

TIPS FROM OUR READERS

Hot water–assisted separation of mounted casts and retrieval of articulator mounting plates

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Dental casts are commonly attached to dental articulators with removable mounting plates by using mounting gypsum materials such as plaster or stone.¹ Some processes require that the cast be separated from their supporting media for a remount procedure.^{2–5} On occasion, the interocclusal relationship of the casts^{6,7} may have to be revised. At the completion of patient treatment, the definitive casts may be discarded, but the operator may wish to reuse the mounting plates.

To ease the separation of casts from the mounting media, the application of lubricating materials such as soap, tin foil substitute, or petroleum jelly has been suggested.^{2,3} A common method of separating the mounting gypsum materials from a cast or mounting plates is to apply a shearing force with a pneumatic chisel or a hammer blow on a blade instrument placed at the junction of the cast and mounting gypsum material.³ However, the use of force may result in fracture of the cast or fail to separate the cast cleanly. If the mounting plates are polymeric, they could easily be damaged.⁸

This article describes how hot water immersion produces differential thermal expansion of the gypsum materials involved, creating thermal stress at the mounting interfaces to help separate either the cast or the mounting plate. Once the gypsum materials have cooled and dried, they revert to their usual hardness and form.⁹ There is no need to pretreat the cast surface before adding mounting gypsum material, and no special separation tools such as hammers and chisels are required.

Casts that contain heat-sensitive materials such as wax can also be separated, but care must be taken not to

allow the wax pattern to contact the hot water. Also, the temperature of the water (80–85°C) could cause scalding, and wearing thermal protective gloves is advised. Temperatures above 85 °C may also result in acrylic base plate distortion.

PROCEDURE

1. Place the mounted cast to be separated (Fig. 1A) in a clear heat-proof vessel which when filled would cover beyond the cast-to-mounting gypsum material junction.
2. Fill the vessel with hot (approximate 85 °C) water that extends beyond the junction (Fig. 1B).
3. After a few seconds, listen for an audible crack, indicating the cast has separated and can be removed. Wear heat-proof gloves or very carefully remove the materials from the water to prevent scalding (Fig. 1C). If the cast is not easily removed, the procedure should be repeated. (Note: poorly trimmed casts without flat bases or those that have mounting gypsum material encapsulating them will be more difficult to retrieve)
4. For casts containing heat-susceptible materials that are to be retained, for example, wax patterns, place either a pen mark or an elastic band on the cast above the mounting gypsum materials such as plaster or stone. Fill with hot water only to this level (Fig. 2), and remove when a crack is heard or after 10 seconds of immersion.

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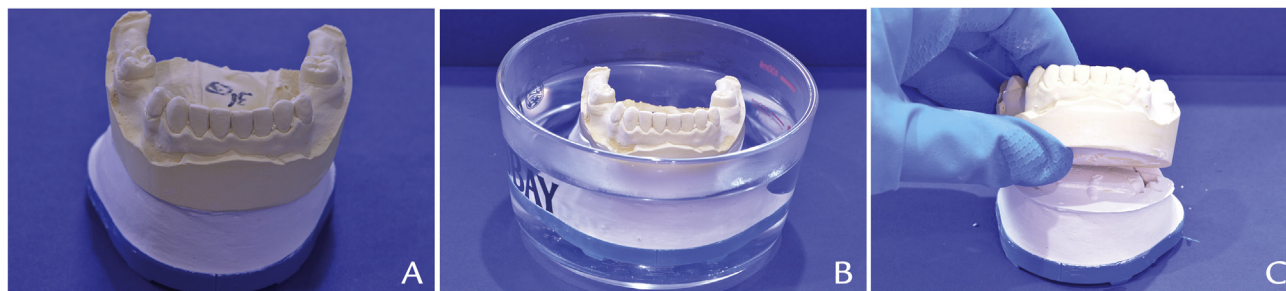


Figure 1. A, Mounted cast to be retrieved. B, Immersed in hot water at approximately 85 °C. C, Separation of cast from mounting gypsum material.



Figure 2. Maintaining diagnostic wax pattern by placing elastic band to signify limit of hot water level.

