

Clinical Report

Role of anterior guidance in esthetic and functional rehabilitation

Aradhana Nagarsekar, Meena Aras

Department of Prosthodontics, Goa Dental College and Hospital, Bambolim, Goa, India

For correspondence

Dr. Aradhana Nagarsekar, Department of Prosthodontics, Goa Dental College and Hospital, Bambolim-403 202, Goa, India.
E-mail: nagarsekar-pros@yahoo.co.in

The key to long-term occlusal stability is providing the correct anterior guidance along with esthetics. Often, little attention is given to the incisal /anterior guidance in prosthetic rehabilitation which equals or surpasses the condylar guidance in its influence upon the functional occlusion. This article presents a conservative approach to restore esthetics and function in a patient having worn anterior dentition with edge-to-edge relationship and reverse smile line.

Key words: Edge-to-edge relationship, incisal / anterior guidance, occlusal stability, reverse smile line

DOI: 10.4103/0972-4052.49189

INTRODUCTION

According to Dawson, anterior guidance is the dynamic relationship of the lower anterior teeth against the upper anterior teeth through all the ranges of function. It plays a very important role in protecting the posterior teeth from protrusive and lateral stresses by discluding effect. An unfavorable anterior guidance contributes to anterior alveolar bone loss and teeth mobility when there are susceptible periodontal tissues and excessive forces.^[1-3]

Factors that control the anterior guidance are:

- a. Overjet and overbite
- b. Location and amount of contact
- c. Incisal level
- d. Labiolingual curve

As the overbite increases and overjet decreases the incisal guidance becomes steep leading to more off-axial forces on the teeth which are potentially dangerous [Figure 1].^[4] The amount of overjet is more significant in influencing the health of the anterior teeth as it gives enough space for the mandible to move anteriorly without injuring the periodontal support of the anterior teeth [Figure 2].

The larger and more gingival the contact area between the labial surface of the mandibular incisors and lingual surface of the maxillary incisors, the more horizontal forces are exerted, leading to bone loss and teeth mobility.

If the incisal level of the mandibular teeth is irregular, [Figure 3 and 4] the teeth in supraocclusion may exert excessive forces that will loosen and cause flaring of both maxillary and mandibular anterior teeth.

Two aspects of the labiolingual curve are important:

the arch form and the alignment of teeth within the arch. The teeth which are out of alignment may exert excessive forces on the opposing teeth.^[2]

CASE REPORT

A 33-year-old patient reported to the department of prosthodontics for the replacement of a missing anterior tooth. The patient gave a history of trauma 12 years back leading to the loss of the tooth.

Intra oral examination revealed missing 21, discolored and fractured 11 (involving incisal angle and two third of the clinical crown) [Figure 5] and the mandibular anterior teeth with a natural wear pattern. Clinical evaluation of 11 revealed gross caries extending into the pulp chamber and perforation in the middle third of the root. After thorough clinical and radiographic evaluation it was decided to extract 11 and give a fixed partial denture from 13 to 23.

PROCEDURE

The abutment teeth were prepared and 11 were extracted. To provide an esthetic emergence profile, temporary acrylic fixed partial denture with an ovate pontic in relation to 11 was placed on the same day as the extraction. After adjustment of the temporary restorations according to the existing incisal guidance, patient revealed a greater edge-to-edge relationship with minimal amount of overjet and overbite. Abrasion of the lower incisal edges led to a reverse incisal curvature / smile line giving the patient an aged appearance [Figure 6]. It was thus decided to alter the patient's existing incisal guidance to restore the

