

Periodontic-Endodontic Interrelationship – A Review

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ABSTRACT

Pulpal and periodontal problems are responsible for more than 50% of tooth mortality today. There is general agreement today that the vast majority of pulpal and periodontal lesions are a result of bacterial infection. Under which conditions and especially in which direction spread of the disease occurs in the pulpo-periodontal continuum remains a matter of controversy. Diagnosis is complicated by the fact that these diseases are too frequently viewed as independent entities when recognition of their interrelationship is critical to successful resolution & treatment of these lesions often requires combined periodontic & endodontic therapy

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INTRODUCTION

In the early 1970s, there has been an upsurge of interest in dental prevention and specifically in the maintenance of teeth for a lifetime. The effect of periodontal disease on dental pulp was first described by Turner and Drew in 1919.(1) Dental plaque is the primary initiating factor of both caries and periodontal disease. The attachment apparatus (cementum, periodontal ligament and alveolar bone) is the working area of both periodontics and endodontics. In periodontics it is treated in the marginal region; in endodontics, it is treated at the apex. Diagnosis is complicated by the fact that these diseases are too frequently viewed as independent entities when recognition of their interrelationship is critical to successful resolution, and treatment of these lesions often requires combined periodontic and endodontic therapy.

ETIOLOGIC FACTORS

- **Live pathogens:** Bacteria, Fungi and Viruses.
- **Intrinsic agents:** Cholesterol, Russell bodies, Rushton hyaline bodies and Charcot-Leyden crystals.
- **Contributing factors**
 - ◆ Poor endodontic treatment and perforation

- ◆ Poor restorations
- ◆ Resorptions

BACTERIOLOGY

- Rupf *et al.* (2000) studied the profiles of periodontal pathogens in pulpal and periodontal diseases associated with the same tooth.(2)
- These pathogens were found in all endodontic samples and the same pathogens were found in teeth with chronic apical periodontitis and chronic (adult) periodontitis. Spirochetes especially *T. denticola* are another type of microorganism associated with both endodontic and periodontal diseases. (Dewhirst *et al.* 2000, Kasunga *et al.* 2000) and Specific PCR methods were used to detect pathogens.(3,4)

FUNGI (YEASTS)

The majority of the recovered fungi were *Candida albicans*. Other species such as *Candida glabrata*, *Candida guilliermondii*, and *Candida inconspicua* and *Rodotorula mucilaginosa* were also detected.

VIRUSES

- In patients with periodontal disease, herpes simplex, human cytomegalovirus and Epstein-barr virus detected in periodontal tissues.

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- In endodontics, the presence of viruses in the dental pulp was first reported in a patient with AIDS (Glick M *et. al.* 1989). DNA of HIV virus has also been detected in periradicular lesions. However, it has not been established that HIV virus can directly cause pulpal disease.(5)

CONTRIBUTING FACTORS

Poor endodontic treatment

Poor endodontic treatments are often found associated with periradicular inflammation. Poor endodontic treatment allows canal reinfection, which may often lead to treatment failure.

Poor restorations

Coronal leakage is an important cause of failure of endodontic treatment. Madison and Wilcox (1988) found that exposure of root canals to the oral environment allowed coronal leakage to occur, and in some cases along the whole length of the root canal (6). Ray and Trope (1995) reported that defective restorations and adequate root fillings had a higher incidence of failures than teeth with inadequate root fillings and adequate restorations (7).

Resorption

Root resorption due to pathologic process resulting in a loss of dentin, cementum and/or bone. It may be initiated in the periodontium and affect initially the external surfaces of the tooth or it may start within the pulp space affecting primarily the internal dentin surfaces (internal resorption).

Perforations

Root perforation causes communications between the root canal systems and either periradicular tissues or the oral cavity may often reduce the prognosis of treatment.

SIGN AND SYMPTOMS

- Swelling and bleeding of the gingiva with deep pockets and suppuration
- Tenderness to percussion
- Radiograph showing angular bone loss and Tooth mobility and sinus formation

IMPACT OF PULPAL DISEASES ON THE PERIODONTIUM

Pulpal infection may cause a tissue destructive process which may progress from apical region to the gingival margin, termed as “retrograde periodontitis (Fig. 1).

