LASER VESTIBULOPLASTY WITH PERIOSTEUM FENESTRATION –A CASE REPORT.

Periodontology

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ABSTRACT

The most common mucogingival problems includes inadequate width of attached gingiva, abnormal frenal attachment, gingival recession, and decreased vestibular depth, pockets extending upto mucogingival junction, gingival excess, inconsistent gingival margin, excessive gingival display and abnormal colour of gingival. Many periodontal plastic surgeries has been employed in the treatment of these problems. But all the procedures are technique sensitive and comes with their own disadvantage. Hence, the case report represents an innovative technique of using 980 nm diode laser instead of convention scalpel to increase the width of attached gingiva and deepening of shallow vestibule with periosteum fenestration. Post operative pain and discomfort was minimal and complete healing of tissues at the end of 3 weeks was reported.

KEYWORDS

980 nm diode laser, vestibuloplasty, frenectomy, periosteal fenestration.

INTRODUCTION:

Periodontal esthetic surgery emphasizes on rehabilitation of biological and functional problems that affect the periodontium and also focuses on the improvement in esthetic appearance. Periodontal plastic surgery can be define as a "surgical procedure performed to correct /eliminate anatomic, developmental, or traumatic deformities of gingival or alveolar mucosa". Gingival recession is defined as the apical migration of junctional epithelium & exposure of root surface, resulting in dental hypersensitivity and unaesthetic appearance. inadequate vestibular depth & inadequate width of attached gingival with gingival recession are very common clinical finding in the mandibular anteriors. Different techniques have been used to attain adequate width of attach gingival along with vestibular depth. However, recent use of lasers in periodontal plastic surgeries has gained popularity due to minimal trauma to surrounding tissues and promising aesthetic result with an effective penetration depth of 2mm in the tissues seal the small lymphatic vessels minimizing edema post surgically. The present case report describes an innovative surgical procedure to treat shallow vestibule with gingival frenum attachment, wherein vestibular deepening was done along with the fenestration technique and a layer of periosteum was scraped and the mucoperiosteum was sutured to lower border of periosteum fenestration with 5-0 silksuture. No adverse effects reported during the healing period of 3 weeks. Excellent esthetic outcomes 3 weeks post surgery with patient satisfaction.

Case report: A 24 years old female patient reported to department of periodontics HKE'S S.Nijalingappa dental college kalaburgi, with the chief complaint of receding gums in mandibular anterior region since 1 month and spacing with upper and lower anterior teeth. There was no history of medical illness or any adverse oral habits. History of toothbrush induced trauma with respect to lower anteriors reported. Diagnosis was made with the clinical sign of shallow vestibular depth and aberrant frenum attachment in mandibular anterior region. According to Miller 1985³ classification for gingival recession it was classified as class I gingival recession with 41³ and frenum attachment was classified as gingival as the fibers were inserted into the attached gingival according to Placek et al⁴ (1974). (Figure 1) No mobility was noticed. As the patients concerns was aesthetics it was decided to perform vestibuloplasty and frenectomy with periosteal fenestration using 980 nm diode laser instead of conventional scalpel technique. The treatment procedure was explained to the patient and written consent was taken prior to the surgery. After complete blood

investigation & routine oral prophylaxis, 980nm diode laser with continous mode with 1.2 Watt power was used to cut the frenum and deepen the vestibule. A horizontal incision was dissecting the fibers of fenum with the laser tip placed parallel to the long axis of tooth, until the entire fibres detached from the attached gingival. The incision was advanced into the mucogingival junction to gain the adequate depth of vestibule. further, fenestration window was created over the periosteum, a thin band of periosteum was excised creating to expose the underlying alveolar bone, mucoperiosteum was then sutured to the inferior border of periosteum fenestration with 5-0 resorbable silk suture. diode laser was used with adequate saline irrigation promoted healing. minimal intra operative and post-operative bleeding was observed as the laser coagulates the blood and lymph vessels, seals the nerve endings which reduces pain. (Figure 2) Patient co-operated well during the entire procedure. A periodontal dressing pack was properly adapted to raw surgical wound to prevent the infection, promote healing of the periosteum fenestration which also facilitates the patient to continue oral hygiene measures. Post operative instructions were given, analgesics and antibiotics were prescribed (amoxicillin 500 mg, ibuprofen with paracetamol, thrice daily for 5 days) 0.12 % of chlorhexidine mouthwash 12 hourly for 1week was advised. Patient was recalled after 1 week, healing was uneventful, no adverse effects reported. Secondary wound closure was attained. 3 weeks post-surgery healing was almost complete, The adequate width of attached gingival & vestibular depth was gained and maintained without any relapse. 100% aesthetic results were achieved after which patient was referred to department of orthodontics for further correction of malocclusion.(Figure 3).

