

## A Simplified Approach for Recording Neutral Zone

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**Abstract** Neutral zone technique is long being used for the management of severely resorbed mandibular ridges. Various materials are used in recording neutral zone, which have their own advantages and disadvantages. This article discusses the use of Polyether impression material which is simpler and more practical.

**Keywords** Neutral zone · Poly-ether · Severely resorbed mandibular ridges

### Introduction

Neutral zone is defined as that area or position where the forces between the tongue and cheeks or lips are equal [1]. We should not be dogmatic and insist that teeth be placed over the crest of ridge, buccal or lingual to the ridge. Rather teeth should be placed as dictated by the musculature, and this will vary for different patients [2]. The influence of tooth position and flange contour on denture stability is equal to or greater than any other factor. Recording neutral zone is most required for patients where there is a highly atrophic ridge. Various materials like tissue conditioners [3], Impression compound [4], Waxes [5], Impression plaster [6] have been advocated to record neutral zone which has their own advantages as well as disadvantages. The present article discusses polyether as a material of choice recording neutral zone which is much simpler and more practical.

### Technique

1. Maxillary and Mandibular primary impressions are made in stock trays using Impression compound (DPI PINNACLE, The Bombay Burmah Trading Corporation, Mumbai). Custom trays are fabricated in autopolymerizing resin (Rapid Repair Powder; Dentsply India, Gurgaon) and final impression taken in zinc oxide eugenol impression paste (DPI Impression Paste, The Bombay Burmah Trading Corporation, Mumbai) after border moulding. Jaw relation records are then recorded using conventional occlusal rims made of modelling wax (HIFLEX-Modelling Wax, Prevest Denpro Limited, Jammu, India) and occlusal blocks are mounted on semiaadjustable articulator.
2. An additional autopolymerizing resin mandibular denture base is fabricated and is attached with retentive loops made of thin orthodontic wire in the centre. Two vertical pillars made of low fusing compound (Tracing Sticks, DPI PINNACLE, The Bombay Burmah Trading Corporation, Mumbai.) are placed in First molar region at established vertical dimension (Fig. 1). This autopolymerizing resin base is placed in the mouth, checked for stability and ensured that loops and vertical pillars do not interfere with muscle movements during function [6]. Maxillary occlusal rim is placed back in the mouth.
3. Poly ether impression material of medium-bodied consistency (3 M ESPE, Impregum™ Soft, St. Paul, Germany) is placed over the base and inserted in the mouth and patient is instructed to perform all muscle functions by sucking and swallowing movements and by producing exaggerated ‘EEE’ and ‘OOO’ sounds [6]. Excess material if any will be displaced upward in the upper denture space from where it can be easily

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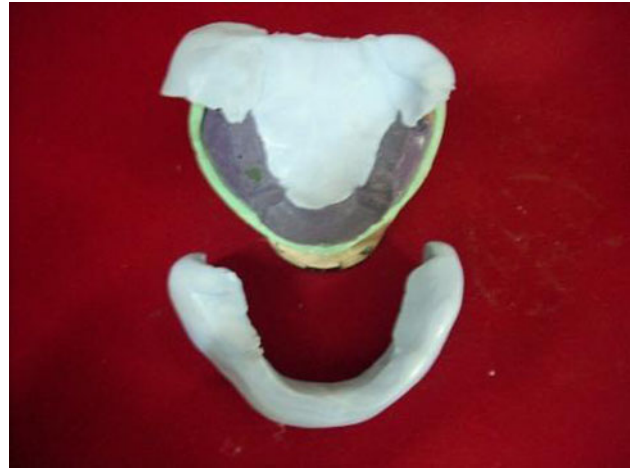
**Fig. 1** Mandibular denture base with retentive loops and two vertical pillars

removed. In case of insufficient material, additions can easily be made using extra material and the process is repeated. The final record should be perfectly stable in place (Fig. 2).