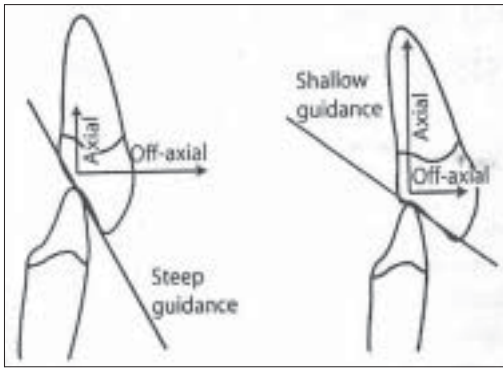


Figure 1: Steep incisal guidance leads to more off-axial forces

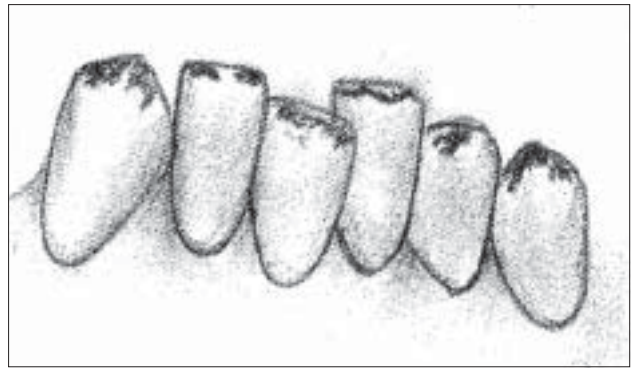


Figure 2: Markedly uneven incisal edge level of mandibular anterior teeth

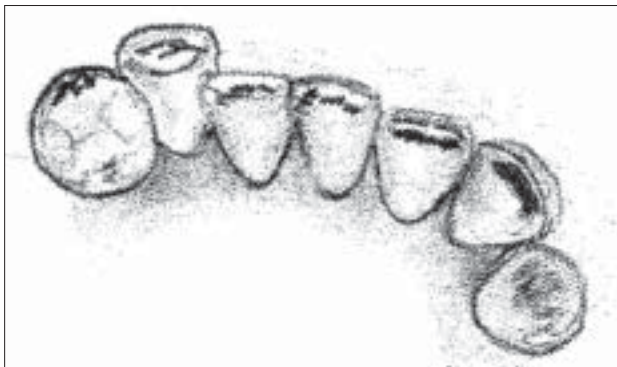


Figure 3: Rectangular arch form. Labiolingual curve with irregular positioning of teeth



Figure 4: Ovoid arch form. Labiolingual curve with irregular positioning of teeth



Figure 5: Preoperative view showing missing 21 and fractured 11



Figure 6: Reverse smile line on placement of first set of temporary restorations



Figure 7: Diagnostic wax up



Figure 8: Putty index to modify mandibular incisor plane

esthetics and function.

Face bow transfer was done. Maxillary and mandibular casts were articulated with the help of centric record on a semi adjustable, non-arcon type of articulator. Condylar guidance was set with the help of protrusive records.

Diagnostic wax-up was done to set up incisal guidance in harmony with condylar guidance and to create a template for making new temporary restorations [Figure 7]. New incisal edge positions and new length of the anterior teeth were established to provide desired amount of overjet and overbite. Lower incisal plane was adjusted according to the temporary restorations on the cast and a putty index was made of the altered cast [Figure 8]. The new temporary restorations were adjusted in the patient's mouth according to the esthetics, phonetics and function. With the help of the putty index the lower incisal plane was adjusted in the mouth. Selective grinding was done to eliminate centric and non-centric interferences. The vertical dimension was unaltered. A pleasing convex smile line in harmony with the lower lip was seen after placing the new temporary restorations. The patient was evaluated after 1, 4 and 6 weeks.

Once the anterior guidance had been established for esthetic and functional rehabilitation, final metal ceramic restorations were fabricated.

DISCUSSION

The anterior guidance sets the limit of the movement of the front end of the mandible.^[5] In this case after placement of the first set of the temporary restorations without altering the existing incisal guidance, the patient revealed reduced overjet with equally reduced overbite which could lead to stress concentration in the incisal edge area with possible chipping and fracture of the incisal margins in both the restorations and the natural dentition.^[6] Besides this, there was decrease in the length and the inter-incisal angles of the upper anterior teeth leading to discrepancy between the incisal plane and the curvature of the lower lip, creating a negative anterior space. The esthetic treatment involved reestablishment of correct incisal curvature in harmony with concavity of the lower lip by restoring adequate tooth shape and proportion.

The guidelines followed for long-term stability of the anterior guidance were:

- 1) Disclusion of all posterior teeth on protrusion.
- 2) Disclusion of all posterior teeth on the balancing side.
- 3) Stable centric holding contacts for each anterior teeth and
- 4) Position and contour of anterior teeth in harmony with the lip closure pathway and envelope of function.^[5]

The ultimate goal of a correct anterior guidance is that it should be comfortable, functional and stable even without posterior teeth contact.^[2,3]

CONCLUSION

Often the importance of establishing the anterior guidance is overlooked or misunderstood. In prosthodontic rehabilitation, the functional aspect must represent the starting point for achieving the optimal esthetics. Usually optimization of esthetics involves functional compromise, and idealizing the functional aspect implies an esthetic sacrifice. Achievement of ideal esthetics by restoring suitable forms and dimension should be combined with re-establishment of correct function.

REFERENCES

1. Schuyler CH. The function and importance of incisal guidance in oral rehabilitation. *J Prosthet Dent* 2001;86:219-32.
2. Ross IF. Incisal guidance of natural teeth in adults. *J Prosthet Dent* 1974;31:155-62.
3. Broderson SP. Anterior guidance: The key to successful occlusal treatment. *J Prosthet Dent* 1978;39:396-400.
4. Mizrahi B. The Dahl principle: Creating space and improving the biomechanical prognosis of anterior crowns. *Quintessence Int* 2006;37:245-251.
5. Dawson DE. Evaluation, diagnosis and treatment of occlusal problems. St. Louis: C.V. Mosby.
6. Fradeni M. Esthetic Rehabilitation in fixed prosthodontics. Vol 1. Quintessence Publishing Co, Inc.

Presentation at a meeting: 8th Goa State Dental Conference, September 2007.

Source of Support: Nil, **Conflict of Interest:** None declared.