CUSTOMISED INCISAL GUIDE TABLE FOR REHABILITATION OF MAXILLARY ANTERIOR TEETH: A CASE REPORT

Prosthodontics

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ABSTRACT

Restoration of anterior guidance is a major challenge to the clinician in the planning of all restorative treatments. An accurate anterior guidance is important for proper function, aesthetics, comfort, and phonetics. Anterior guidance should be established with extreme caution while restoring anterior teeth as even a slight error in this regard can have detrimental effects on the entire stomatognathic system. This article describes the anterior rehabilitation of a 50-year-old patient who met with a road traffic accident and lost his upper anterior teeth. Anterior guidance developed in the provisional restorations was accurately recorded in the customized incisal guide table and permanent restorations were fabricated accordingly. Although the patient presented for the replacement of the fractured prosthesis, a comprehensive evaluation determined that a customized incisal guide table was needed to correct an array of dental issues. The treatment plan dramatically improved overall esthetics, comfort, and function.

KEYWORDS

INTRODUCTION

Apart from aiding in mastication, phonetics, and esthetics, anterior teeth also guide mandible through various functional movements. When the patient performs protrusive or lateral excursions, contacts remain only on anterior teeth, while posterior teeth disocclude. This arrangement is desirable to reduce potentially harmful lateral forces on posterior teeth and is called anterior guidance. Restoring the missing anterior teeth arbitrarily can result in an interference with the envelope of motion, which can lead to premature contacts, cementation failures and tenderness of the abutment teeth. In restoring anterior teeth, Incisal guidance was provided by the contacting surfaces of the maxillary and mandibular anterior teeth.¹ Its steepness depends on the horizontal and vertical overlap of the anterior teeth and lingual surfaces of the six upper anterior teeth. Incisal guidance is of prime importance in the planning of all restorative treatments. Abnormal functional movements of the condyles can result from faulty incisal guidance, which can lead to temporomandibular joint dysfunctions.² Eccentric functional occlusion, depends on right lateral, left lateral and protrusive guide factors in incisal guidance. The paths of movement of the condyle have little or no influence upon incisal guidance. An accurate incisal guidance is necessary for good esthetics, phonetics, a minimal stress occlusion, functional efficiency, and comfort of the patient. Restoration of multiple teeth that are missing or decayed, discoloured, developmental defects and worn out dentition are indications for occlusal rehabilitation.³ A change or modification of unfavorable incisal guidance will have a favorable influence on teeth, restorations and TMJs.⁴⁻⁷ After determining appropriate anterior guidance it should be recorded and transferred accurately in permanent restorations. This paper describes recording of the anterior guidance, using provisional restoration which was borne by the patient for a reasonable period of time with satisfactory appearance, speech and comfort. Replication of these provisional restorations form in the definitive prosthesis was a crucial step in the rehabilitation of this patient. The period of provisionalization helped the patient in getting adjusted to the prosthesis during the transition period from his first visit to final restoration.

CASE REPORT:

A 50-year old male reported to the Department of Prosthodontics, with a chief complaint of fractured prosthesis in the upper front tooth region.

A review of the dental history of the patient revealed that he had lost his maxillary central and lateral incisors during a road traffic accident 10 years back after which he had received Fixed dental prosthesis. Past medical and surgical history was noncontributory.

Patient's intra-oral examination during the first visit revealed tooth preparation and endodontic treatment with respect to maxillary right canine and first premolar and maxillary left lateral incisor and canine (figure 1). Mandibular anterior teeth were intact with generalized

attrition and supraeruption. The patient did not have a defined occlusal scheme at present. Gingival margins of maxillary central incisors were at different levels. The patient had received endodontic treatment for maxillary right canine & first premolar and maxillary left lateral incisor and canine. Any signs and symptoms, such as presence of exudate, fistula, apical sensitivity or pain to indicate presence of active inflammation in any of the endodontically treated teeth were absent. Radiographic examination revealed absence of any peri-apical lesions. After discussing all the treatment options with the patient, a 7-unit Porcelain facing fixed partial denture replacing upper centrals and right lateral incisor using maxillary left lateral incisor and canine and right canine and first premolar as abutments was decided. The proposed treatment plan was divided into pre-prosthetic phase, prosthetic phase, and maintenance phase. The pre-prosthetic phase included advising the patient to undergo oral prophylaxis.

