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Restoration of choice in Endodontically treated structurally compromised mandibular posterior tooth

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Abstract

The successful management of a posterior tooth with substantial damage to the tooth structure not only depends on the Endodontic treatment but also by prompt restoration of lost coronal tooth structure. In Mandibular molars with considerable loss of structure, insertion of posts in both the roots appear necessary so as to achieve proper retention for the core material. A single component metal casting with two posts, one in the mesial root and the other in the distal divergent root, is difficult to contrive due to difference in the path of insertion of the two posts. So, an auxiliary post together with a Single cast post and core can be an effective design to manage grossly decayed mandibular molars. This case report describes the post endodontic management of badly mutilated mandibular molar by the use of two nonparallel cast posts.

Keywords: Non-parallel cast posts; Post endodontic restorations, Posterior teeth.

Introduction

An efficacious treatment of posterior tooth with substantial damage to the tooth structure not only depends on root canal treatment but also by prompt restoration of lost coronal tooth structure. Endodontically treated posterior teeth are often maim due to caries and access requirement, sometimes to the extent that all the walls of coronal structure are missing and only the radicular portion is present. In such cases if ferrule is available and coronal retention core build-up is not sufficient then intra-radicular retention may be used by custom made post and core which replaces any missing coronal tooth structure.¹

The two basic forms of post-core restoration for posterior teeth are General and Multi-piece post-crown method. Posts cannot be assembled into the root canal of

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molars if a general post-crown method is applied because the larger curvature of a molar root than that of the other roots and the angle between two molar root canals of one molar is also wide. Forceful assembly can easily lead to crack in the root wall tissues. Whereas, Multi-piece post-crown restoration can fix this problem¹ this technique is more effective in restoring residual root than other restoration techniques.⁴

Similarly, relatively long post with circular cross sections provides good retention and support in anterior teeth but should be avoided in posterior teeth, which often have curved roots and elliptical or ribbon shaped canals. For multiple rooted posterior teeth retention is better provided by two or more relatively short posts in divergent canals.² which can be effectively achieved by single piece post and core with a separate auxiliary post.

Case History

A 40-year-old main patient reported to the Endodontic clinic with the chief complaint of carious lower left back tooth. Intra-oral examination revealed a grossly carious lower left first molar. Vitality test with an electric pulp tester showed a delayed response suggestive of partial necrosis in tooth 36. The radiographic examination revealed radiolucency suggestive of caries involving the pulp of tooth 36 and periodontal ligament widening [Figure 1]. A diagnosis of chronic apical periodontitis was made. The patient was explained the possible treatment plan involving Endodontic treatment, followed by custom cast post/core and a full coverage crown. An occlusal model evaluation was done to assess the amount of space available for coronal restoration and was considered favourable.

Endodontic treatment was completed by rotary Instrumentation with K3 (Sybron Endo) files and obturation by lateral condensation. The restorative plan included. two non-parallel posts -one in the distal canal and the other in the Mesiobuccal canal. After post space preparation in both the roots [Figure 2], the impression was recorded with addition silicone impression material [Figure 3].

A cast was poured in die stone [Figure 4]. The first pattern fabricated included the post for the distal root and the core [Figure 6]. Following this, an access to the mesio buccal post space was made through the core pattern. A separate wax pattern was fabricated for the mesio buccal canal [Figure 7]. Both the patterns were casted immediately [Figure 8.9].

After the castings were received, they were tried on the cast [Figure 10] and subsequently on the patient [Figure 11]. Cementation was done with Luting Glass ionomer cement (GC), followed by placement of a full coverage crown [Figure 12].

Discussion

In this case report mandibular molar presented with insufficient coronal tooth structure to provide retention for crown. A more conservative treatment approach was planned instead of extraction of the teeth followed by implant or fixed partial denture prosthesis. Because of increase in the chances of failure at the interface of post and core as fiber or prefabricated metal post with GIC, composite, or amalgam core could have.⁷ The decision for cast post and core was taken.

As single post in the distal canal may lead to either rotation of the core or inadequate retention was also not considered. Moreover, a long post also increases the chances of perforation of the root leading to failure.⁶ Internal stresses are more by placing one long post in contrast to two short posts.⁵ So, decision to place one post in distal canal and another post in the mesio-buccal canal. Divergence of both mesial and distal root does not allow fabrication of the two posts with core as single unit considering that path of withdrawal for the two

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posts will be different. Thus, the long axis of post and core in each section of multi-section post and core will not be in a straight line. Hence here single post and core with auxiliary post was planned.

Literature search reveals a few case reports in which custom cast post and core with prefabricated auxiliary post was used for restoration of badly mutilated teeth.⁸ Since, the custom cast auxiliary post is adapted in a superior way according to canal anatomy it was also fabricated. The recommendations of this design discussed here for teeth having divergent roots and canals allowing different path of insertion for the posts. Grossly damaged mandibular molars with all walls missing can be successfully restored by the use of two nonparallel cast posts.

Conclusion

The clinician should have adequate knowledge in selecting the appropriate type of post and core systems for each individual tooth to meet the biological, mechanical, and aesthetic needs. The technique used in this case seems promising for restoration of teeth which are severely destructed.

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Legend Figures



Figure 1: Preoperative radiograph #36



Figure 2: Post space preparation

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Figure 3: Post space impression



Figure 4: Cast



Figure 5: Try in plastic posts



Figure 6: Pattern with distal post



Figure 7: Mesiobuccal post



Figure 8: Final Wax pattern



Figure 9: Casting



Figure 10: Casting tried on cast



Figure 11: Cast post



Figure 12: Postoperative radiograph. © 2022 IJDSIR, All Rights Reserved