

**NEUTRAL ZONE TECHNIQUE IN COMPLETE DENTURE FABRICATION: A  
CLINICAL CASE REPORT****<sup>1</sup>Dr. Sania Mohsin, <sup>2</sup>Dr. Arunachalam Sudheer, <sup>3</sup>Dr. Priya and <sup>4</sup>Dr. Susmita Mondal**<sup>1</sup>Postgraduate Student, Department of Prosthodontics and Crown and Bridge, Mithila Minority Dental College and Hospital.<sup>2</sup>Professor and Head of the Department, Department of Prosthodontics and Crown & Bridge, Mithila Minority Dental College and Hospital.<sup>3</sup>Senior Lecturer, Department of Prosthodontics and Crown and Bridge, Mithila Minority Dental College and Hospital.<sup>4</sup>Senior Lecturer, Department of Prosthodontics and Crown and Bridge, Mithila Minority Dental College and Hospital.**\*Corresponding Author: Dr. Sania Mohsin**

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Article Received on 24/06/2025

Article Revised on 14/07/2025

Article Accepted on 04/08/2025

**ABSTRACT**

The neutral zone technique is a fundamental concept in prosthodontics that emphasizes the importance of muscle balance in the stability and retention of complete dentures. This case report presents the prosthodontic rehabilitation of a completely edentulous patient using the neutral zone technique to enhance denture stability, comfort, and function. Clinical steps included impression making, jaw relation recording, and neutral zone recording using a tissue conditioning material. The contours of the neutral zone were carefully captured and incorporated into the final denture design. Following denture insertion, the patient demonstrated significant improvement in speech, mastication, and comfort, with high satisfaction at follow-up. This case highlights the effectiveness of the neutral zone technique in managing complex denture cases, particularly in patients with compromised ridge anatomy or neuromuscular control.

**KEYWORDS:** Functional impression technique, Neutral zone, Denture retention.**INTRODUCTION**

Successful prosthodontic rehabilitation of completely edentulous patients depends on multiple factors, including the anatomy of the residual ridges, neuromuscular coordination, and the adaptation of the prosthesis to the functional dynamics of the oral environment. One of the significant challenges in conventional complete denture fabrication is achieving optimal stability, retention, and support, especially in patients with severely resorbed ridges or compromised neuromuscular control. In such cases, the neutral zone technique offers a viable solution to improve prosthesis performance by harmonizing the denture contours with the functional movements of the oral musculature.<sup>[1]</sup>

The neutral zone is defined as the area in the oral cavity where the displacing forces of the tongue are neutralized by the forces of the cheeks and lips.<sup>[2]</sup> Recording this zone enables the clinician to position teeth and contour polished surfaces in a way that utilizes the stabilizing effects of surrounding musculature, rather than opposing them. This technique becomes particularly valuable in cases of advanced ridge resorption, where conventional denture principles may fall short.<sup>[3]</sup>

This case report highlights the application of the neutral zone concept in the rehabilitation of a completely edentulous patient who presented with unstable mandibular dentures and significant alveolar ridge resorption. The report underscores the clinical steps involved in capturing the neutral zone and discusses the functional outcomes and patient satisfaction following treatment.

## CASE REPORT



**Figure 1. Resorbed Mandibular Ridge.**



**Figure 2: Secondary Impression of maxilla and mandibular arch.**



**Figure 3. Jaw Relation.**



**Figure 4. Customised Denture Base with orthodontic Wire.**



**Figure 5: Admixed over denture base after functional movement.**



**Figure 6: Jaw relation.**



**Figure 7: putty index.**



**Figure 8: Teeth arrangement in neutral zone.**



**Figure 9: Pre – operative.**



**Figure 10: Post Operative.**

A completely edentulous female patient aged 62 years came to the department of prosthodontics with the complaint of difficulty in chewing food and had no history of wearing any previous denture. As the mandibular arch was highly resorbed [Figure 1], so a special technique was taken to fabricate the denture. The neutral zone technique in prosthodontics involves fabricating complete dentures that harmonize with the functional dynamics of the oral musculature. The procedure begins with preliminary and final impressions to obtain accurate working casts [Figure 2]. A jaw relation was done establishing the vertical dimension and centric relation [Figure 3] followed by fabrication of stable record bases [Figure 4], a neutral zone recording material (Admixed impression is taken in 3:7 ratio of compound and green stick compound) is applied to the mandibular base. The patient performs functional

movements—such as speaking, swallowing, and sucking—to shape the material according to the balance of tongue and perioral muscle forces [Figure 5]. Once set, this recording is indexed [Figure 7] to guide proper tooth arrangement and denture contouring. Teeth are then arranged within the neutral zone, ensuring optimal stability and function [Figure 8]. After try-in verification, the denture is processed and polished with care to preserve muscle-molded contours. This technique is especially beneficial for patients with severely resorbed ridges, improving retention, stability, and overall prosthesis success.

## DISCUSSION

The rehabilitation of edentulous patients, especially those with resorbed ridges, presents unique challenges in achieving denture stability, retention, and comfort.

Traditional denture fabrication often fails to account for the dynamic balance of muscular forces within the oral cavity, leading to poor adaptation and reduced patient satisfaction. The neutral zone technique provides a functional approach to overcome these limitations by utilizing the physiologic balance between the tongue and perioral muscles during denture fabrication.<sup>[4]</sup>

In the present case, the patient had a significantly resorbed mandibular ridge, contributing to instability of the previous dentures and difficulty in mastication and speech. The use of the neutral zone technique allowed for the functional recording of the space where muscular forces are balanced, resulting in a denture that is more stable and better retained during functional movements. This approach is particularly beneficial in cases with minimal residual ridge support, where mechanical retention is inherently compromised.<sup>[5]</sup>

The concept of the neutral zone is rooted in the work of Fish<sup>[6]</sup>, who emphasized the importance of recording tissue function during denture fabrication. Later, the technique was further refined by Schiesser and Beresin, who introduced materials and methods for functional impression making to accurately capture the neutral zone.<sup>[7]</sup> Modern materials such as tissue conditioners and soft waxes have made this technique more practical and effective in clinical settings.

Clinical studies and case reports have consistently shown that dentures fabricated using the neutral zone technique demonstrate improved patient satisfaction, especially in terms of marked improvement in stability during speech and mastication, along with enhanced comfort and confidence. Follow-up appointments confirmed good adaptation of the prosthesis, and no significant sore spots or retention issues were noted. This reinforces the value of incorporating the neutral zone technique in complex cases involving severe ridge resorption or neuromuscular challenges.

While the technique requires additional clinical time and skill, the long-term functional benefits and patient satisfaction it offers justify its application in selected cases. Future research and clinical studies could further explore modifications in materials and methods to streamline the process without compromising outcomes.

## CONCLUSION

The Neutral Zone Technique is a vital approach in complete denture fabrication that prioritizes harmony between muscular forces and denture stability. By recording the space where the forces of the tongue and cheeks are balanced, this technique ensures optimal denture retention, comfort, and function—especially in patients with severely resorbed ridges or compromised oral anatomy. Ultimately, it enhances prosthetic success by aligning the prosthesis with the dynamic functional needs of the patient, rather than relying solely on anatomical landmarks.

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