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A Simplified Technique for Managing Extremely Resorbed Ridge: A Case Report

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ABSTRACT: The Neutral Zone Technique is an alternative approach for the construction of lower complete dentures. It is most effective for dentures in case of highly atrophic ridges and a history of denture instability.
The technique aims to construct a denture that is shaped by muscle function and is in harmony with the surrounding oral structures.
Keywords: Instability, Atrophic Ridge, Muscle Function, Neutral Zone.

I. INTRODUCTION:

Clinicians often come across resorbed mandibular ridges where it is difficult to provide stability for the lower denture. Dental implants are not always possible on the grounds of medical, surgical or economic factors. This is where the 'Neutral Zone Technique' comes into light.

The neutral zone is the potential space between the lips and cheeks on one side and the tongue on the other; that area or position where the forces between the tongue and cheeks or lips are equal.[1]

The major muscles involved are: the buccinators, the modiolus, the orbicularis oris, the mentalis from one side; the tongue on the other side.

The lower denture commonly presents the most difficulties with pain and looseness being the most common complaint.[2]This is because the mandible atrophies at a greater rate than the maxilla and has less residual ridge for retention and support.[3]The neutral zone technique is the most effective for: patients who have had numerous unstable, not retentive lower complete dentures; also for patients who have undergone a partial glossectomy, mandibular resections or motor nerve damage to the tongue- which have led to either atypical movement or an unfavorable denture bearing area.[4]

In this case report a patient with extremely resorbed mandibular ridge was given a set of removable dentures using the neutral zone technique.

II. CASE REPORT:

A 50 years old male visited the Department of Prosthodontics with a chief complaint of edentulous upper and lower arches and an unstable lower denture which was made 4 years back. The anterior region of the residual mandibular ridge was extremely resorbed. The patient was advised a new set of removable complete dentures. A neutral zone technique approach was planned for the resorbed condition of mandibular ridge.

III. PROCEDURE

A case history with evaluation of the maxillary and mandibular residual ridges was recorded. Preliminary impressions were made using impression compound and poured in model plaster.
Border molding procedure using low fusing impression compound was carried out and thereafter the final impression was made using zinc oxide eugenol impression paste and final cast was obtained by pouring impression with type III dental stone.
Temporary record bases were fabricated using cold cure acrylic resin and wax occlusal rims were formed for recording the jaw relation.
Jaw relation records were made and transferred to the articulator.
Lower wax occlusal rim was removed.

Fig.1. Mandibular record base with retentive wire loop.

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A retentive wireloop was attached to the lower record base plate (Fig.1) and a rim using a uniform mixture of rigid impression compound and low fusing impression compound (greenstick)(Fig.2) was fabricated over the retentive loop at the established vertical dimension.[5]

Fig.2. Mandibular rim over the retentive wire loop made using rigid impression compound and low fusing impression compound.

This rim was used to record the neutral zone in the patient's mouth. The rim was heated in a water bath and molded in the patient's mouth by asking him to perform all the functional movements: swallowing, sucking, smiling and pursing the lips. This recorded zone is preserved with an index formed by a mixture of dental stone and dental plaster (Fig.3).

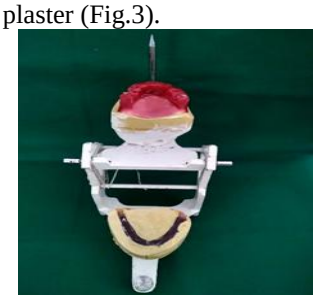

Fig.3. Mandibular rim index made using dental stone and dental plaster.

Teeth arrangement was done according to limits of this zone with the help of the index (Fig.4A) (mandibular first followed by maxillary) keeping every tooth in its required planes while considering the aesthetics (Fig.4B).

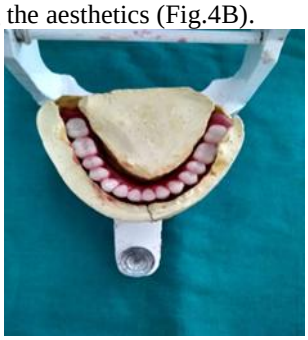

Fig.4.A.Mandibular teeth arranged within the limitations of index.

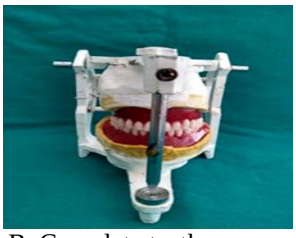

Fig.4.B. Complete teeth arrangement.

Dentures were tried in the patient's mouth. After a satisfactory try-in procedure, dentures were acrylised and inserted. A frequent follow up was carried out post treatment. Patient was satisfied with the denture stability and found improvement in the chewing ability with the new dentures (Fig.5).

IV. DISCUSSION:

The aim of this technique is to construct a denture in muscle balance which is in harmony with its surroundings to provide optimum stability, retention and eventually comfort to the patient.

