

The Optimization of the Method of Surgical Correction of the Vestibulum Oris in the Frontal Segment of the Lower Jaw with a Shaping Prosthesis

Natalia Borisovna Astashina^{1*}, Natalya Maksimova², Alexander Zhuravlev², Anastasiia Laut²

¹Perm State Medical University named after E. A. Wagner (PSMU) of the Ministry of Healthcare of the Russian

²Ryazan State Medical University, Russia

ABSTRACT

The article presents the analysis of clinical research of the surgical intervention tactics performed in 52 patients of the older age groups using the apically positioned flap technique with the formation of the vestibulum oris of the mouth in the area of the frontal segment of the edentulous lower jaw with the help of the forming prosthesis. The clinical, functional, and radiological methods of investigation have been used, proving the advantages of this method of surgical intervention by reducing the healing time of the wound surface and increasing the depth of the newly formed vestibulum oris and the level of keratinized gingiva in the elderly patients.

Key words: Edentulous lower jaw, Mandibular recess, Apically positioned flap forming prosthesis.

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Corresponding author: Natalia Borisovna Astashina
e-mail ✉: n.a.astashina@mail.ru
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INTRODUCTION

The orthopaedic treatment of patients with missing teeth due to unfavourable clinical conditions is clinically challenging, due to the progression of atrophic processes of the prosthetic bed tissue [1,2]. The main challenge for orthopaedic dentists is to ensure good fixation and stabilization of the prosthesis, as these parameters are a good prognosis for permanent wear of the prosthesis by the patient. This fact is proved by statistical studies of Russian and foreign scientists that showed that 26% of patients with full removable dentures do not use them due to poor fixation and stabilization [3,4]. The condition of the prosthetic bed tissue has an important effect on the fixation of removable dentures. Thin, stretched, and dry mucosa is considered most unsatisfactory for removable dentures, which often leads to repeated corrections and even repositioning of dentures. A malleable, moderately moist mucosa provides favourable conditions for fixation and further use of the denture without additional fixation creams [4,5]. To create an optimal mucosa before prosthetic treatment, it is sometimes necessary to remove cheek folds and scars and to deepen the vestibulum oris and oral cavity. On the hard tissue side of the oral cavity, bony protrusions of the alveolar process after traumatic tooth extraction or a strongly pronounced palatal torus

can pose a problem for the prosthesis and create supracontact with the mucosa, resulting in chronic trauma.

Based on the above-mentioned circumstances, to achieve successful orthopaedic treatment, it is necessary to eliminate bone trauma factors and restore the mucosal compliance of the prosthetic bed during surgical preparation.

The objective

To show the advantages of using the apically positioned flap technique with the formation of the vestibulum oris in the frontal segment of the edentulous lower jaw using a forming prosthesis in patients in the older age group.

MATERIALS AND METHODS

This study was conducted on a group of people with missing teeth on the lower jaw between the ages of 70 and 80 years, consisting of 52 people, of whom 14 were men and 38 were women. Clinical, radiological, and functional examinations were carried out at the consultation appointment.

The clinical method consisted of visual assessment of the condition of the prosthetic bed tissue, the condition of the alveolar ridge, the level of keratinized attached gingiva, the depth of the vestibulum oris, and the presence of sub mucosal cheek folds. Based on the clinical data, the need for surgical preparation of the prosthetic bed, which

creates optimal conditions for better fixation of full dentures, was assessed. Radiological examination allowed assessing the condition of the prosthetic bed tissues for the subsequent fabrication of a custom-made, digitally printed prosthesis and to exclude hidden bone tissue pathology. With the help of a functional diagnostic method such as local thermometry using an infra-red scanner, we were able to identify the nature of wound healing in the early postoperative period. Local temperature measurements were performed before surgical intervention, on the 1st, 5th, and 7th days. Clinically, in the early postoperative period, we recorded such general indicators as the increase in body temperature, swelling of the surrounding soft tissues, the severity of pain syndrome, and local indicators—swelling and hyperaemia of the mucous membrane, the presence of fibrinous plaque, and the fixation of the flap.

