

Endodontics Today

SUMMER 2014

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Introduction

The aim of this newsletter is for me to share some general knowledge in endodontics.

The scope of this newsletter will cover a variety of endodontic topics ranging from current research, clinical tips, patient management and a case of the month.

I am hopeful to start making this a biannual newsletter and would very much appreciate any feedback and suggestions for future topics.

Current News in Endodontics

Clinical Efficacy of Electronic Apex Locators: Systematic Review

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Apex locators have been part of the endodontic armamentarium for over 50 years. These devices have been modified numerous times, specifically in terms of their method to determine the 'end of a root canal' / apical constriction. Today it is accepted that apex locators can detect the apical constriction with greater than 90% accuracy within 1mm from the apical constriction.

Studies have shown that the accuracy of determining working length is also further increased with the use of radiography in conjunction with apex locator.

In the June edition of the Journal of Endodontics, a *systematic review* was published that evaluated all the available evidence for the accuracy of apex locators compared to radiographs in determining the accuracy of working length. The conclusions of this paper were:

"Although the available scientific evidence base is short and at considerable risk of bias, it is still possible to conclude that the apical locator reduces the patient radiation exposure and also that the electronic method may perform better on the working length determination. At least one radiographic control should be performed to detect possible errors of the electronic devices."

Technology

File systems

There are over 100 Ni-Ti rotary instruments available today. Most are differentiated by their cross sectional geometry, dimensions and recently, newer manufacturing processes, such as Controlled Memory Ni-Ti wire.

Controlled memory wire is a result of modifications to the manufacturing process that provides reduced shape memory unlike conventional Ni-Ti systems that have memory. Such instruments can be prebent and can 'form' to the anatomy of the root canal.

Further advancements have involved a completely new paradigm to instrument design, the Self Adjusting File (SAF) from ReDent Nova. It is a 'web like' Ni-Ti instrument that does not 'rotate'. Instead the web structure expands within the root canal system in an attempt to touch more surface area while irrigant is channeled through the instrument. This system has shown some promising in vitro research in comparison to current rotary systems.

Appearances may be seen in North America in the near future.

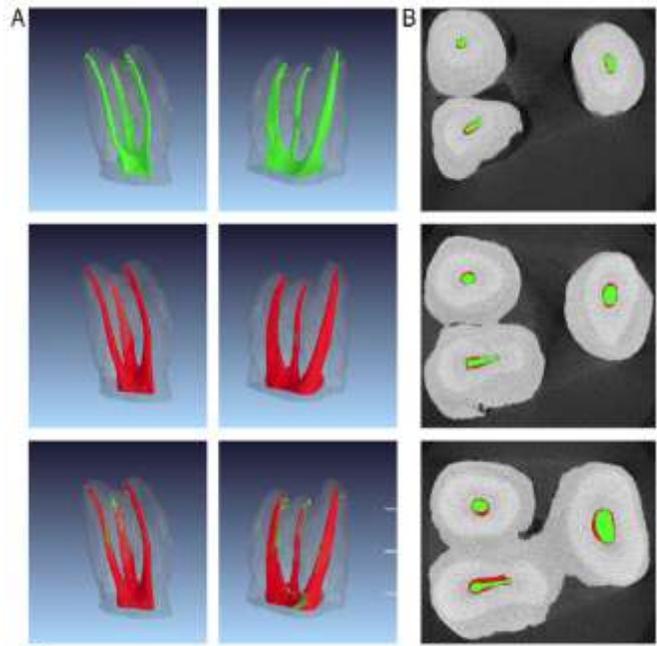


Sealers

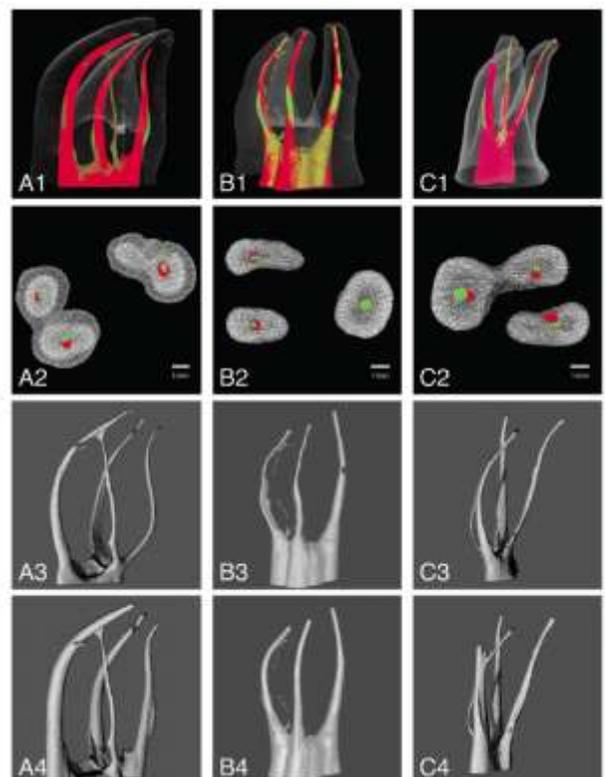
One of the most common questions is which sealer to use?

