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CASE STUDY

FUNCTIONAL CROWN LENGTHENING IN MANDIBULAR PREMOLAR WITH MULTIPLE MUCOGINGIVAL DEFORMITIES - A CASE REPORT

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ABSTRACT

Surgical crown lengthening is a procedure that resects periodontal tissues to increase clinical crown height and reestablishes biologic width. This may be performed for esthetic or for functional purposes. The preservation of a healthy periodontium is essential for the long term success of a restored tooth. It is however important that while undertaking this procedure, its impact to the underlying periodontal tissues be appropriately understood by the periodontist as well as the restorative dentist. This case report discusses the management of a tooth with subgingivally extended caries and with inadequate width of attached gingiva. This case highlights the multiple factors that are to be considered and suggests an appropriate management of this complex interdisciplinary problem.

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INTRODUCTION

Crown lengthening has been considered as an adjunct to restorative dentistry, and may be performed primarily for aesthetic purposes, with or without concomitant restorative management.Crown lengthening procedures are also considered to be a treatment option when the crown height needs to be increased so that restorations may be placed successfully over sound dentine-so as to enhance longevity of the restorations.They are further indicated where the proposed margins of the restoration violate the biological width. The biologic width encompasses the junctional epithelium and connective tissue attachment and yields the combined dimension of 2.04mm (Garguilo, 1961). Impingement of the biologic width willresult in attempts by the gingival tissues to re-establish its original dimension through bone resorption resulting in a chronically inflamed periodontal pocket. Furthermore, there is experimental evidence suggesting that the biologic width will re-establish to its original vertical dimension during healing of the periodontal tissues following surgical procedures (Stephen *et al*., 2007). In addition a consistent three millimetres gain of coronal tooth structure was observed at the three and six months in the treated areas (Sharon *et al*., 2003). The presence of caries or restorations in close proximity to the alveolar crest may lead to inflammation and bone loss due to the violation of the biologic width (Ingber *et al*., 1977). Hence it is recommended that the restorative margin be a minimum of three millimeters coronal to the alveolarcrest, suggesting that this margin could be achieved through crown lengthening surgical procedure (Bragger *et al*., 1992). Various studies have shown that when crown are placed on teeth where there is inadequate width of attached gingiva, attachment loss results.The periodontist evaluates the position of the alveolar crest by performing bone sounding and if there is an intrusion of the biologic width he recontours and locates the level of gingival margin and the alveolar crest to achieve the desired biologic width (Michael *et al*., 2001; Ernesto *et al*., 2004). The following case description illustrate the concepts.

Case description

A 38 year old female reported to the Department of Conservative Dentistry in SRM Dental College with the chief complaint of pain in her left lower back tooth. History revealed that the pain was dull, continuous and aggravated on taking hot foods. The patient was in excellent general health with a non-

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contributory medical history. On intraoral examination, a class II carious lesion was found on 34 which extended subgingivally. There was tenderness on percussion.The adjacent 35 was missing. An electric pulp test and thermal test was done which indicated delayed response in 34. Radiographic examination revealed periapical rarefaction suggestive of periapical pathology in 34. A radiopaque structure on the coronal surface of 36 correlated with the clinical assessment of class I silver amalgam restoration. Endodontic treatment was done for 34 but the restorative margins extended one millimeter subgingivally. As the proposedpost–endodontic restoration would extend further subgingivally, the patient was referred to the Department of Periodontics for crown lengthening procedure. Periodontal examination revealed a fair oral hygiene with minimal plaque and calculus deposits. Generalised probing sulcus depth was around two to three millimetres in all areas. Further an inadequate width of attached gingiva and aberrant frenal attachment around 34 was also noticed. The patient was educated and motivated about optimal oral hygiene. The etiotrophic phase therapy was performed to provide a stable, healthy periodontium as a foundation for restorative care.

A surgical phase consisting of periodontal plastic surgical procedures such as crown lengthening, frenotomy and gingival augmentation to increase the width of attached gingiva around 34 were suggested. Crown lengthening was planned to place the margins of the final restorations in relation to 34 on a sound tooth structure supragingivally. The probing sulcus depth around 34 was found to be three millimetres. Since restorative margins extended one mm subgingivally an external bevel gingivectomy was performed so as to increase the crown height by two millimetres. Care was taken to ensure that the incision blended with the gingival contour of the anterior teeth mesially and distally the incision was extended over the crest in 35 region. Therefore now, one millimetre of sound dentine was remaining for tooth preparation. The biologic width was thus preserved without the need for osseous recontouring.The recipient site around 34,35 region was prepared and frenotomy was done. Connective tissue was harvested from the palate and placed around 34, 35 region in an attempt to increase the width of attached gingiva. Absorbable 5-0 sutures and periodontal dressing were given. Chlorhexidine 0.2% twice daily was prescribed for two weeks and appropriate postoperative instructions was given. Patient was followed up regularly at

