

Management of shallow vestibule using conventional surgical techniques: A Case Report

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World Journal of Advanced Research and Reviews, 2022, 14(03), 185–189

Publication history: Received on 01 May 2022; revised on 04 June 2022; accepted on 06 June 2022

Article DOI: <https://doi.org/10.30574/wjarr.2022.14.3.0520>

Abstract

The presence of a shallow vestibule has long been considered a limiting factor of the use of removable dental prosthetics. Prosthesis failure is caused by extensively resorbed ridges with a shallow vestibule and a high insertion of muscles into the ridge crest. Surgical repositioning of the mucosa and insertion of muscles, which increase the depth of the vestibule and the area of the denture flange for retention and stability determine the success of the prosthesis. Vestibuloplasty is a surgical treatment that involves repositioning the mucosa and muscle attachments in the vestibule to increase the depth of the vestibule. The aim of this case report is to describe the management of the superficial vestibule for periodontal preprosthetics using conventional surgical techniques.

Keywords: Shallow Vestibule; Attached Gingiva; Periodontal Preprosthetic; Vestibular Deepening; Surgical Conventional Technique

1. Introduction

Vestibular depth is measured either from crest of lip or from coronal border of the attached gingiva to depth of mucobuccal fold. Adequate vestibular depth is generally considered as vestibular depth that enables to maintain proper oral hygiene and essential for the retention and stability of removable dentures [1]. A shallow vestibule is associated with plaque accumulation and consequently marginal gingival inflammation which leads to mobility, bone loss, gingiva recession. An appropriate height of the alveolar crest is essential for the retention and stability of removable dentures not supported by implants. However, a long-lasting edentulous crest, an alveolar traumatism, or a severe periodontitis may lead to the reduction of a vestibular depth. This lack of an adequate residual alveolar ridge can compromise an optimal rehabilitation with removable dentures [2,3].

Denture stability and retention may be dramatically affected by severe ridge atrophy. Ulceration and pain may occur because the thin mucosa covering the denture-bearing areas is unable to bear functional stresses. The negative effects of ridge atrophy on oral health related quality of life, and the masticatory function have been explained in several studies which revealed impaired masticatory function in complete denture patients due to severe ridge atrophy. To overcome the sequels of ridge resorption, several approaches had been described such as different techniques of vestibuloplasty, ridge augmentation, and endosseous implants. One method to increase retention and stabilization of the denture is to increase the depth of the sulcus without any bone addition [4].

Vestibuloplasty is a surgical procedure which allows the deepening of the vestibule by modifying soft tissue attachment. It is mostly indicated in pre-prosthetic surgery to correct the inadequate height of the alveolar ridge, and in periodontology to increasing the width of the attached gingiva, increase the keratinized gingiva, producing an anatomical shape that can support patient oral hygiene procedures, improving esthetics, reducing inflammation around

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the restored tooth, stabilizing and retaining dentures, and supporting successful prosthodontic, orthodontic and implant treatments [1,3,5].

The aim of this case report is to describe the management of the superficial vestibule for periodontal preprosthetics using conventional surgical techniques.

2. Case Report

A 66-year-old male patient came to visit the periodontal clinic at the dental and oral hospital, Faculty of Dentistry, Airlangga University wanting to improve the retention and stabilization of the maxillary denture. On clinical examination, a shallow vestibule and inadequate width of attached gingiva were found in the maxillary posterior region. His medical history was noncontributory, and he denied a history of smoking or alcohol consumption. The general condition of the patient was good and he admitted that he did not have systemic disease, and denied a history of smoking or alcohol consumption. To overcome this situation, it is planned to carry out a vestibular deepening procedure using conventional surgical techniques.



Figure 1 Shallow buccal vestibule with inadequate attached gingiva in right posterior maxillary region

At the first visit, Phase I therapy was initiated with patient education and motivation, full mouth scaling and root planing, home plaque care measures and oral hygiene instructions were reinforced to the patient. To overcome the main complaint of the patient, it is planned to carry out a vestibular deepening procedure using conventional surgical techniques.

Prior to surgery, the patient's blood pressure was measured (120/80 mmHg). Pre surgical preparation was done before the surgery with povidine iodine solution rinse for 30 seconds. Then asepsis with povidone iodine was performed around the operating area. Local infiltration anesthesia in the mucobuccal fold of the maxillary posterior teeth using 2% lidocaine, 1: 80,000 epinephrine. The procedure for deepening the vestibule using conventional surgical techniques begins with a horizontal incision at the base of the vestibule with blade no. 15c angle 45°. Position the vestibule to the base of the vestibule to the required depth and perform 5 interrupted sutures.

