# Neutral zone

# Introduction

Surgery of maxillary tumors including all the teeth and radiation therapy procedures lead to severe morphological and histological damages of the oral cavity such as:

- interruption of the bearing surfaces,
- Asymmetrical interlabial gap,
- increase of bone resorption,
- mouth opening limitation,
- reduction in salivary flow

Despite these local conditions, the medical team should keep in mind that a successful oral rehabilitation requires the restoration of speech, deglutition and mastication by providing a stable prosthetic base [2].

Undeniably, loosening of both maxillary or Mandibular M.F.P. may be caused by shortened retracted upper lip and defected tongue mobility

Neutral zone technique may solve this problem by setting the polished surfaces in the space where the displacing forces of lips, tongue and cheeks are balanced leading to individualized design of the prosthesis for each patient [3].

All the other options of stabilizing denture like implant treatment is not always possible for patients who are
medically compromised,
anatomically deficient and
economically depressed,
despite the recent advances in the medical care

Based on two clinical cases of mandibular and maxillary surgeries, we will describe the different steps of M.F.P. using neutral zone technique.

## Case report 1

A 74-year-old male patient was referred to the maxillo-facial prosthodontic department at the University of Monastir, Tunisia for oral rehabilitation (Figure 1). The medical history revealed surgical resection of an epidermoid carcinoma, performed in the maxilla one year ago.

Intraoral examination showed full edentulous ridges with lateral anterior maxillary defect leading to a large communication between oral, nasal and sinus cavities (Figure 2). This situation resulted in nasal regurgitation of food and liquid, inability to masticate properly and impaired speech. Furthermore, the patient was dissatisfied with his distorted facial appearance due to an asymmetric upper lip retraction; this heavy psychological burden worsened his social abilities

The therapeutic decision was the fabrication of a palatal obturator using semi-piezography technique.

The treatment procedure was explained to the patient, and then impression was taken

custom-tray made by self-cure-resin, the secondary impression was performed (Figure 3).

The record base with wax rim was prepared in order to realize the occlusial record: the anterior wax rim height was 2 mm below the lip at rest .

Then, the anterior sector of wax rim was adapted according to the esthetic and phonetic principles, touching the wet line of the lower lip while articulating ‘F’ or ‘V’. The posterior aaprt was oriented also .

Now we can do the modification of nz The thickness of the anterior flange of the maxillary record base was reduced between the first premolars until transparency is reached

5 mm of wax was removed from the buccal side of the anterior rim in order to create space for the piezographic materiel (Figure 6 and 7).

The peizographic material was loaded on the rims and modelling process was initiated by

- encouraging maximum mouth opening,
- after which patient was asked to pronounce the phonetics “P, B and M”. The objective was to obtain the shape of the anterior buccal flange according to the contractile pressure of the orbicular muscle of the upper lip (Figure 8).

This procedure was repeated vigorously until the materiel was properly trimmed and the excess was eliminated (Figure 9).

Lastly, Anterior occlusion plane was set in line with the most concave portion of the upper lip impression and maxillary anterior teeth were set according to the plaster index (Figure 10).

Try-in was done, the stability, esthetics and satisfactory results were evaluated.

# Case report 2

The second case reports the management of a mandibular resorbed ridge with neutral zone technique.

- A female patient aged about 76 years old was referred to the same department for complete denture restoration (Figure 11 and 12). The patient was given radiotherapy after tongue cancer (75 Gyin 30 fractions). Intraoral examination revealed that the mandibular ridge was severely resorbed. In addition to this, the right-side tongue mobility decreased after partial glossectomy while the left side remains hypertonic (Figure 13).

The therapeutic decision was the construction of complete denture using neutral zone technique.

Primary and secondary impressions was performed according to the conventional methods, the record bases were made and carefully adjusted for stability and comfort (Figure 14).

The piezographic material was an acrylic resin, which was hand-mixed, seated over the mandibular record base, and inserted intra-orally: The patient was asked to pronounce the phonetics (So, Six, Se, De, Te) until the material sets (Figure 15).

This wall of resin so obtained is called piezogram or piezographic dam (Figure 16).

The lateral border of the tongue created an impression on the dam which gave information about the situation of the posterior occlusal plan.

Next, the excess of the resin over that curve was removed; 1 mm of the dam thickness was trimmed buccolingually (Figure 17).

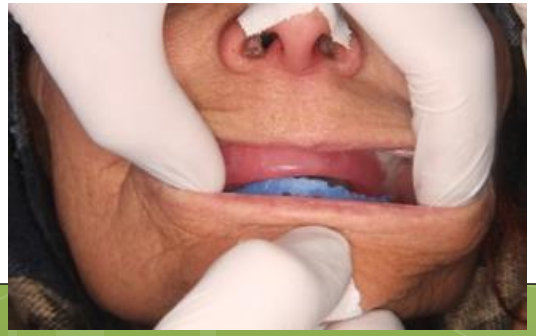
Multiple perforations were made in the piezogram using a 2 mm round bur to help in the retention of the silicone (Figure 18).

Hard liner silicon base was loaded over the dam, and inserted

in the mouth. In the next step, the subject was asked to repeat

the same sequence of phonetics. The mandible was guided close to centric relation position and occlusal vertical dimension for squeezing the impression materiel.

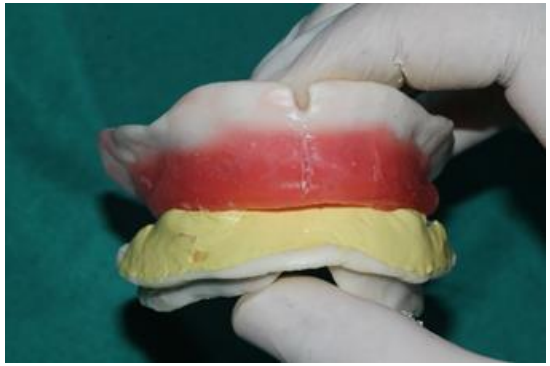
The both record bases were removed from the mouth, placed on their master casts and keyways were prepared.



Then, the piezographic support was removed from the mouth and examined:

thickness, contours and shape of the polished surfaces were captured, in greater details, by the action of the lips, the cheeks and the tongue. External and internal pressure was exerted by these muscles on the resin and was modeled into state of neutral balance.

Artificial teeth arrangement was made according the neutral zone indices with plaster of paris.



## Conclusion

Piezography is still a relevant technique for treating post-oncological unfavorable anatomy. Indeed, the neutral zone technique is used to carve out the appropriate space for teeth arrangement

when constructing a denture in muscle balance, which may enhance the prosthesis stability, improve comfort and ensure masticatory function.

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# Thank you