

Phonetic Value of Palatal Rugae In Complete Denture

Abstract

The interrelationship between periodontal and endodontic disease has always aroused confusion and queries. The simultaneous existence of pulpal problems and inflammatory periodontal disease can complicate diagnosis and treatment planning. The differential diagnosis of endodontic and periodontal diseases can sometimes be difficult, but it is of vital importance to make a correct diagnosis for providing the appropriate treatment. This review article aims to discuss various classifications of endo-perio lesions.

Method and material: In this review article, articles were selected from Google chrome search engine between 1964 to 2014. Amongst 1500 articles, 10 articles were selected for a full-text reading based.

Discussion: The endo-perio lesion is association of periodontal and pulpal disease in the same dental element. So there is importance of taking the complete clinical history and making the right diagnosis to ensure correct prognosis and treatment. Taking into consideration all these factors and the divergences regarding the origin and direction that these infections developed, the classification of these lesions should be justified.

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Introduction

The human dental pulp cavity and periodontium are closely connected by their proximity and by the presence of apical and lateral radicular foramina, which permit the passage of pathogens between these two distinct anatomical areas. They are closely related and diseases of one tissue may lead to the involvement of the other. They are characterized by the association of periodontal and pulpal disease in the same dental element. The relationship between the periodontium and the pulp was first discovered by Simring and Goldberg in 1964.(1)

From that time the term 'perio-endolesion' has been used to describe lesions due to inflammatory products found in varying degrees in both periodontium and pulpal tissues. The periodontium and pulp have embryonic, anatomic and functional interrelationship. This embryonic development gives rise to anatomical connections, which remain throughout life.(2)

Embryonic, Anatomic, Functional



Pulpal and periodontal problems are responsible for more than 50% of tooth mortality. Etiologic factors such as bacteria, fungi, and viruses as well as various contributing factors such as trauma, root resorptions, perforations, and dental malformations play an important role in the development and progression of such lesions.

The possible pathways for ingress of bacteria and their products into these tissues can broadly be divided into: anatomical and nonphysiological pathways.(3)

Anatomical Pathways

The possible anatomic pathways of communication between the pulp and the periodontium;

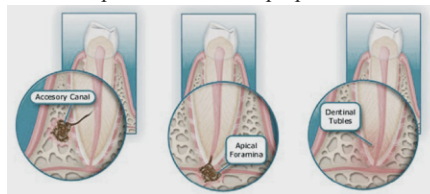
1. Lateral and accessory canals

2. Apical foramen
3. Dentinal tubules

Nonphysiological Pathways

These include iatrogenic root canal perforations. Improper manipulation of endodontic instruments can also lead to perforation of the root.(4)

The second group of artificial pathways between periodontal and pulpal tissues are



vertical root fractures, caused by trauma which occurs in both vital and nonvital teeth. The incidence of vertical root fractures, that may serve as a "bridge" for pulp contamination, is more in the roots that are filled with lateral condensation technique and the teeth restored with intracanal posts.(4)

Rubach and Mitchell suggested that the periodontal disease may cause accessory canal exposure, allowing the periodontopathogenic bacteria to cause inflammatory reactions followed by pulp necrosis.(5)

It is highlighted that the root planning and scaling may result in the destruction of the neurovascular bundle and rupture of the vessels in the lateral canals, provoking a reduction of the blood supply and consequently leading to pulp alterations.(6)

Careful history taking, examination, and performing special tests is essential for the correct diagnosis of endo-perio lesion.

This paper is an attempt to provide a review of classification of the endo-perio lesions in order to scientifically diagnose and treat these lesions with predictable success.

The periodontal endodontic lesions have received several classifications, among which is the classification of Simon et al. (7) separating lesions involving both periodontal and pulpal tissues into the following groups:

- (i) Primary endodontic lesions,
- (ii) Primary endodontic lesions with secondary periodontal involvement,
- (iii) Primary periodontal lesions,

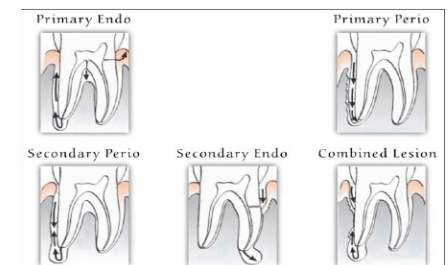
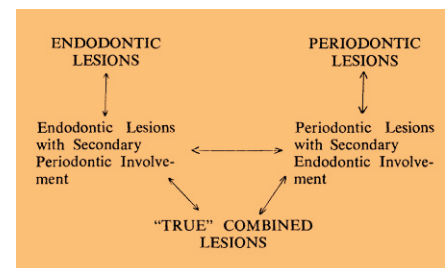
- (iv) Primary periodontal lesions with secondary endodontic involvement,
- (v) True combined lesions.