Sir Wilfred Fish first described the influence of the polished surfaces on retention and stability (1931)[6] and also how dentures should be constructed in the 'dead space', which later became to know as the 'Neutral Zone'.[7]

In highly atrophic mandible muscular control over the denture is the main retentive and stabilizing factor during function.[8]A denture shaped by the neutral zone technique will ensure that the muscular forces are working more effectively and in harmony.

The dentures made using this technique will have other advantages like improved stability and retention, correctly positioned posterior teeth allowing sufficient tongue space, and reduced food entrapment adjacent to the molar teeth and good aesthetics with adequate facial support.[9]

Various approaches can be made to perform this technique. The above method is a simplified one; with only one extra visit required by the patient, additional to the conventional procedure. All the materials used are easily available and basic to the conventional procedure.

Various materials can be used to record the neutral zone with their own advantages and disadvantages.

The use of tissue conditioners was recommended by Kursoglu[10], Beresin and Schiesser[11] . But tissue conditioners do not have body and so it is difficult to use them even after supporting with wire loops.

The use of Impression plaster advocated by Johnson[12] creates mess and is difficult to use; also fractured fragments if any can be swallowed by the patient while performing functional movements.

Beresin and Schiesser[13] used modeling plastic, but reheating it uniformly is critical for success and if not performed correctly, it may result in incorrect occlusal vertical dimension.

Use of polyether impression material[14] is also recommended and is a material of choice for many.

Mixture of Impression compound and greenstick used in above method (heated, softened in a 65`C water bath and uniformly mixed in ratio of 3:7): impression compound provides sufficient body and strength, greenstick provides good flow and better detail recording. It's easy to use, less time consuming and no chance of fracturing or swallowing. Here the material is molded over a denture base with retentive wire loops on the articulated casts opposing the maxillary rim at a determined vertical height. This provides comfort and prevents over closure of the mandible while recording the neutral zone with less chair side time. The index can alternatively be recorded in silicone putty.

V. CONCLUSION:

This article presents a simplified approach in recording the neutral zone with the aim to provide adequate stability retention to the lower denture with resorbed residual ridge and comfort to the patient. This technique is a valuable one to deal with resorbed mandibular ridges which is a very common finding; especially in a country like India where not all the patients can afford implant supported dentures.

REFERENCES:

[1]. The Glossary of Prosthodontic Terms: Ninth Edition. J Prosthet Dent. 2017 May;117(5S):e1-e105. doi: 10.1016/j.prosdent.2016.12.001. PMID: 28418832.

[2]. Beresin VE, Schiesser FJ. The neutral zone in complete dentures. J Prosthet Dent. 1976 Oct;36(4):356-67. doi: 10.1016/0022-3913(76)90155-4. PMID: 787504.

[3]. Basker RM, Harrison A, Ralph JP. A survey of patients referred to restorative dentistry clinics. Br Dent J. 1988 Feb 20;164(4):105-8. doi: 10.1038/sj.bdj.4806372. PMID: 3279981.

[4]. Atwood D A. Post extraction changes in the adult mandible as illustrated by micrographs of midsagittal sections and serial cephalometric roentgenograms. J Prosthet Dent 1963; 13 : 810-824.

[5]. Wright C, Swartz W, Godwin W. Mandibular denture stability: a new concept: Overbeck; 1961.

[6]. Ohkubo C, Hanatani S, Hosoi T, Mizuno Y. Neutral zone approach for denture fabrication for a partial glossectomy patient: A clinical report. J Prosthet Dent 2000; 84: 390-393.

[7]. Fish EW. An analysis of the stabilizing force in full denture construction. Br Dent J 1931; 852:559-570.

[8]. Fish E W. Using the muscles to stabilize the full lower denture. J Am Dent Assoc 1993; 20; 2163-2169.

[9]. Anand Kumar R, Prasad K B, Neutral Zone Impression Technique for Mandibular Compromised Ridges: A case report.

[10]. Kursoglu P, Ari N, Calikkocaoglu S. Using tissue conditioner material in neutral zone technique. N Y State Dent J. 2007 Jan;73(1):40-2. PMID: 17378315.

[11]. Beresin VE, Schiesser FJ. The neutral zone in complete dentures. 1976. J Prosthet Dent. 2006 Feb;95(2):93-100; discussion 100-1. doi: 10.1016/j.prosdent.2005.10.005. PMID: 16473080.

[12]. Johnson A, Northeast SE. The unstable lower full denture--a practical and simple solution. Restorative Dent. 1989 Nov;5(4):82-3, 86-90. PMID: 2700824.

[13]. Beresin VE, Schiesser FJ. The neutral zone in complete dentures. Saint Louis: C.V.Mosby Company; 1973. pp. 1–150.

[14]. Agarwal S, Gangadhar P, Ahmad N, Bhardwaj A. A simplified approach for recording neutral zone. J Indian Prosthodont Soc.2010;10(2):102-104. doi:10.1007/s13191-010-0019-8