

Crown Lengthening of A Carious Broken Tooth: A Case Report

Dr Ashutosh Dixit
Associate Professor Dept. of Periodontics

Dr Seema Dixit
Associate Professor

Dr. Mohit Sharma
Sr. Lecturer,

Dept. of Conservative Dentistry and Endodontics

Shree Bankey Bihari Dental College and Research Centre, Ghaziabad

Abstract

Surgical crown lengthening has been proposed as a means of facilitating restorative procedures and preventing periodontal injuries in teeth with structurally inadequate clinical crown or exposing tooth structure in the presence of deep subgingival caries. Discussed here is a case of deep subgingival caries on the distal surface of a mandibular molar where crown lengthening was done subsequent to which pre-fabricated post was cemented and composite core was made. This was followed by crown preparation and subsequent placement of porcelain fused to metal crown, all leading to a result which was profoundly satisfying for the patient as well as clinician.

Introduction

One of the prime goals of restorative therapy is to establish a physiologic periodontal climate and facilitate the maintenance of periodontal health. There are clinical situations, however, when these goals cannot be fulfilled.

In fact, the presence of a carious lesion, endodontic perforation, crown-root fracture or preexisting margins of failing restorations in a deep subgingival location may hamper access for proper restorative measures. In addition, due to destructive caries, altered passive eruption or pathologic wear, the supra-gingival available tooth structure may not be sufficient to permit adequate retention of the reconstruction in such cases, when attempts are made to obtain access or retention by extending preparation too deep subgingivally, the periodontium may develop increased probing depth, problems with respect to plaque control and a swollen cyanotic appearance.

Biologic width has been described as the space occupied by the junctional epithelium and connective tissue attachment coronal to the alveolar crest. This dimension is approximately 2.04 mm. An additional mm representing the gingival crevice is combined with this figure to permit the establishment of an intra-crevicular restorative margin. A minimum of 3 mm of sound tooth structure above the alveolar process is necessary if a restoration or fracture approaches the crest. Violation of the biologic width may result in inflammation and bone resorption.

Surgical crown lengthening has been proposed as a means of facilitating restorative procedures and preventing periodontal injuries in teeth with structurally inadequate clinical crown or exposing tooth structure in the presence of

deep subgingival caries.

This article presents a case of deep subgingival caries

Case Report

A 17 year old female patient reported to the department of Conservative Dentistry and Endodontics, ITS Dental College, Muradnagar, Ghaziabad, with complaint of pain and swelling in lower left posterior region. Clinical examination showed carious broken with pulp exposure in tooth 36. The caries was extending subgingivally on the distal surface. Since the patient was young and wanted to save the tooth, the following treatment plan was formulated.

- Root canal treatment in 36
- Clinical crown-lengthening in relation to 36
- Prefabricated post in distal canal and core build up with composite
- Porcelain fused metal crown.

After root canal treatment in 36 was completed, the patient was referred to the department of Periodontics for crown lengthening.

Crown Lengthening Procedure

Prior to crown-lengthening procedure, a careful evaluation of location and thickness of underlying bone in relation to 36 was done. Bone sounding after administration of local anaesthetic was performed to rule out the necessity of osseous surgery. The pockets on each surface of tooth 36 was explored with a periodontal probe and marked with a pocket marker.

In this case, gingivectomy was performed using electrosurgical unit. The incision was made with the needle electrode supplemented by small, ovoid loop electrode. A blended cutting and coagulating current was used. Following completion of the surgery, the area was covered with surgical pack. Patient was provided with 0.2% Chlorhexidine gluconate for plaque control post surgically. The patient was recalled one week postsurgically for dressing removal. After six weeks post surgery, the case was referred back to the department of Endodontics. In tooth no. 36, post space was prepared in distal canal and prefabricated carbon fibre post was cemented and core build up was done using posterior composite. Crown preparation was done in 36. Rubber base impression was made and full crown restoration was fabricated. The crown was cemented in position.

Discussion

Crown lengthening is a surgical procedure performed on a health periodontium that requires exposure of adequate tooth structure for restorative procedures. The case discussed here had subgingival caries on distal surface. Placing margins subgingivally can have deleterious effect on periodontium leading to gingival inflammation, loss of attachment and alveolar resorption. Also, deep subgingival margining makes it difficult to achieve accurate impressions. Marginal fit and marginal finishing are compromised and recurrent caries is likely to develop.

So, surgical crown lengthening was the viable option. The goal of surgical crown lengthening is to provide the restorative dentist with sufficient clinical crown to permit optimum restoration of a tooth. The indications for surgical crown lengthening are subgingival caries, subgingival fracture, teeth shortened by extensive caries or fracture, naturally short clinical crown due to non-exposure of anatomical crown. The techniques of surgical crown lengthening are:

- a. Gingivectomy,
- b. Apically positioned flap,
- c. Apically positioned flap with bone reduction.

In the present case, gingivectomy was performed as removal of soft tissue alone provided the visually accessible margin on the distal surface of tooth no. 36. The crown lengthening procedure was performed using electro-surgery as it permits an adequate contouring of the tissue and controls hemorrhage.

In this case, carbon fiber post was used, because they possess adequate rigidity, are not prone to produce tooth

fracture and have been shown to be clinically successful.

Finally, the porcelain fused to metal crown was cemented with the crown margin on sound tooth structure.

Conclusion

Crown lengthening is a viable procedure that enables to restore teeth having a short clinical crown, extensive subgingival caries, sub-gingival tooth fractures at dento-gingival junction, when performed in ideal clinical conditions, crown lengthening gives satisfactory results both from a functional as well as an aesthetic point of view.

References

1. Becker CM, Kaldahl WB. Current theories of crown contour, margin placement and pontic design. *J Prosthet Dent* 1981;45:268-276.
2. Roberto P, Gianfranco C. Surgical crown lengthening: A 12 month Clinical Wound Healing Study. *J Periodontol* 2001;72:841-8.
3. Wolffe NG, Weijden AF, Spanauf JA, Quincey de NTG. Lengthening clinical crowns A solution for specific periodontal, restorative and aesthetic problems. *Quintessence Int* 1994;25:81-88.
4. Nevins M, Skorrow HM. The intracrevicular restorative margin, the biologic width and the maintenance of gingival margin. *Int J Periodont Restor Dent* 1984;4:30-9.
5. Gopal Y, Mullahadi R. Functional crown lengthening on a fractured tooth in a medically compromised patient. *Journal of Clinical and Diagnostic Research* 2007;1:20-22
6. Herrero F, Scott JB, Maropis PS, Yukna RA. Clinical comparison of desired versus actual amount of surgical crown lengthening. *J Periodontol* 1995;6:568-71
7. Newman et al. Carranza's "Clinical Periodontology". Tenth edition, Saunders, Elsevier.
8. Planciunas L, Puriene A, Mackeviciene G. Surgical lengthening of the clinical tooth crown. *Stomatologija, Baltic Dental & Maxillofacial Journal* 2006;8:88-95
9. Ingle IT, Bakland LK, "Endodontics" fifth edition, BL Decker, Elsevier.

