



MANAGEMENT OF RESORBED RIDGES BY HOLLOW DENTURE WITH NEUTRAL ZONE- A CASE REPORT

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ABSTRACT

Severely atrophic ridges provide decreased retention, support, and stability and pose a clinical challenge to the success of complete denture prostheses. The consequent weight of the processed complete denture only compromises the underlying periosteum further. The main aim of neutral zone technique is to construct a denture that is shaped by the muscle function and is in harmony with the surrounding oral structure. Therefore, hollow denture along with neutral zone will provide a denture which is lightweight, as well as stable and comfortable to the patient. This article describes a case of completely edentulous patient successfully rehabilitated with a combination of hollow denture along with neutral zone technique was used.

KEYWORDS : Neutral zone, Hollow denture**INTRODUCTION**

Complete dentures are primarily mechanical devices, but since they function in the oral cavity, they must be fashioned so that they are in harmony with normal neuromuscular function. Whereas, residual ridge resorption is the reduction in size of the bony ridge under the mucoperiosteum. The resorption occurs at a faster rate in mandibular arch as compared to the maxillary arch; but severely atrophic ridges with large inter-ridge distance often pose a clinical challenge during fabrication of a successful complete denture. Thus increased inter-ridge distance often results in heavy maxillary complete dentures that further compromises the retention of the prostheses. Reducing the weight of a maxillary prosthesis has been shown to be beneficial when constructing an obturator for the restoration of a large maxillofacial defect[1,2]. It has also been proved that prosthesis weight can be reduced by making the denture base hollow. Various approaches such as using a solid 3-dimensional spacer, including dental stone[1-6], silicone putty[7,8], modeling clay[9,10], or cellophane wrapped asbestos[11], have been used during laboratory processing to exclude denture base material from the planned hollow cavity of the prosthesis. O'Sullivan et al (2004) described a modified method for fabricating a hollow maxillary denture. A clear matrix of the trial denture base was made. The trial denture base was then invested in the conventional manner till the wax elimination. A 2mm heat polymerized acrylic shim was made on the master cast, using a second flask. Silicone putty was placed over the shim and its thickness was estimated using a clear template. The original flask with the teeth was then placed over the putty and the processing was done. The putty was later removed from the distal end of the denture and the openings were sealed with autopolymerizing resin. The technique was useful in estimation of the spacer thickness, but removal of the putty was found to be difficult especially from the anterior portion of the denture. Moreover, the openings made on the distal end had to be sufficiently large to retrieve the hard putty. In this case report, a 58 year old edentulous female patient with severely resorbed ridges and increased inter-ridge distance was treated with a hollow maxillary denture, using lost salt technique combined with neutral zone concept to improve the retention and stability of dentures.[12]

CASE REPORT

A 58 year old female patient reported to the Department with the chief complaint of difficulty in chewing food and heaviness in his upper denture. History revealed that patient was edentulous for past 15 years and had used many sets of complete dentures. There was no relevant Medical history, means that there was no underlying systemic disorder. The patient was assessed with a view of providing her with an implant retained complete upper denture

in order to minimize the rate of resorption. But because of unwillingness of patient for surgical procedures an alternative was planned, and that was a hollow complete upper denture combined with neutral zone concept to enhance the retention and stability of dentures. On examination, it was found that patient was dolicocephalic. Both maxillary and mandibular ridges were severely resorbed. Her upper lip was long, the inter-ridge distance was more than normal and vertical dimension of occlusion(VDO) and vertical dimension at rest (VDR) were more than average. (Figure 1)

CLINICAL PROCEDURE

Conventional clinical steps of primary impressions and final impressions were done. After final casts were made, processed record base was made on lower cast. The upper record base was made with self cure acrylic resin. The maxillary and mandibular record bases with acrylic shim were made and evaluated intra-orally for their fit. Then the softened impression compound and green stick in the ratio of 3:7 was mixed and loaded over maxillary and mandibular shims simultaneously on buccal, palatal and buccal, lingual aspects and inserted in the mouth of patient, and was asked to perform movements, which included talking, swallowing, drinking some water, whistling, pursing the lips, pronouncing the vowels, etc. Each of the arch is recorded simultaneously so that the predetermined vertical is not lost at any point of time. After 5- 10 min, the set impression was removed from the mouth and examined. The putty index was then made for the upper compound rims to recover the occlusal rims in wax (Figure 2). The shape of the rims was now permanently registered in these putty indices. The impression compound was removed and the acrylic shim was reduced down to the bare acrylic resin. The red baseplate wax was melted and poured into the index through the space between the labial and lingual indices on the occlusal surface. When the index was opened, a hard wax duplicate of the low fusing compound had formed (Figure 3). Thus, lower wax occlusal rims were formed. 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. (Figure 4)

