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CASE REPORT

Radix Entomolaris Meets Nayyar Core: A win situation for post endodontic restoration

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ABSTRACT
This case report present the immediate coronal sealing of endodonticaly treated lower first molar with anatomic variation of having an extra root i.e radix entomolaris. Endodontic treatment of a tooth may prove unfruitful if it is not restored at appropriate time with an adequate restorative material and technique as well. In order to achieve the above goal a restorative material should be such that it could be placed immediately over the obturated canals and should take retention and support from the canals itself. By using this technique (Nayyar core) the force will be transmitted along the long axis of tooth rather than the on weakened peripheral coronal structure thus providing adequate strength to the tooth.
Key words: Nayyar core, radix entomolaris, post-enododontic restoration.

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INTRODUCTION

It is incumbent upon the dentist to restore the form and function of endodontically treated teeth. Earlier endodontic research focused on the quality of the biomechanical preparation and obturation to ensure long-term treatment success, while the effects of poor coronal restorations on endodontic outcome received little attention.

Chong et al &Chailertvanitkul et al have indicated that improper restoration lead to loss of more endodontically treated teeth than actual failure of endodontic therapy[1,2]. Coronal microleakage is a major factor in the etiology of treatment failure, therefore the coronal aspect of the tooth and pulp chamber must be considered as integral components of the endodontic treatment. When viewed this way, the clinician is compelled to control these spaces and expand the "endodontic seal" to the cavosurface margins under the aseptic field of rubber dam isolation.Delaying permanent restorative treatment to assess the success of endodontic treatment is generally not in the best interest of the patient as we all know the fact that temporary restorations do not effectively prevent contamination for extended time periods.[3]So a prompt and effective definitive restoration is recommended upon completion of endodontic therapy to prevent recontamination.[4]

Along with providing hermetic seal to the pulp chamber, a post endodontic restorative material should restore the function of the tooth. It should be such that it conserves the tooth structure while attaining resistance and retention features for optimal anchorage. It is the peri-radicular dentine which gives the strength to the crown. In case of endodonticaly treated teeth, where a large amount of tooth structure is lost due to access cavity preparation, chances of fracture are more[5]. In such cases we make use of canals such that forces will be transmitted along the roots and not on the coronal walls. A coronal-radicular core buildup with silver amalgam[6] or composite resin[7] utilizing the pulp

chamber and possible 2 mm canal extensions (Nayyar core)has proved very potent. NAYYAR CORE is defined as retentive core produced by preparing the coronal 2 to 4 mm of the root canals and slightly undercutting the pulp chamber. Added strength in this technique could be attributed to the reinforcing effect of Nayyar core from the radicular extension to the occlusal surface acting as a single block of restorative material, contributing to good fracture strength.

We also know that mandibular first molar shows large variations, the major variant is occurrence of a third root. Carabelli was first to mention about this supernumerary root[8]. An additional third root, may found either lingually or buccally of the main distal root. When it lies lingually is called the radix entomolaris(RE) whereas atmesiobuccal side is called the radix paramolaris So in case of radix we have an advantage of extending the core material into the extra root for better retention.

With Nayyar core possibility of fabricating an immediate build-up restoration and a provisional crown in one session saves chair time and reduces the number of stages involved in the production of the final restoration.

CASE REPORT

A 20-year-old -male was referred to the department of conservative dentistry and endodontics with chief complaint of pain in his lower right posterior region. The pain was intermittent in nature and got aggravated on having hot beverages. On intraoral examination, the mandibular right first molar was deeply carious. It was hypersensitive to both hot and cold stimuli and was tender to percussion although no pathologic mobility was observed. Radiographic assessment of the tooth revealed large occlusal caries close to the pulp of the tooth. No periapical radiolucency could be seen thus a diagnosis of acute apical periodontitis due to caries was made and root canal treatment was decided as the treatment option. Radiograph also revealed the presence of an additional supernumerary root on distolingual side (radix entomolaris).

