



## Periodontology- Fifth stage

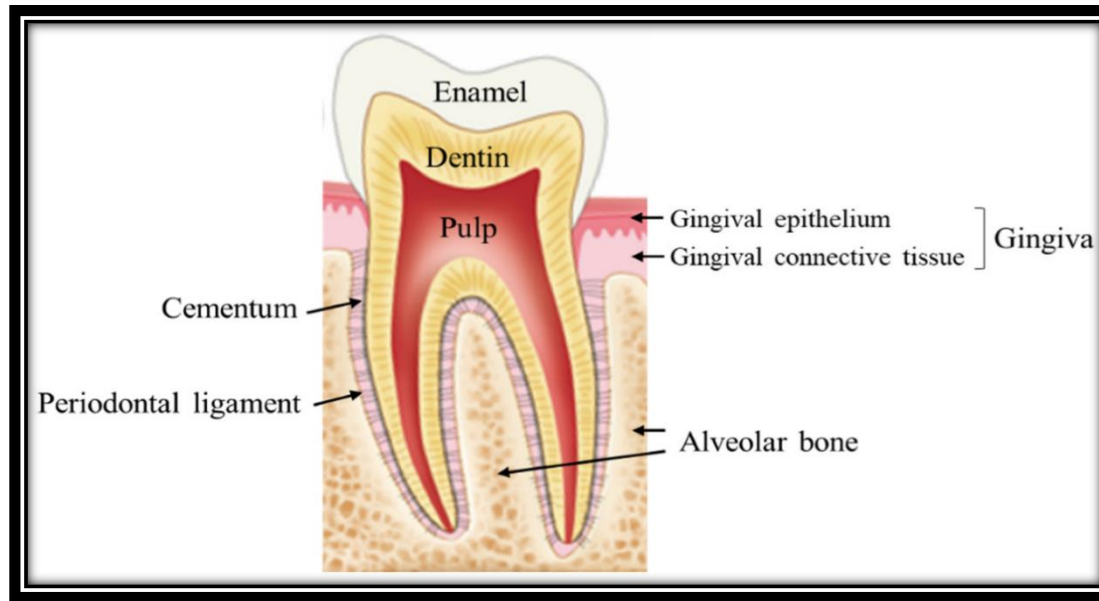


# Second semester-Endodontic-Periodontic Lesions: Pathogenesis, Diagnosis, and Treatment Considerations

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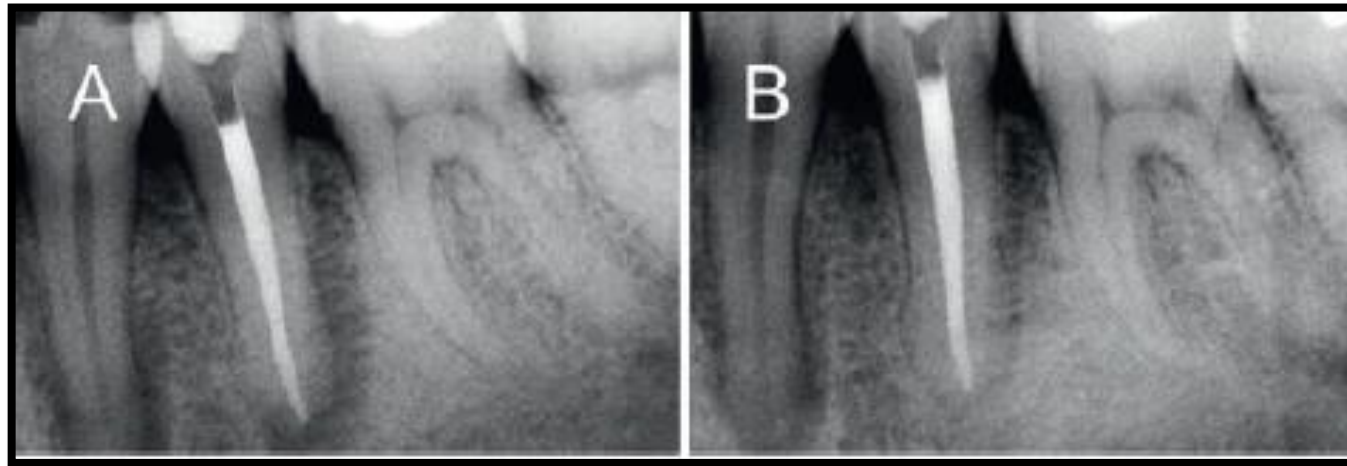
# Introduction

- Periodontium and pulpal spaces represent the two primary sites of dental infection from oral bacteria.
- These two spaces are separated by hard shell of dentin, but they may communicate through various portals, such as root canal foramina, dentinal tubules, and even crack lines, through which bacteria and microbial irritants may trigger inflammatory responses in surrounding tissues.