LABROTORY PROCEDURE

The maxillary denture was processed using the conventional procedure. The Steps Taken for the Fabrication of Hollow Mandibular Complete Denture were as Follows: The mandibular trial denture was flaked and dewaxed in the conventional manner. Half of the heat cure PMMA (Trevalon, Dentsply India Pvt. Ltd., Gurgaon, India) in dough stage was positioned accurately over the dewaxed mould and then salt crystals were placed over it (Figure 6). Above that, the remaining heat cure resin was packed and cured at 74

degree C for 7-8 hours .Cured denture was retrieved and 2 holes were made in the tissue surface. All the residual salt crystals were removed by flushing water with the high pressure syringe through the holes (Figure 7). After making sure that all the salt crystals have been removed, the escape holes were closed with autopolymerizing resin (Trevalon, Dentsply India Pvt. Ltd., Gurgaon, India). The hollow cavity seal was verified by immersing the denture in water, if no air bubbles are evident, an adequate seal is confirmed (Figure 8).The dentures were inserted in the patient's mouth [Figure 8] and instructions regarding care, hygiene and maintenance were given. Preinsertion occlusal corrections were made and the denture was inserted in the patients mouth.(Figure 9)

DISCUSSION

Rehabilitation of patient with severely resorbed ridges and long lip length is a challenge to the dentist. Even though, the choice for rehabilitation can be implant supported overdenture, and ridge augmentation but many a times the patient who come with such a problem are geriatric patients with systemic illness, economic constrains, possess reluctance for a long duration treatment procedure and unwillingness for any kind of surgical procedure. The method described above has advantages over the previously described techniques. The salt crystals being heat labile melt during the curing procedure and thorough flushing after curing results in no crystals remaining in the denture thereby maintaining the integrity of the denture, avoiding the tedious effort to remove the spacer material from the denture. This technique of lost salt technique is simple to execute and utilizes a very cheap and easily available spacer material.

CONCLUSION

Hollow denture along with neutral zone technique is one of the best alternative techniques in case of highly atrophied residual ridge,[13] but it is rarely used because of the extra clinical steps involved [14] . Failures of dentures are often related to non compliance with neutral zone factors, therefore fabrication of denture incorporating both the techniques resulted in a better acceptance by the patient.

LIST OF PHOTOGRAPHS



Fig 1-Pre-operative maxilla and mandible



Fig 2-Putty indices of recorded neutral zone

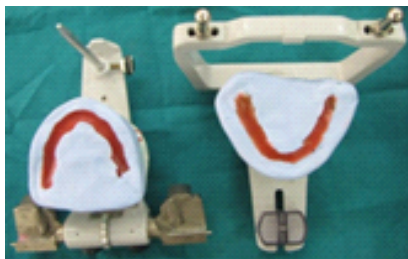


Fig 3- Wax poured in putty indices



Fig 4-Teeth arrangement in neutral zone

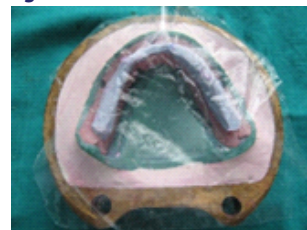


Fig 5-Trial packing of mandibular denture

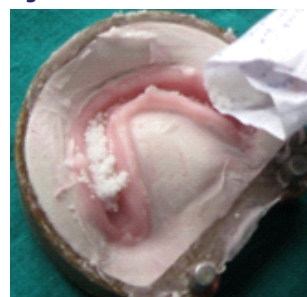


Fig 6-Filling hollow space with salt



Fig 7-Removal of salt using normal saline



Fig 8-Reduced weight of hollow maxillary denture

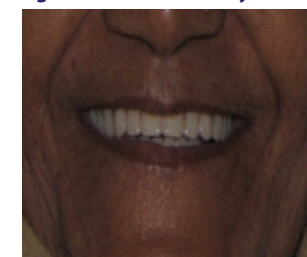


Fig 9- Post operative view of the patient

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