

# Piezography: A Boon For Edentulous Mandibular Atrophic Ridges (a Case Report)

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### Abstract:

Conventional mandibular denture is usually less retentive than the maxillary one & successful treatment involves the development of lingual retention for the same. Several methods have been developed to enhance denture retention and comfort during speech and mastication.

Piezography in complete denture fabrication is a technique used to **record shape by means of pressure**, that is method of recording patient's denture space with respect to oral function. The term Piezography was coined by "Klein" in 1974 from a Greek term meaning "A shape formed by pressure".

The present article describes Piezography as a method to enhance retention, stability and function for the mandibular denture through a case report.

**Keywords :** Piezography, Retention, stability, speech, Neutral Zone, Impression compound, semi adjustable articulator, face bow.

### Case Report

An elderly female patient aged 75 years, came to the Department of Prosthodontics, Sardar Patel post graduate institute of Dental and Medical sciences Lucknow, with the chief complaint of loose lower denture, inability to chew and the lower denture comes out while speaking. On oral examination it was seen that the patient had severely resorbed mandibular ridge, loss of vertical dimension and loss of muscle tonicity. Conventional method was not considered and we decided to implement piezographic technique to manage the case.

Piezography is a technique used to record shape by means of pressure. It involves introduction of a moldable material into the mouth to allow unique shaping by various functional muscle forces. Denture space is recorded by Speech in this technique.

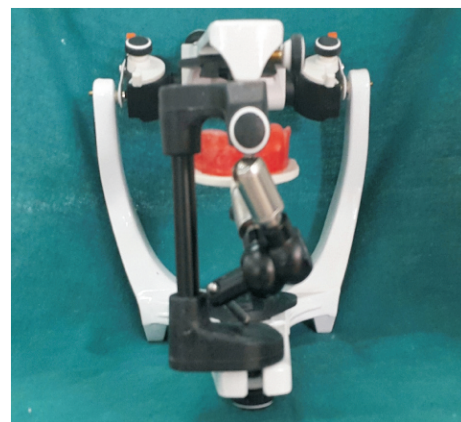
The preliminary steps were performed following the conventional procedures.

Primary and final impressions were made for both the maxillary and mandibular ridges. Wax occlusal rims were fabricated

The upper rim was adjusted parallel to the camper's line and 2mm incisal visibility was established.

VDO and VDR were recorded, freeway space of 3mm was maintained.

Orientation jaw relation done and Face-bow transferred to semi-adjustable articulator.



The piezographic method was carried out from this step onwards. For piezographic recording, a mandibular occlusal rim over conventional acrylic record base using high fusing impression compound was made.

Rim surface that came in contact with tongue, cheek and lip muscle activities during phonetics with low fusing impression compound was softened over the Bunsen-burner flame to easily mold the compound rim and register muscle activity.

Since the technique was based on phonetics, the patient was made to practice pronouncing some of the phonemes before it was actually implemented. speech exercise helped to mold the compound rim inserted in mouth providing the prosthodontic space.

The patient was asked to say "SIS" 5 times followed by "TO" in order to obtain posterior molding.

Anterior Piezography was obtained by asking the patient to speak "T,D,M,P" 5 TO 6 times in a sequence clearly and vigorously, then patient is asked to pronounce "VOWELS"- A,E,I,O,U for 5 times in a sequence clearly and

### Introduction:

The lower denture commonly presents the most difficulties such as pain and looseness being the most common complaints(1). This is because the mandible atrophies at the greater rate than maxilla and has less residual ridge for retention and support.(1) Piezography in complete denture fabrication is a technique used to record shapes by means of pressure. It is a method of recording patient's denture space in relation to oral function.(2) Increasing age related reduction in adaptability and progressive severe mandibular resorption, all adds to difficulty in achieving prosthetic success.

Conventional mandibular denture is usually less retentive than the maxillary one & successful treatment involves the development of lingual retention for mandibular denture.

