

A New Era of Tooth Preparation and Gingivage Retraction Technique: A Case Report

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Abstract:- The demand for procedures intended to improve dental aesthetics has increased recently. Preserving the teeth and surrounding soft structures to the greatest extent possible is preferred in this situation by both patients and dentists. When using fixed prostheses, maintaining the stability and health of soft tissues is a constant struggle. Bone tissue health and soft tissue health are directly correlated. The long-term efficacy of prosthetic therapy thus depends on preserving tissue health and being free of mucositis. This case report describes the successful application of the gingivage technique in a patient requiring aesthetic enhancement of the gingival margins surrounding dental restorations. The patient presented with uneven gingival contours and mild inflammation around subgingival margins of existing restorations, compromising both function and aesthetics. Results demonstrated significant improvements in gingival health, a more balanced gingival margin, and an enhanced aesthetic outcome. Follow-up assessments revealed stable gingival contours and an overall increase in patient satisfaction. This case report underscores the effectiveness of the gingivage technique as a minimally invasive solution for enhancing soft tissue aesthetics and supporting the longevity of dental restorations.

Keywords:- *Gingivage, Gingival Recession, Periodontal Health, Oral Hygiene.*

I. INTRODUCTION

In order to precisely record the prepared tooth margin during impression production, gingival displacement must be performed in conjunction with fixed prosthodontic treatments that require tooth preparation below the level of the free gingival margin (inside the gingival sulcus) [1]. Patients in today's environment are more demanding and aesthetic-conscious, and the prosthodontist's job description has expanded to include methods for incorporating cosmetic dentistry in addition to just replacing lost teeth. Gingival tissues can be manipulated to the required contours using the gingivage retraction technique in tooth preparation, provisionalization, and final prostheses [2].

Since the unsatisfactory outcome caused by the apical migration of the gingival tissue is one of the main clinical issues in fixed prosthodontics on natural teeth. High-quality clinical and aesthetic outcomes are achieved for stability at the prosthetic / tissue interface when tooth preparation finishes with finish lines placed just apical to the free gingival margin, satisfying the patient's aesthetic demands.

II. LITERATURE REVIEW

Historically, mechanical, chemical, or electrosurgical methods have been used to accomplish gingival retraction or displacement. The success of retractions involving gingival displacement and gingival sulcular excision has been documented in a number of papers. Presented guidelines for insertion and removal of cord to prevent injury to the sulcular lining [3]. The gingival sulcus lining is removed by electrosurgical techniques through a "troughing" process utilising an electrical current. Strock introduced this, and Klug shown that it only caused a 0.1 mm drop in gingival height. According to research by Malone, Manning, Podshadley, and Lundeen, when gingival retraction is performed properly, electrosurgery is safe. There have been reports that sulcular tissue can be removed using rotary curettage without the need to initially prepare the teeth. Additionally, it can be used in conjunction with dental preparation. Moskow'G concluded that pocket epithelium was eliminated during gingival curettage using a rotary diamond device in five of the six patients treated. In order to avoid the stress of pressure packing or the need for electrosurgery around subgingival tooth preparations, gingivage, also known as rotating gingival curettage, is suggested as a technique for treating the interfering tissue during restorative operations. When the preparation is complete, a set of diamond instruments with distinct forms and grit allow for the simultaneous removal of the crevicular epithelium. More imprint material volume is allowed in the finish line sections. It is important to enter the retraction cord without exerting pressure [4].

III. TOOTH PREPARATION



Fig 1: Tooth Preparation (Labial View)



Fig 2: Tooth Preparation (Palatal View)

IV. WHAT IS GINGITAGE?

Rotating curettage is another name for Gingitage Concept described by Amsterdam in 1954.

Rotary curettage is a “troughing” technique, the purpose of which is to produce limited removal of epithelial tissue in the sulcus and finish line is being created in tooth structure.

The technique, used with the subgingival placement of restoration margins [5].

V. CASE REPORT

A female patient with a history of trauma to the upper front tooth region one year prior presented to the prosthodontics department of Jaipur Dental College complaining of a missing tooth in the upper front region.

Patient came with an edentulous space of around 11 mm, was esthetically concerned.

