Complications of endodontic treatment

Local
Regional
Systemic
Plug of dentin chips
Ledging
Transportation of the root canal
Via falsa
Zipping a elbow
Local complications
Reasons

Insufficient irrigation and recapitulation

Loss of the working length
Solution

Repeated careful instrumentation with a thin instrument

*Irrigation is not effective in this case!!!*
Ledging

Reasons

The instrument is not bended in advance!

No control of the WL

=  

No recapitulation

Loss of the WL
Solution
The instrument must be bended in advance

Careful but complete rotation

Finishing with the fine filing

No NiTi!!!
Ledging
Zipping a Elbow

The instrument is not bended in advance!

Rotation in curved canals
Stripping

Reasons

Bad orientation in morphology – no diagnostic x-ray
Instruments are nod bended
Rotary NiTi with a big taper

Dangerous zones
Mandibular molars – mesial roots

Premolars, esp. maxillar
Mandibular incisors

Oblast isthmu
Stripping

Důkladný přehled!

Šetřit oblast isthmu!

Ruční preparace!

Menší kónus NiTi!
Stripping

Bend the instrument and eventually blunt it!
Fracture of the root canal instrument

Reasons

- Insufficient coronal flaring
- Old root canal instrument
- Aggressive force
- Incorrect movement of the root canal instrument
Solution

Enlargement of the root canal till the instrument

Ultrasound tips

Rotating root canal instrument – caution!

Bypass

Leaving in

Surgical treatment
Fractured instrument
Obliteration
Obliterace

Access!!!

Hand thion
Instrument!

Steel or NiTi

EDTA

Patience
Obliterace

Úplná - ponechat.
Resorption

Calcium hydroxide

- Long term
- Middle term
- Short term
Via falsa

- Perforation of the bottom of the pulp chamber or the coronal part of the root canal
- Perforation in the middle part of the root canal
- Apical perforation
MTA composition

- Dicalcium silicate
- Trikalcium silicate
- Trikalcium aluminate
- Tetrakalcium aluminate
- Cuprum sulphate
- Bismuthum trioxide

= Portland cement
MTA

- umožňuje hojení – dobrý okrajový uzávěr!

Zabraňuje přístupu mikroorganismům, umožňuje hojení dřeně a periodoncia tvrdou tkání.
Via falsa - treatment

- No bleeding
- Desinfection
- MTA – moisture (wet cotton pellet)
- Calcium hydroxide
- Filling
Via falsa

- Perforace apikálně

Hydroxid kalcia, kořenová výplň.
MTA

- Umožňuje hojení – dobrý okrajový uzávěr!
Zabraňuje přístupu mikroorganismům,
umožňuje hojení dřeně a periodoncia tvrdou tkání.
Zdroj: Manuál firmy Maillefer
Regional complications
Píštěl
Systemic complications
Systemic complications

- Periostitis
- Inflammation of soft tissues (face, neck)
- Gulp of the instrument (X ray, remnant diet, information) - cough
- Aspiration of the instrument - emesis
Odstranění cizího tělesa z hrtanu

Stlačení hrudníku ze stran
Caution!

Always find the loss instrument !!!!!!
Irrigation of the root canal

- Removal of corpuscular material
- Desinfection
Výplachové roztoky

✓ Natrium hypochlorite – 0,5% – 5,25%
   (1% - 2%)

✓ Chlorhexidin (0,12 – 0,2%)

✓ EDTA 17%  solution or lubrication gel

✓ Hydrogen peroxide 3%

✓ Peracetic acid – 1%
Cannula

Activation of irrigation

- Hand
- Ultrasound
- Hydrodynamic
- Laser
Desinfection

- Calcium hydroxide
- Antibiotics and corticosteroids
Calcium hydroxide

- Alcaline
- Antibacterial
- Stimulation of hard tissue formation
- Haemostatic and antiphlogistic
Calcium hydroxide

Temporary root canal filling
Subbase
Component of sealers
Dressing
Calcium hydroxide

- Short term action
  1 – 2 weeks
  Desinfection, haemostasis
Calcium hydroxide

- Midle term action
  2 – 3 months

Apexification

Chronic form of apical periodontitis
Calcium hydroxide

- Long term action
  3 months and more

Prevention of resprption
Magistraliter

The powder is mixed with destilled water

Lentule 2 mm less than WL !!!!!
Apexit® Plus

ApexCal®
Root canal filling
Ideal root canal filling
(Grossman 1988)

1. Easy mixing
2. Sufficient working time
3. Good seal
4. X-ray contrast
5. Easy removal
6. No shrinkage
7. Long term volume stability
8. No bacterial growing
9. No permeability for fluids
10. Biocompatibility
11. No staining
Classification of root canal fillings

- Solid
- Semisolid
- Pastes
Gutta percha

Dried juice of the Taban tree (Isonandra percha) (gutta)

1,4 - polyisoprene

Crystalline structure (60%)

Brittle
Guttapercha

- Beta phase
- Alpha phase 42 – 49 °C
  - plastic
  - Gamma phase 56 – 62° (amorfní)

Cooling process
very slowly (less than 0,5°C) – alpha phase
normal cooling – beta phase
Composition of gutta-percha materials in endodontic

Gutta-percha 19% – 22%

Zinc oxide 59 - 79%

Heavy metal salts 1% - 7%

Wax or resin 1% - 4%
Resilon
(Pentron)

- Thermoplastic synthetic polymer
- Points or material for injection

**Composition:**

*Polyester polymers*
*Bioactive glass*
*Radioopaque fillers (bismuthum oxichlorid a and baryum sulphate)*
Silver or titanium cones

- No good seal
- Silver cones - corrosion
Sealery

Chemically curing plastic materials

Good adhesion to root canal walls as well as solid cones

X-ray contrast

Biocompatibility
Sealers

Zinc Oxide-Eugenol
Chloropercha
Calciumhydroxide
Resins
Glasionomer
Silicone
Sealers

**Importance**

*Filling of the spaces between the solid cones*

*Seal of the root canal filling*
Zinc - Oxid Eugenol

Powder:
Zinc oxide

Liquid:
Eugenol
Acidic resins
Good adhesivity, antimikrobial effect, cytotoxic, resorbable
Zink Oxid Eugenol sealers

Pulp Canal Sealer (Kerr, USA)

Tubuli- Seal (Kerr, USA)

Caryosan (Spofa Dental, ČR)
Chloropercha

- Powder
- Canadian balsam
- Resins
- Guttapercha
- Zinc oxide

Liquid:
- Chloroform
- Resins
Chloroperča

Vlastnosti:

Good adhesivity
Shrinkage
Toxicity
Calcium hydroxide sealers

Base (powder)
Calcium hydroxide
Zinc oxide
Other components and vehicula
Kalciumhydroxidové sealery

Catalystr (paste)
Zinc stearat
Titanium dioxide
Baryum sulphate
or
Eugenol,. Eukalypt

others
Kalciyumhydroxide sealers

- Increase of the healing potential of periapical tissues
- Antibacterial effect
- Easy manipulation

But!

Resorbable if not homogeneous

Not suitable for the single cone technique
Resins

- Rezorcin formaldehyd
- Epoxide
- Polyketone
- Metacrylate
Toxicity

N2, Endomethason, Riebler’s paste, Foredent