Case Report

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Aesthetic Rehabilitation of Malposed Proclined Maxillary Permanent Incisor by Richmond Crown with Angulated Post

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ABSTRACT

Background: Orthodontics is always the first choice treatment for aesthetic and functional rehabilitation of malaligned teeth but in some exceptional cases, the unwillingness of the patient for orthodontic correction poses a tough challenge to the dentist. In such cases, the only other option for aesthetic restoration is the change in angulation with custom cast post and core followed by the placement of an aesthetic crown. In order to change the angulation, gross tooth destruction is required. Restoring malposed teeth is a challenge in restorative dentistry. Restoring such compromised teeth often requires additional support from the root canal with the help of post and core restoration. This case report describes a patient with malposed central incisor with reduced interocclusal space, deep bite and loss of overjet treated with Richmond crown.

Keywords: Richmond crown, Post and core, Angulation.

INTRODUCTION

Restoration of endodontically treated teeth involved major aspect in restorative dentistry. Loss of too much tooth structure due to caries/fracture/developmental disorders or gross reduction of tooth structure labially to achieve straight alignment for crown placement always had challenge in restorative procedure. Remaining tooth structure is not enough to retain large prosthetic crown in such cases . Post and core treatment has been successfully practiced since ages . Alternative procedure needed to obtain remaining crown structure so as to manage arc of rotation under oblique forces (function) such as crown lengthening procedure or forceful orthodontic extrusion. Many causes of failure of post and core retained restorations have been identified, including: recurrent caries, endodontic failure, periodontal disease, post dislodgement, cement failure, post-core separation, crown-core separation, loss of post retention, core fracture, loss of crown retention, post distortion, post fracture, tooth fracture, and root fracture. Also, corrosion of metallic posts also has been proposed as causes of fracture. Richmond crown is a single-piece, post-retained crown with a porcelain facing. Richmond crown is not a post and core system but it is customized castable post and crown system as both are single unit and casted to gether. It is easy to make cast metal restoration with aid of posts for long term retention[3]

CASE PRESENTATION

A 33-year-old male patient reported to our dental hospital for the aesthetic restoration of malposed, proclined maxillary left central incisor (figure1). The patient also expressed his unwillingness for the correction of malaligned tooth by the removable or fixed orthodontic therapy and wanted the correction by any other procedure. He had already undergone orthodontic treatment for six months and he left the treatment uncompleted due to multiple visits and long duration of the orthodontic treatment.

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Fig 1: Labial view of malposed, proclined maxillary left central incisor.

The two possible treatment options presented to the patient for the aesthetic and functional rehabilitation, orthodontic treatment and by coronal alingment with fabrication of post & core and Richmonds crown. The patient chose the second option because of his unwillingness for orthodontic treatment.

Treatment

Seven days after successful root canal therapy of left maxillary central incisor remaining crown structure was prepared circumferentially. Gross amount of tooth structure was removed from the labial surface of the tooth to achieve straight alignment for the placement of Richmond crown. Shoulder finish margin was prepared on buccal surface and chamfer on palatal surface with creating adequate ferrule. (Figure 2)

Fig 2: Crown preparation.

Fig 3: Richmond crown with angulated post.

Impression of post space was done with light body addition silicone impression material (Take1 Advanced Kerr Corporation, 28200, wick road, Romulus, MI 48174, USA). 21 guage orthodontic wire (Pigeon Dental stainless steel, India) was adjusted in post space area and length was confirmed on radiograph. Outer end of wire was made J-shaped. Light body was flooded in post space and immediately j-shaped adjusted orthodontic wire was inserted in post space. Full arch impression was made with j-shaped wire in position using light body and putty of addition silicone impression material (Care was taken not to disturb apical seal).

Wax pattern (Inlay wax medium-green, GC, IWM. GRN, GC Japan) for Post and core was prepared on die. Casting of post and core was made and fabrication was completed in base metal alloy. Placing the post and core in position impression was made for preparing porcelain facing metal crown.

The tooth was fabricated with change in angulation with custom cast post & core fused with porcelain (Richmonds crown). The pink porcelain was built up at cervical margin to replace missing gum tissue.(figure 3). Final crown was placed in position and occlusion correction was made. High points were recorded and corrected. Final cementation was done with Type I glass ionomer cement (GC, Japan).(figure 4,5,6)

Fig 4: Post treatment radiograph.

Fig 5: Final crown cementation.

Fig 6: The patient reported no discomfort on 2 and 5 year follow up.

DISCUSSION

Orthodontic therapy is the first choice treatment for the aesthetic correction of proclined or rotated teeth[1] but in some rare cases where patients are not ready for any orthodontic treatment, the only other option for the satisfactory aesthetic restoration of such teeth is the change in angulation of the coronal portion of the tooth with post and core followed by the placement of the crown.

Custom cast post and core is usually preferred for the change in mesiodistal and labiopalatal angulation of the proclined or rotated teeth as compared with the prefabricated post. Custom cast post and core is a single assembly in which core can be shaped until satisfactory aesthetic is achieved[2] although the core might not be in the same axis as the post or the root. But in prefabricated post–core system, the core is build around the post after postcementation[3] in the prepared canal so that if tooth is rotated or more labially inclined, the post will remain in the direction of the long axis of that tooth. So any change in angulation, performed by shaping of the core around the prefabricated post, usually results in loss of coronal extended post during preparation resulting in unsupported core. The functional loading of the crown might result in fracture of the unsupported core making the treatment complicated. So only the treatment option in such cases is the change in angulation with custom cast post &core/ Richmonds crown. To overcome these problems Richmond crown can be advised in such cases where there is deep bite, very less overjet and less occlusal clearance.

CONCLUSION

This clinical report describes the aesthetic rehabilitation of a male patient with malposed and slightly rotated maxillary central incisor with the Richmond crown to improve the function and esthetics with a minimally invasive procedure. Hence, it is the prime responsibility of the clinician to judge the clinical situation and select the appropriate procedure best suited for the patient to improve the function and aesthetics.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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