The most common sealers used today are the eugenol and resin based. Others can include calcium hydroxide and newer silicate based cements.

AH Plus is an epoxy resin based cement. It has a working time of 4 hours and a set time of up to 8 hours. It has a very low film thickness, good radiopacity and experimentally it has shown to provide minimal tissue response and a weak bond to gutta percha. It forms an excellent bond to dentin with deep penetration into the dentinal tubules after the use of EDTA and is heat stable for use with modern thermoplasticized obturation systems.



MicroCT. Green is the original tissue and red is after preparation with SAF



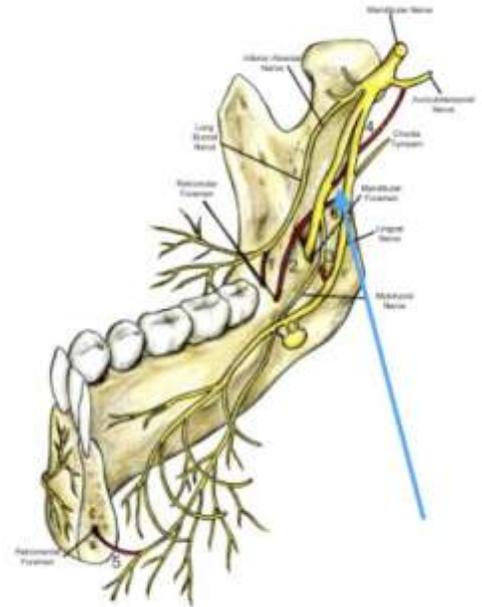
MicroCT with ProTaper. Notice the amount of untouched canal space (green) and transportation (red)

Clinical Tips

Local anesthesia

8 Facts about the Inferior Alveolar Nerve Block for Vital Teeth

- Success rate is around 20-70% (vital teeth).
- Most 'likely' cause of failure is 'missing the block'
- Lip numbness does not always assume pulpal anesthesia. Pulpal anesthesia is at a slower rate vs. soft tissue anesthesia.
- The 'effectiveness' of the block decreases towards the midline.
- Giving more volume does not 'increase' the effectiveness of anesthesia.
- Articaine has not shown to be superior to Lidocaine.
- SLOWER rate of injection results in higher success rate of pulpal anesthesia.
- The decrease in pH within inflamed periapical tissues 'may' decrease the effectiveness of the local anesthetic.



Molar access

ACCESS into Molars: Here are some numbers to remember. This is taken from the Journal of Endodontics (Deutsch JOE 2004). Of importance are the values of D and E.

E: shows the average distance to the roof of the pulp chamber and D: shows the average distance to the furcal floor from the cusp tip. Upon access into 'calcified' pulp chambers, after an average drilling depth of around 6mm, one should start to look meticulously for canal orifices and avoid drilling further to prevent iatrogenic perforation. If the orifices cannot be located at this point, referral to an endodontist is advised.

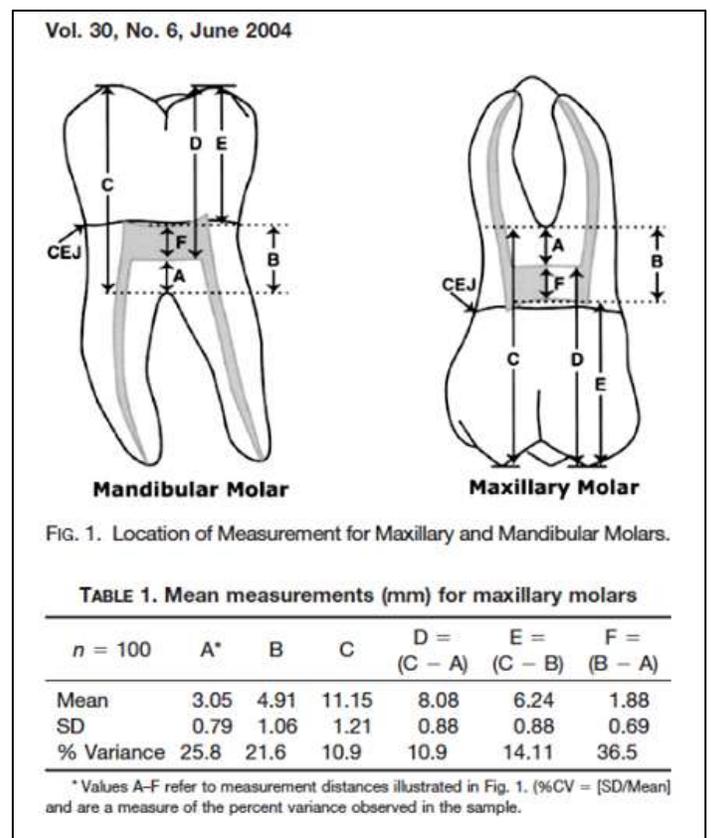
MB2

The maxillary first molar has undergone a significant amount of research and the majority of the research is related to the MB root.

