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Short Communication

Minimizing the risk of fracture of definitive casts for removable partial dentures: A dental technique

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ABSTRACT

A technique is described to facilitate impression making and safely obtain the definitive cast for removable partial dentures with long, retentive, or lone-standing abutment teeth. Firstly, the individualized stock tray receives a coating of melted wax. Next, the prepared teeth are impressed with irreversible hydrocolloid, and the set impression is removed from mouth. The mold is then poured conventionally and, after the gypsum has set, is immersed in hot water to soften the wax and allow removal of the tray. The impression material is carefully cut away with a scalpel blade to expose the cast. With these straightforward and easily made changes compared with the conventional technique, the risk of fracturing the definitive cast is minimized, especially when reproducing long retentive teeth.

Key Messages: A dental technique is presented that uses wax to coat the impression tray to facilitate the passive displacement of the cast. This results in a straightforward and precise definitive cast for removable partial dentures.

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1. Introduction

When providing removable partial dentures (RPDs), an accurate definitive cast of the arch after tooth preparation is essential for fabricating the framework.¹ Definitive casts are conventionally obtained from irreversible hydrocolloid impressions and poured with gypsum.^{1,2} However, fractured teeth in the definitive cast can occur, especially when the abutment teeth are associated with periodontal disease, have retentive undercuts, or are lone standing.³

In these situations, the conventional technique of obtaining definitive casts can become a challenge because the gypsum could fracture during removal of the tray from the set gypsum.⁴ Therefore, techniques have been described for avoiding that situation, including the use of pins as additional reinforcement structures.⁵ However, their

placement adds an additional step and may interfere with critical areas in the cast. This report presents an alternative technique by coating the tray with melted wax before the impression to help obtain a precise definitive cast. The technique is straightforward, reproducible, and effective.

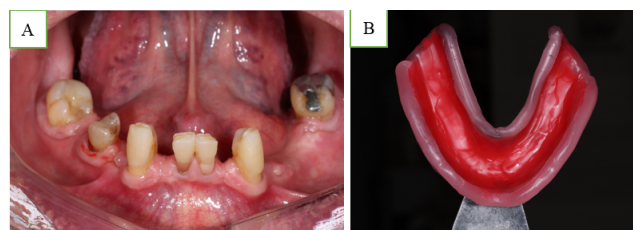


Fig. 1: A: Clinical situation with long and retentive abutment teeth; B: Stock tray coated with even layer of melted wax.

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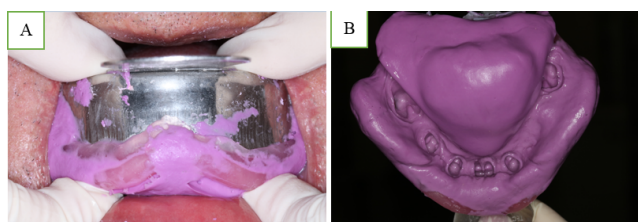


Fig. 2: Impression making; **A:** Removal by applying displacement force on the impression material at the depth of the vestibule; **B:** Definitive impression.

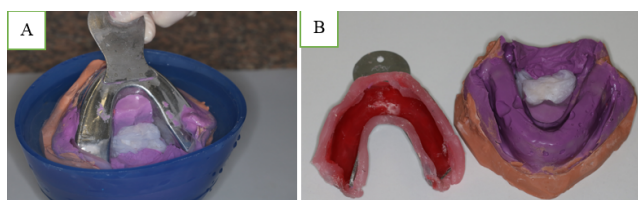


Fig. 3: **A:** Poured impression immersed in hot water to soften wax; **B:** Tray removed.

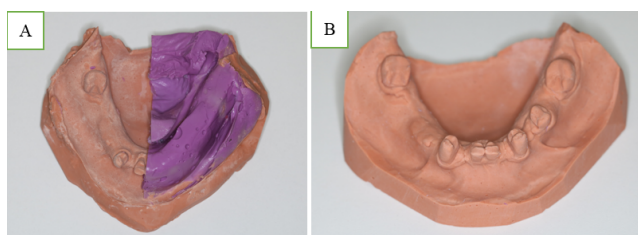


Fig. 4: **A:** Impression material being removed carefully; **B:** Definitive cast

2. Technique

The technique is illustrated in a patient with long and retentive abutment teeth (Figure 1).

1. Coat the stock tray with melted modeling wax (Cera 7; Lysanda Produtos Odontológicos) (Figure 2).
2. Make an impression with irreversible hydrocolloid impression material (Hydrogum; Zhermack GmbH Deutschland).
3. Remove the impression after its geleification by applying displacement force on the impression material at the depth of the vestibule to avoid displacing the impression material from the tray (Figure 3).
4. Pour the impression in a mold with a Type IV gypsum (Durone IV; Dentsply) and, after it has fully set, immerse it in hot water (Figure 4A) to soften the wax and allow displacement of the tray (Figure 4B).
5. Carefully trim away the impression material with a scalpel blade to expose the definitive cast.

3. Discussion

A fractured definitive cast may be repaired with an adhesive, but the result is an imprecise cast, risking a poorly fitting RPD framework.² The technique described uses melted modeling wax in a tray to minimize the risk of fracturing the definitive teeth, especially with long, retentive, or lone-standing teeth. Studies are needed to evaluate the clinical benefits of this approach and whether the accuracy of the impression might be adversely affected.

4. Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

5. Source of Funding

None.

References

1. Abdou J. Accuracy of casts produced from conventional and digital workflows: a qualitative and quantitative analyses. *J Adv Prosthodont.* 2019;11(2):138–46.
2. Tregeman I, Renne W, Kelly A, Wilson D. Evaluation of removable partial denture frameworks fabricated using 3 different techniques. *J Prosthet Dent.* 2019;122(4):390–5.
3. Correia A, Lobo FDS, Miranda MCP, Framegas de Araújo FMS, Santos Marques TM. Evaluation of the periodontal status of abutment teeth in removable partial dentures. *Int J Periodontics Restorative Dent.* 2018;38(5):755–60.
4. Prombonas A, Vliissidis D. Compressive strength and setting temperatures of mixes with various proportions of plaster to stone. *J Prosthet Dent.* 1994;72(1):95–100.
5. Robinson FB, Block B. Dowel pin positioning technique for fixed partial denture working casts. *J Prosthet Dent.* 1981;46(2):215–6.

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