

ELIMINATION OF THE DEFECT OF THE ALVEOLAR CEST WITH A VASCULARIZED PALATINE FLAP

Kh.M. Magomedova¹, V.A. Sletova², K.S. Gandylyan³, I.V. Gabbasova⁴,
A.V. Kononenko⁵, A.M. Idrisova¹, A.A. Sletov⁴

¹Dagestan State Medical University, Ministry of HealthCare of the Russian Federation, Makhachkala, Russian Federation.

²Volgograd State Medical University, Ministry of HealthCare of the Russian Federation, Stavropol, Russian Federation.

³Stavropol State Medical University, Ministry of HealthCare of the Russian Federation, Stavropol, Russian Federation.

⁴Pyatigorsk Medical and Pharmaceutical Institute, branch of the Volgograd State Medical University of the Ministry of HealthCare of the Russian Federation, Pyatigorsk, Russian Federation.

⁵Rostov State Medical University, Ministry of Health of the Russian Federation, Rostov-na-Donu (Rostov-on-Don), Russian Federation.

SUMMARY

Soft tissue augmentation is a narrow direction in the reconstruction of the jaw bones, the number of techniques increases every year, while the issues of integrating flaps outside the axial type of blood supply remain relevant [1, 2]. The development of a minimally invasive method with the creation of an optimal blood supply will allow recreating the architectonics of soft tissue structures for a stable result and the subsequent possibility of bone augmentation with extended mandibular defects. Target. Clinical approbation of a vascularized palatal mucoperiosteal flap to eliminate the defect of the alveolar ridge.

Materials and methods. 42 patients underwent defect repair using a vascularized mucoperiosteal flap and 31 patients using standard free flaps.

Results and discussion. In the early postoperative period on the 12th day the restoration of soft tissue structures in a volume of at least 2 cm², along the top of the alveolar ridge, a height of at least 16 mm, a thickness of at least 20 mm. One month after surgery, the height is not less than 15 mm, the thickness is not less than 20 mm, the volume is about 2 cm². By the end of the third month, the indicators remained stable and corresponded to the previous figures, which indicates the absence of a shrinkage mechanism and the stability of soft tissue structures. 31 patients who have previously undergone augmentation using free grafts note a significant difference in the volume of the intervention and note its effectiveness in comparison with the previous one.

Conclusions. The use of a vascularized palatal mucoperiosteal flap is justified by its incomparable capabilities. After it's taken, it is possible to restore soft tissues with an area of 3.5 cm² or more. The risk of postoperative shrinkage is minimal due to adequate blood supply. Identical morphological characteristics of the oral mucosa are fundamental in solving aesthetic issues in dental implantation.

KEYWORDS: vascularised flap, bone augmentation, dental implantation.

CONFLICT OF INTEREST. The authors declare no conflict of interest.

Introduction

Restoration of functional balance in the dentoalveolar system often occurs through prosthetics on dental implants, the installation of which requires compliance with a number of conditions [2]. To achieve them, various methods of bone and soft tissue augmentation are being developed and implemented. They make it possible to obtain optimal parameters in the projection of the recipient bed [3, 4]. The current methods of reconstruction of soft tissue structures of the alveolar ridge fit into the framework of the use of free full-thickness and (or) split mucoperiosteal flaps [5–7]. A significant number of cases is characterized by an unsatisfactory result, which is due to a high degree of shrinkage, as well as an insufficient volume of donor structures [8]. Existing techniques for the collection and transposition of a vascularized palatine autograft are used to eliminate den-

toalveolar anomalies and recreate the volume of soft tissue structures in the lateral segment of the upper jaw. The use of this flap to compensate for a defect in the alveolar ridge is a laborious process, at the same time, according to a number of researchers, its morphological and functional capabilities are characterized as the most optimal for eliminating soft tissue defects covering the alveolar ridge [9,10].

The purpose of the study

Clinical approbation of a vascularized palatal mucoperiosteal flap for elimination the defect of the alveolar ridge.

