

Rehabilitation Of Anterior Teeth With Customized Incisal Guidance Table - A Case Report

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Abstract

Ensuring proper anterior guidance presents a significant challenge for clinicians when planning restorative treatments. Accurate anterior guidance is crucial for optimal function, aesthetics, comfort, and phonetics. The posterior teeth's collapse leads to both the loss of the normal occlusal plan. This case report outlines a 46-year-old female who experienced anterior guidance loss, severe dentition wear. The vertical height was maintained by molar teeth in left posterior region. Loss of anterior teeth was accurately re-established with the help of customized incisal guidance table. The accurately recorded anterior guidance from the provisional restorations was transferred to the customized incisal guide table, and permanent restorations were then fabricated based on this guidance.

Keywords: *Tooth wear, Vertical dimension of occlusion, customized incisal guidance table.*

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I. Introduction

During a patient's lifetime, the gradual wear of occlusal surfaces is a natural process. Yet, excessive wear can lead to pulpal issues, occlusal disharmony, compromised function, and aesthetic concerns.¹ Tooth wear can be categorized as attrition, abrasion, or erosion, depending on its cause. However, it's often challenging to make a precise diagnosis as many cases involve a combination of these processes.² Hence, identifying the factors contributing to excessive wear and assessing the alteration of vertical dimension of occlusion (VDO) due to worn dentition is crucial.³

In many cases, the vertical dimension of occlusion (VDO) is maintained by tooth eruption and alveolar bone growth. As teeth are worn, the alveolar bone undergoes an adaptive process and compensates for the loss of tooth structure to maintain the VDO. Therefore, VDO should be conservative and should not be changed without careful approach.^{4,5} Raising the vertical dimension of occlusion (VDO) in bruxers places significant stress on the teeth, frequently leading to damage to restorations or the teeth themselves.⁴

Rehabilitating severely worn dentition becomes challenging when there is insufficient space for restoration. In 1975, Dahl et al.⁶ documented the application of a removable cobalt-chromium anterior occlusal device on an 18-year-old patient with advanced localized attrition. This device was used to create interocclusal

space for future restoration. The treatment involved a combination of orthodontic anterior teeth intrusion and posterior teeth eruption. Long-term follow-ups revealed stable vertical relations.^{7,8} Currently, this technique has been replaced by utilizing adhesive resin^{9,10} or an overlay splint^{5,11,12} instead of a cobalt-chromium device.

Replacing missing anterior teeth without consideration can cause interference with the envelope of motion, leading to premature contacts, cementation failures, and abutment teeth tenderness. For restoring anterior teeth, incisal guidance was established through contact between the surfaces of the upper and lower anterior teeth.¹³ Once the appropriate anterior guidance has been established, it should be meticulously recorded and accurately transferred into permanent restorations.

This case describes the rehabilitation of posterior teeth with fixed and removable dental prosthesis and recording of anterior guidance using provisional restorations, which the patient wore for a reasonable duration with satisfactory appearance, speech, and comfort. Replicating these provisional restorations in the definitive prosthesis was a vital part of this patient's rehabilitation. The temporary period aided the patient in adjusting to the prosthesis during the transition from their initial visit to the final restoration.

II. Case Report

A 52-years-old patient reported to the department of prosthodontics, who had lost few teeth due to poor oral hygiene and anterior teeth were severely attrited. Her main concern was aesthetic as well as mastication. Intraoral examination reveal a generalized attrition along with missing 17, 14, 36, 46, 47 and root stump 44 was present (figure-1).

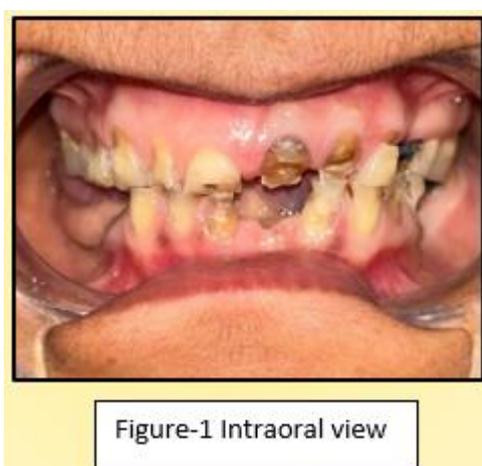


Figure-1 Intraoral view

Patient was advised to undergo RCT w.r.t 11, 12, 13, 21, 22, 23, 32, 33, 41, 41, 43 and extraction of 44. On recording tentative jaw record it was found that there was no need of increasing VD. Primary impression made and primary cast poured. Facebow transfer was done and mounted on semi-adjustable articulator and diagnostic mock-up was done (figure-2).

