

Replacement of Defects in the Dentition in Children with Acute Trauma of the Teeth by Transplantation

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Abstract The absence of teeth leads to dysfunction of the gastrointestinal tract, speech function. At an older age (13-15 years old), children become less contact, withdrawn and laugh little. All this ultimately leads to various nervous disorders. On the basis of experimental and clinical observations, it was established that disruption of the continuity of the dentition causes pathomorphological and functional changes near the defect and extends to the entire dentition, and then to the entire body as a whole.

Keywords Teeth, Dentoalveolar system, Nervous disorders, Replantation, Chronic periodontitis, Tissue transplantation, Complications, Dental defect

1. Introduction

Partial absence of teeth is the most common pathology of the dentition. According to D.A. Gavrilov, L.A. Shavlyanova (2002) already by the age of 14, 10-24% of children have small defects in the dentition, and among high school students, 31.9% of students need orthopedic treatment of dentition defects.

Based on experimental and clinical observations established. that a violation of the continuity of the dentition causes pathomorphological and functional changes near the defect and extends to the entire dentition, and then to the entire body as a whole. [1,3]. The absence of teeth in children leads to persistent, and sometimes irreparable changes in the face, a noticeable flattening of the soft tissues. shortening of the upper lip, progenic ratio of the jaws, lowering of the lower part of the face, which gives the patient's face an senile appearance [3,4]. The absence of teeth leads to a violation of the function of the gastrointestinal tract, the function of speech. At an older age (13-16 years), children become less contact, withdrawn, laugh a little [1,2,5].

A practically healthy person with a defect in the dentition turns to a doctor for the purpose of prosthetics. The doctor grinds intact teeth. located near the defect. Subsequently, a crown is put on these turned teeth. As you know, after 4-5 years, these previously healthy teeth under the crown are destroyed and subsequently removed. Unfortunately. today this is the norm, since many orthopedists do not know how to mix the defect in another way [1].

Smirnof and Flitr presented the long-term results of implantation after 10 and 15 years. 26 implants were studied in 18 patients. 13 out of 26 implants were found to be satisfactory. In the other 13 cases, rarefaction of the bone tissue around the implants was noted, as well as deep bone pockets. The success rate was 50%.

Over the years, implantologists, accumulating more theoretical and practical experience, began to receive better clinical results. Hermann and many other authors during a five-year follow-up of 487 patients with 1738 implants of the Branemark system received a positive result in 91.2% of cases. A.I. Sidelnikov observed patients after implantation for 3-6 years: in 98% of cases when installing lamellar implants and in 93.7% when installing screw implants, he received positive results. However, the analysis of literature data shows that despite the introduction of new materials, the fact of their true engraftment in the jaw has not yet been established for implantation, and they are held solely due to mechanical compression by the surrounding tissues. Gradually, due to the occlusive load in the surrounding tissues, the cellular structure is destroyed, and later pathological pockets are formed, where food residues fall, ultimately leading to infection and loss of implants.

Based on this, various artificial organs have been developed in the field of medicine: artificial limbs, artificial blood vessels, joints, etc. But it should be noted that all this was done and is being done due to the lack of the possibility of transplanting biological, live grafts in place of the missing ones. With the development of science, namely clinical and experimental immunology, microbiology, biophysics, various issues of transplantology are being studied more and more. As a result, donor heart, liver, kidneys and joints are successfully transplanted today. It should be noted that ideally, from a physiological point of view, all defects of the human body

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should be replaced only by living tissues and organs. Only then can the doctor who performed the operation proudly speak of the complete restoration of one or another organ [5,7].

The absence of teeth is the most common pathology of the dentoalveolar system, according to most authors, it causes the development of deformation of the dentition and occlusion [1,5,6].

Considering the significance and activity of the problem, in this work we have set ourselves the goal of replacing defects in the dentition in children by transplanting teeth.

2. Materials and Methods of Research

We conducted a study and studied 22 patients with various types of trauma of one or another tooth. Observations showed that most often in children 58.6% of cases of dental trauma were 1 and 2 teeth, including 3. Lower jaw (44.2%), upper jaw (53.2% 54.2%). We studied and analyzed 62 outpatient records of patients after the operation of replantation of teeth in an outpatient clinic. Basically, the operation of replantation of teeth was carried out for unsuccessful treatment of chronic periodontitis and for complete dislocation of permanent teeth in children. In most cases, the active mobility of children, active physical education and sports in the absence of the necessary control from adults contributed to the occurrence of the injury.

