# Alternative Procedure to Improve the Stability of Mandibular Complete Dentures: A Modified Neutral Zone Technique

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The aim of this report is to describe an alternative technique to record the neutral zone. An acrylic resin base with posterior occlusal rims was applied using a thermoplastic denture adhesive. After being worn for 2 days, the base was transferred into an acrylic resin complete denture. Most patients reported an improvement in denture stability and a reduction of pressure sores. This procedure seems to be helpful to improve denture function, especially in the mandible, in patients who cannot be treated with implants. However, because of its complexity, this neutral zone technique cannot be recommended for routine clinical use. *Int J Prosthodont 2012;25:506–508.*

If an edentulous patient has problems with his or her dentures, the mandibular denture is almost always the cause for complaint. In such instances, dentures must be predominantly stabilized muscularly[1] in an area where the teeth are located in a balance between the muscular systems of the tongue and cheek. This area is called "the neutral zone"[2] and was first propagated by Fish.[1] Beyeler[3] described a technique to identify the neutral zone. He used close-fitting trays in both arches and connected them to a single unit using pins after a preliminary arch recording. Subsequently, he used this monoblock for the master impression. However, this technique was not accepted in daily practice. To avoid the problematic monoblock, the authors decided to focus on the more difficult mandibular denture. In patients with compromised ridges, long-term impression techniques have been proven favorable, and the recording of the neutral zone can be expected to be more successful if it allows for casting over a longer period of time. Therefore, the aim of this study was to develop a way to locate the neutral zone using a long-term impression technique.

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## Materials and Methods

A functional maxillary denture with the anterior teeth arranged according to esthetic principles[4] is a prerequisite for this neutral zone recording technique. After alginate (CA37, Cavex) impressions of the edentulous mandible and maxillary denture were taken, a close-fitting base with a wax rim was fabricated (PalaXpress, Heraeus Kulzer) on the mandibular cast. With this, the arch relation was recorded,[5] and the casts were mounted in an articulator. A custom acrylic resin base with posterior acrylic resin rims for occlusal support (Fig 1) was manufactured. Cushion Grip (Merck), a thermoplastic denture adhesive that has proven suitable for this purpose, was plasticized in hot water (70°C) and applied to the lower and upper aspects of the acrylic resin base (Fig 2). Patients were instructed to wear the base as much as possible over the following 2 days to allow the material to adjust to the neutral zone. Written hygiene instructions were given to the patients, who were asked to handle the base carefully when taking it out and to rinse it only under tap water for cleaning purposes.

During the next appointment, a seal molding (Xantopren Light/Medium, Heraeus Kulzer) was performed. Thereafter, the base was coated with a thin layer of separator, flasked (Octa-Mol, Heraeus Kulzer), and transferred into an acrylic resin denture blank (PalaXpress) using the fluid resin technique. The denture blank was given to the patients, who were asked to wear it for several days as a try-in period (Fig 3).

If the patients were satisfied with the stability of the denture blank, silicone matrices of the occlusal

**Fig 1** Acrylic resin base with posterior occlusal rims, which help to fix the vertical dimension of occlusion.

**Fig 2** Cushion Grip thermoplastic relining material applied to the base in situ.

**Fig 3** Denture blank in situ.

**Fig 4** Completed denture in functional balance with the accessory masticatory muscles.

rims were fabricated, and the rims were subsequently removed and substituted with acrylic resin denture teeth (Fig 4). Finally, a Gothic arch registration was carried out to adjust the occlusion. If necessary, the posterior teeth of the maxillary denture were replaced using the mandibuar posterior teeth as a matrix to ensure stable occlusion.

All patients were asked to rate the improvement in denture stability in general, while speaking, and while chewing. Additionally, the frequency of pressure sores was rated.

## Results

Five patients (mean age: 61 years) were treated with this protocol. All patients had unsatisfactory previous conventional treatment with new dentures, and implant treatment was not an option. Four patients reported an improvement in denture function (Fig 5). Only one patient described his situation as unchanged. The perceived frequency of pressure sores presented similar results.

