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GINGIVO-OSSEOUS SURGERY WITH THE MANAGEMENT OF BIOLOGICAL WIDTH (A CASE REPORT)

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Abstract- The knowledge of the inter-relationship between periodontal tissues and restoration is a predominant to ensure relevant form, function, esthetics and comfort of the dentition. Most of us as a dentist are ignorant of this important relationship, hence uncertainty remains regarding a special concept that is biologic width, its maintenance and applications of crown lengthening in cases of biologic width violation. A Crown lengthening procedure is a constitutive component of the esthetic armamentarium and is utilized with increasing frequency to inflate the appearance and retention of restorations placed within the esthetic zone. Thus, we are presenting a case report on management of biological width with gingivo-osseous surgery.

Keywords: biological width, crown lengthening, periodontal health, anterior restoration, esthetic restoration.

INTRODUCTION

A surgical procedure that is known as crown lengthening is been designed to increase the extent of supragingival tooth structure for restorative/esthetic purposes by apically positioning the gingival margin, removing supporting bone or both and also it is used in the management of biological width violation[1]. Indications of this special procedure include subgingival caries or grossly carious tooth due to which the tooth get shortened, periodontal pocket, gingival enlargement and fractures. Different techniques for clinical crown lengthening are being used which consistsofs gingivectomy, undisplaced flap with or without osseous surgery, apically repositioned flap with or without resective osseous surgery, and orthodontic forced eruption with or without supracrestal gingival group fibrotomy. Selection of one technique out of these depends on patient-related factors such as clinical crown to root ratio, ability to restore the teeth, root proximity, root morphology,esthetics, furcation location, individual tooth position and collective tooth position,.

The biological width has been defined as the "dimension of the soft tissue, which is attached to the portion of the tooth coronal to the crest of the alveolar bone". It can also be considered as a natural seal which develops around tooth and helps in protecting the alveolar bone from infections and diseases. **Gargiulo *et al***. in 1961 suggested a sulcus depth of 0.69 mm, an epithelial attachment of 0.97 mm, and a connective tissue attachment of 1.07 mm in his studies and also **Ingber *et al*** in 1977 recommended a 3mm space between the restoration margin and the crest of alveolar bone[2]. Hence, due to the increasing interest in esthetic dentistry the understanding of therapeutic modalities by an interdisciplinary approaches are developed. As a result of which in esthetic dentistry this procedures have become an essential part and is being utilized with increasing frequency[3].

In our body the invasion of bacteria and other foreign bodies are prevented by the ectodermal tissue. Similarly, in oral cavity biologic width acts as an essential barrier from such irritants that might damage the periodontium and helps in the preservation of periodontal health [4]. Hence, main aim of this case report is to manage the biological width with gingivo-osseous surgery.

CASE REPORT

A 32 year old female patient reported to the Department of Periodontology and Implantology,BRS Dental college and hospital with a chief complaint of unesthetic appearance of gums wrt 12. On clinical examination a PFM crown given by a local dentist was noticed wrt 12 associated with inflamed and edematous tissue and a periodontal pocket of 5mm. On radiographic evaluation, the patient was given crown without endodontic therapy and their was a periapical lesion and vertical bone loss was seen wrt same.

Pre-surgical procedure: Phase I therapy was done, including scaling and root planing and oral hygiene instructions were given to the patient. After that patient was advised to use 0.2% chlorhexidine mouth rinses twice a day for 2 weeks, and oral hygiene instructions were given to the patient and brushing techniques were described. Patient was then sent to the department of conservative dentistry and endodontics for endodontic therapy and was recalled after two weeks for re-evaluation of the phase I and conducting the surgical phase.

