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### RESEARCH ARTICLE

#### CROWN LENGTHENING: LE MAQUILLAGE FOR THE ANTERIOR PERIODONTIUM

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#### Abstract:-

*The aim of this case report is to highlight and describe crown lengthening procedure keeping in mind the increasing demand of esthetic dentistry. As mentioned by 2003 American Academy of Periodontology (Practice Profile Survey), crown lengthening is the most conventional surgical periodontal treatment. The present case is managed with the surgical approach of crown lengthening without compromising esthetics and tooth support.*

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#### Introduction:-

As William Shakespeare had rightly quoted "Smile cures the wounding of a frown" hence it is of utmost importance to maintain a perfect smile in this highly aesthetic applauding society. To uphold a perfect smile it is of paramount importance to maintain a healthy and an equitable relationship between the gingiva, lips and teeth. It is estimated that 10% of the population has excessive gingival display and most of them are women<sup>[1]</sup>. The notion of crown lengthening was first initiated by D.W. Cohen (1962)<sup>[2]</sup> and is presently described as a surgical approach that often avails amalgamation of tissue reduction or removal, osseous surgery, and / or orthodontics for tooth exposure. The common causes of short clinical crown include caries, erosion, tooth malformation, fracture, attrition, excessive tooth reduction, eruption disharmony, exostosis, and genetic variation<sup>[3]</sup>. Therefore, this deficiency in clinical crown length should be increased when margins of caries or margins of the tooth fractures are subgingivally placed, the crown is too short for retention of the restoration, there is an excess of gingiva, and anatomical tooth crown is partially erupted<sup>[4]</sup>.

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The ultimate goal of crown lengthening is to provide a tooth crown dimension adequate for a stable dentogingival complex and for the placement of a restorative margin, so as to achieve the best marginal seal and an aesthetically pleasing final restoration<sup>[5]</sup>. The amount of tooth structure exposed above the osseous crest (about 4 mm) must be enough to provide for a stable dentogingival complex and biologic width to permit proper tooth preparation and account for an adequate marginal placement, thus ensuring a good marginal seal with retention for both provisional and final restorations<sup>[6]</sup>.

**The various indications<sup>[7]</sup> for crown lengthening are:**

1. Restorative needs
2. To increase clinical crown height lost due to caries, fracture or wear
3. To access subgingival caries
4. To produce a “ferrule” for restoration
5. To access a perforation in the coronal third of the root
6. To relocate margins of restorations that is impinging on biological width.
7. Aesthetics
8. Short teeth
9. Uneven gingival contour
10. Gummy smile.

**The various contra-indications<sup>[8]</sup> and limiting factors are:**

1. Inadequate crown to root ratio
2. Non restorability of caries or root fracture
3. Esthetic compromise
4. High furcation
5. Inadequate predictability
6. Tooth arch relationship inadequacy
7. Compromise adjacent periodontium or esthetics
8. Insufficient restorative space
9. No maintainability

Biologic width is defined as the physiologic dimension of the junctional epithelium and connective tissue attachment, according to the pioneering study conducted by Gargiulo et al.<sup>[9]</sup> Usually, the biologic width is reported to be 2.04 mm which comprises of 0.97 mm of junctional epithelium and 1.07 mm of connective tissue attachment. But this can definitely vary with age, due to orthodontic treatment as well as due to tooth migration due to loss of arch or occlusal integrity.

**Case report:-**

A 21 year old female patient was referred to the Department of Periodontics, GNIDSR, with a complaint of inadequate crown structure to produce a ferrule length facilitating prosthetic management with respect to tooth number 12. [Figure: 1] There was absence of periapical radiolucency on radiographic examination, the periodontal ligament was within the realm of normalcy, and the crown-to-root ratio was around 1:3. On clinical evaluation, the width of attached gingival was recorded to be around 5 to 6 mm in width and pocket depth of 3 mm or less was encountered. No potential periodontal disease neither tooth mobility was encountered. The tooth was endodontically treated. The principal arena of interest for treatment was to resolve the issue of inadequate crown structure for crown replacement.

