Case Report
Non-Surgical Root Canal Therapy #24

22 yo female presented for evaluation and treatment of tooth #24

**Subjective:**

Chief Complaint: “My tooth is dark, and my dentist referred me for a root canal. He said you could also bleach it for me.”

Medical History: The patient is seen regularly by a physician and has mild hypothyroidism controlled well with levothyroxine. NKDA. ASA II

Dental History: The patient sees a dentist about once a year. When she was young, her brother threw a penny at her and it knocked her tooth. Ever since then, her tooth has been a little dark, and she points to tooth #24. Starting about a year ago she noted a “strange feeling” in tooth #24. The patient reports occasional cold sores in her gums close to this tooth. Her dentist examined it said it wasn’t a problem. She has generalized cold sensitivity when eating but does not have any problems with chewing.

**Objective**

**Extraoral exam:** No swelling or tenderness to palpation

**Intraoral exam:** Healthy periodontium with no probings deeper than 3mm. Approximately 1mm of recession noted on the facial of #24. No BOP. #24 has moderate gray discoloration of the crown and root. Incisal chip #24 from initial trauma. No signs of swelling or drainage.
Diagnostic Findings:

<table>
<thead>
<tr>
<th>Tooth</th>
<th>Perc</th>
<th>Palp</th>
<th>Prob</th>
<th>Mob</th>
<th>Cold</th>
</tr>
</thead>
<tbody>
<tr>
<td>#22</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
</tr>
<tr>
<td>#23</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
</tr>
<tr>
<td>#24</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>NR</td>
</tr>
<tr>
<td>#25</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
</tr>
<tr>
<td>#26</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
</tr>
<tr>
<td>#27</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
<td>WNL</td>
</tr>
</tbody>
</table>

WNL = Within Normal Limits     NR = Not Responsive

Radiographic interpretation:

A large, well defined, atypically shaped radiolucency associated with apex of #24 was observed. The lesion was associated with root movement. Tooth #24 has an immature root apex. The estimated age of devitalization of #24 is approximately 8yo. Traumatic incisal chip #24 is radiographically evident.
**Assessment**

#24 Pulpal necrosis with associated coronal discoloration and asymptomatic periradicular periodontitis

**Plan**

Discussed the following options with the patient:
- No treatment, resulting in possible expansion of lesion and associated complications.
- RCT with restoration (with optional intracoronal whitening). Discussed prognosis for whitening is unknown, due to the length of time of discoloration of the tooth, and presence of recession with resulting exposure of discolored root. Minor risk of resorption was discussed.
- Extraction

The patient chose RCT with intracoronal whitening and restoration.

**Treatment**

8/25/2010
1 carp 4% articaine with 1:100,000 epi administered via buccal infiltration. Rubber dam isolated. Accessed #24, necrotic pulp space noted in coronal aspect upon access. Apical 1/3 hemorrhagic. Radiographic length 19mm. Cleaned and shaped to 60.02 NiTi hand files to 19mm. By the end of the appointment, consistent drying of paper points was achieved at 18.5mm. Temporized with Ca(OH)$_2$, sponge Cavit. Film at end of appointment shows Ca(OH)$_2$ to apex.

Ca(OH)$_2$ placement
9/1/2010
The patient reports no pain since the last visit. Percussion, palpation, probing and mobility were all within normal limits for #24. The diagnosis remains previously initiated RCT #24 with asymptomatic periapical periodontitis. 1 carp 4% articaine with 1:100,000 epi administered via buccal infiltration. Rubber dam isolated #24 and reaccessed. Irrigation with full strength NaOCl. Bleeding uncontrollable with paper points in apical 3mm. Instrumentation limited to 18.5mm due to constant drying at 18.5mm at the end of the previous appointment. MTA condensed into the apical 3mm and check film taken. Obturated with gutta percha and Kerr EWT with Hotshot. Fuji II barrier placed at the level of the alveolar crest. Sodium perborate in water and cotton placed in chamber. Access temped with IRM.