From the point of view of treating these cases efficaciously, another clinical classification was provided by Torabinejad and Tropein(8), based on the origin of the periodontal pocket:

- (i) Endodontic origin
- (ii) Periodontal origin
- (iii) Combined endo-perio lesion
- (iv) Separate endodontic and periodontal lesions
- (v) Lesions with communication
- (vi) Lesions with no communication.

Another classification was recommended by the World Work-Shop for classification of periodontal diseases (9), Periodontitis Associated with Endodontic Disease:

- (i) Endodontic-periodontal lesion



- (ii) Periodontal-endodontic lesion



Combined lesion.

According to Grossman Based on treatment procedures:

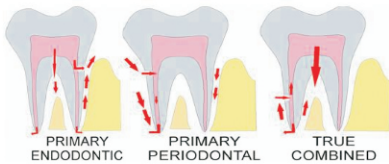
1. Lesions that require endodontic treatment procedures only.
2. Lesions that require periodontal treatment procedures only.

Lesions that require combined endodontic/periodontal treatment procedures

According to Weine:

Class I: Tooth in which symptoms clinically and radiographically simulate periodontal disease but are in fact due to pulpal inflammation and/or necrosis.

Class II: Tooth that has both pulpal or periapical disease and periodontal disease



concomitantly.

Class III: Tooth that has no pulpal problem but require endodontic therapy plus root amputation to gain periodontal healing.

Class IV: Tooth that clinically and radiographically simulates pulpal or periapical disease but in fact has periodontal disease.

Classification by William Hiatt:

1. Pulpal lesion of short duration with secondary periodontal disease.
2. Pulpal lesion of long duration with secondary periodontal disease.
3. Periodontal disease of short duration with secondary pulpal disease.
4. Periodontal disease of long duration with secondary pulpal disease.
5. Periodontal lesion treated by hemisection / root resection.
6. Complete / incomplete crown root fracture
7. Independent periodontal & pulpal lesions which merge into combined lesion.
8. Pulpal lesion which evolve into periodontal lesion following treatment.
9. Periodontal lesion which evolve into pulpal lesion following treatment.

According to Geurtsen, they are classified as:

1. Combined lesions requiring only single root canal treatment (favorable prognosis).
2. Combined lesions requiring both endodontic & periodontal treatments (less favorable prognosis).
3. Combined lesions with little hope of successful treatment (poor prognosis).

VonArx and Cochran proposed aclinical treatment classification of perio_ endo_ furcation lesions based on the role of membrane application in endodontic surgery. (10)

Singh(11) classified endo_ perio lesions based on the pathogenesis and added the term iatrogenic lesions, usually endodontic lesions produced as a result of treatment modalities.

Based on these classifications, the most widely used classification of endodontic-periodontal lesions is the one that has been classified by Simon et al., according to the primary cause of disease. One of the main classification items was primary endodontic disease, which were believed and should be modified, since it has no periodontal relationship.

Another new endodontic-periodontal interrelationship classification by Khalid S. Al-Fouzan, based on the primary disease with its secondary effect, is suggested as follows (11.a):

- (1) Retrograde periodontal disease:
 - (a) Primary endodontic lesion with drainage through the periodontal ligament
 - (b) Primary endodontic lesion with secondary periodontal involvement.
- (2) Primary periodontal lesion
- (3) Primary periodontal lesion with secondary endodontic involvement
- (4) Combined endodontic-periodontal lesion
- (5) Iatrogenic periodontal lesions.

(1) Retrograde Periodontal Disease: It could be of two subcategories

(a) Primary Endodontic Lesion with Drainage through the Periodontal Ligament: A deep narrow probing defect on just one aspect of the tooth root. A chronic apical lesion on a tooth with a necrotic pulp may drain coronally through the periodontal ligament into the gingival sulcus, which is a sinus tract from pulpal origin. A gutta-percha cone can be inserted into the sinus tract and radiographs can be taken to determine the origin of the lesion. Primary endodontic diseases usually heal following root canal treatment.

