

Case Report

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Versatility of Customized Incisal Guide Table In Prosthodontic Rehabilitation

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Abstract

Customized Incisal Guidance is a commonly advocated procedure for governing the contours of palatal surface of maxillary anterior teeth during Prosthodontic Rehabilitation of anterior esthetic zone. Utilization of concept of Customized Incisal guidance ensures that the restoration fits into the entire stomatognathic system and does not interfere in the harmony of the same. The case series showcases two cases where customized incisal guidance has been used for designing the contours of maxillary teeth and to govern the position of incisal edges of mandibular anterior teeth.

Key words: Esthetic, Incisal Guidance, FDP

Introduction

Incisal guidance is defined as the influence of the contacting surfaces of the mandibular and maxillary anterior teeth on mandibular movements.¹ Along with fulfilling the esthetic requirement, rehabilitation in anterior esthetic region needs to be carefully designed to fulfill its functional requirement in complete harmony with the stomatognathic system. Incisal guidance, condylar guidance, steepness of palatal surface of maxillary anterior teeth and how the mandibular incisal edge glide over it forms the basis of Prosthodontic rehabilitation of anterior teeth. With the recent advancements in material science, technique and technology, achieving pleasing esthetics has become possible. However, even with digital dentistry the application of conventional concepts of Prosthodontics cannot be disregarded. Customised incisal guidance is a commonly ignored concept but it is essential for longevity of the restoration by harmonizing the artificial tooth surfaces with a patient's unique mandibular movement patterns. This case series highlights two cases where customized incisal guidance has been utilized for fabrication of anterior Fixed Denture Prosthesis in esthetic zone. Customised Incisal Guidance has been commonly used and documented in

literature for designing of maxillary anterior teeth, however the use in designing mandibular anterior FDP is not very extensively discussed in literature. This case reports highlights two cases, in the first one the concept has been used for long span maxillary anterior FDP using existing incomplete guidance for designing provisional restoration and stage II guide table for definitive prosthesis. The second case showcases the use of Customised Incisal Guidance for mandibular anterior FDP.

Case Report

A 36 yrs old patient reported with complaint of unesthetic appearance and difficulty in eating due to missing teeth in upper front tooth region since 05 years due to fall during horse riding. On intraoral examination, the ridge was narrow with a palpable bony defect on buccal side. Maxillary right central and lateral incisors and maxillary left central incisor were missing. The existing occlusion was group functional occlusion with absence of mutually protected occlusion due to missing anterior teeth. [Figure 1] CBCT was done to explore the options of dental implant but the bone width was unfavorable for rehabilitation using dental implants. The treatment plan was to rehabilitate the patient

using 06 unit FDP utilizing the concepts of customized incisal guidance to enable the restoration to be in complete harmony with the stomatognathic system. Diagnostic impressions were made and a facebow transfer was done. The diagnostic casts were mounted on the Hanau wide Vue semi adjustable articulator using facebow record and interocclusal records. Intentional root canal treatment was done for maxillary right canine and maxillary left lateral incisor and canine as they were to be used as abutments. Tooth preparation was done for Porcelain fused to metal 06 unit FDP. Impressions were made and the cast was mounted on the articulator. A customized incisal guide table was fabricated on the diagnostic mounting to record the existing incisal guidance guided by the lateral incisor and canine. The intent was to use this incomplete available guidance to adjust the provisional restoration in the lab to reduce the chairside adjustment of provisional restoration. The provisional restoration was fabricated, adjusted and luted in the patient mouth. Impressions were again made with provisional restorations in situ, cast were fabricated and mounted on the preprogrammed articulator using facebow transfer and interocclusal records. This mounting was now used to fabricate a stage II customized guide table which would act as a guide for fabrication of definitive restorations. [Figure 2] The guide table was used during wax up stage and during veneering of metal with ceramic. The definitive restoration was luted using glass ionomer type II luting cement. [Figure3]



Figure 1: Extraoral & Intraoral View showing missing teeth in anterior esthetic region.

