

IIUM HOMECOMING *workshop*

Endo-Resto Course :
Mastering Root to Crown

SPEAKERS



**DR IMRAN
ZAINAL ABIDIN**



**DR HAIKAL
HALIL**



**DR DINIE
QURRATUAINI**



**DR ROSTAM
IFFENDI**



**DR SYUWARI
AZHAR**



8.00AM - 5.00PM



28 - 29 JAN 2023

CONTENTS



- Molar Endodontics : Back to Basic
- Diagnosis & principles of root canal treatment
- Theory of access cavity, working length determination & obturation
- Introduction to NiTi
- Hands on ProTaper Gold



- Direct vs indirect restoration
- Partial vs full coverage crown
- Adhesive system
- Matrixing & posterior composite
- Hands on Posterior composite restoration using Neo Spectra

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Sirona**

IIUM Homecoming Workshop
28-29 January 2023
Dentsply Sirona @ The Grand

Day 1

28 January 2023			
Time			Speaker
8.30 am – 9.00 am	Registration Breakfast		
9.00 am – 10.00 am	Lecture I	Diagnosis Principles of root canal preparation Introduction to NiTi Straight line access preparation	Dr Imran Zainal Abidin
10.00 am – 11.00 pm	Lecture II	Working length 1. Technique 2. Outcome Importance of Glide Path Root canal preparation with Pro Taper Gold	Dr Dinie Qurratuaini
11.00 am - 12.00 pm	Lecture III	Disinfection 1. Principles & objectives 2. NaOCl vs others 3. Delivery of disinfecting material -tip and safety measures 4. Final irrigation protocol 5. Activation Obturation 1. Principles & objective 2. Techniques 3. Sealer 4. Troubleshooting	Dr Haikal Halil
12.00 pm – 2.00 pm	Lunch		
2.00 pm – 5.00 pm	Hands-on	Protaper Gold	Dr Haikal Halil Dr Imran Dr Dinie Dr Dara
5.00 pm	Refreshment and disperse		

Day 2

29 January 2023			
Time			Speaker
8.30 am – 9.00 am	Registration Breakfast		
9.00 am – 10.30 am	Lecture I	1. Direct vs Indirect Restoration 2. Partial vs Full coverage crown	Dr Rostam
10.30 am – 12.00 pm	Lecture II	1. Adhesive system 2. Matrixing 3. Posterior composite	Dr Syuwari
12.00 pm - 2.00 pm	Lunch		
2.00 pm – 5.00 pm	Hands-on	Posterior Composite Restoration using Neo Spectra	Dr Syuwari Dr Rostam Dr Haikal Dr Dara
5.00 pm	Refreshment and disperse		

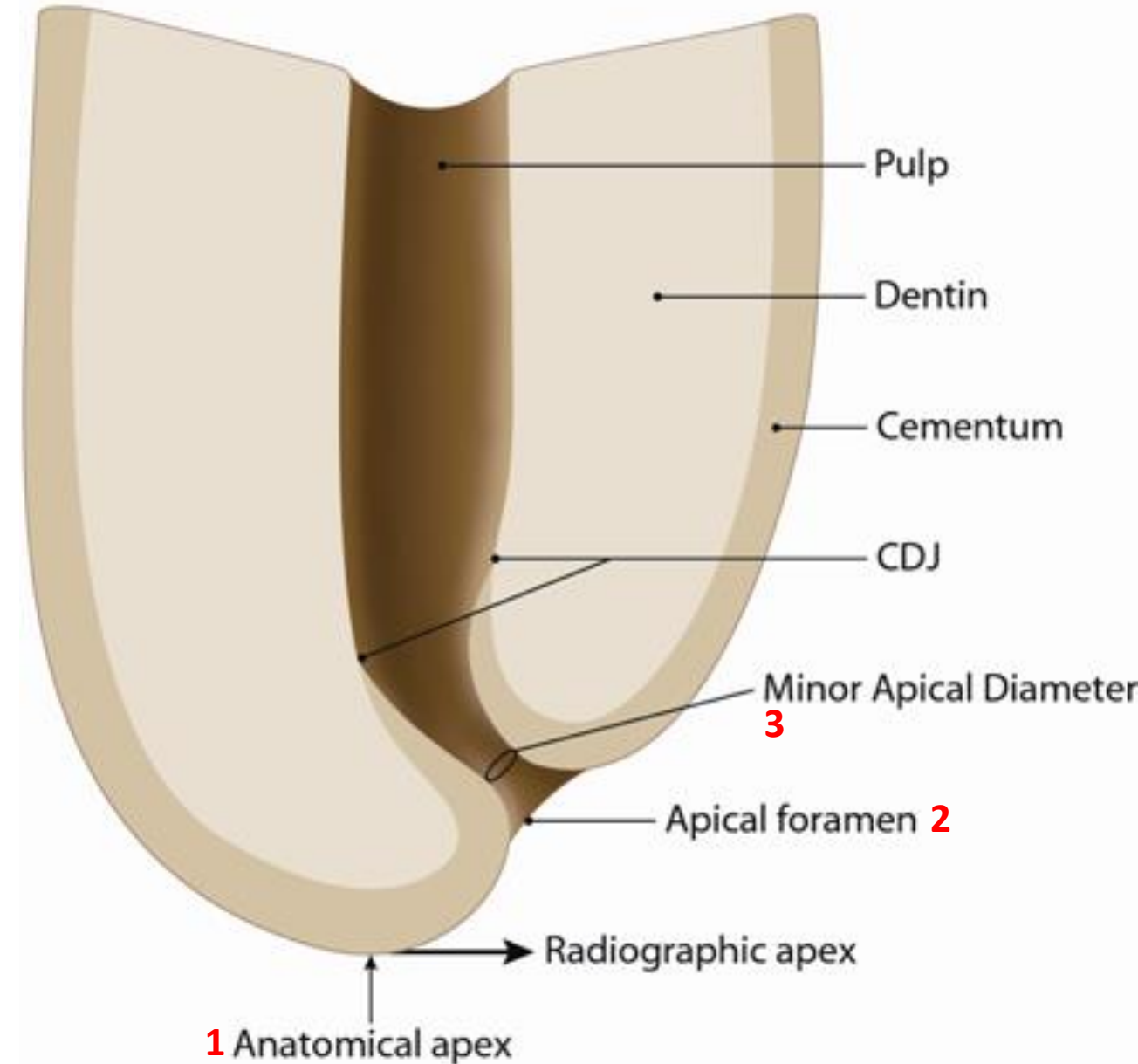
Working Length Root Canal Preparation

Dr Dinie Qurratuaini

Apical Control Zone

Anatomy

1. Anatomical apex (radiographic apex)
2. Apical foramen (major foramen)
3. Apical constriction (minor foramen)

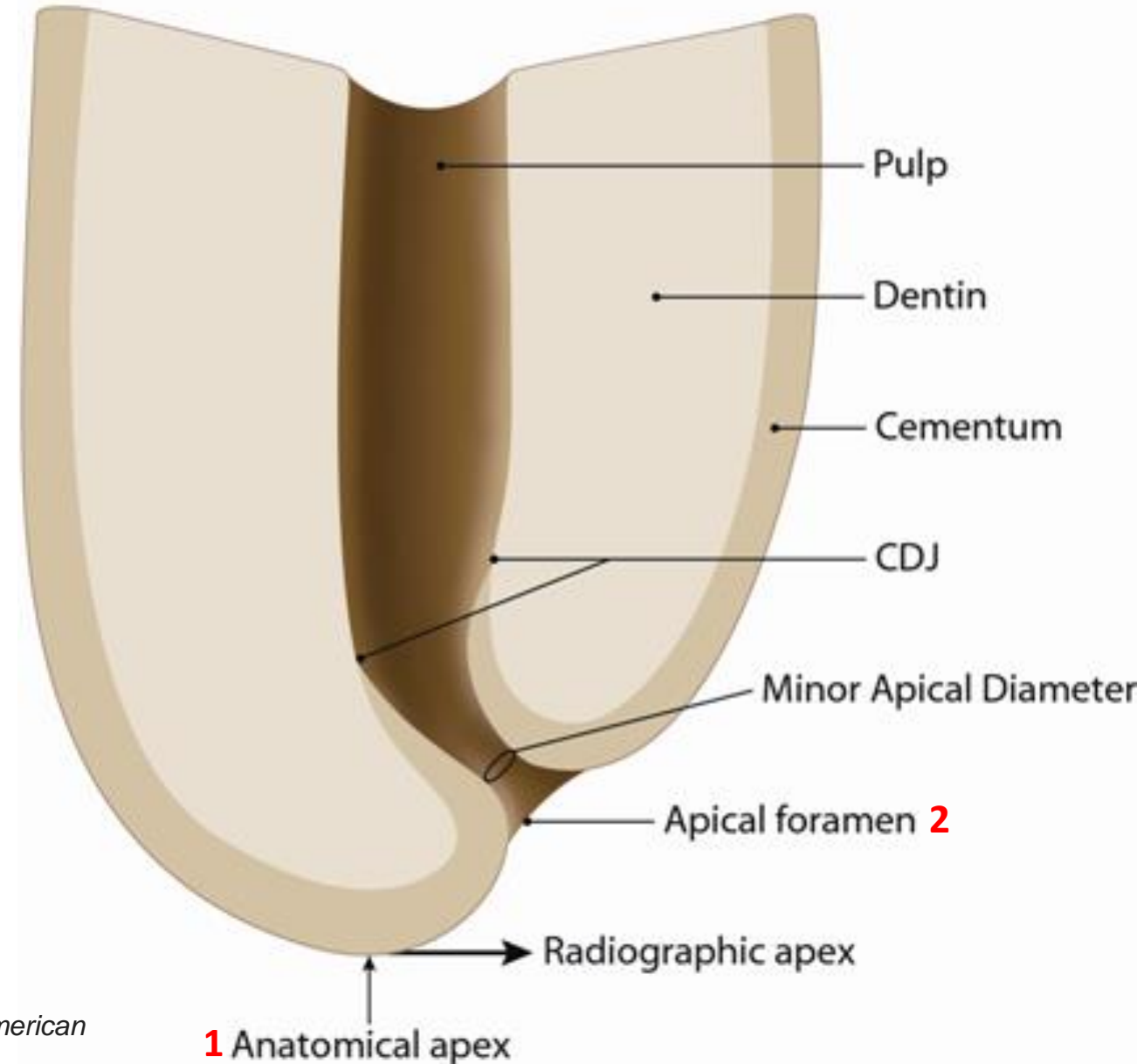


Apical Control Zone

Anatomy

Distance between 1 and 2:

- The apical foramen deviates from the apex in 50-98% of the teeth.
- This deviation averages 0.3 to 0.6 mm but could be as much as 3 mm.

