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Case Report

Neutral zone - a myth or a reality

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***ABSTRACT*:**
There are some issues in complete denture prosthodontics which have been difficult to locate objectively and one of them is certainly a neutral zone. It is important since placement of teeth within the zone can be crucial for long term denture stability. We present a simple technique of recording neutral zone for a complete denture prosthesis using commonly used clinical dental materials. The technique involves recording the neutral zone in the patient using impression compound as a molding material over which a putty index is formed. The index when placed on the denture base allows pouring of wax within the mold, the walls of which represent the functionally molded surrounding oral musculature. The technique is simple, inexpensive and easily mastered. .

Keywords: cheeks, functional impression, complete denture, neutral zone, tongue.

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INTRODUCTION

A complete denture (CD) has three surfaces out of which two surfaces (tissue and occlusal) are developed with great attention while the third surface (polished surface) is mostly done arbitrarily. This surface bears most of outer and internal muscular forces, [1] and corresponds to that surface which is thought to even displace natural teeth into malalignment if the same come in the way of their functioning. [2] In short, the war between the muscles and the teeth or the bone is always won by the muscles. The neutral zone has been defined aptly as a latent space between muscles on either side of dentition where forces are neutral in balance.[3,4] Pathological conditions involving either the nerve or the muscles may at times impair these forces. [5] ankyloglossia or tongue tie is one the rarest physiological congenital condition that may also impair the inner side of the balancing musculature. [6]
Muscular forces surrounding the mandibular CD are mainly overcome by patients ability to learn 'not to displace the denture' from its basal seat therefore enhancing denture retention and stability.[7,8] with advances in material sciences and digital technology, there has been a renewed interest in recording the neutral zone which has resulted in a wide range of materials being reported in the literature. [9-12] Since the material used involves being in contact with tissues for short period of time, it is less imperative that even a non biocompatible material like soft liners have been used to record the zone, [13] since they provide ideal working time to record the same. This article in the form of a clinical technical report describes a simplified technique for recording the neutral zone using routinely available dental materials.

Technique and discussion

1. All conventional clinical and laboratory steps need to be followed till the recording of jaw relations especially the recording of vertical dimension of occlusion. The casts are to be mounted on the articulator. The mandibular occlusal rims are stripped off the wax and are replaced with thermally modified impression compound. The compound when sufficiently heated, sticks to the resin denture base therefore added retention in form of orthodontic wires is not required.

Figure 1: (a) compound occlusal rims after molding (b) making putty index (C) putty mold (d) mold filled with molten wax (e) mandibular occlusal rim (f) teeth arrangement (g) final denture

2. All excess impression compound is removed especially from the peripheral areas of the denture base. The vertical dimensions of compound occlusal rims are established by closing the softened compound against the opposing occlusal rims on the articulator.
3. the next step is a clinical step wherein the compound occlusal mandibular rim has to be softened in a hot water bath and then the patient is asked to functionally mold the compound rim using functional movements of oral musculature. The compound occlusal rim is removed and then the contours recorded on it are observed for accuracy **(Fig 1a).** Sufficient depth of the compound should be softened to allow muscular molding on either sides.
4. In the next step, the compound mandibular rim is placed back on the articulator and a putty index is formed around the outer surfaces of the compound rim **(Fig 1b).** The entire compound is removed from the denture base at this stage and the putty index previously made is checked for accuracy in terms of seating on the cast **(Fig 1c).**
5. Modelling wax is then heated and the heated liquid wax is poured within the putty mold that has been sealed in place with sticky wax from outsied **(Fig 1 d)**.
6. Once the entire mold is filled with wax in increments, the wax is allowed to cool till. The putty mold is then removed and the wax surfaces are observed for contours **(Fig 1 e).** Instructions should be given to the technician otherwise the molded surfaces can be altered while arranging teeth. the teeth are arranged without disturbing the contour of its future polished surfaces of the denture **(Fig 1f)**.
7. At the denture trial procedure, the clinicians must verify the influence of recording neutral zone by observing the stability of the mandibular dentures. Whenever a neutral zone is recorded, one must use a denture processing technique that minimizes finishing of the tissue surfaces (Fig 1 g). liberal application of cold mold seal when the mold is warm imparts a polish on the concerned denture surfaces. Also trial closure during denture packing is essential to minimize finishing at the end.

CONCLUSION

A simple clinical technique has been described, that uses commonly available materials in every dentists clinic. The technique can be easily mastered since it does not modify or introduce a new or existing procedure. Rather than the choice of the material, it is the patients understanding of the procedure that should be important and commonly neglected too. The technique has ample advantages the chief advantage as compared to other techniques being that one can continously mold the compound if one does not get functional movements right.

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