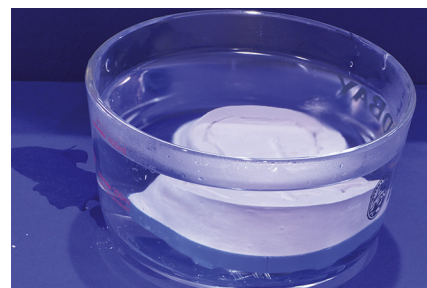


Figure 3. Immerse mounting plate and mounting gypsum material in hot water for 20 to 30 seconds.

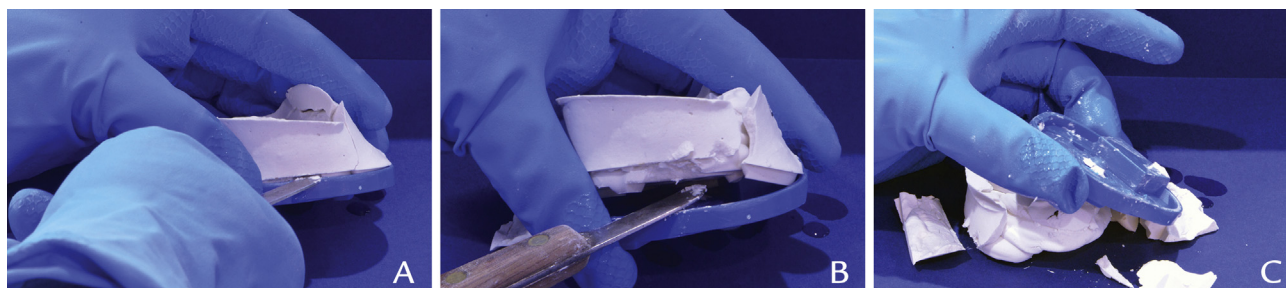


Figure 4. A, Laboratory knife at junction. If necessary, work around mounting plate. B, Continue to gently cleave until plate detaches. C, Polymeric mounting plate retrieved.

5. To retrieve mounting plates, immerse the mounting plate with associated mounting gypsum material in the vessel of hot water but leave for approximately 20 to 30 seconds (Fig. 3).
6. Detach the mounting ring carefully by placing a laboratory knife at the mounting gypsum material-to-polymeric plate junction (Fig. 4A). Gently cleave the polymeric plate away from the plaster (Fig. 4B). If it does not readily part, replace in the hot water and try again 30 seconds later. Repeat the aforementioned cleaving procedure.
7. Remove remnants of the mounting material by using the laboratory knife. Visually check for distortion; if none, store for reuse (Fig. 4C).

REFERENCES

1. Glossary of prosthodontic terms. 9th ed. *J Prosthet Dent* 2017;117:e1-105.
2. Carr AB, Brown DT. McCracken's Removable partial prosthodontics. 13th ed. St. Louis: Elsevier; 2016. p. 279-80.
3. MacEntee MI. The complete denture. A clinical pathway. Chicago: Quintessence; 1999. p. 57.
4. Rosenstiel SF, Land MF, Fujimoto J. Diagnostic casts and related procedures. In: Contemporary fixed prosthodontics. 5th ed. St. Louis: Mosby/Elsevier; 2016. p. 37-55.
5. Hudson JM. Articulators in orthodontics. *Am J Orthod Dentofacial Orthop* 2012;141:528-9.
6. Roraff AR, Stansbury BE. Errors caused by dimensional change in mounting material. *J Prosthet Dent* 1972;28:247-52.
7. Peregrina A, Feil PH. Reproducibility of occlusal contacts relative to mounting cast variables. *Quintessence Int* 1994;25:617-9.
8. Lee W, Kwon HB. Vertical repositioning accuracy of magnetic mounting systems on 4 articulator models. *J Prosthet Dent* 2018;119:446.
9. Michalakis KX, Stratos A, Hirayama H, Pissiotis AL, Touloumi F. Delayed setting and hygroscopic linear expansion of three gypsum products used for cast articulation. *J Prosthet Dent* 2009;102:313-8.

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