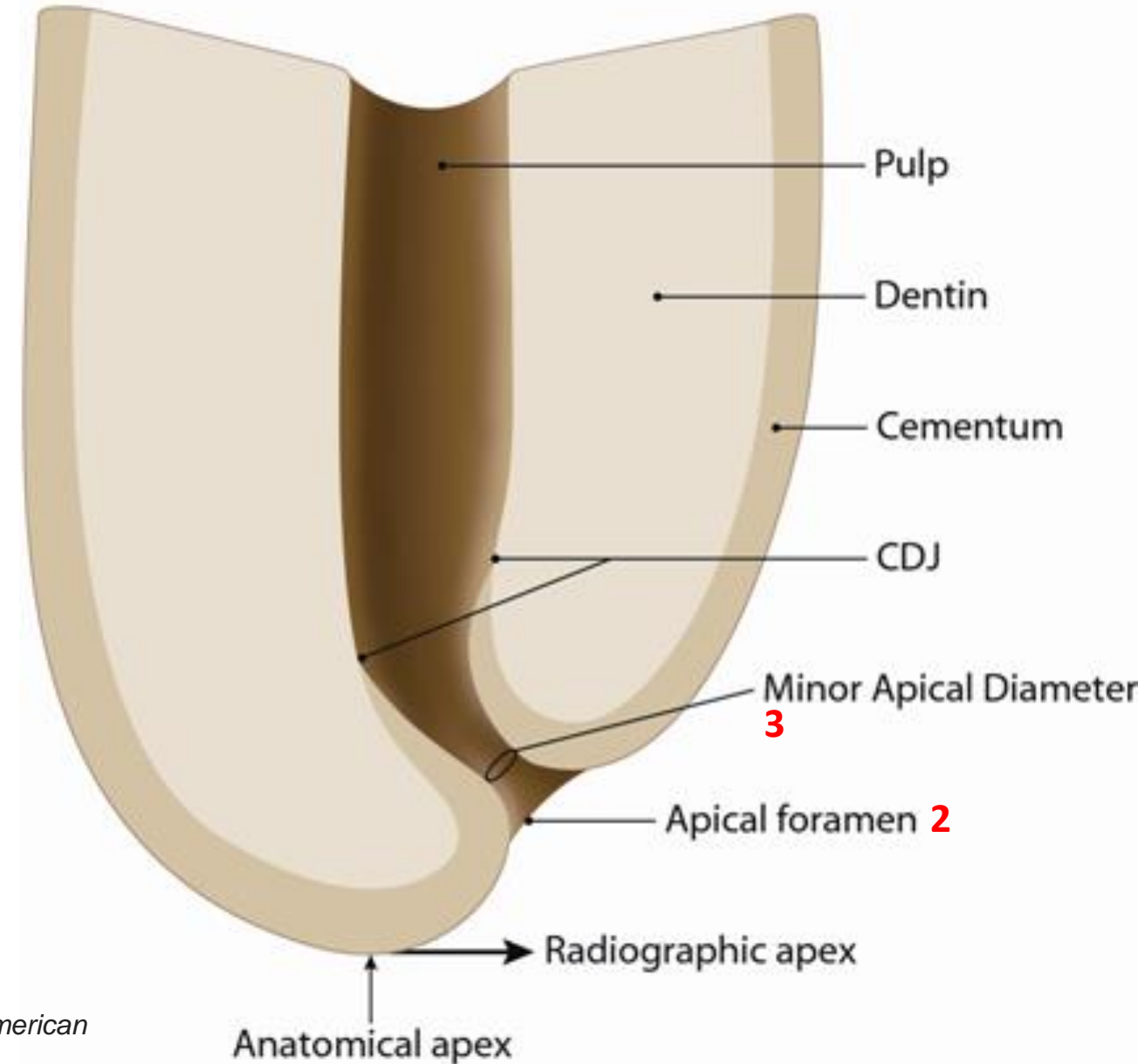


Apical Control Zone

Anatomy

Distance between 2 and 3:

- 0.5 mm in 18-25 y old, and 0.7 in 55+ y old.

