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Vestibular Troughing Using Clarke's Technique: Case Report

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Abstract

One of the main objectives of periodontal therapy is to achieve optimal oral hygiene. Inadequate vestibular depth leads to inability to maintain oral hygiene, which in turn leads to increased plaque retention and decreased stability and retention of the denture owing to insufficient width of keratinized gingiva. Decreased vestibular depth depends on various factors like age, physical status, position and tension of adjacent muscles, amount of alveolar and basal bone position of neurovascular foramina and consistency of mucous membrane. Vestibuloplasty helps to achieve the required amount of vestibular depth in order to retain the denture and maintain one's oral hygiene. The present case reports have been done using Clarke's technique, which is simple, effective and yields good results along with good patient satisfaction.

Keywords: Clarke's technique, scalpel, keratinized gingiva, vestibuloplasty

Introduction

The oral rehabilitation of patients after loss of teeth has made progress in recent times. Absence of good vestibular depth and insufficient amount of keratinized gingiva leads to poor oral hygiene and inadequate plaque control. The “Gold standard” for sustainment of healthy periodontium

is 2 mm of keratinized gingiva and 1 mm of attached gingiva.[1]

Vestibuloplasty is a surgical procedure where the oral vestibule is deepened changing the soft tissue attachments and thus increasing the size of the denture bearing area and height of the residual alveolar ridge. It is a mucogingival procedure that aims at the surgical modification of the gingiva-mucous membrane relationships including widening of the attached gingiva zone, alteration of frenula attachment and deepening of the vestibular trough.[2]

To describe the mucosa-gingiva relationships with reference to three area: attached gingiva, shallow vestibule and frenum interfering the marginal gingiva Friedman introduced mucogingival surgeries.[3] "Local extension of the vestibular trough and the "gingival extension operation" were termed previously as Schlüger "pouch" and the Fox "push back" procedures respectively.

A variety of vestibuloplasty procedures have been advocated in the literature such as Kazanjian's technique, Clarke's technique etc. Most of these techniques are used as pre-prosthetic procedures to enhance vestibular depth for good retention. All of these techniques were aimed at exposing large areas of bone or periosteum according to Orban [4] and Pfeifer [5], who reported that keratinized tissue forms when functional stimuli (eg. mastication) act on exposed bone or periosteum. Karring et al.[6], suggested that the differentiation of keratinized tissue is not the result of a functional adaptation but is controlled by the underlying connective tissue.

Classification of vestibular depth-

Class	Definition
I	The alveolar ridge is ample in height but shows significant undercut areas and insufficient width.
II	The alveolar ridge is deficient in both height and width and confers to a knife edge appearance.
III	The alveolar ridge has been resorbed to the extent of the basal bone.
IV	The mandible or the maxilla presents with severe resorption, there is impeding pathological fracture.

Clarke's vestibuloplasty came into vogue and is more popular due to its ability to enhance the vestibular depth and addressing the mucogingival problems related to it.

These case reports discusses about the effectiveness and ease of performing Clarke's technique of vestibuloplasty to increase the width of attached gingiva in the lower anterior region of the jaw.

Surgical procedure-

Clark's Vestibuloplasty

After the phase 1 therapy, all the necessary oral hygiene instructions were given with emphasis on adequate plaque control. Prior to the surgery, width of attached gingiva and vestibular depth were recorded. Mental nerve block was administered bilaterally with 1:80000 concentration of adrenaline. After achieving adequate anaesthesia, a horizontal incision was given in the mucous membrane at the mucogingival junction with a scalpel blade no.15. The incision was extended with sharp dissection resecting all the muscle fibres over the periosteum. After the supraperiosteal dissection, the mucosal flap was sutured at the depth of the vestibule. The periosteal surface was properly evaluated for any remining muscle fibre attachments. A periodontal dressing (Coe-pak) was then placed over the wound. Patient was assessed for bleeding before discharging.

Post operative instructions were given to the patient. Antibiotic prescribed was Amoxicillin 500 mg three times a day for 5 days along with ketorolac dispersible tablet(Ketorol DT®) as an analgesic was prescribed. Plaque

control was supplemented by use of 0.2% Chlorhexidine mouthwash twice daily for 3 weeks postoperatively.

Case report 1

A 30 year old man reported to the Department of Periodontology with the chief complaint of swollen gums. Intraoral examination revealed that he had aberrant frenum attachment, inflamed and inadequate attached gingiva in the lower front teeth region of jaw. The patient desired treatment for the same. The patient also had pain in the lower front tooth region since six months. The pain was dull, gnawing and aggravated on having cold water and on chewing. The pain relieved on its own in 15 min and patient did not take any medications for the pain. A complete medical and family history was recorded. Blood investigations were carried out to rule out any contraindications for the surgery. The entire procedure was explained to the patient and informed written consent was obtained. Extraoral examination revealed no significant findings. Periodontal examination revealed swollen gums in the lower anterior teeth region with probing depth of 7 mm with no mobility and class III recession with 32. Clark's vestibuloplasty was carried out.

Fig.1 Pre-operative photo

Fig. 2 Vestibular troughing done with scalpel

Case report 2

A 40 year old female reported to the Department of Periodontology with the chief complaint of unstable lower denture. Intraoral examination revealed that she had aberrant frenum attachment and inadequate attached gingiva in the lower front teeth region of jaw. The patient desired treatment for the same. A complete medical and family history was recorded. Blood investigations were carried out to rule out any contraindications for the surgery. The entire procedure was explained to the patient and informed written consent was obtained. Extraoral examination revealed no significant findings. Clark's vestibuloplasty was carried out. Healing took place by secondary intention.

Fig 5- Incision given, vestibular troughing done

Fig 6- Post operative healing after 7 days

Fig 7- Healing after 1 month

Discussion

The optimal width 2mm of keratinized gingiva and 1 mm of attached gingiva is the "gold standard" for sustainment of a healthy periodontium[1]. Lack of adequate residual alveolar ridge and basal seat severely jeopardizes the success of prosthodontic treatment. It has been assessed that expansion of the denture bearing area by means of vestibuloplasty would scale back the denture load per square unit of supporting bone and thus reduce the bone

resorption caused by transfer of occlusal forces.[7] Various surgical procedures such as Kazanjian's technique, Edlanplasty, Clarke's technique have been used to deepen the vestibule with varying success. Contemplating the mucogingival problems posed by an inadequate vestibular depth, an array of treatment procedures like gingival augmentation with grafts and membranes, an vestibuloplasty with secondary epithelialization have been planned to enhance the vestibular depth. The vestibular troughing method prevented necrosis of the site. Since the muscle attachment and overlying tissue are fenestrated, the relapse of vestibular deepening was negligible. Therefore, the prognosis of the fixed prosthesis is good. As of now, vestibular deepening was considered important in considering removable prosthesis wherein adequate flange extension was found to be necessary for retention and stability of the prosthesis.

Conclusion

Extended muscle traction, especially in cases with reduced attached gingiva, causes gingival recession. The management of shallow vestibule has largely been considered important when replacing it with a removable prosthetic system for retentive purposes. To prevent scar formation, deepening of the vestibule was done by the vestibular troughing method which led to the success of the fixed prosthesis. Dentists must treat the defect before prosthetic intervention to ensure prosthetic success in the long-term.

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