(b) Primary Endodontic Lesion with Secondary Periodontal Involvement: The more extensive periodontal pocket has occurred as a result of the drainage from noxious agents present in an infected root canal system. Long-term existence of the defect has resulted in deposits of plaque and calculus in the pocket with subsequent advancement of the periodontal disease. The integrity of the periodontium will be re-established if root canal treatment is done properly. If a drainage sinus tract through the periodontal ligament is present before root canal treatment, resolution of the probing defect is expected.

(2) Primary Periodontal Lesion. The periodontal disease has gradually spread along the root surface towards the apex. The pulp may remain vital but may show some degenerative changes over time. In such cases, it is advisable to treat the periodontal tissues only.

(3) Primary Periodontal Lesion with Secondary Endodontic Involvement. Progression of the periodontal disease and the pocket leads to pulpal involvement via either a lateral canal foramen or the main apical foramen. The pulp becomes necrotic and infected. In such cases endodontic treatment should be done first followed by periodontal therapy.

(4) Combined Endodontic-Periodontal Lesion. A simpler classification would be to define any situation with both endodontic and periodontal diseases as being a "combined endodontic-periodontal lesion." In such cases, the treatment will involve both endodontic and periodontal management. If only one of the problems was treated, then it would be expected that the lesion would not heal adequately. It is generally advisable to treat both tissues concurrently in order to create the most favorable environment for healing.

(5) Iatrogenic Periodontal Lesions. Lesions produced as a result of treatment modalities include the following.

(A) Root Perforations. Iatrogenic root canal perforations are serious complications during dental treatment and have a rather poor prognosis.

(B) Coronal Leakage. It is the leakage of bacterial elements from the oral environment along the margin of the restoration to the

endodontic filling. Studies have indicated that this factor may be an important cause of endodontic treatment failure.

(C) Dental Injuries or Trauma. They may take on many shapes but generally can be classified as enamel fractures, crown fractures without pulp involvement, crown fractures with pulp involvement, crown-root fracture, root fracture, luxation, and avulsion.

(D) Chemicals Used in Dentistry. They have the potential to cause root resorption. The irritating chemical may diffuse through the dentinal tubules, and when combined with heat, they are likely to cause necrosis of the cementum, inflammation of the periodontal ligament, and subsequently root resorption.

(E) Vertical Root Fractures. The artificial pathways between periodontal and pulpal tissues are vertical root fractures. Vertical root fractures are caused by trauma and have been reported to occur in both vital and nonvital teeth. In vital teeth, vertical fractures can be continuations of coronal fractures in the "cracked tooth syndrome" or can occur solely on root surfaces.

Discussion

The pulp and the 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. Although there are these communication routes, the mechanism of direct transmission of the periodontal infection to the pulp is still controversial. Rubach and Mitchell confirmed that the exposure of accessory canals through the apical foramina and the canaliculi in the furcation will be affected by the periodontal disease (11). Adriaens et al. reported that the bacteria from the periodontal pockets may contaminate the pulp through the dentinal tubules that would be exposed during root planning and scaling. (12) Some studies have contradicted this idea, because even with the removal of the cementum, the pulp tissue will be protected against the harmful agents through forming reparative dentin. (13) Moreover, the dentinal fluids move to wards the exterior, thereby reducing the diffusion of the harmful products of the bacteria on the exposed dentin. On the other hand, Lange land et al. (14) affirmed that only pulp would be affected by the periodontal disease if the apical foramen is involved.

The endo-perio lesion is association of periodontal and pulpal disease in the same dental element. So there is importance of taking the complete clinical history and making the right diagnosis to ensure correct prognosis and treatment. Taking into consideration all these factors and the divergences regarding the origin and direction that these infections developed, the new modified classification of the selections by Khalid S. Al-Fouzan has been justified.

Conclusions

Based on the current classification, it can be concluded that it is of extreme importance that the dentist should know how to differentiate between the origins of the periodontal-endodontic lesions, including all the routes of communication between the pulp and the periodontium which act as possible "bridges" for the microorganisms, thereby enabling the dissemination of the infection from one site to another. Through this knowledge, the dentist will achieve the correct diagnosis and adequate treatment, resulting in greater chances of obtaining success in the treatment of the periodontal-endodontic lesions. Due to the complexity of these infections, an interdisciplinary approach with a good collaboration