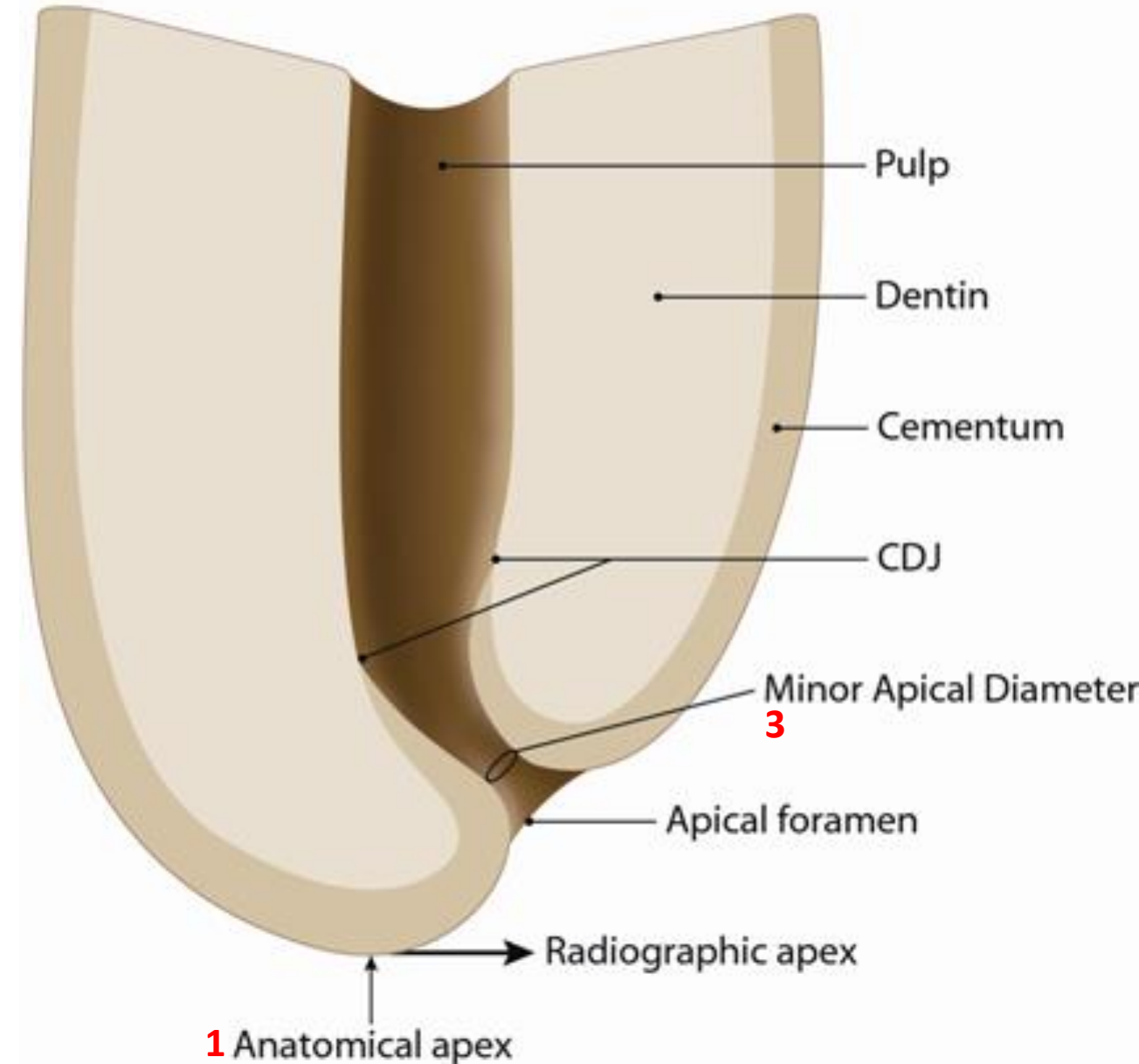


Apical Control Zone

Anatomy

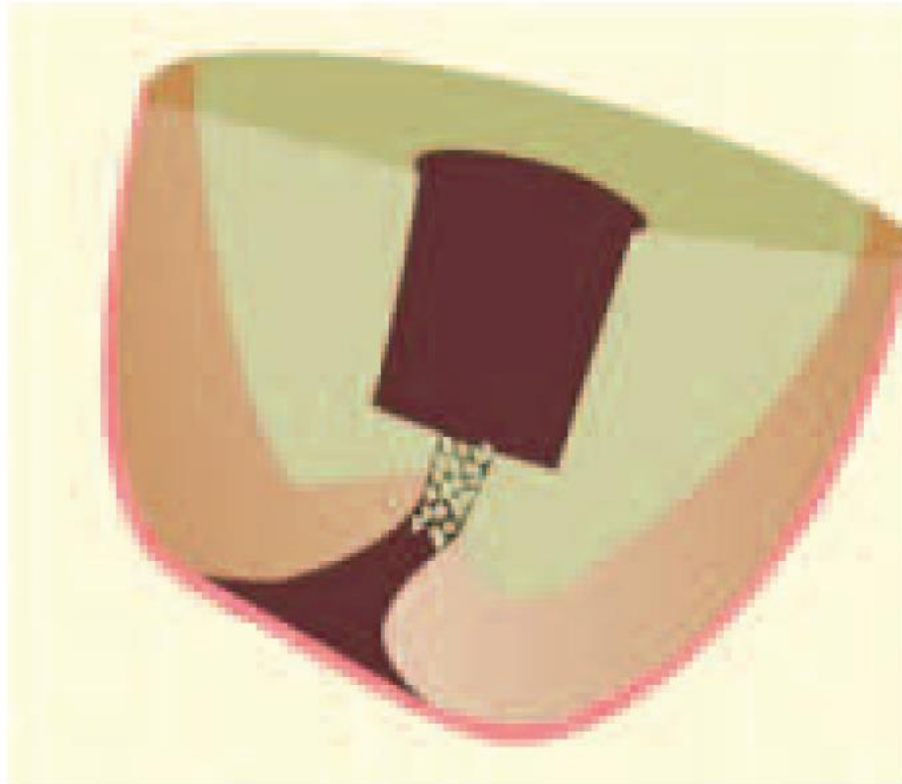
Distance between 1 and 3:

- 0.89 mm with a range of 0.1 to 2.7 mm.

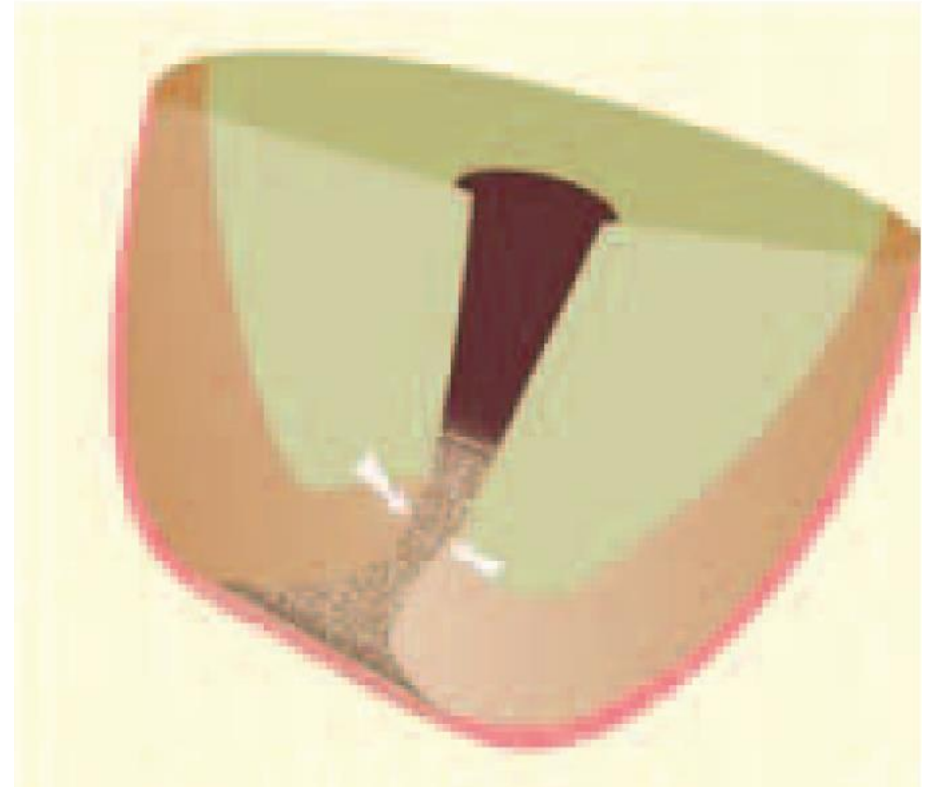


DUMMER, P. M., MCGINN, J. H., & REES, D. G. (1984). The position and topography of the apical canal constriction and apical foramen. *International Endodontic Journal*, 17(4), 192-198.

Scandinavian vs North American concepts



concept of preparation is to leave it
'short'

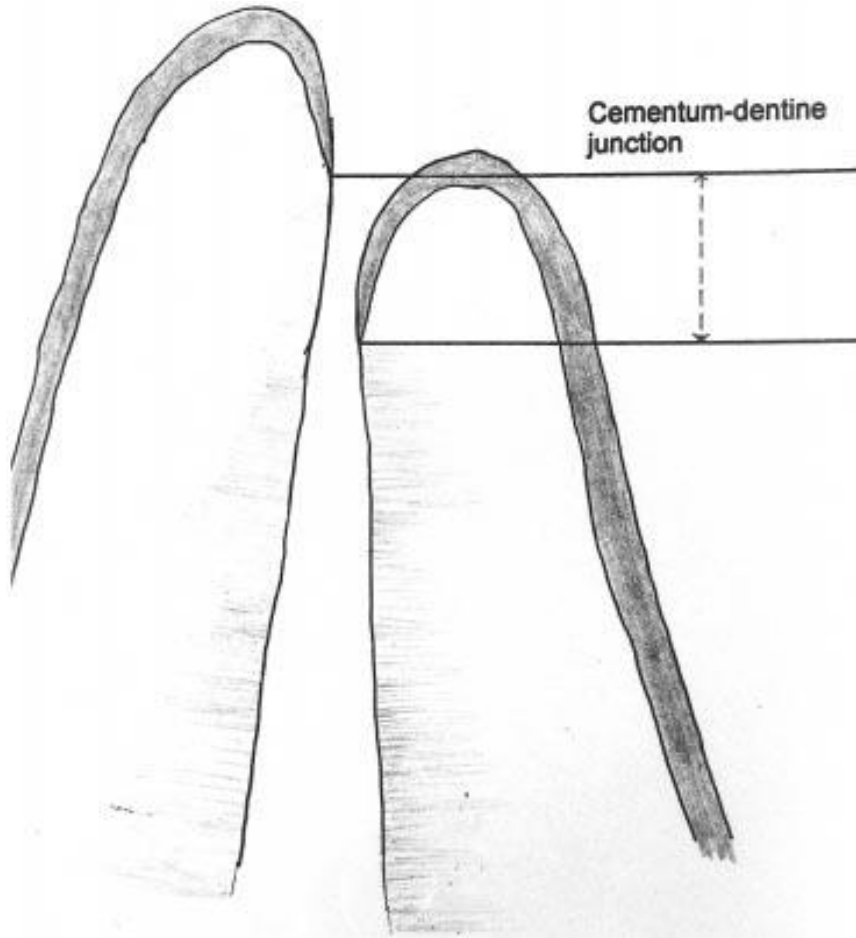


shaping of the canal to the
'radiographic apex terminus'.

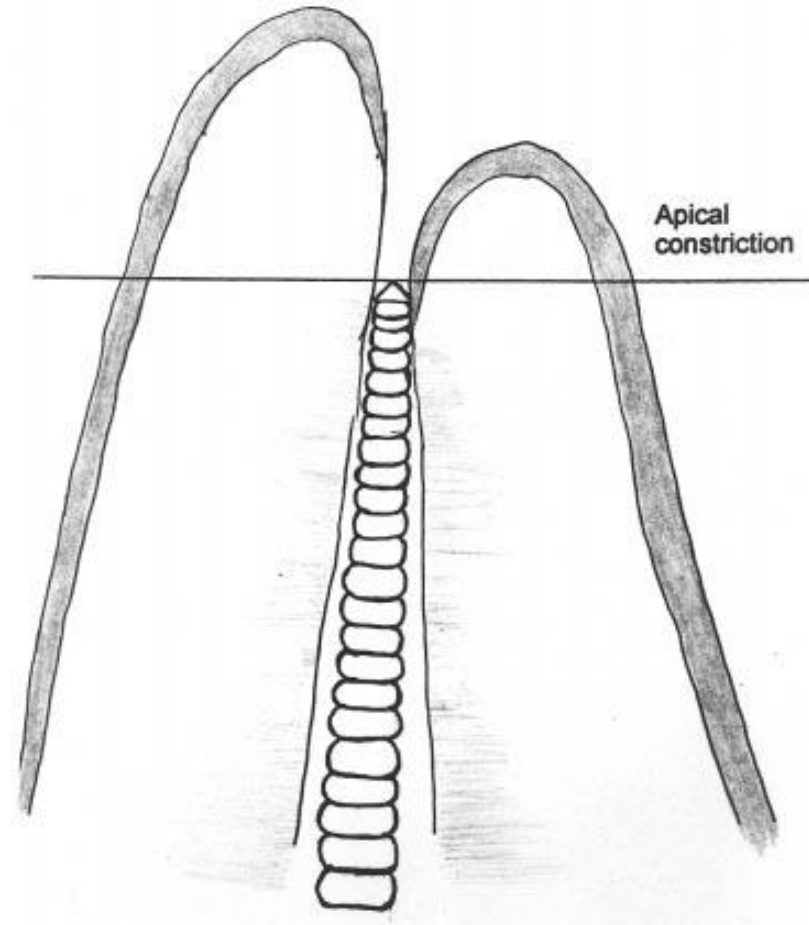
Apical limit

Kuttler et al. (1955)

