CASE STUDY

Aesthetic and Functional Rehabilitation of Multiple Grossly Decayed Anterior Teeth- A case report

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Abstract

The loss of tooth structure due to caries in the anterior region is a major issue, as it affects both the function and the aesthetics. Only root canal treatment may not be the solution for such cases and the advancement of the material sciences and the cutting edge technology has brought forth many options to treat such cases. Fibre reinforced post is one such contribution to the material advancement. The present case report will demonstrate the use of the fibre reinforced post and prefabricated metal NiTi post for the successful treatment of the unaesthetic, functionally damaged maxillary anterior teeth.

Key words: anterior teeth, aesthetics, dental caries, fibre reinforced post, metal post, rehabilitation.

الملخص

فقدان بنية الأسنان بسبب التسوس في المنطقة الأمامية لها تبعات كثيرة، حيث أنها تؤثر على الناحيةالوظيفية والجمالية.

معالجة قناة الجذر فقط قد لا يكون الحل الأمثل لمثل هذه الحالات.

مع التقدم العلمي والطبي والتطور التكنولوجي أصبح هنالك العديد من الخيارات لعلاج مثل هذه الحالات.

من هذه التطورات صناعة أوتاد سنية من الألياف والأوتاد السنية المصنوعة من مادة النيكل تيتانيوم. وفي هذه الحالة العلاجية تم استخدام هذه الاوتاد بنجاح لإعادة بناء الشكل الجمالي والوظيفي للأسنان الأمامية العلوية والتي كانت تعاني من تسوس وكسور شديدة.

Introduction

Dental caries remains one of the oldest non-communicable disease (NCD) to effect the human Race. According to the survey on the global burden of diseases, dental caries remains the most prevalent among 291 NCD's [1]. The consequence of the untreated dental caries range from mild to severe pain, odontogenic infections, tooth loss and subsequently compromise in the functional abilities of the oral cavity [2]. Apart from this, if caries affects tooth is in the anterior region of the oral cavity it might have the complications like unaesthetic appearance and the psychological problems related to the negative appearance [3].

A variety of treatment options have been proposed to deal with caries affected tooth and usually, the condition of the affected tooth determines the treatment choice. In cases where significant loss of tooth structure has occurred due to caries, most common treatment of choice is root canal treatment followed by post and core [4,5]. The factors that determine the choice of the post are; the aesthetic requirement, position of the affected tooth and the extension of caries in the oral cavity and the remaining tooth structure [6,7,8].

The purpose of the current article is to present a case report on the successful treatment of severely decayed maxillary anterior teeth using the fibre reinforced composite resin and Prefabricated metal posts. Both posts have the advantage of increased strength and are more durable. According to the recent literature fibre reinforced composite are expected to become still more popular as they are minimally invasive and they offer low-cost alternative to conventional restorative procedures [9]. This, in fact, is the truth of the moment as the literature is explicit with case reports on the fibre reinforced posts [5, 10, 11, 12].

Case report

A 19-year-old male patient came to the department of restorative dentistry with the chief complaint of the decayed tooth in the upper front teeth. On examination, it was found that the maxillary right lateral incisor and the left lateral incisor and the canine were grossly decayed (Figure 1).



Figure 1. Pre-operative intra oral view

Maxillary right central incisor had a porcelain fused ceramic crown. There was severe loss of tooth structure in the maxillary right lateral incisor. The left maxillary central incisor had an unaesthetic filling. On closer examination, it was found that the maxillary left lateral incisor was decayed as well as fractured. Upon the performance of vitality test, it was evident that the maxillary right lateral and maxillary left lateral and canine were non-vital. However, the upper left central incisor showed the partial response, suggesting the underlying degenerative changes.

Treatment plan

After the thorough investigation, it was decided to go ahead with the root canal treatment of maxillary right lateral incisor and maxillary left central incisor, lateral incisor and canine. Following root canal treatment maxillary left central incisor, lateral incisor and canine were restored using the metal post. As the maxillary right lateral incisor had significant loss of tooth structure due to extensive caries and subsequent fracture, it was decided to go ahead with glass fibre reinforced post as it is more durable and it is the material of choice for the tooth with the minimal crown. Three-unit porcelain fused to metal ceramic bridge in relation to maxillary left central incisor, lateral incisor and canine and single unit ceramic crown in relation to maxillary right lateral incisor was planned.