# Definition

- **Endo-perio lesion** refers to a lesion that shows dependent and/or independent involvement of the pulp (or the pulp space in the case of endodontically treated teeth) and periodontal tissues of an individual tooth, regardless of the aetiological factors, pathological patterns, or the treatment approach.
- **Retrograde periodontitis** is the most common example of pulpal diseases leading to secondary periodontal breakdown and it represents periodontal tissue breakdown from an apical to a cervical direction.
- **Orthograde periodontitis**, which results from a sulcular infection. This condition is typically identified as a periapical radiolucency.



# Factors Initiating Pulpal and Apical Diseases

- Microorganisms.
- Trauma.
- Excessive heat.
- Restorative procedures.
- Restorative agents.
- Malocclusion.

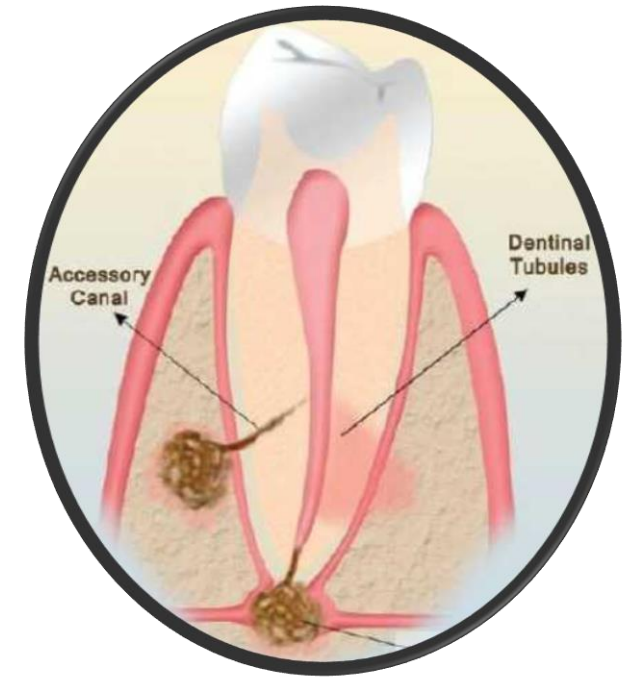
# Pathways connected endodontic and periodontal tissue

## 1-Anatomical pathway

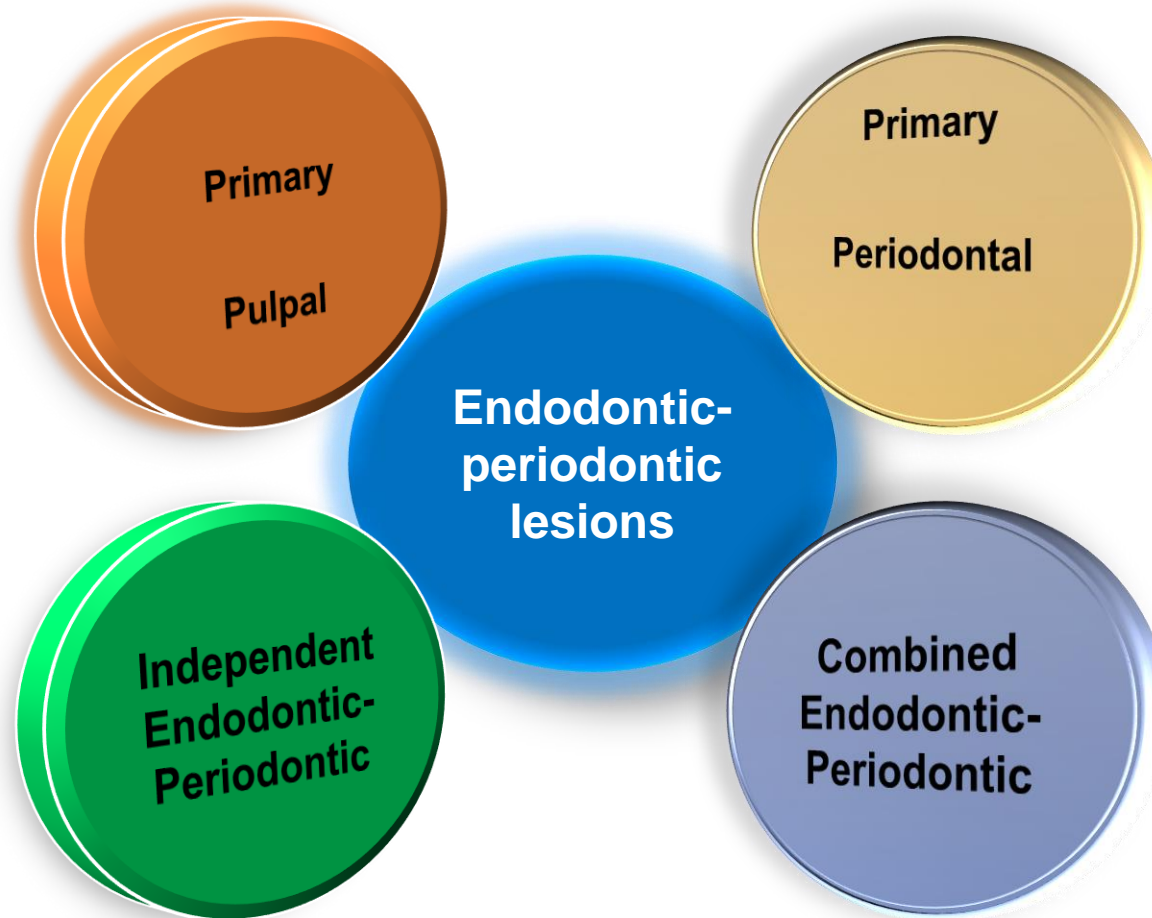
- Apical foreman
- Accessory canals (including lateral and furcation canals)
- dentinal tubules

