

Anterior esthetic crown lengthening: A Case Report

Avneet Dengre¹, Gaurav Kumar², Swati Garg³

^{1,3}Department of Pedodontics and Preventive Dentistry, Post Graduate Institute of Dental Sciences, Rohtak, India

²Department of Conservative Dentistry and Endodontics, Post Graduate Institute of Dental Sciences, Rohtak, India

ABSTRACT

Rehabilitation of severely mutilated teeth often presents a challenging task to the clinician. Pediatric dentist often encounters clinical cases of trauma presenting as fractured tooth with insufficient clinical crown length or discrepant gingival margins. Crown lengthening procedure is preferred to facilitate sufficient supragingival tooth structure prior to commencement of final restoration. This paper describes crown lengthening surgery along with ostectomy performed in maxillary anterior tooth of a 11-year old male patient followed by post and core and porcelain fused to metal crown. Such a treatment modality provides a way to address both the esthetic and functional demands.

Keywords: Rehabilitation, Ostectomy, Dentogingival, Gingivectomy.

INTRODUCTION

Traumatic injuries culminating in fractured maxillary anterior teeth are a common entity in children. The prevalence of such injuries ranges from 6 to 37%.¹ Crown lengthening serves as a viable option to facilitate restorative therapy or enhance the esthetics in such cases. The concept of crown lengthening was first introduced by D.W. Cohen in 1962.²

Clinical crown lengthening has been defined as a surgical procedure that aims at exposing sound tooth structure for restorative purposes via apical repositioning of the gingival tissue with or without removal of alveolar bone.³ The concept behind the procedure often employs a combination of tissue resection, ostectomy/ osteoplasty or orthodontics for exposure of tooth. Clinician often needs to assess the functional, biologic and esthetic requirements of individual cases. Tooth structure of around 4mm must be exposed above the alveolar crest to preserve the biologic width and provide a stable dentogingival complex to ensure an optimum marginal seal and retention for the restoration.

This article discusses a case report addressing both the functional and esthetic requirements to restore a traumatized anterior tooth.

CASE REPORT

An 11-year old male patient accompanied by his parents reported to the Department of Pediatric & Preventive Dentistry, PGIDS, Rohtak (Haryana), with the chief complaint of broken upper front teeth. Patient's medical history was noncontributory. On intraoral examination, patient was found to be in mixed dentition stage and class III fracture involving 11, 21, 22 [Figure 1] and sinus in relation to 21. Intraoral periapical radiographs revealed pulp involvement as well as open apex in relation to all the above mentioned teeth and periapical radiolucency associated with 21. Teeth 11 and 22 were indicated for apexification followed by crowns. Tooth 21 presented with adequate root length as revealed by IOPA and lack of ferrule. Hence, it was planned to perform crown lengthening procedure involving undischarged flap with osseous surgery in relation to 21 followed by post and core and crown.

The child's parents were informed about the treatment plan, its advantage and shortcomings, other treatment alternatives and consequences if treatment was avoided. The treatment goal was to provide adequate supra osseous tooth structure to preserve the biological width and maintain periodontal harmony after reconstruction of tooth architecture.

Initial or internal bevel incision was made on the labial aspect of 21 depending upon the amount of crown exposure required and taking into consideration the gingival margin of tooth 11 to maintain the esthetics. A muco-periosteal flap

was raised and alveolar bone was reduced using carbide bur in a slow speed hand piece and ostectomy was completed with curette. A 4 mm of supraosseous tooth structure with positive osseous architecture was attained. Flap was then repositioned and sutured back in position [Figure 2]. Post operative instructions were given and patient was recalled after 7 days for suture removal [Figure 3]. Customized metal post was fabricated 4 weeks post surgery followed by provisional crown. Final porcelain fused to metal crown was cemented 3 months after surgery [Figure 4].



Fig. 1: Pre-operative



Fig. 2: After crown lengthening



Fig. 3: week follow up



Fig. 4: Final Restoration

DISCUSSION

Crown Lengthening is a resective surgical procedure that allows for exposure of optimum tooth structure for restorative procedures. Clinical crown lengthening is performed where there is need to increase clinical crown height lost due to caries or fracture and to attain a ferrule for restoration.⁴ It may also be indicated to restore esthetics in case of uneven gingival contours. It should be carried out in a way to avoid any violation of biologic width so as to avoid any deleterious effects on periodontium leading to gingival inflammation, attachment loss and alveolar resorption.

The concept of the biologic width was first originated by Gargiulo, Wentz, and Orban.⁵ Biologic width has been determined to be approximately 2mm in 85 percent of population, greater than 2 mm in approximately 13 percent of the population, and less than 2mm in 2 percent of the individuals.⁶ If the apical margin of restoration is placed within the biologic width, it may lead to development of zone of chronic inflammation which can be attributed to short and weak junctional epithelium lacking sealing effect.⁷ Moreover, such areas impair proper plaque control and are prone to damage by mechanical oral hygiene practices. Hence, crown lengthening must be planned in a way to attain a minimum distance of 3 mm between the alveolar crest and restorative margin⁸ and to achieve a ferrule of 1-2 mm.⁹

Various techniques recommended for crown lengthening include external bevel gingivectomy, internal bevel gingivectomy with or without ostectomy, apically positioned flap with or without bone reduction and combined technique using surgical and orthodontic approach.¹⁰ Appropriate technique should be performed taking into consideration all hard tissue and soft tissue parameters.

CONCLUSION

Crown lengthening serves as a viable treatment procedure recommended to enable restoration of teeth having short clinical crowns and to enhance esthetics. Crown lengthening gives satisfactory results when it is performed taking into consideration the functional, biologic and esthetic requirements of the patient.

CONFLICT OF INTERESTS

The author declares no conflict of interests.

REFERENCES

- [1]. Gojanur S. Prevalence and etiology of traumatic injuries to the anterior teeth among 5 to 8 years old school children in Mathura city, India: an epidemiological study. *Int J Clin Pediatr Dent.* 2015;8(3):172-5.
- [2]. Cohen DW. Lecture, Walter Reed Medical Center 1962 June 3
- [3]. Majzoub ZAK, Romanos A, Cordioli G. Crown lengthening procedures: a literature review. *Semin Orthod.* 2014;20(3):188-207.
- [4]. Camargo PM, Melnick PR, Camargo LM. Clinical Crown Lengthening in Esthetic Zone. *C D A Journal.* 2007;35(7):487- 98.
- [5]. Gargiulo AW, Wentz FM, Orban B. Dimensions and relations of the dentogingival junction in humans. *J Periodontol.* 1961;32(3):261-7.
- [6]. Kois J. The restorative-periodontal interface: biological parameters. *Periodontology* 2000.1996;11(6):29-38.
- [7]. Schroeder HE, Listgarten MA. Fine structure of the developing epithelial attachment of human teeth. *Monogr Dev Biol.* 1971;2:1-134.
- [8]. Nevins M, Skurow HM. The intracrevicular restorative margin, the biologic width, and the maintenance of the gingival margin. *Int J Periodontics Restorative Dent.* 1984;4(3):30-49.
- [9]. Libman WJ, Nicholls JI. Load fatigue of teeth restored with cast posts and cores and complete crowns. *Int J Prosthodont.* 1995;8(2):155-61.
- [10]. Gupta G, Gupta R, Gupta N, Gupta U. Crown lengthening procedures: a review article. *IOSR-JDMS.* 2015;14(4):27-37.