



**A UNIQUE REVERSE APPROACH FOR ESTABLISHING ORIGINAL ANTERIOR  
GUIDANCE OF MISSING ANTERIOR TEETH – A CASE REPORT**

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**ABSTRACT**

Loss of anterior guidance can lead to rapid destruction of posteriors. Several reasons like pathological or traumatic injuries can result in loss of anterior teeth causing loss of anterior guidance. In such cases maintaining original anterior guidance of patient gives the most comfortable results for patients. This case has been performed in a way such that the original anterior guidance has been restored with help of posterior teeth with the help of unique reverse approach.

**KEY WORDS:** Anterior Guidance, Fossa Guide, Customised guide table, Reverse approach.

**INTRODUCTION**

Anterior tooth loss is commonly seen in patients due to reasons like genetic, caries, and traumatic injuries.<sup>1</sup> Anterior tooth loss is detrimental to aesthetically conscious patient from psychological point of view. The teeth and the supporting structures of the abutment teeth can be damaged if the prosthetic design is not properly fabricated.<sup>[1]</sup> Arbitrary restorations of anterior teeth can result in an faulty prosthesis which interferences with the envelope of motion. This can in turn lead to premature contacts, cementation failures and tenderness of the abutment teeth, or temporomandibular dysfunction.<sup>[2]</sup>

The incisal guidance is path travelled by the contacting surfaces of the maxillary and mandibular anterior teeth.<sup>[2]</sup> It's steepness depends on horizontal and vertical overlap of the anterior teeth and palatal surfaces of the maxillary anterior teeth.<sup>[2]</sup> Eccentric functional occlusion is determined by right lateral, left lateral and protrusive guide factors of anterior guidance.<sup>[2]</sup> Good aesthetics, phonetics, a minimal stress occlusion, functional efficiency and comfort of the patient can be restored satisfactorily if the incisal guidance is properly established.

Optimum anterior guidance should bring about uniform disocclusion of posterior teeth in protrusive and lateral mandibular excursive movements.<sup>[1]</sup> Whenever we

rehabilitate patients who need both anterior and posterior restorations by the conventional approach, we set the anteriors first and the posteriors according to the anteriors, such that the anterior guidance should disocclude the posteriors (Pankeymann-Schuler philosophy). A fossa guide is used to confirm that the anterior guidance and the cuspal guidance of the posteriors match.<sup>[3]</sup> However, in cases where only anteriors are missing and we are not changing the original posterior teeth (that is, a predetermined fixed cuspal guidance), the most suited anterior guidance will be the one which will be derived from the posterior disocclusion. This reverse approach will give us an anterior guidance exactly matching to the existing posteriors to create an interference free disocclusion of posteriors.

**CASE PRESENTATION**

A 29 year old male, reported to the department of Prosthodontics, with a chief complaint of missing upper front teeth due to a road accident 6 months back, causing compromised aesthetics, phonetics and mastication. On examination, patient was missing both maxillary central incisors, and had peg laterals. The edentulous span was much longer than the one expected for the loss of both centrals. The fact that he had 2 peg lateral incisors was a contributory factor for the increased length of the edentulous span. No abnormality was detected in the

medical history of the patient. Following traumatic accident, the patient had sought immediate dental care. The posterior occlusion was unaltered and stable. There was no tenderness on percussion or mobility around any of the remaining teeth and the sulcus depth around them was normal. The temporomandibular joint was in a healthy condition, and both the arches had a stable favourable relationship to each other.



**A: Pre-op photos, B&C: IOPA of 12 & 22, D: Intra-oral view**

Being a young patient, the first choice of treatment suggested was implant supported prosthesis. However, the patient was not willing/ did not prefer any invasive procedure. He also had financial and time restrictions, which made him opt for the next option given of a tooth supported fixed prosthesis. The treatment plan required a fixed partial denture replacing both the central incisors using the bilateral maxillary lateral incisors and canines as abutments. There was no pain on percussion or pathological mobility detected around the abutments. Their sulcus depth was in normal range. Owing to the small peg shaped anatomy of the lateral incisors, their intentional root canal treatment was carried out. These abutments had a favourable crown root ratio and root configuration. Their periodontal ligament and the pericemental area was adequate to support the missing anterior teeth. Although the cause of the loss of teeth was traumatic, there was no hard or soft tissue defect associated with the edentulous area. This was another factor favouring the use of fixed partial denture as replacement prosthesis.

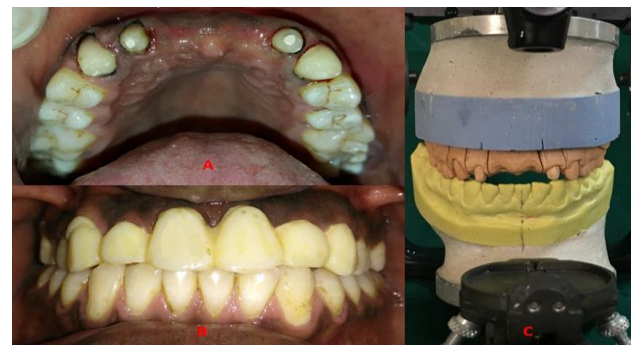
The following clinical steps were followed: Before beginning any treatment, elimination of all the interferences that were preventing a full range of functional movements was accomplished. Subsequently, diagnostic impressions were taken in alginate irreversible hydrocolloid material and casts were poured in dental stone and mounted on a semi adjustable articulator using a facebow transfer. Now before proceeding with the diagnostic wax -up of the casts, a fossa guide of the pre-existing cuspal angulation was made by using pattern resin. A layer of petroleum jelly was applied on the occlusal surface of mandibular posterior teeth. The handle of the fossa guide was loaded with pattern resin, and it was held along the long axis of any of the

mandibular 1 st molar, perpendicular to the plane of occlusion. This was allowed to set and excess was trimmed off.