On intraoral examination defect was present 12 to 21 due to the trauma which was present with a thin residual ridge. (Siebert's Classification- class I).

After complete evaluation the patient was suggested the following treatment options-

- Removable partial denture
- Fixed partial denture
- Implant supported prosthesis
- Fixed removable prosthesis

After discussing with the patient, treatment decided was fixed partial denture.

Patient was explained about the duration of the treatment, number of appointments needed, maintenance of prosthesis, importance of oral hygiene maintenance, advantages and disadvantages of fixed partial denture (porcelain fused to metal).

VI. PERIODONTAL ASSESSMENT – (BEFORE THE TOOTH PREPARATION)

➤ Gingival Bleeding Index-

- Grade II- 21, Grade II- 22, Grade 0- 12
- $\frac{4+3}{2} = 1.4$ (Moderate), Biotype- thin

➤ Gingival Status-

- Colour- Pale Pink ,Contour- Rolled & rounded w.r.t 21, 22, Knife edge w.r.t 12
- Consistency- firm and resilient w.r.t 12 , soft and edematous- w.r.t 21, 22
- Size- Enlarged w.r.t 21,22
- Surface Texture- Stippling present
- Position- 1mm above CEJ
- Inflammation- Grade II- 21,22
- Bleeding on probing- Grade II- 21,22 (2.5mm).

➤ Oral Hygiene Index-

- OHI = DI+CI (tooth no. 21) = 2, OHI = DI+CI (tooth no. 1) = 0
- OHI = DI+CI (tooth no. 22) = 0

VII. EXTRA ORAL (PRE-OP)



Fig 3: Front View



Fig 4: Lateral View



Fig 5: Intra Oral (Pre-Op)



Fig 6: Facebow Transfer



Fig 7: Transfer to Articulator



Fig 8: Wax Up

The diagnostic impression was made using irreversible hydrocolloid impression material, cast was poured with type III (dental stone) and treatment plan was formulated.

Face bow transfer made (Fig. 6) and cast was mounted on Hanau wide view articulator (Fig.7)

Diagnostic wax up was done (Fig. 8) Patient was shown the wax up. After her consent, Putty index made for the provisional restoration.

VIII. PROCEDURE

- Tooth preparation was done on 12, 21 and 22 as per the requirements of PFM crown. (FIG.9,10)
- Gingival rotary curette (gingitage) was done on 12, 21, 22 with the help of ultra fine long tapered diamond around the tooth margins. (Fig.11)
- After this, Final impression was made with putty and light body polyvinyl siloxane using two step technique. (Fig.12)



Fig 9: Labial View



Fig 10: Palatal View



Fig 11: Gingivage

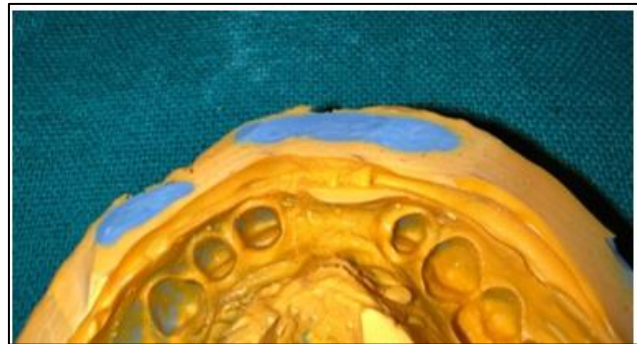


Fig 12: Final Impression

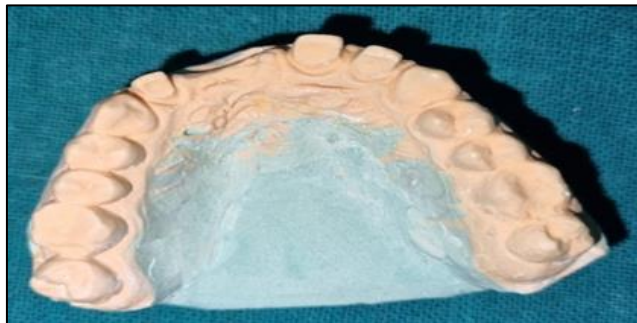


Fig 13: Master Cast (Occlusal View)



Fig 14: Master Cast (Labial View)

- Provisional restoration using (tooth colored acrylic-self cure) was fabricated with the help of putty index and cementation done with the temporary cement Meta Ntc (non-eugenol Zinc Oxide), which apart from maintaining the aesthetics also helped in evaluation of the final outcome of restoration. (FIG.15)



Fig 15: Temporization



Fig 16: Final Prosthesis

- The final prosthesis was fabricated (Fig.16) and after verifying the fit, phonetics and esthetics, it was cemented using Glass Ionomer luting cement. (Type-I).



