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Vestibuloplasty using diode laser – A case report

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Abstract:*The various mucogingival problems are inadequate width of attached gingiva, abnormal frenal attachment, gingival recession, and decreased vestibular depth, pockets extending uptomucogingival junction, gingival excess (pseudopocket), inconsistent gingival margin, excessive gingival display and abnormal colour of gingiva. The shallow vestibule was one of the mucogingival problems cited by Friedman in the late 1950s that required apicocoronal dimension of gingiva. Vestibuloplasty is defined as 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. In this case report vestibular extension was carried out by soft tissue diode laser.*

Key words:*Vestibuloplasty, Vestibular depth, Shallow Vestibule, Diode Laser, Mucogingival Problem.*

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I. Introduction

The termination of the orofacial muscles into the soft tissues covering the alveolar process forms the vestibular fornix.Vestibular depth has been defined in two ways:

1. The distance between the crest of the lip and the point on the greatest concavity of the mucobuccal fold vertically below.
2. The distance between a point on the coronal margin of the attached gingiva, which corresponds to the base of the gingival crevice, and the point on the greatest concavity of the mucobuccal fold vertically below. This is equivalent to the width of attached gingiva plus the width of alveolar mucosa.[1]

Shallow vestibule, was one of the mucogingival problems cited by Friedman in the late 1950s. Problems with shallow vestibule includes,

- Intra sulcular cleaning or modified Bass method, requires placement of tooth brush bristle into the gingival sulcus. In patients with reduced vestibular depth this couldn't be possible. Thus it interferes with oral hygiene procedures causing ineffective plaque control.
- It compromises the denture retention and stability
- Predisposes the gingiva to recession
- Compromises esthetics

Vestibuloplasty is defined as 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.[2] Other names ofVestibuloplasty include Sulculoplasty, Sulcus deepening procedure, Vestibular extension procedure, & Sulcus extension technique.

Vestibuloplasty is indicated to halt the progression of gingival recession, to regain the width of attached gingiva, for effective plaque control procedures, better esthetics, to improve denture retention and stability, and to prevent inflammatory alterations and tissue recession around implants. It is contraindicated in areas showing bone loss due to chronic periodontitis or traumatic extraction and in cases with ridge resorption around implants.

Traditional scalpel method is still the gold standard for vestibuloplasty, but it can cause discomfort to the patient. Patients treated with scalpel vestibuloplasty technique often had increased post-operative pain and bleeding, during the surgical procedure. In order to avoid these problems, soft tissue lasers hold a promising role in the field of dentistry.

Advantages of lasers over scalpel includes, no or minimal requirement of anaesthesia, a bloodless surgical field that will provide increased visibility to the operator, no requirement of sutures, tissue surface sterilization, less post-operative pain and a good healing response.

This article focuses on correction of shallow vestibule in the lower anterior region by vestibuloplasty, using soft tissue diode laser.

II. Case Report

A 24 year old female patient came with the chief complaint of spacing in upper and lower anterior tooth bearing region. Patient also complaints of difficulty in placing the tooth brush in lower anterior region. Intra oral examination reveals that the vestibular depth of 2 mm seen in lower anterior region (Figure 1.a, b, &c). Prior to the fixed orthodontic therapy Vestibuloplastywas planned in order to correct the shallow vestibule.Vestibuloplasty was carried out by Zolar soft tissue diode laser with the power setting of 1.0w. Periodontal dressing was placed over the raw wound surface till the desired depth. (Figure 2.a, b, & c)

Patient was recalled after one week for review. After one week a Protein coagulum was seen to occupy the healing area. (Figure 2.a) Complete epithelialization was observed after 2 weeks. Patient was recalled for regular follow up, in the third, fifth, eighth and ninth month after surgery. (Figure 3.b-f) Orthodontic treatment was started after 6 months of healing. Excellent tissue healing was observed and the vestibular depth had increased up to 8 mm after 9 months of healing (Figure 3.f).

