

A NOVEL SUTURING TECHNIQUE FOR VESTIBULOPLASTY – REPORT OF TWO CASES.

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Abstract : Various mucogingival problems and severely compromised denture function can occur due to inadequate width of attached gingiva and presence of a shallow vestibule. This case series presents a modified suturing technique, inspired from pterygium plastic surgery, in combination with periosteal fenestration vestibuloplasty technique in order to promote healing by secondary epithelialization and preventing relapse of the mucogingival problem. The treatment for both the patients resulted in an increase of the width of attached gingiva and no recurrence was noted after 3 months of follow-up.

Keywords: Suturing, Vestibuloplasty, Vestibular depth, Pterygium surgery.

INTRODUCTION

Mucogingival surgery term was first introduced by Nathan Friedman in 1957. It was renamed in 1996, World Workshop in Clinical Periodontics as Periodontal Plastic Surgery and can be defined as procedures which are performed to prevent or correct anatomical, developmental, traumatic, or plaque disease-induced defects of the gingiva, alveolar mucosa, and bone (American Academy of Periodontology 1996). The presence of a shallow vestibule leads to plaque accumulation and consequently gingival inflammation which results in difficulty in maintaining the oral hygiene in that area.

The surgical deepening of the vestibule without any addition of the bone is termed as vestibuloplasty. It is a procedure to increase the width of the attached gingiva and the depth of the vestibule by denuding the basal bone of its mucosal layer surgically and by repositioning the overlying mucosa and the muscle attachments to a more apical position in the mandible or maxilla. The exposed periosteum heals via secondary intention.

This case series aims to demonstrate a novel suturing technique for vestibuloplasty wherein the epithelial wound margins are prevented from coming in contact with each other and the exposed periosteum is left to heal by secondary intention. This innovative suturing method is inspired from Pterygoplasty surgery. To date, there is only a single study which used the same suturing principle and reported to have successful results^[1].

Pterygium, from the Greek *pterygos* meaning “wing”, is the fibrovascular overgrowth of conjunctiva onto the cornea^[2]. Pterygium plastic surgery is performed when there is encroachment of the pterygia onto the cornea and progression toward the visual axis [Figure-1].

The goal of pterygium surgery is to remove the pterygium with minimal surgical trauma to the globe and to prevent recurrence. Regrowth of the pterygium post surgically is considered to be a surgical failure. Recurrences are usually considered to be more aggressive, more extensive and more damaging than a primary pterygium. Various techniques have been described in the literature for the treatment of pterygium^[3]. In order to prevent scar formation and recurrence of the pterygia, the head of the pterygium is transplanted nasally [Figure-2a and b] towards the lower eyelid and sutured in its position by using continuous sutures^[4].

The rationale behind using this technique was to prevent the proliferation of the fibroblasts towards the cornea and resulting in recurrence of the pterygium. As a result of changing the direction of the pterygial head, it grows away from the cornea and the defect which was previously occupied by the pterygium, heals by secondary intention. The objective of this case series was to use the same principle for vestibular extension.

CASE REPORTS

Case 1: A 37-year old female patient reported to the Department of Periodontology, Bharati Vidyapeeth Deemed to be University Dental College, Navi Mumbai, with the chief complaint of receding gums with respect to her mandibular anterior teeth. On clinical examination, Miller's grade – I recession was present with mandibular central incisors (#31, #41). An aberrant mandibular labial frenum with an inadequate vestibular depth was also observed [Figure-3a and b].

Thorough scaling and root planing was performed under Phase-I periodontal therapy followed by re-evaluation of the gingival and periodontal status. After completion of phase-I therapy, a vestibular deepening procedure was planned in order to increase the width of the attached gingiva in the region of mandibular incisors. The procedure to be performed was explained, followed by obtaining an informed written consent from the patient.

For the surgery, adequate local anesthesia was obtained by administering a local infiltration of 2% lignocaine with 1:100,000 epinephrine in the region of mandibular incisors (#31, #41). A semilunar incision was given using a scalpel and blade no. 15 in the depth of the vestibule to raise a lip-cheek mucosal flap and a mucosal alveolar flap [Figure-4]. The muscles and fibrous tissues were dissected to the required depth and bone scoring was performed in the region of mandibular incisors [Figure-5]. The lip-cheek mucosal flap was then sutured to the sub mucosa by everting the wound margin inwards thus preventing the epithelial cell migration onto the wound site. The suture was passed from the distal end of the left mandibular canine, passing it across the wound continuously while everting the wound margin inwards till the distal end of the right mandibular canine and then slinging it across the wound to bring it back to the starting point [Figure-6]. The flap was adjusted at the required position and the suture was secured by tying a single surgeons knot. A periodontal pack [Coe-pak, (GC, USA)] was applied at the surgical site [Figure-7].