Irrigation was done with sterile saline, and a periodontal dressing (Coe-pak®) was placed to protect the operated area for 7 days to reduce bleeding, prevent tissue relapse and reduce patient discomfort when eating and drinking. The patient was prescribed Cap Amoxicillin 500 mg TID for 5 day, anti-inflammatory Tab Diclofenac 50 mg BD for 5 days for postoperative pain, and 0.2% chlorhexidine mouth wash. Patient was instructed to have soft diet for 1 week along with other post-operative instructions and control 1 week postoperatively for evaluation. The patient was recalled after two weeks for removal of sutures.

One week after surgery showed satisfactory healing, the periodontal pack (Coe-pak®) was detached on the 5th post surgery day. Sutures were removed on the 14th day after the surgical procedure. No complications were observed during the postsurgical healing period. The patient reported mild to moderate post-surgical pain from the surgical site on the maxillary.

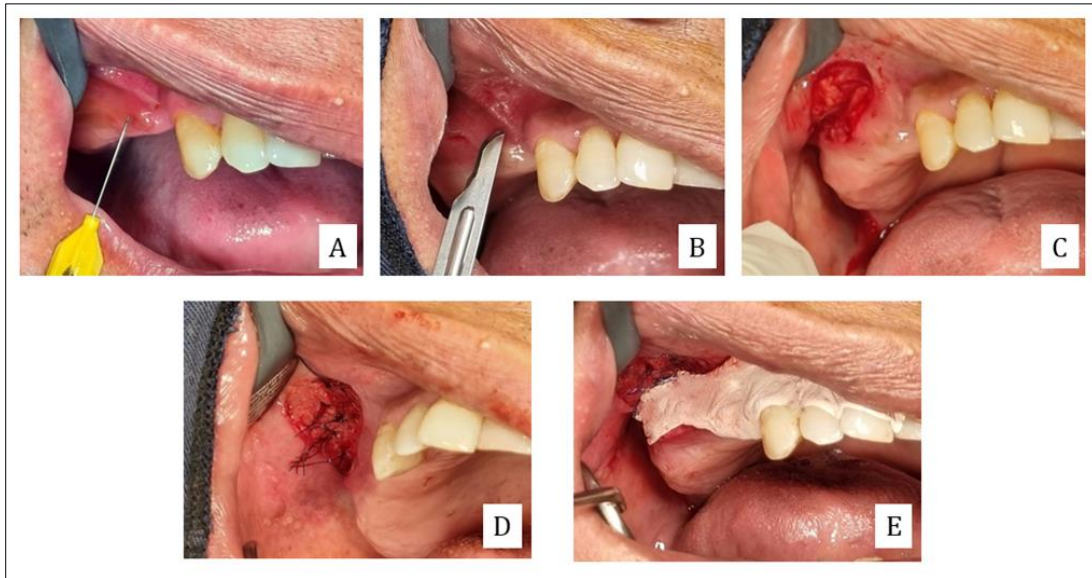


Figure 2 (A) Local infiltration (2% lidocaine, 1:80,000 epinephrine); (B,C) Horizontal incision at the base of the vestibule with blade no. 15c angle 45 ; (D) Interrupted suture of 5 stitches; (E) The operating area was covered with a periodontal pack (Coe-pak®).

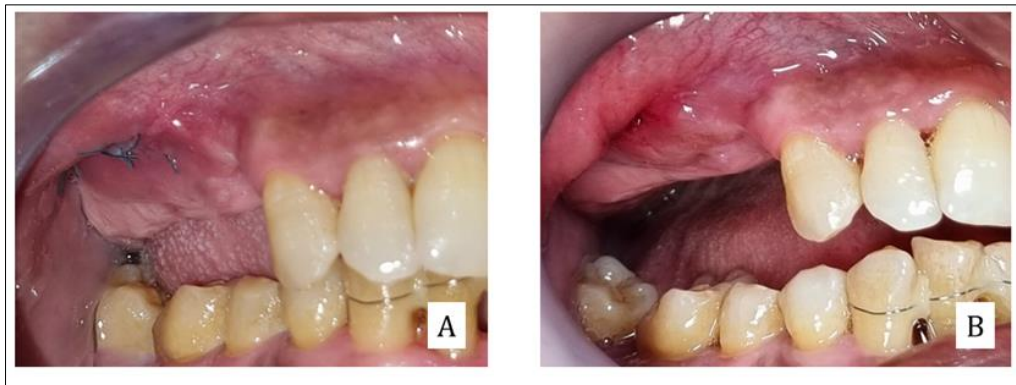


Figure 3 (A) 1 week after surgery, no bleeding, harmonious appearance of gingival tissue and gingival health was achieved; (B) 2 weeks after surgery, suture removal.