The postoperative hraling was uneventful, without pain or any signs of infection. Sealing of the blood and lymph vessels minimize the postoperative swelling, while sealing of the nerve endings reduced pain and discomfort. The required vestibular depth was gained and maintained without contraction.

Figure 1: Pre-Operative view

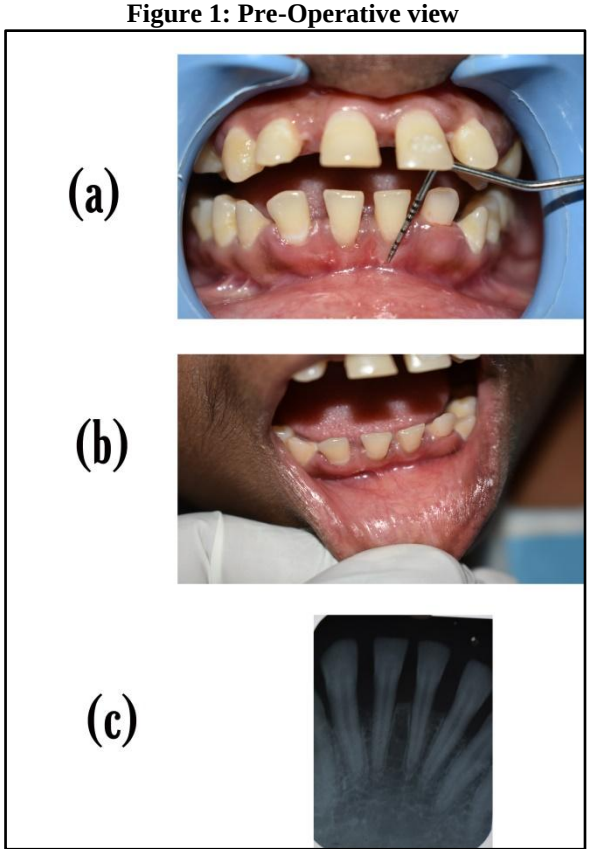


Figure 2: Intra-operative view

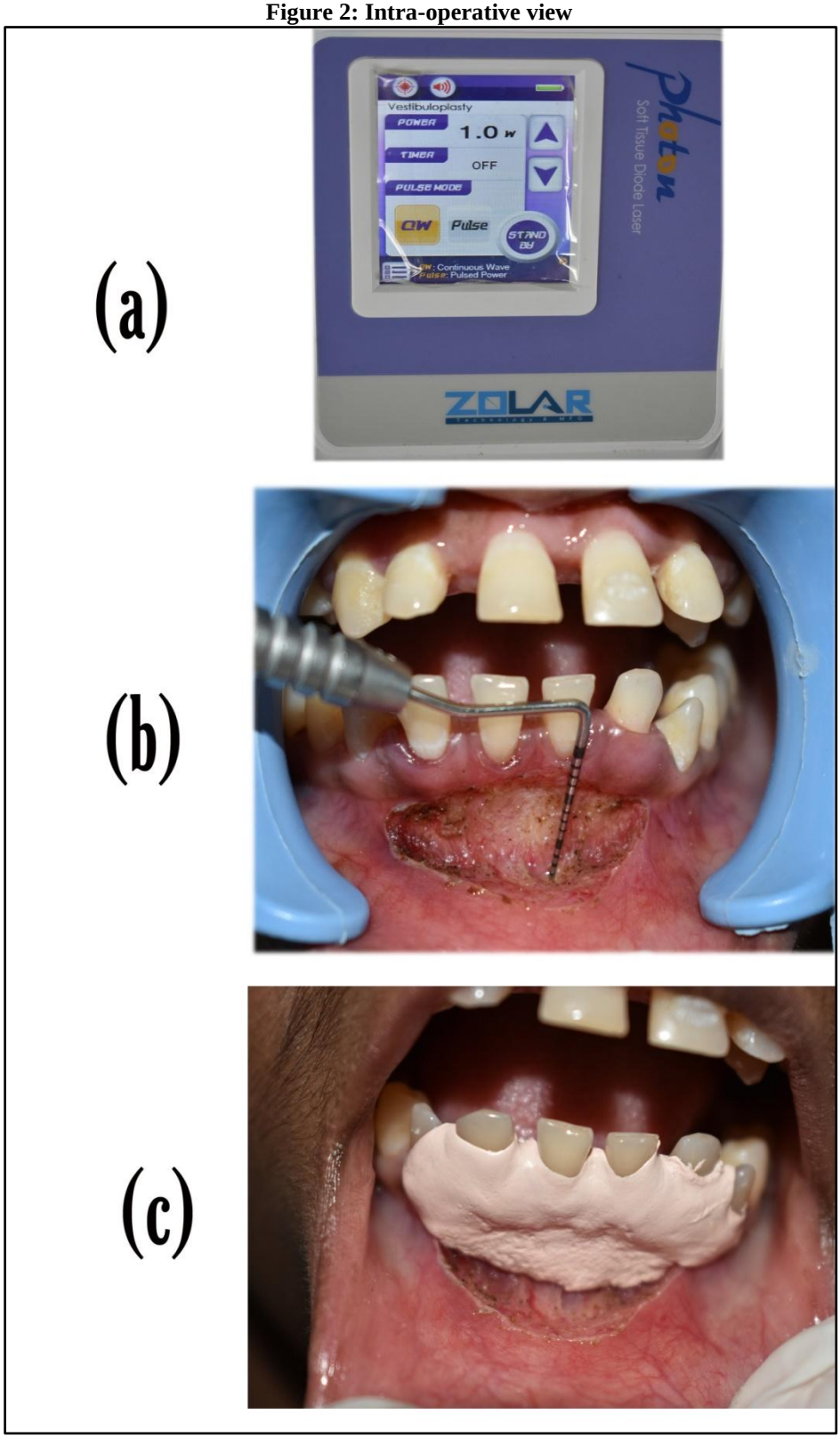
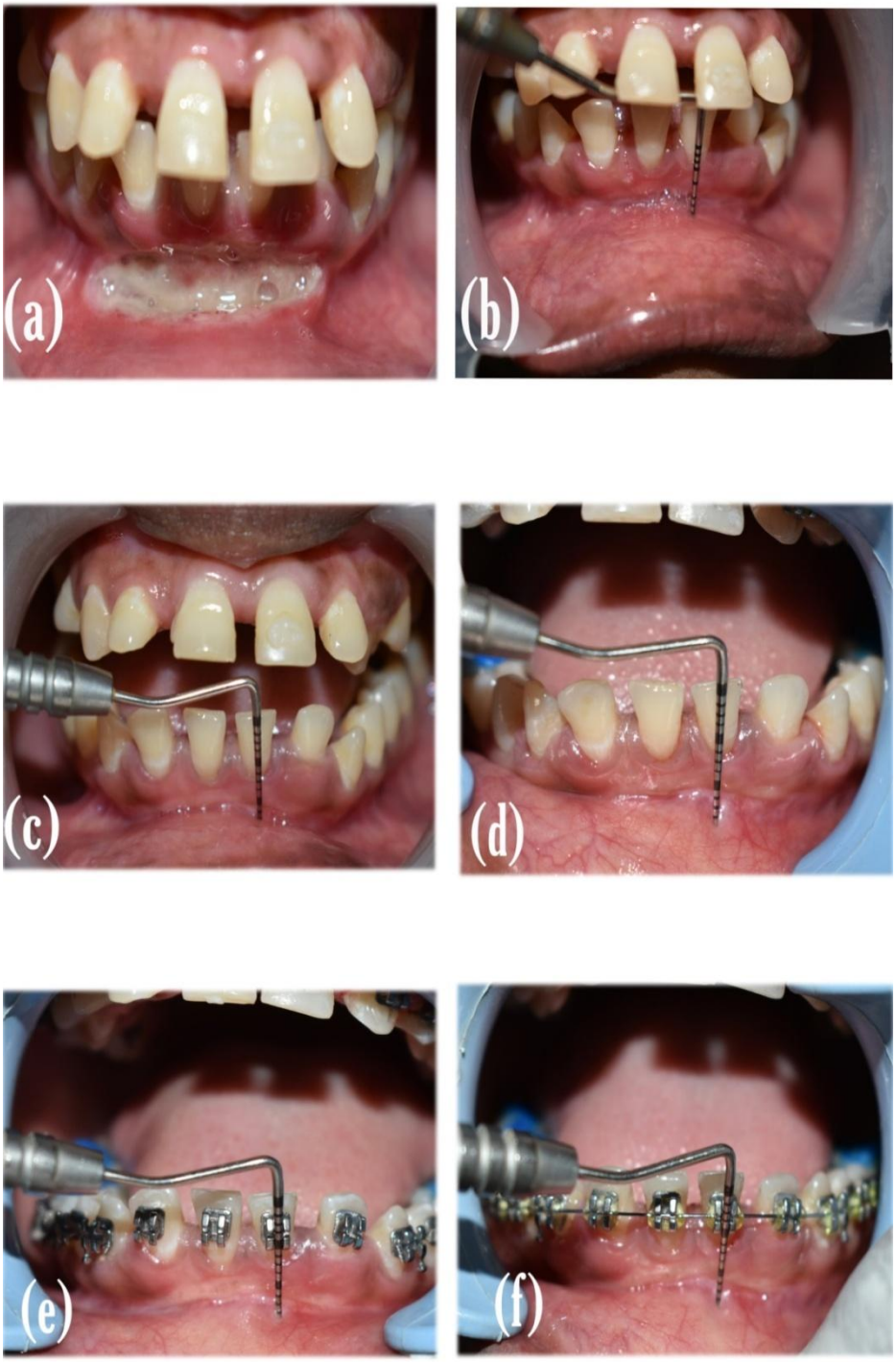