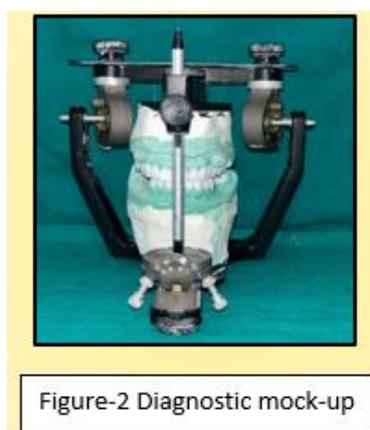


Figure-2 Diagnostic mock-up

Cast post and core was fabricated w.r.t 11, 21, 22 and fiber post and core was fabricated w.r.t 32, 33, 34, 35, 41, 42, 43 followed by tooth preparation w.r.t 11, 12, 13, 14, 21, 22, 23, 26, 32, 33, 34, 34, 35, 37, 42, 43, 44 (figure-3).



The patient's adaptation to the provisional fixed restorations, cemented with temporary cement (FREEGENOL TEMPORARY PACK; GC Corp., Tokyo, Japan), was observed (figure-4). Over a three-month period, interim restorations were adjusted and served as a reference for the final oral rehabilitation. Throughout this time, the patient's overall condition and various functions, including muscle tenderness, TMJ discomfort, mastication, mandibular movement range, swallowing, and speech, were assessed. Enhancements in mastication, speech, and facial aesthetics validated the patient's acceptance of the restored vertical dimension of occlusion (VDO) and the new mandibular position.



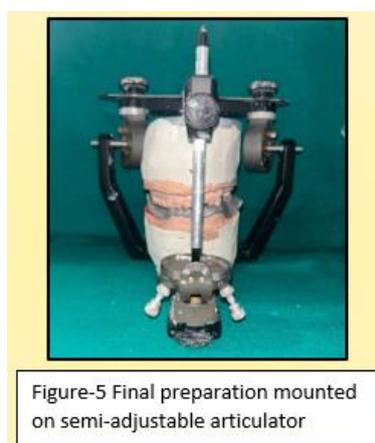
Impression was made with temporary crown luted in the mouth and facebow transfer done. This impression was poured mounted on the semi-adjustable articulator. Vaseline was applied on the incisal table and autopolymerizing resin was mixed and placed on the incisal table. When the autopolymerizing resin came to dough stage articulator was closed and the incisal rod was moved in centric relation and all eccentric relation. A arrow shape was obtained in the customized anterior guide table (figure-4).



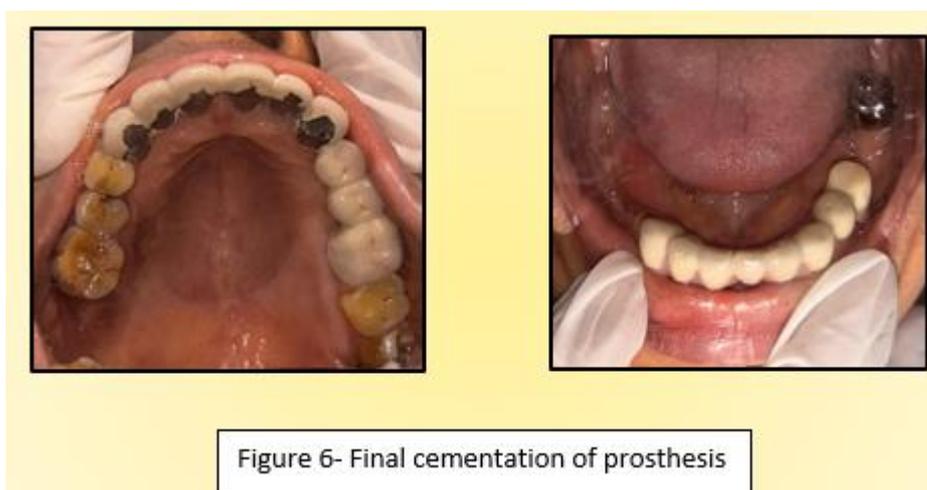
Final impression of prepared tooth was made. Facebow transfer and intraocclusal record of prepared tooth was completed and was mounted on semi-adjustable articulator (Hanau™ Modular Articulator; Whip Mix Corp., Louisville, USA). The final preparation was completed, and definitive impressions were taken using polyvinylsiloxane impression material (Extrude; Kerr Corp., Romulus, Germany). A bite registration was obtained using a provisional crown and occlusal registration material (StoneBite; Dreve Dentamid GmbH, Unna, Germany) in a half-and-half manner (figure-5).



