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Dynamic Functional Impression Technique for Severely Resorbed Alveolar Ridges

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Abstract - *The process of bone resorption can reduce the volume of the alveolar crest, which makes may make difficult impression taking of the alveolar tissue and the subsequent fit of a new denture. This clinical report describes a fast and simple technique for impressions of edentulous ridges to replace complete dentures, using a temporary tissue conditioner material on the denture base. The existing denture must cover the whole supporting area and should be in harmony with the adjacent oral structures. This technique reduces the number of steps involved and minimizes treatment time and expenses.*

KEYWORDS: Complete denture, Elderly, Oral function, bone resorbtion.

INTRODUCTION

The population of individuals of more than 65 years of age has increased as a result of advancements in health care, in both developed and developing countries [1,2] although the total number of edentulous patient has declined [3]. As the ability to adjust to removable denture decrease with age, complaints related to removable dentures may increase in older age groups and may alter the nature of requests for prosthodontics rehabilitation [4-6] . The oral condition often has a negative impact on quality of life in edentulous patients[7]. Psychological and emotional factors can play a major role in patients who do not adjust to the treatment performed[8] nevertheless, in order to function effectively, a complete denture should have appropriate stability, retention and function, and it should provide the patient with aesthetics and comfort while chewing and speaking. Changes in the supporting tissues associated with the natural wearing of the artificial teeth may lead to the need for denture replacement[9,10].

The process of bone resorption is continuous, progressive and irreversible,[9] and can cause an exaggerated reduction of the alveolar process, especially in the mandible and so make it more difficult to make a satisfactory impression. For patients who cannot afford dental implants, the only available alternative is the conventional complete denture[12]. Construction of custom trays and subsequent master impressions in extremely reabsorbed ridges is usually a laborious technique [13,14] due to the difficulty in providing suitable stock trays for the primary imressions[14-16] . Alternative techniques, such as using the patient's existing denture, may facilitate the procedure, making it simple and effective[10]. This article presents an alternative impression technique for use in severely resorbed alveolar ridges, using the patient's existing denture and tissue conditioners to develop a dynamic functional impression.

Clinical Report

Following clinical examination to ensure that the denture extends over the support area and has adequate width the denture borders were modified using the impression compound (Kerr, Orange, CA) (Fig. 01) The fitting surface of the denture was lightly relieved to allow space for the tissue conditioner material.

A thin layer of a separator such as Vaseline hand & body lotion (New York, USA) was applied over the artificial teeth region, leaving a 3mm rim near the border to ensure tissue conditioner retention in this region (Fig. 02).

Soft tissue conditioner material (Soft Confort, Dencril Produtos Odontológicos, São Paulo, Brazil) was mixed according to the manufacturer's instructions. The material was then applied to the basal surface of the denture and put in position by applying low pressure in the mouth. The patient was instructed to occlude lightly (Fig. 03). With the denture at occlusion, the musculature was as for a standard impression technique[17]. The denture was then held in position with the fingers by the dentist, and the patient is asked to move the tongue to record the impression of the lingual region musculature [18].

The tissue conditioner impression was examined to verify that the material covered the whole basal surface with a width of at least 2mm (Fig. 04)[16]. Excess materials that covered the occlusal or polished surfaces were removed with a scalpel. The patient was instructed to wear the denture for at least 24 hours, to allow the tissue conditioner to low during the functions of chewing, speech and swallowing. Due to the fragility of the conditioner the patient was told to avoid any abrasion of the relining material.

At the next visit condensation silicone adhesive (Universal Tray Adhesive, Zhermack, Badia Polesine, Italy) was applied to the denture base for two minutes to allow bond-

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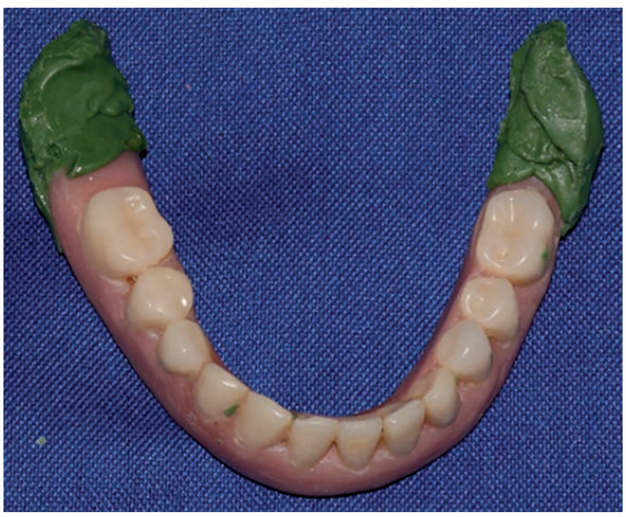

Figure 1. *The border of the denture corrected with compound modeling.*

Figure 2. *Vaseline applied over the artificial teeth.*

Figure 3. *Occluding the tissue conditioner on the base.*

Figure 4. *Verification that the tissue conditioner covers the whole basal surface.*

ing the tissue conditioner to the new impression. The impression material was mixed and the dentures were inserted into the mouth and held in while performing the functional movements with the manipulation of the musculature (Fig. 05) [17].

The obtained impression model was examined. This impression should be stable and represent the exact negative copy of the whole supporting area, especially its borders, with the same width and extension as the relined denture (Fig. 06).

The plaster was poured to obtain the functional model (Fig. 07).

Finally, the remaining stages necessary to fabricate a complete denture were performed.

DISCUSSION

The resilient tissue conditioners or "soft liners" are able to absorb the impact energy of masticatory forces and distribute them evenly over the supporting tissues, thus reducing trauma to the supporting mucosa. As such, these materials are a good alternative for treating chronic irritations caused by conventional dentures and for recovering the health of remaining supporting tissues, due to the greater comfort provided to the patient[14-16,20]. Used as materials to make dynamic functional impressions, they are able to flow and record the form of the residual ridge when subjected to the functional stress of chewing, speaking, swallowing and parafunction[14].

However, the use of this material should be associated with rigorous clinical control, since its resiliance is lost over time [16]. Some authors recommend that, when used as functional impression materials, these models should be obtained at least after 24 hours, to avoid the materials from presenting elastic recovery, and within a maximum of three days, thus avoiding the deleterious effects of prolonged immersion in saliva[7]. In addition, the use of a complementary impression material, in this case fluid condensation silicone, has the purpose of avoiding the possible surface roughness that the material could develop due to being immersed in saliva that could compromise the quality of the functional model. Some authors have stated this fact previously[14].

This article describes a fast and simple technique to make the impression of totally edentulous ridges with the aim of replacing complete dentures, first using a temporary tissue conditioner material on the denture base. To do this, the existing denture needs to cover the whole supporting area. In addition, it should be in harmony with the adjacent oral structures, respecting the anatomic and physiologic limitations. As such, comfort is enhanced and the patient's acceptance of the denture is improved.

Figure 5. *Performance of functional movements to confirm occlusal stability.*

Figure 6. *Analysis of the obtained impression model.*

Figure 7. *The finished impression model.*

CONCLUSION

The reduced number of steps involved in the technique presented, herein, minimizes treatment time and expenses, characterizing an important advantage over previously described techniques. In addition, a reduction in the number of sessions required to fit the denture has been observed as well as a better adaptation of rehabilitated patients, thus increasing the level of post-treatment satisfaction.

ADDRESS FOR CORRESPONDENCE

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