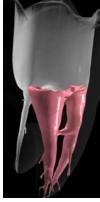
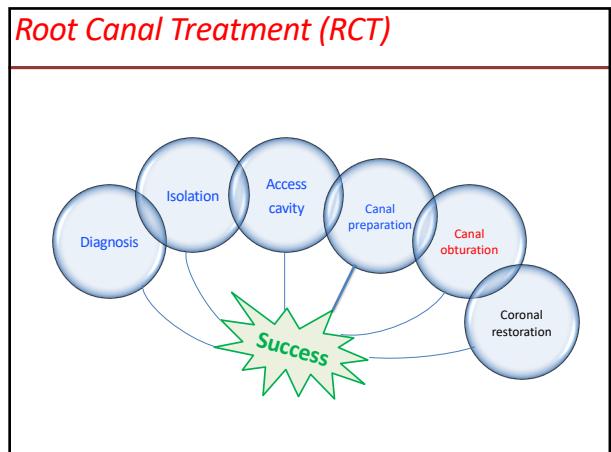


Obturation and Latest Advances

Dr Saaid Al Shehadat



Year4
24/9/2019



Aims and objectives

To fill the entire space resulted from pulp tissue extirpation and root canal preparation



Timing Of Obturation

- No pain, swelling, tenderness to percussion
- canal is **dry** and free of odor
- A little **colorless** exudate??
- Canal was not in contact with oral cavity



Obturation Techniques

1. Lateral Compaction
2. Vertical Compaction
3. Continuous Wave
4. Warm Lateral
5. Injection Techniques
6. Thermomechanical
7. Carrier-Based
8. Chemoplasticized
9. Pastes
10. Apical Barrier

American Association of Endodontists, 2009



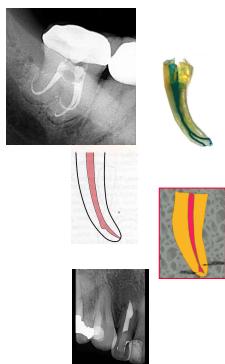
1- Lateral Compaction



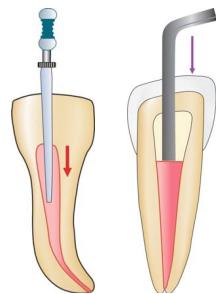
Lateral Compaction

Not suitable for

- severely curved canals
- abnormally shaped canals
- gross irregularities
- internal resorption



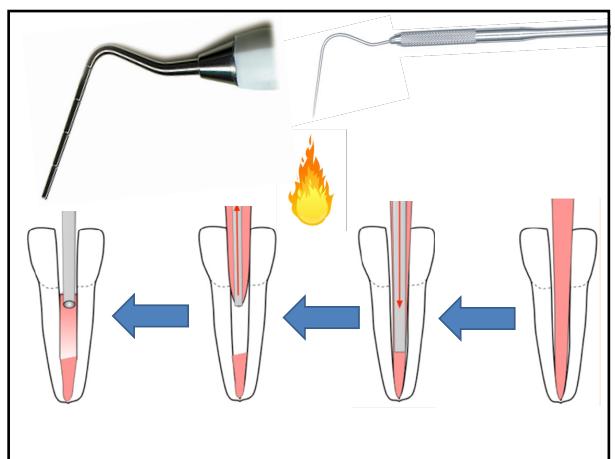
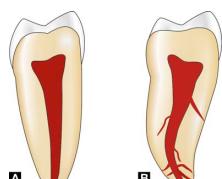
2. Vertical Compaction



Schilder's technique of obturation

Vertical Compaction

Vertical compaction aims to fill all lateral and accessory canals and anastomoses



Vertical Compaction



Vertical Compaction

Advantage

- Excellent sealing of canal apically, laterally and obturation of lateral as well as accessory canals

Disadvantages

- Difficult procedure to master
- Time consuming
- Mishaps: lip burning

Vertical Compaction



3. Continuous Wave



1987

Continuous Wave

The heat carriers (Buchanan pluggers):

- soft stainless steel heat pluggers
- fairly flexible, allowing condensation in narrow, curved canals



Buchanan heat pluggers

(XF, F, FM, M, ML)

Continuous Wave

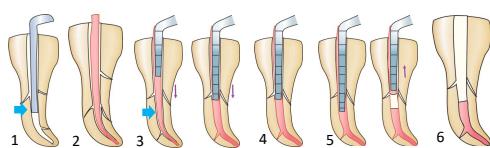
Precautions

- Canal shape should be continuous perfectly tapered
- Do not set at high temperature (200°C, power setting 10, touch mode)



