AAE Clinical Considerations for a Regenerative Procedure

7/31/13

Case Selection:
• Tooth with necrotic pulp and an immature apex.
• Pulp space not needed for post/core, final restoration.
• Compliant patient/parent.
• Patients not allergic to medicaments and antibiotics necessary to complete procedure.

Informed Consent
• Two (or more) appointments.
• Use of antimicrobial(s).
• Possible adverse effects: staining of crown/root, lack of response to treatment, pain/infection.
• Alternatives: MTA apexification, no treatment, extraction (when deemed non-salvageable).
• Permission to enter information into AAE database (optional).

First Appointment
• Local anesthesia, dental dam isolation and access.
• Copious, gentle irrigation with 20ml NaOCl using an irrigation system that minimizes the possibility of extrusion of irrigants into the periapical space (e.g., needle with closed end and side-vents, or EndoVac™). Lower concentrations of NaOCl are advised [1.5% NaOCl (20mL/canal, 5 min) and then irrigated with saline (20 mL/canal, 5 min), with irrigating needle positioned about 1 mm from root end, to minimize cytotoxicity to stem cells in the apical tissues.
• Dry canals with paper points.
• Place calcium hydroxide or low concentration of triple antibiotic paste. If the triple antibiotic paste is used: 1) consider sealing pulp chamber with a dentin bonding agent [to minimize risk of staining] and 2) mix 1:1:1 ciprofloxacin: metronidazole: minocycline to a final concentration of 0.1 mg/ml.
• Deliver into canal system via syringe.
• If triple antibiotic is used, ensure that it remains below CEJ (minimize crown staining).
• Seal with 3-4mm of a temporary restorative material such as Cavit™, IRM™, glass-ionomer or another temporary material. Dismiss patient for 1-4 weeks.

Second Appointment (1-4 weeks after 1st visit)
• Assess response to initial treatment. If there are signs/symptoms of persistent infection, consider additional treatment time with antimicrobial, or alternative antimicrobial.
• Anesthesia with 3% mepivacaine without vasoconstrictor, dental dam isolation.
• Copious, gentle irrigation with 20ml of 17% EDTA.
• Dry with paper points.
• Create bleeding into canal system by over-instrumenting (endo file, endo explorer) (induce by rotating a pre-curved K-file at 2 mm past the apical foramen with the goal of having the entire canal filled with blood to the level of the cemento–enamel junction).
• Stop bleeding at a level that allows for 3-4 mm of restorative material.
• Place a resorbable matrix such as CollaPlug™, Collacote™, CollaTape™ or other material over the blood clot if necessary and white MTA/CaOH as capping material.
• A 3–4 mm layer of glass ionomer (e.g. Fuji IILC™, GC America, Alsip, IL) is flowed gently over the capping material and light-cured for 40 s. MTA has been associated with discoloration. Alternatives to MTA should be considered in teeth where there is an esthetic concern.
  ○ **Anterior and Premolar teeth** - Consider use of Collatape/Collaplug and restoring with 3mm of RMGI followed by bonding a filled composite to the beveled enamel margin.
  ○ **Molar teeth or teeth with PFM crown** - Consider use of Collatape/Collaplug and restoring with 3mm of MTA, followed by RMGI or alloy.

**Follow-up**

• Clinical and Radiographic exam
  ○ No pain, soft tissue swelling or sinus tract (often observed between first and second appointments).
  ○ Resolution of apical radiolucency (often observed 6-12 months after treatment)
  ○ Increased width of root walls (this is generally observed before apparent increase in root length and often occurs 12-24 months after treatment).
  ○ Increased root length.
  ○ Pulp vitality test

• The degree of success of Regenerative Endodontic Procedures is largely measured by the extent to which it is possible to attain primary, secondary, and tertiary goals:
  ○ Primary goal: The elimination of symptoms and the evidence of bony healing.
  ○ Secondary goal: Increased root wall thickness and/or increased root length. (desirable but perhaps not essential)
  ○ Tertiary goal: Positive response to vitality testing. (which, if achieved, could indicate a more organized vital pulp tissue)

**References**

**Chapters**


**Articles**


