Case Report
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Refurbishing the Pink and the White. Surgical Crown Lengthening in Esthetic Zone- A 5 Year Follow Up

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Abstract

Root stumps serve as pillars which can be utilized effectively as for future restorative needs in esthetic zones. Enhancing the white and depleting the pink may serve the purpose. Clinical Crown Lengthening Surgery (CCLS) is a traditional procedure which can be utilized to rehabilitate esthetics. The study involves a 30-year old patient with fractured crown irt 13. Crown lengthening was performed with apically repositioned flap and osseous reduction of 2 mm such that the new exposed tooth was approximately 4mm in length. The positive architecture was bone was established and 3 mm of attached gingiva was preserved. Root canal therapy followed by post and core was performed and the prosthesis was fabricated post-surgery. With the 22nd century approaching and dental implants being the new fad, it is still our responsibility to try to preserve what has been provided by nature to prevent us from becoming fictitious entities.

Keywords: Apically Positioned Flap (APF), Clinical Crown lengthening (CCLS)

1. Introduction

Fracture, caries, or perforations at or below the gingival level often present periodontal and restorative challenges. Many of these teeth are extracted and the missing tooth is restored either by an implant or a fixed partial denture.

Undeniably, this is an era of dental implants but 'extraction and replacement` should not be the only option. If the patient wishes to save his teeth, the dentist should be seasoned with all heroic methods to consider the patients wish and fulfill their confronting demand, provided the outcome is predictable and prognosis is fair to good[1].

Clinical Crown Lengthening Surgery (CCLS) poses a superior option to enhance the white esthetics. It can be classified in two aspects: a. esthetics and b. functional. The two may converge in times of esthetic concerns such as in the present scenario[1].

When inadequate clinical crown is present, a CCLS facilitates exposure of sound tooth structure for placement of restorative margin, ensures adequate supracrestal tissue attachment necessary for the long term stability of the periodontium[2] and provides space for ferrule, at the expense of the supporting bone, essential for the strength and longevity[3].

This article presents a clinical case of a tooth with no remaining clinical crown restored functionally and esthetically illustrating the potential of contemporary crown lengthening therapy.

2. Case report

A 30-year-old patient reported to the Department of Periodontology, Regional Institute of Medical Sciences, Imphal, Manipur, India. The chief complaint of the patient was related to his esthetics and functional disability due to loss of crown associated with tooth no. 13 since 2 years. Findings revealed that the patient had been given a crown by the previous dentist but cervical caries led to loss of the crown and the coronal tooth structure enmasse [Figure1]. All treatment options were presented including orthodontic extrusions, dental implants, fixed bridge and removable partial denture. The patient was young and strongly wished to save the tooth.

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Figure 1. Root piece embedded in the subgingival region of 13.

Preservation of the tooth requires surgical intervention in the form of a crown-lengthening procedure. The patient had a noncontributory medical history. Clinical examination revealed healthy periodontal status, shallow probing depths and no mobility. The appropriate crown lengthening procedure would be an Apically Positioned Flap (APF) with osseous reduction. Post-surgery, the root will be endodontically treated. A post, with ferrule and a core followed by initial crown preparation was planned thereafter. The patient was made aware of the risks and benefits after which an informed consent was duly obtained.

Presurgical assessment and treatment planning is prudent in patients undergoing CCLS. An important measure and initial step in crown lengthening in esthetic zone includes bone sounding[4].

It is done on the facial and at times proximal areas of the tooth to detect the location of the alveolar crest. It is also critical to maintain gingival symmetry in such cases (to visualize the final margin of gingiva with respect to the adjacent teeth). Prior to CCLS patient underwent full mouth scaling and root planning. Following local anesthesia, the operculum of gingival tissue was excised in such a way that all the inflamed and granulation tissue is removed, preserving the normal gingival architecture and minimum of 3mm of attached gingiva. A full thickness flap was reflected to expose the osseous crest. Nearly 2mm osseous reduction with osteoplasty was done. Also the positive architecture of bone was maintained. Resection was made in such a way that 4 mm of sound tooth structure is present above the alveolar crest [Figure 2]. The flap was apically displaced and sutured placing the gingival margin at the level of the [Figure 3] alveolar crest. The patient was given routine post-operative instructions.

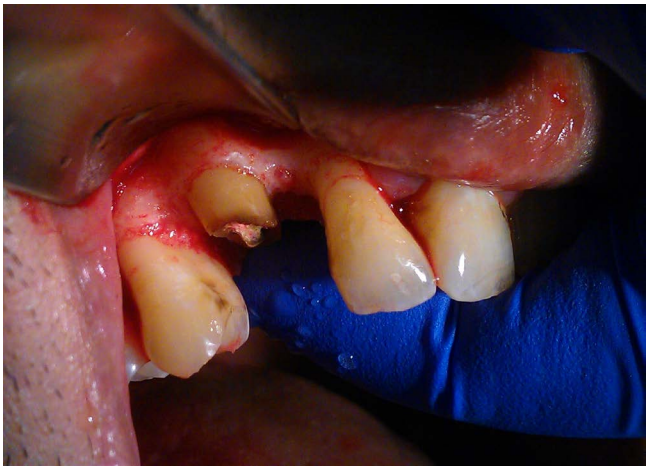


Figure 2. Root piece exposed using apically positioned flap along with osteoplasty and osteotomy to expose the crown height of 4 mm.

