



RESEARCH ARTICLE

DOWEL PIN - SNAP FIT TECHNIQUE: A NOVEL SPLIT CAST TECHNIQUE

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Abstract

Complete denture construction comes with a lot challenges both during the clinical and laboratory steps. Lab remounting is one of those steps; it is done to mount the master cast back in position after acrylisation of the complete denture to undergo selective grinding. But the conventional methods used for this technique have not been good enough to hold the master cast in place in a stable manner. The novel technique introduced in this article uses dowel pins for remounting, and it provides a more stable, reliable and snug fit technique without making the technique any more complicated.

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Introduction:-

The prosthodontist meticulously completes each clinical step involved in making a prosthesis following which, the laboratory technician makes every effort to complete the remaining lab tasks. However, some changes are noticeable when the processed dentures are remounted on the articulator. The thickness of the denture, the polymer to monomer ratio, the trial closure method, and the curing cycle are all potential causes of these errors. Denture bases may distort and artificial teeth may shift as a result of the interaction of polymerization shrinkage, thermal contraction during flask cooling, and strain accompanying stress release during deflasking.¹

Therefore, during the laboratory processing of entire dentures by compression molding, the problem of complete denture processing arising from tooth movements may occur. Occlusal spot grinding is required prior to the patient using the prosthesis as a result of these tooth movements. This will help in better integration of the dentures with the masticatory functions and the patient's psychological acceptance which are key components of successful total denture therapy.¹

Casts are mounted on the articulator using split cast mounting. The process makes it simple to remove and replace the cast to the exact same position as before and allows for the verification of the accuracy of the mounting. This offers a precise method of correcting the occlusion changes brought on by the processing method.²

The split mounting's instability has always been a concern for prosthodontists, making its use limited. The literature makes reference to a variety of materials. J.W. Needles introduced the term "split casts" for the first time in 1923. Split casts that have been constructed properly offer a quick and dependable way to verify articulator settings from occlusal records and mount articulators with a high degree of accuracy.³ It is essentially a cast that is divided horizontally into two parts. Primary base refers to the first segment of the split master cast with index grooves. The height of the palatal vault, the depth of the sulcus, and the clinician's personal preferences are taken into consideration when deciding on the style, quantity, and placement of the index grooves. The second component, also

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known as the secondary base or sandwich, is attached to the upper member of the articulator and is fitted to the master cast.⁴ The correct centric relation record is verified by the perfect fit of the master cast, sandwich, and upper member of the articulator. If there is a gap between the master cast and sandwich or between the sandwich and the upper member of the articulator, the centric relation previously recorded is incorrect.⁴

The split-cast mounting method enables:

- (i) Simple cast removal and replacement.
- (ii) Using eccentric records to program the articulator.
- (iii) Verification of the records for centric jaw relations
- (iv) To fix occlusal mistakes brought on by the processing method.

This article will introduce a novel, significantly less time-consuming, yet highly accurate spit casting technique that can also simplify the process considerably.^{5,6}

Procedure:

- 1: Once the secondary impression of the patient's maxillary and mandibular arches are made using the custom tray after the border molding, it is poured with dental stone to obtain the master cast.
2. Here is where the novel strategy is applied. Dowel pins, along with their sleeves and rubber tips, are dipped into the unset dental stone poured in the beaded and boxed secondary impressions so that only the screw head is visible on the exterior. Fig 1.
3. Now, separating media or petroleum jelly is applied to the master cast's underside, being careful not to get any of it on the exposed dowel pin screw point. This will make it possible to easily separate the master cast from the primary base.
4. When the jaw relation record needs to be transferred to an articulator, a small amount of die stone is used so that the exposed dowel pin screw tip is retained by it, and dental plaster is applied in the remaining locations to finish mounting the casts onto the articulator. Fig 2.
5. Due to its superior physical characteristics in comparison to dental plaster, die stone is preferred over dental plaster around the dowel pin screw tip because it would more effectively grip the dowel pin by the screw tip when trying to split the master cast from the primary base for acrylisation of the denture. Dental plaster can be applied to the remaining places.
6. Once the mounting is set and the master cast is removed from the primary base, the dowel pin remains in the primary base because the die stone holds it by the screw tip, and the dowel pin sleeves are now in the master cast. Fig 3
7. The holes in the sleeves of the dowel pins present on the undersurface of the master cast can be sealed with putty-consistency addition silicone impression material to stop plaster from seeping into the sleeves when flasking the master cast for acrylisation of the denture.
8. After acrylisation the silicone impression material may be withdrawn from the sleeve holes and the master cast can be held back in place for selective grinding by enabling the primary base's dowel pins to snap into the master cast's dowel pin sleeves. This guarantees quick and precise replacement of the master cast, delivering improved stability without requiring the employment of extra stability measures.



Fig 1:- Dowel pins with their sleeves and rubber tips are dipped into the unset dental stone poured in the beaded and boxed secondary impressions.



Fig 2:- A tiny quantity of die stone is needed to ensure that the exposed dowel pin screw tip is held by it.



Fig 3:- Cast separated from the primary base.

The following are some advantages this technique has over other techniques: -

1. Benefits of this procedure over alternative techniques include the availability of all necessary materials in any dental facility.
2. There is no need for additional steps like making a second base or sandwich component.
3. In comparison to utilizing sticky wax, plasters, or other adhesive alternatives, the stability dowel pins provide on holding the master cast in place while opening and closure of the articulator is far more superior.
4. Although the accuracy has increased, there haven't been any further stages added; instead, there are fewer steps in this approach, making it far more preferable, reliable and accurate.

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