Fig 17: Periodontal Assessment

➤ Periodontal Assessment– (After 1 Week)

- *Gingival Bleeding Index*
 - ✓ Grade I- 21, Grade I- 22, Grade 0- 12
 - ✓ =2/3= 0.7 (Mild) Biotype- thin
- *Gingival Status-*
 - ✓ Colour- Pale Pink
 - ✓ Contour- Rolled & rounded w.r.t 21, 22
 - Knife edge w.r.t 12
 - ✓ Consistency- firm and resilient w.r.t 11
 - soft and edematous- w.r.t 21, 22
 - ✓ Size- Slightly Enlarged w.r.t 21, 22
 - ✓ Surface Texture- Stippling present
 - ✓ Position- 1mm above CEJ

- *Inflammation*

✓ Grade I- 21,22

- *Bleeding on Probing*

✓ Grade I- 21,22 (1.5 mm)

- *Oral Hygiene Index*

✓ OHI = DI+CI (tooth no. 21) = 1 + 0 = 1

✓ OHI = DI+CI (tooth no. 12) = 0

✓ OHI = DI+CI (tooth no. 22) = 0

➤ *Periodontal Assessment – (After 1 Month)*

- *Gingival Bleeding Index*

✓ Grade 0- 21 ,Grade 0- 22 ,Grade 0- 12 = 0

✓ Biotype- thin

- *Gingival Status*

✓ Colour- Pale Pink

✓ Contour- - Knife edge w.r.t 12, 21, 22

✓ Consistency- firm and resilient w.r.t 12,21,22

✓ Size- 1mm for Marginal gingiva - 5mm for Attached gingiva

✓ Surface Texture- Stippling present

✓ Position- 1mm above CEJ

✓ Inflammation – Grade 0- 12, 21,22

✓ Bleeding on probing-Grade 0- 21,22 (1.5 mm)

✓ Oral hygiene index-

✓ OHI = DI+CI (tooth no. 21) = 0

✓ OHI = DI+CI (tooth no. 12) = 1

✓ OHI = DI+CI (tooth no. 22) = 0



Fig 18: Result

IX. DISCUSSION

Restoring the patient's aesthetics while preserving the patient's natural anatomic tooth shapes and employing conservative, cost-effective methods is a difficult task.

When fixed prosthodontic treatments necessitate tooth preparation below the level of the free gingival margin (within the gingival sulcus), gingival displacement is required in order to adequately record the prepared tooth margin during impression production [6].

The term "gingitage" refers to the simultaneous subgingival tooth preparation and deliberate curettage of the gingival sulcus' inner lining with a rotating diamond instrument. In order to avoid the stress of pressure packing or the need for electrosurgery around subgingival tooth preparations, gingitage, also known as rotating gingival curettage, is suggested as a technique for treating the tissue which is interfering during restorative operations. When the preparation is finished, the crevicular epithelium can be

removed simultaneously thanks to a set of diamond instruments with unique shapes and grit. In the finish line areas, more impression material volume is permitted. Nonpressure retraction cord insertion is emphasised [7].

This case report describe there is a significant difference by the gingitage technique, to restore the esthetic demand of the patient.

X. CONCLUSION

Enhancing the patient's appearance is essential for boosting their self-confidence and self-worth. Any missing, broken, stained, or chipped anterior teeth may be a factor. Therefore, in order to visualise the treatment end and create the treatment plan that is most appropriate for the patient, a dentist must make use of all of his knowledge, experience, and resources. As following with the conservative and esthetic treatment-

The gingival retraction procedure can be performed without the need for extra materials or tools, which is one of its main advantages.

- The process is simple.
- In comparison, the process is quicker.
- The outcomes are encouraging.