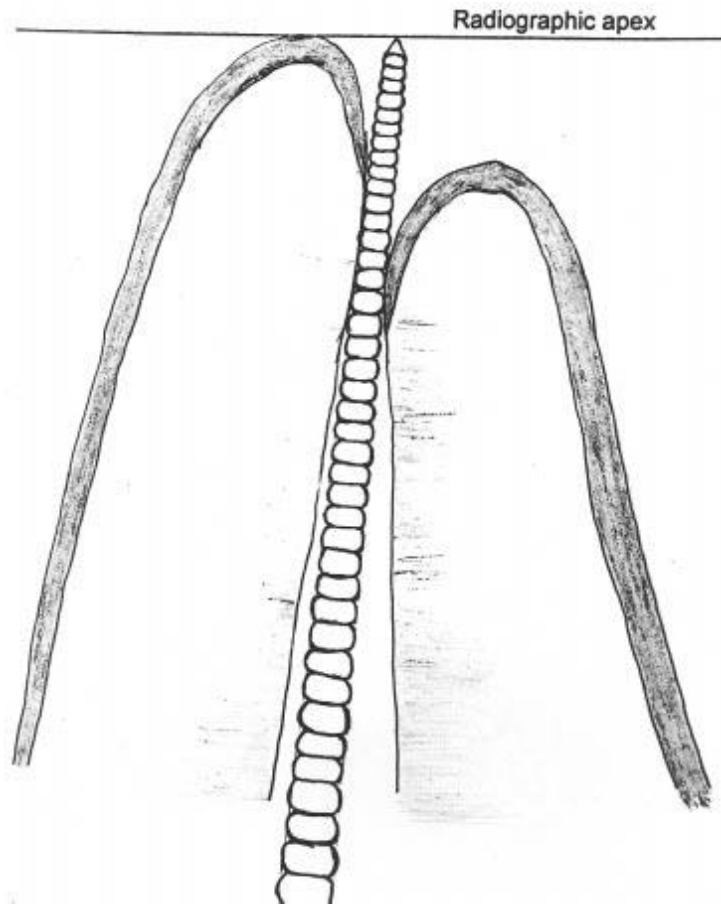
- Identified a smaller diameter or 'apical constriction' as the point where the canal preparation should end & where the deposition of calcified tissue is most desirable
- Periapical radiolucency with radiographic signs of apical resorption: the preparation should be shortened by an additional 0.5 mm from the radiographic apex



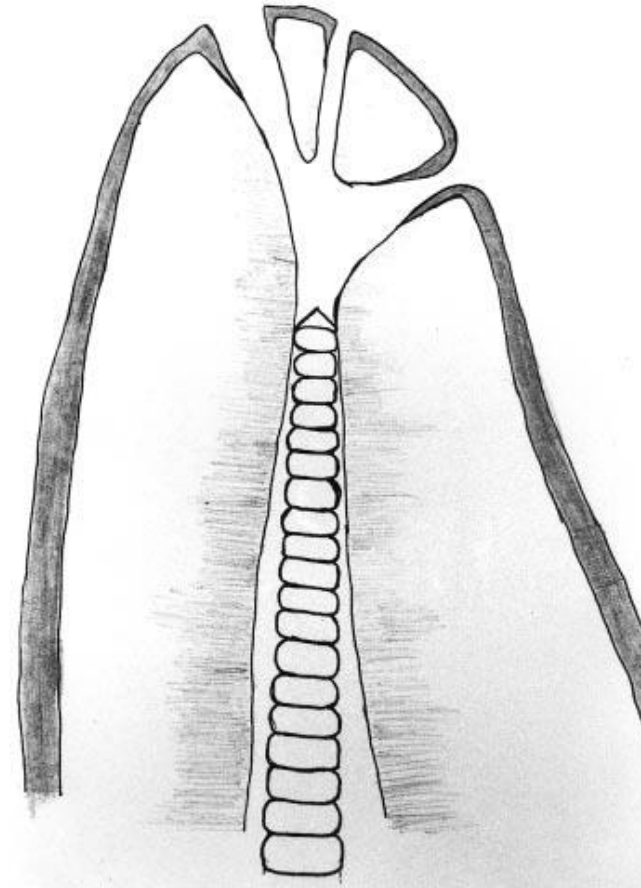
CDJ is located at different levels on opposite sides of the root canal wall, and does not coincide with the apical constriction



The choice of the apical constriction as limit of the procedure appears reasonable regardless of the type of tissue contacted by the instrument (dentine, cementum or CDJ)

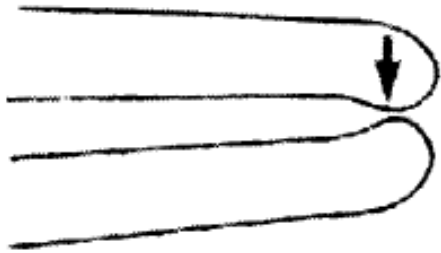


An instrument inserted at the radiographic apex is already beyond the root canal limits, in the adjacent periodontal ligament

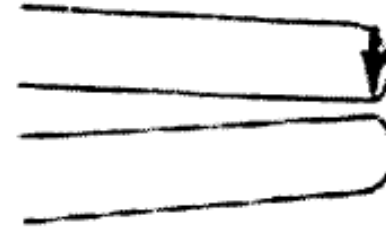


The decision to limit the procedure inside the canal near the constriction does not interfere with the tissue contained in the apical ramifications.

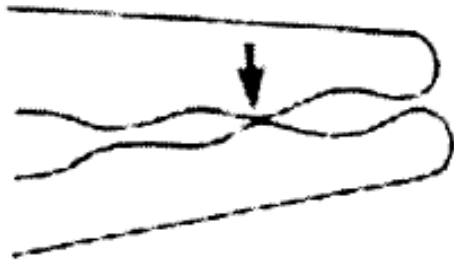
Type A: 'Traditional' single constriction



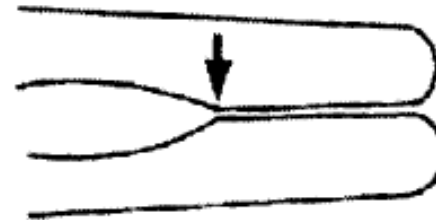
Type B: Tapering constriction



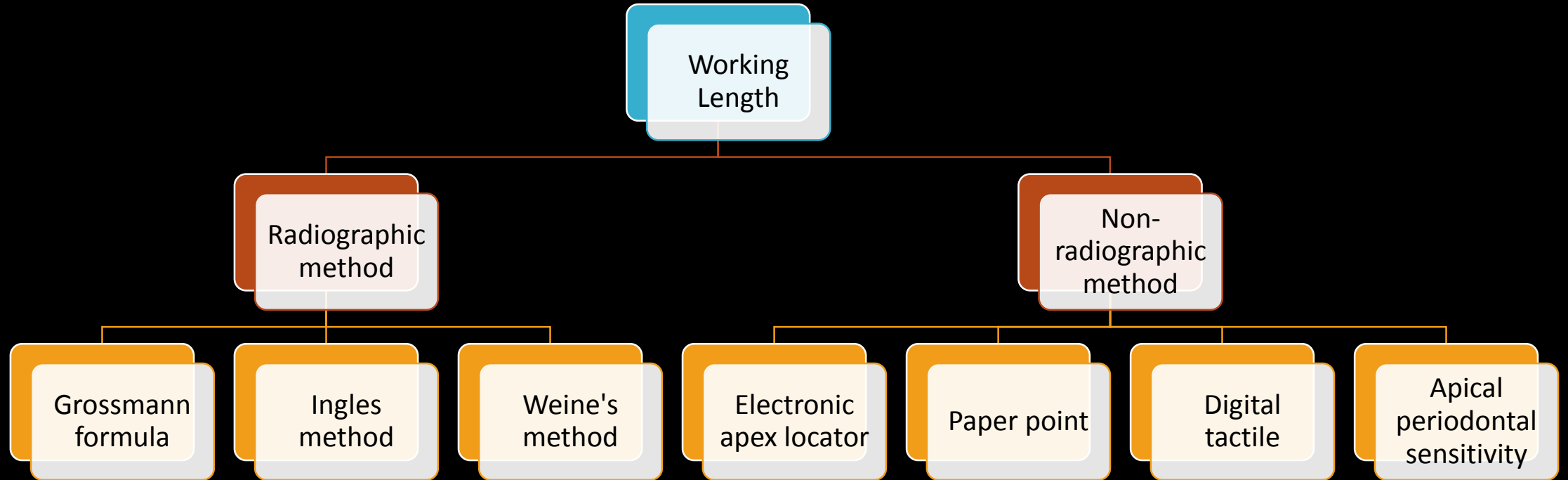
Type C: Multiconstricted



Type D: Parallel constriction



Working Length



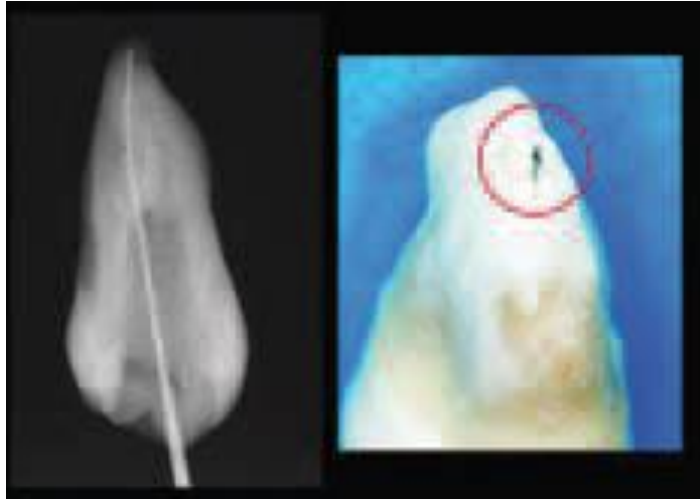
Radiographs

Advantages

- Assess the tooth anatomy
- Assess the degree of root curvature
- Can see relationship between adjacent teeth & anatomic structures