## 2-Non anatomical pathway

- Vertical root fractures
- Tooth perforations.

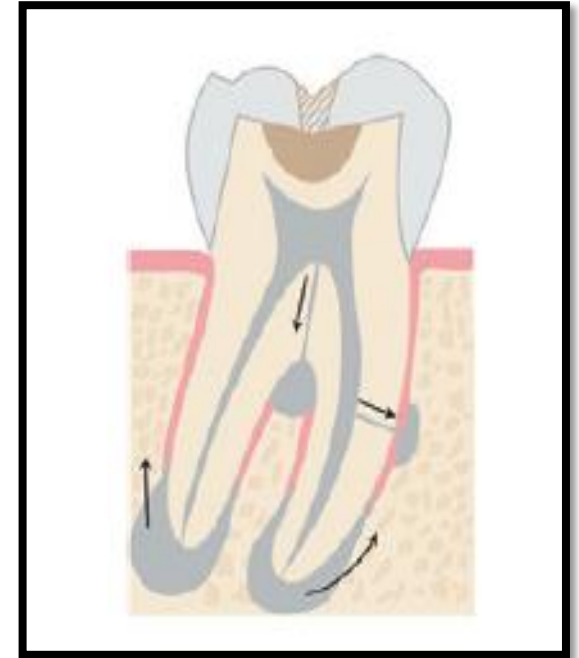


# Classification of endodontic-periodontic lesions



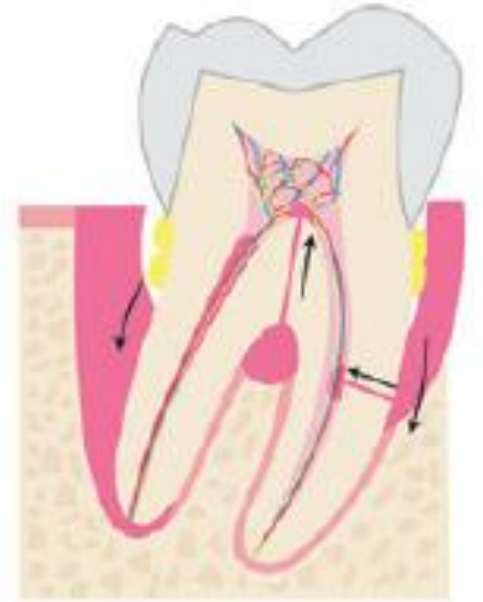
## Primary pulpal lesion

- Primary pulpal infection can lead to chronic periradicular periodontitis by which a periapical radiolucency can develop and migrate cervically.
- The root canal system primarily becomes infected as a result of dental caries, traumatic injuries and coronal micro leakage.
- Pulp inflammation or necrosis may lead to an inflammatory response in the periodontal ligament at the apical foramina or at the site of a lateral or accessory canal and cause secondary breakdown of the periodontium at their respective loci.



