Journal of Applied Dental and Medical Sciences
NLM ID: 101671413 ISSN:2454-2288
Volume 2 Issue 1 January - March 2016

Case Report

Restoring esthetics and function with crown lengthening: A Case Report

Anuja N. Moharir [1], Alka. S. Waghmare[2], Hemant Gadge[3], Mahesh Gandhewar [4]

[1] *Post Graduate student ,* [2]*Professor and Head, Department of Periodontics and oral Implantology, JMF's A.C.P.M Dental College, Dhule*
[3,4]*Senior Lecturer , Department of prosthodontics, JMF's A.C.P.M Dental College, Dhule*

ARTICLE INFO

Keywords:
crown lengthening, biologic width, vertical dimension

ABSTRACT

Crown lengthening is a surgical procedure which aims to increase the clinical crown height.A male patient reported with chief complaint of difficulty in mastication. On examination generlised attrition and reduced vertical dimension was observed for which only prosthetic rehabilitation was not possible so full moth crown lengthening was selected as the treatment modality.
This case report demonstrated that surgical crown lengthening technique improved the vertical dimension of the patient.

Introduction

Tooth wear can be classified as attrition, abrasion, and erosion depending on its cause. Excessive occlusal wear can result in pulpal pathology, occlusal disharmony, impaired function and esthetic disfigurement.[1] It is important to evaluate alteration of the VDO caused by the worn dentition.[2] In many cases, the vertical dimension of occlusion (VDO) is maintained by tooth eruption and alveolar bone growth. However, the rehabilitation of the severely worn dentition is challenging when the space for restoration is not sufficient.

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.[3]

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.[4] 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.[5]

Crown lengthening is a surgical procedure which aims at removal of periodontal tissue to increase the clinical crown height and reestablishing the biologic width. It is procedure which helps to meet both restorative and aesthetic demands of the patient.

* *Corresponding author:* ***Dr. Anuja N. Moharir, Department of periodontics and oral implantology, JMF's A.C.P.M Dental College, Dhule E mail: anuja-_moharir@yahoo.in Mobile Number: +91 9423975066***

The present case report depicts the use of full mouth crown lengthening to meet the functional and aesthetic demands of a patient with reduced vertical dimension.

Case report

A 63 year old male reported to department of Periodontics with a chief complain of inability to masticate. Intraoral examination revealed generalised attrition. The patient did not have temporomandibular disorder history and soreness of the mastication muscles, but the discrepancy between centric occlusion (CO) and maximum intercuspal position (MIP) was found when he was guided to centric relation with bimanual technique.

During the initial visit appointment was scheduled for complete medical examination, radiographs, impressions for study models, bite registration. The possible causes of patients worn dentition that might include posterior interferences, parafunction, eating habit, and dental ignorance were explained to the patient.

The treatment plan involved :

- Periodontal therapy which includes scaling and polishing
- Endodontic treatment of severely atritted teeth
- Crown lengthening procedure
- Full mouth metal ceramic crowns increasing vertical dimension at occlusion (VDO) and restoring function.

Treatment procedure:

Patient was informed about the treatment and after obtaining his consent scaling followed by endodontic treatment was carried out for severely worn teeth. Radiographic examination showed gutta percha point in the apical one‑third for the placement of post and core. On probing, a generalized depth of 2 mm was observed with 3-4 mm of attached gingiva. The teeth were not mobile. Maxillary and mandibular impressions were taken and diagnostic casts were obtained along with preoperative intraoral photographs (fig1,2,3).

An average of 2-3 mm of the clinical crown and 3 mm of biologic width was required to place the margins of the crown for which surgical crown lengthening was planned. After giving local anesthesia, bone sounding was carried out to determine the amount of osseous reduction to be done. Undisplaced flap surgery with osseous recontouring was performed to increase the clinical crown length and to maintain the biologic width (Fig.4). Ostectomy followed by osteoplasty was performed to maintain an overall distance of 3mm between the gingival margin and the alveolar crest. This was achieved using a high speed drilling with carbide round bur under sterile water irrigation. The scalloping of the flap was performed anticipating the final underlying osseous contour. Flap was repositioned and interrupted sutures (silk 3-0) were placed (Fig.5). Then surgical site was covered with periodontal dressing. Routine postoperative instructions were given. The medications prescribed were, amoxicillin 500 mg tid for 5 days and paracetamol tid for 3 days.

Patient was recalled after 1 week for suture removal and re-evaluation was done after 1 month. Proper exposure of clinical crowns with increased crown height was observed then the patient was referred to the Department of Prosthodontics for the full mouth metal ceramic crowns.

The patients casts were mounted on a semi-adjustable articulator using a face-bow record and an interocclusal record that was made. The adaptation of patient to the increased VDO was evaluated during 1-month trial period (Fig.6). No muscle tenderness and temporomandibular discomfort was found. Hence the final prosthesis was given to patient(Fig.7).

List of figures

Fig.1 : Front view

Fig.2 : Right lateral view

Fig.3 : Left lateral view

Fig.4 : Crown lengthening procedure

Fig.5 : Sutures given

Fig.6 : Metal ceramic prosthesis

Fig.7 : Final full mouth prosthesis

Discussion

D. W. Cohen[6] in 1962 introduced the concept of crownlengthening, 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[7] 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.[8]

It was found that margins of fixed prosthesis significantly compromise the gingival health if placed below the gingival margin.[9] One important factor should be considered during crown lengthening is amount of attached gingiva. It has been shown that to maintain periodontal health there should be 2-3mm of attached gingiva.[10] In the present case scalloped incision was given by preserving as much of attached gingiva as possible.

Conclusion

Surgical crown lengthening is a technique that can be used to increase the height of clinical crowns in cases with reduced clinical crown heights and in dentitions that are worn with reduced vertical dimensions. It is a technique by which a clinician can address both restorative and aesthetic demands of the patient as in the current case report where full mouth surgical crown lengthening was selected as a treatment modality for a patient exhibiting generalized attrition and full mouth rehabilitation was done.

References

1.Turner KA, Missirlian DM. Restoration of the extremely worn dentition. J Prosthet Dent 1984;52:467-74.

2. Prasad S, Kuracina J, Monaco EA Jr. Altering occlusal vertical dimension provisionally with base metal onlays: a clinical report. J Prosthet Dent 2008;100:338-42.

3 Davarpanah M, Jansen CE, Vidjak FM, Etienne D, Kebir M, Martinez H. Restorative and periodontal considerations of short clinical crowns. Int J Periodontics Restorative Dent 1998;18:424‑33.

4.Garguilo AW. Dimensions and relationships of the dentogingival junction

in humans. J Periodontol 1961; 32:261-7.

5. Yeh S, Andreana S. Crown lengthening: Basic principles, indications, techniques and clinical case reports. N Y State Dent J 2004;70:30‑6.

6.Cohen D. Lecture; Walter Reed Medical Center. 1962.

7.Kois J. New paragigms for anterior tooth preparation: Rationale and technique. Oral Health 1998;88:19-22, 25-7, 29-30.

8.Allen EP. Surgical crown lengthening for function and esthetics. Dent Clin North Am 1993;37:163‑79.

9.Silness J. Fixed prosthodontics and periodontal health. Dent ClinNorth Am 1980;24:317‑29.

10. Maynard JG Jr, Wilson RDK. Physiological dimensions of the periodontium significant to the restorative dentist. J Periodontol 1979; 50: 170–177.