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Case Study

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A PATH TOWARDS BETTER SMILE: CROWN LENGTHENING FOLLOWED BY METALLIC POST AND PROECELAIN FUSED TO METAL CROWN

Dr. Neha Priya*[1], Dr. Naveen Manuja[2], Dr. Seema Chaudhary[3] and Dr. Sana Akhtar[4]

[1]Post-graduate Student, Department of Pedodontics and Preventive Dentistry Kothiwal Dental College and Research Centre, Moradabad-244001, Uttar Pradesh, India.

[2]Professor, Department of Pedodontics and Preventive Dentistry Kothiwal Dental College and Research Centre, Moradabad-244001, Uttar Pradesh, India.

[3]Professor and Head, Department of Pedodontics and Preventive Dentistry Kothiwal Dental College and Research Centre, Moradabad-244001, Uttar Pradesh, India.

[4]Post-graduate Student, Department of Pedodontics and Preventive Dentistry Kothiwal Dental College and Research Centre, Moradabad-244001, Uttar Pradesh, India.

***Corresponding Author: Dr. Neha Priya**
Post-graduate Student, Department of Pedodontics and Preventive Dentistry Kothiwal Dental College and Research Centre, Moradabad-244001, Uttar Pradesh, India.

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ABSTRACT

Clinical crown of the tooth is the distance from gingival margin to incisal edge or occlusal surface of the tooth. Crown lengthening is a surgical procedure designed to increase the extent of the supragingival tooth structure, so that the clinician can restore the tooth. The crown lengthening procedure (CLP) is commonly used to maintain the dentogingival complex in optimal conditions and to correct aesthetic defects through a smile design. The aim of the current case report is to evaluate the implications of CLP followed by metallic post and porcelain fused to metal crown in routine dental practice.

KEYWORDS: Clinical crown, Crown lengthening, Metallic post, PFM crown.

INTRODUCTION

Clinical crown of the tooth is the distance from the gingival margin to incisal edge or occlusal surface of the tooth. The common causes of short clinical crown include caries, erosion, tooth malformation, fracture, attrition, excessive tooth reduction, eruption disharmony, exostosis, genetic variation, amelogenesis imperfecta and gummy smile.[1]

Garguilo described various components of the periodontium, giving mean dimensions of 1.07 mm for the connective tissue, 0.97 mm for the epithelial attachment and 0.69 mm for the sulcus depth. These measurements are known as the biologic width. When this biologic width is violated by a restoration as a defense mechanism, inflammatory response accelerates bone loss to provide space for new connective tissue attachment, which results in increased pocket depth. Therefore, impingement of a restoration on the biologic width will trigger loss of bone, connective tissue and epithelial attachment.[2]

Crown lengthening is a surgical procedure which aims at the removal of periodontal tissue to increase the clinical crown height and reestablishing the biologic width. Endodontically treated teeth (ETT) have been problematic in most cases as a result of dental caries, fractures, previous restorations and endodontic procedures. Several post system techniques and materials are currently used to build up ETT with moderate or severe loss of coronal tooth structure and to retain final restorations.[3,4]

Following crown lengthening and root canal treatment, the custom-made cast metallic post and core with porcelain fused to metal crown to save the fractured central incisor is being described in the following case report.

CASE REPORT

A 12 year old female patient reported to the department of pediatric and preventive dentistry at Kothiwal dental college, Moradabad with the chief complaint of fractured central incisor. The patient gave the history of fall from the bicycle 3 days before. On examination, it was found that the tooth was non-vital with short clinical crown (Figure 1).

Figure 1: Pre-operative photograph of the patient.

The medical history was non-contributory. The crown lengthening procedure followed by root canal treatment and placement of metallic post along with porcelain fused to metal crown was planned.

On the first visit, crown length was determined by periodontal probe (Figure 2) and subsequently crown lengthening was done both labially and lingually by gingivectomy technique (Figure 3). Periodontal pack was applied and the patient was recalled after a week.

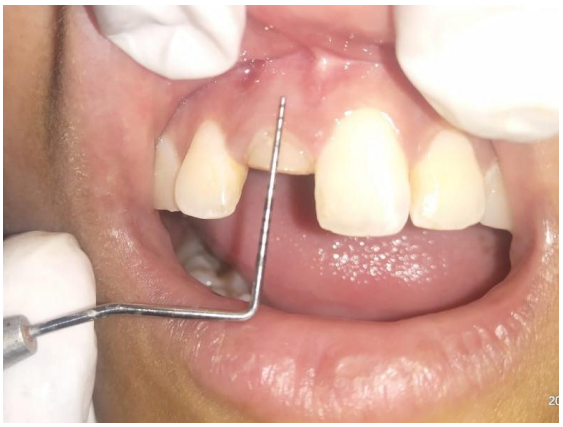

Figure 2: Crown length determination.