Examination of children with acute dental trauma consisted of a survey, clinical and additional methods - radiography, thermo and electroodontodiagnostics. During the survey, the general condition of the child was assessed, special attention was paid to the presence and absence of signs of a traumatic brain injury that may accompany traumatic effects on the maxillofacial region, especially in childhood. During external examination, attention was paid to the presence of damage to the soft tissues of the face, and a fracture of the lower or upper jaw was ruled out. When assessing the condition of the teeth during intraoral examination, attention was paid to the position or absence of teeth in the dental arch, changes in the color of the mucous membrane.

Our clinical studies on transplantation of autodontal replants allowed us to suggest the following indications for this operation: unsuccessful treatment of chronic periodontitis (35.3%), complete dislocation of permanent teeth in children (54.6%), erroneous extraction of teeth (7.1%) and tortoanomalies one tooth in the dentition (6.7%). Contraindications to this operation were general diseases of the body (diabetes, tumors, blood diseases, periodontal disease and poor oral hygiene).

Before surgery, patients and their parents were explained the essence of dental replantation and probable outcomes, and strictly followed the stages of replantation. In this case, the tooth to be replanted was thoroughly washed with saline using a syringe. Using a diamond disc, constantly cooling with saline, the root apex was resected by 2 mm. When preparing the replant, it is impossible to allow the surface of the tooth root to dry out and damage to the circular ligament, touching the surface of the tooth root with tools or hands,

given the presence of periodontal collagen fibers in the area of the roots of the teeth. During the preparation of the patient for surgery, the replant was always left in the Biodent preservative solution. The preservation time (from 2 hours to 7 days) depended on the methods of replantation. Then local anesthesia was performed, the replant and the well were thoroughly washed with an antibiotic, the tooth was returned to the soybean well. The transplanted tooth must be in bite. Fixation was carried out using a wire or wire-composite splint. Oral antibiotics were prescribed for 5-6 days in order to prevent the inflammatory process. The splint was removed after 5-6 weeks.

In the presence of an injury to the oral mucosa or soft tissues, the surgical debridement of the wound was first performed, and only after the relief of the inflammatory processes of the socket, delayed replantation was performed. A control X-ray examination of the replanted tooth was carried out after 1, 6, 12 months. At the same time, speaking about the role of periodontal collagen fibers that cover the surface of the root of a transplanted tooth, it should be emphasized that earlier these collagen fibers were practically ignored. When teaching us students at a medical institute, they assured us that the root of the tooth was closed only with cement. Apparently, therefore, practical doctors and dental scientists, when performing a tooth transplant, did not pay attention to collagen fibers, which, in the form of a thin and delicate film, cover the entire surface of the root of the extracted tooth.

As our experimental and clinical studies have shown, the outcome of the operation depends on the safety of this collagen film, namely, whether the replant root will resolve or not in the long term. This is due to the fact that with careless handling of the replant or ignorance of the role of periodontal collagen fibers, this collagen film is damaged.

Conducted antibacterial, anti-inflammatory, analgesic and desensitizing therapy. The tooth was immobilized using a wire or wire-composite splint. For the therapeutic treatment of the replant, we have proposed a device in the form of a vise, easy to handle and safe for the doctor.

Our clinical, radiological and functional studies after tooth transplantation included the study of the process of engraftment of the replant and the restoration of its function. In the postoperative period. A month after the operation, when the reinforcing replant splint was removed, the patient's general condition was satisfactory. Objectively: the mucous membrane in the oral cavity and in the area of the replanted tooth is pale pink, palpation does not cause pain, percussion of the replanted tooth is painless.

The replant is immobile or shows slight mobility. The gum tightly covers the neck of the replant.

6 months after the operation of dental replantation, the complete restoration of the function of the replant is clinically determined. Patients note that they use replanted teeth as well as others. Strengthening of the grafts was observed after 40 days, was not visually observed from intact teeth. On radiographs of this period. there is a complete or ending repair of bone tissue in the area of the top of the replanted

tooth resected during the operation. There is a uniform thin line of the periodontal fissure.

3. Conclusions

An analysis of the long-term replantation periods showed that the methods of conservation of replanted teeth also affect the timing of their functioning in the postoperative period. We concluded that the success of the result of replantation of teeth depends on the preservative, while: preserved in saline for 1–2 years, and preserved in Biodent solution for 5–6 years of the postoperative period. This confirms that after conservation in the Biodent solution, the replanted teeth function for a longer period than when preserved in a physiological solution. Thus, the results of clinical studies have shown that during the replantation of teeth they contribute to the early elimination of local and general signs of inflammation, it is possible to save the causative tooth according to its condition. As a result, replantation is easily accessible, simple and effective, less traumatic, and the replacement of dentition defects by transplantation is the ideal that humanity is striving for.

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