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Exposure of Clinical Crown And Prosthetic Placement- An Interdisciplinary Approach

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Abstract: *A total destruction of coronal crown structure due to fracture or caries presents a question for the restorative dentistry on how to determine the prognosis of the tooth. The management of remaining crown below the subgingival margin is of prior importance as it may lead to inappropriate crown margin, non retentive fixed prosthesis, chronic inflammation due to plaque accumulation at the junction between the tooth and the prosthesis. Many shortcomings after prosthetic placement is due to ignorance related to the soft and hard tissue management of the tooth. Thus, keeping these factors under consideration a mutilated crown was managed by osseous recontouring and a fixed prosthesis thereafter, to obtain a tooth with stable function, integrity and morphology for long one year.*

Keywords: *biologic width, crown lengthening, osseous recontouring, periodontal health, restorative margin*

I. Introduction

Dentists must constantly balance the restorative and esthetic needs of their patients with periodontal health. One factor that is of particular importance is the potential damage that results in the periodontium when margins are placed subgingivally. Supragingival placement of restoration margins allows for ease of impression making, cleansing, and detection of secondary caries and is associated with maintainable probing depths. Subgingival restorations can have damaging effects on the neighbouring hard and soft tissues, especially when they encroach on the junctional epithelium and supracrestal connective tissue.[1]

The main aim of crown lengthening is to expose the crown above the gingival margin. Crown lengthening can be established by various surgical procedures such as gingivectomy, osseous surgery with gingivectomy, osseous surgery with apically positioned flap and two stage crown lengthening. All these can be done either by using conventional surgical approach or by using soft and hard tissue laser. Crown lengthening can also be accomplished orthodontic extrution of the tooth and this also increase the width of attached gingiva but the disadvantage is the prolonged treatment.

Indications for crown lengthening are: caries if extended below the marginal tissue, tooth fracture, post perforation, cervical resorption, and minimal tooth structure for crown retention, altered passive eruption, and asymmetrical gingival margin in esthetic region, gummy smile and gingival enlargement. On the contrary, the contraindications comprises of: active inflammation or periodontal disease, vertical maxillary excess, poor crown/root ratio, compromised adjacent osseous tooth support, exposure of furcation areas in case of short root trunk followed by crown lengthening, unrestorable tooth, aesthetic concern in anterior region, anatomic concern includes large torus, maxillary sinus, ascending ramus, proximity of a neurovascular bundle.[2]

To maintain periodontal stability around teeth with cosmetic veneer and full-coverage reconstructions, there must be no biologic-width invasion. Otherwise, inflammation, attachment loss, and recession initiate.[3-5] Inflamed gingiva, of course, contributes to a gummy smile. The prosthetic margin should lie at least 3 mm from the alveolar crest, as the junctional epithelial and connective tissue attachment averages 2 mm and the sulcus comprises 1 mm.[6,7]

Osseous crown lengthening resolves both restorative and esthetic concerns. This article presents a clinical report on management of the short palatal crown structure by gingivectomy with osseous recontouring followed by a temporary prosthetic placement for 3 months and then final prosthesis for 1 year.

II. Case report

An 18 year old male patient was referred to the department of periodontics at Annoor Dental College & Hospital, Muvattupuzha, Kerala for crown lengthening of upper left first premolar (#24). The medical history was non-contributory. Dental history included greater than 30% of teeth with caries. On clinical examination, a temporary restoration was already done and it was seen that the margin of the crown on the palatal aspect was at the gingival level (Fig. 1). There was mild gingival inflammation with probing depth 0.5mm. Radiographically, the remaining palatal crown structure was approximately 0.5mm above the level of interproximal bone and the caries was involving the pulp (Fig. 2). Keeping all the above factors under consideration, an interdisplinary approach was carried out. In the department of conservative and endodontics, root canal treatment was indicated

and performed in relation to #24. The patient was then referred to the department of periodontics for crown lengthening.

The treatment plan in our department included an initial phase I therapy which comprised of full mouth scaling followed by a recalled visit after one week. Phase II, a surgical procedure included: firstly, under local anesthesia (Xicaine 2% with epinhephrine 1: 80,000) internal bevel gingivectomy was given. The incision extended from mesial aspect of #24 to the mesial aspect of #25 followed by a cervicular incision. Secondly, a full thickness flap was elevated which incorporated #23 and #25 to gain access to the site of operation. Thirdly, in order to obtain the biologic width a 2mm gingiva was excised followed by a 4mm osseous recontouring on the palatal aspect of #24 was carried out (Fig. 3). The flap was then approximated and sutured with 3-0 braided silk suture (Fig. 4). Post surgical instructions were given and oral medications included amoxicillin 500mg tid for 5 days and ibuprofen 400mg tid for 3 days. A chlorhexidine mouthwash (0.2%) was prescribed to supplement his routine oral hygiene regimen. The patient was recalled after 10 days and sutures were removed. The healing was uneventful.

On the same day, patient was referred to department of conservative and endodontics for pre-fabricated post placement and core build up (Fig. 5). After which, in the department of prosthodontics crown preparation was performed and then a temporary crown was fabricated. The over contouring and under contouring of the crown was avoided on all the aspect of the fabricated crown surface, roughened surface was abstained and a proper occlusal and interdental embrasure space was maintained to avoid food lodgement and to provide easy maintenance of the interdental site. The crown was cemented with temporary cementation. After three months, placement of permanent full ceramic crown was perfected (Fig. 6). The patient was then observed for one year with no history of re-bounding of the gingival margin. The biologic width was maintained with 2 mm probing depth and a healthy periodontium with absence of inflammation was obtained. Patient was put under regular periodic intervals as a supportive periodontal therapy.