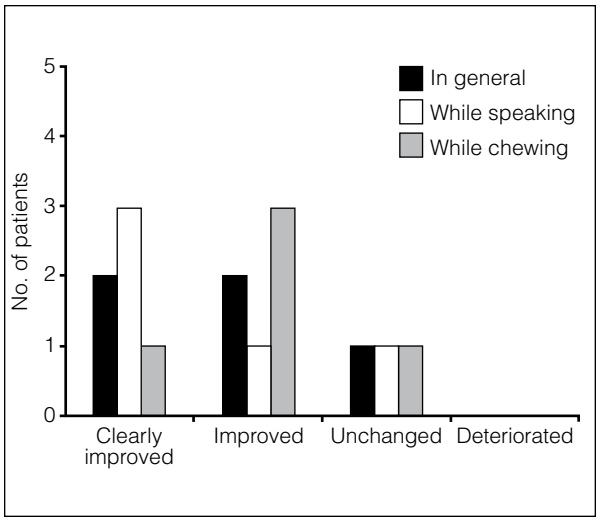


**Fig 5** Patient assessment of denture treatment. Because of the small number of patients, statistical analysis was deliberately omitted.

## Discussion

In contrast to Fahmy and Kharat,[4] who reported that conventionally fabricated complete dentures were superior regarding mastication when compared to a neutral zone recording technique, the patients in this study showed a notable improvement in masticatory function, which may have resulted from the long-term impression technique. It is hypothesized that conventional functional impression techniques may not allow sufficient time to register the entire spectrum of physiologic movements and thus may only represent a part of the functional situation.

Nonetheless, some minor problems did occur with this approach. Special attention had to be paid to the fitting of the acrylic resin base, and the borders had to be adapted so that the appliance would not dislodge during movement of the tongue or cheek. Another problem occurred when the patients wore the base lined with the thermoplastic material during eating. Since food was consistently being impacted into the material, it is suggested that patients remove the base while eating and use their old dentures instead.

Overall, this technique requires extensive instructions to the patient as well as the dental technician and is decisively more demanding than conventional procedures. However, since most patients reported improved denture function, the described procedure seems to be worth considering as an alternative in problematic edentulous patients. The procedure can also be carried out in the maxilla, but its application in both arches at the same time has proven unsuitable since the impression material in the maxilla and mandible was adhered to a monoblock and thus cannot be recommended.

## Conclusions

Because of its complexity, the neutral zone technique described cannot be recommended for routine clinical use. However, it is a good alternative to improve the function of mandibular dentures and to enhance patients' quality of life when implant treatment is not an option.

## References


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*Literature Abstract*

**The relationship between self-reported oral health, self-regulation, proactive coping, procrastination, and proactive attitude**


The aim of this study was to investigate the relationship between self-regulation, proactive coping, procrastination, proactive attitude, perceived oral health, and self-reported oral health behaviors. A definition of the mentioned personality traits is given. One hundred ninety-eight first-year medical students were invited to participate in the survey using two questionnaires. The questionnaires addressed sociodemographic factors, perceived oral health status, and oral health habits. In addition, they also contained questions assessing anxiety, stress, and depression. The following assessment scales were used to identify which group the subjects belonged to: the Self-Regulation Scale, Proactive Coping Inventory, Procrastination Scale, and the Proactive Attitude Scale. The results showed that significant differences were found for self-regulation, proactive coping, procrastination, and proactive attitude according to several variables (anxiety, stress, and depression). Proactive coping emerged as a significant predictor for tooth-brushing frequency and reasons for dental visits. The study showed that individual stress-coping strategies appear to also influence oral health behaviors, nonsurgical periodontal therapy, and the course of periodontal disease.



**Dumitrescu AL, Dogaru BC, Dogaru CD, Manolescu B.** *Community Dent Health* 2011;28:170–173. **References:** 18. **Reprints:** Associate Professor Dr A.L. Dumitrescu, Institute of Clinical Dentistry, Faculty of Medicine, University of Tromsø, 9037 Tromsø, Norway. Email: alexandrina.l.dumitrescu@gmail.com—*Y.L. Seetoh, Singapore*