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Case Report

Dual Use of Thermoplastic Sheet to Mark Posterior Palatal Seal and as a Spacer: A Dental Technique

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Abstract

The posterior palatal seal (PPS) area plays a crucial role in the retention of maxillary complete dentures and is often missed by clinicians. Various techniques have been proposed to record the PPS area. However, the success of these techniques depends on the accurate location and transfer of the anatomic boundaries of the PPS area to either the primary or definitive cast, which may be identified with a T-burnisher and indelible marking pencil. In 2006, Chang and Wright described a technique for the location of the PPS intraorally and accurate transfer to the maxillary complete denture cast. This article describes a modified technique for the transfer of the PPS area on the maxillary cast using a thermoplastic sheet and using it as a spacer for a custom tray.

Key words: Final impression, Posterior palatal seal, Retention, Thermoplastic sheet

INTRODUCTION

The posterior palatal seal (PPS) area plays a crucial role in the retention of maxillary complete dentures and is often missed by the clinician.[1,2] The PPS area is defined by the glossary of prosthodontic terms[3] as "the soft tissue area limited posteriorly by the distal demarcation of the movable and non-movable tissues of the soft palate and anteriorly by the junction of the hard and soft palates on which pressure, within physiologic limits, can be placed; this seal can be applied by a removable complete denture to aid in its retention." Various techniques have been proposed for recording the PPS area.[4] However, the success of these techniques depends on the accurate location and transfer of the anatomic boundaries of the PPS area to either the primary or definitive cast, which may be identified with a T-burnisher and indelible marking pencil. In 2006, Chang and Wright[5] described a technique for the location of the PPS intraorally and accurate transfer to the maxillary complete denture cast.[5] However, a drawback of this technique is the replication of intraoral markings on the record base. The selective pressure theory varies the pressure over the denture-bearing area depending on the displaceability of supporting tissues. The spacer used in this procedure plays an important role in making the final impression for complete dentures. In addition to providing space for the impression material, the spacer also helps determine the amount of tissue displacement due to the pressure applied. Given the challenges in accurately recording the PPS area and its critical role in denture retention, this article introduces a modified technique that utilizes a thermoplastic sheet both for the precise transfer of the PPS area to the cast and as an innovative spacer for custom tray fabrication.

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TECHNIQUE

1. Primary impressions were made using alginate impression material (Jeltrate Alginate Impression Material,

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DENTSPLY Caulk, Milford, DE, USA), and primary casts were made using Type III dental stone (Silky-Rock, Whip Mix Corporation, Louisville, KY, USA).

2. The extension of the custom tray, spacer design, and tissue stops were marked on the primary cast. A resilient polyvinyl thermoplastic sheet (Easy-Vac Gasket; 3A Medes, Seoul, South Korea) 0.5 mm thick was adapted over the primary cast using a vacuum-forming machine (Easy-Vac; 3A Medes, Seoul, South Korea) [Figure 1].

3. During the second clinical visit, the PPS was marked with a T-burnisher and an indelible pencil[6] [Figure 2]. The thermoplastic sheet template was placed intraorally, and the markings of PPS were transferred to it using a black permanent marker (Permanent Marker; CamliN, India) [Figure 3].

4. In the laboratory it was then placed on the primary cast and the markings of PPS were marked on the primary cast. It was cut to the desired spacer design and tissue stops. The custom tray was fabricated using autopolymerizing acrylic resin (DPI, Dental Products of India, Mumbai, India) [Figure 4].

5. The maxillary custom tray was checked in the patient's mouth to check the space required for border molding. The tray borders was trimmed and the border molding was done using putty consistency of polyvinyl siloxane impression material (Aquasil, DENTSPLY Caulk, Milford, DE, USA).

6. After border molding, the previously adapted spacer was peeled off [Figure 5]. Vent holes were created to avoid the buildup of hydrostatic pressure and to avoid tissue displacement.[7] The definitive impression material (Aquasil Ultra, Monophase, DENTSPLY Caulk, Milford, DE, USA) was loaded, and a final impression was made [Figure 6].

This streamlined process not only simplifies the transfer of the PPS but also enhances the efficiency of the custom tray fabrication.

