Case Report

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ROOT REINFORCEMENT OF AN IMMATURE MAXILLARY CENTRAL INCISOR

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ABSTRACT

Over the past, restoration of endodontically treated teeth has been a concern to the clinician. The amount of tooth structure that remains after endodontic therapy, post space preparation and time taken for the preparation appears to be of prime importance. In order to overcome these challenges there are various post systems available. These post systems aid in better adaption, distribution of occlusal forces and protect the tooth from trauma. The aim of this presentation is one concept which is effective clinically.

KEYWORDS: Endodontically treated teeth; post systems; occlusal forces

INTRODUCTION

Endodontic treatment is largely performed on teeth which are structurally weakened. Such teeth are further weakened by various endodontic procedures.[1,3] Therefore, Endodontically treated teeth tend to have a lower life time prognosis if not satisfactorily restored. These types of teeth require special consideration for final restoration.[3] The special needs involve ensuring both adequate retention for the final restoration and maximum resistance to tooth fracture.[3,4] The weakened tooth structure is attributed to Caries which destroys major portion of the tooth, fracture or trauma, decreased moisture and Endodontic instrumentation overall leading to weakening of the tooth.[2,3] Various new concepts are being rapidly introduced for the restoration of this pulp less teeth which require further analysis before widespread acceptance can be recommended. The aim of the present case report is to restore a structurally weakened tooth by a concept which is effective clinically.[3,4]

CASE REPORT

A 25 yrs old male patient came to the hospital complaining of discolored tooth in the upper right front tooth region since 8yrs. The past dental history revealed trauma to the maxillary anterior teeth 9yrs back. Upon Clinical examination the tooth (11) revealed an Ellis class-III fracture with discoloration, no intraoral sinus opening, swelling or any other relevant findings .The Radiographic examination of the tooth (11) revealed blunder buss canal with open apex & periapical radiolucency (Fig. 1). Following these investigations the provisional diagnosis was non vital pulp with open apex (11). The treatment consisted of conventional root canal therapy followed by one step apical seal. The Access opening was carried out following rubber dam application. The working length was determined with the help of 60 K file (Fig. 2). The Canal debridement along with irrigation procedures were carried out using (sodium Hypochlorite & hydrogen peroxide and saline). This was followed by calcium hydroxide dressing for 1 week. After one week calcium hydroxide dressing was removed, canal was irrigated & dried. The apical barrier was created using white MTA (angelus) 4-5mm in thickness (Fig. 3). Obturation carried out with the help of chemo-plasticized gutta percha (Roeko coltene & whaledent) (Fig. 4). The Separating media applied along the walls of the root canal as per manufacturer's instructions, indirect Composite (adoro) was initially rolled into a shape of post and further cured with the help of a light curing unit. On to this obtained post increments of indirect composite material was added and light cured. Finally the post was placed into the furnace (POLY-MAT) for further polymerization. Core build up was done using the same composite material (Fig. 4). The obtained post & core was cemented with resin cement

Fig. 1: Photograph of A Non Vital Tooth (11)

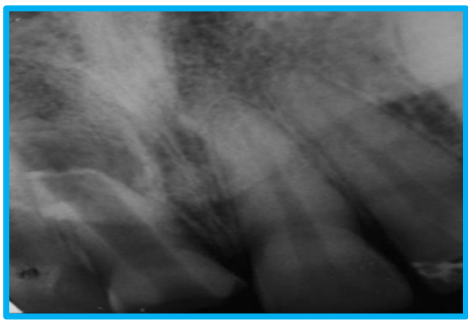


Fig. 1: Radiograph of A Non Vital Tooth (11)