Figure 3: Post-operative view



III. Discussion

A normal vestibule aids in proper plaque control and contributes to a good oral hygiene. In certain instances, like, an anatomical variation such as higher insertion of the muscle attachments of vestibular mentalis and other associated muscles, leads to a decrease in the vestibular depth. To make matters worse, an insufficiently keratinized gingiva, which is a critical component for the maintenance of periodontal health, aggravate the disease.[3]

Inadequate vestibular depth results in poor plaque control owing to an insufficient width of keratinized gingiva. Vestibuloplasty provides the necessary vestibular depth and can be performed either with a scalpel, electrocautery or lasers.[4]

The advent of new technologies with the introduction of lasers in dentistry have enabled practitioners to use various types of lasers (diode laser, Er.YAG, Nd.YAG) for vestibuloplasty procedures.[5] Laser vestibuloplasty with the Diode laser represents a contemporary non-invasive alternative to conventional scalpel method. Here a 980nm Zolar soft tissue laser was used to minimize the patient discomfort. Laser also enhances wound healing and reduces scar formation.[6] Diode lasers with an effective penetration depth of 2mm in the tissues seal the small lymphatic vessels minimizing edema post surgically.[7]

The postoperative period was uneventful, without pain or signs of infection. Kalakonda et al 2016 suggests that patients in the laser group had lower VAS scores for pain and discomfort compared to the scalpel group in vestibular extension techniques.[4]In our case after nine months, vestibular depth increased up to 8 mm and was maintained without any contraction. This increased vestibular depth enables the patient to perform adequate plaque control thus it reducing the incidence of periodontal diseases.

IV. Conclusion

Because of the rapid operations and regular wound healing without sutures, lasers are a great technology and are useful for soft tissue surgery in modern dentistry. Cost and the Laser safety measures may be the biggest obstacles for its routine application.

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