Disadvantages

- Varies with different observers
- Superimposition of anatomic structures
- 2D view of a 3D object
- Radiation exposure
- Cannot interpret if apical foramen has buccal or lingual exit
- Limited accuracy



Reliability of Radiographic WL

When radiographic working length in vitro was set to be 0.5 – 2.0 mm short of the apex:

- 25% of the time the file was beyond the apical foramen.
- 51% of premolars and 22 % of molars were beyond the apical foramen.
- 66% of files were longer than a point 0.5 mm shorter than the apical foramen.

EIAyouti, A., Weiger, R., & Löst, C. (2001). Frequency of overinstrumentation with an acceptable radiographic working length. *Journal of Endodontics*, 27(1), 49-52.

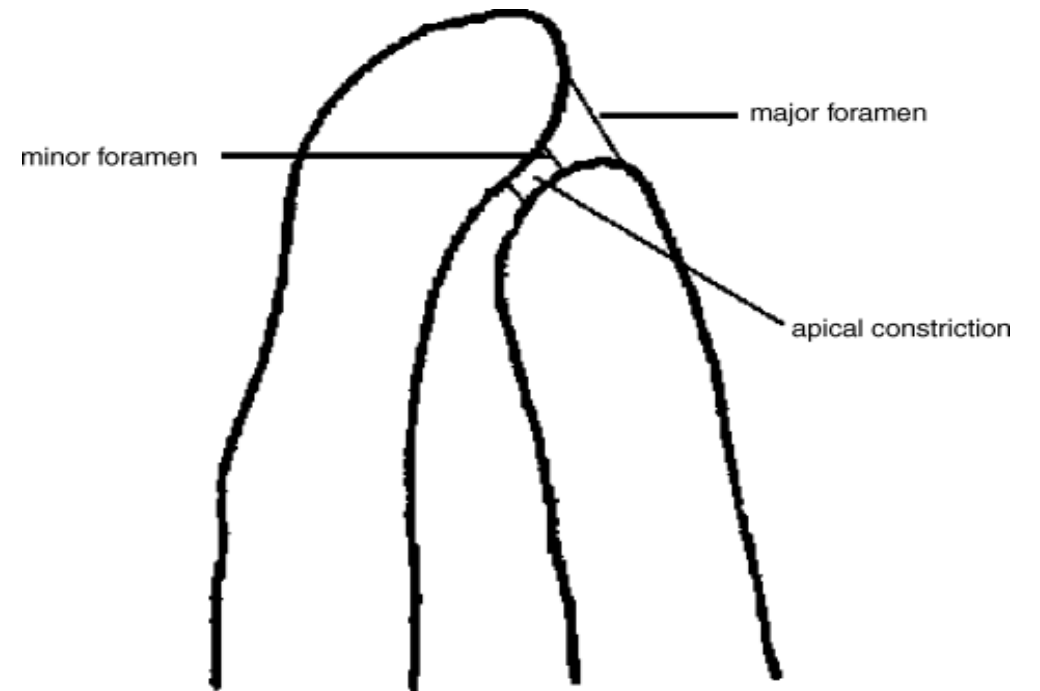
Anatomical evidence

It is not possible to recognize radiographically if the apical foramen ends on the buccal or lingual aspect of the root

- Over instrumentation is a common and unnoticed
- Can appear as short radiographically were in fact obturated beyond the foramen – failure of the treatment
- Ricucci et al. (1991) – apicectomies and successive histological sections demonstrated that the obturation material protruded into the PDL several mm on the buccal aspect

Electronic Apex Locator (EAL)

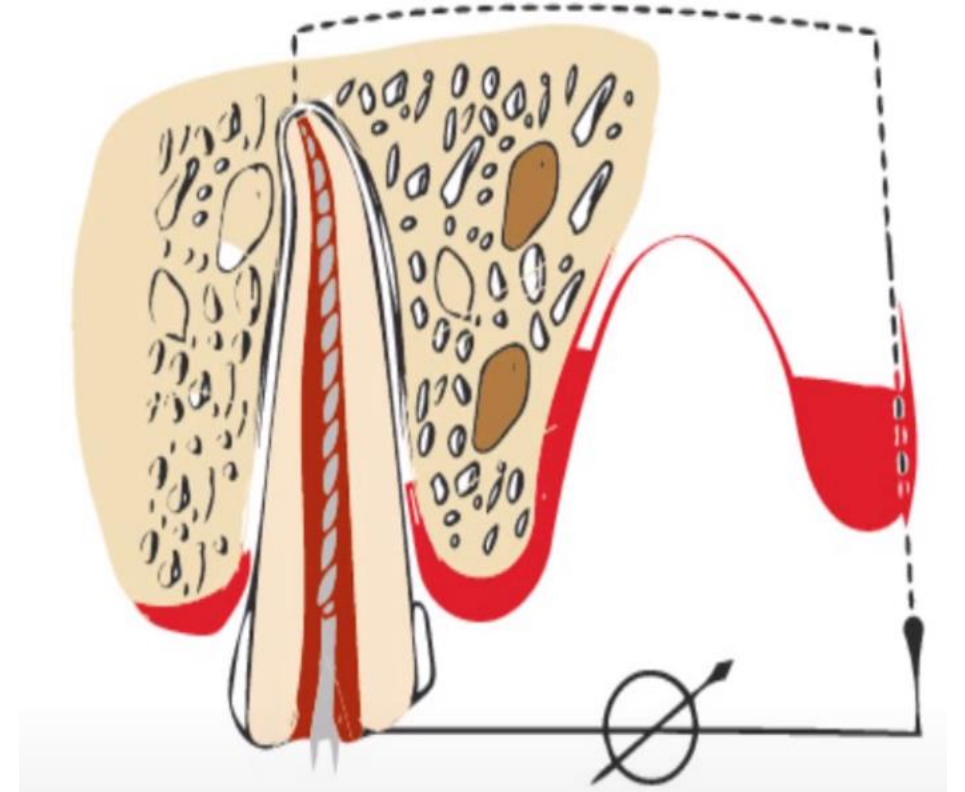
- An electronic apex locator is an electronic device used to determine the position of the apical foramen, which determines the length of the root canal space.



How does it work?

When the tip of an endodontic instrument had reached the periodontal membrane through the 'apical foramen', the electrical resistance between the instrument and the oral mucous membrane was a constant value.

(Sunada, 1962)



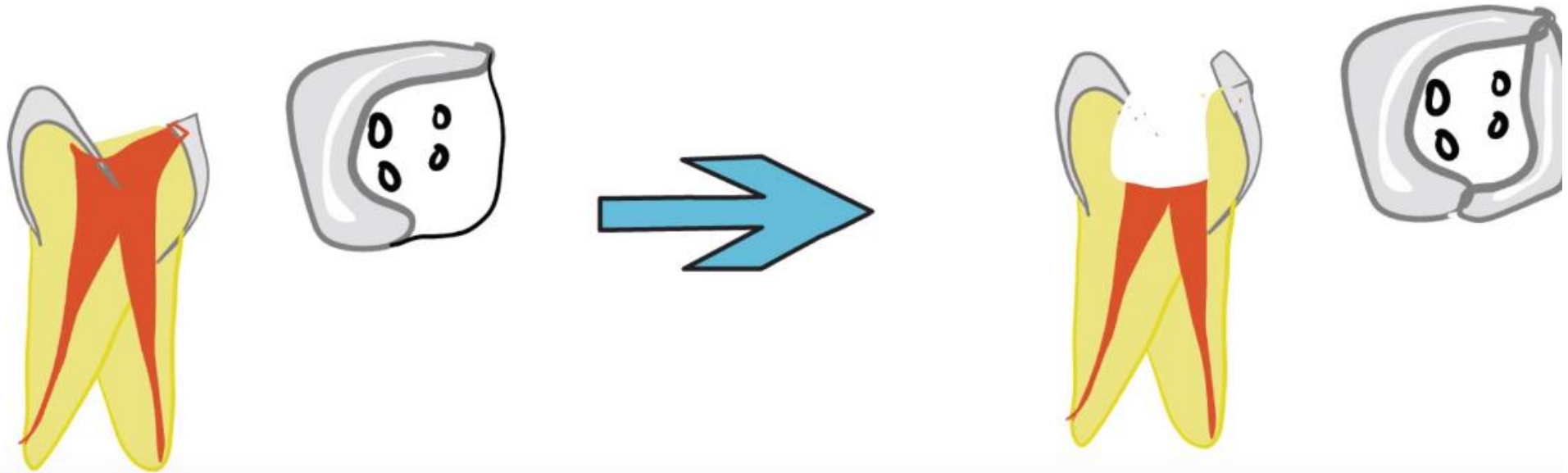
Evolution of apex locator

- 4th and 5th generation EAL uses alternating current.