Post-operative instructions included prescription of antibiotics (Amoxicillin 500 mg TID for 5 days) and analgesics (Paracetamol 650 mg TID for 5 days). Furthermore, the patient was asked to abstain from any active lip movements by limited talking, mouth opening and smiling/laughing.

The sutures were removed after 10 days and the wound was irrigated using sterile saline. The oral hygiene instructions were reinforced and the patient was recalled after 2 weeks, 1 and 3 months respectively.

By the end of 3 months, the wound showed uneventful healing with no post-operative complications. An increased in the width of attached gingiva and the depth of the vestibule [Figure-8, 9] was observed after 3 months in the surgically operated area.

Case 2: A 62-year-old male patient was referred to the Department of Periodontology, Bharati Vidyapeeth Deemed to be University Dental College, Navi Mumbai from the Department of Prosthodontics, with inadequate vestibular depth. On clinical examination, inadequate width of attached gingiva and height of the residual alveolar ridge was observed in the region of mandibular incisors [Figure-10].

After thorough scaling and root planing, vestibular deepening surgery was carried out using the same technique as in case-1 and the novel suturing method was performed [Figure-11 a, b and c].

Healing at the end of three months showed adequate gain in the width of attached gingiva as well as in height of the residual alveolar ridge in relation to mandibular central incisors [Figure-12 a and b].

Discussion

Vestibuloplasty techniques can be generally categorized as mucosal advancement, secondary epithelialization and grafting vestibuloplasty^[5]. The physical status and the age of patient are the most important factors for the selection of technique involved^[5]. A secondary epithelialization technique of vestibuloplasty is indicated when the available mucosa and the bone is inadequate or of the poor quality.

Kazanjian was the first one to describe secondary epithelialization technique in mandible to correct the poor quality of mucosa i.e.; hyperplastic mucosa and scar tissue^[6]. For this, a labial incision was given and a large flap was reflected so that the mucosal flap was transposed onto the bone and sutured to the desired vestibular depth^[5, 6]. The wound healed by secondary epithelialization. Godwin in 1947 modified Kazanjian's technique by stripping the sub-periosteal layer instead of giving a supra-periosteal incision^[7]. Both the techniques had a drawback of obliteration of sulcus depth and scar tissue contracture^[5, 6, and 7]. Many techniques have been put forth in the published literature in order to overcome these drawbacks^[8, 9, and 10].

To prevent the relapse at the base of the vestibule, Tortorelli^[11] further modified Clark's technique as periosteal fenestration technique. In this technique, the periosteum was incised horizontally at the desired depth of vestibule and the cut edge of the periosteum was gently pushed toward the inferior border of the mandible, which was then sutured to the alveolar mucosa. Sutures were placed at 5 mm intervals to maintain the tissues in position so that the denuded bone remained exposed. This was done so that the denuded bone healing is delayed by 2-3 weeks than bone which is covered with periosteum; and this difference in healing period was effective in preventing relapse.

Lang and Loe (1972) in their study concluded that 2mm of keratinized gingiva, with less than 1mm of attached gingiva is adequate to maintain gingival health^[12]. In another study done by Miyasato et al^[13], they concluded that there is no relationship between inflammation and amount of attached gingiva whether or not plaque is present. Thus, no minimum width of attached gingiva has been established as a standard requirement for gingival health. So, the ultimate goal of adopting these vestibular extension

procedures is to gain adequate width of attached gingiva and create an adequate vestibular depth so that the patient can maintain proper oral hygiene and avoid various mucogingival problems. It also greatly enhances the patients' post-surgical requirements of prosthesis and aids in denture retention by limiting traction produced by muscular and fibrous attachments.

The present case series incorporated the periosteal fenestration technique with the novel suturing method. The idea of using this suturing technique was to prevent the early epithelial cell proliferation onto the surgical site which is the inherent feature of the epithelial cells and thus allowing the wound to heal via secondary intention. Healing via secondary intention is desirable for advantages such as good match of color, contour, and texture; and absent donor site pain (in case of grafting)^[11].

Conclusion

The results of the present case series indicate that the combination of the conventional vestibuloplasty technique with the novel suturing method gave desirable increase of the width of attached gingiva, depth of the vestibule and most importantly, it prevents relapse. Further studies are required to substantiate the findings of these cases.

Financial support and sponsorship: Nil.

Conflicts of interest: There are no conflicts of interest.

FIGURES



Figure-1: Pterygium invading visual axis.

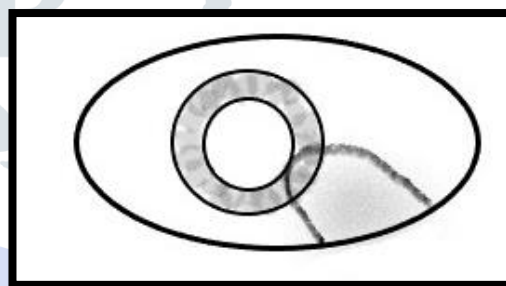


Figure-2a: Pterygium invading the visual axis.