Figure 1: Preoperative View

In the prosthetic phase, Maxillary and mandibular diagnostic impressions were made and casts were mounted on a Hanau wide view semi-adjustable articulator using orientation and centric jaw relation records. Protrusive and lateral interocclusal records were used to determine protrusive and lateral condylar guidance of the patient on the articulator. A diagnostic wax up was done to determine the length, width & angulation of the teeth and proper anterior guidance was established, so that posterior teeth are discluded in excursive movements.⁸⁻¹⁰

The tooth preparations margins were redefined and final impressions were made using putty wash impression technique. Putty indices were prepared from the diagnostic wax-up and the tooth contours from the diagnostic wax-up were replicated into the provisional restorations (Protemp II, 3M ESPE) (figure 2). The provisional restorations were finished and polished, cemented with a non-eugenol temporary cement for easy removal at subsequent appointments. The patient was left with these provisionals for a period of 2 weeks to evaluate aesthetics, phonetics and function with respect to anterior guidance.

Two weeks following provisionalisation, the patient was recalled to verify the patient's comfort and satisfaction with the aesthetics. At the follow-up appointment, the accuracy of the occlusion was verified. It

was checked whether the established functional pathways were in harmony with the envelope of function.

Figure 2: Provisionalisation

The maxillary cast was replaced with a new cast with prepared maxillary abutments. The provisional restorations were transferred on to the semi adjustable articulator. The next step involved fabrication of a customised anterior guide table. Incisal guide table with petroleum jelly was lubricated to prevent adherence of the resin.

Autopolymerising acrylic resin (*PATTERN RESINTM LS*) was placed on the incisal guide table and incisal pin was firmly locked in position. The articulator was moved through protrusive and lateral excursions, taking care to reproduce occlusal contact relationships that were developed previously in a pre-restorative diagnostic wax-up and provisionalisation (figure 3). Incisal guide table helps to communicate details of anterior guidance precisely to the technician.

Figure 3: Customised Incisal Guidance

The master casts were submitted to the lab for fabrication of 7 unit Porcelain facing FPD. The wax up was done with a cutback design followed by casting (figure 4). The metal try-in was done to check for complete passive seating of the prosthesis (figure 5). Finally after porcelain buildup, the prosthesis was checked for the occlusal interferences and the anterior guidance (figure 6). The final restorations were cemented with type I GIC (GC Corporation) (figure 7).

Figure 4 Waxup With Cutback Design

Figure 5 Metal Try-in

Figure 6 Porcelain buildup

Figure 7 Post-operative view

In the maintenance phase, Follow-up appointments were carried out at regular intervals. The patient was satisfied with the aesthetics of prosthesis and was following good oral hygiene measures.

DISCUSSION

The lingual surfaces of the provisional restorations were contoured in such a way that they were in harmony with the functional envelope of motion. Successful restoration of lost anterior guidance was possible only if the satisfactory functional performance achieved with provisional restorations was present in final restorations also. A custom incisal guide table, as described by Dawson, allows the Technician to reproduce the anterior guidance established in the mouth with the provisional restorations.¹¹ Hence, communication of the details of anterior guidance with laboratory technician was very important. In this case, autopolymerising acrylic resin was used to make customised anterior guide table for duplication of functional guiding surfaces of anterior teeth. Sabek et al suggested an alternative procedure for reconstructing anterior guidance. To replicate the provisional restoration they used plaster templates, because they found them to be more accurate than silicone ones. According to them, the use of an articulator was not necessary.¹² Alpert RL presented a precise method for recording and transferring anterior guidance called the anterior functional core. The anterior guidance developed in provisional restorations was accurately recorded in the customised incisal guide table and permanent restorations were fabricated accordingly. The provisional restoration provided an opportunity to evaluate phonetics, lip support, aesthetics, lip closure path, the envelope of function, the neutral zone, skeletal base relation, tooth position, abutment distribution, abutment bone support and tooth preparation.^{13,14} The patient was comfortable with the final restoration as, it was an exact replica of the temporary restorations with which the patient had already adjusted.¹⁵

CONCLUSION

This clinical case report describes a diagnostically based protocol for restoration on maxillary anterior teeth. Successful outcome in treating an endodontically anterior tooth not only depends in providing optimum restoration but also a prosthesis with adequately contoured and located incisal guidance to meet functional requirements of stomatognathic system.

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