

## Complete denture fabrication using piezography technique for resorbed ridges: A Case Report.

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### Abstract

The utility of a complete denture prosthesis is dependent on arrangement of the teeth. But the lack of denture bearing area in the mandibular ridge possess a challenge for the dentist especially in case of long time edentulousness where the alveolar ridge has resorbed significantly. Hence, tissue coverage for denture base is less in such cases. Fabrication of complete denture in the neutral zone technique provides stability and allows an individual to perform all the function of mastication, speech. The neutral zone is that area in the mouth where, during function, the forces of the tongue pressing outward are neutralized by the forces of the cheeks and lips pressing inward. This zone can be achieved by swallowing technique or by piezography technique. In piezography technique, an individual is trained to pronounce different phonemes. This produces pressure of the tongue and the cheek muscles and the neutral zone area is reproduced on a moldable material.

**Keywords:** Piezography, residual ridge resorption, neutral zone, complete denture.

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### Introduction

It is agreed upon that an exact replica of the edentulous arches and its adjacent functional structures is a prerequisite for a complete denture. Without a good primary impression, providing patients with idyllic function, comfort, and aesthetics is impossible. The mandibular denture commonly presents the most trouble as atrophy rate of the mandibular ridge is much greater than the maxilla. The denture bearing area of the mandible being much less, possess less chance of retention and support.<sup>[1,2]</sup> Despite the fabrication technique used, improper contour of denture base, lack of tissue coverage or faulty tooth arrangement results in poor retention, stability of prosthesis and ultimately lead to prosthesis failure.<sup>[3]</sup> Beresin and Schiesser suggested the use of the neutral zone concept to harness posterior teeth positioning and contouring of denture base.<sup>[4]</sup>

Piezography was a term coined by Klien in 1974 which means “A shape Formed by Pressure”. He recorded the neutral zone by speech.<sup>[5]</sup>

### Case Report:

A 78 years old male patient came with a chief complaint of difficulty in speaking and chewing food (Figure 1 and 2). On intraoral examination, the patient presented with a severely resorbed mandibular ridge (Figure 3 and 4). He also reported of being edentulous for last 10 years. A conventional denture fabrication could not be possible hence, denture fabrication with piezography technique was followed.

In piezography technique a moldable material is introduced on to the denture base in order to achieve shape of the neutral zone of an individual by functional muscle forces. At first the primary impression for the maxilla was made using Y-DENTS

impression compound. Mandibular impression was made using McCord and Tyson's technique.

After making secondary impression and fabricating the master cast, the occlusal rims were made. Coronally, the maxillary occlusal rim was adjusted parallel to interpupillary line and sagittally, parallel to ala-tragus line, the smile line was adjusted,<sup>[6]</sup> midline and canine areas were marked. After establishing the vertical relation at rest and vertical relation at occlusion, a functional impression in closed mouth technique was made with Orthoplast Acryton Soft Liner material in the mandibular ridge (Figure 5).<sup>[7]</sup> With the upper and lower occlusal rim in centric bite, Cast was poured for the mandibular ridge. The assembly of maxillary and mandibular casts with the denture bases in patient's tentative centric bite was set up on a mean value articulator. Retentive grooves were made after removing wax from the lower denture base (Figure 6).

This method was based on phonetics; hence patient was directed to practice articulating some phenomes in order to shape the material inserted in mouth providing prosthodontic space. After inserting upper occlusal rim into the mouth, Orthoplast Acryton Soft Liner material was applied first on both sides of the denture base and the base was introduced into position (Figure 7).

The patient was requested to say "SIS" 5 times and "TO" subsequently in order to obtain the posterior molding. For anterior piezography, same material on the anterior part of the denture base is introduced patient is asked to speak "T,D,M,P" 5 to 6 times in a succession. Later, patient is asked to pronounce "VOWELS"- A,E,I,O,U for 5 times sequentially.

The excess material was removed. Analyzing the piezography it was noted that impressions were created by the lateral border of the tongue and the apex of the tongue on the dam.

Also, the piezography of the vestibular space was created by the action of the buccinator and the masseter muscles. The neutral zone achieved by piezography technique gave an idea about the space available for posterior teeth arrangement (Figure 8).<sup>[8]</sup>

The impression of denture space is set over the mandibular master cast. Three ditches were made in the mandibular cast index. The indicators for the neutral zones are made of dental plaster to aid in teeth arrangement.

The molded rim was then separated from the record base after placement of plater index, Molten wax was poured in the mold created by the soft liner (Figure 9). Teeth arrangement was done with monoplane teeth in order to reduce the harmful forces of occlusion (Figure 10). After try-in was done (Figure 11, 12 & 13). Wax was removed from apical part of artificial teeth on the labial and palatal aspect of the maxillary and mandibular trial dentures.

On the labial aspect of the maxillary and mandibular trial dentures, zinc oxide eugenol impression paste is applied and carefully placed in the patient's upper and lower arches. Patient is ordered to make few movements and repeat them several times e.g; pout the lips, smile widely. Similarly external impression of the palatal sides of the maxillary and mandibular dentures respectively are achieved with ZOE impression paste. Thus, the external contours of denture bases were recorded, excess material was trimmed (Figure 14).

Dentures were flaked and processed. Conventional method is followed while finishing and polishing the denture. During insertion, the minor processing errors were corrected, post insertion instruction were given and follow up was done and outcome was found satisfactory (Figure 15, 16 17 and 18).

**Conclusion:**

Piezography is the method of recording the neutral zone with as accuracy for construction of the complete denture on severely atrophic ridge. It is useful especially in individuals for whom dental implants are not permissible either clinically or due to patient's financial limitation.

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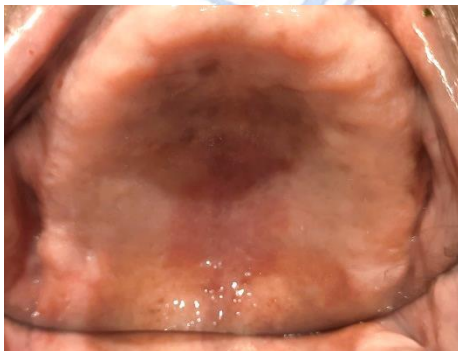
**FIGURES**



**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**



**Figure 5**



**Figure 6**



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12



Figure 13



Figure 14



Figure 15



Figure 16



Figure 17



Figure 18