

Customised Thermo-Sectional Edentulous Impression Tray for Exaggerated Gag Reflex Patient– A Dental Technique

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Abstract

Prosthodontic rehabilitation of a completely edentulous maxillary arch is always challenging in exaggerated gag reflex patients. However, the exaggerated gag reflex imparts discomfort, less patient cooperation and significantly impairs the impression making procedure in the process of fabrication of complete dentures. Thermo stands for water and sectional stands for part. The thermo-sectional tray design includes three parts; Section 1 or the ridge section of the tray, Section 2 or the thermo-palatal section of the tray with water inlet, and the Handle. The aim of the thermo-sectional tray design is to minimise the gagging reflex in an exaggerated gag reflex patient while making the final impression of an edentulous maxillary arch and to overcome the limitations of bulk in conventional autopolymerising acrylic resin custom tray, more palatal coverage, and increase period of contact of the tray with the palate during border moulding and wash impression.

Introduction

Prosthodontic rehabilitation of a completely edentulous maxillary arch is always challenging in exaggerated gag reflex patients.¹The gag reflex or pharyngeal reflex is an involuntary reflex causing contraction of pharyngeal muscle and elevation of the soft palate.¹Gag reflex can be normal, hyposensitive and hypersensitive.²Normal gag reflex is a healthy defence mechanism that prevents foreign bodies from entering the trachea and prevents choking.^{2,3}However due to certain systemic, psychological, physiological and iatrogenic factors the normal gag reflex can be exaggerated in some patients.^{4,5}Digital methods, Implant fixed dentures, palateless overdentures, marble technique, U-shaped dentures, acupuncture and conventional dentures after sensitisation are various treatment modalities used for exaggerated gag reflex patients.⁶⁻⁸Digital impressions using intraoral scanners can be used but have the disadvantage of inappropriate scanned images of the edentulous tissues and less accuracy due to the resilient edentulous denture-bearing tissues.^{9,10}The exaggerated gag reflex imparts discomfort, less patient cooperation and significantly impairs the impression making procedure in the process of fabrication of complete dentures.^{11,12}To overcome the problems during final impression making the custom tray design was modified.

This article describes the design philosophy, purpose, advantages, drawbacks and the technique of making an impression in an exaggerated gag reflex completely edentulous patient using the thermo-sectional tray so that it will aid the clinicians to make an accurate final impression of a completely edentulous maxillary arch in lesser time and with increased comfort to the patients.

Technique

1. Design Philosophy: Thermo stands for water and sectional stands for part. The thermo-sectional tray design includes two sectional trays and the incorporation of chilled water while making the final impression. The tray is made up of clear acrylic autopolymerising resin with a thickness of 1 mm.

2. Parts of thermo-sectional tray: It consists of three parts; Section 1 or the ridge section of the tray, Section 2 or the thermo-palatal section of the tray with water inlet, and the Handle (Fig. 1 & 2).
3. Fabrication of Section 1 or the ridge section of the tray: It is a U-shaped section that covers the entire residual alveolar ridge and extends from the sulcus to slopes of the residual ridge medio-laterally. It is kept 2mm short from the sulcus to create space for border moulding. It consists of three rectangular slots; an Anterior slot, a left posterior slot and right posterior slot of 2 X 1 mm dimension created at the palatal border of section 1 (Fig. 3).
4. Fabrication of Section 2 or thermo-palatal section of the tray with water inlet: It covers the remaining part of the palate extending anteriorly from the rugae area, laterally from slopes of the residual ridge, and posteriorly till the posterior vibrating line. It consists of capillary space in between the tissue surface and the polished surface of the tray for chilled water. It consists of a water inlet at the posterior border (Fig. 4).
5. Fabrication of tray handle: The handle is 10 X 5 X 5 mm in dimension and attached in the centre near the incisive papilla at a 45-degree angle to section 1. It is used to hold the tray in its position.
6. Border moulding: Section 1 or the ridge section of the tray is used for border moulding.
7. Making of wash impression: Section 2 is assembled with Section 1 with help of interlocking keys (Fig. 5) and the capillary space in Section 2 is filled with chilled water (Fig. 6). The assembled thermo-sectional tray is then used to make a wash impression of the completely edentulous maxillary denture-bearing area. Elastomeric impression material with light body consistency is used for making a wash impression of the maxillary denture-bearing area.

Discussion

Gagging is a normal defence mechanism of the trachea. However, the exaggerated gag reflex interferes with ease while making the final impression. The aim of the thermo-sectional tray design is to minimise the gagging reflex in an exaggerated gag reflex patient while making the final impression of an edentulous maxillary arch and to overcome the limitations of bulk in conventional autopolymerising acrylic resin custom tray, more palatal coverage, and increase period of contact of the tray with the palate during border moulding and wash impression. The customised thermo-sectional tray design is used to make a final impression of the edentulous maxillary arch in exaggerated gag reflex patients. The advantages of a thermo-sectional tray include less discomfort to the patient due to the reduced bulk of the tray to 1mm thickness, dividing the entire tray into two sections reduces the period of contact of the tray to the entire palate as compared to full coverage acrylic tray design, the period of palatal tray contact is minimised due to single step border moulding with putty elastomeric impression material or low fusing impression compound separately using section 1 of the tray, as wash impression is made on the assembled part the period of palatal contact of material is less, less messy due to use of light body consistency elastomeric impression material for wash impression, the presence of chilled water over the palate helps to desensitize the area causing numbness for certain period while making impression, reduced gag reflex, the tray can be fabricated with clear acrylic autopolymerising resin, pink autopolymerising acrylic resin, tray material acrylic resin, vacuum sheet and three-dimensional printed resin. The disadvantages include the customised fabrication of the tray for every patient.

Summary

The thermo-sectional tray design aids the clinician in recording an accurate wash impression with border moulding within a minimum time period and causing less discomfort to the exaggerated gag reflex patient. Thermo-sectional tray design can be used as one of the modifications to record the final impression of the completely edentulous maxillary arch in an exaggerated gag reflex patient.

Declarations of Interest Statement & Form:

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Figures

Figure 1. Parts of thermo-sectional edentulous impression tray.

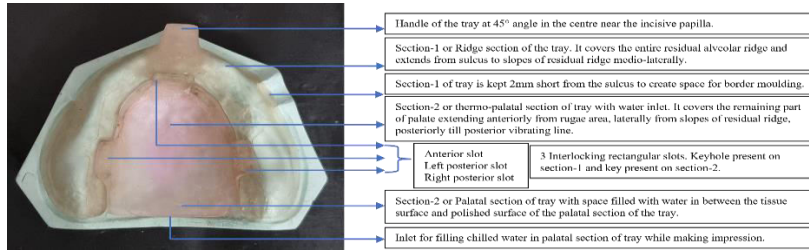


Figure 2. Parts of thermo-sectional edentulous impression tray.



Figure 3. U-shaped Section-1 or ridge section of thermo-sectional tray.



Figure 4. Section-2 or thermo-palatal section of tray with water inlet.



Figure 5. Assembled ridge section and thermo-palatal section of thermo-sectional tray with help of interlocking keys.



Figure6. Assembled thermo-sectional tray with capillary space filled with chilled water.



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