Surgical procedure: Administration of local anesthesia with 1:100,000 epinephrine was done followed by external bevel incision for gingivectomy with #15 surgical blade corresponding the normal architecture of the scalloping along the adjacent tooth (about 2mm)(figure 5). Then, intracrevicular incision was given along with interdental incision to raise a full thickness flap with 24 G periosteal elevator followed by the debridement of the granulation tissue(figure 6-9). The alveolar bone is reduced by ostectomy, using low speed handpiece and carbide bur under copious saline irrigation to expose the required tooth length in a scalloped fashion and to follow the desired contour of the overlying gingival(figure 10). The flap was repositioned and sutured with simple interrupted sutures (figure 11) Chlorhexidine rinse 0.2% bid was prescribed for 2 weeks, and the patient was given appropriate postoperative instructions. and recalled for follow after 15 days. Alginate impression was taken and on next visit temporary crown was delivered to the patient wrt 12.

Figure 1- Pre-operative

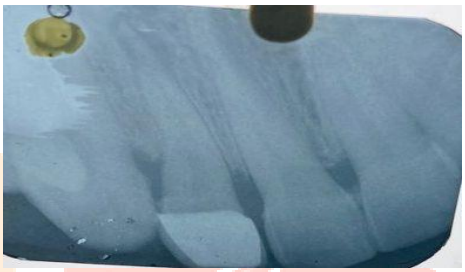

Figure 2- Pre-operative radiograph

Figure 3- Measuring periodontal pocket

Figure 4- After crown removal and Endodontic therapy

Figure 5- Gingivectomy done with external

Figure 6- Crevicular incision given

bevel incision

Figure 7- Interdental incision given

Figure 8- Full thickness flap was raised

Figure 9- Flap raised

Figure 10- Bone ressection done

Figure 11- Simple interrupted suture given

Figure 12- Temporization done

DISCUSSION

According to Ingber et al., (1977)a minimum of 3 mm of space should be considered between restorative margins and alveolar bone which would be a essential for periodontal health, allowing for an average 2 mm of BW space and 1 mm for sulcus depth[5]. An average width of keratinized gingival i.e ≥2 mm should be maintained around a tooth for gingival health whenever possible[6]. Nevins and Skurow suggested that the restoration must not disrupt the integrity of junctional epithelium or connective tissue apparatus during preparation and impression taking when subgingival margins are to be placed. Also they recommended a subgingival margin placement at 0.5–1.0 mm because it is difficult for the dentist to detect clinically the exact location where the junctional is beginning and the sulus is ending[7]. In situations where the restoration margin is placed too far beyond the gingival sulcus which impinges on the gingival attachment apparatus and hence results in a violation of biological width as seen in above mentioned case report.

Two different responses can be seen , first possibility is bone loss of an unpredictable nature and gingival tissue recession occur as human body attempts to recreate a room between the alveolar bone and the gingival margin to allow space for tissue reattachment, which is more likely to occur where alveolar bone surrounding the tooth is very thin. Also it is commonly seen that the fragile tissue receedes from the trauma caused by faulty restorations. Second possibility is no change appears in the bone level, but gingival inflammation develops and persists[8]. **Shobha *et al***. in a study evaluated that crown lengthening can be used to re-establish the biological width to its original vertical dimension along with 2 mm gain of coronal tooth structure after six months and our study also shows the same results on evaluation after 3 months[9]. And recently **Lanning et al** confirmed in his study that the after 6 months biological width will re-establish itself following crown lengthening procedure which is in concordance with our study[10]. In a study conducted by **Brägger *et al***. reported that between 6 weeks and 6 months after the surgery gingival recession can occur, if restorations are to be planned after crown lengthening procedure recessions should be carefully observed during the healing phase. Till the wounds are completely healed temporary crowns should be retained i.e upto around 6 months after which final crowns can be placed and hence gingival recession can be minimized. In our case we have given temporary restoration and 12 weeks follow up shows no recession at all[11].

CONCLUSION

Periodontal tissues health depends on properly planned restorations. Biological width that is an important component of peridontium get violated due to incorrect restoration margin and unadapted restorations. If margins are to be placed subgingivally when esthetic is of main concern, then we should stick to these factors : Correct crown contouring in the gingival third; correctly rounded and polished margin; sufficient zone of the attached gingiva; and there should be no biologic width violation by the restoration margin. To improve the success of restorative procedure patient co-operation, motivation and repeated visits are of significance in maintaining the periodontal health.

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