



## CASE REPORT

### NEUTRAL ZONE: BEST CONCEPT IN UNFAVOURABLE RIDGES

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#### ABSTRACT

Organizations today have increasingly focusing on the importance of Strategic Human Resource Management (SHRM). Strategic human resource management (SHRM) plays a vital role to organizations performance and job satisfaction. People become an essential element to organizations development. These strategic decisions determine the demand for skills and human resource. Incompetent and unbalanced: resourcing, training, development, reward, and appraisal methods have led to poor performance which causes job dissatisfaction. Although, extensive literature is available on the SHRM effectiveness, but what SHRM practices can influence job satisfaction and organizational performance is not effectively studied. Thus, to fill this gap, this study aims to examine the relationship between SHRM practices and job satisfaction. Results indicated that SHRM practices (recruitment and selection, training and development, performance appraisal and compensation and rewards) are directly linked with job satisfaction. Effective human resource management strategy systematically organizes all individual human resource management measures to directly influence employee performance and behavior in a way that leads business to achieve its organization success. At last, the paper takes the qualitative research method to study on the relationship between strategic human resource management and job satisfaction, what factors influence on the relationship between the two, and the mediating variables and how to influence the process. Finally, this article develops a conceptual framework that explains the relationship between strategic human resource management and job satisfaction.

**Key words:** Strategic human resource management, Organization performance, Commitment, Expectation, Job satisfaction

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#### INTRODUCTION

The eruption of the teeth in the oral cavity is influenced by the forces exerted by tongue, cheeks and lips. These muscular forces collectively determine the final dental arch form and position of the tooth in the oral cavity. This muscular environment continues throughout life, even after teeth have been lost and greatly influences this potential space. It is one of the major determining factors for any prosthesis that will be placed in the oral cavity to replace these missing teeth. This potential space is known as neutral zone, which is bounded by the tongue medially, and the lips and cheeks laterally. Hartwell and Rahn (1974), indicated that the posterior teeth should be positioned buccolingually on the residual alveolar ridge. Pound (1954), stated that invariably arranging the teeth over the crest of the residual ridge condemned patients by accentuating facial deformity, provoking phonetic problems and making food manipulation difficult during deglutition. Robinson (1969), Payne (1971), Murray (1978), and Watt (1978) are of the opinion that artificial teeth should be positioned where the natural teeth grew.

Brill *et al* stated that forces are developed as a result of the contraction of muscles during function. This present article describes the fabrication of a complete denture using neutral zone impression technique.

#### Case Report

A 60 year old male patient reported to clinic with the complaint of missing teeth and wanted the replacement of the same. On examination, it was found that both the upper and the lower arches were edentulous and severely resorbed with oral submucous fibrosis (Fig.1a and 1b). Patient also gave a history of no denture wearing. A treatment was planned which included fabricating the complete dentures with the help of neutral zone technique and the patient was explained about the same.

#### Primary impressions and secondary impressions

The primary impressions were taken in a stock tray with a muco-displacive material such as impression compound or a high viscosity alginate. The lower secondary impression was taken in a close-fitting special tray with a low viscosity

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mucostatic such as a zinc oxide eugenol. The impression surface of the denture was correctly extended to provide the maximum support from the underlying structures. The borders were moulded to represent muscle activity, recording the functional depth and width of the sulcus.



**Fig. 1A (severely resorbed maxillary ridge with OSMF)**

#### Jaw registration

The wax record rims were constructed on heat cured acrylic bases for increased stability, and assessed for extension, comfort and stability. Once the base plates were assessed and modified, jaw registration was carried out. The upper rim was carved to provide support for the musculature labially and buccally. It was vitally important that the record rim is correctly trimmed to the full width of the sulcus; otherwise the correct width of the lower arch cannot be developed. After establishing the correct incisal level, occlusal planes and palatal contour — the lower rim was adjusted to the correct occlusal vertical dimension (OVD). The rims were now registered in the retruded arc of closure. The articulation of the rims on a hanau articulator with face bow transfer and construction the upper wax try in and lower base plate was done (Fig. 2).



**Fig. 1B (severely resorbed mandibular ridge with OSMF)**

#### Lower base plate construction

The wax was removed from the heat cured base plate and a superstructure is constructed. The superstructure has two



**Fig. 2 (Face bow transfer on HANAU)**

functions: to provide even occlusal stops at the correct OVD and to provide support for the NZ impression material. Numerous designs have been proposed and the final decision one of clinical preference. Favoured designs include self-cured pillars in the premolar regions with a short vertical fin between them or a light cured vertical fin along the centre of the base plate (Fig. 3).