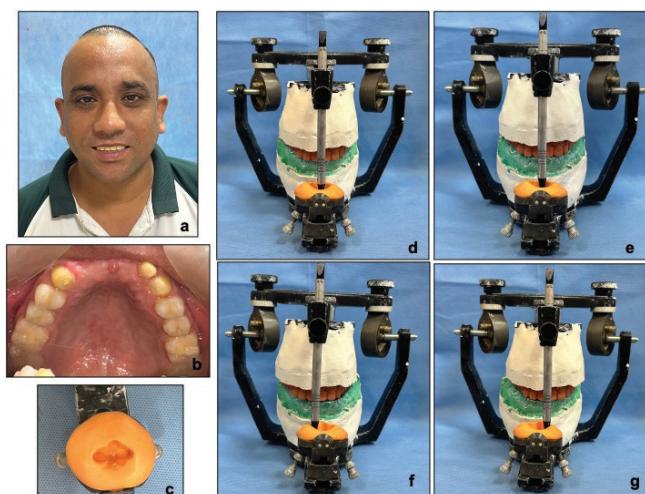


Figure 2: Intra-op showing fabrication of Customized Incisal Guide table.

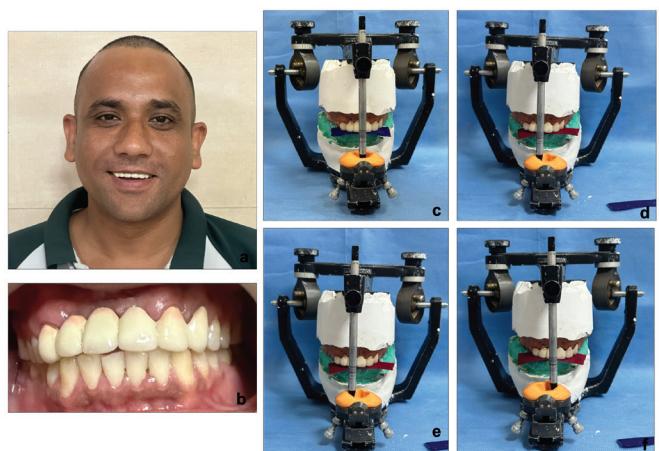


Figure 3: Post-op with use of Customized Incisal Guide Table for modification of Definitive Prosthesis.

A 22 years old patient reported with chief complaint of missing teeth in lower front tooth region since 03 years. History revealed that patient had decayed front teeth 03 years back with crowding in maxillary and mandibular arches and had undergone Orthodontic treatment. Orthopantomogram revealed tipping movement of mandibular left and right central incisors to position of lateral incisors and missing mandibular lateral incisors bilaterally. Intraoral examination revealed completed Orthodontic treatment in maxillary arch with brackets retained as retainers temporarily and missing third molars bilaterally, lateral incisors on both left and right side and missing mandibular right second premolar with retained deciduous molar on right side. [Figure 4] Since the incisors were tipped during orthodontic treatment, the apex of their roots were in such a position that ruled out chances of placement of dental implants. Hence, a 04 unit FDP was planned for mandibular central incisors with lateral incisors bilaterally as abutments. It was planned to utilize concepts of customized incisal guidance while designing the mandibular prosthesis to reduce chairside time. Tooth preparation was done for mandibular lateral incisors for full coverage PFM restorations and impressions were made. The cast was fabricated using type IV gypsum product and mounted on semi adjustable articulator. The articulator was programmed, provisional restorations were fabricated and customized incisal guide table was made on the articulator. [Figure 5] This guide table was utilized while designing and fabrication of 04 unit FDP was done. Review was done after 01 week, 01 month and 03 months and satisfactory treatment outcome was achieved. [Figure 6]



Figure 4: Extraoral & Intraoral view showing missing mandibular anterior teeth.

