The Endodontics
Introduction

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Introduction

Definition

Endodontontology

• form
• function
• health of the dental pulp and the periradicular tissues that surround the root(s) of teeth.
• injuries and diseases of the pulp and periradicular tissues and their prevention and treatment.
Introduction

History

1- Ancient root canal filling: Nabatean warrior in 2200 years ago (200 BC), 2.5 mm metal bronze wire inside the root canal

2- It was thought that the metal wire could prevent the tooth warm from burrowing inside the canal

Figure 1. (2.5 mm) metal bronze wire inside the root canal.
Introduction

History

3- The ancient Chinese also thought that the cause of the caries is tooth warm

4- Chinese used arsenicals to treat pulpitis by the year 200 AD

Figure 2. Chinese character representing the warm and tooth
History

5- Dr Louis I. Grossman, divided the period between the 1776 and 1976 into four 50-years periods.

- **1st period** → Leeches or toasted fig poultries & red-hot wire
- **2nd period** → General anaesthesia, rubber dam, Intracanal antiseptics, barbed broaches & gutta-percha
- **3rd period** → Local anaesthesia, x-ray, CMCP
- **4th period** → Improvements in the radiographs, anaesthetics and procedures of treatment and introduction of new agents such as Calcium hydroxide & EDTA

Figure 3. Dr. Louis I. Grossman, the dean of American endodontists, if not the world.
Introduction

Anatomy

Pulp space or cavity
1-Pulp chamber
2-root canal

Change in size and shape of the pulp cavity

1-Secondary dentine
2-Irritation dentine (reparative dentine, irregular secondary dentine, osteodentine and tertiary dentine)

Aging

External stimuli or irritant (caries, attrition, abrasion, erosion, impact trauma and clinical procedure)

Figure 4. Anatomy of pulp space
Introduction

Histology

Pulp
- cells, intercellular substance, fibre elements, vessels and nerves

1-Peripheral region
- Odontoblast cells, cell-free zone of Weil (subodontoblastic layer) which consists of plexuses of capillaries and small nerve fibres and cell-rich zone which consists of fibroblasts and undifferentiated cells

2-Central region
- Large vessels and nerves, cells (fibroblast are the principal cells) and extracellular substance (ground substance and collagen are the principal components)
Introduction

Pathology

Noxious stimuli ➔ Pulp inflammation, necrosis and dystrophy

Noxious Stimuli:

I. Bacterial
II. Traumatic
III. Iatral
IV. Chemical
V. Idiopathic
I. Bacterial

A. Coronal ingress
   1. Caries
   2. Fracture (a. Complete. b. Incomplete)
   3. Non-fracture trauma

B. Radicular ingress
   1. Caries
   2. Retrogenic infection (a. Periodontal pocket. b. Periodontal abscess)
   3. Hematogenic

II. Traumatic

A. Acute
   A. Coronal fracture
   B. Radicular fracture
   C. Vascular stasis
   D. Luxation
   E. Avulsion

B. Chronic
   1. Adolescent female bruxism
   2. Traumatism
   3. Attrition or abrasion
   4. Erosion
A. Cavity preparation
1. Heat of preparation
2. Depth of preparation
3. Dehydration
4. Pulp horn extensions
5. Pulp haemorrhage
6. Pulp exposure
7. Pin insertion
8. Impression taking

B. Restoration
1. Insertion
2. Fracture (a. Complete . b. Incomplete)
3. Force of cementing
4. Heat of polishing

C. Intentional extirpation and root canal filling

D. Orthodontic movement

E. Periodontal curettage

F. Electrosurgery

G. Laser burn

H. Periradicular curettage

I. Rhinoplasty

J. Osteotomy

K. Intubation for general anaesthesia
IV. Chemical

A. Restorative materials
   1. Cements
   2. Plastics
   3. Etching agents
   4. Cavity liners
   5. Dentine bonding agent
   6. Tubule blockage agent

B. Disinfectants
   1. Silver nitrate
   2. Phenol
   3. Sodium fluoride

C. Desiccants
   1. Alcohol
   2. Ether
   3. Others

V. Idiopathic

A. Aging
B. Internal resorption
C. External resorption
D. Hereditary hypophosphatemia
E. Sickle cell anaemia
F. Herpes zoster infection
G. HIV and AIDS
2. Aim

Endodontic or root canal treatment aims to preserve teeth in a healthy and functional condition by

• removing diseased pulp tissue
• managing internal infection
• preventing its recurrence.
Specific indications

Every tooth is indicated for endodontic treatment, from central incisor to third molar.

The specific indications of endodontic treatment are:

• Teeth with irreversibly damaged or necrotic pulps, with or without clinical and/or radiographic signs of apical periodontitis.

• Teeth with no clear evidence of pulp disease, where pulp space is required for restorative procedure (e.g. post space preparation, preparation of overdenture abutments, tooth hemisection, crown preparation on mis-aligned teeth).

So, RCF can be provided for teeth with vital and non-vital pulp tissues.
3. Method

1. Instrumentation
   - opens access for the deep exchange of irrigants

2. Irrigation
   - develop a smoothly tapering canal form that will promote the dense compaction of root canal filling materials

3. Obturation
Thank you