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STABILIZATION ASSESSMENT RESULTS OF INDIVIDUAL MAXILLARY IMPLANTS AT FOLLOW-UP PERIODS USING HARDWARE METHODS

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Article history:		Abstract:	
Received:	November 6 th 2022	Osteointegration of implants continues to generate scientific and practical	
Accepted:	December 8 th 2022	interest. Currently, implant systems have great potential, which contributes to	
Published:	January 8 th 2023	the engraftment of implants and their acceptance by bone tissue in 95% of cases	
		[1,15]. Implantation is considered as the most effective method of treating jaw	
		defects, directly related to the quality of life of patients. [10,13].	
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INTRODUCTION. Many types of maxillary implants with superstructures as well as additional elements and instruments that influence the results have been developed and proposed [1,3].

Due to the accumulated experience and effective results the indications for implantation are expanding. Along with this, the requirements for implant quality, which is important for implant placement immediately after resection, are becoming high and stringent. A number of indicators are used to evaluate the success of the surgery. One of the most commonly used is implant mobility, which, along with percussion, manual stability control, and periosteometry are used to determine it. Successful implants are considered to be immobile and any detected mobility indicates implant failure [15]. With the various methods available to determine implant stability, it is advisable to perform more studies to assess implant mobility. To obtain information regarding implant integration in bone, a special machine created for this purpose, the MEGA ISQ II, is used [4, 13]. Also, to ensure successful osseointegration, it is necessary to evaluate the stability of the implant at different points in time.

Thus, an important criterion for the successful and long-term functioning of a jaw implant is its stability, which is expressed by the optimal interaction between the bone and the implant. In this regard, monitoring of the implantation performed and evaluation of the implant mobility are relevant.

OBJECTIVE OF THE STUDY: was to determine the mobility and assess the stability of individual jaw implants by the periotest method.

MATERIAL AND METHODS OF RESEARCH: We examined and treated 24 patients with congenital cleft lip and palate aged 18 to 20 years. Of these, 9 were male and 15 were female. The patients were examined and operated in the children's maxillofacial surgery department of TSSI clinic in Tashkent.

The study was conducted in accordance with the Declaration of Helsinki of the World Medical Association [11]. Written informed consent was obtained from the patients.

RESULTS AND DISCUSSION. Restoration of the alveolar process continuity of the maxilla in cases of TMJD has several positive effects simultaneously. Firstly, the growth and development of the maxilla is normalized. Secondly, the reconstructed alveolar process serves as a framework for the operated lip as well as the nose, and in addition, it affects the development of the upper jaw. For a successful operation, the surgeon should not only be familiar with the size of the alveolar process defect, but also assess the relationship between the upper and lower jaw for the next step in the operation.

All patients received orthodontic treatment for a long period of time, and the displacement of the cleft fragments of the maxilla was minimal. The most unfavorable situation was noted in bilateral GERD, when the intermaxillary bone protrusion persisted to a lesser extent, but still.

To assess the clinical effect of the use of custommade implants, we performed a comparative analysis with the standard methods of treatment according to clinical, radiological indicators (bone condition in the area of implant fixation) and bed-days. For this purpose, a scheme of assessing the effectiveness of the use of custom-made implants was developed.

The MEGA ISQ II device (Megagen, South Korea) was used to assess the effectiveness of bone integration



and determine the degree of implant mobility, which determined the attachment strength and damping effect. The operating principle of the device is based on the registration of resonant electromagnetic vibrations of the implant in the bone tissue.



The tip of the device transmits electromagnetic vibrations to the magnetic pin (SmartPeg), which begins to oscillate and transmits this oscillation to the implant. The more stable the implant, the less oscillation, the higher the reading. The magnetic posts are calibrated in such a way that the reading is independent of the implant type:

- Low stability \rightarrow 60 (implant at risk)
- Medium stability \rightarrow 65
- High stability \rightarrow 70

In the course of the study we followed the manufacturer's recommendations. the studies were performed immediately after implantation, after 6 and 12 months.

Statistical processing of the obtained data was performed using Statistica 6.0 software. The data of the study were processed using methods of variation statistics: the mean level of the studied features was

Periosteometric values at the time of examination (3 and 6 months) were significantly different with respect to the initial value. Patients with implantation in the upper jaw had 39.9 % (p<0.05) better stability compared to the initial value after 3 months, after 6 months. - by 46,3 (p<0,05).

It should be noted, that implants which had relatively low initial stability increased their stability afterwards more markedly than implants which had higher initial stability, i.e. their secondary stability didn't have any increase. Our observations agree with the characterized using the arithmetic mean and mode; the representativeness of the studied features was evaluated by the value of the index error and error.

Indicators of periosteometry in upper jaw implant patients

Timing of the study		
3 month	6 month	
73	89	

Note: * - statistical reliability of differences in the groups between the initial value and values after 3 and 6 months (p<0.05).

literature data [6, 7, 9].

When implant stability was measured with the MEGA ISQ II device in the control group, the data ranged from -73 to -89.

The implant must be stable, fit its functional purpose, osseointegrate and have maximum bone implant contact, which is important. Studies have shown that for successful implant integration, the minimum contact should reach 50% [13, 15]. The periosteometry method is one of the methods to determine the stability of the implant and (by default) the degree of



osseointegration. The literature presents data on the use of periostest values in a comprehensive study of bone implant stability, which allowed us to assess the acceptability of periostestometry in stability assessment [13, 14]. We investigated the initial stability of the implants as well as after 6 and 12 months. The implants with through porosity that we used contributed to the reduction of the existing stresses in the bone tissue.

CONCLUSIONS. We can draw a conclusion that the individually fabricated titanium implants surpass the standard methods of treatment in their functional characteristics at the expense of the 1:1 accuracy of reconstruction of the upper jaw alveolar bone defect form. Individually fabricated implant reproduced by MSCT data most accurately reproduces the anatomical shape of the jaws, at the same time being a universal implant. The obtained indicators of implant stability showed the positive level of osseointegration. Besides, when using individually made implants it is possible to carry out early orthopedic treatment of the patients, since titanium is a stable material and does not resorb with the course of time, unlike allo- and autografts..

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