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REVIEW ARTICLE

ADVANCES IN POST SYSTEMS- PIT AND FALLS TO AVOID

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ABSTRACT

With the evolution of new post systems every day. It's hard to select post systems on the basis of strengths and resistance as every new post systems claims to have higher aesthetic quotient, resistance, and strengths. Although the post system selection is based on the operator. In this paper we are trying to compare various post systems and materials on the basis of various clinical and in vitro studies regarding strengths and resistance and use of luting agents for post space.

Key words:

Fiber Post Systems,
Resin Cements,
Stress Concentration Under Straight And
Oblique Loading.

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INTRODUCTION

Restoring a pulpless tooth had started in 1740's. Posts were fabricated of gold and silver and were held in the root canal space with a heat softened adhesive. If ET (endodontic therapy) is unavoidable, conservation is utmost important. The combined loss of tooth structural integrity due to caries, trauma and ET may lead to fracture of the tooth. The primary objective of every post system is to give necessary retention for the core (Ring, 1992). The selection of post system for clinical use is based on (1) biocompatibility (2) Physio chemical properties (3) handling characteristics (4) Aesthetics (5) Economy (Silvers *et al.*, 1992). Post retention is influenced by canal contour, post size, shape and surface configuration and the luting agent (Standlee *et al.*, 1978; Tjan and Whang, 1985 and Yalcin *et al.*, 2005). The shape and surface configuration of the post system have vital effect on retention of core (Tjan and Whang, 1985). The cast post and core procedure has been advocated as the standard restoration for decades. Based on the clinical studies problems with cast post aesthetically unpleasant, need for retentive characteristics (grooves, threads) for tapered posts. With the introduction of prefabricated post systems, associated techniques and materials for adhesion have been improving and it often gets difficult to decide one to use.

The new posts are introduced before existing ones are fully evaluated in laboratory and clinical studies. This paper describes studies on different post types and their advantages and disadvantages.

Classification

Fibre reinforced resin post systems classification

A. Based on Composition

Carbon fibres

Composi post
Endo post
Carbonite system
Mirafit Carbon

Silica fibres

Glass Fibre

Snow post
Fibre White
Glassix
Mirafit White
Lucent Anchor
Fibrekor

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Silica fibres**Quartz fibre**

Aesthetic Post
 Aesthetic Plus
 Style post
 Light post

Polyethylene Fibre

Ribbon

Construct

B. Based on Clinical Applications

1. Custom made
2. Prefabricated
3. Direct fabrication
4. Intraradicular rehabilitation

2. Ceramic post and core system**C. Based on how retention is achieved**

1. Active posts (self-threaded& luting)
2. Passive posts (luting)

D. Based on general shape of the posts

1. Tapered
2. Parallel sided

DISCUSSION

The cast metal post and core has been the traditional and time honoured method of restoring endodontically treated teeth. However, there are some disadvantages associated with conventional post and core systems such as poor retention of post, greater incidence of root fracture and risk of corrosion with different metals are used in the systems. Fabrication of cast metal post and cores can be time consuming and involves additional laboratory cost. The laboratory procedure itself may introduce errors within casting and thus increase risk of failures (Yalcin *et al.*, 2005). A growing interest in aesthetic dental restorations and adhesive dentistry has led to the development of innovative post materials and techniques for restoration of endodontically treated teeth. These newer systems (fibre post systems) have focussed on physical properties such as modulus of elasticity that are closely related to dentin to decrease stress concentration within the root canal and reduce incidence of fracture. Most of the fibre post can be removed from a root canal with ease and predictability when necessary without compromising core retention in cases of endodontic retreatment (Yalcin *et al.*, 2005). In various in vitro and clinical studies comparison of strengths and resistance of fractures during angled and straight compressive loading carbon fibre post systems exhibited inferior stress values at failures in comparison to other systems (Radovic *et al.*, 2009). Inferior stress values and their failures to silane coupling agent leading to replacement by quartz and glass fibre post as they

are aesthetically superior and resistance to fracture is <176 N in the aesthetic zone. These systems show less failure due to their surface characteristics exhibiting amenability to silane coupling agents i.e. why these systems mostly exhibit failures due to carelessness in adhesion and that criterion is below 5 % as compared in many studies (Monticelli *et al.*, 2006). Light curing resins are not recommended for fibre post cementation because of inadequate depth of cure in the apical portions of the root even if translucent post was used. Therefore dual cured and self-cured resin cements have been advised for fibre post cementation. It was reported that in the absence of light some dual cured cements may not reach an adequate degree of conversion. Therefore, light curing was recommended for dual cured resin cements (Radovic *et al.*, 2009). A novel zirconia ceramic post can provide an aesthetic foundation for an all ceramic crown and is suitable for use with composite core materials. The increased use of all porcelain crowns provides a rationale for tooth colored cores (Zalkind *et al.*, 1998 and Meyenberg *et al.*, 1995). The strength and integrity of the bond between the zirconia post and the pressed ceramic core is of possible concern with this system. However, push out tests have demonstrated a reliable bond strength between the lower coefficient of thermal expansion than that of the zirconia ceramic and a stress and a crack free bond between the 2 materials can be achieved (Schweiger *et al.*, 1998 and Sorensen and Mito, 1998).

Conclusion

With a plethora of post systems available, it is often difficult to decide which one to use. This is made more difficult by the fact that new posts are introduced before existing ones are fully evaluated in laboratory and clinical studies. The choice of post system will influence whether further tooth preparation is required and will dictate which luting cement and core material are most appropriate. Whilst the choice of the post will, for many dentists be driven by personal preference and a history of clinical success, there are certain pit falls to avoid and these are outlined.

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