REFERENCES

- [1]. Prasanna GR, Reddy K, Kumar RN, Shivaprakash S. Evaluation of Efficacy of Different Gingival Displacement Materials on Gingival Sulcus Width. *The Journal of Contemporary Dental Practice*. 2013;14(2):217–21.
- [2]. Afaf Al-Haddad, Noor, Yee A, Kohli S. Biological Oriented Preparation Technique (BOPT) for tooth preparation: A systematic review and meta-analysis. *The Saudi Dental Journal* 2023 Oct 1;36(1).
- [3]. S S, Ma VS, Mi VS, F HG, M H. Gingival Retraction Methods for Fabrication of Fixed Partial Denture: Literature Review. *Journal of dental biomaterials* 2016;3(2):205–13.
- [4]. Neha Nandal, Budhiraja D, Sehrawat M, S Bharathesh, Nasir Ul Sadiq, Sharma D. A literature review on techniques of gingival retraction. *IP Annals of Prosthodontics and Restorative Dentistry*. 2015; 7(3):128–30.
- [5]. Kamansky FW, Tempel TR, Post AC. Gingival tissue response to rotary curettage. *Journal of Prosthetic Dentistry*. 1984 Sep 1;52(3):380–3.
- [6]. Ingraham. Rotary gingival curettage--a technique for tooth preparation and management of the gingival sulcus for impression taking. *The International journal of periodontics & restorative dentistry* 2024;1(4).
- [7]. Baba NZ, Goodacre CJ, Jekki R, Won J. Gingival Displacement for Impression Making in Fixed Prosthodontics. *Dental Clinics of North America*. 2014 Jan;58(1):45–68.
- [8]. Moskow, B. S.: The response of gingival sulcus to instrumentation: a histological investigation of gingival curettage. *J Periodontol* 35: 112, 1964.
- [9]. La Forgia, A.: Cordless tissue retraction for impressions for fixed prosthesis. *J PROSTHET DENT* 17:379, 1967.
- [10]. Benjamin, S. D., and Colman, H. I.: Periodontal considerations in gingival retraction procedures. *J South Calif Dent Assoc* 38:823, 1970.
- [11]. Scrivner, E. I.: Gingival tissue management during fixed prosthodontic procedures. *Dent Clin North Am* 15:587, 1971.
- [12]. Woychesin, F. F.: An evaluation of the drugs used for gingival retraction. *J PROSTHET DENT* 14:769, 1964.
- [13]. Nemetz, H.: Tissue management in fixed prosthodontics. *J PROSTHET DENT* 31:628. 1974.
- [14]. Anneroth, G., and Nordenram, A.: Reaction of the gingiva to the application of threads in the gingival pocket for taking impressions with elastic material. *Oral Res* 3:301, 1969.
- [15]. Strock. M. S.: The rationale for electrosurgery. *Oral Surg* 5:1166, 1952.
- [16]. Klug, R. G.: Gingival tissue regeneration following electrical retraction. *J PROSTHET DENT* 16:955, 1966.
- [17]. Malone, W. F., and Manning, J. K.: Electrosurgery in restorative dentistry. *J PROSWET DENT* 20:417, 1968.
- [18]. Podshadley, A., and Lundeen, H.: Electrosurgical procedures in crown and bridge restorations. *J Am Dent Assoc* 77:1321, 1968.
- [19]. Loe, H.: The gingival index, the plaque index and the retention index systems. *J Periodontol* 38:610, 1967.
- [20]. Hirschfeld L. Subgingival curettage in periodontal treatment. *J Am Dent Assoc* 1952;44:301.
- [21]. Ainslie P, Caffesse RG. A biometric evaluation of gingival curettage. *Quintessence Int* 1981;5:519.
- [22]. Echeverria JJ, Caffesse RG. Effects of gingival curettage when performed one month after root instrumentation. A biometric evaluation. *J Clin Periodontol* 1983; 10:277-286.
- [23]. Nadler H. Removal of crevicular epithelium by ultrasonic cures. *J Periodontol* 1962;33:220.
- [24]. Sanderson A. Gingival curettage by hand and ultrasonic instruments: A histologic comparison. *J Periodontol* 1966;37:279.