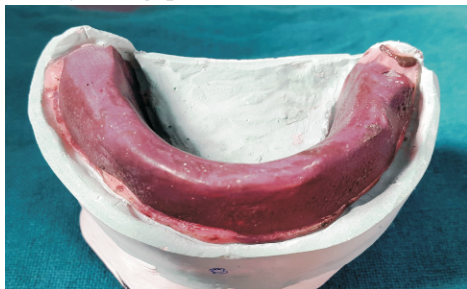
One of the philosophies was introduced to overcome the challenge of unstable denture in clinics was the concept of "Neutral Zone". The neutral zone concept was based on neuromuscular control on the polished surface of denture and positioning the teeth in space where the oral musculature and tongue forces are nullified by each other.

However the conventional as well as the functional techniques have certain demerits. Therefore "Klein" in 1974 introduced a method named Piezography which recorded the prosthodontic space for teeth placement using speech. In the following case report we have implemented the Piezographic technique in the fabrication of mandibular complete denture in a patient with long standing edentulous and severely resorbed mandibular ridge.





slowly. Neutral-zone impression made by the technique of Piezography: Molding on the surface of occlusal rim following the muscle activity during speech.



Mandibular rim articulated with maxillary rim.



### Laboratory Steps:

3 ditches were made in the mandibular cast index.

Place silicon putty index around the molded impression compound rim.

The molded compound rim was then separated from the record base after placement of putty index.

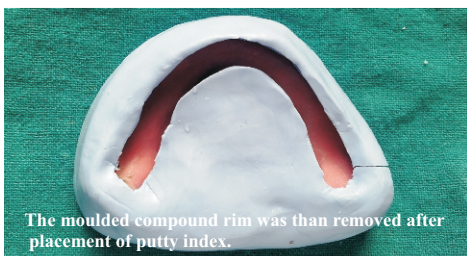
Molten wax was poured in the mold created by the compound rim.

Teeth setting was done with monoplane teeth in piezographically recorded prosthodontic space.

Try-in was done and dentures were acrylised.



Putty index made on piezographic impression along with cast



The moulded compound rim was then removed after placement of putty index.

Molten wax was poured in the place mould created by the impression compound rim.



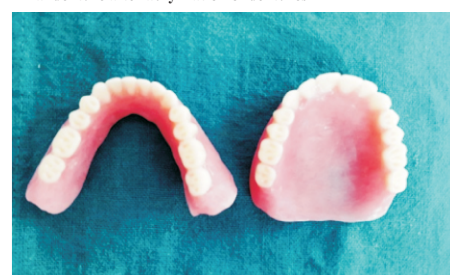
Teeth setting done in piezographically recorded Neutral-Zone area.



After complete maxillary and mandibular teeth setting with Monoplane teeth.



Final denture after acrylization of dentures



Patient after denture insertion with enhanced aesthetics, function and phonetics



### Discussion:

One of the philosophies that was introduced to overcome the challenge of unstable denture in clinic was based on "Neutral Zone". Neutral zone concept was based on

neuromuscular control on the polished surface of the denture and positioning the teeth in space where the oral musculature and tongue forces are nullified by each other.

However the conventional as well as functional techniques have certain demerits therefore Klein in 1974 introduced a method named "Piezography" which recorded the prosthodontic space for placement using speech. The bucco lingual tooth position and the contours of the polished surface are important for the denture stability.

The idea behind positioning teeth in neutral zone has 2 objectives:-

- The teeth will not interfere with normal muscle function
- The force exerted by the musculature against the denture will be more favourable or stability and retention.

Piezography helps to record the neutral zone. The denture based on piezography is more stable than the other conventional and functional techniques like swallowing.

Since a person speaks much more than he/she involves in swallowing, we should follow phonation method more often to fabricate denture for more stable denture prosthesis.

The bucco lingual centre of the occlusal table obtained by piezography technique for fabrication of complete denture is generally located slightly to the buccal of the residual alveolar ridge.

It is observed that speech exercise helped moulding the material that was inserted in the mouth providing the prosthodontic space

### Conclusion

Piezography is a method of recording neutral zone with much precision for the construction of complete denture on highly atrophic ridges.

It is specially useful in cases where dental implants are not possible.

The aim of piezography is to construct a denture in muscle balance, as muscular control will be the main establishing and retentive factor during function and speech. The technique is relatively simple but there is increased chair time and lab cost.

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