Customized anterior guide table was utilized to create porcelain fused to metal restorations, which were then cemented with resin-modified glass ionomer cement (FujiCEM; GC America, Alsip, USA). Since the patient's anterior guidance table was employed in fabricating the definitive restoration, minimal occlusal adjustment was required on the lingual surface of the maxillary anterior teeth (figure-6).



Stock perforated tray with alginate was used for impression of mandibular RPD. Cast was poured and denture base and occlusal rim was fabricated. Jaw relation was done and mounted on three-pin articulator. Following the adaptation of the removable partial denture (RPD) framework and the wax denture trial, the final mandibular RPD was created and provided after making minor occlusal adjustments (figure-7). The prostheses were designed with a mutually protected occlusion, where the anterior teeth shielded the posterior teeth from lateral forces and wear, while the posterior teeth bore the bite force. Oral hygiene instructions were provided, and regular check-ups were scheduled.



III. Discussion

Turner's 1984 classification structured the management of severely worn dentition around vertical dimension loss and restoration space availability. His classification and conventional treatment, which entail raising VDO through multiple crown-lengthening procedures, have stayed widespread. Nonetheless, tooth wear originates from various factors, and there is a scarcity of clinical trials on restorative and prosthodontic techniques, both in number and quality. Furthermore, the lack of evidence regarding long-term treatment results and materials complicates clinical decision-making.¹⁹ Turner's 1984 classification structured the management of severely worn dentition around vertical dimension loss and restoration space availability. His classification and conventional treatment, which entail raising VDO through multiple crown-lengthening procedures, have stayed widespread. Nonetheless, tooth wear originates from various factors, and there is a scarcity of clinical trials on restorative and prosthodontic techniques, both in number and quality. Furthermore, the lack of evidence regarding long-term treatment results and materials complicates clinical decision-making.^{9,10,19} However, composite resin restoration was not suitable for this patient. The remaining tooth structures were too small to provide adequate retention for composite resin, and surveyed crowns were required to support the removable partial denture (RPD). Consequently, the traditional treatment approach, which involves a trial overlay splint, provisional restoration, meticulous monitoring, and definitive prosthesis, was selected.

Previous literature reports varying wearing times for overlay splints and provisional crowns. The trial period for reversible and conservative overlay prostheses ranges from 3 weeks to 5 months, while intensive fixed provisional prostheses are worn for 2 to 6 months.^{1,5,9,11,20} In this instance, the patient underwent careful monitoring for one month to assess adaptation to the removable occlusal overlay splints.¹⁶ Moreover, the patient's adjustment to the provisional restoration was monitored over three months.¹⁵ The trial duration was comparatively brief compared to other case reports; however, no discomfort, wear, or muscle fatigue were noted during this time. The decision to increase the vertical dimension of occlusion (VDO) was not based on standardized esthetic principles such as the golden proportion of anterior teeth, but rather on physiological factors like interocclusal rest space and speech. Arbitrary adjustments to VDO without thorough evaluation could lead to numerous complications and require an extended treatment period. Depending on the patient's condition and adaptability, the interim period can be adjusted, and vigilant evaluation and monitoring may reduce the total treatment time.

Restoring anterior crowns and using a removable partial denture (RPD) for posterior support is a widely used and cost-effective rehabilitation approach for many patients dealing with tooth wear, primarily due to economic and traditional considerations.²⁰ Nevertheless, restored anterior teeth may face excessive occlusal forces if the patient neglects wearing the RPD or experiences further resorption of the residual ridge. Given the documented poor compliance of patients with free-end saddle dentures, educating them on RPD usage becomes imperative. Regular check-ups for occlusal adjustments and RPD fitting are crucial in this regard.²¹

IV. Conclusion

In this clinical report, the use of customised incisal guidance table for rehabilitation of anterior teeth with fixed dental restoration and rehabilitation of posterior teeth based on accurate diagnosis has led to a successful full-mouth rehabilitation for severely worn dentition.

