

“Location Of The Neutral Zone Using Thermoplastic Impression Material”

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Abstract

The neutral zone is a dead space within the orofacial musculature where the forces created by the muscles are equal or, incorrect terms, non-existent. The various techniques that vary from the material used, the indication of patients, the stage of denture construction, and cost-effectiveness have been described. We present an even simpler technique in this article that requires routine materials used during complete denture fabrication. The technique utilizes self-cure denture base acrylic resin for trial denture base on which heat softened impression compound is placed. No need for retentive devices is required. The vertical dimensions are maintained by mounting previous fabricated occlusal rims on an articulator while the contours are transferred using a putty index. The technique can be mastered by even undergraduate students.

Keywords — xerostomia, complete denture, denture processing, elastomeric impression material

I. INTRODUCTION

One of the oldest anatomical concepts that are functional biologically in dentistry is the concept of a neutral zone. Its importance can be gauged by the fact that even natural teeth that have their roots embedded within the alveolar bone may also succumb to the muscular pressures if they encroach the space occupied by orofacial musculature. The normal functions of the oral cavity are basically a synergistic action of the muscles of the tongue, cheeks, lips, or the floor of the mouth and are highly complex. ^{1,2} they are also thought to be individual for each person, thus making them an important area of patient evaluation. Their importance in complete denture fabrication is usually seen in conditions like parkinsonism, ³ where they are thought to play a major role that determines the success or failure of a prosthesis. While authors have stated that the first step in carrying out any treatment should always be based on patient evaluation, ⁴ it is not easy to evaluate the effect of the neutral zone on a treatment clinically. The zone is defined basically as a potential space between the lips and cheeks on one side while the tongue is on the other side. ⁵ Its importance is even seen in orthodontic treatment, where most of the relapses are basically associated with treatment

not complying with the forces of the neutral zone. ⁶ various techniques have been described in the literature that ranges from the use of different materials to different methods of retaining the material while recording the neutral zone. ^{7,8} It also has been defined for certain abnormal conditions like partial glossectomy. ⁹

This article describes a new innovative technique of recording the neutral zone using a thermoplastic impression material which requires minimal equipment material and can be done by any dental practitioner in his daily practice. The important aspects of the training are the dentist's ability to extract the best functional performance from the patient rather than the technique itself.

Technique

- Step 1:** The technique described here is for conventional complete denture prosthesis that can be performed at the time of jaw relations. Clinical and laboratory steps for this technique fall within the normal steps of complete denture fabrication. All steps are the same till the jaw relation record when the vertical dimensions of the occlusal rims have been established. After recording the vertical dimensions, the mandibular occlusal rims are stripped of the wax (an alternative to this would be to fabricate another set of trial denture bases and carry all the steps of recording neutral zone on the duplicate denture base).
- Step 2:** For this technique, it is imperative that a well-fitting trial denture base is fabricated preferably of self-cure denture base resin using a sprinkle-on method. The denture base should also have an adequate thickness (2mm), especially at the crest of the ridge where the grooves for retention of the material are made. Once the trial denture base is evaluated for the above-mentioned criteria, multiple horizontal grooves are placed in a lab lingual direction on the denture base that covers the crest of the residual alveolar ridge (Fig 1 A)
- Step 3:** Mount the occlusal rims on an articulator (mean value) with correct vertical dimensions. Substitute the mandibular occlusal rims with a duplicate denture base and place softened impression compound on the denture base and close the articulator, thus transferring the vertical dimensions on the compound mandibular occlusal rims. With



material still soft, instruct the patient to perform the necessary functional movements of the lips and cheeks (puffing, blowing, swallowing, etc.) once the compound mandibular rims are placed on the residual alveolar ridges.