Materials and methods

From 2019 to 2023, 42 patients were operated in State Budgetary Health Institution of the Stavropol Territory

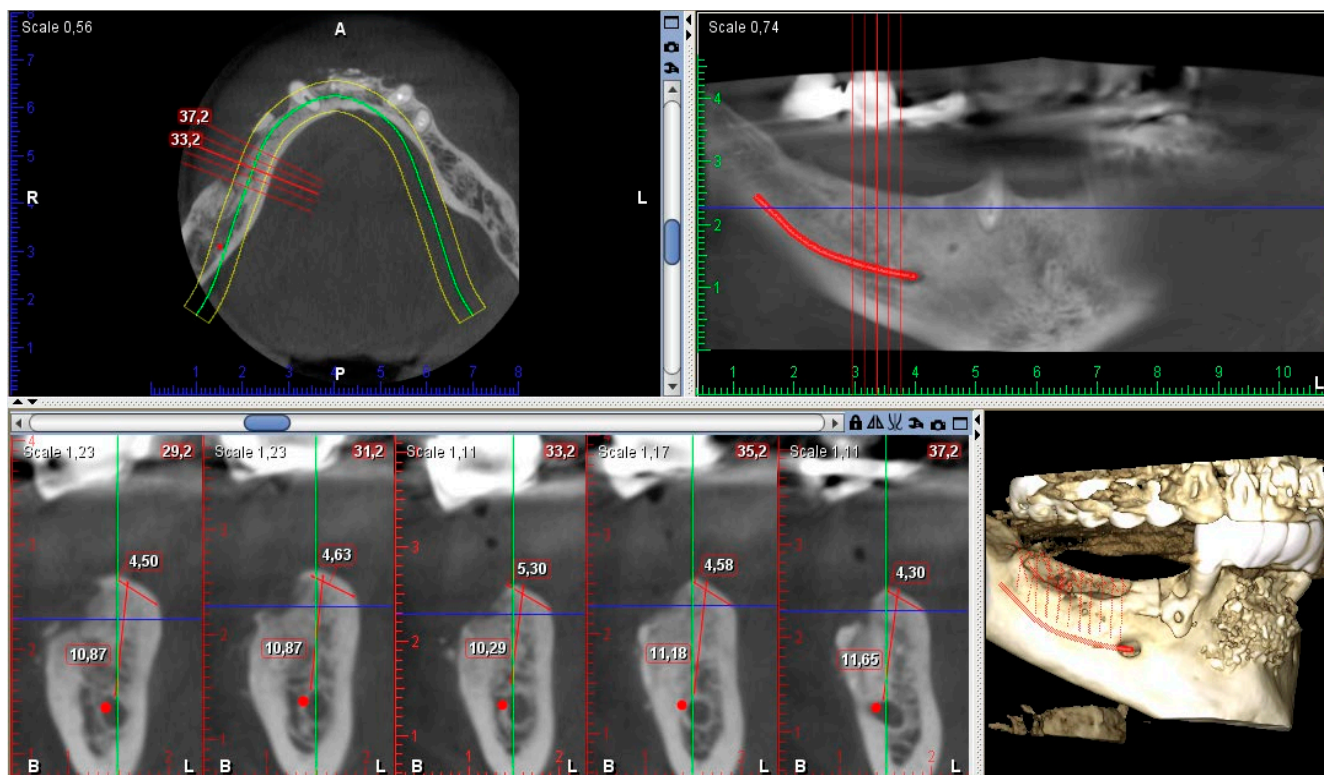


Fig. 1. Patient S., 54 years old, state after repeated osteoplastic surgeries, the Kennedy second class

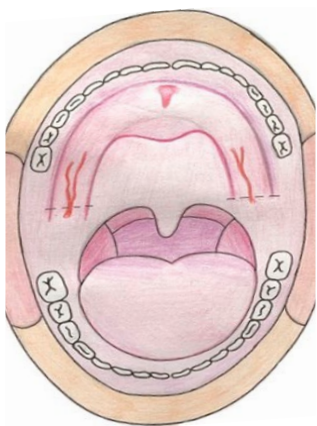


Fig. 2. Schematic representation of the incision design when modeling the tested flap



Fig. 3. Schematic representation of cutting out and transferring one of the supports of the tested flap

«Stavropol Regional Clinical Hospital» for the reconstruction of the alveolar ridge using a vascularized palatine mucoperiosteal flap. According to the methods of additional visual studies and clinical examination, the patients had subtotal mandibular defects, ranging from 2 to 5 teeth in the lateral segment of the mandible with a deficiency of connective tissue structures (Figure 1). Surgical interventions, fixation of personal and other data of patients were carried out after signing an informed voluntary consent to participate in a clinical trial. Patients with no consent to participate in it, somatic pathology in the acute stage were excluded from the study.