References

- [1] Turner Ka, Missirlian Dm. Restoration Of The Extremely Worn Dentition. *J Prosthet Dent.* 1984;52:467–474. [PubMed] [Google Scholar]
- [2] Smith Bg. Toothwear: Aetiology And Diagnosis. *Dent Update.* 1989;16:204–212. [PubMed] [Google Scholar]
- [3] Prasad S, Kuracina J, Monaco Ea., Jr Altering Occlusal Vertical Dimension Provisionally With Base Metal Onlays: A Clinical Report. *J Prosthet Dent.* 2008;100:338–342. [PubMed] [Google Scholar]
- [4] Dawson Pe. *Functional Occlusion - From Tmj To Smile Design.* 1st Ed. New York: Elsevier Inc.; 2008. Pp. 430–452. [Google Scholar]
- [5] Jahangiri L, Jang S. Onlay Partial Denture Technique For Assessment Of Adequate Occlusal Vertical Dimension: A Clinical Report. *J Prosthet Dent.* 2002;87:1–4. [PubMed] [Google Scholar]
- [6] Dahl Bl, Krogstad O, Karlsen K. An Alternative Treatment In Cases With Advanced Localized Attrition. *J Oral Rehabil.* 1975;2:209–214. [PubMed] [Google Scholar]
- [7] Dahl Bl, Krogstad O. Long-Term Observations Of An Increased Occlusal Face Height Obtained By A Combined Orthodontic/Prosthetic Approach. *J Oral Rehabil.* 1985;12:173–176. [PubMed] [Google Scholar]
- [8] Dahl Bl. The Face Height In Adult Dentate Humans. A Discussion Of Physiological And Prosthodontic Principles Illustrated Through A Case Report. *J Oral Rehabil.* 1995;22:565–569. [PubMed] [Google Scholar]
- [9] Hemmings Kw, Darbar Ur, Vaughan S. Tooth Wear Treated With Direct Composite Restorations At An Increased Vertical Dimension: Results At 30 Months. *J Prosthet Dent.* 2000;83:287–293. [PubMed] [Google Scholar]
- [10] Darbar Ur, Hemmings Kw. Treatment Of Localized Anterior Toothwear With Composite Restorations At An Increased Occlusal Vertical Dimension. *Dent Update.* 1997;24:72–75. [PubMed] [Google Scholar]
- [11] Sato S, Hotta Th, Pedrazzi V. Removable Occlusal Overlay Splint In The Management Of Tooth Wear: A Clinical Report. *J Prosthet Dent.* 2000;83:392–395. [PubMed] [Google Scholar]
- [12] Windchy Am, Morris Jc. An Alternative Treatment With The Overlay Removable Partial Denture: A Clinical Report. *J Prosthet Dent.* 1998;79:249–253. [PubMed] [Google Scholar]

- [13] Schuyler H. The Function And Importance Of Incisal Guidance In Oral Rehabilitation. *J Prosthet Dent* 2001;2013:219–32 [Pubmed] [Google Scholar]
- [14] Hemmings Kw, Howlett Ja, Woodley Nj, Griffiths Bm. Partial Dentures For Patients With Advanced Tooth Wear. *Dent Update*. 1995;22:52–59. [Pubmed] [Google Scholar]
- [15] Yunus N, Abdullah H, Hanapiah F. The Use Of Implants In The Occlusal Rehabilitation Of A Partially Edentulous Patient: A Clinical Report. *J Prosthet Dent*. 2001;85:540–543. [Pubmed] [Google Scholar]
- [16] Ganddini Mr, Al-Mardini M, Graser Gn, Almog D. Maxillary And Mandibular Overlay Removable Partial Dentures For The Restoration Of Worn Teeth. *J Prosthet Dent*. 2004;91:210–214. [Pubmed] [Google Scholar]
- [17] Hempton Tj, Dominici Jt. Contemporary Crown-Lengthening Therapy: A Review. *J Am Dent Assoc*. 2010;141:647–655. [Pubmed] [Google Scholar]
- [18] Hoyle De. Fabrication Of A Customized Anterior Guide Table. *J Prosthet Dent*. 1982;48:490–491. [Pubmed] [Google Scholar]
- [19] Johansson A, Johansson Ak, Omar R, Carlsson Ge. Rehabilitation Of The Worn Dentition. *J Oral Rehabil*. 2008;35:548–566. [Pubmed] [Google Scholar]
- [20] Brown Ke. Reconstruction Considerations For Severe Dental Attrition. *J Prosthet Dent*. 1980;44:384–388. [Pubmed] [Google Scholar]
- [21] Witter Dj, Van Elteren P, Käyser Af, Van Rossum Gm. Oral Comfort In Shortened Dental Arches. *J Oral Rehabil*. 1990;17:137–143. [Pubmed] [Google Scholar]