III. Discussion

The concept of crown lengthening was first introduced by D.W. Cohen (1962). The amount of tooth structure exposed above the osseous crest (about 4mm) 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. Treatment options for crown lengthening procedure include: gingivectomy **(**conventional by using scalpel or kirkland knife, laser and electrocautery), internal bevel gingivectomy with or without ostectomy, apical positioning of flap with or without ostectomy, combined (surgical & non surgical) orthodontic treatment.[8]

Violation of the biologic width is a common occurrence in the practice of restorative dentistry. A familiar clinical situation in which the biologic width can be violated is by the placement of a deep subgingival restoration. The need to establish a subgingival restorative margin can be dictated by caries, tooth fracture, external root resorption, or the need to increase axial height of a tooth preparation for retention purposes. If the apical margin of the restorative preparation is placed within the biologic width (i.e., too close to the bone), a zone of chronic inflammation is likely to develop. The result of this case report found that post-surgically clinical crown length was 2mm.The gingiva was healthy, no bleeding on probing present and there was probing depth of 2mm. The patient was then followed at 3momths, 6 months and 1 year.

Presurgical analysis Smukler and Chibi (1997) recommended the following presurgical clinical analysis prior to crown lengthening procedures: determine the finish line prior to surgery if non determinable, it should be anticipated. Transcrevicular circumferential probing prior to surgery is performed for establishing the biologic width (Bone Sounding) both at surgical site and contralateral site. The biologic width requirements will determine the amount of alveolar bone removal. The combination of biologic width and prosthetic requirements determines the total amount of tooth structure necessary for exposure. Tooth structure topography, anatomy, and curvature are analyzed for determining osseous scallop and gingival form.[8]

The factors influencing the amount of coronal displacement of the marginal periodontal tissues seemed to be related to the different tissue biotypes. Patients with thick tissue biotype demonstrated significantly more coronal soft tissue regrowth than patients with thin biotype due to the natural biological differences in inter-individual patterns of healing responses.[1] On contrary to this, in our case report there was no regrowth or re-bound of the gingival margin. And the same was followed for 1 year after placement of permanent prosthesis.

A number of articles on osseous crown lengthening demonstrate a 1mm to 3 mm coronal rebound of the free gingival margin 6 months to 1 year postsurgery.[9,10] Attributed to thick tissue biotype and inadequate bone removal, this coronal shift may be avoided by adequate gingivectomy and ostectomy, and stable results may be detected at 3 months.[11] Final prosthetic impressions may begin at least 3 months after crown lengthening, though to be safe, wait 6 months, when the remodelling finishes.[9] If crown lengthening fails to rectify all defects, prosthetic work may compensate for the rest. Ultimately, most cases include reshaping both teeth and

gums. Even after careful consideration of patient factors and adequate surgical technique, it is difficult to predict where the gingival margin will be in the long term.

IV. Conclusion

The fabrication of prosthesis can be a problematic situation for decision making, especially when there is minimal crown structure. Surgical crown lengthening can be used to enhance the clinical outcome. Ultimately, the clinical results strictly emphasize the importance of a disciplined and comprehensive approach.

References

[1] Kiran KG, Veena AP, Jiji J. A Comparative Evaluation for Biologic Width following Surgical Crown Lengthening Using Gingivectomy and Ostectomy Procedure. Int J Dent. 2012; 26(4): Article ID 479241.
[2] Pitman DP. Surgical Crown Lengthening for Enhanced Clinical Success**.** Dent Today. 2002; 21(11):112-5.
[3] Günay H, Seeger A, Tschernitschek H, et al. Placement of the preparation line and periodontal health—a prospective 2-year clinical study. Int J Periodontics Restorative Dent. 2000; 20(2):171-181.
[4] Tal H, Soldinger M, Dreiangel A, et al. Periodontal response to long-term abuse of the gingival attachment by supracrestal amalgam restorations. J Clin Periodontol. 1989; 16(10): 654-659.
[5] Nevins M, Skurow HM. The intracrevicular restorative margin, the biologic width, and the maintenance of the gingival margin. Int J Periodontics Restorative Dent. 1984; 4(3): 30-49.
[6] Rosenberg ES, Garber DA, Evian CI. Tooth lengthening procedures. Compendium. 1980; 1(3):161-172.
[7] Vacek JS, Gher ME, Assad DA, et al. The dimensions of the human dentogingival junction. Int J Periodontics Restorative Dent. 1994; 14(2):154-165.
[8] Gunjan G, Ramesh G, Nishant G, Udit G. Crown Lengthening Procedures- A Review Article. IOSR-JDMS. 2015; 14(4): 27-37.
[9] Brägger U, Lauchenauer D, Lang NP. Surgical lengthening of the clinical crown. J Clin Periodontol. 1992; 19(1): 58-63.
[10] Pontoriero R, Carnevale G. Surgical crown lengthening: a 12-month clinical wound healing study. J Periodontol. 2001; 72(7):841-848.
[11] Lanning SK, Waldrop TC, Gunsolley JC, et al. Surgical crown lengthening: evaluation of the biological width. J Periodontol. 2003; 74(4):468-474.

Figure 1: Pre-operative clinical

Figure 2: Pre-operative radiograph

Figure 3: After resective osseous surgery

Figure 4: Sutures placed

Figure 5: Pre-fabricated post and core build up

Figure 6: Permanent prosthesis