In 31 patients, surgical interventions were previously performed in other institutions with the use of free palatine autografts, which did not bring the proper result. The tested

method was carried out under anaesthesia, the restoration of the volume of soft tissue structures was performed in 3 stages with the movement and fixation of the flap both along the top of the alveolar ridge, and from the vestibular and lingual sides. Surgical protocol: under conditions of local anesthesia, at the first stage, detachment of the mucoperiosteal flap is performed along its entire length, while maintaining 3 supports of the tested flap (Figure 2).

To prevent refixation of the flap to the bone base of the hard palate, an insulating pad was placed on its surface for a period of up to 5–7 days. At this time, the flap supports were subjected to daily “training” by applying hemostatic clamps at least for 5 minutes. The readiness of supports for transfer was determined by the time of restoration of blood circulation in the flap after removal of the hemostatic forceps.

At the second stage, one of the supports of the tested flap was cut off with its transfer to the projection of the recipient bed (Figure 3).

The preparation of the recipient bed consisted in making an H-shaped incision along the top of the alveolar ridge in order to expose its top from all sides and to fix the flap stem in the required position, corresponding to the greatest degree of bone tissue atrophy, with the prevention of the formation of «pockets» and «infringements». At the same stage, intermaxillary fixation was installed to prevent the detachment of the flap stem. Fixation was carried out for a period of up to 10 days with daily “training” of the flap. At the third stage, the second leg of the flap was cut off and spread over the top of the alveolar ridge. The third preserved support was split and positioned in such a way as to cover the bony base of the hard palate (Figure 4). Intermaxillary fixation was previously removed at the third stage.

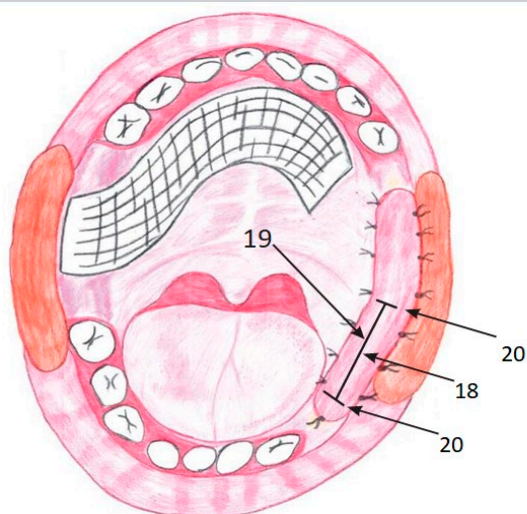


Fig. 4. Schematic representation of the recipient bed after fixation of the legs of the vascularized flap

Results and discussion

Dynamic observation was carried out in the early and late postoperative periods. In the early postoperative period, on the 12th day, the restoration of soft tissue structures in a volume of at least 2 cm² in patients who underwent the tested surgical intervention, at the top of the alveolar ridge, the height is at least 16 mm, and the thickness is at least 20 mm. One month after surgery, the height is not less than 15 mm; the thickness is not less than 20 mm. By the end of the third month, the indicators remained stable and corresponded to the previous figures, which indicates the absence of a shrinkage mechanism and the stability of soft tissue structures. In 31 patients who had previously undergone augmentation using free grafts, only remote dynamics could be monitored, after 21 days, at the end of the first and third months. In the absence of preoperative data, metric parameters were examined using a Michigan probe. On average, the height of soft tissue structures at the top of the alveolar ridge did not exceed 5 mm; the gum biotype was thin. In 27 patients, cicatricial changes in the mucous membrane covering the alveolar ridge were noted, creating additional tension in the soft tissue structures, which did not allow to proceed to the stage of bone augmentation and (or) dental implantation. In 4 patients the height of soft tissue structures in the projection of the top of the alveolar ridge on the 21st day was 6 mm, the mucosa is pliable, slight cicatricial changes are visualized, while by the end of the third month the height changed in the negative direction, descending to 3–4 mm, which is most likely, was equal to the units of the preoperative period. On average, the height of soft tissue structures at the top of the alveolar ridge did not exceed 5 mm; the gum biotype was thin. In 27 patients, cicatricial changes in the mucous membrane covering the alveolar ridge were noted, creating additional tension in the soft tissue structures, which did not allow to proceed to the stage of bone augmentation and (or) dental implantation. In 4 patients, the height of soft tissue structures in the projection of the top of the alveolar ridge on the 21st day was 6 mm, the mucosa is pliable, slight cicatricial changes are visualized, while by

