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Aesthetic smile designing of an orthodontically managed class 3 case – A case report

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Abstract
One of the most popular surgical techniques in periodontal practice is crown lengthening. Crown lengthening (CLP) is a frequent procedure used to both repair aesthetic problems through a smile design and to preserve the dentogingival complex in ideal conditions. CLP may be difficult in an anterior aesthetic-driven area. Hence, a multidisciplinary approach for better outcomes should be practised. The current case report emphasises the need for perio-ortho interdisciplinary approach while restoring anterior esthetics and function.

Keywords: Crown lengthening procedure (CLP), biologic width, dentogingival complex, aesthetics

Introduction

Crown lengthening is a surgical technique that involves apically positioning the gingival border, removing supporting bone, or both in order to expand the extent of supragingival tooth structure for restorative or cosmetic purposes. In order to establish the best marginal seal and an aesthetically attractive final restoration, the ultimate goal of crown lengthening is to produce a tooth crown dimension sufficient for a stable dento-gingival complex and for the implantation of a restorative margin. A band of attached gingiva between 2-3mm is preferred to successfully retain the restored tooth, according to several studies. Planning a crown lengthening operation should take this into great consideration as there is a chance that it will decrease due to the resetting nature of the procedure. Crown lengthening is indicated for teeth that have inadequate exposure of the anatomic crowns resulting in fractures, subgingival caries, or severe cavities that shorten the tooth. For clinical crown lengthening, a number of methods have been proposed, including gingivectomy, undisplaced flap with or without osseous surgery, apically repositioned flap with or without resective osseous surgery, and orthodontic forced eruption with or without fibrotomy. The novel study by Gargiulo *et al* [1]. Defined biologic width as the physiologic dimension of the junctional epithelium and connective tissue connection. According to this study, people typically exhibit a junctional epithelium of 0.97 mm below the base of the gingival sulcus and a connective tissue connection of 1.07 mm above the alveolar bone crest. The biological width, or 2.04 mm on average, is the result of adding these two measurements. According to Ingber *et al*., in order to allow for healing and appropriate restoration of the tooth, an extra 1 mm may be coronal added to the 2mm dentogingival junction as the ideal distance between the bone crest and the restoration's edge. Furthermore, bone loss following an aesthetic crown lengthening operation is a significant factor in determining where the free gingival margin will finally heal.

1. Case Presentation

A 16-year-old girl was referred to the Department of Periodontics of Dr R Ahmed Dental College & Hospital from Orthodontics Department. The patient presented with disalignment of gingival zenith in upper anterior region after finishing of orthodontic treatment. The periodontal condition was within normal limit, and the crown-to-root ratio was about 1: 3. At clinical examination, attached gingiva band was 5 to 6 mm in width, and periodontal pocket depth was 3 mm or less. The primary concerns was the dissatisfaction of excessive gingival display during smiling. Then for upper anterior region crown lengthening with osseous recontouring surgery has planned. To diagnose wax-up, a maxillary impression was first taken. Then, a silicone surgical guide was confectioned, to correspond to the cervical region. A scalpel was used to record the new gingival margin after insertion of the guide. As a result, full thicknes mucoperiosteal flap has been raised, and the gingival collar extracted with a Gracey curette and Orban's knife. For the osteotomy, measurement of the distance between the guide edge of the newly formed gingival margin and the cervical bone was recorded. This distance should be about 2-3 mm, for the biologic width maintenance. A careful osseous contouring, was carried out with surgical chisels and carbide/diamond burs with sufficient irrigation to prevent bone necrosis; the flaps were then sutured. Patient was given appropriate postoperative instructions. Uneventful healing was noted 15 days post-op.

Fig 1

Fig 2

Fig 3

Fig 4

Discussion

The two guiding concepts of crown lengthening therapy are the preservation of sufficient keratinized gingiva (KG) surrounding the tooth and the establishment of BW. The dimension of soft tissue linked to the region of the tooth coronal to the alveolar bone crest is known as the BW, or the supracrestal tissue attachment [2]. According to studies, there should be at least 3 mm of space between alveolar bone and restorative margins for periodontal health, with an additional 1 mm for sulcus depth and 2 mm for bone. For gingival health, a sufficient KG width of ≥2 mm should be maintained around a tooth whenever possible [3]. Nevins and Skurow advised against extending the subgingival edge beyond 0.5–1.0 mm since it is impossible for a clinician to tell where the junctional epithelium and sulcular epithelium separate [4]. A damage of BW occurs when the restoration border is positioned excessively below the gingival tissue crest, impinging on the gingival attachment apparatus. The gingival tissues that are implicated exhibit two distinct reactions. One explanation is that the body tries to make space between the alveolar bone and the edge so that tissue reattachment may take place, which can result in unanticipated bone loss and gingival tissue recession. In regions where the alveolar bone surrounding the tooth is extremely thin, this is more prone to happen. This delicate tissue might regress mostly because to trauma from restorative therapies. The third scenario is that there is no visible change in the level of bone but that gingival inflammation starts and lasts.

When smiling, the lip's location is crucial because it affects the quantity of tooth and gingiva that is visible, which ultimately affects the appearance. For best outcomes following crown lengthening surgery, wound healing must be permitted to reach its full potential in areas of the mouth where aesthetics are significant. Following crown lengthening surgery, the periodontium keeps growing and changing. Gingival recession has been described by Brägger *et al*. to happen anywhere from six weeks to six months following surgery.

Therefore, recessions need to be continuously monitored during the healing phase if restorations are planned. According to multiple studies, the biologic width should return after six months following crown lengthening treatments [5]. Phase.

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