ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 05, pp.49967-49970, May, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

CASE STUDY

DENTURE STABILITY IN COMPROMISED MANDIBULAR RESIDUAL RIDGE WITH NEUTRAL ZONE TECHNIQUE

Dr. Mohd. Siddique Qureshi, *Dr. Nayana Anasane and Dr. Dilip Kakade

Department of Prosthodontics, Dr. D. Y. Patil Dental College and Hospital, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune

ARTICLE INFO

Article History:
Received 22nd February, 2017
Received in revised form
15th March, 2017
Accepted 25th April, 2017
Published online 19th May, 2017

Key words:
Mandibular residual alveolar ridge,
Neutral zone technique, Complete denture.

ABSTRACT

One of the most common problems faced by mandibular complete denture patients is loose and unstable denture because of severely resorbed mandibular edentulous ridge. Prosthodontic rehabilitation of such patients with resorbed edentulous foundation is the most difficult treatment modality for the prosthodontist. To have a favourable prognosis for the complete denture, neutral zone technique is one of the most effective method with favourable prognosis to treat such patients. The neutral zone is defined as the area where the displacing forces of the lips, cheeks and tongue are neutralised. This is the zone where the natural dentition lies and where the artificial teeth should be arranged. This article presents the case of resorbed mandibular edentulous foundation in which neutral zone concept was applied in an effort to achieve a stable mandibular complete denture.

Citation: Dr. Mohd. Siddique Qureshi, Dr. Nayana Anasane and Dr. Dilip Kakade, 2017. "Denture stability in compromised mandibular residual ridge with neutral zone technique", *International Journal of Current Research*, 9, (05), 49967-49970.

INTRODUCTION

Complete denture is a mechanical device but since they function in oral cavity it should be in balance with the normal neuromuscular function. The co-ordination of complete denture with the neuromuscular function is the foundation of successful and stable dentures. (Beresin and Schiesser, 1976) Loss of teeth leads to multifactorial changes occurring in the mouth like alveolar ridge resorption, expansion of tongue and laxity of facial muscle. (Fahmi, 1992) Mandibular complete denture stability is most difficult to achieve due to the continuous resorption of residual alveolar ridge and its proximity to limiting landmarks. As edentulous life span increases alveolar ridge resorption also increases, due to which denture retention and stability decreases, consequently retention and stability become more dependent on correct positioning of the teeth and contour of polished surface. (Anand and Prasad, 2014) When the patient becomes edentulous a void exist in the oral cavity between cheek, lips and tongue, which is the potential denture space. The neutral zone is the potential space between the cheeks and lips on one side and the tongue on the other side, the area or position where the forces between the tongue, cheeks and the lips are balanced. (Makzoumé, 2004) Neutral zone concept was described by Sir Wilfred fish of England in the year 1931. Various materials and techniques have been advocated in the literature for recording the neutral zone area. The materials advocated includes tissue conditioners, resilient lining materials, soft wax, polymer of dimethyl siloxane filled with calcium silicate, silicon and impression compound. Many methods have also been suggested using the materials in conjunction with movements including sucking, grinning, swallowing, whistling and pursing the lips. (Makzoumé, 2004) This article present a case report which describes the fabrication of a complete denture using neutral zone impression technique for enhancing stability and masticatory efficiency.

Corresponding author:* **Dr. Nayana Anasane,
Department of Prosthodontics, Dr. D. Y. Patil Dental College and Hospital, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune

Case report

A 68 year old female patient reported to the OPD of Dr. D. Y. Patil Dental College and Hospital, Pune with the chief complaint of completely edentulous maxillary and mandibular arches. Patient had been edentulous for the past five years. Intra oral examination revealed severely resorbed mandibular ridge and higher muscle attachments which were close to the residual alveolar ridge (Fig.1). The mandibular ridge was classified in order IV according to Atwood's classification (Atwood, 1963). Primary impressions of maxillary and mandibular arches were made with impression compound (Fig.2) and the cast were poured using dental plaster. Border moulding was done with green stick compound and secondary impression was made with zinc oxide eugenol impression material by using selective pressure impression technique (Fig.3). Occlusal rims were fabricated on acrylic record bases using modelling wax. The

maxillo-mandibular relation was registered (Fig.4) and the casts were mounted on the semi adjustable articulator. Mandibular occlusal rim was completely removed and the vertical stoppers in premolar region on both the sides were made on the record base in accordance with recorded vertical height to support the tissue conditioner (Fig.5).Before making the neutral zone impression, the patient was made comfortable in an upright position with the head unsupported. The maxillary rim was inserted into the patient's mouth and reassessed for support and occlusal plane. The mandibular special tray was carefully adjusted for proper extension and checked for stability during opening, swallowing and speaking. Tissue conditioner was mixed as per the manufacturer's instructions and was loaded uniformly onto the mandibular record base. Both the maxillary and mandibular record bases were placed in the patient's mouth. The patient was asked to perform a series of actions like swallowing, speaking, sucking, pursing lips, pronouncing vowels in an exaggerated manner, sipping water and protruding the tongue several times which stimulated physiological functioning. The actions moulded the loaded tissue conditioner material on mandibular record base by muscle activity. After 10mins the neutral zone impression was removed from the mouth and examined (Fig.6).

