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Selecting the Right Cement for Cast Post Core Crowns – A Dental Students Quandary

Authors

Khurshid A. Mattoo¹, Aditya Kapoor², Amit Sivach³

¹Assistant Professor, College of Dental Sciences, Gizan University

²Post Graduate Student, Subharti dental college, Subharti University

³Lecturer, Kalka Dental College, Chowdhury Charan Singh University

Corresponding Author

Dr Khurshid A Mattoo

Assistant Professor, College of Dental Sciences, Gizan University

Email: drkamattoo@rediffmail.com

Work Attributed to Subharti Dental College and Hospital, Subharti University, Meerut

ABSTRACT

Selecting cement for restorations, especially cast post core crown is a subject which every dental student should be thorough with. More than knowledge about the cements, it is important to apply this basic science into the clinical findings of an individual patient so that the restoration fulfils all the objectives of the treatment planned without compromising the fundamental principles. With so many cements available presently, especially with overwhelming claims of the manufacturers, it becomes imperative to overview the requirements of a cast post core restoration. This clinical report of the restoration of a maxillary left central incisor discusses the factors that every dental student should overview before selecting cement for such purpose.

Keywords: - dowel, endodontic treatment, cast restoration, ferrule

INTRODUCTION

In my tenure of more than a decade as an academician and clinician who has been teaching basic scientific discipline of dental materials, an eminent serious lacuna exists in the application of science of luting agent for cast restoration. Most of

the dental students that have been trained in the science of dental materials find it difficult to select the most appropriate cement for a particular case. The students tend to forget the application of clinical findings in most cases. On the other hand,

they do well when the choice is between temporary and permanent cementation.

Their choice for cement is particularly led by the potency of the cement and most of them choose adhesive cements like glass ionomer for permanent cementation for all types of restorations in all types of patients without any clinical basis. They even tend to forget the disadvantages that are associated with strong cements especially when cementing a crown for endodontically treated teeth. The confusion peaks when a large portion of the clinical crown has been lost and it is impossible to achieve sufficient anchorage of a restoration in the remaining dentin or in other words where a root canal – retained restoration is required.¹

Restoring an endodontically treated tooth with post core crown has its own problems like quantity and quality of the remaining dental tissue,^{2,3,4} inability of the post to strengthen the root,^{5,6} preparation associated with post and more importantly reliability of the endodontic treatment that has been done. Amongst the numerous types of posts available, alternatives to the cast post and core have not yet enjoyed widespread clinical use.^{7,8} this is because the cast post core allows the clinician a wide range of restorative options including the customization of the prepared canal. However, selecting cement for cast post and core is critical in many ways. Factors like working time, compatibility with obturating material, risk of endodontic failure, possibility of retrieval of the post, microleakage, modulus of elasticity, remaining tooth structure (length and width of the root) and most importantly, clinical features associated with a

particular patient like age, oral hygiene index, occlusion and aesthetics influence cement selection for post core restorations. This article discusses the restoration of a maxillary left central incisor with post core metal, ceramic restoration with particular emphasis on the factors affecting the selection of final cement.

CLINICAL CASE REPORT

A young male patient, aged 28 years reported to the department of Prosthodontics of Subharti University with chief complaint of broken maxillary left front tooth, seven months after endodontic treatment. Medical history was non-significant and dental history revealed history of trauma seven years back. The patient did not consult any dentist after the accident, till he had developed pain in maxillary left central incisor one year back. The patient underwent endodontic treatment of maxillary central incisors, one year back, but did not opt for restoration with crowns in relation to affected teeth. This resulted in the fracture of maxillary left central incisor while consuming non vegetarian diet. Clinical examination revealed good oral hygiene with low caries index, class I molar and canine relation with adequate overjet and overbite, evidence of midline diastema and diffuse white patches within the enamel of entire dentition. The extent of the damage to the clinical crown of maxillary left central incisor indicated a cast post core with metal ceramic crown. Due to personal reasons, the patient decided only restoration of maxillary left central incisor expecting the artificial crown to match with remaining natural teeth. Meanwhile a diagnostic

mounting was done to evaluate the influence of occlusion on the restored incisor. Endodontic filling material was removed from the root canal and the canal was prepared so as to leave an adequate amount of surrounding dentin (Fig. 1).



Figure 1: Removal of endodontic filling material with intra radicular and extra coronal tooth preparation

Direct wax pattern was made (Fig. 2) with inlay wax (Harvard, Germany) which was refined directly on the patient following which the pattern was removed and sent to prosthodontic laboratory for fabrication of cast post with core (single unit). At the next appointment, cast post core was cemented with Zinc phosphate cement (Harvard, Germany) and the margins were refined to blend with the prepared natural tooth surface (Fig. 3).

