Title: *In vitro* antibacterial activity of different endodontic irrigants.

Author: Claudia Poggio et al.

Journal: Dental Traumatology 2012; 28: 205-209

Reviewer: Arnav R. Mistry, DMD

Purpose: To compare *in vitro* the antibacterial activity of Tetraclean (mixture of doxycycline, citric acid and polypropylene glycol), Niclor 5 (5.25% sodium hypochlorite), Cloreximid (0.2% chlorhexidine and 0.2% cetrimide solution) and hydrogen peroxide 12 volumes on three endodontic pathogens associated with primary endodontic infections.

Methods and Materials:
- Three endodontic pathogens used in this study: *Enterococcus faecalis*, *Streptococcus mutans*, *Staphylococcus aureus*.
- Antibacterial activity of endodontic irrigants was evaluated by the agar disc-diffusion test.
- Paper discs were saturated with each one of the test solutions (at room temperature and preheating at 50°C) and placed onto culture agar-plates preadsorbed with bacterial cells and further incubated for 24 h at 37°C.
- Growth inhibits zones around each irrigant were recorded and compared for each bacterial strain.

Results:
- At 37°C: Tetraclean showed significantly higher inhibition of bacterial growth than all other irrigants.
- Preheating at 50°C: significantly increased growth inhibition for all the groups tested.
- At 50°C, H₂O₂ 12 volumes and Tetraclean showed significantly higher efficacy than all other irrigants tested.
- Please refer tables 1, 2 and 3

Discussion:
- Preheating of sodium hypochlorite resulted in an even greater bactericidal effect.
- The bactericidal effect of sodium hypochlorite is because of the fact that when sodium hypochlorite is added to water, hypochlorous acid (HOCl), which contains active chlorine, a strong oxidizing agent, is formed. Chlorine exerts its antibacterial effect by the irreversible oxidation of -SH groups of essential enzymes, disrupting the metabolic functions of the bacterial cell.

LOE: 4
Title: Short-term vs. long term calcium hydroxide therapy after immediate tooth replantation: a histomorphometric study in monkey’s teeth

Author: Panzarini et al.

Journal: Dent. Trauma 28 (3) 226-232

Reviewer: Quan Nghiem, DMD

Purpose: To evaluate the repair process on immediate replantation of monkey’s teeth after short-term (1 month) and long-term (6 months) calcium hydroxide therapy and root canal filling with a calcium hydroxide based sealer

Materials and Methods: Five adult female monkey were used

Group 1 (1 monkey - control):
- 4 maxillary and mandibular lateral incisor were treated endodontically
- Rubber dam isolation and accessed with continuous irrigation with distilled water
- Pulp was extirpated with 15 K file and coronal and middle third of canal was enlarged
- Root canal was instrument to 35 K file within 1 mm short of apex
- Teeth were irrigated with calcium hydroxide/distilled water suspension and dried.
- Canals were filled using cold lateral with gutta percha cones and calcium hydroxide based sealer (Sealapex™)
- Coronal access was then sealed with glass ionomer cement.
- Roots were then extracted and immersed in 20 ml of saline for 15 min.
- After gentle irrigation with alveolar wounds with sterile saline, teeth were then replanted and splinted with 0.7 mm stainless steel orthodontic wire for 10 days

Group 2 (2 monkeys):
- 8 maxillary and mandibular lateral incisor were extracted and immersed in 20 ml of saline for 15 min then replanted and splinted for 10 days as group 1
- After removal of splint, endodontic initiation was completed the same as group 1, except for the use of intracanal dressing before obturation
- Canals were filled with calcium hydroxide based paste for 1 month prior to definitive obturation as group 1

Group 3 (2 monkeys):
- 8 maxillary and mandibular lateral incisor received the same treatment as group 2, except for the intracanal dressing was maintained for 6 months prior definitive obturation, with change of medication at 3 months.
- After extraction and replantation procedures, the animals received amoxicillin (20 mg/kg 3 times a day for 7 days), sodium diclofenac (30 mg/kg twice a day for 7 days), and paracetemol (30 mg/kg once a day for 2 days
- Euthanasia was performed 9 months after replantation.
- Analysis of the outcomes was performed by histomorphometric analysis.

