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Short Communication

A technique for using short term soft liners as complete dentures final impression material

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ABSTRACT

Tissue conditioners can be used to condition abused tissues, record functional impressions, make temporary relining for surgical splints and obturators, and for other clinical applications, mainly because of their specific viscoelasticity. Their function in complete denture fabrication is debatable but their use as a functional impression material has been proved. The present article describes a technique for using tissue conditioners as functional impression materials. Correct method of usage, manipulation, specific properties as impression materials and precautions in different situations for obtaining accurate impressions has been highlighted.

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1. Introduction

Tissue-conditioning materials are soft, resilient, temporary relining materials which, by reducing and evenly distributing stresses on the mucosa of the basal seat, have a rehabilitating effect on unhealthy tissue and allow reversible conditions to return to normal states of health.¹ In addition to tissue

conditioning, its use has been advocated in impression making procedure or as a final impression material. In the past, there was little agreement about the best method of using them as functional impression materials and their use in complete denture impressions was even controversial.^{2–5} The study on the physical properties of tissue conditioners revealed that these materials do have the essential properties

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of a satisfactory impression material if working casts are poured promptly.^{1,6,7}

The viscoelastic behaviour of a tissue conditioner is the key to its clinical success of being used for conditioning the traumatised, inflamed or irritated tissues. On the other hand, for taking impressions, it should exhibit good flow and minimal elastic recovery.⁸ For guaranteed accuracy of the impression, it should flow readily under functional stresses and exhibit adequate dimensional stability in terms of weight change, water sorption and solubility.⁷ Wilson and co-workers⁹ also concluded that a material used for functional impressions should be plastic while one used for tissue conditioning should be soft and resilient. Thus by altering certain characteristics of a tissue conditioner and varying manipulation, one can successfully use it as a final impression material for edentulous ridges.

Modified complete denture impression techniques using tissue conditioners of different consistencies for border moulding and final impression materials have been tried in the past to solve the drawbacks of traditional methods.^{10,11} Smutko described an impression technique for resorbed residual alveolar ridge using three applications of conditioning material of varying consistencies.¹⁰ Wang and Hong modified Smutko's technique to further thicken and conform the denture borders, improving the overall retention of the complete dentures.¹¹

2. Technique

2.1. For edentulous patients having complete dentures fabricated for the first time

1. Make the primary casts from the preliminary impressions in the conventional manner.
2. Over the primary casts, fabricate autopolymerising acrylic resin custom trays, 2 mm short all over the borders, except the peripheral seal area in the maxillary ridge. Remove the wax spacer from the custom trays (scrape the tissue surface of the custom trays for the impression material, if spacer is not applied).
3. Mix 1.5 parts of powder and 1 part of liquid (Recon, Coltène/Whaledent Inc. Cuyahoga Falls, USA) in a glass bottle for 5 s. Pour the mix on a mixing pad and spread it with a spatula for 10 s to remove air bubbles.¹²
4. Apply immediately to all tissue bearing surfaces of the maxillary custom tray in a thin, even layer.
5. While retracting the patient's lip, seat the tray in the mouth with a rather firm pressure. Mould the borders by digitally manipulating the cheek and lip tissues in one step.
6. Permit patient a few minutes (5 min) to test alignment and material to flow, then remove tray, rinse with cold water and determine remaining pressure points that require further relief. Add material where necessary and repeat step 5.
7. Make thin mix of tissue conditioner (1:1 powder/liquid ratio) and apply as a wash to last application. Secure impression by static compression technique. Remove after 5 min.
8. A completed final impression should be free of any pressure spots or bubbles in the tissue conditioner (Fig. 1). Pour the impression in stone immediately (while the material is in plastic stage) after removal from the mouth.
9. Take the impression of the mandibular residual ridge in a similar manner, except that the patient's tongue should be directed to mould the lingual borders (Fig. 2).

2.2. For patients having existing complete dentures

Patients requiring fabrication of new dentures, often have traumatised, irritated or inflamed mucosa beneath their old dentures. In such cases, tissue conditioners are of great help in not only restoring the tissue health but also, reproducing the tissue details for a good final impression.