- The impression of denture space is placed over the mandibular master cast. Indexing is made on side and centre of the land area of cast. Lingual matrices of this denture space is made using silicone putty (Aquasil, Soft putty/Regular set, Dentsply DE TREY, Germany). Putty is adapted into the tongue space of the neutral zone record so that it is in level of occlusal plane of record and extends over the posterior land area of cast. Likewise facial matrices is developed along the facial contours of the neutral zone record. Once polymerized, putty matrices is sectioned and removed from the cast (Fig. 3). Poly ether material is removed from the base and replaced with wax using putty matrices (Fig. 4).



**Fig. 2** Neutral zone recorded with Poly ether impression material



**Fig. 3** Matrices of denture space made using silicone putty



**Fig. 4** Polyether replaced with modeling wax in silicon putty matrices

- Neutral zone limits the labial position of the mandibular anterior teeth. The mandibular posterior teeth are arranged first. They must be positioned within the neutral zone and to the proper height of the occlusal plane as established on the polyether occlusion rim with the Putty matrices in position. However position of maxillary anterior teeth can be modified based upon the esthetic and phonetic requirements of the patient. The upper posterior teeth are then positioned. Care must be taken that the occlusal surfaces of the upper posterior teeth fit perfectly against the occlusal surfaces of the lower posterior teeth.
- Carefully remove wax apical to denture teeth on the facial and lingual aspect of the mandibular trial denture. Apply zinc oxide eugenol impression paste onto the facial aspect of mandibular trial denture and carefully place it in the patient's mouth. Instruct the patient to pucker the lips forward, smile broadly. Have



**Fig. 5** External impression of mandibular Trial denture with zinc oxide eugenol Impression paste

the patient repeat these movements several times. Remove the trial denture and evaluate the impression. Similarly external impression of the lingual aspect of mandibular denture is made with zinc oxide eugenol impression paste. Remove the trial denture and examine denture flange dimensions and extensions (Fig. 5). Trim the excess material and eliminate all material covering the denture teeth.

7. Flasking, processing, finishing and polishing of denture is then done using conventional method [7].

## Discussion

Providing stable mandibular dentures for patients with severely resorbed mandibular ridges is a challenge. One can overcome this problem if dentures are fabricated with their contours harmonizing neutral zone. The aim of neutral zone technique is to construct a denture in muscle balance. That is a denture which is in harmony with its surroundings to provide optimum stability, retention and comfort. A denture shaped by neutral zone technique will ensure that the muscular forces are working more effectively in harmony and gives advantage of stabilizing potential of oral and perioral musculature.

Various materials have been recommended by different authors for recording neutral zone. Kursoglu [3], Beresin and Schiesser [8] recommended tissue conditioners for recording neutral zone. Since tissue conditioners does not have body, one finds it difficult to use even after supporting it with wire loops. Impression plaster advocated by Johnson [6] is messy and cumbersome to use and fractured

fragments of plaster can be swallowed by patient while performing functional movements. Beresin and Schiesser [4] used modeling plastic for recording neutral zone. Uniformly reheating the modeling plastic occlusal rim is critical for success. If this step is not performed exactly, an incorrect occlusal vertical dimension may result. Use of polyether impression material when compared to other recommended materials for recording neutral zone is a material of choice since it has sufficient body, good flow, easy to use, less time consuming and no chance of fracturing or swallowing. Beresin and Schiesser recommended building of two occlusal pillars with self-cured acrylic resin on the lower arch that are to be moulded and adjusted to the correct vertical height using green stick so as to give the usual 3 mm freeway space [8]. In the present technique two vertical pillars with low fusing compound in the first molar region are fabricated on additional denture base with retentive wire loops in the anterior region on the articulated casts opposing maxillary rim at a determined vertical height. This provides comfort and prevents overclosure of the mandible while recording neutral zone with less chair side time.

## Summary

This article presents a simplified approach in recording neutral zone using polyether impression material. Polyether has the advantage of moderate viscosity to record neutral zone over other conventionally used materials.

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