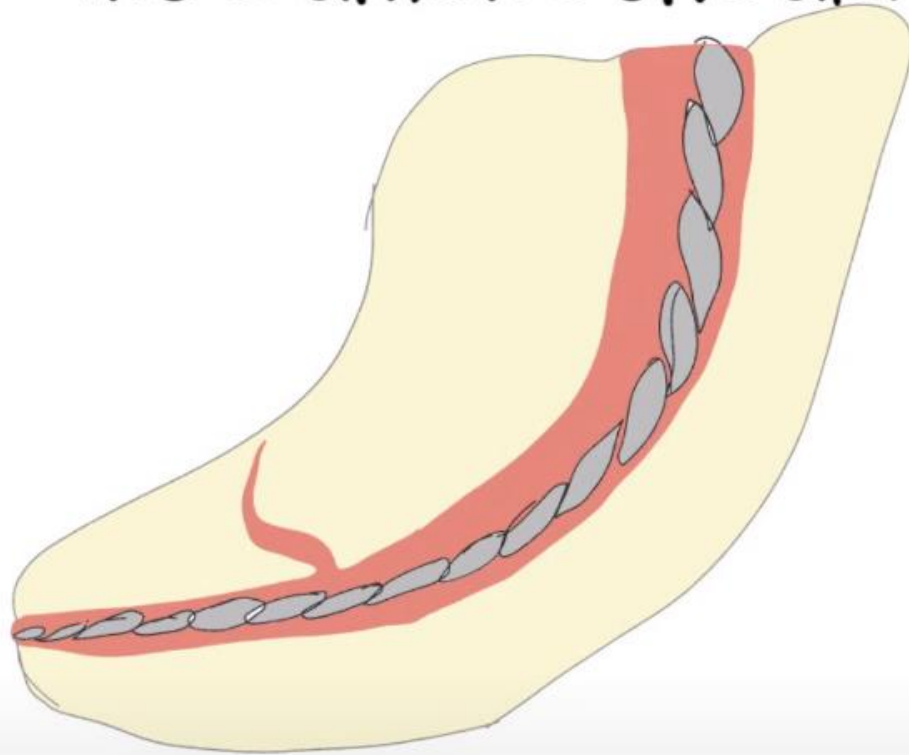
Tips & Tricks

.pre endodontic filling



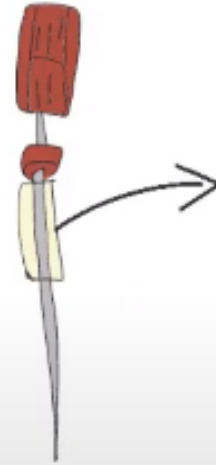
...pre endodontic filling is highly recommended
to avoid leakage of fluids

instrument should not be loose in the canal



file should bind apical part only

metal fillings or metal crowns
should not come in contact



plastic sleeve

sudden change in graph

wrong length

perforation

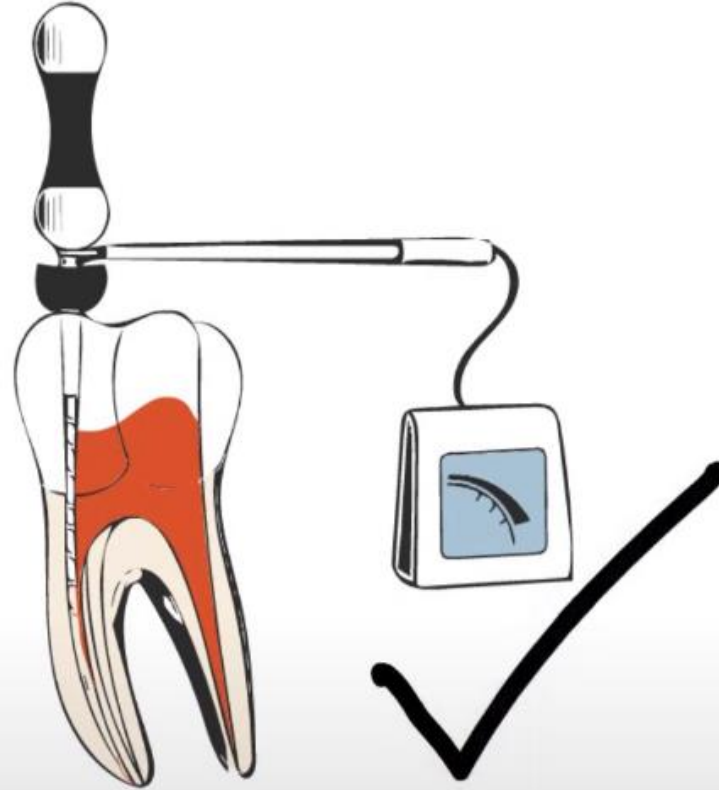
wide apical foramen

accessory canal

for correct reading ----

there should be gradual increase in graph

recheck working length after cleaning & shaping



Success rate – radiographic level of the endodontic obturation

Sjogren et al. (1990)

- Roots with necrotic pulps and periapical lesions:
 - The best prognosis obtained when the obturation within 2 mm of the apex (94%)
 - Prognosis decreased to 76% if the obturation beyond the apex
 - Success rate of 50% in cases with excess root filling during retreatment of previously filled roots

Factors Affecting the Long-term Results of Endodontic Treatment

Ulf Sjögren, DDS, Björn Hägglund, DSS, Göran Sundqvist, DDS, PhD, and Kenneth Wing, DMD, PhD

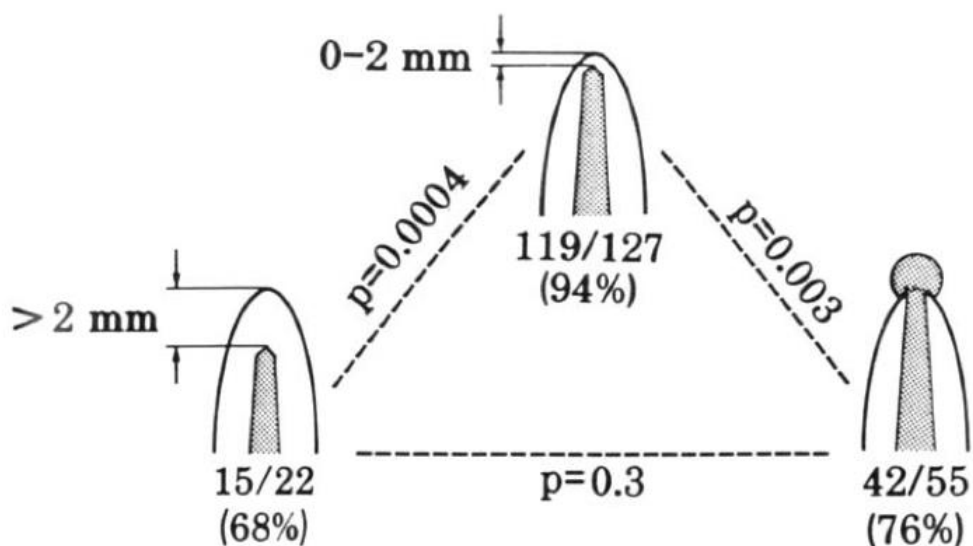


FIG 2. Outcome of treatment according to the level of the root filling in relation to the root apex in cases with pulp necrosis and apical periodontitis preoperatively. Number of healed lesions/number of preoperative lesions.

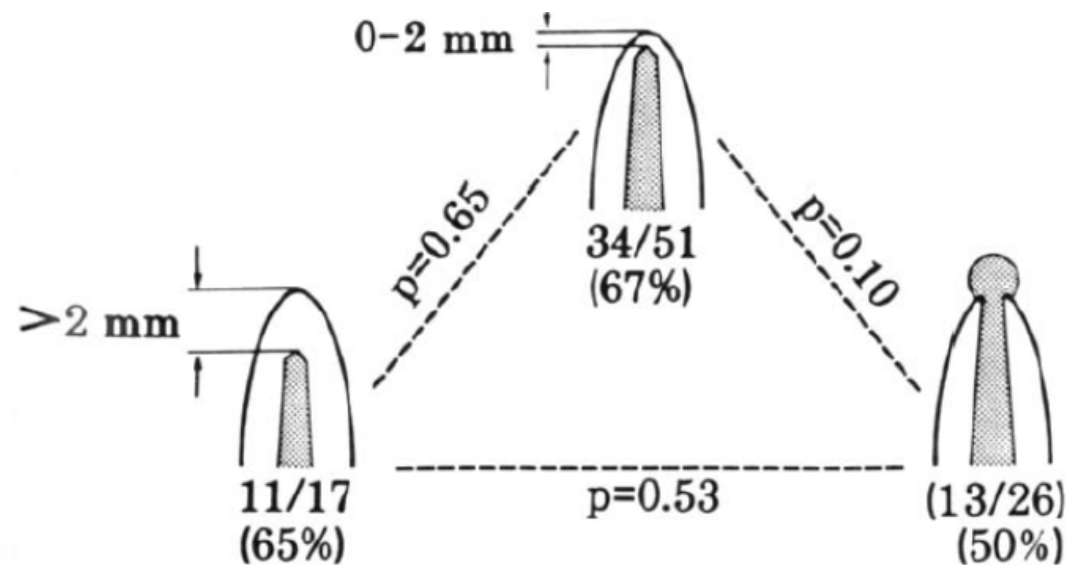


FIG 3. Results of retreatment of previously filled roots with apical periodontitis with regard to the level of the final root filling in relation to the root apex. Number of healed lesions/number of preoperative lesions.