Continuous Wave

- Plugger 5-7 mm short of working length
- Confirm fit of the cone, cut 0.5 mm of the tip
- Push the preheated plugger smoothly 3-4 mm of the binding point (on)
- Release the switch (off). Keep pressing here (10 s) to compensate possible shrinkage
- Removal of plugger: Maintaining pressure, activate 1 s, pause 1 s, then remove
- use a small plugger with pressure to confirm that gutta-percha has not dislodged
- backfill by any means



Continuous Wave



Continuous Wave

Advantages

- Excellent apical control
- Less technique sensitive
- Fast, easy, predictable
- good condensation of the main canal and lateral canals

Re-RCT for tooth # 26
69 old female patient
1 session treatment



Re-RCT for tooth # 26
69 old female patient
1 session treatment

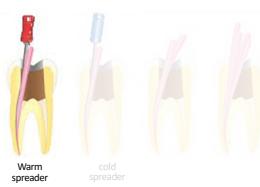


4. Warm Lateral



Warm Lateral

- Insert the heated spreader
- Insert unheated spreader (better bigger size)
- Insert accessory
- This process is continued until canal is filled



Warm Lateral

Advantages

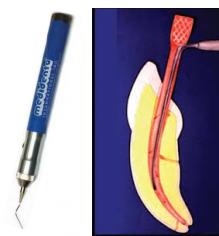
- Heat is not introduced to apex
- Precise guttap percha length control
- Filling of voids, isthmus, lateral and accessory canals
- Potential for root fracture is reduced
- No need for special gutta percha or special instruments

Warm Lateral

- Insert the heated plugger in canal beside master cone to within 3-4 mm of the apex using light apical pressure

- Use vibration for lateral condensation

Endotec II



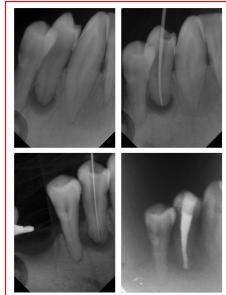
Warm Lateral

Ultrasonic Plasticizing of Gutta-Percha

- Earlier cavitron US scaler was used in anterior teeth
- Recently Enac Ultrasonic unit: produce homogenous compaction of GP



Ultrasonic vibration



5. Injection Techniques

Thermoplasticized Injectable GP Obturation

Injection Techniques

filling systems

- Obtura II (Obtura Spartan, Earth City, Mo.)
- Ultrafil (Coltene Whaledent, Cuyahoga Falls, Ohio)
- Calamus® (DENTSPLY Tulsa Dental Specialties, Tulsa, Okla)



Injection Techniques

- Continuous tapering to maintain unrestricted flow
- A definite apical stop to prevent overfilling



Injection Techniques

Indications

- Roots with straight or curved canals
- Abnormalities (anastomosis, ramifications, C-shaped)
- Roots with internal resorption
- For backfilling of canals



Injection Techniques

Techniques (obtura II)

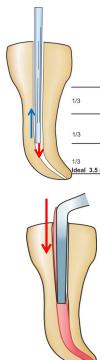
- Regular Beta phase of GP pellets are heated to 365-390°F (185-200°C) and injected



Injection Techniques

Techniques (obtura II)

- Fit the needle tip
- Apply sealer
- Inject warm GP and let the back pressure pushes the needle out of the canal
- Use pluggers to compact the GP

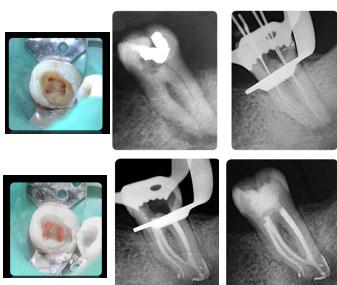


Injection Techniques

Number	Description		
974-0058	Size #1 Red	Stainless tip NiTi Tip	.02/.1.2 .03/.40
974-0059	Size #2 Blue	Stainless tip NiTi Tip	.02/.1.2 .03/.70
974-0060	Size #0 Yellow	Stainless tip NiTi Tip	.02/.75 .03/.25



Injection Techniques



Mohammed Zafrahy

Endodontic Apical plug

Dr Mohammed Alshehri, KSA

European Patent Certificate



Injection Techniques

Is there any injectable technique where master cone is needed?