3. Results and discussion

The vestibule oris is a cavity in the mouth that is bounded by the teeth and gingiva medially, the cheek and lip mucosa laterally and the movable and immovable mucosal border apical and is commonly called the vestibular sulcus or fornix. Shallow vestibule can be caused by gingival recession, alveolar bone resorption, edentulous teeth, muscle attachment is too high, post cleft lip and palate surgery and inflammation or trauma. These conditions are not functionally and aesthetically beneficial, hindering oral hygiene procedures performed by patients so that they can initiate or exacerbate gingival inflammation, interfere with esthetics, and denture placement [2,5].

An insufficient residual alveolar ridge is a major obstacle for the patients who need a removable denture to rehabilitate the loss of teeth. There will be a discomfort associated to the instability of the denture and a dysfunction of the apparatus. It was also suggested that in this case, the pressure exerted by the denture base on the alveolar ridge will be elevated, increasing the resorption rate of the alveolar bone and thus the instability of the denture. A vestibuloplasty can then be required in order to deepen the vestibule, increasing the height of the residual alveolar ridge and thus optimizing the retention and stability of a prosthetic rehabilitation with removable dentures [6].

Freidman (1957) described the term “mucogingival surgery” as a surgical procedure that corrects the relationship between the gingiva and oral mucosa with reference to three areas - attached gingiva, shallow vestibule, and aberrant frenum that interfere in the maintenance of marginal gingival health [7]. Shallow vestibule can occur as a result of alveolar ridge atrophy after extraction, high muscle insertion or as a result of surgical procedures such as coronally advanced flaps, excisional wound followed by scarring, etc. Shallow vestibule has been associated with problems such as barrier in maintenance of oral hygiene, increased food accumulation during mastication, gingival recession, difficulty in placing removable prosthesis, etc [10].

Adequate vestibular depth is generally considered as vestibular depth that enables to maintain proper oral hygiene. Shallow vestibule often favours food accumulation and impedes oral hygiene maintenance. If combined with inadequate attached gingiva, it can cause pulling of marginal tissue and gingival recession [8,9].

Vestibuloplasty is the surgical modification of the gingiva mucous membrane relationships including deepening of the vestibular trough, altering the position of the frenulum or muscle attachments, and widening of the zone of attached gingiva [10]. Indications for vestibuloplasty are to stop progressive gingival recession, regain attached gingiva and increase vestibule depth, to assist in plaque control and increase resistance to masticatory trauma. Vestibuloplasty can also be indicated for esthetic reasons and to create a surface for denture bases in edentulous patients in order to increase retention and stabilization. Vestibuloplasty is also useful in cases of inflammation and tissue recession around the implant caused by tension of the frenulum, this is generally the case in the tissue surrounding the implant [11].

Contraindications to vestibuloplasty are heavy bone loss following traumatic tooth extraction, bone resorption secondary to periodontitis and alveolar bone atrophy after extraction. Therefore, in the case of an edentulous mandible, the height and width of the bone as well as the attachment of the muscles and mucosa must be sufficient to give adequate results, because if the mandibular alveolar bone is less than 20 mm high, the mental nerve can be exposed to great pressure from the denture prosthesis. Therefore, alveolar ridge augmentation and implant techniques are a priority. Another contraindication is if the patient's systemic condition does not allow surgery, the patient must agree to all procedures and get an explanation about the source of the material to be used [12,13].

In the case presented here, correction of the superficial vestibule using conventional surgical techniques was considered a successful treatment. One week postoperatively showed minimal inflammation, such as absence of redness, pain and bleeding. One month postoperatively at the follow-up visit the results were very satisfactory, there was no relapse and good gingival health was achieved.

4. Conclusion

Through correct diagnosis and technique, it can be concluded that vestibular deepening using conventional surgical techniques is a successful procedure to increase the attached gingival width and vestibule depth required for periodontal prosthetic preparation. This conventional surgical technique is relatively simple, safe, minimally invasive, and has a favorable postoperative period.

Compliance with ethical standards

Acknowledgments

The authors thank the reviewers for their insightful suggestions.

Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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