## Primary periodontal lesion

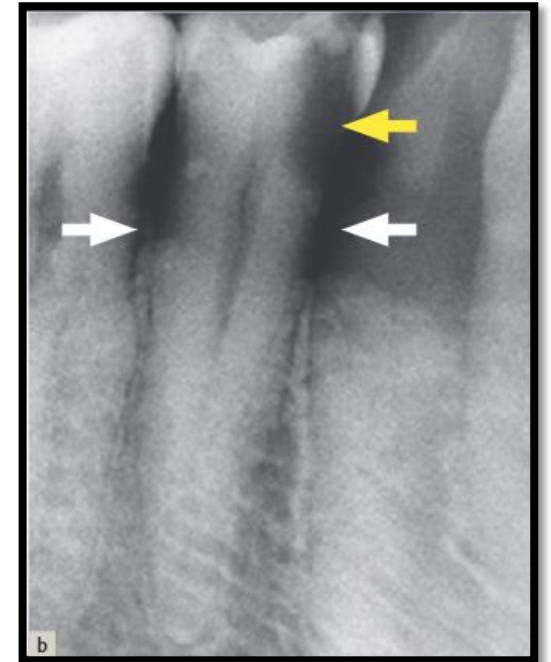
- Primary periodontal infection can lead to extensive breakdown of alveolar crest bone that migrates from the cervical area to the apex.
- In these lesions, one would find generalized bone loss around a single tooth or that often could involve multiple adjacent teeth.
- Because of the pulpal-periodontal continuum through main root canal foramina or through accessory canals, extensive periodontal infection can cause irritation in the pulp tissues.





## “Independent” endo-perio lesion

- This class describes the independent association of the pulp and periodontal pathosis caused by different aetiological factors.
- The pulp disease (acute, chronic or necrotic) is only limited to the root canal space and does not cause a periradicular pathosis either radiographically (no widening in the periodontal ligament space or periapical radiolucency) or clinically (no pain on palpation or percussion).
- This class is usually noted in patients with generalized marginal periodontitis.



## “combined” endo-perio lesion

- Primary pulpal and primary periodontal infections can occur extensively in this “combined” endo-perio lesion.
- These lesions occur when an endodontically induced periapical lesion exists at a tooth that is also affected by marginal periodontitis. •
- The tooth has a pulpless, infected root canal system and a co- existing periodontal defect.



# Differential Diagnosis of Pulpal and Periodontal Infection

- **Patient symptom**
- **Coronal integrity**
- **Radiographic lesions**
- **Vitality**
- **Periodontal probing**

## Patients' Subjective Symptoms

- Patients' symptoms of pulpal lesions may vary, depending on the type of pathosis. Chronic lesions can be completely asymptomatic, whereas acute pain symptoms can be triggered without any radiographic lesions.
- Primary pulpal lesions may not manifest with any periodontal defect. Narrow probing in pulpal lesions may indicate a sinus tract through the sulcus.

## Coronal Integrity

- Periodontal infection without pulpal involvement may manifest with an intact crown structure and the absence of coronal defects.
- Conversely, endodontic infection is almost always associated with loss of coronal integrity such as caries, failing restorations, extensive restorations, and cracks or fractures that extend to the pulpal tissues.
- Combined lesions (so-called endo-perio lesions) would manifest with a periodontal infection and extensive coronal destruction.

## Radiographic Appearance

- ✓ **Periapical radiographs can provide distinguishing information on whether the lesion is of pulpal or periodontal origin**
  
- ✓ **It is important to focus on specific entities on a radiograph, These should include:**
  - The coronal status,
  - Crestal bone height and shape,
  - Presence of an apical or lateral radiolucency,
  - Bony trabeculation,
  - Integrity of the lamina dura, and careful evaluation of the obturation of the root canal if present
  
- For example, radiographic lesions representing severe periodontitis appear wider at the cervical end than the apical portion of the lesion. Apical or lateral radiolucencies may also result from differences in trabeculation patterns not associated with pulpal infection. For this reason, it is critical to consider the integrity of the lamina dura

# Vitality

- Testing of tooth vitality is often one of the most important methods to differentiate between periodontal and endodontic infection. Teeth with periodontal infection usually test vital to thermal testing.
- Teeth with both endodontic infection and periodontal abscess usually test nonvital
- Thermal testing is usually the most reliable way to determine pulpal health or disease
- Although thermal testing can be informative about the status of the pulp, a patient's response to thermal stimulus may be confused with hypersensitivity resulting from exposed dentin and patent dentinal tubules in the absence of pulpitis.