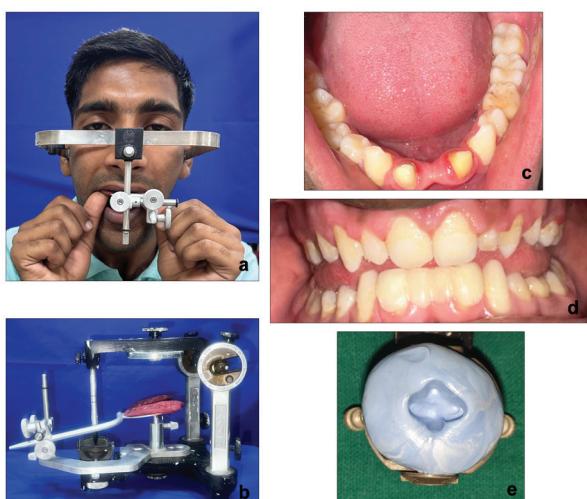


Figure 5: Intra-op with steps in utilization of Customized Incisal Guide Table.



Figure 6: Post-op with definitive prosthesis in-situ.

Discussion

The stomatognathic system consists of teeth, the alveolar bone, muscles of mastication and temporomandibular joint. A functional harmony is achievable only with optimally healthy teeth, joints, periodontium and musculature, in combination with reasonably satisfying esthetics. Abnormal functional movements of the condylar assembly may result from improper incisal guidance and this may further lead to temporomandibular joint dysfunctions.² Restoration of missing anterior teeth arbitrarily can lead to interference with the envelope of motion, this may lead to premature contacts, failure in cementation and eventually tenderness of the abutment teeth arising due to trauma from Occlusion.³

The indications for utilization of customized incisal guide table is to record or fabricate a physiologically acceptable incisal guidance, to re-establish restoration in complete harmony with the existing physiologic occlusion and to aid the laboratory steps during designing the restoration to decrease the chairside time for adjustment of the prosthesis.⁴

An accurate anterior guidance is critical for optimal esthetics, phonetics, comfort, function, stress minimization, and longevity of teeth and restorations.⁵ The utilization of customized incisal guidance table serves as the definitive mechanism for transferring

a patient's unique "envelope of motion" from verified provisional restorations to the final prosthesis. Standard mechanical guide tables on articulators are intrinsically limited by their straight-line designs, which often fail to replicate the complex, curvilinear lingual contours and physiologic pathways essential for anterior tooth harmony.² The use of a semi-adjustable Hanau articulator significantly enhances the precision of this procedure by allowing for the accurate orientation of the maxillary cast via a facebow transfer and the adjustment of horizontal and lateral condylar inclinations.⁶ By incorporating the Hanau articulator's ability to simulate individual mandibular pathways, the clinician can calibrate the device to match the patient's specific condylar guidance, which works in tandem with the customized incisal table to provide a highly accurate simulation of the stomatognathic system.^{7,8} This mechanical precision ensures that the vertical and horizontal overlap established in the provisional restorations is maintained, effectively preventing posterior interferences during excursive movements.^{9,10}

In long-span anterior rehabilitations, the steepness of the incisal guidance acts as a primary determinant for posterior disocclusion achieving mutually protected occlusion effectively shielding them from non-axial, potentially traumatic forces.^{2,9} If the arbitrary guidance is too steep, it can lead to excessive stress at the connector sites and abutment interfaces, resulting in mechanical failures such as porcelain chipping, restoration debonding, or even root fractures.¹⁰ Furthermore, faulty guidance can force abnormal condylar movements, leading to temporomandibular joint (TMJ) dysfunction. Customization ensures the guidance remains in harmony with the patient's existing condylar paths, promoting neuromuscular comfort and joint stability.⁷

The designing of precise provisional restorations and the diagnostic period is a scientific prerequisite for success. It allows the clinician to evaluate and modify tooth position, emergence profile, and functional contours while monitoring the patient's biological response. Once the patient adapts comfortably to these contours, the same precise reference can be replicated for the validated lingual slopes and incisal lengths in the definitive prosthesis, significantly reducing the need for chairside adjustments. Ultimately, for long-span anterior FPDs, the synergy between a semi-adjustable Hanau articulator and a customized incisal guidance table is the gold standard for bridging the gap between static models and dynamic function.

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