

The Outcomes of Treating Crown - Root Fractures with Crown Lengthening Procedure and Restorations: A Comparative Prospective Study

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Abstract: To examine long-time quantity outcomes of changed crown continuance tactics for crown-root damaged enamel, and to examine additives which have an effect at the dental remedy health of the treated enamel. **Methods:** The dentists have a look at prospectively analyzed facts from one hundred patients (fifty three person adult males and 47 females) who had presented with crown-root fractured enamel and received modified crown lengthening tactics blended with recuperation for ≥ 13 months. In total, crown-root fractured enamel are treated and examined for plaque index, inquisitor depth, damage index, bleeding on probing, best and consequently the crown margin locality. The contralateral teeth and ipsilateral enamel sagittal and distal to the treated teeth are used as managements. Expertise had been assessed descriptively or analyzed statistically with Mann-Whitney-U take a look at at $\alpha=0.05$. **Results:** Recorded dental remedy indices diagnosed stable periodontal reputation in twenty five of twenty six treated enamel with the recommend values for sophisticated and useful. A bad correlation grows to be decided many of the subgingival crown margin area and consequently the damage index.

Keywords: crown lengthening, subgingival margin, crown-root fracture, bleeding index, plaque index

1. Introduction

Dentists perpetually encounter challenges within the management of crown-root broken cases.¹⁻⁴ In most instances, oblique crown-root subgingival fracture lines settled in shut proximity to or below the alveolar bone crest which may end in violation of biological dimension imply appreciable challenges for resultant restorative procedures.⁵ The violation of biological width may result in periodontitis with resulting bone reabsorption to form house for associate degree attachment and soft tissue crevice, therefore the resulting bone contours is also unfavourable and causative to additional dental tissue breakdown. So, to confirm long periodontal and functional stability, a minimum of three millimeter of sound root structures higher than the alveolar bone, that would satisfy each the life dimension and one to a pair of mm soft tissue crevice, ought to be surgically created before restoring the crown-root broken tooth.^{6, 7} many techniques have been projected for clinical crown protraction cherish gingivectomy, apically positioned flap surgery, and animal material surgery,⁶⁻¹¹ however all have some limitation in terms of perform or aesthetics. The foremost common methodology is surgical crown lengthening.¹²⁻¹⁶ However, the surgical process procedure of ancient crown lengthening surgery perpetually sacrifices the bony support of each treated and adjacent teeth, and creates unpleasant aesthetic outcomes cherish 'black triangle' formation and unfavourable crown-to-root magnitude relation results.^{6, 8, 16} Melker and Richardson¹⁶ conferred a surgery of reshaping the prevailing tooth surface together with conservative removal of the supporting alveolar bone to form the dimension required for the restoration to be biologically acceptable, and projected that this procedure accomplishes many goals: (1) minimum supporting bone is removed; (2) hurtful root surface anatomy, such as grooves, concavities, and cemento-enamel projections, is diminished; (3) a swish root surface that's a lot of biologically acceptable

to soft tissue is created; (4) category I and II angular shape lesions is also weakened or eliminated; and (5) improved animal tissue contours and house for restorative materials will be created in things during which shut root proximity is present. Hu and colleagues changed the traditional crown protraction surgery mistreatment odontoplasty and surgical process procedures to manage and preserve seven severe crown-root broken teeth.¹⁷

2. Method and Material

All sufferers have been in search of dental care because of teeth fracture and have been mentioned the periodontist for crown lengthening surgical procedure. Consultation and reality of a beneficial analysis in addition to settlement upon the remedy plan have been completed between practitioners and the affected person's choice for the method in preference to different feasible options changed into established. Each affected person obtained initial periodontal remedy which includes oral hygiene instructions, scaling and root planing, and elimination of marginal irritants. All fractured tooth had passed through endodontic remedy earlier than the periodontal surgical procedure. After acting all remedy procedures, sufferers have been scheduled for everyday periodontal supportive remedy. Patient age ranged from 18 to 50 years with an average of 34 years of age. According to the vicinity of worrying incidence, sixteen (60%) of the fractured tooth have been maxillary incisors, twenty (20%) have been premolars, and twenty (20%) have been molars. In all cases, the fracture lines prolonged obliquely with an approximate 2 to 6 mm subgingival involvement. The contralateral teeth and ipsilateral tooth mesial and distal to the handled teeth have been used as controls. The proposed quantity of gingival tissue elimination numerous with intensity of the subgingival fractures. Regarding the incision design, the preoperative width of keratinized tissue changed into used as a parameter

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to determine and estimate the postoperative keratinized tissue width.¹⁹