1. Trim the existing dentures to obtain space for tissue conditioner (Fig. 3).
2. Mix 1.5 parts of powder and 1 part of liquid (Recon, Coltène/Whaledent Inc. Cuyahoga Falls, USA) in a glass bottle for 5 s. Pour the mix on a mixing pad and spread it with a spatula for 10 s to remove air bubbles.¹²
3. Apply immediately to all tissue bearing surfaces of the maxillary denture in a thin, even layer.
4. While retracting the patient's lip, seat the tray in the mouth with a rather firm pressure. Mould the borders by digitally manipulating the cheek and lip tissues in one step.
5. Permit patient a few minutes (5 min) to test alignment and material to flow, then remove tray, rinse with cold water and determine remaining pressure points that require further relief. Add material where necessary and repeat step 4.
6. Take the impression of the mandibular residual ridge in a similar manner, except that the patient's tongue should be directed to mould the lingual borders.
7. Tissue conditioners have a tendency to slump during setting so they should be adequately supported by the borders of the denture. Now dentures can be given to the patient. Dismiss the patient for 2 weeks with the proper home care instructions given for the material.
8. At the next appointment the patient should be evaluated for healthy mucosa and well rounded peripheral borders of the denture.

Fig. 1 – Maxillary liner impression in customised tray.

Fig. 2 – Mandibular liner impression in customised tray.

9. Some of the material might have reached firm stage, so vulnerable to deterioration. Therefore, for a functional wash impression, replace last application of tissue conditioner with new thin mix (1:1 powder/liquid ratio). Dismiss the patient for 24 h during which the mix will flow and change form with normal usage. A functional impression will result from which the model can be poured (Fig. 4).

3. Discussion

When a tissue conditioner is to be used as a functional impression material, a material should flow readily by means of functional stresses and register the accurate shape of the oral structure.¹³ Although the flow property of this material would compensate in part for the dimensional changes and produce a close adaptation to the denture foundation area at the clinical situation, the material with smaller dimensional changes is adequate to the functional impression making. Tissue conditioner with least difference between the percentage of solubility and absorption would show least

dimensional change. Moreover, it has been shown that all tissue conditioners show least shrinkage between 8 and 24 h.⁷ Thus, it is important to obtain a good understanding of the dimensional stability of each tissue conditioner and the appropriate period of application as an impression material and to choose the material suitable for functional impressions.

The technique for use of tissue conditioner as final impression material has been described in the present article. A clinician can modify his technique to cope with various situations presented by different patients. The proposed technique offers several advantages over conventional methods of border moulding and impression making. Firstly, since the borders can be moulded by single insertion of the impression tray or the denture, errors inbuilt by multiple insertions of traditional section border moulding are minimised. Secondly, tissue conditioners being hydrophilic, are easier to handle in oral environment and impressions obtained are accurate and dimensionally stable. Because tissue conditioners of different consistencies can adhere together impeccably, rewashing of the impression is greatly simplified.¹¹ The resultant denture has thicker and conforming buccal borders, with more surface contact area, than is found in the conventional denture. This results in improved denture retention of the mandibular denture, particularly in severely resorbed ridge cases. Lastly, this technique is time saving, for both the patient and the clinician. In cases of existing complete denture, this modified technique has an added advantage of conditioning the abused oral tissues. In its plastic stage, tissue conditioner responds to functional stresses to improve fit and adaptation (few hours to few days). In elastic stage, overall stresses are cushioned and tissue recovery takes place. In firm stage, tissue conditioner attains dimensional stability to be removed from the mouth without distortion (1–2 weeks).⁸

The most critical step in using a tissue conditioner as impression material is pouring of the impression. Since the material shows strain rate dependent plastic characteristics, immediate pouring of the impression is required. A thin layer of stone can be painted over the tissue surface and the borders of the impression to prevent the permanent deformation by the weight of the stone or the material itself. Rest of the impression can be poured after the initial layer sets. These

Fig. 3 – Existing dentures prepared to make liner impressions.

Fig. 4 – Impressions made in existing dentures.

materials have a tendency to slump during setting so, the custom trays or the previous denture borders should be adequately supported. Maxillary working casts have to be scored in the posterior palatal seal area because the period of plasticity of tissue conditioner may not create sufficient displacement action in this area.

4. Conclusion

A simplified technique for using tissue conditioners as final impression materials has been outlined. The technique has its advantages and is time saving, yielding good results. This can be particularly useful in geriatric patients, old denture wearers, replacement of ill fitting dentures and certain clinically compromised situations.

Conflicts of interest

All authors have none to declare.

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