Periodontal surgery report for crown lengthening of tooth number 24,25

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Computer Number:
Abstract

Crown lengthening is a surgical procedure aimed at removal of periodontal tissue to increase the clinical crown height. Upon using this technique of crown lengthening we need to understand the biological width, general indications and contraindications, plus the examination, surgical procedure, as well as the prognosis and the follow up of this specific case.

Introduction

**Surgical Crown Lengthening**

Crown lengthening is a surgical procedure performed on a healthy periodontium that requires exposure of adequate tooth structure (so, the amount of tooth exposed supragingivally is increased) for restorative purposes. This may be achieved by several techniques (either orthodontically or surgically) depending upon:

1. The proposed location of the restorative margin.
2. The location of the alveolar crest and gingival margin.
3. The width of the keratinized attached tissue.
4. The amount of exposed tooth structure available.

**Biological Width**

- Periodontium anatomy
Biological width is a natural defense of the periodontium. The concept of a minimum dimension of tissue from the alveolar crest to the bottom of the gingival sulcus is based on a study done by Garguilo and colleagues. They examined 30 cadavers with clinically healthy periodontia and reported on the average histologic dimensions of:

1. connective tissue attachment
2. the epithelial attachment
3. the gingival sulcus.

They found that there appears to be a proportional relationship between the crest of the alveolar bone, the connective tissue attachment, and the epithelial attachment.

The investigators found that the average histologic dimension of the connective tissue fibers was 1.07 mm, the average histologic dimension of the epithelial attachment was 0.97 mm, and the average histologic dimension of the sulcus was 0.69 mm.

The combined dimension of the junctional epithelium and connective tissue attachments is referred to as the "biologic width".

**biologic width**: definite dimensional relationship exists among the alveolar crest, the supra-alveolar connective tissue attachment, the junctional epithelium, and the base of the gingival sulcus.

Understanding of the biological width and the level of the osseous crest is key to maintaining periodontal health in the presence of dental restorations. The location of a restorative margin relative to the crest of the alveolar bone is more critical for preserving gingival health than its distance below the free gingival margin.
**General Indications for Crown Lengthening:**

1- **Periodontal indications:**
   - cases of "delayed passive eruption"
   - where intracrevicular placement of the restorative margin encroaches on the gingival attachment and may lead to inflammatory periodontal disease.

2- **Restorative indications:**
   - lack of retention due to short clinical crowns
   - treatment of overerupted teeth to correct the occlusal plane
   - presence of subgingival caries
   - presence of a subgingival crown or tooth fracture, root perforation
   - subgingival root resorption

3- **Esthetic indications:**
   - changing a "gummy smile"
   - or when there is marked discrepancies in the height of the gingiva around teeth in the esthetic zone.

- But in esthetic needs we may also demand orthodontic forced eruption before surgical crown lengthening to maintain existing gingival contours. And its most common in the anterior maxilla with a high smile line.
**General Contraindications for Crown Lengthening**

- Teeth that are nonrestorable
- Teeth or adjacent teeth that would be compromised either functionally or esthetically
  - Teeth whose value is not compatible with the procedures necessary to save it.
- We should weigh the advantages of retaining a tooth in terms of its significance to the overall treatment plan against the extent of the procedures needed to properly restore the tooth, especially today with the introduction of dental implants.
- If the resulting crown-to-root ratio will compromise the overall treatment plan.
- Inability of the patient to maintain the periodontium in a state of health after the restorative procedures have been completed.

**Procedure**

- Patient came to the 411 PDS clinical course at 28/12/2008 Sunday at 9:00 am for crown lengthening procedure before crowning of endodontically treated #24,25, but due to recurrent caries around the temporary restoration (figure 1) patient referred for the interns to remove the caries and restore the teeth with GI.

**Figure 1:**

- A: Clinical intraoral photographs occlusal view
- B: Clinical intraoral photographs buccal view
- C: Clinical intraoral photographs lingual view
  - (In A, B, C notice the recurrent caries around the temporary restorations)
- D: Radiographic periapical radiograph
- E: Radiographic bitwing radiograph
  - (In C, E notice the recurrent caries around the restoration and the violation of the biological width by the restoration.)
Patient came after redo of the temporary restoration to the 411 PDS clinical course at 4/1/2009 Sunday at 9:00 am and the following information was obtained.

**DATA COLLECTION**

- **Patient name**: Huda Al shaya
- **File number**: 140502 D3
- **Age**: 24 Y
- **Social status**: single
- **Chief complaint**: Patient was referred from 431 SDS for crown lengthening of #24,25 for future crowning

- **History of the chief compliant**: In 2007 endodontic treatment was formed for #24,25 and future crowning was indicated.
- **Medical history**: Patient is medically fit.
- **Family history**: Both patient, mother and father are diabetic (type II) and hypertensive.
- **Past dental history**:
  - From 2004-2008 Multiple restoration in private clinic
  - 2006-2007 endodontic treatment #15,24,25 in dental collage Ksu
Nov.2008  crown lengthening of #15.