MTA check
MTA, gutta percha, Fuji II sodium perborate and IRM temp final film
9/3/2010

Photo taken at the beginning of the appointment. Patient returns for 2 day follow-up and reports that the temporary fell out in car on the way home after the last appt. For all intents and purposes, the tooth shade shown in this photo reflects the pre-whitening coloration of the tooth. She experienced mild gingival sensitivity since the last appt, but no other discomfort. Percussion, probings and mobility all test within normal limits. Mild palpation sensitivity at gingival margin consistent with gingival trauma from clamp. Rubber dam isolated #23-26. No local anesthesia administered and no clamp used. Irrigated already open chamber with NaOCl and removed 1.5mm of Fuji II barrier due to noted thickness of the barrier in the x-ray from the previous appointment. Sodium perborate with water in cotton pellet placed, then Fuji II used to temporize the access.

9/10/2010

No photo was taken at this appointment. Patient reported for 1 week follow-up for whitening. No visible changes in color of tooth were noticeable. The patient was informed again that whitening may take several visits and complete return to normal coloration of neighboring teeth may not be reached. Percussion, palpation, probings and mobility were within normal limits. Rubber dam isolated #23-26. No local anesthesia was administered. Accessed #24, replaced sodium perborate and water in cotton pellet and temporized the access with Fuji II.
9/16/2010

Patient reported for two week whitening recall. Slight lightening of tooth noted by patient, but still discolored, particularly in root. No discomfort since last visit. Percussion, palpation, probings and mobility all within normal limits. Discussed with patient lowering of barrier to below level of alveolar crest needed to lighten root. Pt accepts slight increased risk of external cervical resorption. Rubber dam isolated #23-26, and no local anesthesia administered. Removed an additional 3mm of gutta percha and replaced Fuji II barrier. Sodium perborate and water in cotton was refreshed. Fuji II used to temporize the access.

9/30/2010

Patient presents for 4 week whitening followup. She remains asymptomatic. Percussion, palpation, probings and mobility within normal limits. Tooth #24 root discoloration getting better. Rubber dam isolated #23-26, no local anesthesia administered. Reaccessed and refreshed sodium perborate with water in cotton pellet. Temporized access with Fuji II.
10/7/2010
No photo taken. Patient reports for 5 week whitening followup. Palpation and probings test within normal limits. Slight mobility and percussion sensitivity observed. The patient admits to habitually placing her finger nails between her teeth. She was advised to stop this to allow the tooth to heal. No visual changes in tooth shade observed since last appt. Advised patient that if at next appt no further changes are observed, whitening therapy is finished. Rubber dam isolated #23-26. No local anesthesia administered. Replaced sodium perborate and water in cotton and temporized access with Fuji II.

10/14/2010

Post-whitening final film
Patient reports for 6 week whitening followup. The patient remains asymptomatic with no observed color change in tooth #24. Percussion, palpation, probings and mobility of #24 all within normal limits. Advised patient that due to lack of color change in the past two weeks, she would likely not benefit from any further whitening appointments. In addition, crown is slightly lighter than adjacent teeth, and further whitening might result in overcompensation of coronal whitening and an unaesthetic result. Patient understands and agrees to finalize the treatment. Rubber dam isolated #23-26. No local anesthesia administered. Removed Fuji II barrier due to soft consistency of material. Placed fresh Fuji II barrier, then temporized chamber and access with cotton and Fuji II. A final film was taken and the patient was referred back to her general dentist for the final restorative procedure. In the referral reply, a note to the general dentist indicated that a post of any kind in this root is contraindicated due to the thin walls of the root. No obvious osseous changes were noted in the final radiograph. If the lesion progresses in size by the 6 month recall or if the lesion does not change size by the 1 year recall, surgery will be recommended to rule out other pathology. The patient was scheduled for a 6 month recall.