When the expected postoperative keratinized tissue width through smooth tissue excision become extra than 3 mm, indicating that the handled enamel with subgingival restorative margins possessed sufficient keratinized tissue to keep periodontal fitness after modified crown lengthening surgical treatment,²⁰ the proposed quantity of gingival tissue resection approach with inner bevel incision become selected. If the expected postoperative keratinized tissue width become much less than three mm even as the preoperative keratinized tissue width become extra than three mm, minimum gingival tissue resection approach with inner bevel incision leaving no much less than three mm of keratinized tissue become used. For enamel whose preoperative keratinized tissue width become identical or much less than three mm, no gingival tissue resection approach with crevicular incision blended with apically placed flap strategies become performed.²¹ Full thickness flaps at the buccal and lingual factors had been multiplied to reveal the alveolar crest. Thorough debridement of all granulation and epithelial tissue become done to allow unobstructed visualization of the underlying bony structure and root fracture configuration. According to the precept of root reshaping and conservative elimination of the assisting alveolar bone, spherical surgical burs had been used to put off sufficient alveolar bone to reveal the sub crestal root fracture and behavior the vital osteoplasty. A coarse diamond bur become used to cast off the fractured aspect accompanied through a superfine diamond bur to refine and clean the basis floor of the fractured tooth. Finally, the brink or sharp margin of the fracture become eliminated, which allowed a brand new biologically beneficial surroundings for the destiny restorative manner to be established. The flap become repositioned the usage of 4. Zero non-resorbable silk sutures and guarded through periodontal dressing. Patients had been informed to chorus from tooth brushing on the surgical websites for 14 days and use a zero.12% chlorhexidine gluconate oral rinse two times daily. At 7 days post-surgical treatment the sutures had been removed. Patients resumed everyday oral hygiene protocol 14 days postoperatively. All handled enamel had been restored with restorations margins placed both equigingivally or subgingivally.

Patients have been recalled periodically and the dealt with tooth have been tested for subjective signs consisting of pain, bleeding on brushing, gingival swelling, mobility, exudate, pain in the course of mastication, oral hygiene habits, fame of the supportive periodontal therapy, clinical history, and the Visual Analogue Scales (VAS) for cultured and useful evaluation of dealt with tooth.²²

3. Results

All treated teeth were still in function aside from one left jaw central tooth wherever a continual accidental root fracture was according and also the tooth was extracted when the 1-year recall. The mean and variance of the VAS scores for aesthetics and performance of the treated teeth are shown in Table 1. The mean values for the treated teeth were 9.5 for each aesthetic and purposeful aspects. All

restorations were intact with none abnormal findings and no marginal tooth decay was detected throughout the last recall visit. Knowledge analysis discovered a predominance of low PLI scores and high frequency of BOP for all dealt with enamel. The majority (96%) of web sites displayed PD withinside the variety of 1-3 mm. Only three out of 26 enamel had Grade I tooth mobility. Parallel radiographic evaluation of the dealt with enamel discovered regular density of the lamina dura, no pathological modifications with inside the periapical regions, and no apparent discount of the bone crest height. No statistically huge variations in periodontal indices had been determined among reshaped and non-reshaped facets of the dealt with enamel ($P > 0.05$). Statistically huge variations in BOP had been decided among the dealt with enamel and controls on the corresponding facets ($P < 0.05$). However, no statistically huge variations had been determined among dealt with enamel and controls for any of the other periodontal indices.

4. Discussion

Results of this retrospective observe indicate that the remedy results of the crown-root damaged tooth receiving modified crown protraction surgical treatment accompanied via way of means of dentistry remedy and put up and center recuperation are beneficial. All the crown-root fracture tooth recruited have been everlasting tooth. Patient age ranged from twenty four to fifty years and each one decided to keep the affected teeth and repair the defect. Dentistry hospital treatment is now and again essential now no longer solely to cast off the unsupported teeth shape and local contamination but moreover to deliver a solid base for destiny procedures.²⁶ as a result of the reshaping of the muse floor and conservative elimination of the assisting alveolar bone, a biologically appropriate configuration of final root shape is established. Therefore, a much better crown-to-root value relation and beneficial aesthetic results for triumphing restorative procedures have been achieved. Due to the making use of a reshaping manner to cast off the fracture line from the foundation floor, the integrity and electricity of the final root shape is likewise compromised, in particular whilst crown guidance manner. Sorrentino et al.²⁷ used 3-dimensional finite issue evaluation to cost the scenario of the most pressure in faulty root shape models, and located that the scenario and consequently the amount of pressure can change therefore and pass apically. It's miles a widely recognized in deniable truth that the position of the crown margin and dental remedy fitness are intently related. Flores-de-Jacoby et al.²⁸ studied the effect of crown margin region on bone for a 12 months length and located that crowns with subgingival margins had a bad effect on periodontal parameters. A correlation ($r = -0.417$) among subgingival margin region and hemorrhage index determined in the course of this study. Therefore, there must be no purpose for over 0.5 to 1 millimeter subgingival extension for the notion of aesthetics or retention. The reshaping of root floor at some stage in modified crown perpetuation expedited relocation of the long run restorative margin in the occlusal direction.

5. Conclusions

The changed crown continuance machine might be an ability and minimally invasive therapeutic numerous for manage of crown-root damaged cases.

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