ENDODONTIC RETREATMENT INICATIONS
“Getting to the Root of the Problem”

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Essential Goal of Endodontic Treatment:
To regenerate and protect the attachment apparatus
“I SKATE TO WHERE THE PUCK IS GOING TO BE, NOT WHERE IT HAS BEEN.”
Wayne Gretzky

LEARNING OBJECTIVES
- To become familiar with identifying reasons for root canal failure
- Learn current and documented pharmacological uses of intra canal medicaments, antibiotics and pain medication
- Recognize when to tackle retreatment cases, refer to a specialist or seek an alternate treatment plan

REASONS FOR INITIAL ROOT CANAL FAILURE
- Insufficient debridement of the canal spaces
- Missed canal anatomy
- Incomplete obturation
- Coronal leak-age
- Iatrogenic causes
- Poor visibility of radiographs
- Vertical root fracture
INSUFFICIENT DEBRIDEMENT OF THE CANAL SPACES
Access

"RESTORAL"

1. Radiographic assessment and design of occlusal entry
2. Entry (initial)
3. Ceiling removal
4. Identification of primary orifices
5. Freighting of grooves
6. Accessory orifice identification
7. Lengthening/Widening of orifices

Restricted Access versus Convenience Form
**Bacterial Invasion**

Penetration is visible within a week of exposure

**Depth of penetration:**
- Increases with time
- 50μm to 375μm
- Up to 600μm for E. Coli
- Entire 1000μm length for E. Faecalis

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**Limiting Factors In Disinfection**

- **ANATOMICAL**
  - Anatomical complexities makes complete elimination of bacteria impossible
  - Dentin structure makes penetration of disinfectants difficult
  - Dentin constituents and tissue remnants can inactivate irrigants/medicaments

- **MICROBIAL**
  - Bacteria persist after chemo-mechanical preparation.
  - Bacteria may invade dentinal tubules.
  - Bacterial biofilm/byproducts (endotoxin) resists many anti-microbial agents.
• The PH of the periapical region will determine in part the success or failure of the root canal case
• Healthy PH of 7 is responsible for cells of the mesenchymal layer to convert to fibroblasts/osteoblasts which in turn produces new bone
• Any shift in the balance of the PH results in damage to this delicate process

<table>
<thead>
<tr>
<th>Concentration of NaOCl</th>
<th>Time to kill E. faecalis</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5%</td>
<td>30 min</td>
</tr>
<tr>
<td>1.0%</td>
<td>20 min</td>
</tr>
<tr>
<td>2.5%</td>
<td>10 min</td>
</tr>
<tr>
<td>4.0%</td>
<td>5 min</td>
</tr>
<tr>
<td>5.25%</td>
<td>&lt; 30 s</td>
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</tbody>
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Potential Consequences of NaOCl Irrigation

- Intracanal irrigation beyond the apex
- Vessel damage
- Facial edema
- Cellulitis
- Ecchymosis
“Perfect storm”

Patent Apex
Anatomical variation: drainage of NaOCL directly on anterior facial vein
Apical pressure during syringe irrigation

Chlorhexidine
CHX
Cationic bisguanide
pH: of 5.5 to 7
Disinfectant
Substantivity: 90 days (Souza, 2012)
Broad-spectrum antimicrobial agent

Combinations

Temperature
NaOCl + Heat = better antibacterial effect
Ultrasonic

Apical Negative Pressure

Master Delivery Tip
Macro Tip
Micro Needle

THE CORONAL SEAL

Regardless of the technique used to obturate the canals, coronal leakage can occur through seemingly well-obturated canals within a short time, potentially causing infection of the periapical area. A method to protect the canals in case of failure of the coronal restoration is to cover the floor of the pulp chamber with a lining of glass ionomer cement after the excess gutta-percha and sealer have been cleaned from the canal.
• Includes perforations, stripping and zipping along the root length

You can’t treat what you can’t see!
You can't treat what you can't see!!!
• Case selection
• Patient consent
• Scheduling the right amount of time
• Armamentarium
• Procedure
• Restorative options
• Recall

Case selection and proper informed consent go hand in hand.

