

Biologic Width Impingement: Recession and its Correction with Connective Tissue Graft: A Case Report

Sneh Nidhi^{1*} Kapil Garg² Md Rabiul Islam³ Dilip Kumar Singh⁴ Payal Gupta⁵

¹Senior Lecturer, Department of Periodontology, Awadh Dental College & Hospital, Jamshedpur, Jharkhand, India.

²Senior Consultant, Department of Periodontology, City Dental Clinic & Implant Centre, Delhi, India.

³Clinical Tutor, Department of Dentistry, Midnapore Medical College, West Bengal, India.

⁴Reader, Department of Prosthodontics, Azamgarh Dental College, Azamgarh, UP, India.

⁵Senior Dental Surgeon, Department of Periodontology, District Headquarter Hospital, Nayagarh, Odisha, India.

ABSTRACT

Background: To ensure adequate form, function, esthetics, and comfort of the dentition proper understanding relationship between periodontal tissues and restorative dentistry is very important. The biologic width is defined as the dimension of the soft tissue, which is attached to the portion of the tooth coronal to the crest of the alveolar bone. The violation of biologic width due to restorative margin restorative margin location, materials, and contours can lead to gingival inflammation, clinical attachment loss, and bone loss. This case shows how impingement on biologic width by restoration lead to gingival inflammation and recession which was further corrected by connective tissue graft.

Keywords: Biologic Width Violation, Attachment Loss, Junctional epithelium.

INTRODUCTION

The maintenance of healthy periodontium is very important as it forms foundation for proper esthetics, function, and comfort of the dentition. The interplay between periodontics and restorative dentistry is present at many fronts, including location of restorative margins, crown contours, and response of the gingival tissues to restorative preparations. The close relationship of iatrogenic factors with periodontal breakdown was originally recognized by Black 1912[1]. Many studies have focused their attention on different aspects of the periodontal- restorative interaction, such as "position of the restoration with respect to the gingival margin, presence of overhangs, presence of marginal leakage, roughness of the surfaces, and the type of restorative material" [2]. The biologic width is defined as the dimension of the soft tissue, which is attached to the portion of the tooth coronal to the crest of the alveolar bone. This term was based on the work of Gargiulo et al. (1961), who described

the dimensions and relationship of the dentogingival junction in humans [3]. There is general agreement that placing restorative margins within the biologic width frequently leads to gingival inflammation, clinical attachment loss, and bone loss. The most reliable mechanism by which dental restorations may affect marginal health is the increase of plaque accumulation; however, modifications of the composition of the subgingival microbiota have also been described in the presence of overhanging metal restorations with an increase in putative periodonto pathogenic microflora[4]. Any type restorations that are properly not adapted at the margins, that are over hanging, and that have rough or porous surfaces can result in inflammation, over growth, or recession of gingival tissues. In this case temporary restoration given after root canal treatment was not properly adapted to margin, overhanging encroaching biologic width and also roughened surface had lead to gingival inflammation and recession. Since there

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*Correspondence Dr. Sneh Nidhi.

Department of Periodontology, Awadh Dental College & Hospital, Jamshedpur, Jharkhand, India.

Email: Not Disclosed

was minimal bone loss and recession was present on maxillary incisor so after grinding of restoration recession was done with subepithelial connective tissue graft followed by permanent restoration.

CASE REPORT

A female patient 38 year old was referred from the Department of Prosthodontics to the Department of Periodontics, Guru Nanak Institute of Dental Sciences and Research with the complaint of recession and inflammation in her left upper anterior region. An intraoral examination revealed fair oral hygiene and Miller class I gingival recession in 21 of about 4 mm in height [Fig.1]. Past dental history revealed patient had undergone root canal treatment 5 months ago and had composite restoration on tooth. On further examination it was seen restoration surface was roughened and radiological examination revealed restoration was impinging on biologic width [Fig.2]. So cause of recession was impingement in biologic width by restoration. Treatment executed was oral prophylaxis, grinding of restoration followed by recession coverage by subepithelial connective tissue graft and further patient was referred back to Department of Prosthodontics for permanent restoration.

Surgical Treatment- The procedure was explained to the patient and informed consent was taken. Initially, intra and extraoral antisepsis was carried out using 0.12% chlorhexidine digluconate. Following local anesthesia a minimal invasive envelope technique proposed by Raetzke was done [5]. A sulcular incision was made in on 21 and a partial thickness envelope or pocket (without vertical releasing incisions) was prepared around the receded root surface [Fig.3] and a free subepithelial connective tissue graft was placed within the envelope. Part of the graft rested on the exposed root surface and remained uncovered. Releasing incisions were not used since they could interrupt the vascular plexus of the connective tissue and periosteum.

The CTG was harvested from the palate, following a "trap-door" flap design [6]. Horizontal incision was made with a partial-thickness flap 3-5 mm apical to the gingival margin in the palate (preparation of primary flap). Secondary incision was made 1-2 mm coronal to the primary horizontal incision line. This



Fig 1: Preoperative photograph.

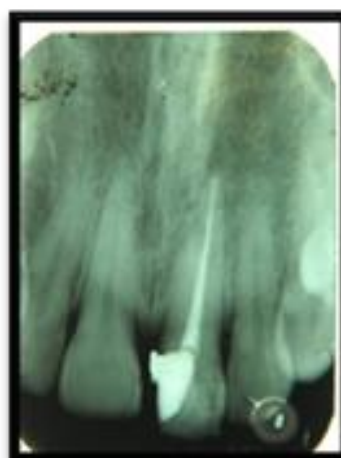


Fig 2: Impingement on Biologic Width.



