

Relation between Endodontics and Periodontics: A review

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Abstract

The Endodontium and Periodontium influence each other during health, function and disease. A Perio- endo lesion can have a varied pathogenesis which ranges from quite simple to relatively complex one. Knowledge of this disease process is essential in coming to the correct diagnosis. This is achievable by careful history taking, examination and the use of special tests. The success of both periodontal and endodontic therapy depends on the elimination of both disease processes, whether they exist separately or as combined lesion. This review gives a fair knowledge about several aspects of endo-perio relationship.

Keywords: Endodontium, Periodontium

Introduction

Simring and Goldberg in 1964 first discovered the relationship between the periodontium and the pulp.¹ The periodontium and pulp have embryonic, anatomic and functional interrelationship. Ectomesenchyme cells give rise to dental papilla and dental follicle. They in turn differentiate into periodontium and pulp respectively. This development during the embryonic stage results in

anatomical connections, which remain throughout the life.

Endodontic – periodontal lesions present challenges to the clinician as far as diagnosis and prognosis of the involved teeth are concerned. Etiologic factors such as bacteria, fungi and viruses as well as various contributing factors such as trauma, root resorption, perforations, and dental malformations play an important role in the development and progression of such lesions. The endo- perio lesions have been characterized by the involvement of pulp and periodontal disease in the same tooth. Infection in the pulp tissue may lead to secondary infection or periodontal tissue breakdown. In contrast, severe periodontal disease may initiate or exacerbate inflammatory changes in pulp tissue.² There are some difficulties in endo-perio lesions treatment, especially when a severe loss of periodontal attachment and osseous structure occurs.³

Pathways of developmental origin (anatomical pathways)

- Apical foramen, accessory canal\ lateral canals

- Congenital absence of cementum exposing dentinal tubules
- Developmental grooves.

Pathways of pathological origin;

- Empty spaces on root created by Sharpey's fibers
- Root fracture following trauma
- Idiopathic root resorption- internal and external
- Loss of cementum due to external irritants

The main etiological factors for endo-perio lesions are living (bacteria, fungi and viruses) and nonliving pathogens. Along with these, many contributing factors such as trauma, root resorption, perforations, and dental malformations also play important role in the development and progression of such lesions.⁴

Classification of periodontal – Endodontic lesions

The first classification of endodontic –periodontal lesions based on pathology of origin was proposed by Simon et al⁵ as follows;

- Primary endodontic lesions
- Primary periodontal lesions
- Primary endodontic lesions with secondary periodontal involvement.
- Primary periodontal lesions with secondary endodontic involvement
- True combined lesions

Though Simon et al have classified these lesions into five types but actually three, four and five can be considered as combined lesions,

Primary endodontic diseases

An acute exacerbation of a chronic apical lesion in a tooth with necrotic pulp may drain coronally through the periodontal ligament into the gingival sulcus. This condition may mimic clinically the presence of periodontal abscess. In reality, it is a sinus tract from pulpal origin that opens through the periodontal ligament

area. For diagnosis purpose, it is essential for the clinician to insert gutta percha cone, or another tracking instrument, into the sinus tract and to take one or more radiograph to determine the origin of the lesion.

Primary endodontic lesion is usually healed following root canal treatment. The sinus tract extending into the gingival sulcus or furcation area disappears at an early stage once the affected pulp has been removed and root canals well cleaned, shaped, and obturated.

Primary periodontal diseases:

These lesions are caused primarily by periodontal pathogens. In this process, chronic marginal periodontitis progresses apically along the root surface. In most cases, pulp test indicates a clinically normal pulpal reaction.

Primary endodontic disease with secondary periodontal involvement

If after a period of time a suppurating primary endodontic disease remains untreated, it may then become secondarily involved with marginal periodontal breakdown. Plaque forms at the gingival margin of the sinus tract and leads to marginal periodontitis.

Primary endodontic lesions with secondary periodontal involvement may also occur as a result of root perforation during root canal treatment, or where pins or posts have been misplaced during coronal restoration.

Symptoms may be acute, with periodontal abscess formation associated with pain, swelling, pus exudate, pocket formation and tooth mobility.

Primary periodontal disease with secondary endodontic involvement:

The apical progression of a periodontal pocket may continue until apical tissues are involved. In this case, the pulp may become necrotic as a result of infection entering via lateral canals or the apical foramen.

True combined lesions

True combined endodontic-periodontal disease occurs with less frequency. It is formed when an endodontic disease progressing coronally joins with an infected periodontal pocket progressing apically.^{6,7}

History

Cahn (1927) was one of the first investigators to state that periodontal disease had an influence on the pulpal tissue.

The relationship between periodontal and pulpal disease was first described by Simring and Goldberg in 1964.

Torabinejad in 1985 could not establish any interrelationships between periodontal and pulpal diseases.

Hiatt (1977) and Hemington (1979) stated that there is no apparent relationship between periodontal and pulpal disease.

Discussion

It is known that both the pulp and periodontium are closely linked to each other, through the apical foramen, accessory canals, and dentinal tubules of the root, and one can interfere on the integrity of the other. Some authors such as Rubach and Mitchell⁸ affirmed that the periodontal disease may affect the pulp when there is exposure of the accessory canals through the apical foramina and the canaliculi in the furcation. Adriaens et al⁹ reported that the bacteria coming from the periodontal pockets may contaminate the pulp through the dentinal tubules that would be exposed during root planning and scaling, serving as microorganisms reservoir resulting in the recolonization of the treated root surface. Some studies^{10,11} have contradicted this idea, because even with removal of the cementum during the periodontal therapy in vital teeth, the pulp tissue will be protected against the harmful agents through forming

reparative dentin. On the other hand, Langeland et al.¹² affirmed that only pulp would be affected by the periodontal disease if the apical foramen is involved.

Conclusion

For the endodontic-periodontal lesions to be treated successfully, an accurate diagnosis is mandatory that must cover both the endodontic and the periodontal component of the lesion.

The success of endodontic therapy is dependent on the completion of periodontal therapy. The complete treatment of both aspects of endodontic-periodontal lesions is essential for successful long-term results

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