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A Technique to Increase Retention of all Metal and Porcelain Fused to Metal Crowns to Cast Post and Core Restorations

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ABSTRACT

Retention prevents dental restoration from being dislodged along its path of insertion. However, classic retentive factors are not always possible to implement in fixed prosthodontics. Therefore, it may be helpful to utilize non-conventional methods to enhance retention in situations where retention can't be obtained from primary and secondary retentive factors. This article describes a technique to increase crown retention to cast post and core by using a horizontal retentive post to lock the crown to the cast post and core.

Keywords: Retention, Cast, Post, Core, Crown, Technique

INTRODUCTION

Retention prevents dental restoration from being dislodged along its path of insertion [1]. In fixed prosthodontics, the axial surfaces of tooth preparation are considered primary contributors to the overall retention through their length, parallelism and surface area [1]. Retention in tooth preparations that lack these beneficial primary factors can be improved by incorporating secondary internal retentive factors such as grooves, boxes, and vertical pin-holes [1-4]. Several other methods and techniques have been recommended and developed in order to overcome lack of retention. These include increasing surface roughness of restorations as well as the use of adhesive cement [5,6].

Unfortunately, in many clinical cases, the classic retentive factors can't be implemented leading to compromised retention. Therefore, it may be helpful to utilize non-conventional methods to enhance retention in certain clinical scenarios. This article describes a technique to increase crown retention to cast post and core by using a horizontal retentive pin to lock the crown to the cast post and core.

TECHNIQUE

1. Prepare the root canal for cast post and core
2. Make an impression with a plastic impression post (ParaPost® XP™; Coltene, Whaledent Int, New York, NY) for the fabrication of a cast post and core utilizing the indirect technique

3. Create a wax pattern for the post and core incorporating a horizontal plastic burnout or impression post (ParaPost® XP™; Coltene, Whaledent Int, New York, NY) within the core (Figure 1)
4. Separate and remove the horizontal post from the core pattern, and complete the investing, casting, and finishing procedures in a conventional manner for both the post and core and the horizontal post patterns
5. Try in the cast post and core clinically then retrieve it without cementation in order to fabricate the crown in the laboratory
6. In the laboratory, seat the cast post and core on the cast and insert the casted horizontal post in its housing within the core (Figure 2)
7. Wax the crown pattern, then remove the cast horizontal post and complete the investing, casting, and finishing procedures of the crown in a conventional manner (Figure 3)
8. Verify the fit of the crown clinically over the cast post and core and evaluate contacts, margins, and occlusion
9. Cement the three pieces simultaneously, starting with the post followed by the crown, and finally cement the horizontal retentive post by inserting it through the crown and core
10. When the cement is fully set, remove excess cement, and cut the excess part of the retentive post (Figure 4)
11. Finish and polish in a conventional manner

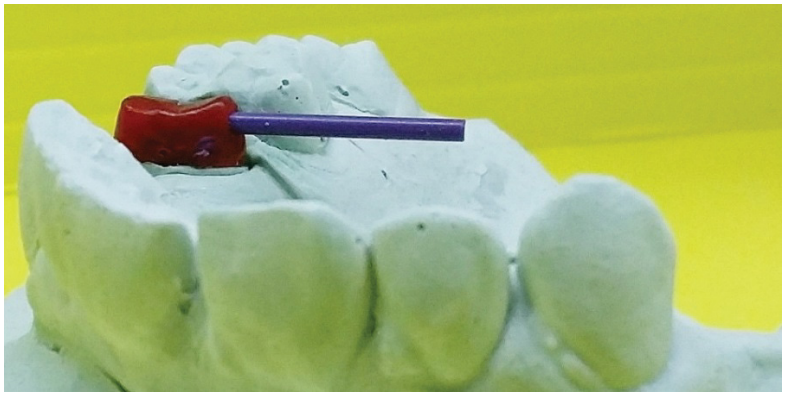

Figure 1 Wax pattern for the post and core with a horizontal plastic burnout post

Figure 2 Casted horizontal post inserted in its housing within the core

Figure 3 Casted crown with cast post and core and horizontal post

Figure 4 Final result with cemented components

DISCUSSION

This article describes a technique to increase retention in endodontically treated teeth that require cast posts and cores. This technique may be beneficial when the interocclusal space does not permit long parallel axial walls to contribute to the retention of the crown when secondary retentive features can't be placed where they would be effective and when resin cement can't be utilized to compensate for the compromised retention form. The horizontal retentive post locks the crown to the cast post and core and prevents its movement or dislodgement.

The crown hole created to house the horizontal retentive post in this technique will also function as a vent hole. Literature has found that incorporating a vent hole in a crown can improve crown seating, decrease occlusal cement thickness and contribute to additional retention [7-9].

To seal the vent holes, multiple materials have been utilized using both direct and indirect techniques [7]. One of the methods described by Basset suggested fabricating a casted pin that fits into crown vent holes to seal them [10]. In the current article, the casted retentive horizontal metal post functions as a metallic plug that seals the vent hole. The technique is simple and can be accomplished using materials that are conventionally used in the fabrication of cast post and core and all-metal/porcelain fused to metal crowns.

DECLARATIONS

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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