The criteria for inclusion of patients in the study were the presence of type 3 mucosa according to Supplee, a mandibular structure corresponding to Oksman grade 2-3, no pathological changes in the mucosa, and no general medical conditions in the decompensation stage. All patients were equally divided into 2 groups. In patients in group 1, the vestibuleum oris in the frontal segment of the lower jaw was shaped using a surgical technique in the form of an apically positioned flap with an individually designed shaping prosthesis in the early postoperative period. In comparison, group 2 patients were operated according to the standard technique with an apically positioned flap.

On the 14th and 21st days, which characterized the late postoperative period, the depth of the newly formed vestibulum oris and the level of keratinized attached gingiva were assessed.

All patients enrolled in the study received a report from the attending physicians for the underlying medical

condition that there were no contraindications to dental surgery.

A surgical intervention to deepen the vestibulum oris of the lower jaw in the frontal segment was performed by cutting out a mucosal flap and displacing it apically to a depth of 3-5 mm. The flap was sutured in the new position using Catgut 5.0 suture material. In group 1, patients were treated one day after the operation with an individually fabricated prosthesis. Patient management was performed traditionally. All patients, regardless of the study group, were treated with weak antiseptic solutions for the wound defect. Anaesthetic gels were applied to the wound.

RESULTS AND DISCUSSION

During the study, we found that in group 1 with the application of a forming prosthesis, the early postoperative period proceeded with light manifestations of swelling and hyperaemia of the mucous membrane. Early normalization of the body temperature and temperature in the area of the wound defect in comparison with the 2nd study group operated on using the standard method with the wound healing by the open method-secondary healing. The measurement of the local temperature to reveal the signs of the inflammatory reaction of the local tissues showed that in the main group little inflammatory phenomena were registered within the first day after the operation while in the comparison group, such phenomena remained till 3 days after the operation (Tables 1 and Table 2).

There were no significant differences in the degree of pain syndrome in the two groups. All patients reported moderate pain syndrome. No exacerbation of concomitant pathology was detected after the surgery.

Table 1: Early postoperative period indicators.

Indicators	Group 1. n= 26				Group 2. n=26			
	Before the surgery	1st day	3rd day	5th day	Before the surgery	1st day	3rd day	5th day
Body temperature	N	36.7 ± 0.2°C	N	N	N	36.8 ± 0.3°C	N	N
Collateral soft tissue swelling	-	+	±	-	-	+	+	±
Swelling of the oral mucosa	-	+	-	-	-	+	+	±
Hyperemia of the flap	-	+	±	-	-	+	±	±
Fibrinous plaque	-	-	-	-	-	-	+	±
Flap fixation	-	good	good	good	-	good	satisfactory	satisfactory
Local thermometry	36.6 ± 0.2°C	36.8 ± 0.3°C	36.6 ± 0.3°C	N	36.6 ± 0.2°C	37.2 ± 0.3°C	37.0 ± 0.3°C	N

+: Strong manifestations, ± : Manifestations of moderate intensity, -: Slightly expressed/non-existent; N:Normal indicators

Table 2: The clinical characteristics of the prosthetic bed tissue at the beginning of the study and in the late postoperative period.

Indicators	The beginning of the study		Late postoperative period	
	The main group	The comparison group	The main group	The comparison group
Level of keratinized attached gingiva	3.1 ± 0.6 mm	3.2 ± 0.5 mm	5.3 ± 0.4 mm	4.3 ± 0.3 mm
The depth of the vestibulum oris	2-3 mm	2-3 mm	5 ± 0.5 mm	4 ± 0.5 mm

CONCLUSIONS

The method of surgical correction of prosthetic bed tissues in the frontal segment of the lower jaw using the apically positioned flap, consisting of the formation of a new vestibulum oris using individually designed forming prosthesis, showed advantages over the traditional method. They consist of reduced healing time of the wound surface, the increased depth of the newly formed vestibulum oris, and keratinized gingiva level in patients of this age group, which allow recommending the postoperative management with the application of a shaping prosthesis.

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