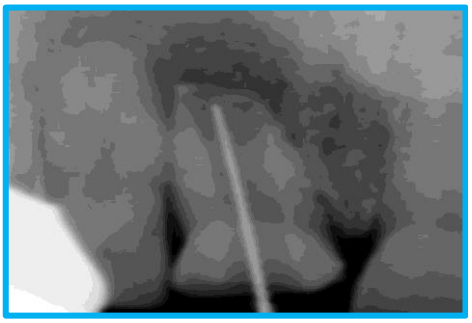


Fig. 2: Working length determined

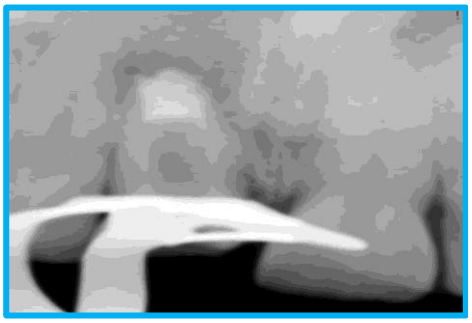


Fig. 3: MTA used as apical barrier

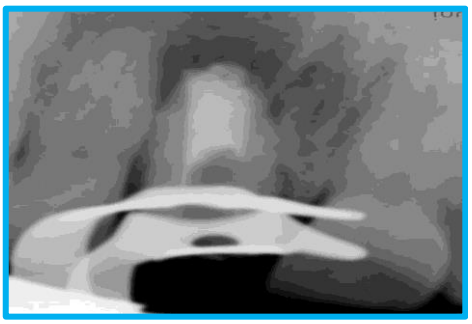


Fig. 4: Obturation & cementation of the indirect

Fig. 4: Post & Core

Fig. 5: After cementation of indirect composite post

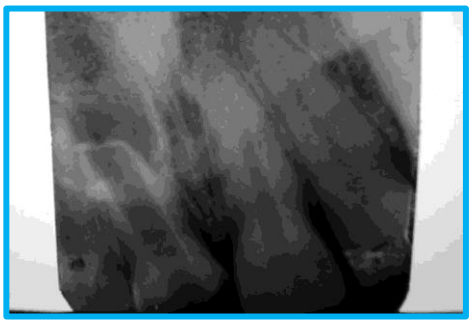
(Rely X). The Tooth then was prepared for receiving a porcelain fused metal crown (Fig. 5). The obtained Crown was then cemented with GIC (Type I). The patient was recalled after 1yr, a radiograph was taken which showed satisfactory healing.

DISCUSSION

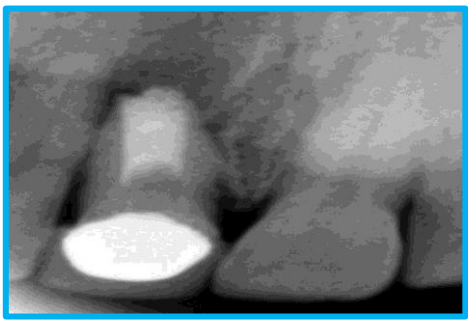
Restoration of endodontically treated teeth is an important aspect of dental practice that involves a range of treatment options of variable complexity. Posts were used in restoration of endodontically treated teeth for more than one hundred years. [1,2]. In the past wooden pivots were used as post to often reinforce the tooth structure, due to their drawbacks such as reinfection.[1-3] Cast post and core were the option of choice for the restoration of endodon-tically treated teeth.[1,2] Since endodontically treated teeth require special consideration the physical properties of the posts gained a lot of importance. The physical properties should be similar to the tooth structure with a good bonding ability which aids in better retention of post, further improving the stress distribution and reinforcing the tooth structure.[3,4] The post should also be removed easily from the canal if required and also to protect the tooth from a catastrophic root fracture. Since the cast post and core have drawbacks such as poor bonding ability, and are more prone to corrosion. Cast post and core also have elasticity different from the tooth structure producing stress and the potential

Pre-operative (Clinical)

Post-operative after 1 year (Clinical)



Pre-operative (IOPA)



Post-operative after 1 year (IOPA)

tooth structure producing stress and the potential root fracture. These overall drawbacks lead to the development of the composite posts systems that have a good bonding ability to dentin.[3,5,6] These posts can reinforce the tooth, with their elasticity compatible with dentin. In the present case indirect composite post and core was used since there is reduced chair time procedure when compared to cast post & core. Modulus of elasticity is nearer to that of dentine when compared to the traditional cast post & core. Indirect composite can also be used in wide canals. In this case one step apexification was done using white MTA (angleus), since MTA has properties superior to that of any other root end filling material. MTA has excellent marginal sealing ability. MTA also aids in periradicular cementum formation and does not demand complete dry field.[8]

CONCLUSION

Although many new restorative materials are available over the past decades, some basic concepts in restoring endodontically treated teeth remains the same, in this case indirect composite was used as a material of choice because of its better ability to bond to the tooth structure, its ready availability and reduced chair time procedures. Finally, the choice of core material and final restoration are important in achieving long term clinical success.

CONFLICT OF INTEREST & SOURCE OF FUNDING

The author declares that there is no source of funding and there is no conflict of interest among all authors.

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