The neutral zone impression obtained was placed on the master cast. Locating grooves were cut on the master cast on the land area and centre of the cast. The master cast was coated with a separating medium and the neutral zone impression was covered with 1 inch thick layer of a plaster. This was done in two sections a lingual and a labial section (Fig.7). When the plaster was set, the index was splitted in the centre of the labial side so as to remove the labial portion in two sections. The lingual portion was made as a single section. Now the shape of the neutral zone area was permanently registered in the plaster index. The tissue conditioner occlusal rim was then removed from the record base and the index was replaced. After replacing the plaster index, softened wax was filled in the space to fabricate a wax rim for teeth arrangement in the neutral zone area (Fig.8). The mandibular teeth were arranged followed by maxillary teeth and the teeth position was evaluated using plaster index (Fig.9). Waxed up denture was checked in the patient's mouth for stability, aesthetics, phonetics and occlusion (Fig.10). The denture was then processed using compression moulding technique. Finishing and polishing was done carefully without altering the contour of the polished surface. The denture insertion was done and retention, stability and support was evaluated (Fig.11).

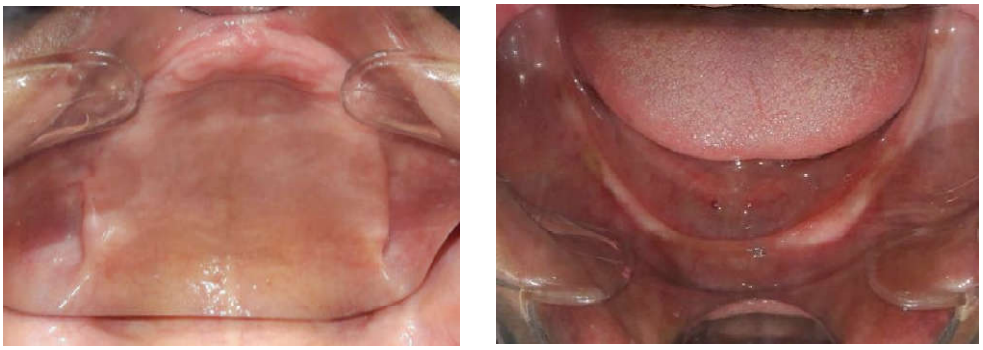

Fig.1. Intra oral view

Fig.2. Primary impressions

Fig.3. Secondary impression

Fig.4. Maxillo-Mandibular relation

Fig.5. Modification of mandibular record base

Fig.6. Neutral zone impression with tissue conditioner

Fig.7. Plaster index

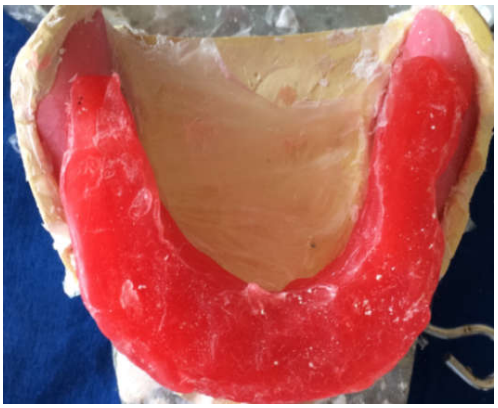

Fig.8. Wax rim

Fig.9. Waxed-up denture

Fig.10. Denture try-in

Fig. 11.Denture insertion

Fig.12. Pre and Post operative view

The denture was stable in place during function because it was in harmony with their surrounding musculatures due to the neutral zone technique. The patient was then followed up after 24 hours, 1 week and 6 months and she was highly satisfied with her denture (Fig.12).

DISCUSSION

Recording of neutral zone is a simple to perform, highly effective and economical procedure which involves just one extra clinical step and improves the denture stability tremendously. Fish pointed that among the three surfaces of the denture the polished surface is bounded by the musculatures of tongue and cheeks. These musculatures are involved in normal functional movements like speech, mastication, swallowing, smiling and laughing. Hence the complete denture should be fabricated in harmony with tongue and cheek musculature to improve retention and stability of the denture. Thus the recording and arranging teeth in the neutral zone area is considered to be an important factor in severely resorbed mandibular residual ridge to improve denture stability.

REFERENCES

Anand KR and Prasad KB. 2014. Neutral Zone Impression Technique for Mandibular Compromised Ridges: A Case Report. *Int J Dent Med Res*., 1(4):79-82.

Asnani P, Chandu GS. and Mishra SK. 2015. Neutral zone technique in complete denture –Case report. *J App Dent Med Sci*., 1(1):15-18.

Atwood DA. 1963. Post extraction changes in the adult mandible as illustrated by microradiographs of midsagittal sections and serial cephalometric roentgenograms. *J Prosthet Dent*, 13:810-824.

Beresin VE. and Schiesser FJ. 1976. The neutral zone in complete dentures. *J Prosthet Dent*, 36(4):356-67.

Fahmi FM. 1992. The position of the neutral zone in relation to the alveolar ridge. *J Prosthet Dent*, 67(6):805– 809.

Makzoumé JE. 2004. Morphologic comparison of two neutral zone impression techniques: A pilot study. *J Prosthet Dent*, 92(6):563-8.

****