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PROSTHODONTIC REHABILITATION OF TRAUMATIZED ANTERIOR TOOTH WITH METAL-FREE CERAMICS AND POST SYSTEM — A CASE REPORT

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ABSTRACT

The practical and esthetic reinstatement of severely compromised anterior teeth is a challenge to clinicians in their daily practice. The replication of the optical description of an intact tooth, including shade, translucency, and fluorescence, is often made difficult by the use of metal infrastructures, such as post-and-cores and copings. The development of reinforced ceramics and metallic post systems made possible the generation of metal-free ceramic restorations in severely compromised anterior and posterior teeth. This article discusses interdisciplinary approach to restore function and esthetics of severely damaged treated teeth by means of metal free ceramic restorations after metal fibre post and composite core. Coordinated prosthetic, endodontic and periodontal treatments with careful consideration of patient's expectations and requests were critical for a successful outcome and patient satisfaction.

KEYWORDS: Metal Free Crown, Post and Core, Anterior Tooth, Esthetics

Fractured teeth are always a challenge to the dentist. The root canal therapy today can retain even very badly broken teeth. One of the most accepted techniques involve restoration of extensively carious or badly fractured teeth by the fabrication of a post and core while utilizing the root canal space for anchorage .Modern dentistry aims at conservation of remaining tooth structure. This procedure becomes more complex when the involved teeth have previously undergone trauma, extensive fractures, endodontic-access preparation, canal instrumentation and other idiopathic causes. (Asmussen et al., 1999, Oden et al., 1998, Purton et al., 1998). These problems result in loss of tooth structure and consequent reduction in tooth resistance to masticatory forces. (Assif et al.,1994, Burgess et al.,1992, Sorensen et al.,1990, Sorensen, Engelman et al.,1990)

Dentistry has undergone a revolution in the last 30 years, not only with regard to the introduction of new materials and techniques, but also with regard to the scientific evidence supporting their clinical applications. As ceramic materials for dentistry evolve and as patient's demand for esthetic restorations increases, practitioners must keep up with the science as well as the demand of the patients (Spear et al., 2008). Proper guidance to the practitioner is required in selecting the appropriate system for crowns as well as the knowledge of the optical properties of available ceramic systems which will enable the clinician to make appropriate choices when faced with the various esthetic challenges. The following case report describes a technique for rehabilitation of an endodontically compromised tooth with a metal post and an all ceramic crown.

CASE REPORT

A 24 year old male patient reported to the department of Prosthodontics, Faculty of Dental Sciences, IMS, BHU, Varanasi with the chief complaint of poor appearance left upper front teeth and not satisfied with their appearance (Fig.1a &Fig.1b). His dental history revealed that an accident caused a coronal tooth fracture of his left maxillary central incisor 5 years back. He had undergone treatment for fractured upper left central incisor some dental clinic. On detailed examination showed there was a provisional crown placed with support of wire and swollen gums with redness on surrounding mucosa (Fig.2). Treatment planning was done after a thorough clinical examination. The patient was in good general health and the medical and dental history.

Figure 1a: Pre-treatment Intra oral – occlusal view

Figure 1b: Pre-treatment Intra oral –Front view

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Figure 2: After Removal of past prosthesis

The prosthesis was removed followed by thorough supragingival and subgingival scaling in relation to maxillary anterior region. The patient was given oral hygiene instructions and was advised to use 0.2% chlorhexidine mouthwash twice daily for the next 7 days. After 7 days the inflammation had come down. A Digonastic impressions (Jeltrate, Dentsply/Caulk)), were made and diagnostic casts were obtained. Evaluation was done after analysing the mounted diagnostic casts and radiographs. A multidisciplinary treatment plan was devised that consisted of endodontic treatment, and metal post, composite core built up and restoration by metal free crowns.

Initial treatment sequence started with Root canal treatment done on Left Central incisor. On next appointment removal of root canal filling was done leaving 4 mm of apical filling to maintain good apical seal and post space preparation was done with the help of Gates Glidden drill. A metal post placed on the prepared canal. Size of the post selected was 0.70 mm in diameter at the apical end and 1.30 mm in diameter at coronal end with 3.44° of taper and tooth build by composite restoration(Fig.3). Tooth preparation was done according to fundamentals of metal free crowns. Final impression was then taken with heavy- and light-viscosity polyvinyl siloxane Impression material after the placement of gingival retraction cord, for the fabrication of prosthesis for left lateral incisor with the full ceramic crown. Proper shade matching was done. The final prosthesis was made for left lateral incisor and prosthesis was with dual-cure resin luting agent (RelyX Unicem®, 3M ESPE, USA). Patient was pleased with the life-like appearance of his new crown and oral hygiene instructions were given to patients (Fig.4).

Figure 3: Placement of post and composite core

Figure 4: Final Prosthesis

DISCUSSION

The size, form and appearance of the maxillary anterior teeth are important not only to dental esthetics but also to facial esthetics. The goal is to restore the maxillary anterior teeth in harmony with the adjacent tissues as well as the facial appearance. However, there is little scientific data in the dental literature to use as a guide for defining the proper size and shape of anterior teeth or determining normal relationships for them and the adjacent tissue (Hasanreisoglu et al., 2005). All-ceramic systems offer a promising alternative for the restoration of anterior teeth, and short-term clinical evaluations have demonstrated high success rates (Burgess et al., 1992, Sorensen et al., 1990).

This clinical report describes an interdisciplinary approach for the rehabilitation of fractured teeth by endodontic treatment, periodontal treatment, metal post insertion, core build up and fabrication of metal free prosthesis which was satisfying both esthetically and functionally. Compromised clinical crown status of the patient was improved and sufficient clinical crown length was obtained by means of crown lengthening procedures and fibre-core restorations. Teeth with severe coronal destruction and insufficient clinical crown length limit the success of the final prosthetic restorations. The treatment options may vary considerably depending on the above mentioned factors. The prosthetic treatment usually includes complete coverage metal ceramic crowns for

functional and esthetic rehabilitation and protection of the remaining teeth.

CONCLUSION

Restoration of teeth becomes more complex when the involved teeth have previously undergone trauma, fractures, endodontic access preparation, canal instrumentation and other idiopathic causes. Excessive loss of dental hard tissues creates difficulties for the esthetic outcome of subsequent prosthetic restorations. In such instances, an interdisciplinary approach is necessary to evaluate, diagnose and resolve esthetic problems using a combination of endodontic, periodontal and prosthetic treatments. Definitive treatment outcomes in terms of function and esthetics satisfied the expectations of both the patient and the interdisciplinary approach.

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