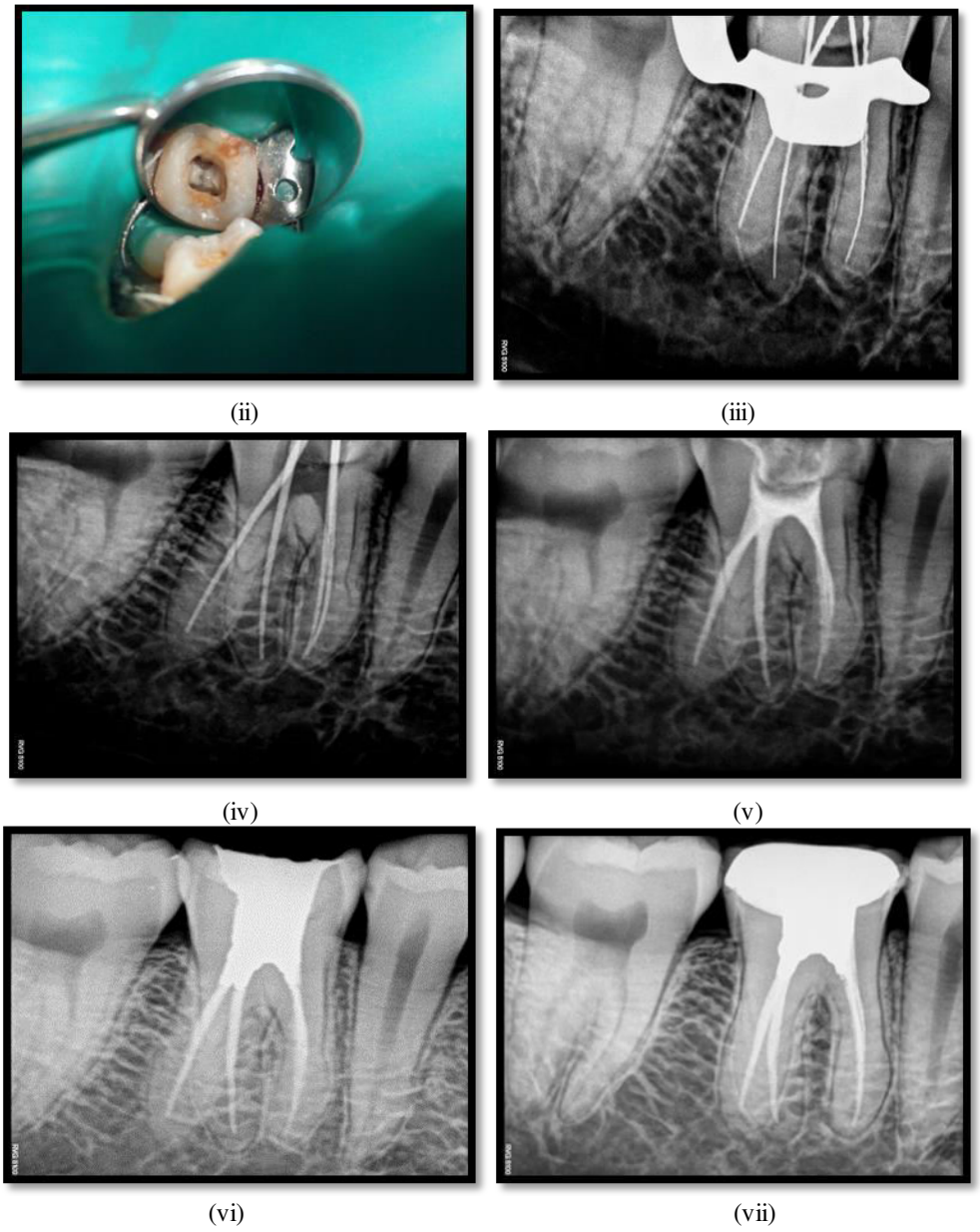
After anaesthetizing the tooth, access preparation was done under rubber dam isolation with endo-access bur. The pulp chamber was accessed and two mesial canal orifices and one distal canal orifice were initially located. On further exploration, another orifice was located towards the distolingual part of the pulpal floor.Initial negotiation of the root canals was conformed with K-file ISO 15 (DentsplyMaillefer, Ballaigues, Switzerland) and working length was measured radiographically which also confirms the outline of the third separate root between mesial and distal root.