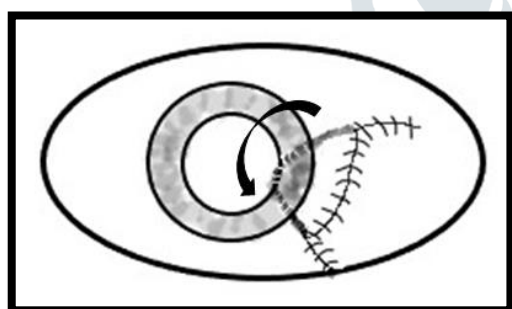


Figure-2b: Trans positioning the pterygial head nasally.



Figure-3a: Miller's Grade-I recession with 31 and 41.



Figure-3b: Shallow vestibule with an aberrant mandibular labial frenum (Lateral View).



Figure-4: Incision at the depth of the vestibule.



Figure-5: Relieving muscle attachments and bone scoring.

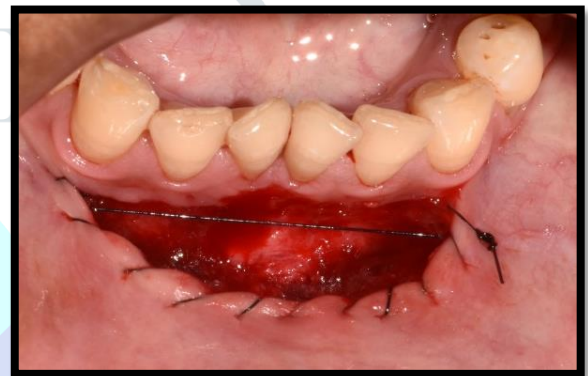


Figure-6: Modified continuous suturing.



Figure-7: Periodontal pack (Coe-pak) placed at the surgical site.



Figure-8a: Healing after 1 month.



Figure-8b: Healing after 3 months.



Figure-9: Pre-operative and Post-operative increase in width of attached gingiva.



Figure-10: Inadequate width of attached gingiva and height of alveolar ridge in relation to mandibular incisors.

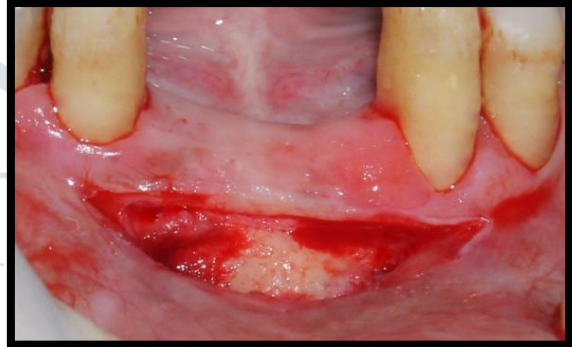


Figure-11a: After incision and bone scoring.

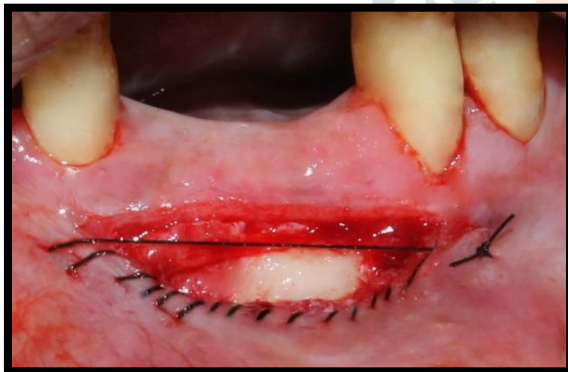


Figure-11b: Novel suturing method.

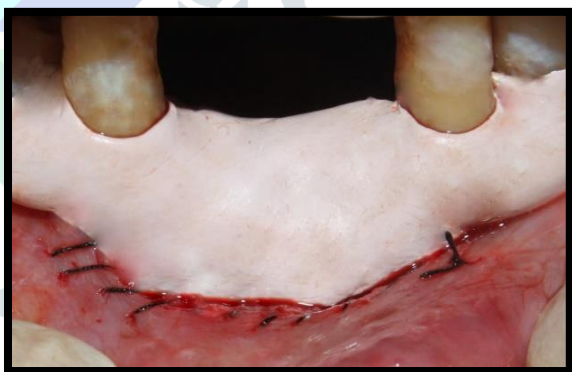


Figure-11c: Coe-Pak placed at the surgical site.



Figure-12a: Healing after 10 days.



Figure-12b: Healing after 3 months.

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