Case report

Restoration of Endodontically Submerged Root – A Case Report

Dwivedi K, Mehrotra A, Sangur R, Mahajan T, Chawla PS

ABSTRACT: The use of endodontically treated submerged root as an abutment primarily presents with the advantage of preservation of underlying bone and preventing the psychological trauma that a patient undergoes due to extraction. This case report discusses a case where in an endodontically treated root has been used as an abutment for placement of all ceramic crowns.

Key words: Post & Core; Ceramic; Crowns; Gingivectomy; Endodontic; Abutment.

Introduction:

Over the years, many studies showed that roots which are fractured and left behind during extractions are retained into the alveolar bone with no evidence of pathosis. Such situations can be used to clinical advantage as preservation of the tooth structure not only prevents underlying bone resorption but also saves the patient for the psychological trauma of extraction. The concept of use of endodontically submerged root has been used regularly with success for overdenture treatment options and the same concept has been applied in this case.

Case report

A 21 year old female patient reported to the Department of Prosthodontics, Rama Dental College-Hospital and Research Centre, Kanpur, with the chief complaint of missing tooth in the upper right front region of the jaw since past 3 months (Figure 1). The patient gave history of trauma 3 months back and history of some treatment in relation to the right maxillary central incisor. On examination it was found that the right maxillary central incisor was fractured upto the cervical third and an edentulous area was present in relation to the right lateral incisor. IOPA radiograph was advised.

On radiographic evaluation, it was found that, the central incisor was root canal treated and that there was still root portion of the lateral incisor left which had also been root canal treated (Figure 2). After discussing with the

Fig. 1: Preoperative

patient, it was decided to surgically expose the lateral incisor (Figure 3), followed by a post and core for both the central and lateral incisor. Gutta percha was removed using Peso reamers, leaving behind an apical seal of 4mm.[1] Pre fabricated posts of the desired

Photograph 2: Preoperative IOPA Radiograph

Fig 3: Surgical exposure of the Root

length were chosen to be placed. The canals prepared were dried, etched and bonding agent was applied and cured.

Flowable composite resin (Fluro cure) was flown into the prepared canals and the prefabricated post was inserted and cured (Figure 4). Core build up was subsequently done and gingivectomy was performed around the lateral incisor to gain adequate crown structure for the subsequent crown (Figure 5). COE pack dressing was given to the patient (Figure 6).

The patient was called after 1 week, and the COE pack was removed. The gingiva had healed perfectly. Putty-wash impression was made for the maxilla and the cast was poured with die stone. Removable die pins were placed using post pour technique. The dies were then sectioned and using copy milling two all ceramic crowns were fabricated.

Fig 4: Post and Core IOPA Radiograph

Fig 5: Core Build up with Gingivectomy

Fig 6: Coe Pack

The two crowns were joined together to provide for better retention of the final prosthesis. The final restoration was luted using resin cement (Relyx, 3M) (Figure 7).

Fig 7: Final Restoration

Discussion

Endodontically treated teeth not necessarily require crowns. If a moderate sized anterior tooth is intact except for the endodontic access and one or two small proximal lesions, composite resin restorations will suffice.[2] A dowel is placed to provide the retention for a

crown that ordinarily would have been gained from coronal tooth structure. The use of a dowel requires that canals be obturated with gutta percha. If a dowel is used, its extension into the root must at least equal the length of crown for optimum stress distribution and maximum retention, or the dowel should be two-thirds the length of the root, whichever is greater.[3] A minimum length of 4.0 mm of gutta percha and more if possible should remain at the apex to prevent dislodgement and subsequent leakage. The longer the a dowel, the greater its retention.[4,5,6]

There are several types of post and core systems available, each with its own advantage and disadvantage. The currently available systems are amalgam, glass ionomer, composite resin, custom cast post and core, wire post and core, tapered prefabricated post, parallel sided prefabricated post, threaded post, carbon fiber post, zirconia ceramic posts and glass fiber posts.[7] The prefabricated posts can be classified as tapered smooth posts, tapered serrated posts, tapered threaded posts, parallel sided smooth posts, parallel sided serrated posts and parallel sided threaded posts.[7] Parallel sided prefabricated posts are recommended for conservatively prepared root canals in teeth with roots of circular cross sections. If a dowel is necessary, the choice is not limited to a custom cast device. Prefabricated systems can be used if the dowel does not have to be incorporated into the crown.[1]

The other possible treatment options for this particular case could have been to leave the edentulous area as it is and fabricate a 3 unit FPD for the patient. However, the disadvantage with this treatment modality would be involving a normal vital canine tooth for taking support which is against M.M. Devan's dictum. Apart from this, since it was the lateral incisor that was missing, a cantilever could have been done using canine as the abutment. The disadvantage of this would be reduced strength of the subsequent prosthesis and inadvertent tooth preparation of the otherwise healthy canine. Thus the treatment modality described in this case report utilizes the already present root structure in accordance with Devan's principle.

The final cementation for the prosthesis was done with resin cement in this case as it has been documented that ceramic crowns that have been etched internally and bonded with composite resin cement are 50% stronger than similar crowns cemented with zinc phosphate cement.[1]

Author affiliation: 1. Dr. Kshitij Dwivedi, PG Student, 2. Dr. Ankit Mehrotra, MDS, Senior Lecturer, 3. Dr. Rajashekar Sangur, MDS, Professor & H.O.D, 4. Dr. Tanu Mahajan, MDS, Professor, 5. Dr. Pawan Singh Chawla, MDS, Senior Lecturer, Department of Prosthodontics, Rama Dental College Hospital & Research Centre, Kanpur.

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Corresponding author:
Dr. Kshitij Dwivedi,
Postt graduate student,
Dept. of prosthodontics
Rama Dental College Hospital and Research Centre. Kanpur.
Email id – kshitijdwivedi1@gmail.com

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