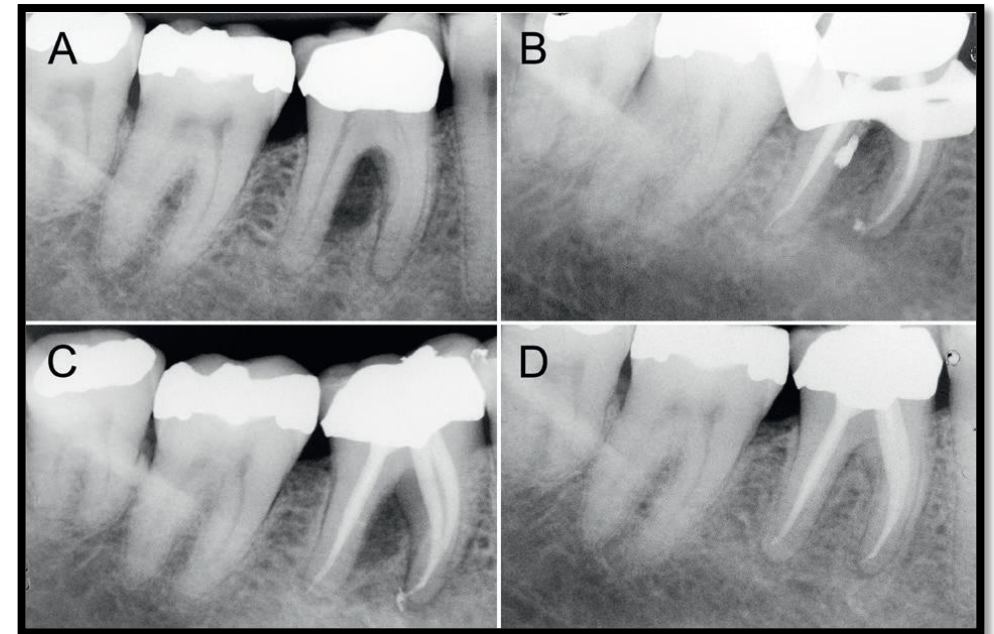
## Different Characteristics of Pulpal and Periodontal Lesions

	Primary Pulpal	Primary Periodontal	Independent Endodontic-Periodontic	Combined Endodontic-Periodontic
Patient symptom	Varies <sup>b</sup>	Mild discomfort	Varies <sup>b</sup>	Varies <sup>b</sup>
Coronal integrity	Compromised	Intact	Compromised	Compromised
Radiographic lesions	Periapical radiolucency	Crestal bone loss	Separate periapical radiolucency and crestal lesions	Continuous bony lesions from alveolar crest to apex
Vitality	Nonvital	Vital	Nonvital	Nonvital
Periodontal probing	Narrow probing to apex <sup>c</sup>	Generalized bone loss	Generalized bone loss	Generalized bone loss with narrow probing to apex



# Treatment Considerations

- In managing lesions of pulpal or periodontal origin, making an accurate diagnosis of the source of infection is a critical determinant of treatment outcome.
- In general, when primary disease of one tissue, **i.e. pulp or periodontium**, is present and secondary disease is just starting, treat the primary disease.
- When secondary disease is established and chronic, both primary and secondary diseases must be treated.
- Periodontal therapy may or may not be required, depending on disease status.
- The complete healing of destroyed periodontal support can be expected following the treatment of pulpal pathology.



❑ **Primary pulpal pathoses** combined with *secondary* periodontal defects completely resolve by conventional root canal therapy alone.

### ❑ **Independent or combined endo-perio lesions**

- Independent or combined endo-perio lesions require both endodontic and periodontal therapy for complete healing to occur.

**One important consideration is the sequence of therapies: Which of the two should be performed first?**

- ✓ More importantly, in combined endo-perio lesions, some periodontal defects will resolve on completion of the endodontic treatment, whereas the opposite would not be the case.
- ✓ These considerations indicate that combined endo-perio lesions are best treated by performing the necessary endodontic treatment first, followed by periodontal therapy.

## Management of periodontal and apical abscesses

- ✓ When patients present with an abscess, periodontal and apical abscesses are managed differently.
- **Management of acute periodontal abscesses** involves establishing drainage through the periodontal pocket and subgingival scaling and root planing. Curettage of the epithelium lining, the pocket, and the surrounding connective tissue is then accomplished followed by compression of the pocket wall
- If the swelling is large and fluctuant, flap surgery or incision and drainage may be necessary to relieve the pressure.
- In cases in which the bone loss is extensive and the prognosis for the tooth is hopeless, extraction may be required
- **In the management of acute apical abscesses**, the abscess should be drained by incision and drainage and/or root canal debridement.

# Bibliography

- *Newman and Carranza's Clinical Periodontology, THIRTEENTH EDITION.*



Thank  
you