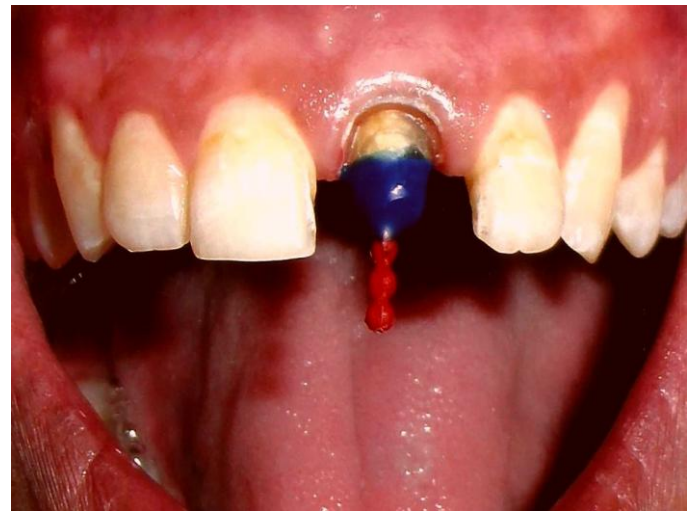


Figure 2: Direct pattern fabrication with combination of pattern resin and inlay wax



Figure 3: Cast post and core cemented with zinc phosphate cement to the remaining tooth followed by finishing of the core.

Another impression was made after cementation of cast post core with addition polyvinyl siloxane material (Reposil, Dentsply/Caulk; Milford, DE, USA) following which the porcelain fused to metal crown was cemented in the next appointment with zinc phosphate cement for the trial cementation following which after 10 days the same was carried as final cementation (Fig. 4). The patient was put on a follow up for one year during which he did not have any complications or problems.



Figure 4: Definitive post core crown cemented with zinc phosphate cement.

DISCUSSION

A cast post core crown is a two unit restoration that has two important junctions, the one junction is between the post and the inner surface of the root and the second is between the inner surface of the crown and the outer surface of the core. At both these junctions the luting cement that is selected plays an important role. This is especially true for single rooted teeth (especially incisors) as they are loaded non axially, which results in more stress during mastication.⁹ Luting agents used in cast post restorations are zinc phosphate, polycarboxylate, glass ionomer and resin cements along with its hybrid forms.

Age of the patient is significant because one should keep in mind that no treatment is lifelong, therefore such cement should be selected where the chance of retrievability is possible like zinc phosphate. If clinically the patient shows moderate to poor oral hygiene index and the patients are young then the choice should be cement having anticariogenic potential. Resin cements on the other hand should

be avoided if endodontic prognosis is not favorable whereas because of their high retentive ability they are indicated in teeth where post length is less.¹⁰⁻¹² For cast post core crown systems a cement should have adequate working time with adequate flow, be compatible with obturating materials, should not promote micro leakage, should allow the post to be retrieved easily and should possess high modulus of elasticity.

CONCLUSION

Selection of cement is a clinical science and is a basic requirement for treatment success not only with post core systems but also with any restoration. Clinical requirements should be taken into consideration before cementing a post within the weakened root canal.

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REFERENCES

1. Shillingburg HT, Hobo S, Whitsett LD, Jacobi R, Brackett SE. Preparations for extensively damaged teeth. In: Fundamentals of fixed prosthodontics. Chicago: Quintessence; 1997. p. 181-209.
2. Assif D, Gorfil C. Biomechanical considerations in restoring endodontically treated teeth. J Prosthet Dent 1994; 71:565-7.
3. Gutman JL. The dentin-root complex: anatomic and biologic considerations in

- restoring endodontically treated teeth. J Prosthet Dent 1992; 67: 458-67.
4. Cohen BI, Pagnillo MK, Condos S, Deutsch AS. Four materials measured for fracture strength in combination with five designs of endodontic posts. J Prosthet Dent 1996; 76:487-95.
 5. Lloyd PM, Palik JF. The philosophies of dowel diameter preparation: a literature review. J Prosthet Dent 1993; 69:32-6.
 6. Sorensen JA, Engelman MJ. Effect of post adaptation on fracture resistance of endodontically treated teeth. J Prosthet Dent 1990; 64:419-24.
 7. Gutmann JL. The dentin-root complex: anatomic and biologic considerations in restoring endodontically treated teeth. J Prosthet Dent 1992; 67:458-67.
 8. Gutmann JL, Tidwell E. Restoring endodontically treated teeth. Tex Dent J 1997; 114:14-23.
 9. Peters MC, Poort HW, Farah JW, Craig RG. Stress analysis of a tooth restored with a post and core. J Dent Res 1983; 62:760-3.
 10. Chan FW, Harcourt JK, Brockhurst PJ. The effect of post adaptation in the root canal on retention of posts cemented with various cements. Aust Dent J 1993; 38:39-45.
 11. Standlee JP, Caputo AA. Endodontic dowel retention with resinous cements. J Prosthet Dent 1992; 68:913-7.
 12. Varela SG, Rábade LB, Lombardero PR, Sixto JM, Bahillo JD, Park SA. In vitro study of endodontic post cementation protocols that use resin cements. J Prosthet Dent 2003; 89:146-53.