DISCUSSION

By using a thermoplastic sheet to demarcate the PPS and then directly employing it as a spacer, this technique eliminates the need for separate spacer materials, thereby simplifying the custom tray fabrication process and reducing the margin for error. This technique minimizes complete denture construction time as it helps in the fast and accurate location of the PPS area, and the same sheet can also act as a spacer for the final impression. The PPS plays a crucial role in the retention of the maxillary denture.[8] The determination of the PPS should be the responsibility of the dentist and not the obligation of a laboratory technician.[6]

Figure 1: Thermoplastic spacer on primary cast

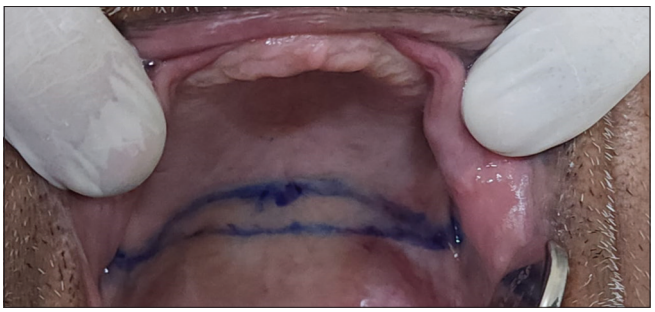

Figure 2: Anterior and posterior vibrating line marked intraorally

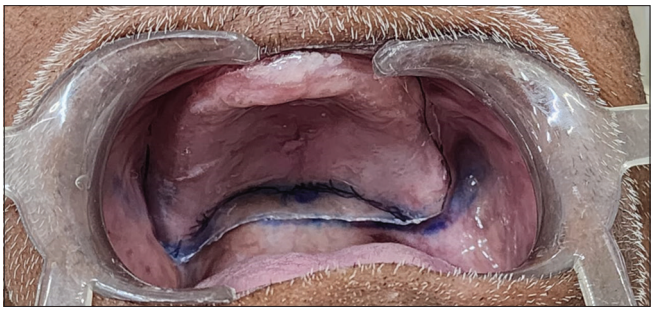

Figure 3: Transferring the markings on the thermoplastic sheet

Figure 4: Special tray

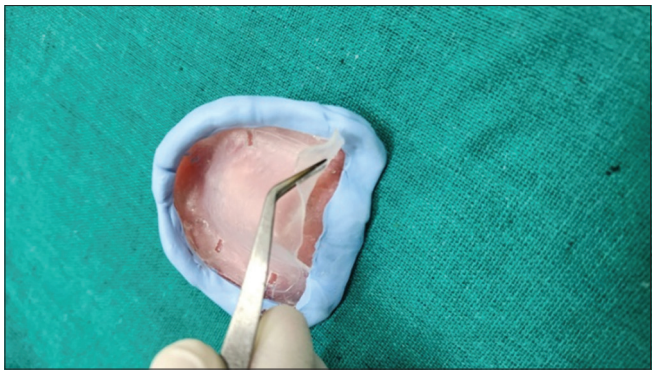

Figure 5: Removal of spacer

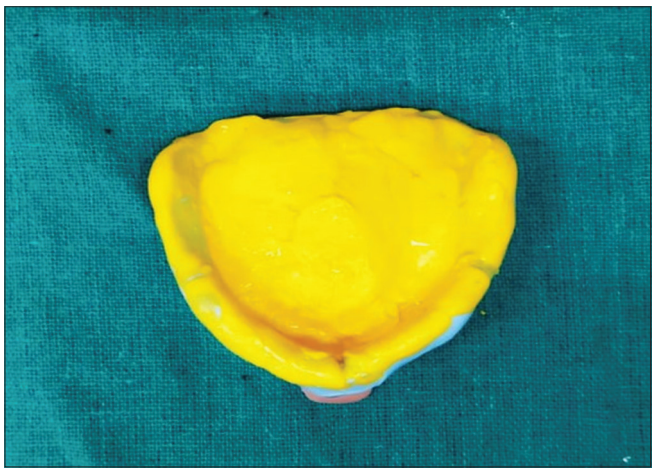

Figure 6: Final impression

The procedure depicted develops a replica of the PPS in the thermoplastic sheet, which creates imprints on the primary cast. The technique described gives the clinician a method of creating and evaluating a PPS and transferring this likeness to the primary cast in a customized fashion, and the same thermoplastic sheet will also act as a spacer for the final impression. This approach may be considered less arbitrary than traditional methods of carving the definitive cast. If incorporated into the subsequent record base, PPS helps to promote stability and retention for the interocclusal records and the wax trial appointment steps.[7-9]

CONCLUSION

This dual-use technique employing a thermoplastic sheet provides an efficient method for accurately transferring the posterior palatal seal to the cast while simultaneously serving as a spacer for the custom tray fabrication. It enhances precision and contributes to improved retention and stability of maxillary complete dentures.

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