GuttaFlow®

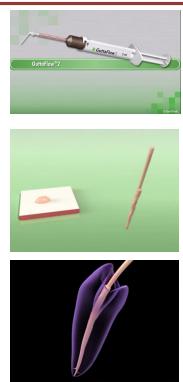
- Consists of powdered GP added to a resin sealer in one capsule
- Mix the capsule 30 s in a triturator
- The material is injected into the canal followed by placing of a single master cone



Coltene Whaledent

GuttaFlow® 2

- No condensation
- Expanded slightly and adhere to dentin
- Easy to remove for re-treatment and post preparation
- Easy handling
- Biocompatible



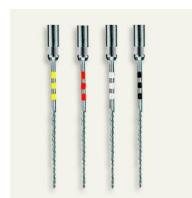
GuttaFlow Bioseal

- Less setting time
- Forms hydroxylapatite crystals on the surface of GuttaFlow bioseal



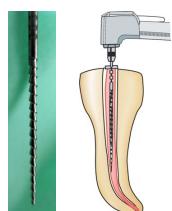
6. Thermomechanical technique

McSPADDEN COMPACTION



Thermomechanical tech.

- Resembles reverse H-file
- Can be rotated at 8000-15000 rpm alongside GP
- Designs of blade forces the material apically



Thermomechanical tech.

Disadvantages

- Not indicated in narrow and curved canals
- Frequent breakage of compactor blades
- Overfilling of canals
- Shrinkage of gutta-percha on cooling



Revo Condensors - Micro-Mega



7. Carrier-Based Technique

- Solid Core Carrier Technique
- Thermafil Endodontic Obturators (Dentsply)



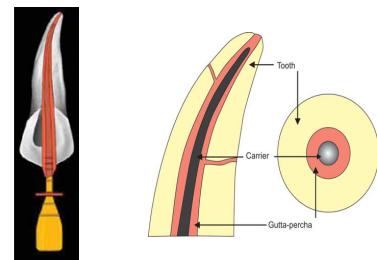
Carrier-based tech.

Flexible steel, titanium or plastic carriers coated with alpha phase GP



Carrier-based tech.

The carrier acts as carrier and condenser for thermally plasticized GP



Carrier-based tech.

Have ISO color coding; sizes of 20-140



Carrier-based tech.

Advantages

- Less chair side time
- Easy, one single insertion
- Dense 3D filling
- Excellent radiopacity
- Fill lateral canals and canal irregularities (fins, anastomoses)
- Minimum compaction and less strain
- Matches the shape created by today's files

Disadvantages of solid core Carrier techniques

- Strict apical stop
- Re-treatment
- Post placement



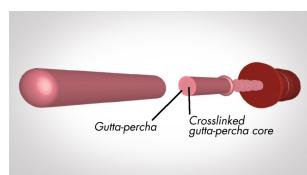
Carrier-based tech.

- **Realseal 1™** (Sybron, Orange, Calif.)
- **Densfil™** (Dentsply Maillefer, Tulsa, Okla.)
- **Soft-Core®** (Axis Dental, Coppell, Texas)
- **Gutta-Core®** (Dentsply Sirona)

Gutta core (Dentsply)

Ease of retreatment:

- No plastic core remaining in the root canal
- The core comes out efficiently, saving time and hassle



8. Chemoplasticized



Chemoplasticized tech.

- Indicated in a very wide canal with open apex



Chemoplasticized tech.

Braided cone



chloroform, eucalyptol or halothane



Chemoplasticized tech.



9. Pastes

- Hydron
- Calcium phosphate
- Gutta flow

When used as the definitive filling material without a core, they are generally considered to be less successful and not ideal

10. Apical Barrier

For canals with immature roots with open apices

- Dentin chips
- Calcium hydroxide
- MTA filling

MTA is generally considered the material of choice at this time



Apical Barrier

Dentin Chip Filling

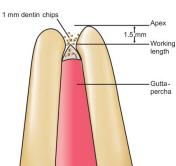
- a Biologic seal
- H-file or gates glidden is used to produce dentin chips
- Chips are then packed apically with butt end of paper point and compact them apically



Apical Barrier

Dentin Chip Filling

- 1-2 mm of chips should block the apical foramen
- Backpacking is done using gutta-percha compacted against the plug



Apical Barrier

Dentin Chip Filling

Advantages

- Biocompatible
- Promotes healing and decreases inflammation
- Prevent extrusion of filling material from the canal space

Apical Barrier

Dentin Chip Filling

Disadvantage

- infected pulp tissue can be present in the dentinal mass and may cause harmful effects
- Weaken the root

Apical Barrier

MTA

- Mix to putty consistency
- Carry in the canal with
 - Messing gun
 - amalgam carrier
 - specially designed carrier
- Compacted with micropluggers



Apical Barrier

MTA

Advantages

- excellent biocompatibility
- Radiopaque
- bacteriostatic
- resistance to marginal leakage

Disadvantages

- Difficult to manipulate
- Long setting time (3-4 h)

References

- Cohen's Pathways of the pulp. 10th edition, 2011
- Garg, Nisha, and Amit Garg. Textbook of endodontics. Boydell & Brewer Ltd, 2010.