive properties and allow filling cavities with a complex anatomical structure.

A comparative analysis of DBC treatment is presented in the Table. Analysis of treatment results showed the following: Analysis of treatment results showed the following: among 30 children who were operated using materials from titanium nickelide, good results were obtained in 29 (96.6 %), satisfactory in 1 (3.4 %), unsatisfactory results were not noted. In the group of children who were operated according to the standard method, the analysis of surgical treatment of DBC showed that a good result was obtained in 11 (44 %) patients, satisfactory in 10 (40 %), 4 (16 %) – unsatisfactory (there was a resorption of the material , which required a second operation). In most children, filling the cyst cavity with granules of titanium nickelide and forming a biocomposite took place for 6–8 months, restoring the full anatomical structure of the bone for 1.5 years.

Table

A comparative analysis of DBC treatment

Results	Traditional methods of surgery		Procedure of operation using mycrogranules of titanium nickelide	
	n=25	%	n=30	%
Good	11	44.0	29	96.6
Satisfactory	10	40.0	1	3.4
Unsatisfactory	4	16.0	0	0
Total	25	100	30	100

Conclusions. The problem of treatment of DBC continues to be actively studied. A number of authors use both autografts and bioimplants as bone plastics. With the use of these methods, the result remains unsatisfactory in 7 % of patients [9]. Other authors use intraosseous injection of methylprednisolone acetate in treatment of DBC; in 17 % of patients, pathological refracture is established [10].

Analyzing the results of our study, it is clear that in the group where the traditional procedure of the operation was used, there were 16 % of unsatisfactory results, which does not make it possible to consider this method of treatment promising. In the group with the traditional procedure of the operation, there was 16 % of unsatisfactory results, which does not make it possible to consider this method of treatment as prospective.

In the group with microgranules of titanium nickelide technique, good results of treatment were obtained in 29 (96.6 %), satisfactory in 1 (3.4 %) patients, unsatisfactory results were not observed. Porous granular materials from titanium nickelide have the properties of biocomposite formation, preserve bone strength in patients, and thus prevent the development of pathological changes. The use of this technique in conditions of the decomposing organism is justified, since materials from titanium nickelide possess mechanical strength, optimize regeneration due to osteoconductive properties and allow to effectively fill the areas with a complex anatomical structure, while the congruence of the composite with the bone tissue is preserved in the child's growth process. Using these materials not only improves the quality of life, but also reduces the likelihood of disability.

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POLYMORPHISM G-105A SEPS1 GENE AND MENS' INFERTILITY

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ПОЛИМОРФИЗМ G-105A ГЕНА SEPS1 И МУЖСКОЕ БЕСПЛОДИЕ

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Reproductive disorders in men are the cause of infertility of 30–40 % of infertile couples. The genetic factors play a great role in male infertility as they are detected in 15–30 % of men. The distributions of polymorphic variants of candidate genes relevant to male fertility in different populations are of great interest to explain the male idiopathic infertility. The aim of this study was to explore the association of the SEPS1 gene polymorphism G-105A (rs28665122) with pathospermia in infertile men in Moscow region. Polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) was used to detect SEPS1 G-105A polymorphism in 26 cases and 24 controls. The results showed that the frequency of the minor allele A of geneSEPS1 is higher in men with pathospermia than in the control group of fertile men. Conclusion: The SEPS1 gene polymorphismG-105A is associated with idiopathic infertility in men with pathospermia and can be used to screen idiopathic infertility in men.

Keywords: idiopathic male infertility, genetic factor, gene SEPS1, G-105A polymorphism

Нарушение репродуктивной функции мужчин является причиной бесплодия 30–40 % бесплодных пар. Большую роль в формировании мужского бесплодия играют генетические факторы, которые выявляются у 15–30 % мужчин. Актуальным является изучение популяционных особенностей распределения частот генотипов и аллелей генов-кандидатов при мужском бесплодии. Цель исследования – изучить влияние полиморфизма G-105A (rs28665122) гена SEPS1 на развитие патоспермии среди мужчин с бесплодием Московского региона. Результаты этого исследования показали, что частота встречаемости аллеля А гена SEPS1 выше у мужчин с патоспермией, чем в контрольной группе фертильных мужчин. Заключение: полиморфизм G-105A гена SEPS1 может быть использован для скрининга идиопатического бесплодия у мужчин с разными формами патоспермии.

Ключевые слова: идиопатическое мужское бесплодие, генетические факторы, ген SEPS1, полиморфизм G-105A

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DNA – Deoxyribonucleic Acid
PCR – Polymerase Chain Reaction
RFLP – Restriction Fragment Length Polymorphism