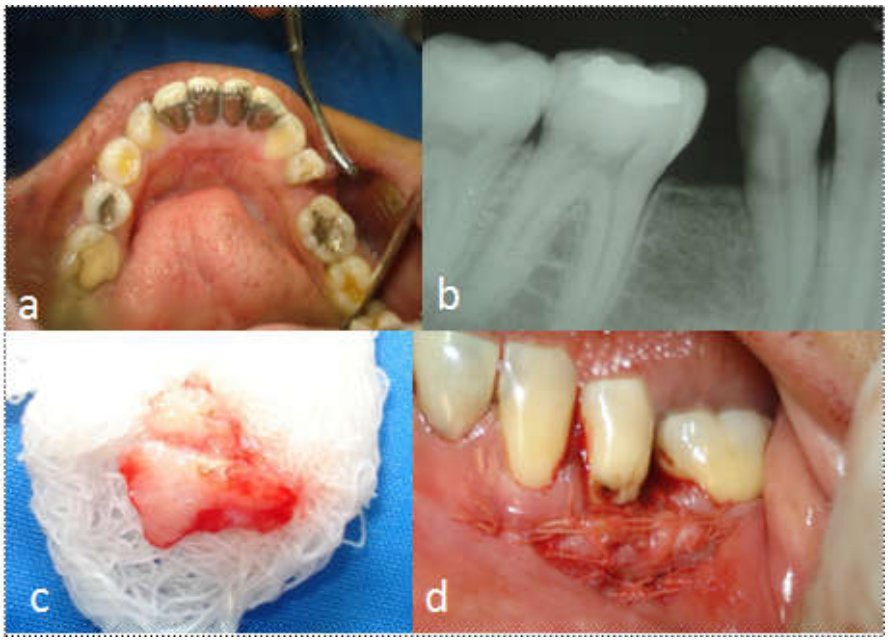

Figure 1 a. Class II Caries in 34 and Missing 35, b.IOPA Shows Class II Caries in 34 and Missing 35, c.Connective Tissue Graft Harvested, d. Graft Placed In The Recipient Site

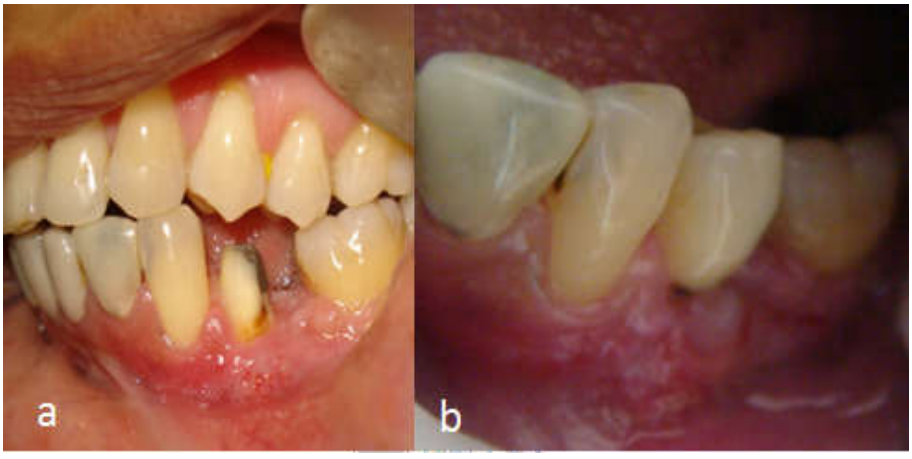

Figure 2 a.Crown Preparation Done On 34, b.Crowns Placed On 34,35

weekly intervals to ensure that meticulous plaque control was maintained. After optimal healing of the periodontium, the patient was referred back to the Conservative Department for the preparation of the tooth. (Fig 1 a-d) On review at the restorative clinic it was decided that since the edentulous space between 34 and 36 was reduced due to the mesial drifting of 36 making it not possible to place a regular pontic of premolar dimension into 35 space. Therefore it was proposed to have an altered occlusal pattern prepared in 34 so as to restore thee dentulous space. Hence a crown with increased mesiodistal width was planned in 34. Hence this might cause a horizontal cantilever thereby magnifying the impact of the transmission of the occlusal force, an enameloplasty was done on the opposing tooth to decrease thetorquing occlusal forces on the crown. Care was taken to ensure that the margins of the crown were smooth with good marginal integrity. (Fig 2a,b)

DISCUSSION

The field of periodontics and restorative dentistry are interdependent. In the present case sufficient soft tissue dimensions was present coronal to the alveolar crest, allowing the surgical alteration of the gingival margin levels without the need for osseous recontouring. An external bevel gingivectomy was performed to establish the desired gingival margin position while simultaneously avoiding a violation of biologic width. Although no minimum width of attached gingiva has been established as a standard necessary for gingival health, a wider zone of attached gingiva is needed around teeth that have restorations. The objective is to ensure that plaque does not extend further subgingivally. It also reduces inflammation around restored teeth. Therefore a connective tissue grafting procedure around 34 was preferred in the present case for gingival augmentation as it is more versatile and highly predictable. Clinicians need to combine periodontal and restorative procedures in a coordinated manner to optimize clinical outcomes in these type of cases. After periodontal plastic surgery, the periodontium continues to remodel and mature which would take about three to six months. Therefore wound healing must be allowed to proceed to completion if optimal results are to be achieved. Conventional protocols require a waiting period of four to six weeks for sufficient healing of attachment apparatus prior to initiating restoring endeavours. Other factors such as patient compliance, oral hygiene also influence the surgical outcome. In a multidisciplinary approach, coordination between the different specialties is more critical for a better clinical outcome and success of the concerned tooth.

Conclusion

A comprehensive periodontal and restorative management is required for these kind of cases which should be planned based on the individual patient's needs. The integrity of the dentogingival junction should be respected which would otherwise result in detrimental effect on the periodontal tissues.The crown- periodontal tissue interface needs to be maintained with a diligent plaque control as well as with an understanding of the various aspects of restorative dentistry that have a bearing on periodontal health.

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