**A: Facebow Transfer, B: Diagnostic mounting on semi-adjustable articulator, C: Preparation of fossa guide, D: Making a customised guide table from fossa guide, E: Making Diagnostic wax up according to fossa guide & guide table.**

Thus, the lingual surface inclination of the buccal cusps was recorded on the buccal side of the fossa guide and the buccal surface inclination of the lingual cusps was recorded on the lingual sides of the fossa guide. The mesial and distal cusp inclines were recorded on the anterior and posterior side of the fossa guide respectively. This fossa guide can be fabricated on any side of the arch, as the other side would have the same cuspal angulations for the converse working and non working movements.



**A: tooth preparation, B: Temporisation, C: Mounting of final casts**

After the fabrication of the fossa guide was completed, it was in turn used to fabricate an incisal guide table, by attaching the handle of the fossa guide in the incisal pin, and moving it along all the excursive and protrusive movements on a layer of setting cold-cure acrylic on the incisal table to form the arrow shaped grooves.

This incisal table, which was now synced with the posterior cuspal tooth inclinations during working and non working excursive movements (by the fossa guide) was used as a reference and guide to make the diagnostic wax up. Wax was added on to the diagnostic wax up in such a way that the incisal guidance was set to be just

more than the recorded condylar guidance. This ensured that the diagnostic wax up was guided according to the existing posteriors, not arbitrarily made and caused a definite uniform disocclusion of the remaining posterior teeth on excursive movements.



**A: coping trial, B: final prosthesis in centric, C & D: canine guided occlusion in during excursions**

The teeth were prepared for PFM restorations. Provisional fixed partial denture was fabricated with indirect-direct technique. (Protemp 4, 3M ESPE) The provisional restorations were finished and polished cemented with a temporary cement (Templute). The patient was recalled after 24 hours after restoration to verify its comfort, gingival health and satisfaction with the aesthetics. These provisionals were kept in the patient's mouth for a period of 2 weeks. They were used to check the anterior guidance along with aesthetics, phonetics, and occlusion in function. It was also confirmed that the provisionals did not interfere in the envelope of function.

After the provisional restorations were acceptable with respect to anterior guidance, aesthetics, phonetics, and comfort, their alginate impression was made, poured in dental stone, and mounted on the articulator with the face bow transfer. Autopolymerizing acrylic resin was used to fabricate a customised guide table on the semiadjustable articulator. This would help to replicate the anterior guidance created from the provisionals. Final impressions were made with addition silicone (double step double mix technique). The working cast was replaced on the articulator.

A polyvinyl siloxane putty index was made and sent to the laboratory to help recreate the acceptable contours and shapes of the anteriors.

Coping trial was checked for fit and clearance. Shade selection was done. Bisque trial was ordered. Uniform stable centric contacts, canine guided occlusion in lateral excursive movements and a group function of anteriors in protrusive was checked in bisque trial. Interferences, if any, were removed and the prosthesis was sent for final processing. On receiving the final prosthesis, it was checked in the mouth and was luted with type 1 GIC after the operator's satisfaction and patient's approval.

The patient was recalled after 1 week and the residual cement, gingival health, and occlusal integrity was evaluated and modified if necessary. The patient was satisfied with the aesthetics of prosthesis and was practising good oral hygiene measures.

## DISCUSSION

While replacing the anterior teeth, equal importance must be given to the palatal surface of maxillary anteriors as much as the contour and shape of the labial surface, as it is the palatal surface which determines the anterior guidance.

It is better to evaluate the occlusion as a whole during anterior teeth replacement. This is important as both these factors are interdependent; and by establishing proper position, length, and overlap of the anterior teeth, any occlusal interference can be managed. This is precisely the main advantage of the reverse approach, that we get an anterior guidance that is optimally steeper than the condylar guidance, just enough to bring about posterior disocclusion but to avoid excessive loads on the canines.

Another advantage is that, this approach ensures by default, an anterior guidance that is in harmony with the envelope of motion. As this approach is in fact tracing the reflection of the functional movements of the mandible on the posterior teeth, anterior guidance set by this technique does not interfere with the envelope of function.



**A: pre- op, B: post op**

Lastly, the limitations of the semi- adjustable articulator of not being able to exactly simulate mandibular movements, of not accepting precise lateral records, of having a non- changeable intercondylar distance or of having a straight condylar path can be drastically compensated by this technique. Since this technique directly records the existing angulations of cusps as a representative of the functional mandibular movements and doesn't depend on the articulator for simulating the mandibular movements, the effect of limitations of the articulator affecting the anterior guidance is minimised



**CONCLUSION**

Multiple factors like overbite, overjet, lip closure path, lip support, and the envelope of function determine and affect the anterior guidance and the replacement of missing anterior teeth. All these factors should be carefully taken into consideration and modified to give the most harmonious restoration with remaining structures.

The method described above has many advantages in avoiding overloading on the prosthetically replaced canines in a canine guided occlusion as also getting as close as possible to restoring the original anterior guidance of the patient. Apart from the disadvantage that this method is more time consuming due to an extra step, this technique gives a multifold advantage of being more functionally efficient and giving a much more harmonious restoration to replace back the anterior guidance of the patient.

**COMPETING INTERESTS:** None.

**PATIENT CONSENT:** Obtained.

**PROVENANCE AND PEER REVIEW:** Not commissioned; externally peer reviewed

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