

A Case Report

Aesthetic Approach For Vestibular Deepening

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Abstracts

A shallow labial vestibule hampers maintenance of good oral hygiene. In the present case report, a 18 year old female presented with the complaint of slight lower loose front teeth with downward movement of gums. An extremely shallow vestibule was observed with marginal gingival recession with respect to mandibular central incisors and pronounced midline diastema. The initial therapy included education, motivation, oral hygiene instructions and scaling and root planing. The deepening of mandibular labial vestibule was done by combination of denudation technique and split flap procedure with slight modification. Incisal grinding of mandibular central incisors was done to relieve trauma from occlusion. The surgical procedure resulted into a considerable gain in the width of attached gingiva which was maintained itself even six months after the surgical procedure. Complete resolution of mobility was seen leading to improved function of the mandibular anterior teeth. The above surgical procedure leads to a consistence and predictable increase in the width of attached gingiva and may be successfully used in the treatment of a shallow vestibule.

Keywords: Shallow vestibule, gingival recession, vestibular extension

INTRODUCTION

Most of the periodontal therapies are aimed at to achieve an area which permits an optimal level of oral hygiene. A shallow vestibular depth hampers the proper placement of a tooth brush, as a result of which decreased depth of the vestibule is commonly associated with plaque accumulation and marginal gingivitis.

The gingival augmentation procedure comprises a number of surgical techniques, the majority of which have been developed mainly on an empirical basis and without sufficient knowledge of the biology of the involved tissues. The earliest of these techniques are the 'vestibular extension operation' which was designed mainly with the objective of extending the depth of vestibular sulcus.¹

Periodontal plastic surgery is one of the most recent advancement in the surgical phase of the periodontal case management. The term periodontal plastic surgery was used by Miller². Earlier, the term Mucogingival surgery was used by Friedman³. He referred to corrective surgery of the alveolar mucosa and the gingiva which includes problems with the attached gingiva,

shallow vestibule and the aberrant frenum. Since the term Mucogingival surgery did not adequately describe all the periodontal procedure i.e. root coverage, functional crown lengthening and ridge preservation, therefore, periodontal plastic surgery is now a preferred terminology. Adequate vestibular depth is important for both good oral hygiene and retention of prosthetic appliance. Shallow vestibular sulcus leads to: (i) deposition of food particle (ii) interfere with maintenance of good oral hygiene (iii) increased plaque accumulation.

Methods

A 18 year old female reported to the department of periodontics at career postgraduate institute of dental sciences and hospital, Lucknow with the complaint of slight lower loose front teeth with downward movement of

Access this article online

Website:
www.healtalk.in

DOI:
[10.4880/zenodo.6550469](https://doi.org/10.4880/zenodo.6550469)

Quick Response Code:



How to cite this article: Dr. Avadhesh Kumar, Aesthetic Approach For Vestibular Deepening, HTAJ OCD.2022;Mar-Apr(4):12-15.

gums. The problem had developed gradually over a period of one year. After thoroughly reviewing the patient clinical history and taking out a detailed examination, a diagnosis of chronic generalized gingivitis with localized periodontitis in the region of mandibular incisors was made (Fig.1).



Fig.1. Preoperative after scaling and root planing

There was gingival recession in relation to mandibular central incisors. It was decided to carry out extension of the patient's mandibular labial vestibule to increase the width of attached gingiva. Initial therapy included patient education and motivation for the maintenance of good oral hygiene, thorough scaling and root planing and incisal grinding of mandibular central incisors. Routine blood investigations: blood glucose- fasting and post prandial, haemoglobin, ESR, bleeding and clotting time, total and differential leukocyte count, HIV, HBs antigen assays were carried out. IOPA X-ray was advised in respect to mandibular central incisors. Patient was recalled after two weeks for surgery.

Surgical Procedure

Patient was made to seat comfortably on dental chair. The entire procedure was explained to the patient and her family in advance. A written consent was obtained. The entire instruments used in surgery were autoclaved. Under all aseptic conditions patient preparation was done. Surgical site was painted with 5% povidone-iodine solution. Patient was operated under local anaesthesia with a solution of 2% lignocaine with 1:80,000 adrenaline. Mental nerve block was given bilaterally. The surgical procedure performed was combination of 'denudation technique' and 'split flap' procedure with slight modification. With the help of 15 no. blade incision was given from first premolar to first premolar into the depth of vestibule downward to reach the desired depth and all the soft tissues within an area extending from gingival margin to the level apical to the mucogingival junction was removed as in denudation technique but periosteum was preserved i.e. bone was not completely exposed as in split flap procedure. All the tissue tags were removed and surface was made even

(Fig.2).



Fig.2. After incision and removal of tissue tags

Then continuous suturing was done using 3-0 catgut suture in such a way so that split flap i.e. Loose labial flap was folded inside apically to prevent attachment of the soft tissues at the same preoperative level (Fig.3).



Fig.3. Continuous suturing

Periodontal dressing was given at the surgical site (fig.4).



