Temporary Splinting in secondary trauma from occlusion followed by vestibular extension: A case report

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ABSTRACT: Background: A 27 year old female patient presented with the chief complaint of pain and mobility in mandibular anterior teeth. An extremely shallow vestibule with less width of attached gingiva was observed with marginal gingival recession in 31, 32 and 41. Secondary trauma from occlusion was observed clinically with respect to 31.

Methods: After adequate oral prophylaxis, the trauma from occlusion on 31 was relieved by selective grinding. The mobile mandibular anterior teeth were splinted with a temporary splint material (26 gauge stainless steel wire). The mandibular labial vestibule was extended using the lip switch procedure or the Edlan-Mejchar technique.

Results: The procedure yielded a considerable gain in the width of the attached gingiva, which maintained itself even 9 months after the surgical procedure. Mobility was reduced with complete resolution of injury to the supporting tissues leading to improved function of the mandibular anterior teeth.

Conclusion: Patients presenting with secondary trauma from occlusion and a shallow vestibule, treatment options such as oral prophylaxis, selective grinding, splinting combined with Edlan-Mejchar technique leads to complete resolution of mobility along with maintenance of the width of the attached gingival for a considerable period of time.

KEYWORDS: Vestibular extension, Trauma from occlusion, Splinting.

INTRODUCTION
The goals of periodontal therapy include maintenance of health of periodontal tissues, prevention of recurrence of periodontal disease with desirable esthetics and harmonious functioning of the entire masticatory apparatus. Excessive occlusal forces do not initiate but can modify pathway of periodontal destruction. Secondary trauma from occlusion is an occlusal force which itself may not necessarily be abnormal but is excessive when it acts on the reduced or weakened periodontium.2 Splinting is carried out to immobilise or stabilise the injured or diseased parts which in turn increases the resistance to the applied force by increasing the effective root surface area for the dissipation of forces and providing reciprocal antagonism. Although the force remains the same but the resistance is increased.10

The presence of an adequate width of attached gingiva has been considered essential for the protection of periodontium from injury caused by frictional forces during mastication and also to dissipate the muscle pull of adjacent alveolar mucosa on the marginal gingiva. This facilitates subgingival plaque accumulation due to improper closure of periodontal pocket thus facilitating apical spread of plaque due to decreased tissue resistance which in turn favors attachment loss and soft tissue recession.11 A situation that is commonly seen on the labial aspect of the mandibular anterior teeth is a shallow vestibule that may also impede proper oral hygiene measures by hampering the proper placement of a tooth brush. One of the mucogingival surgical procedures advocated for the correction of this defect include “denudation techniques”.14 12 18 The main disadvantage of this technique is alveolar bone resorption due to its exposure13 and severe
postoperative pain. The “split flap” procedure removes only the superficial portion of the oral mucosa leaving the bone covered by periosteum\(^1\), \(^{14}\), \(^{15}\), \(^{19}\) so that there is less severe bone resorption and loss of crestal bone height due to retention of thick layer of connective tissue on the bone surface.\(^5\)

Thus, this case report describes a vestibular extension technique by Edlan and Mejchar\(^6\) that increases vestibular depth and keratinized tissue on the labial side of mandibular anterior teeth. Temporary splinting was carried out to reduce mobility in mandibular anterior teeth due to secondary trauma from occlusion.

**CASE REPORT**

A 27-year-old female patient reported to the Department of Periodontics at Punjab Government Dental College and Hospital, Amritsar with the chief complaint of localised dull pain and mobility in lower front teeth. Intraoral examination revealed grade II mobility of 31 and grade I mobility of 41. Miller's class II recession was present wrt 31(6 mm) and wrt 41(4mm). [Figures 1 and 2]. The width of the attached gingiva was reduced in this region, measuring 2 mm. Grade 2 calculus (Oral hygiene simplified) with marginal gingivitis was present in all mandibular anterior teeth.

A diagnosis of chronic generalised marginal gingivitis with localised periodontitis in the region of the mandibular incisors was made. The patient was in good systemic health with no contraindications for periodontal surgery. She was made aware about the surgery and written informed consent was taken by the patient.

A thorough oral prophylaxis i.e phase-I therapy was carried out with ultrasonic instruments.

**MANAGEMENT OF MOBILE MANDIBULAR INCISORS:**

The mandibular anterior region was isolated with cotton rolls labially and lingually, followed by appropriate etching and application of a bonding agent on the lower anterior teeth. A 26 gauge stainless steel wire was used for splinting adapted lingually to the mandibular anterior teeth and secured with flowable composite resin material which was then light cured. [Figure 4]

**VESTIBULAR EXTENSION PROCEDURE:**

Two weeks after phase I therapy, the patient was planned for surgical procedure. Prior to the surgical procedure, a calibrated periodontal probe was placed on the labial aspect of the mandibular central incisors to measure the distance between the gingival margin and mucogingival junction. This measurement was recorded at subsequent follow up intervals every 3 months postoperatively upto a period of 9 months.