Posts, silver wires, separated files and retreatments of Thermafil cases should be referred to an endodontist.
RE: TREATMENT CONSIDERATIONS

- Check patient's insurance protocol for payment
- Patients use the internet to follow treatment
- Select earlier in the week and in the AM
- DON'T RUSH!!
- Respect the biology of the post disease root system
- Decide on restorative options before the retreatment if possible
- Discuss the unexpected with the chairside assistant

RE: TREATMENT CONSIDERATIONS

- Decide what works best in your hands
- Not every system or method is 100% foolproof
- Review manufacturers recommendations
- Begin and go slow

ARMAMENTARIUM

- Gates glidden numbers 2-6
- Peeso reamers sizes 1 and 2 only
- New diamond shoulder bur
- 2 cc of Chloroform in a new syringe
- Perio probe
- Bitewing x-rays
- 19 millimeter files by Roydent or others
- Hedstroms files 21mm in sizes 20-30
PROCEDURE

- Access to floor of chamber and expose the old gutta percha
- Use shoulder diamond to remove mesial buccal wall
- Deposit 2 drops of chloroform into chamber
- Let set for one minute
- Introduce a peeso or gates only 2-3mm into the softened gutta percha
- Re flood the chamber and wait
- Use the 19 mm files from large to small to engage the old gutta percha
- Repeat chloroform and filing steps, now engage with hedstroms too
- Take radiograph to see if all remnants of old gutta percha are removed

DATA LED MAXILLARY MOLAR
R-1R= A I M N I
Detailed Maxillary Molar Retreatment

- Identify and "puck" missed MB.
- "Bowel" out corners.

Detailed Maxillary Molar Retreatment

- Explore MB.
- Extend MB wall.

Detailed Maxillary Molar Retreatment

- Final Smoothing.
CASE SELECTION

- Severe percussion sensitivity on a 2 visit vital root canal.
- Well filled root canal in length and width
- What went wrong?
Take Home Message

- Understand anatomy
- Don’t force an ill-conceived expectation of root anatomy into the root preparation
- Patient development of the apical prep
LATEST GUTTA PERCHA REMOVAL KIT

- Mani GPR files for endodontic retreatment
- Introduced 2 years ago
- Different sizes and lengths
- Requires heat source

DRAWBACKS

- Heat activation requires other endodontic equipment
- Heat source can harm the surrounding PDL
- Misuse of rotary files can still transport or perforate
- H files bend easily
INTRAMEDIATE
- Calcium Hydroxide is still our best option
- pH of 12.4
- Easy to dispense
- Biocompatible with surrounding tissues

EXCEPTIONS
- Teeth with open apices
- Extruded CaOH₂ is toxic with its high pH
- Will cause exacerbation of the periapical tissues
IS IT NECESSARY TO RETREAT ALL CANALS?

- Usually yes
- Sometimes only the canal with the periapical lesion
- However CaOH2 must be used

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NEW TRENDS USING CAOH2

- Recent studies show better overall retreatment success by leaving CaOH2 in canals for up to 4 months
- Less likely to need apical surgery
- However, must postpone final restoration
- Patient compliance?
ANTIBIOTIC USAGE IN ENDODONTIC RETREATMENT

- Does it improve the chances of a successful outcome?
- Many mixed reviews on this topic
- Is patient perception YOUR reality?
- More general dentists than endodontists prescribe antibiotics
- Amoxicillin versus Augmentin
- Combination therapy?

MOST IMPORTANT

- Cleaning and reshaping is still the best option over antibiotic prescription
- Start with a low dose
- Switch after 2 days if not resolved
- Incision and drainage if still symptomatic

ENDODONTIC PAIN MANAGEMENT

- Communication to patient
- Alternate to this therapy was apical surgery or extraction
- NSAIDs are best
- 600mg of ibuprofen is ideal
- 400mg too little
- 800mg not significant to pain threshold
- Tylenol 500mg BID with NSAID allergy
- Reduction of working cusps
- Check protrusive excursion
- Vicodin ES most often prescribed among general dentists
ENDODONTIC PAIN MANAGEMENT

- I and D if necessary to control local swelling
- Trephination of buccal bone will also work
- Steroid dose pack

SUMMARY

- Proper case selection to establish results and expectations of both the dentist and the patient
- Perform retreatment as completely as you can to increase a successful result
- Appreciation of root anatomy and periodontal condition is critical to retreatment success
- Chairside magnification is critical to assess what you can't see under the old gutta percha and chamber floor
- A CBCT scan is helpful as an adjunct to contemporary endodontics

Thank you
Questions?
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