Fig.4. Periodontal dressing

Medication were prescribed to the patient (Amoxicillin 500 mg thrice daily, Ibuprofen 600mg thrice daily, Multivitamin and multimineral capsule once daily for 5 days and Vitamin C 500mg once daily for 14 days).

Patient was instructed not to brush the operated area for one week and was advised to rinse with 10ml aqueous 0.2% chlorhexidine gluconate solution twice daily for two weeks. Patient was advised to take soft and liquid diet for first 24 hours after surgery and warm saline rinse from next day. Patient was recalled

after one week for follow up and maintenance. After one week periodontal dressing and sutures were removed (Fig.5) & (Fig.6)



Fig.5. Periodontal dressing removed



Fig.6. Sutures removed

and surgical site was irrigated with povidone-iodine solution. Patient was recalled after one month & six months for maintenance and follow up (Fig.7 & Fig.8).



Fig.7. Postoperative after one month



Fig.8. Postoperative after six months

DISCUSSION

Shallow vestibule leads to food impaction against the gingival margin and into the interproximal spaces and makes it difficult for the patient to place the tooth brush properly and cleanse the area. Goldman⁴ was the first to point out the limitations of mucogingival topography upon periodontal surgery. He described three problems which inter-relate gingival, mucosal and vestibular surgery : (i) extension of pocket depth through attached gingiva into alveolar mucosa (ii) the extension of the frenum attachment into the marginal gingiva and (iii) shallow vestibular depth resulting from surgical pocket reduction procedure.

There are several techniques to increase the depth of vestibule. Technique designed to deepen the vestibule in edentulous patients was introduced by Kazanjian⁵. One of the first periodontal applications of mucogingival surgery was reported by Nabers⁶. Bohannon⁷ introduced 'periosteal separation technique' or 'vestibular extension technique' which included routine gingivectomy extending laterally to the first premolars and apically to the mucogingival junction. All soft tissue coronal to this line was removed by blunt dissection. This exposure was extended to depth (approx. 12mm) which permitted detachment of the mentalis muscles from their origin.

The resulting soft tissue flap was removed by excision

The surgical procedure performed in the present case was combination of 'denudation technique' and 'split flap' procedure with slight modification. In denudation technique all the soft tissues are removed within an area extending from gingival margin to a level apical to mucogingival junction, leaving the alveolar bone completely exposed. Healing in such cases results in an increase in the height of gingival zone however it results in bone resorption with permanent loss of bone height.^{8,9} To prevent bone loss, bone was not completely exposed in this case.

In 'periosteal retention' or 'split flap procedure'^{10,11} in which only the superficial portion of the oral mucosa within wound area is removed, leaving the bone covered by periosteum. Here, there is less bone resorption than denudation technique if thick layer of connective tissue was retained on the bone surface. However loss of crestal bone height was observed also following this type of operation unless a relatively thick layer of connective tissue was retained on the bone surface.⁹ Then as a modification in the present case continuous suturing was done using 3-0 catgut suture in such a way so that split flap i.e. labial mucosal flap was folded inside apically to prevent attachment of the soft tissues at the same preoperative level.

Apically repositioned flap described by Friedman¹² involved the elevation of soft tissue flaps and their displacement during suturing in an apical position, often leaving 3-5 mm of alveolar bone denuded in the coronal part of the surgical area. This resulted in the same risk for extensive bone resorption as other denudation techniques'. According to Friedman in this technique a postsurgical increase of the width of the gingiva can be predicted with the apically repositioned flap, but several studies indicated that the presurgical width most often was retained or became only slightly increased.^{13,14}

The described vestibular/ gingival extension procedures were based on the assumption that it is the frictional forces encountered during mastication which determine the presence of keratinized tissue adjacent to the teeth^{15,16}. Therefore, it was believed that by the displacement of muscle attachments and the extension of vestibular depth, the regenerating tissue in the surgical area would be subjected to physical impacts and adapt to the same functional requirements as those met by 'normal' gingival.¹⁶⁻¹⁸ Later studies, however, showed that the characteristic features of the gingiva are determined by some inherent factors in the tissue rather than being the result of functional adaptation, and that the differentiation (keratinization) of the gingival epithelium is controlled by morphogenetic stimuli from the underlying connective tissue.

Grafting Procedures

The gingival and palatal soft tissues will maintain their original characteristics after transplantation to areas of the alveolar mucosa. Hence, the use of transplants offers the potential to predict the postsurgical result. The type of transplants used can be divided into: (1) pedicle grafts, which after placement at the recipient site maintain their connection with the donor site, and (2) free grafts, which have no connection with the donor area. Free grafts have most commonly been used for gingival augmentation.¹⁹⁻²³

CONCLUSION

Analyzing the findings of present case it can be concluded that in cases with shallow vestibule and a reduced width of attached gingiva on the labial aspect of mandibular anterior teeth. The modified technique described in the present case leads to a consistence and predictable increase in the width of attached gingiva and may be successfully used in the treatment of a shallow vestibule.

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ISSN: 0975-6329 (Print)

Impact Factor: 6.491(2017) & 7.053 (2018)



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