4. *Step 4:* Remove excess once the material is hard and outline the excess that is beyond the confines of the maxillary opposing occlusal rim (Fig 1 C). Place the rims on the master cast (Fig 1 D) and check for accurate adaptation of the trial denture base.
5. *Step 5:* Using putty elastomeric impression material, prepare a putty index around the labial and lingual surface of the mandibular occlusal rims and remove the compound from the occlusal rims while pouring softened modeling wax within the putty index.
6. *Step 6:* The labial and lingual borders of the final denture are thus established and should not be altered during teeth arrangement; otherwise, the neutral zone recording will be lost

Conclusion

The technique described in this article is simple and easy to master since routine materials are used. The technique utilizes the retentive ability of impression compound to denture acrylic and therefore does not require adaptation of orthodontic wire on the trial denture base. The adaptation and incorporation of the wire retention mechanism are time-consuming and difficult to master. The technique follows the scientific principles of recording neutral zone

and can be taught to undergraduate students when materials are deficient.

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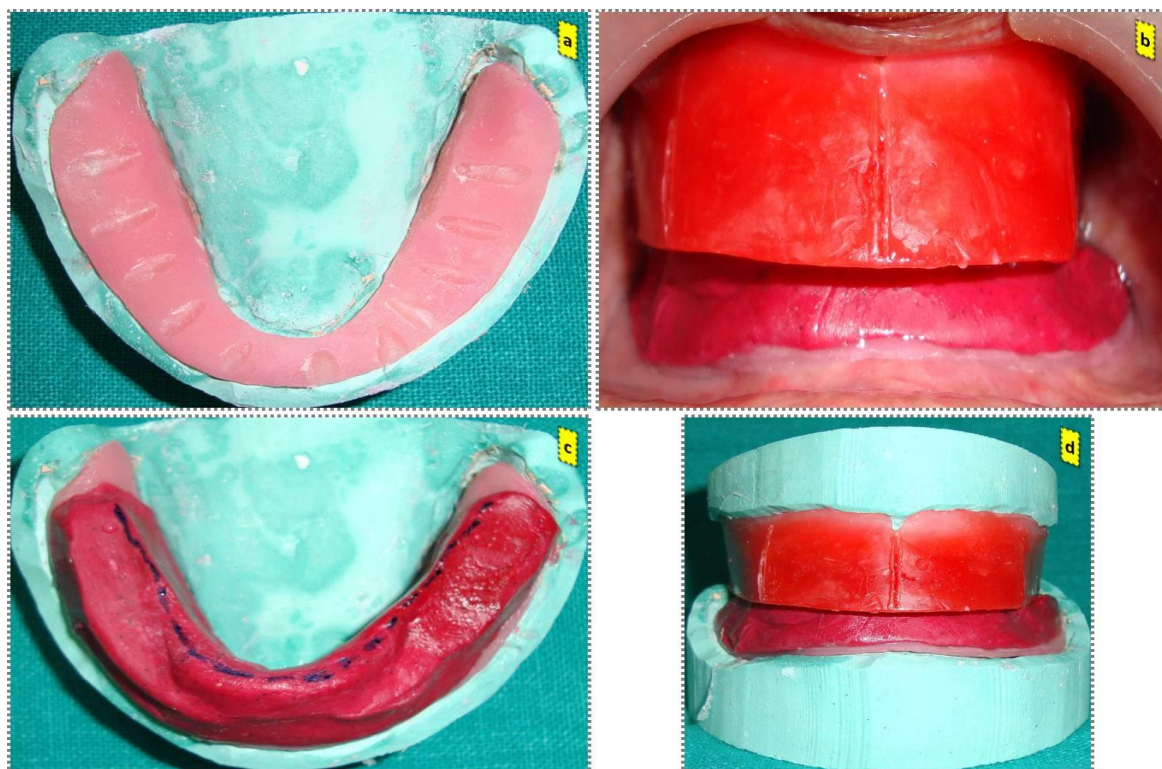


Figure 1: (A) Trial denture base with horizontal grooves for retention (B) Maxillary wax and mandibular compound occlusal rims after recording neutral zone (C) Outline of excess material that needs to be removed (D) Final occlusal rims with neutral zone recorded