

Chang-Sung Kim, DDS, PhD, Seong-Ho Choi, DDS, PhD, Jung-Kiu Chai, DDS, PhD, Chong-Kwan Kim, DDS, PhD, Kyoo-Sung Cho, DDS, PhD. Surgical Extrusion Technique for Clinical Crown Lengthening: Report of Three Cases. Int J Periodontics Restorative Dent 2004; 24:412–421.

Purpose: to present three cases wherein the atraumatic surgical extrusion technique for clinical crown lengthening was used, with more than 1 year of follow up after the surgical procedure, and for which no esthetic or functional deformities were induced.

Materials and Methods: presentation of three clinical case reports.

Findings and Conclusions: several techniques have been proposed for crown lengthening, such as gingivectomy, apical positioned flap with or without osseous surgery, and orthodontic forced eruption with or without fibrotomy. The selection of one technique over the other depends on several patient-related factors: 1) esthetics, 2) clinical crown-to-root ratio, 3) root proximity, 4) root morphology, 5) furcation location, 6) individual tooth position, 7) collective tooth position, and 8) ability to restore the tooth. Often in cases of deep subgingivally located caries, lesions, and tooth fracture, extensive resective osseous surgery may result in increased pocket depth and mobility, furcation involvement, poor crown-to-root ratio, and loss of the supporting periodontal tissues of the neighboring teeth. To treat teeth with deep cervical root fractures or root caries that are difficult to treat conservatively, the surgical extrusion technique has been proposed, with predictable short- and long-term results. Occasionally, apical root resorption and marginal bone loss are observed, which could be induced by surgical trauma.

Operative technique:

- 1- clinical and radiographic evaluation were performed before the surgical procedure.
- 2- All patients received oral hygiene instruction and complete mouth scaling prior to the surgical procedure.
- 3- Following local anaesthesia, an internal bevel incision was made around the tooth to be treated.
- 4- The intrasulcular incision was then extended to each side of the adjacent teeth.
- 5- Full-thickness mucoperiosteal flaps were raised, and all associated granulation tissue were removed.
- 6- The tooth was carefully luxated to avoid damaging the marginal bone area or root apex of the tooth to be treated. The periosteal flap was placed into the periodontal ligament space of the tooth to be treated. Then it was manipulated in the PDL space of the tooth in “walking motion” to luxate the tooth without inducing surgical trauma.
- 7- After careful luxation, the tooth was extruded to the desired position using a hemostat to protect the vital PDL.
- 8- The simple interrupted suture technique was employed for closure of the flaps.

- 9- Patients were instructed to rinse twice a day with 0.12% Chlorohexidine solution during the first 2 weeks following surgery. Antibiotic regimens were prescribed for 7 days.
- 10- Patients were checked every 1 or 2 weeks for the first 2 months, and then once a month for the following 6 months.
- 11- Radiographic and clinical examinations were performed to assess changes in periapical and periodontal healing, probing depths and tooth mobility.

In terms of marginal bone loss and apical root resorption reported in other studies, the surgical extrusion technique described in this case report should be more favorable, since they used the periotome, which is specially designed for atraumatic extraction or luxation, and the root never left the socket during surgical manipulation, thus minimizing the risk of dehydration of the PDL. Tooth mobility was minimal after 4 weeks, and there was radiographic evidence of new periapical bone formation as early as 2 months post operatively. The fixation of the extruded teeth was accomplished only by means of sutures. This method seems to allow for some mobility, thus allowing functional stimulation throughout the healing period. Slight mobility during the fixation period is said to be favorable for the prognosis by preventing ankylosis and resorption. The clinical and radiographic findings presented in the article suggest that this protocol offers several advantages over the conventional surgical approaches. The proposed technique could constitute an alternative surgical approach to performing clinical crown lengthening. This technique can be used to successfully treat a severely damaged tooth without producing functional and esthetic deformities, especially in the anterior region, where esthetics is of great concern.

Heitz F, Heitz-Mayfield LJA, Lang NP. Effects of post-surgical cleansing protocols on early plaque control in periodontal and/or periimplant wound healing. J Clin Periodontol 2004;31:1012-8.

Purpose: To investigate the clinical effects of two protocols aimed at the regular and complete removal of newly formed biofilms on the early healing following periodontal surgical procedures, including one-stage implant installation.

Materials and Methods: 40 patients aged between 21 and 92 years with 27 females and 13 males were recruited for this study. All patients were partially edentulous and in need of implant installation or were diagnosed as having chronic periodontitis. After initial phase and re-evaluation, a sequence of 60 consecutive surgeries were performed and divided into 30 test and 30 control procedures. Patients were instructed to brush teeth not involved in the surgical site twice daily with usual tooth brush dipped in CHX and then rinse with 0.1% CHX mouthrinse timed for 1 min. Use of toothpaste was avoided for the 4 weeks. In addition to the above protocol, the patients in the test procedure gently wipe the surgical area with the prescribed ultra-soft toothbrush from days 3 to 14 post-operatively. The toothbrush was loaded with CHX gel 0.2% and used to wipe the dentogingival area with light vertical strokes. The brush was to be used purely as a delivery device for the CHX gel. From 14 to 28 days, the toothbrush was replaced with a slightly firmer, but still very soft tooth brush loaded with CHX gel 0.2%. Baseline measurements included gingival crevicular fluid (GCF) flow rate, probing depth, probing attachment level, presence of bleeding on probing and full-mouth plaque score (PII by Silness and Loe). Measurements were repeated at 1, 2, and 4 weeks after surgery.

Findings and Conclusions: The surgical interventions included 35 placements of ITI implants and 25 periodontal flap procedures. Both test and control procedures demonstrated reductions in FMPS from baseline at all subsequent examinations. The FMPS showed a significantly greater decrease from baseline to week 1 and to week 2 in the test group compared with the control group but by week 4, the difference was no longer significant. No significant change in GCF volume was detected for either group over the study period. No sites of the test protocol showed increased recession ($\geq 2\text{mm}$) when compared with baseline. The difference in the number of increased recessions following the two protocols was statistically significant. Most of the measurements of the post-surgical location of the free gingival margin in relation to the CEJ stayed within 1mm of the baseline measurements. The difference in the number of wounds with secondary closure between the test and control groups was not statistically significant. No statistically significant difference in PD was found between groups at any observation. Both protocols resulted in similar successful healing outcomes at 4 weeks. The value of a mechanical delivery aid for CHX was previously shown to be highly effective and the ultra-soft toothbrush used in the present study was considered preferable to deliver CHX. The use of specific post-surgical cleansing protocols including the introduction of mechanical cleansing at day 3, using local application of CHS in addition to daily rinsing with CHX may be recommended.