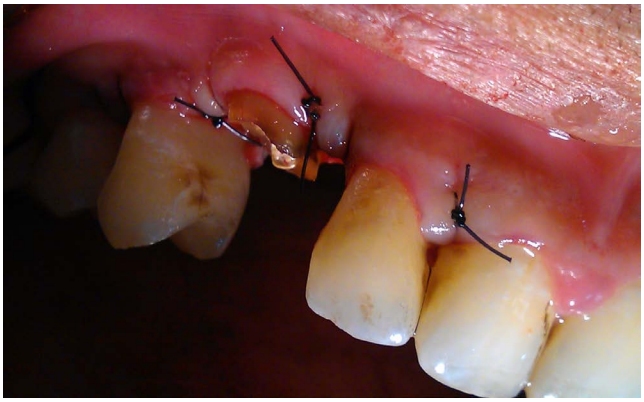


Figure 3. Sutures given. The tooth was treated endodontically and post and core was done.

The sutures were removed after a week. The root was then endodontically treated and a post-core done. A temporary prosthesis was cemented. After a healing period of 6 months, clinical parameters were found to be satisfactory. Final tooth preparation followed by cementation of the final prosthesis was accomplished [Figure 4]. A gingival rebound of approximately 0.5 to 1.2 mm was anticipated at the end of 12 months. However, it was not observed to such an extent so as to create a marginal discrepancy with the adjacent tooth as the tooth in concern was a canine where the arch turns as well as the placement of the canine was slightly distal and hence in line with the first premolar which has been maintained so till date. Additionally, a positive architecture of bone was achieved with led to minimal or no gingival rebound[5].



Figure 4. Final prosthesis given.



Figure 5. One year post operative follow-up.

A follow up for five years was uneventful and the patient was satisfied [Figure 5].

3. Discussion

Tooth with no clinical crown often presents a common treatment planning dilemma. The criticality of the situations is- to extract or to restore? Restorations of such teeth is challenging and risk of failure is reportedly high. Given this unfavorable situation, any measures for improving the success rate must be carefully instilled.

The esthetic crown lengthening treatment planning requires the consideration of necessity or associated prosthetic rehabilitation. Clinical scenarios requiring crowns or veneers, the expected prosthetic margin must match the contours of the gingival margin and will further determine the osteotomy extent[6].

Multitude of factors seem to contribute towards the maintenance of tooth structure gained through surgical crown lengthening. Individual patient healing characteristics, reformation of biologic width, adequacy of positive osseous architecture created during surgery, timing of restorative procedures, position of the flap margin after surgery and postoperative plaque control, may be some of the factors [1].

A simple approach is done by creating 4mm of sound tooth structure coronal to the alveolar crest with 2mm bracing on sound tooth structure and 2mm biologic width, and at the same time maintaining sufficient alveolar support for the preservation of the tooth. A bracing in form of ferrule needs to be given as it unequivocally produces better restorative results[7].

Despite a 2 mm bone reduction, the necessary crown-root ratio and biomechanical leverage is maintained. An added advantage of the case is the tooth in question i.e. maxillary canine which has a remarkably long root and thereby a high potential to allow restorability.

After crown-lengthening surgery, the periodontium continues to remodel and mature. Bragger and others[5] reported that final gingival position can change between 6 weeks and 6 months after the surgery. Hence, if prosthetic reconstructions are planned, gingival margin must be closely observed during the healing phase. Temporary crowns should be retained until the wounds are completely healed (possibly up to 6 months), after which final crown preparation and insertion can be accomplished. As a general rule, atleast 4mm of sound tooth structure must be exposed, so that the soft tissue will proliferate coronally during the healing phase and cover 2-3 mm of the root, thereby leaving only 1-2mm of supragingivally located tooth structure[8].

Appearance of black triangles is inevitable if the distance between the alveolar crest to the interdental bone exceeds 5mm. To minimize the exposure of black triangle and maximize the interproximal gingival tissue creep in this case, the crown morphology and contact area position is so optimally altered that the mesial and distal contact areas are shifted a little cervically minimizing the interproximal volume without compromising the aspects of esthetics and gingival health[7].

4. Other alternatives

Implant and FPDs may be in vogue with a promising outcome they were not a delightful choice in this case as

the patient desired to retain the tooth. Moreover, there are disadvantage associated with implants and FPDs like prohibitive cost, more number of appointments, lack of shock absorbers due to which fractures of crowns and bridgework are more common than with natural teeth crowns and high maintenance which cannot be underestimated.

Other options to expose adequate tooth structure could be root extrusion which can either be forced/ orthodontic or surgical.

Orthodontic extrusion requires an activation period of four to six weeks and a six to eight-week retention period for the tooth to become stabilized in its new position. To reestablish the biologic width after orthodontic extrusion, surgical crown lengthening is however needed to remove the gingiva and bone tissue that follows the tooth in its coronal path. This procedure entails more time than conventional crown lengthening, does not exclude the possibility of minor periodontal surgery and adds to the cost of restoring the tooth and is frequently associated with a relapse of 1mm. Moreover, a fibrotomy prior to treatment and following treatment has been advocated[9].

5. Conclusion

Clinicians often encounter the need for crown lengthening in the practice of dentistry and have to make treatment decisions taking into consideration how to best address the biological, functional, and aesthetic requirements of a particular case. It is seemingly less destructive than extraction and subsequent restoration with osseointegrated implant or fixed bridge and is more natural to the patient. Case control studies are needed to establish long term success.

6. References

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