In general, the MB2 is present over 95% of the time. Most times both the MB1 and MB2 canals will merge anywhere 3-5mm from true length.

This is the most common retreated tooth.

About 33% of the time there are two separate exits of the MB1 and MB2 seen radiographically.

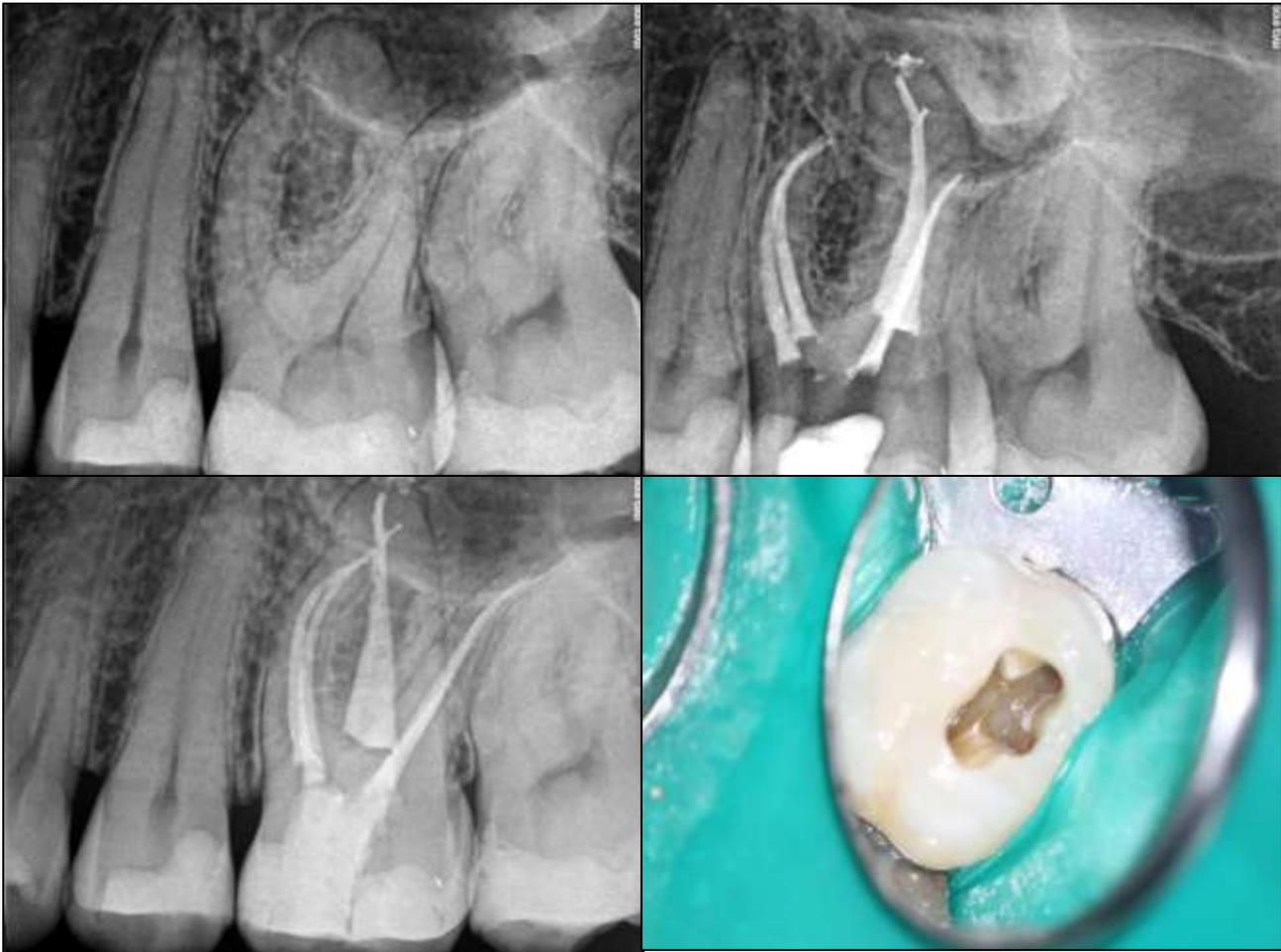


Case of the Month

Tooth #26.

Diagnosis was necrosis with symptomatic apical periodontitis.

This was a tough tooth. Working lengths were at 24mm for all four canals. Vortex Blue instruments (Tulsa Dental Specialties) were used, mainly for their reduced shape memory in this case. All canals were obturated using gutta percha and AH Plus sealer via warm vertical compaction. The lower left image shows the short term recall.



Tips for long teeth:

- Do not try to reach the apex off the get go with K-files
- Obtain good coronal and midroot flare in the canals
- Do not use larger tapered instrument to length
- Foreshorten working radiographs if needed to see root end
- Warm vertical technique is the preferred method for obturation



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