Figure 1: pre-operative – shallow vestibule, gingival frenum attachment, millers class I gingival recession with 41.

Figure 2: immediate post –operative : periosteum fenestration created and mucoperiosteum sutured to lower border fenestration with 5-0 silk suture.

Figure 3: 3 weeks post operative, adequate width of attached gingival and vestibule depth.

DISCUSSION:

inadequate width of attached gingival with shallow vestibule depth in mandibular anteriors resulting in gingival recession may occur without any symptoms, but it causes discomfort for the patient due to unesthetic appearance, difficulty to perform plaque control procedures, dentinal hypersensitivity, etc., Several studies indicated that role of adequate depth of vestibule is very important for the maintenance of oral hygiene. According to Wennstrom and Pini Prato combination of the shallow vestibule and inadequate width of attached gingival favors accumulation of food during mastication and difficulty in maintaining the oral hygiene⁵. Gingival recession results in root sensitivity, cervical root caries, decreased width of attached gingiva, and unpleasant esthetics. Width of attached gingiva can be corrected using various surgical techniques that have been developed over the years. In 1956, Goldman introduced the rationale and techniques of the emerging field of mucogingival surgery⁶. Kazanjian in 1924 first introduced techniques to deepen the vestibule in edentulous patients⁷. In the early 1960s periosteal separation technique introduced by Corn⁸ which did produce the apical scar and a deepened vestibule. Vestibuloplasty provides the necessary vestibular depth and can be performed either with a scalpel, electrocautery or lasers. The purpose of this case report was to use 980nm diode laser in vestibuloplasty - frenectomy with periosteum fenestration & to develop a minimally invasive technique to increase predictability of esthetic outcomes. Gupta et al, 2017 reported a case of high frenum attachment along with shallow vestibule depth that was treated with a periosteal pedicled flap, when combined with a fenestration technique for vestibular deepening & concluded the above technique offers a successful and viable alternative for increasing the width of attached gingiva in lower anteriors⁹. Yadav et al, 2014 carried out study to compare the periosteal fenestration and free mucosal graft techniques in mandibular anterior region to increase the vestibular depth, the periosteal fenestration refrains the fibers of reattach into the gingival mucosa¹⁰. Emmanuel B. P et al, 2019 reported a case of shallow vestibule treated with 980 nm diode laser conclude, laser enhances wound healing and reduces scar formation. Diode lasers with an effective penetration depth of 2mm in the tissues seal the small lymphatic vessels minimizing edema post surgically¹¹. Kalakonda et al 2016 suggests that patients in the laser group treated for shallow vestibule had lower VAS scores for pain and discomfort compared to the scalpel group in vestibular extension techniques¹². In present case, 980nm diode laser assisted vestibuloplasty -frenectomy with periosteum fenestration was performed. Secondary wound healing of periosteum fenestration was completed at 3 weeks with minimal scar formation which refrains the reattachment of frenum fibers into gingiva. 6 months after the surgery vestibule depth was maintained

without any contraindications. Patient was referred to department of orthodontics for closure of upper and lower anterior spacing after complete healing of surgical site.

CONCLUSION:

The present case report with gingival frenum attachment and shallow vestibule depth was corrected with 980nm laser assisted vestibuloplasty – frenectomy with periosteum fenestration. Because of the rapid surgical procedure, bloodless operative field, minimal scarring of surgical site & minimal post operative complications. The use of 980nm diode laser produces desired clinical outcomes with no contraindications, meets the esthetic demand of patients and can be implemented in the treatment of shallow vestibule with aberrant frenum attachment.

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