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Conclusions

Soft tissue augmentation for extended defects of the jaw bones requires a radical approach with the use of wide volumetric flaps that can't give a high success rate in the late postoperative period. The applied standard free flaps have a number of advantages: minimally invasive intervention, an accelerated rehabilitation period, while a high shrinkage coefficient, lack of proper integration and the formation of cicatricial deformities do not allow timely and in the absence of risks to proceed to the subsequent stages of rehabilitation of the dentoalveolar system. The tested method, despite the aggressiveness of the surgical stages, makes it possible to achieve a hypervolume of the mucous membrane, which, according to morphometric parameters, is closest to the tissues covering the alveolar ridge.

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INFORMATION ABOUT AUTHORS:

Magomedova Khadijat Magomedovna, assistant of the Department of Surgical Dentistry and Maxillofacial Surgery, Dagestan State Medical University, Ministry of HealthCare of the Russian Federation, Makhachkala, Russian Federation. ORCID ID: <https://orcid.org/0000-0001-8744-2976>. SPIN-code: 3546–1187. Tel. +7-962-345-36-78, email: hadizhat.m@yandex.ru

Sletova Valeria Alexandrovna, resident of the Department of Maxillofacial Surgery, Volgograd State Medical University, Ministry of HealthCare of the Russian Federation, Stavropol, Russian Federation. ORCID ID: <https://orcid.org/0000-0002-7420-8141>. Tel. +7-918-653-45-68, email: tazler9@yandex.ru

Gandylyan Kristina Semyonovna, candidate of Medical Sciences, Professor of the Department of Surgical Dentistry and Maxillofacial Surgery, Stavropol State Medical University, Ministry of HealthCare of the Russian Federation, Stavropol, Russian Federation. ORCID ID: <https://orcid.org/0000-0001-8682-6986>. SPIN-code: 3130–9816. Tel. +7-928-563-99-76, email: gandylyans@yandex.ru

Gabbasova Irina Victorovna, lecturer in the Department of Clinical Dentistry with a course of Surgical Dentistry and Maxillofacial Surgery, Pyatigorsk Medical and Pharmaceutical Institute – branch of the Volgograd State Medical University of the Ministry of HealthCare of the Russian Federation, Pyatigorsk, Russian Federation. ORCID ID: <https://orcid.org/0000-0003-3850-4274>. Tel. 7-989-850-89-99, email: viktor.gabbasov.56@mail.ru

Kononenko Vladimir Ivanovich, MD, Professor, Head of the Department of Surgical Dentistry and Maxillofacial Surgery, Rostov State Medical University, Ministry of Health of the Russian Federation, Rostov-na-Donu (Rostov-on-Don), Russian Federation. ORCID ID: <https://orcid.org/0000-0002-8646-7834>. SPIN-code: 3345–1310. Tel. +7-962-442-65-55, email: kononenkovi@yandex.ru

Idrisova Asiyat Magomedovna, assistant of the Department of Surgical Dentistry and Maxillofacial Surgery, Dagestan State Medical University, Ministry of HealthCare of the Russian Federation, Makhachkala, Russian Federation. ORCID ID: <https://orcid.org/0000-0003-0496-3691>. SPIN-code: 2145–1965. Tel. +7-918-456-37-21, email: aishdgm@mail.ru

Sletov Alexander Anatolievich, MD, professor, Head of Department of Clinical Dentistry with a course of Surgical Dentistry and Maxillofacial Surgery, Pyatigorsk Medical and Pharmaceutical Institute – branch of the Volgograd State Medical University of the Ministry of HealthCare of the Russian Federation, Pyatigorsk, Russian Federation. ORCID ID: <https://orcid.org/0000-0001-5183-9330>. Tel. +7-962-446-59-86, email: dr.sletov.aleksandr@yandex.ru

Contact person: Gabbasova Irina Victorovna, lecturer in the Department of Clinical Dentistry with a course of Surgical Dentistry and Maxillofacial Surgery, Pyatigorsk Medical and Pharmaceutical Institute – Volgograd State Medical University of the Ministry of HealthCare of the Russian Federation, Pyatigorsk, Russian Federation. ORCID ID: <https://orcid.org/0000-0003-3850-4274>. Tel. 7-989-850-89-99, email: viktor.gabbasov.56@mail.ru