EFFECT OF PERIODONTAL DISEASE ON THE PULP

- Periodontal disease may involve pulp through apical foramen, lateral and accessory canals, dentinal tubules or iatrogenic errors.
- Chemical irritants and medicaments irritate pulpal tissue.

CLASSIFICATION OF ENDODONTIC PERIODONTAL LESIONS

Simon *et al* (1972) has classified the lesions based on the primary source of infection.(8)

- Primary endodontic disease
- Primary periodontal disease
- Primary endodontic disease with secondary periodontal involvement
- Primary periodontal disease with secondary endodontic involvement
- True combined diseases

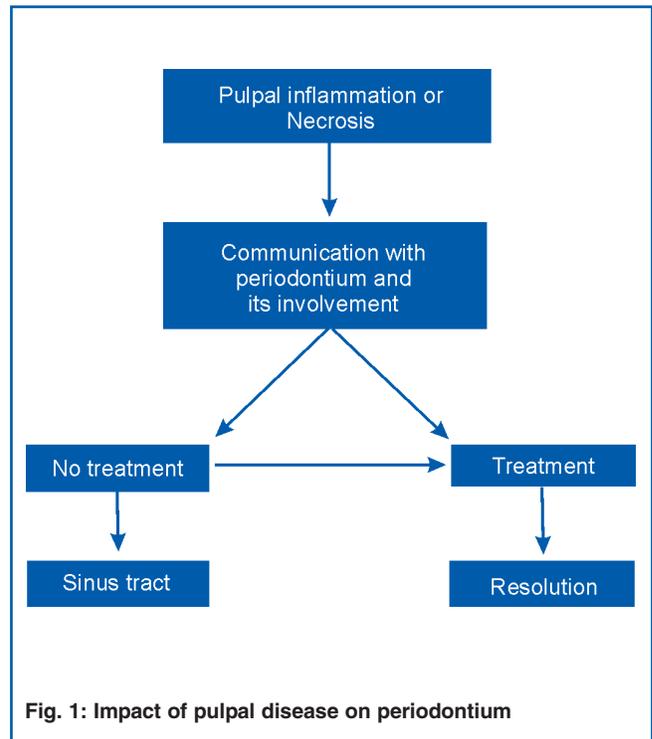
DIAGNOSIS

- Clinical tests
- Radiographs
- Pulp vitality tests
- Tracking sinus or fistula
- Pocket probing
- Microbiological examination

MANAGEMENT OF PRIMARY ENDODONTIC DISEASE

Primary endodontic diseases usually heal following root canal treatment. The sinus tract extending into the gingival sulcus or furcation area disappears at an early stage once the necrotic pulp has been removed and the root canals are well sealed.

The prognosis for primary endodontic lesions is good but worsens in the advanced stages of secondary periodontal involvement.



MANAGEMENT OF PRIMARY PERIODONTAL DISEASE

- Oral prophylaxis and oral hygiene instructions.
- Periodontal surgeries, root amputations may be required in advanced cases.

MANAGEMENT OF PRIMARY ENDODONTIC LESION WITH SECONDARY PERIODONTAL INVOLVEMENT

- It should first be treated with endodontic therapy. Treatment results should be evaluated in 2– 3 months and only then should periodontal treatment be considered.
- This sequence of treatment allows sufficient time for initial tissue healing and better assessment of the periodontal condition. It also reduces the potential risk of introducing bacteria and their byproducts during the initial healing phase.
- Periodontal therapy.

MANAGEMENT OF PRIMARY PERIODONTAL DISEASE WITH SECONDARY ENDODONTIC INVOLVEMENT

- Root Canal treatment.
- Periodontal surgery.

MANAGEMENT OF TRUE COMBINED DISEASE

After completion of the endodontic therapy, periodontal therapy is started which may include: Scaling and root planing; Periodontal surgeries along with oral hygiene instructions may be required.

CONCLUSION

Endodontic-Periodontal lesions often present a diagnostic

and treatment dilemma. Once periodontal disease progresses to involve pulp careful diagnosis and classification help to determine outcome and subsequent prognosis. Those teeth that appear to have periodontal problem of endodontic origin have an excellent prognosis. Some cases may require only endodontic therapy or periodontal treatment and other cases may require a combined approach. If prognosis is questionable/poor extraction of affected tooth may be indicated. The treatment rendered and subsequent success or failure of treatment is directly dependent on making accurate diagnosis of lesion.

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