



## A New Method for Plastics of Upper Jaw Defects with Individually Designed Titanium Implants for Congenital Cleft of the Upper Lip and Palate

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**Abstract:** In the Republic of Uzbekistan, the improvement of the health care system has allowed not only to improve public health, but also to achieve certain success in the prevention of formation of malformations, including congenital cleft lip and palate. Certain successes have been achieved in diagnostics, treatment methods have been improved, rehabilitation and improvement programs for these children have been developed.

**Key words:** maxillary defect, individual implants, Congenital cleft lip and palate

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**Introduction:** Congenital cleft lip and palate (CMH), being one of the most frequent malformations of the maxillofacial region, since the birth of a child is accompanied not only with cosmetic defects but also with severe functional disturbances. The high frequency of congenital cleft lip and palate, severe anatomical and functional disorders, the difficulty of social adaptation of such children indicate the particular relevance of this problem. According to the World Health Organization (2009), among all congenital malformations, congenital cleft lip and palate takes 2-3rd place and by the severity of anatomical and functional disorders - the leading place. It should be noted that the congenital cleft lip and palate is not only a medical but also a social problem worldwide. The alveolar process plasty seems to be a difficult task, which has not yet found its solution. Good results are observed when autografts are used to restore the integrity of the maxilla, the alveolar process and the shape of the upper lip. When using the allograft a number of issues related to the preparation, preservation and storage are required, which requires significant material costs. These difficulties determine the relevance of alveolar process defect plasty, necessitating the development of new methods for the treatment of congenital cleft lip and palate, including alveolar process plasty with autografts using membranes. Early diagnosis of congenital malformations, the use of modern surgical methods of treatment, improvement of rehabilitation and prevention methods aimed at preventing childhood disability, is the current topic of many scientific studies.

It is known that to provide skilled care for this category of patients requires complex operations involving a group of specialists: orthopedists-dentists, maxillofacial surgeons, engineers, etc., for subsequent rehabilitation, which determines the relevance of the topic.

**Objective of the research:** improvement of methods of the upper jaw defects restoration with application of individually made implants for increasing efficiency of complex treatment and rehabilitation of upper jaw defects in congenital cleft lip and palate.

**Materials and methods of research.** Surgical treatment of 44 patients with maxillofacial defects was carried out at the Scientific and Rehabilitation Center of Children's Oral and Maxillofacial Surgery of Tashkent State Dental Institute from 2019 till 2023. A retrospective analysis of the results was carried out.

The clinic performed 44 reconstructive surgeries using autografts and titanium endoprostheses. All patients at initial admission were divided into 3 age groups; for comparison of treatment results and selection of optimal methods of rehabilitation with regard to age, they were divided into 2 age groups.

**Results of the study:** After examination and preparation under endotracheal anesthesia, the reconstruction of the alveolar process of the upper jaw with individually manufactured implants was performed. The essence of the surgery is as follows: Before the incision, 5-10 ml of 0.5% novocaine solution was injected into the tissue of the upper lip, nose and alveolar process, which greatly facilitated the manipulation. The incision was made along the edge of the oro-nasal junction and the alveolar process by mobilizing the mucosal-periosteal flaps. Sutures were placed on the oral side, isolating the palatal surface of the alveolar process.



**Fig.1. Stages of the operation**

The defect was filled with an individual implant. Then we proceeded to the formation of the external lining. The front surface of the defect was closed with a flap taken from the mucous membrane of the vestibule of the mouth. For this purpose, on the side of the cleft, 2-3 mm from the transitional fold, a mucous flap of 4-6 mm in size was cut out with the base at the apex of the defect. Then the cut out flap was turned by 90 degrees and strengthened with sutures. Poliglicolid 4.0 was used for suturing the flap and mucosa. Thus, surgical treatment of patients by our suggested method - using individually made titanium implants - is characterized by the main index of surgical treatment efficiency evaluation, high clinical and statistical significance; the main index of surgical interventions efficiency evaluation in patients operated on using traditional methods of treatment is high clinical and statistical significance of the result; it also indicates expediency of using the suggested method. Such parameter as psycho-emotional satisfaction of patients after surgical and orthopedic rehabilitation stage is the sign of high statistically and clinically significant positive results when estimating effectiveness of the intervention. Taking into account restoration of facial symmetry and, most importantly, restoration of masticatory function, unsatisfactory psycho-emotional state after surgical and orthopedic rehabilitation stage is practically absent when using individually made implants in comparison with traditional methods. A

scientific study based on the surgical treatment of the alveolar process defect with custom-made titanium implants achieved a stable positive dynamics and high effectiveness in 95% of cases.



**Fig. 2 Postoperative MSCT and orodopedic treatment**

**Conclusion.** The results of four-year follow-up with control of the level of anatomical and functional rehabilitation have shown that custom-made implants made of titanium allow to avoid complications arising during implant fitting, due to the possibility to regulate the height and position. In addition, in comparison with autografts, the patient is not subjected to additional trauma, thereby reducing surgical aggression and the risk of complications.

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