The root canals were shaped with hand instruments K Files (DENTSPLY Maillefer, Ballaigues, Switzerland). During preparation, Glyde (DENTSPLY Maillefer, Ballaigues, Switzerland)) was used as a lubricant and the root canals were disinfected with a sodium hypochlorite solution (2.5%). Calcium hydroxide in the paste form (R C Cal) was used as intracanal medicament in between the visits.Master cone radiograph was obtained. Obturation of the root canals was performed using the guttapercha points and AH Plus sealer.

Immediate core build was decided to provide a coronal tight seal. As the tooth had a large pulp chamber with four root orifices, Nayyar's core technique could provide retention and resistance form through the corono-radicular retention concept. As the tooth is located posteriorly, giving more privilege to functional demand than esthetics, amalgam was opted as a material of choice. Alsoamalgam is tolerant to a wide range of clinical placement conditions and moderately tolerant to the presence of moisture during placement[9] In contrast, the techniques for composite resin placement are more sensitive to many factors like double application of bonding material or curing in layers and stages.

Gutta-percha was removed to a depth of 3mm from all the canals with size IV Gates-Glidden drills with a scribed mark placed on the shank to ensure accuracy. Natural under cuts in the pulp chamber wall was retained in order to assist with core retention. Amalgam as a material of choice was condensed into the cavity. Fine long pluggers were used to initially to fill the canal orifices and standard pluggers were used for the remainder of the condensation. After that full coverage PFM crown was given over the restored tooth.

(i)



(ii) (iii)

(iv) (v)

(vi) (vii)

Legend for figures:
(i) Pre operative intra occlusalperiapical radiograph; (ii) Pulp chamber with four canal orifices; (iii) Determination of working length; (iv) Master cone radiograph; (v) Obturation done with lateral compaction; (vi) Nayyar core build–up; vi) Post-operative radiograph with full coverage crown

DISCUSSION

The restoration of an endodontically treated tooth should commence as soon as possible after root canal treatment as the sealing quality of the coronary restoration is one of the major factors associated with the failure of endodontic treatment[10]. In a retrospective study, Ray and Trope found out that the sealing quality of restoration was even more important for periapical health than the quality of root canal treatment[11].

The current standard of merely "temporizing" the coronal aspect of a tooth following its endodontic treatment can potentially result in various impediments[12].Magura et al found that the failure rate was twice as high in cases without an adequate coronal restoration compared to cases which were adequately restored.[13] If only a provisional coronal restoration is placed following endodontic treatment, it will rapidly be subjected to breakdown and microleakage. It was also studied by Castro (2013)[14] that none of the provisional restorative materials are capable of

preventing marginal leakage within the 30 and 60 day period. It is more advantageous to place a permanent restoration with immediate core build up at the time of the endodontic obturation. Molar teeth rarely require a post unless there has been significant loss of tooth structure.

There are various materials for immediate build up of endodonticaly treated molar like amalgam, composite, GIC and reinforced GIC, out of them amalgam exhibits the greatest compressive strength (65,000 PSI)[15] and has a successful clinical history[16]. Although there are controversies regarding dental amalgam toxicity but major health and professional organizations say that amalgam is safe.[17,18]

Kovarik et al[19] compared these three direct buildup materials and found that amalgam cores had the lowest failure rate and more than 1 million cycles were required to produce the median fatigue life of the amalgam cores. Composite resin cores experienced 83.3% failure and required only 385,212 cycles to achieve their median fatigue life. All of the reinforced technique glass-ionomer cores failed during the cycling period.

Amalgam has an additional advantage of the marginal adaptation that occurs through condensation, improves with the deposition of corrosive products (which themselves may be bacteriostatic). Although it may cause staining (amalgam tattooing) but esthetics are not a major concern in posterior teeth. Due to its properties and improved physical interface with tooth structure over extended function, amalgam is used as a material of choice. Amalgam was also found advantageous as intra-orifice barrier by Wolcott et al, where it was placed in the canal orifices after removal of portion of gutta percha[20].

It was decided to provide resistance and retention to the amalgam by extending it into the canals. Nayyar et al (1980) recommended that gutta-percha be removed to a depth of 2 to 4 mm in each canal by the use of a hot instrument and Gates-Glidden drills. He recommended certain criterias, first, the remaining pulp chamber should be of sufficient width and depth to provide adequate bulk of amalgam for retention, and second, an adequate thickness of dentin should be present to deliver the necessary rigidity and strength.