Treatment

Access opening was done in relation to maxillary right lateral incisor using cavity access Z set (Dentsply). This was followed by the cleaning and shaping using the protaper NiTi rotary instruments (Dentsply), up to the apical size of F2. Continuous copious irrigation us-

ing 5ml of 2. 5 % sodium hypochlorite solution was carried out. Using Apex plus sealer (IvoclarVivadent) and F2 (Dentsply) gutta-percha cones the obturation was performed. The gutta-percha was partly removed leaving the apical 5 mm of the filling to maintain a good seal after the completion of a root canal. Corresponding FRC Posted reamer was used to prepare the post space. An adhesive (IvoclarVivadent AG), dual-curing luting composite system (Multilink II, Ivoclar Vivadent AG) and a glass-fibre reinforced composite root canal post (FRC Postec, Ivoclar Vivadent AG) were placed according to the manufacturer's instructions in relation to maxillary right lateral incisor (Figure 2).





Figure 2. Post-operative intra oral view

Prefabricated unimetric NiTi posts were placed using the corresponding reamer according to manufacturer's instructions in relation to maxillary left lateral incisor and canine. This was followed by core build-up using composite in an incremental manner (Tetric N Ceram, Ivoclar Vivadent AG). Cementation of all ceramic crowns was done using glass ionomer luting cement (Medium) (Figure 3).

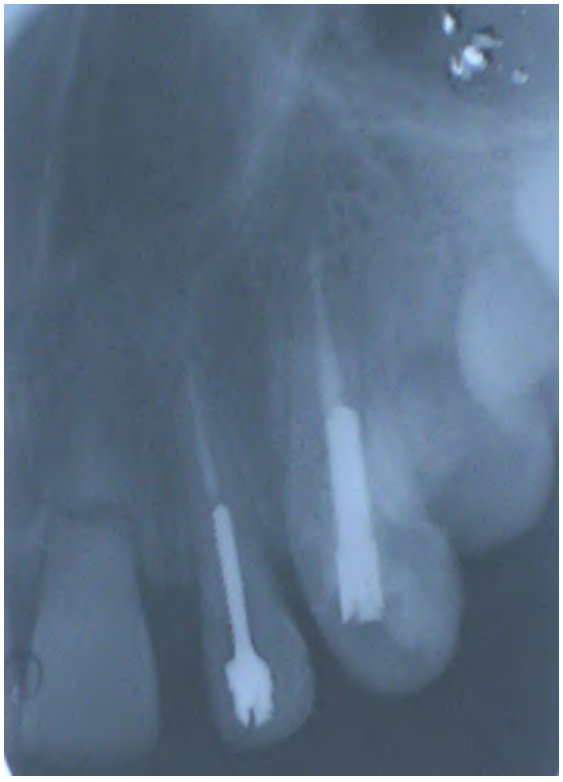


Figure 3. Post-operative IOPA

Discussion:

The traditional cast metal post and prefabricated metal post core is widely popular treatment modality in cases where the tooth structure has been lost significantly due to caries or trauma. Nevertheless, the major disadvantage of these type of post was the lack of modulus elasticity, which resulted in the root fracture [9].

The coronal dentin is adhesive friendly and can bond to the adhesive in better manner then the radicular dentin. Nevertheless, the fibre reinforced composites mimic the dentin, solving the problem of bonding to the radicular dentin [13].

The advancement in material research has brought forward the fibre reinforced restorative material and this new generation restorative material has proven its worth in the mutilated cases as well. The fibre reinforced materials have the unique properties of unidirectional fibres in the resin matrix which enhance the impact strength, flexural strength and the modulus of elasticity. Apart from this, they are capable of creating monoblock unit for supporting the coronal restoration [5, 14, 15].

The present case report illustrates the capability of fibre reinforced tooth material in restoring the grossly mutilated tooth. The procedure is simple and can be performed in the single sitting. Moreover, the material is biocompatible, can maintain the hue and translucency of the natural tooth and it is corrosion resistant as well [16]. However, these fibre-reinforced materials are very costly and hence are not economically viable.

The concurrent literature is in support of the usage of fibre reinforced post in endodontically treated incisors as they increase the resistance to fracture and can improve the prognosis [13]. Although the fibre reinforced materials are here to stay, it requires a meticulous protocol. The clinician showed by wise enough to choose the best possible material and the best possible technique for each case as the field of endodontics continuously evolving in terms of material advancement and technique enhancement.

The possible causes of fibre reinforced material include the presence of the secondary

smear layer. During the removal of the root filling material to create a post space the secondary smear layer will be formed which is rich in remnants of the sealer and gutta-percha which become plastic under the influence of the friction produced during the drilling. This may compromise the adhesive ability of the material. Thus, one has to be meticulous enough to achieve clean dental surface for the successful retention of the post.

Conclusion

The fibre reinforced tooth material provides ideal strength and durability as an anterior restorative material and the prefabricated metal posts are more economical. The present case report illustrates the same.

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