



# ENDODONTIC TREATMENT OF NECROTIC TOOTH WITH CEMENTAL TEAR

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## Abstract

Cemental tears are an uncommon diagnosis which involves the fracture of cementum from the root surface. This can lead to periodontal breakdown and can mimic perio-endo lesions because the diagnosis is difficult. This clinical case report details the treatment of a necrotic tooth with periodontal destruction and an endodontic lesion that once surgically evaluated was determined to have a cemental tear. The necrotic cementum likely prevented complete healing despite root canal therapy and apicoectomy with facial root surface debridement. Once the tooth was extracted and the remaining cemental tear on the lingual was adequately removed and treated, the tooth was replanted and attachment was regained without subsequent infection. After 5 months, both clinical and radiographic evidence suggests a favorable response. This reports illustrates a successful outcome of multiple cemental tears with adequate removal.

## Case Report

### Dental History/Sensibility Testing

A 72 y/o patient was referred to Indiana University Graduate Endodontic Clinic from the undergraduate clinic for evaluation on 1/17/12 (Figure 1). A PA lesion was found on #25 which the patient had reported some sensitivity. The patient presented with a sinus tract in the periapical area of #25 and radiographic evidence of a periapical radiolucency. The patient could not recall a history of trauma. Testing of tooth #25 revealed no percussion sensitivity, slight palpation sensitivity, and no response to thermal testing or EPT. Tooth #25 was unrestored, but all lower incisors displayed attrition. Tooth #25 had Class 2 mobility, 6mm probing depth on MF, 2mm facial gingival recession with cervical abrasion. The diagnosis of #25 was necrosis w/ chronic apical abscess. Treatment options were discussed informed consent given, and the patient elected for NSRCT.

### Treatment

#### RCT 2-15-12 and 3-5-12

- RCT was initiated. Access and canal location was determined. Cleaning and shaping done with hand and rotary instruments using 6% NaOCl. The canal was dried, CaOH placed and the tooth temporized. Two weeks later, the patient returned asx (no ST), and #25 was obturated and access filled with resin.

#### Emergency exam 3-29-12

- The patient reports "pressure" when he bites down. Exam revealed 2x2m fluctuant F midroot swelling. Radiograph taken (Figure 2). Discussed treatment options and scheduled apicoectomy.

#### Apicoectomy 5-21-12

- The patient presents for apico #25. After FTMPF elevated, found dehiscence of bone on facial and cementum found detached from facial midroot. Apical lesion curetted and submitted for biopsy, root end resected, and filled w/ Endosequence Root Repair Material (Brasseler). Loose cementum curetted, TCN placed for 1 min and rinsed with sterile saline. Emdogain applied to root/bone (crypt) and DFDBA placed and flap repositioned. Post-op radiograph taken (Figure 3). (IU Pathology report revealed apical periodontal cyst and fibrous connective tissue scar.)

#### 3 month recall 8-2-12

- The patient reports swelling but no pain. Exam revealed two sinus tracts adjacent to #27 on facial attached gingiva. Radiograph shows GP point tracing back toward #25 (Figure 4). Vitality testing reveals #26 and #27 are vital. Patient placed on Keflex 500mg 1po q6h with no change. CBCT revealed possible cemental tear on the lingual (Figure 7) and fracture could not be ruled out. Discussed treatment options and scheduled extraction-replant, with possible extraction if fracture found.

#### Extraction-Replant 10-2-12

- Tooth #25 was extracted, and necrotic cementum was found on L surface of root. The loose cementum was curetted as before, treated with 17% EDTA for 1 min and rinsed with sterile saline. The apical bevel was eliminated and retrofilling replaced. No root fracture was found. The tooth was handled with moist gauze and kept moist with Hanks Balanced Salt Solution throughout the procedure (Figure 8). The tooth was replanted into the socket and a flexible wire splint was placed.