Clinicians should be aware of the morphological variations of the tooth and how to utilize them for the best outcome of the treatment. In the present scenario, the molar (radix entomolaris) with large pulp chamber and intact surrounding walls made it ideal for Nayyar's core. Here bulk of amalgam provides resistance and retention form through the corono-radicular retention concept[7]. So, the placement of an immediate amalgam buildup at the time of endodontic obturation yield a quantum leap in the long-term success of endodontic and restorative care.

CONCLUSION

The placement of an immediate amalgam buildup at the time of endodontic obturation allows the endodontic seal to be extended from the foramen to the cavosurface margin. This increases the length of the seal and presumably the longevity of the endodontic treatment.

REFERENCES

1. Chong BS. Coronal leakage and treatment failure. J Endod 1995;21:159-60.
2. Chailertvanitkul P. An assessment of microbial coronal leakage in teeth root-filled with guttapercha and three different sealers. IntEndod J 1996: 387.
3. I Heling, C Gorfil, H Slutzky, K Kopolovic, M Zalkind, and I Slutzky-Goldberg. Endodontic failure caused by inadequate restorative procedures: review and treatment recommendations. J of Prosth Dent 2002; 87: 674–678.
4. J Alves, R Walton, and D Drake. Coronal leakage: endotoxin penetration from mixed bacterial communities through obturated, post-prepared root canals. J Endod 1998; 24:587–591.
5. Sedgley CM, Messer HH. Are endodontically treated teeth more brittle? J Endod1992;18:332.
6. Nayyar A, Walton RE, Leonard LA. An amalgam coronal- radicular dowel and core technique for endodontically treated posterior teeth. J Prosthet Dent 1980;43: 511-515.
7. Yashwanth G, Roopa R Nadig. Fracture resistance of endodontically treated premolars with direct resin restoration using various corono-radicular retentive techniques: An in-vitro study.Endodontology 2012;23:81-89.
8. CarabelliG. Systematic manual dentistry.2nd ed. 1844; 114.
9. Soncini JA, Maserejian NN, Trachtenberg F, Tavares M, Hayes C. The longevity of amalgam versus compomer/composite restorations in posterior primary and permanent teeth: findings From the New England Children's Amalgam Trial. J Am Dent Assoc 2007;138: 763–772.
10. Tronstad L, Asbjørnsen K, Døving L, Pedersen I, Eriksen HM. Influence of coronal restorations on the periapical health of endodontically treated teeth, Endod. Dent. Traumatol 2000;16:218-21.
11. Ray HA, Trope M. Periapical status of endodontically treated teeth in relation to the technical quality of the root filling and the coronal restoration. IntEndod J 1995; 28:12-8.
12. JambaiSampathkumarSivakumar, BeriNarasimiah Suresh Kumar, and PalaniyandiVadivelShyamala. Role of provisional restorations in endodontic therapy. J Pharm Bioallied Sci. 2013;5: S120–S124.
13. Magura ME, Kafrawy AH, Brown CE, Newton CW. Human saliva coronal microleakage in obturated root canals: An in vitro study. J Endod 1991;17:324 – 331.
14. Pedro Henrique Duarte Franca DE Castro.Evaluation of marginal leakage of different temporary restorative materials in Endodontics.ContempClin Dent 2013;4:472–475.
15. Christensen G. Tooth build-up-Status report. CRA Newsletter 1991;15:1-2.
16. American Dental Association. Dental amalgam: Update on safety concerns. ADA council on scientific affairs. J Am Dent Assoc 1998;129:494-505.
17. About Dental Amalgam Fillings". Food and Drug Administration. Retrieved 19 April 2015.
18. Final opinion on dental amalgam". European Commission. 2 June 2015. Retrieved 17 January 2016.
19. Kovarik RE, Breeding LC, Caughman WF. Fatigue life of three core materials under simulated chewing conditions. J Prosthet Dent 1992;68:584-590.
20. Wolcott JF, Hicks ML, Himel VT. Evaluation of pigmented intraorifice barriers in endodontically treated teeth. J Endod 1999;25:589-92.