Results:

Group 1 – Root canal filling before extraction
In all specimens, epithelial attachment occurred at the CEJ, with no signs of inflammation in the adjacent connective tissue. PDL was organized, with no inflammatory cells, and PDL fibers were arranged perpendicular to the root surface and attached along the entire extension of the alveolar bone and cementum. Small areas of surface root resorption were observed in most specimens with presence of cementoblasts depositing newly formed cementum close to the root surface.

Group 2 – root canal filling 1 month after replantation
In all specimens, epithelial attachment occurred at the CEJ with no signs of inflammation in the adjacent connective tissue. Small and shallow resorptive areas on the cemental surface of the root were observed. PDL was organized, with no signs of inflammation and fibers were arranged perpendicular to the root surface. Epithelial rest of Malassez were present, indicating PDL regeneration

Group 3 – root canal filling 6 months after replantation
Epithelial attachment occurred at the CEJ in most specimens and slightly below this region in some specimens. No chronic or acute inflammatory process was observed in the connective tissue. The PDL was organized, with the absence of inflammatory cells and fibers arranged perpendicular to the root surface. PDL space was preserved. Some resorbed areas of the root surface were repaired with newly formed cementum. Replacement root resorption was observed in only one specimen.
Conclusion:
Under the conditions evaluated in this study, the histomorphometric analysis of the repair process suggests that when endodontic treatment is initiated 10 days after immediate tooth replantation, and an antibiotic regimen is associated, definitive root canal filling can be performed after short-term calcium hydroxide therapy.

Title: Contemporary management of tooth replacement in the traumatized dentition

Authors: A. Alani, et al.

Journal: Dental Traum., 28(3), 183-192

Reviewer: Hector M. Garcia, DMD

Purpose: Identify key challenges in the provision of tooth replacement in the traumatized dentition and outline contemporary methods in treatment delivery

Treatment Considerations:
- Once post trauma stabilization has been achieved, an objective assessment of the dentition can commence
- Long term planning is best carried out after the acute phase healing phase is complete
- In developing dentition, the option of implants may not be available until growth is completed

Trauma and the Resin-retained Technique:
- Resin bonded bridge can be used in cases where surgical placement of implants is not possible
- Technological developments in adhesives have allowed for crowns of avulsed teeth as pontics in an immediate manner
- One of the advantages of resin bonded bridges is their retrievability. Initial cementation post trauma may provide an interim measure until growth is completed or the dentition is fully stabilized

Osseointegration in the Traumatized Dentition:
- Elective decoronation is a technique that can be utilized with the aim of allowing alveolar development to continue
- When horizontal fractures are present, extraction of only the most coronal portion can be considered (to prevent the loss of more bone)
- Where multiple teeth are lost or alveolar bone has resorbed after trauma, bone grafting of the area should be considered
- Forcible orthodontic eruption of an unrestorable tooth for alveolar bone development has also been described
- Management of soft tissues is also key in order to have good esthetics
- The timing for the placement of the implant post trauma is still not clear. Placing of the implant immediately after trauma reduces the number of surgical episodes, but there is a higher chance of postoperative complications

Conclusion: Tooth replacement in the traumatized dentition has specific challenges that are unique to this patients, thus making treatment planning a more difficult process that may require multidisciplinary team planning

LOE: 1
Title: New guidelines for treatment of traumatic dental injuries in the primary dentition.

Author: Malmgren B, et al


Reviewer: Andrew H. Chang, DMD

Purpose: To delineate an approach for the immediate or urgent care for management of primary teeth injuries.

Materials and Methods: A review of current dental literature utilizing EMBASE, MEDLINE, and PubMed searches from 1996-2011. In cases where the data did not appear conclusive, recommendations were based on the consensus opinion of the working group followed by review by the members of the International Association of Dental Traumatology (IADT) Board of Directors.