#### 5 month recall 3-5-13

- The patient presented for recall and splint removal with no complaints. Exam revealed absence of signs of infection, probing depths within 2-3 mm (2 mm at #25MF), and no percussion or palpation sensitivity (Figure 9). Mobility was recorded at Class 2 for #25 and Class 1 for #24 and #26. The patient will be re-evaluated in 3 months.



Figure 1. Pre-op 1-17-12



Figure 2. 3 wk post op 3-29-12



Figure 3. Apicoectomy 5-21-12

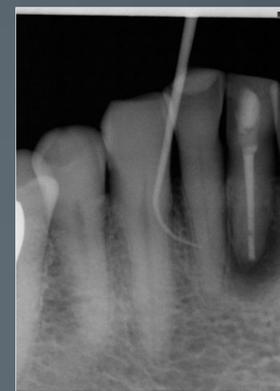


Figure 4. 3 month post-op 8-2-12



Figure 5. Extraction-Replant 10-2-12



Figure 6. 5 month post-op 3-5-13



Figure 7. CBCT with cemental tear



Figure 8. Extraction-Replant



Figure 9. Clinical evaluation

## Background

Cemental tear is a special type of root surface fracture that is rarely reported in the periodontal and endodontic literatures.<sup>4</sup> These entities involve a complete separation of a cemental fragment along the cementodentinal junction or a partial split in the cementum along an incremental line, which is commonly related to occlusal overloading, aging, or history of trauma.<sup>1,2</sup> These separations may lead to periodontal destruction<sup>4</sup> including loss of attachment and bone<sup>3</sup> and can mimic endodontic and periodontic lesion owing to their difficult diagnosis.<sup>4</sup>

The differential diagnosis of most periodontal or endodontic lesions is generally not difficult. However, the diagnosis of an unexpected rare lesion such as a cemental tear can prove challenging even when proper history, comprehensive clinical and radiographic examinations have been taken.<sup>2</sup> This is due to the fact that these lesions are located in the periapical region and often mimic endodontic lesions.<sup>5</sup> Although rare, cemental tear may be considered in the differential diagnosis when routine root canal treatment fails to resolve sinus tracts or isolated periodontal defects are noted.<sup>7</sup> Other clinical signs such as tissue swelling, narrow deep pocket formation, the presence of a radiopaque fragment on the root surface and the related periodontal/periapical bone destruction are major features of teeth with cemental tears.<sup>8</sup>

While cemental tears can occur on any tooth, findings indicate that these entities occur most often on the proximal surfaces of upper or lower incisors in men over the age of 60. Cemental tears can occur on facial or lingual surfaces which make diagnosis difficult.<sup>4,5</sup> They can occur on one or more root surfaces, and are similarly either in the middle or apical third of the root. The size of cemental tear has an average length of 3.8 mm, width of 2.2 mm, and thickness of 0.9 mm. Soft tissue adjacent to the tear was found to be granulation tissue (92.3%) or cyst (7.7%). They typically occur at the cementodentinal junction, but can be found in cementum only and can involve periodontal and periapical bone destruction.<sup>4,6</sup>

Only case reports and case series are available for review. No interventional or controlled studies evaluating and comparing different treatment modalities have been done. The existing body of literature, however, strongly suggests that a removal of the defective cementum is required as it represents a causative factor. The surgical management of the bony defect greatly depends on the defect type, as well as patient characteristics and compliance.<sup>8</sup> Treatment modalities including the removal of the detached cementum in combination with bone grafting using a minimally invasive surgical approach has been shown to successfully correct the periodontal destruction.<sup>3</sup> Guided tissue regeneration may also lead to bone gain and a prolonged survival rate.<sup>8</sup> Clinically, dentists and endodontists should know about this disease entity, make accurate early diagnosis, and completely remove the cemental tear to improve the prognosis.<sup>4</sup>

## Conclusions

The predictability and success of treating cemental tears has not yet been determined. Only case reports are available for review at this time. However recent case reports indicate with appropriate early diagnosis and surgical treatment, prognosis can be improved. This case report illustrates the need to completely debride the loose cementum to achieve reattachment.

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