Vital vs non-vital tooth

Wu et al. 2000

- Vital pulp: the best success rate has been reported when the procedures terminated 2 to 3 mm short of the radiographic apex
- Necrotic pulp: better success was achieved when the procedures terminated at or within 2 mm of the radiographic apex (0 to 2 mm)

With an irreversible pulpitis (vital pulp), bacteria (if present) are usually limited to the chamber.

In pulpal necrosis, bacteria and their byproducts, as well as infected dentinal debris may remain in the most apical portion of the canal

Apical limit of root canal instrumentation and obturation, part 2. A histological study

D. RICUCCI^a & K. LANGELAND^b

^aPrivate practice, Cetraro (CS), Italy; ^bDepartment of Restorative Dentistry and Endodontology, School of Dental Medicine, University of Connecticut, CT, USA

- The best prognosis for root canal treatment is: adequate instrumentation and homogeneous obturation to the apical constriction.
- The worst prognosis for root canal treatment is: instrumentation and filling beyond the apical constriction.
- The second worst prognosis is: obturation more than 2 mm short of the apical constriction, combined with poor instrumentation and obturation.

Glide Path Management & Root Canal Preparation

Glide Path Management

To fully negotiate, catheterize, and manually secure any given canal to its terminus.

A size 10 stainless steel (SS) hand file is typically selected to anatomically follow either a partial length or the full length of any given canal.

Further expand this pathway so that the terminus of any given canal is confirmed to be equivalent to at least 0.15 mm.

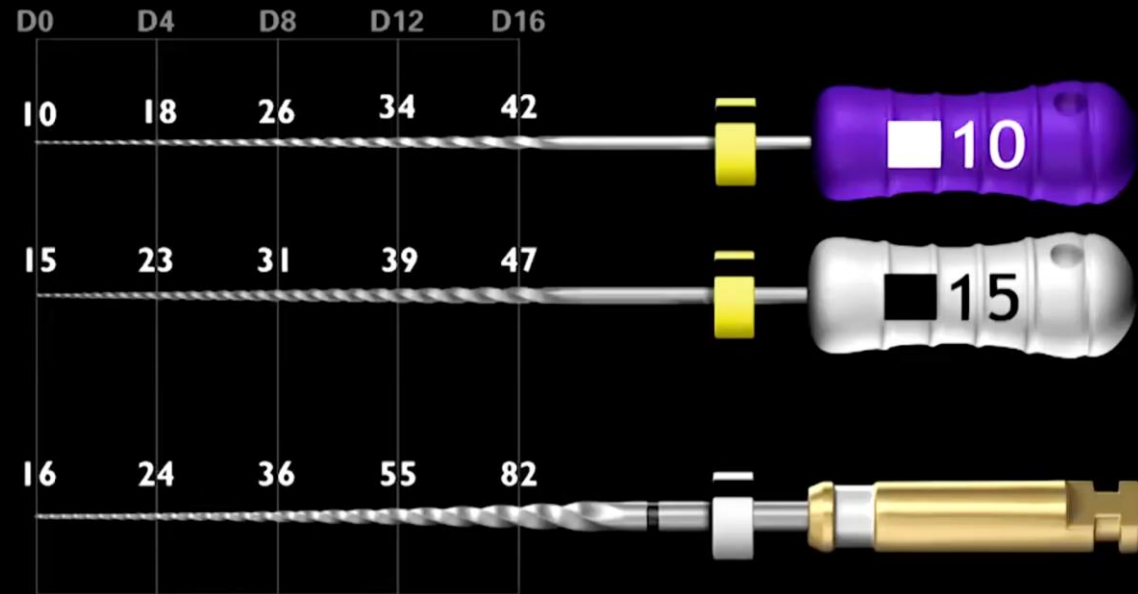
GLIDE PATH MANAGEMENT



1298
997

The size 15 file is 50% larger in diameter at D0 than the size 10 file. Because of this large D0 discrepancy, many partially or fully negotiated canals become iatrogenically blocked, ledged, perforated, or apically transported when using a size 15 SS hand file.

GLIDE PATH MANAGEMENT



1,199
070

A significantly more flexible, dedicated NiTi glide path file has been shown that certain mechanical glide path files more predictably follow a previously secured canal compared to utilizing a manual size 15 SS hand file

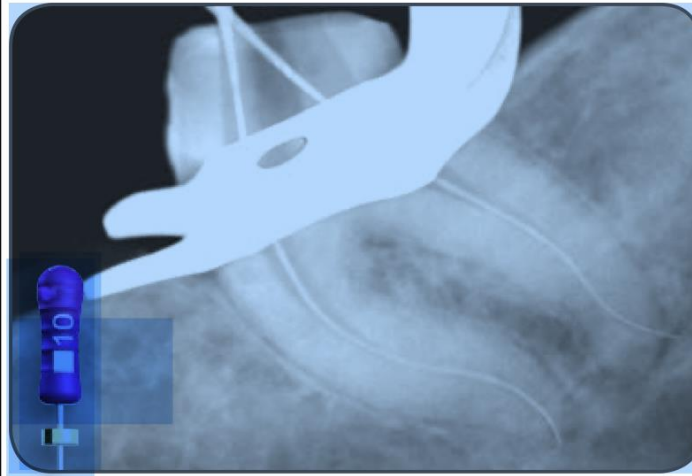
GLIDE PATH MANAGEMENT

PROGLIDER



D16
82
55
36
24
D0 16

Progressive Taper
(2%-8%)



SECURE THE CANAL

GOLD GLIDER



85
61
41
26
15
D16
D0

Progressive Taper
(2%-6%)

ROTARY

M-Wire Metallurgy
300 RPM / 4-5.2 Ncm

CHOOSE YOUR PATH

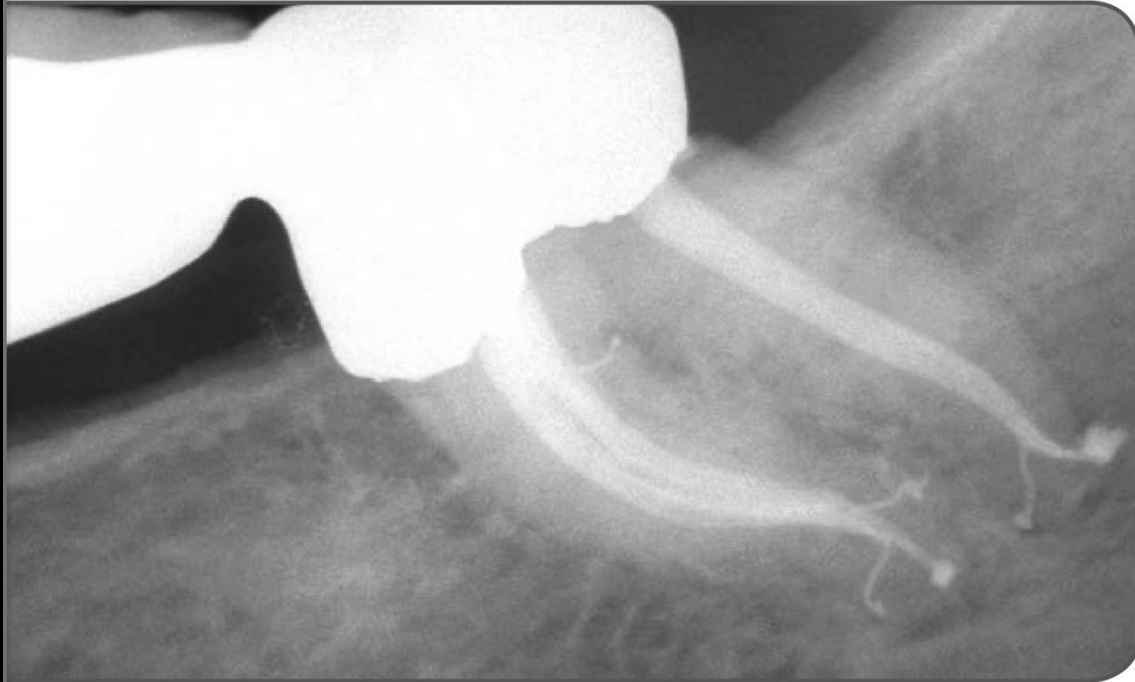
OR

RECIPROICATION

Gold-Wire Metallurgy
150 CCW : 30 CW

MECHANICAL ADVANTAGES

Follow & Expand Original Anatomy • Decrease Postoperative Pain
Improve Shaping Results • Reduce Chair Time • Rotary OR Reciprocation



A smooth, reproducible glide path promotes shaping canals, 3D cleaning, and filling root canal systems.

The metallurgically-enhanced heat treatment of ProGlider and Gold Glider has been shown to significantly improve flexibility and the resistance to cyclic fatigue.

- Prepare straightline access to canal orifice.
- In the presence of a viscous chelator, explore the canal up to a size 10 hand file.
- Establish working length, confirm patency and verify a smooth, reproducible glide path.
- In preparation for using the selected Glider, set the motor to manufacturer prescribed settings.
- In the presence of NaOCl, "float" the selected Glider into the secured canal and passively "follow" the glide path.
- Continue with the selected Glider in one or more passes until the full working length is reached.
- Upon removing the selected Glider, irrigate the expanded glide path, recapitulate and re-irrigate.
- Reconfirm the working length before shaping the canal with rotary or reciprocating mechanical files.