Results:

- Treatment selections are aimed at minimizing potential sequelae and additional risks of further damage to the permanent successors.
- The most common sequelae are white or yellow-brown discoloration and hypoplasia of permanent incisors due to intrusion or avulsion of primary teeth during the ages of 1-3.
- There is a lack of consensus about the best treatment for trauma to primary dentition. Some literature advocate extraction, others stress the importance of more conservative approaches.
- Radiographs should be taken at several angles, including PA, Occlusal, Lateral Ceph (if needed).
- No antibiotics warranted unless injuries require significant surgery, or patient’s medical status warrants it.
- Crown discoloration can be present and more common in luxation injuries, which may return to normal. This should not be the primary reason for root canal therapy; infection is.
- Pulpal obliteration occurs 35-50% in luxation injuries, and indicates ongoing pulpal vitality.
- Oral hygiene should be maintained and can lead to better healing.

<table>
<thead>
<tr>
<th>Fractures:</th>
<th>Treatment:</th>
<th>Follow-up:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enamel</td>
<td>Smooth sharp edges</td>
<td>None</td>
</tr>
<tr>
<td>Enamel Dentin</td>
<td>Restore with GI or Composite</td>
<td>3-4 wks</td>
</tr>
<tr>
<td>Enamel Dentin Pulp</td>
<td>Partial Ca(OH); Pulpotomy</td>
<td>1 wk, 6-8 wks, 1 yr</td>
</tr>
<tr>
<td>Enamel Dentin Root</td>
<td>Small: Fragment removal Large: Ext</td>
<td>1 wk, 6-8 wks, 1 yr</td>
</tr>
<tr>
<td>Enamel Dentin Root Pulp</td>
<td>Extraction</td>
<td>Monitor eruption of successor</td>
</tr>
<tr>
<td>Root with No Coronal Displacement</td>
<td>None</td>
<td>1 wk, 6-8 wks, 1 yr, each year after until exfoliation</td>
</tr>
<tr>
<td>Root with Coronal Displacement</td>
<td>Reposition and Splint, or Extract coronal portion</td>
<td>1 wk, 6-8 wks, 1 yr, each year after until exfoliation</td>
</tr>
<tr>
<td>Alveolar</td>
<td>Reposition and Splint for 4 wks</td>
<td>1 wk, 3-4 wks (splint removal), 6-8 wks, 1 yr, each year after until exfoliation</td>
</tr>
</tbody>
</table>

Luxation Injuries | Treatment | Follow-up |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Concussion</td>
<td>None</td>
<td>1 wk, 6-8 wks</td>
</tr>
<tr>
<td>Subluxation</td>
<td>None</td>
<td>1 wk, 6-8 wks</td>
</tr>
<tr>
<td>Extrusive Luxation (&lt;3 mm)</td>
<td>Careful repositioning or no treatment</td>
<td>1 wk, 6-8 wks, 6 mo, 1 yr</td>
</tr>
<tr>
<td>Lateral Luxation</td>
<td>No interference: None Slight interference: Slight grinding More interference: Gentle repositioning Sever displacement: Ext</td>
<td>1 wk, 2-3 wks, 6-8 wks, 1 yr</td>
</tr>
<tr>
<td>Intrusion</td>
<td>Towards labial plate: None Towards developing tooth: Ext</td>
<td>1 wk, 3-4 wks, 6-8 wks, 6 mo, 1 yr, each year after until exfoliation</td>
</tr>
<tr>
<td>Avulsion</td>
<td>No replantation</td>
<td>1 wk, 6 mo, 1 yr, each year after until eruption of successor</td>
</tr>
</tbody>
</table>
Discussion:

- Application of these guidelines is in hopes to maximize positive outcomes, but favorable outcomes are not guaranteed.
- Consideration needs to be made based on child’s behavior during and after treatment, as well as full cooperation of child and parent on maintenance and follow-up.
- If full cooperation cannot be achieved, extraction is usually the alternative option.

LOE: 2