In this particular case it was decided to pursue surgical technique of crown lengthening procedure, to increase the extent of supragingival tooth structure and also to maintain a potent, superlative relationship between the restoration and the periodontium. The patient was educated about the pros and cons of the procedure and a consent form was signed.

After administering local anaesthesia, transgingival probing was done to check for the crest of the alveolar bone. Usually it is considered that bone crest should be ideally 2 mm away from the gingival margin. Hence if the distance between the two is not so or less, it is recommended to advance with osseous resection. The level at which the final incision will be placed was marked and using a no. 15 Bard-Parker blade, the initial internal bevel incision was placed 2 mm above the gingival margin to achieve the goal of obtaining ideal contour both labially and palatally.

[Figure: 2] Post incision, the mucoperiosteal flap was raised reflecting the bony contours of the particular tooth. [Figure: 3 & 4] After reflection and access, osseous resection was performed using a low speed hand piece and carbide bur using copious amount of saline irrigation. [Figure: 5] On achieving the satisfactory distance, gauze compressions were done to achieve haemostasis. The reflected flap was repositioned and sutured. [Figure: 6 & 7] Patient was given appropriate postoperative instructions and was asked to rise with 0.2% chlorhexidine digluconate mouthwash twice daily for two weeks. The patient was recalled after 7 days, [Figure: 8] followed by 30 days [Figure: 9] and post placement of the crown for evaluation.

### Discussion:-

The entire protocol of crown lengthening procedure is based on two important doctrines: biologic width and amount of keratinized gingiva around the tooth. Studies have revealed that a minimum of 3 mm of space between restorative margins and alveolar bone would be adequate for periodontal health, allowing for 2 mm of biologic width space and 1 mm for sulcus depth.<sup>[10]</sup> whenever possible, an adequate width of keratinized gingiva ( $\geq 2$  mm) should be maintained around a tooth for gingival health.<sup>[11]</sup>

As mentioned by Nevins and Sukrow in relation to cases where subgingival margins are advisable, the junctional epithelium or the dentogingival apparatus should not be disheveled, thus recommending to maintain the subgingival extension to 0.5-1.0 mm. If there is violation of biologic width on impingement of the gingival apparatus, there may be two major consequences. One of them is loss of unpredictable nature along with tissue recession. The other outcome is development of gingival inflammation and persistence of the same.

In the above described case report, the treatment plan comprised of internal bevel incision as choice so that the periodontal health and the postoperative esthetics of the patient is unhindered. The most appealing feature of this surgical approach comprising internal bevel incision is that as it thins down the marginal gingiva, the knife edge contour is maintained as well as superlative amount of keratinized gingiva is also withheld.

### Conclusion:-

Crown lengthening is often considered a feasible option for aiding restorative treatment plans or enhancing esthetic appeal of the patient. The dominant factors which makes the surgical technique of crown lengthening procedure appealing is the benefit of good tissue healing, reduced inflammation of the surgical field and minimized post operative unpleasantness.



Figure 1:- Pre Operative.



Figure 2:- Incision Given.



Figure 3:- Reflection Of Buccal Flap.

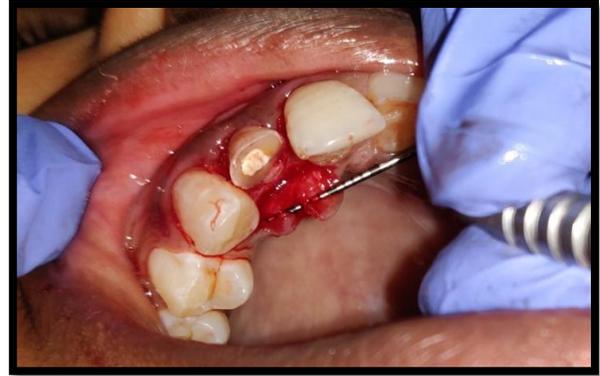


Figure 4:- Reflection Of Palatal Flap.



Figure 5:- Osteotomy And Osteoplasty Done.



Figure 6:- Suture Placed.



Figure 7:- Immediate Post Operative.



Figure 8:- 7 Days Post Operative.



**Figure 9:- 21 Days Follow Up.**

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