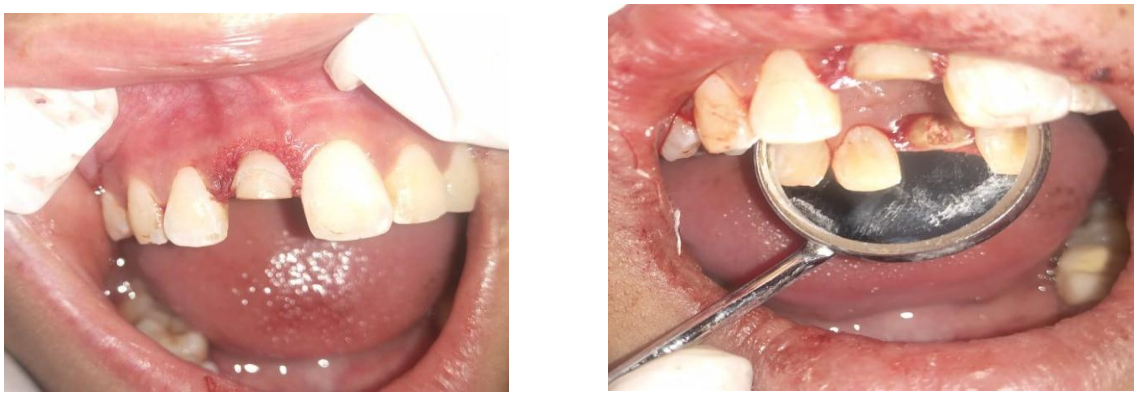

Figure 3: Crown lengthening procedure done labially and lingually.

Uneventful healing has occurred after a week. On the second visit, root canal treatment was done (Figure 4). Gutta percha was then removed with gates glidden drills and 5 mm was being left at the apex. Wax pattern was then made with inlay wax and impression of the canal was taken (Figure 5). Core was then formed and the pattern was subjected to investing procedures.

Figure 4: Root canal treatment done.

Figure 5: Wax pattern fabricated.

Cast metal post was then fabricated in the laboratory and was placed and luted in the patient's mouth. Then impression was taken for fabrication of crown and temporary crown was given to the patient. On the third visit, porcelain fused to metal crown was luted (Figure 6).

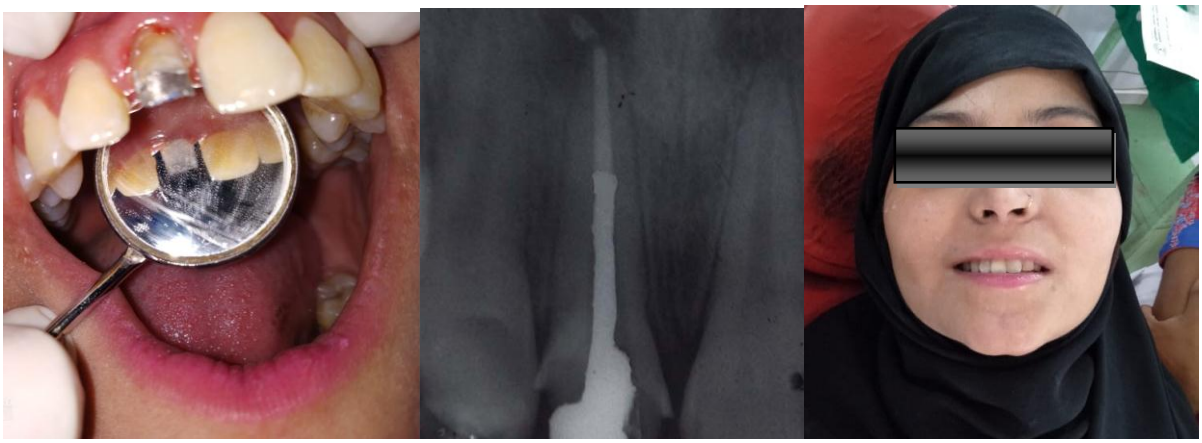

Figure 6: Metallic Post luted and Porcelain fused to metal crown fabricated.

DISCUSSION

D. W. Cohen in 1962 introduced the concept of crown lengthening, which is presently a procedure that often involves a combination of soft tissue reduction/removal, osseous surgery and/or orthodontic treatment for tooth exposure. Kois has stated that 3 mm is necessary to satisfy the requirements for a stable biologic width (2.04 mm: biologic width; 1 mm: sulcus depth). Violation of the biologic width may result in inflammation and bone resorption. The amount of tooth structure that is exposed above the osseous crest must be above 4 mm which is enough to provide for a stable dentogingival complex and biological width to permit proper tooth preparation and account for an adequate margin placement.[5]

Generally, it is agreed that post and core materials should have as many of the following desirable features as possible:

- Adequate post adaptability within the root and maximum retention of crown.
- Conservation of remaining tooth structure
- Biocompatibility and compatibility of post material with the core
- Uniform stress distribution along post length during function. It has been reported that a well-adapted, passively luted, parallel-sided post provides the most retention with the least stress.[7]
- Physical properties, such as compressive strength to resist intraoral forces, modulus of elasticity (stiffness), and coefficient of thermal expansion, similar to those of dentin
- Rapid setting, dimensionally stable core material, resistant to leakage of oral fluids at the core/tooth interface, that is easy to use with high compressive strength and rigidity.[8]
- Pleasing aesthetics, when indicated

Custom-made metallic post and core combined with metal-ceramic crown are used in the present case due to the patient's coronal destruction, extensive loss of anterior tooth structure and the demand for aesthetic and functional rehabilitation.

Factors for good retention and resistance in porcelain fused to metal restorations includes, size of the tooth, the magnitude of dislodging force, geometry of the tooth preparation and roughness of the preparation. The preparation of porcelain fused to metal (PFM) crowns is a common procedure in general dental practice. Therefore, it is essential that dental graduates develop optimum skills and expertise during the studying period.

PFM crowns are one of the most commonly recommended restorations for extensively damaged anterior teeth. The ability of dentists to adequately prepare teeth is fundamental to the success of these crowns.

CONCLUSION

Gingival contour and tooth abnormalities play an important role in the social life of the patients. Predictable long-term restorative success requires a combination of restorative principles along with the correct management of the periodontal tissues.

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