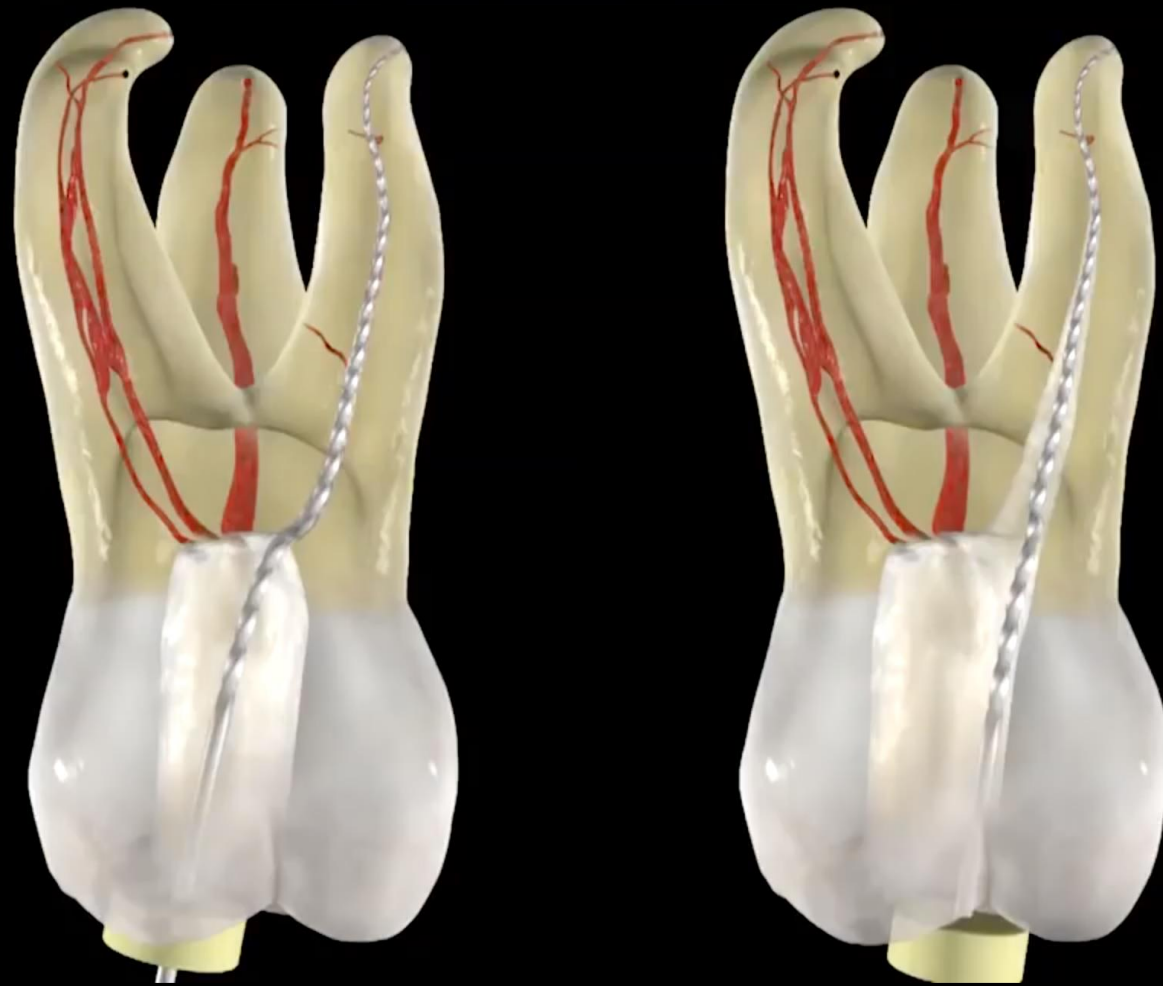


See Directions For Use

ADVANCED  ENDODONTICS®

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Advantages of Pre-enlargement





SEQUENTIAL GLIDE PATH

SCOUT CORONAL 2/3

- Viscous Chelator
- Explore & Discover
- Verify Glide Path



SCOUT APICAL 1/3



- Viscous Chelator
- WL & Patency
- Verify Glide Path



SHAPE APICAL 1/3

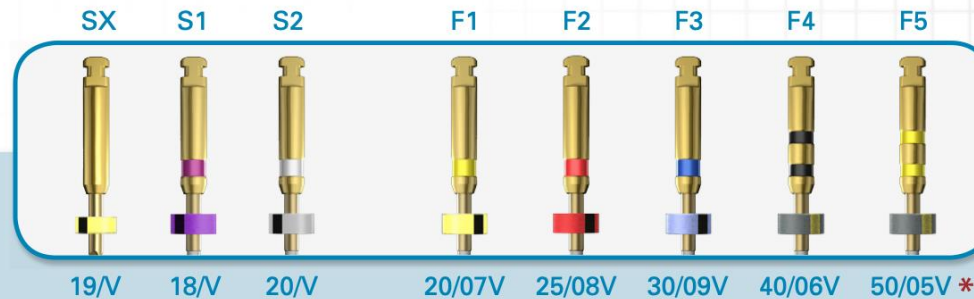
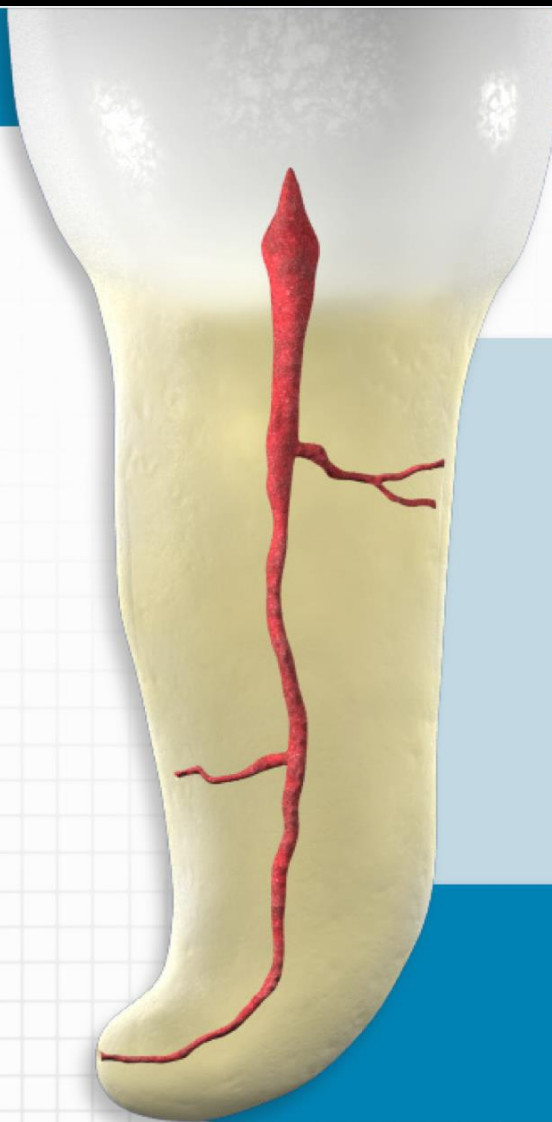


- NaOCl
- Terminal Diameter
- Apical Taper

PROTAPER

Gold™





SECURE CORONAL 2/3
SHAPE CORONAL 2/3

10 | PROGLIDER
SX

SECURE APICAL 1/3
FINISH APICAL 1/3

10 | PROGLIDER
S1 | S2 | F1 ● ● ●

* ProTaper Shaping & Finishing files each have a variably tapered design which respects the concept of minimally invasive endodontics

When necessary, proceed with the F2, F3, F4 or F5 as needed or when more shape is desired

TECHNIQUE TIPS

Use ProTaper files at 300 RPM with a torque of 5.2 Ncm

Use ProTaper files in regions of the canal that have a confirmed, smooth and reproducible glide path

Use ProTaper files in a deliberate brushing motion on the outstroke to more optimally prepare canals that exhibit irregular cross-sections and to facilitate apical file progression

Irrigate, recapitulate with a 10 file and re-irrigate after removing each rotary file

Frequently clean and inspect the flutes of the rotary file

Use SX to relocate the coronal aspect of a canal away from an external root concavity and eliminate triangles of dentin when present

Visit endoruddle.com
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- Create straightline access to canal orifice
- In the presence of a viscous chelator, use a size 10 file to verify a glide path to length. In more restrictive canals, use the size 10 file in any region of a canal to create a glide path
- Expand this glide path to a size 15 hand file, or preferably, use ProGlider
- In the presence of NaOCl, “float” the SX into the canal and passively “follow” the glide path. Before resistance, laterally “brush” and cut dentin on the outstroke
- Continue with SX, in one or more passes, to pre-enlarge the canal and improve radicular access especially in longer, more narrow and curved canals
- In more restrictive canals and in the presence of a viscous chelator, use the size 10 file to scout the terminus of the canal. Gently work this file until it is completely loose at length
- Establish working length, confirm patency and verify a smooth, reproducible glide path to the terminus of the canal
- Expand this glide path to a size 15 hand file, or preferably, use ProGlider
- In the presence of NaOCl, use S1, exactly as described for SX, in one or more passes, until the working length is reached
- Use S2, exactly as described for SX and S1, until working length is reached
- Reconfirm working length, especially in longer, narrower and more curved canals
- Use F1 with a *brushing action* until working length is reached then withdraw the file and inspect its apical flutes. The shape is confirmed whenever any one of the Finishers’ apical flutes are filled with dentinal mud



References

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Thank you!