-FINDINGS:

-extra oral examination:

• NDA.

-Intra oral examination: (figure-2)

• Patient oral hygiene is fair
• Generalized mild tooth discoloration

Preoperative clinical photographs

A- clinical intraoral photographs occlusal view
B- clinical intraoral photographs buccal view
C- clinical intraoral photographs lingual view

Probing depth

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<td>M, mid B,D</td>
<td>3, 1, 2</td>
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- *Preoperative Radiographic examination:* (figure-3)

- There is root proximity
- The teeth are endodontically treated
- There is no adequate space between the temporary restoration and the crestal bone (biological width is violated)

![figure-3: Preoperative radiograph:](image)

**INDICATIONS FOR THE SURGICAL PROCEDURE FOR # 24,25:**

- due to inadequate tooth structure for FPD fabrication
- to avoid the violation of the biological width.

**INSTRUMENTS**

- Mirror.
- Periodontal prob.
- Disposable plastic Syringe + Saline solution
- Metal syringe + Anesthetic solution (xylocain 2% + adrenalin 12,5 microgm/ml)
- Sterile gauze
- Surgical kit:
  - scalpel blades (no.15,12)
  - Austin retractor
  - periosteal elevator
  - tissue forceps
  - surgical curettes
  - bone file (sugarman)
  - surgical scissors
  - high speed hand piece
  - small round bur
  - periodontal scalers
- silk nonresorbable suture,
  (size: 3-0)
- needle holder

**SURGICAL PROCEDURAL STEPS**

(1) *local anesthesia:

- Buccal infiltration for the branches of the middle superior alveolar nerve apical to #24,25
- Palatal infiltration for the branches of the greater palatine nerve related to #24,25
- Xylocain 1.8 ml with adrenaline 12.5 microgm/ml (2 carpules)
(2-a) internal bevel incision was formed 1.5 mm apical to gingival crest extending mesial to #26 to the distal of #13 by No.12 scalpel blade touching the bone both buccally and palatally.

(2-b) the incision is scalloped and a new interdental papilla was formed both (A) buccally and (B) palatally.
(3) A full thickness flap was used to detach the flap from the bone by the periosteal elevator both (A)bucally (B)palatally (i.e. for bone exposure)

(4) A. Austin retractor is used buccally
B. Periosteal elevator used palatally
BOTH to reflect the flap during the procedure and enhancing the visibility. Then tissue collar and granulation tissue removed by surgical curettes.
(5) - (2-3mm) of bone was removed all over by high speed hand piece with small diamond round bur

- Due to root proximity there was a difficulty in bone removal

- Saline irrigation was formed during bone removal to:
  - Prevent heat generation and bone necrosis
  - Clean the area for clear visualization

- After bone removal a radiographically undetected root caries was exposed in the distal of #25

(6) - The flap repositioned and sutured.

- Non resorbable silk suture size 3-0
- 3 direct interrupted suture was formed with the knot positioned buccally
(8) Postoperative radiograph was taken

(9) Post operative instruction was given to the patient:

- Keep biting on the gauze for 30 min, if bleeding persist bite on another gauze for another 30 min
- Keep your tongue and your fingers away from the surgical area so you don’t disturb the healing process.
- At the same day of the surgery:
  - Eat soft food
  - Don’t eat or drink hot food
  - Follow your regular activities with no excessive exercise
  - No gargling is allowed.
- After one day of the surgery:
  - Rinse with chlorhexidine 2% for 1 week twice a day
  - Brush your teeth regularly except the area of surgery.
- If any complications occur as bleeding or severe pain contact the dental clinic.

Suture removal was scheduled after one week.
Prognosis

Due to root proximity and root caries the prognosis for both #24,25 is questionable.
Follow up visits

**FIRST FOLLOW UP VISIT:**

- Patient came at Sunday 11\1\09 at 9:00 am for suture removal and follow up appointment.

- Upon examination the surgery area was inflamed, and suture removal postpone to the week next. *(figure-4)*

- Patient also complain from burning sensation when using **chlorhexidine** mouth wash, in addition to tongue staining.

- The patient was instruct to locally using the chlorhexidine in the area of surgery without contacting the rest of the oral cavity.

- Patient visit documented in the file. *(figure-5)*

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*Figure-4* inflammation in the area of surgery after one week  
*A*, buccal view  
*B*, lingual view
SECOND FOLLOW UP VISIT:

- Patient came at Sunday 25\1\09 9:00 am for the second follow up visit
- Upon examination The gingival inflammation is reduced and the area is healed
- The sutures removed (figure-6) (figure-7)

- Generalized polishing.
- Patient Oral hygiene reinforced
- Patient visit documented in the file. (figure-8)