Fig 3: Envelope flap prepared at recipient site.

incision, which was perpendicular to the surface of the gingiva, extended to the bone. Then vertical incision was made mesiodistally approximating the width and length of the necessary graft. Tissue

forceps was used to lift the prepared palatal flap edge.



Fig 4: Connective tissue taken from Palate.



Fig 5: Connective Tissue Graft.



Fig 6: Graft Placed.



Fig 6: Suture at donor site.



Fig 7: Suture at recipient site.



Fig 8: Periodontal Dressing.



Fig 9: 7 days Post operative.



Fig 12: 6 month post operative.

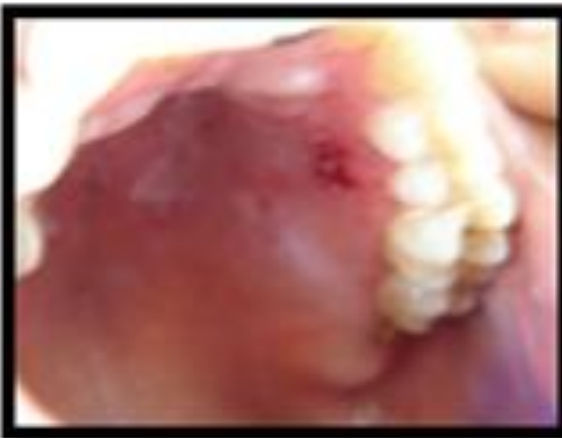


Fig 10: 7 days Post operative.



Fig 13: 1 Year post operative.



Fig 11: 3 month post operative.

It was reflected toward the center of the palate and the underlying connective tissue was exposed. An incision perpendicular to the bone was made around the edge of the connective tissue, facilitating its reflection from the bone. A small periosteal

elevator and Kirkland knife were used to reflect the connective tissue and harvest it [Fig.4]. The graft was then harvested, and stored in cold saline moistened gauze [Fig.5] . The donor site was sutured and bleeding stopped within few minutes [Fig.6]. Acrylic stent was given.

The graft procured was placed into the envelope made at the recipient site [Fig.7], and suturing was done with a 4-0 bio absorbable sutures (Vicryl®, Johnson & Johnson) and covered with Coe-pack [Fig.8 & 9]. The patient was then discharged after giving routine postoperative instructions and medications.

Healing was uneventful; the patient was recalled at weekly intervals after surgery [Fig.10]. Then follow up was done for 1 year [Fig.11,12,13]. Patient was also referred to Department of Prosthodontics for permanent restoration. There was 80 percent recession and coverage and after final restoration

no further recession of tissue was noticed. Patient was also pleased with the outcome of treatment.

DISCUSSION

The periodontal health is the basis of all restorative dentistry [7]. Bryan stated that, "We must keep constantly in mind that the dental restorations we make have a twofold purpose; the restoration of the tooth or teeth to function and the protection of the supporting tissues from injury" [8]. It is clear then that restorative procedures must be based not only on mechanical specifications but must also fulfill biologic requirements [9]. Conversely, a close attention should be paid to the response of the periodontium to the irritants arising from careless techniques, which can initiate or add to existing gingival inflammation. In turn, loss of periodontal support and subsequent tooth loss can result if the condition is not recognized and treated in its early stages. Dental restorations or appliances are frequently associated with the development of gingival inflammation, especially when they are located subgingivally. Restorations may impinge on the biologic width by being placed deep in the sulcus or within the junctional epithelium. This may promote inflammation and loss of clinical attachment with apical migration of the junctional epithelium and reestablishment of the attachment apparatus at a more apical level. Temporary restorations that are improperly adapted at the margins, that are over or under contoured, and that have rough or porous surfaces can result in inflammation, over growth, or recession of gingival tissues. The outcome can be unpredictable; and unfavorable changes in the tissue structures can compromise the success of the final restoration. This case showcases how slight impingement and roughened restoration lead to recession in otherwise healthy periodontium. Since recession was present on maxillary incisor in esthetic Zone there was no bone loss and restoration was temporary so initially grinding of restoration with recession coverage by Subepithelial connective tissue graft was planned followed by permanent restoration of tooth. The sub epithelial connective tissue graft (SCTG) has been the preferred technique for gingival esthetics and to cover root surfaces since its introduction by Langer and Langer in 1985 [10].

Langer and Langer originally proposed the coronal mobilization of a split thickness flap to cover a connective tissue graft [10]. Later, Nelson suggested moving a flap laterally with the same purpose [11]. In 1985, Raetzke proposed the envelope technique. It consisted of preparing a partial thickness envelope or pocket (without vertical releasing incisions) around the receded root surface and placing a free subepithelial connective tissue graft within the envelope as with the other approaches [5]. Part of the graft rested on the exposed root surface and remained uncovered. Releasing incisions were not used since they could interrupt the vascular plexus of the connective tissue and periosteum. The envelope technique has been used for nearly 20 years and has provided excellent and consistent results even when dealing with different types of recessions. This technique was employed in this case and recession coverage and good esthetic result was obtained.

CONCLUSION

It is very important to maintain healthy periodontium so the clinician must be aware of all the biological variables relevant to restorative therapy. Encroachment to biologic width can lead to recession so proper attention should be while placing any restoration.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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