**Fig. 3. Vertical Fins maintaining OVD**

Whichever design is used OVD must be maintained. The stops and fins were modified with self-cured acrylic or greenstick tracing compound until the correct dimensions are produced.

#### The neutral zone impression

Prior to taking the NZ impression the upper wax try-in was inserted. This will support the facial muscles and allow the tongue to be positioned on the teeth and palatal contours during function. The NZ impression requires a material that can be moulded by muscle activity. A high viscous mix of Viscogel (Dentsply, Weybridge, UK), which is a tissue conditioner, was used for the impression (Fig. 4). The mix was placed along the base plate and superstructure. The volume of the material was controlled and kept to a minimum so that the sulci were not distorted.

The material was mixed so that it can be manipulated by hand and positioned as an approximate rim on the lower base plate. Before taking the impression the patient was made in a comfortable, upright position with the head supported. The plate was then rotated into the patient's mouth and they were asked to perform a series of actions designed to simulate physiological functioning. These actions were needed to be rehearsed so that they are performed naturally and effectively. Suggested actions include asking the patient to: smile, grin, pout/purse lips, count from 60 to 70, talk aloud, pronounce the vowels, sip water, swallow, slightly protrude the tongue and lick the lips. These actions were repeated for 10 minutes until material has set. The anterior labial surface shows proclination and the posterior part shows where the tongue has rested and moulded the rim. The neutral zone impression so obtained was placed on the master model, locating grooves were cut on the master cast and was covered with a silicone putty index around the impression on both the labial and lingual sides (Fig. 5).



**Fig. 4. Neutral Zone Impression made in Tissue Conditioner**



**Fig. 5. Putty index after neutral zone impression**

The compound occlusal rim was then removed from the base plate and the index was replaced. The index would have preserved the space of the neutral zone in which wax was melted and filled (Fig. 6). Teeth arrangement was done exactly following the index. The position of the teeth was checked by placing the index together around the wax try-in (Fig. 7). Once the waxed up trial dentures were ready, they were checked in the patients mouth for aesthetics, phonetics and occlusion. Later on, wax was removed from the labial and the lingual

surfaces of the trial dentures leaving only minimal wax which could support the teeth that were placed. Patient was trained for making physiological movements such as tongue, cheek and lip movements. Once the patient was trained regarding the functional movements PVS light body was placed on the labial as well as lingual surfaces of the trial dentures, it was placed in the mouth and patient was asked to perform movements.



**Fig. 6. Formation of wax rims according to neutral zone**



**Fig. 7. Confirmation of teeth arrangement in neutral zone**



**Fig. 8. Dentures seated in mouth**



This procedure was carried out for both the maxillary and mandibular arches. This recorded the polished surfaces of the denture according to the neutral zone. Once the try-in was deemed satisfactory the dentures were processed and finished. Care was taken during finishing and polishing of the dentures so that the contours recorded previously were unaltered. During insertion the dentures are fully checked to eliminate any minor errors. The dentures provided the patient with improved facial appearance, stability and retention during function — as they have been constructed in harmony with their surroundings (Fig. 8).

## DISCUSSION

The ultimate goal of any prosthodontic treatment is to restore the form, function, and esthetics of the patient. Fish<sup>7</sup> pointed that out of the three surfaces of the denture the polished surface is bounded by the tongue and the cheeks. These are involved in normal physiologic movements such as speech, mastication, swallowing, smiling, and laughing. Hence, the fabrication of the denture must be in harmony with these functions. Because physiologically unacceptable denture is responsible for poor prosthesis stability and retention<sup>8,9,10</sup>, insufficient facial tissue support<sup>11</sup>, less tongue space<sup>12</sup> and compromised phonetics<sup>2,11</sup>. Denture fabricated over a severely resorbed mandibular ridge by neutral zone impression technique will insure that the muscular forces aid in the retention and stabilization of the denture rather than dislodging the denture during function<sup>13</sup>. The dentures will also have other advantages such as reduced food lodgment, good esthetics due to facial support, proper positioning of the posterior teeth which allows sufficient tongue space. Clinicians must identify and record the neuromuscular dynamics of the oral tissues and this should be applied in the construction of the definitive prosthesis that will exist within the stabilizing boundary conditions of the neutral zone area.

## Conclusion

With advancement in dental material science and development of newer techniques in prosthodontics, the neutral zone impression technique may be incorporated into fabrication of any complete denture.

Though this is indicated for patients with severe residual ridge resorption, the procedures discussed can also be used for full mouth rehabilitation of edentulous patients with dental implants.

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