Patient was scrubbed with 7.5% povidone iodine solution after a pre procedural rinse with 0.2% chlorhexidine mouthwash. Bilateral mental nerve block was administered using 2% lignocaine with 1:1, 00,000 adrenaline.

Incision: Mesial to one of the mandibular canines and starting at the junction of the attached and free gingiva, an incision was made with a 15c surgical blade for a distance of 10 to 12 mm extending on to the lower lip. A similar incision was made on the contralateral mandibular canine. These two incisions were joined by a horizontal incision across the midline.

The mucosa included within this incision was reflected from the underlying muscular tissue using sharp dissection with the surgical blade. This resulted in a loose flap of labial mucosa with its base on the gingiva. [Figure 5]

Incision and reflection of the periosteum: The loose flap of labial mucosa was folded upward and a horizontal incision was made on the periosteum, which had now become visible. This incision was made so that it extended between the two initial vertical incisions mesial to the canines. The incision of the periosteum was extended in a vertical direction at its ends. The periosteum was then separated from the bone, forming a second flap with its base on the apical portion of the mandible.

Transposition of the two flaps: The loose flap of labial mucosa was folded back and placed on the bone from which the periosteum had been removed. It was fixed with interrupted 3-0 black silk sutures to the inner surface of the periosteum, which had been removed from the bone. The upper edge of the periosteum was also sutured to the mucous membrane of the lip to cover the area denuded by the reflection of the labial mucosal flap.

A periodontal dressing COE pack (Coe Laboratories Inc., Chicago, IL) was placed to protect the operated area. An antibiotic amoxicillin 500 mg TDS and anti-inflammatory Brufen 400mg BD for 5 days were prescribed to the patient in addition to 0.2% chlorhexidine rinse twice daily for two weeks. Other postsurgical instructions included intermittent cold fomentation on the first postoperative day, soft/liquid diet for one week, and maintenance of good oral hygiene. The patient was recalled after one week.
Postoperative recall: The one week postoperative examination revealed excellent healing (by first intention) and a considerable gain in the width of the attached gingiva and depth of the vestibule (up to 7 mm). The patient was subsequently placed on a recall programme and her periodontal condition was periodically reviewed. No loss of width of the attached gingiva was observed throughout the recall period.

DISCUSSION
Several changes in the periodontal tissues are caused by trauma from occlusion.

Secondary trauma from occlusion was seen as a contributing factor for the destructive processes initiated by bacterial periodontal inflammation similar to that stated by William W. Hallmon.8 The lowered tissue resistance or tissue integrity leads to faster progression of the bacterial inflammation of the periodontium. Clinically, trauma from occlusion occurs as premature contacts with fremitus in the suspected teeth and radiographically, a widening of the periodontal space can be seen.9 [Figure 3]

In the absence of inflammation, the changes seen in trauma from occlusion are believed to be reversible which is consistent with the study by Geramy et al.1 Thus the oral prophylaxis i.e scaling and root planning was carried out first before splinting to eliminate source of infection that led to inflammation in the tissues of the periodontium.

Mobility may either cause or accelerate the progression of periodontal disease and inhibit periodontal tissue repair.7 Stabilization which in this case was achieved by temporary splinting decreased mobility leading to increase in function.10 that was beneficial for the patient and thus allowed repair during periodontal treatment.

A modification of the Kazanjian technique9 of vestibular extension was used for the present case. This technique has the advantage that healing occurs by first intention and no bone is left exposed which reduces the chances of bone resorption and further recession. In the present case, an excellent clinical result was obtained which was maintained even 9 months after surgery. The patient maintained good plaque control throughout the follow-up period, thus the plaque did not have any influence on the final stable attachment level that was achieved. Thus, based on the findings of the present case it can be concluded that in cases with secondary trauma from occlusion having mobility in mandibular anterior teeth; thorough oral prophylaxis followed by temporary splinting of teeth for stabilisation gives an opportunity for healing of the underlying periodontal tissues. [Figure 6] The technique for vestibular extension advocated by Edlan and Mejchar to increase shallow vestibule depth and narrow width of attached gingiva on the labial aspect of mandibular anterior teeth provides a predictable way in which gingival health can be achieved and maintained.

REFERENCES

Figure 1 showing preoperative intraoral depth of gingival recession on mesial of 31

Figure 2 showing preoperative intraoral depth of gingival recession on distal of 31

Figure 3. preoperative radiograph showing decreased and uneven alveolar bone levels due to inflammatory disease along with widening of PDL space in 31
Figure 4. intraoral splinting of mandibular anterior teeth with 26 gauge stainless steel wire and flowable composite resin

Figure 5. vestibuloplasty by edlan mejchar technique in mandibular labial vestibule

Figure 6. post operative radiograph showing decrease in the width of PDL space and improvement of levels of alveolar bone