

TREATMENT AND PROGNOSIS OF COMBINED LESIONS

In the absence of a definitive diagnosis of a truly combined periodontal and endodontic lesion, **endodontic therapy should be performed first**. This is because lesions of endodontic origin, even if they drain through the sulcus, do not usually cause permanent damage to the cementum when the infection has not been present for a long period of time. The loss of attachment can be reversed with endodontic therapy alone. Instead of completing root canal therapy in one visit and obturating the canal with gutta percha, an intra-canal medicament should be used to clean the canals and improve the success of treatment. Calcium hydroxide is the medicament of choice because it is bactericidal, anti-inflammatory, inhibits resorption, and favors repair. Periodontal therapy should not be performed ideally until after three months of healing after calcium hydroxide is placed as periodontal root instrumentation can delay healing if the lesion is of endodontic origin.

If the lesion persists after endodontic treatment, then periodontal therapy should be initiated. This may range from scaling and root planing to root amputation. However, caution should be taken to **discuss the long term prognosis** of the tooth in this case. If the amount of attachment loss is severe, if there is significant mobility or furcation involvement (particularly in maxillary molars), if the patient has poor oral hygiene or may not be compliant with long term periodontal maintenance, then extraction is indicated. This is particularly true today with the use of dental implants which have a more predictable long term prognosis. In addition, the sooner the offending tooth is removed, the safer are the adjacent teeth with regard to potential bone loss, and more bone can be maintained at the site itself for future implant placement.

THE ORIGINS OF THE DREADED PERIO-ENDO LESION

The pulp and the periodontium develop from the same mesodermal source embryologically. When the tooth bud pinches off a portion of mesoderm to form pulp leaving the remaining mesoderm to form periodontium, strands of mesodermal tissue may get trapped forming future accessory root canals in furcations or along the root surface. These accessory canals form a means of communication between the pulp and the periodontium. Meng's review notes accessory canals in furcations of 20-60% of permanent molar teeth, and lateral canals in 27% of permanent teeth at various levels of the root, 2% of which were within the periodontal pocket, but the majority of which are in the apical third of the root. Even more perplexing is that the 'apex' of the tooth is not always where the nerve enters the tooth, so a periodontal lesion that is near but not at what we might consider the 'apex', does not necessarily mean that the pulp has not been infected (Fig 1). Other avenues of communication include lingual grooves, root fractures or perforation, cemental abnormalities, root anomalies, and root resorption.

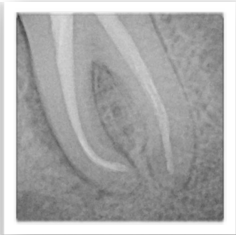
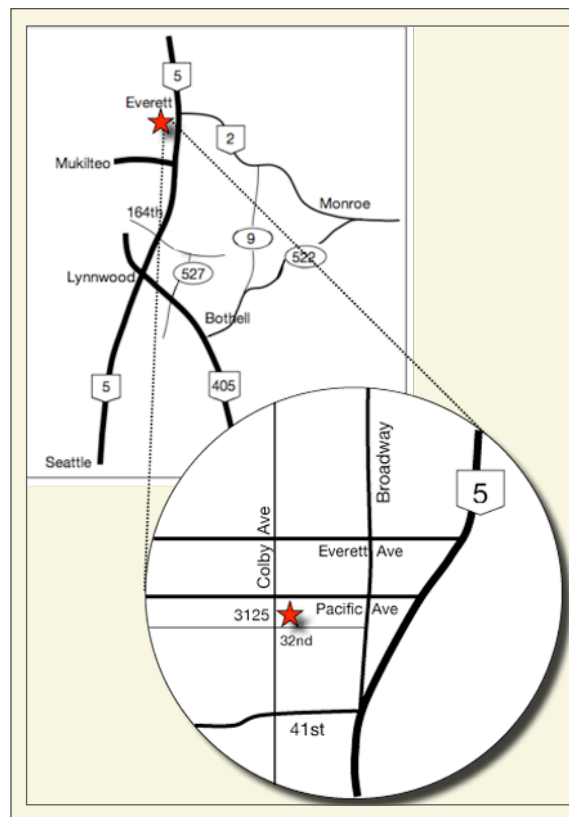


Fig 1

Dento-alveolar infections can occur anywhere along the root surface and can be classified by their location as either endodontic in origin, periodontal in origin, or as a combination of the two. The entirely endodontic lesion or entirely periodontal lesion is generally relatively easy to diagnose and treat. The difficulty arises when the lesion involves both the periodontium and the pulpal tissues. This issue of **ProbeTips** will investigate combined periodontal and endodontic infections, and review diagnosis and treatment options.

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PROBE TIPS

A QUARTERLY PERIODONTAL
NEWSLETTER

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Combined Periodontal and
Endodontic Infections



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Characteristics of Perio-Endo Lesions

GENERAL CONSIDERATIONS

In order to properly diagnose a combined periodontal-endodontic lesion, it is first important to review the more important aspects of each individual lesion.

PERIODONTAL ABSCESS

Lesions of periodontal origin either involve a single tooth, or multiple teeth. Periodontal abscess formation of **multiple teeth** is most common, and we all recognize this as generalized chronic periodontitis. It is characterized by a slow formation of deepened probings on multiple teeth which can have suppuration on palpation or on probing. There is generally no discomfort other than a vague sense of negative change. Because infection drains via the sulcus, acute abscess formation is rare. Periodontal lesions on **single teeth** are much more rare than abscess of multiple teeth. These lesions typically occur in an otherwise healthy mouth, and are usually caused by local factors such as food impaction. If the patient has generalized periodontitis, the abscess can be caused by foreign body (calculus) impaction. This situation occurs when there has been inadequate scaling to the depth of the pocket where coronal tissues heal against the newly cleaned root surface, but apical calculus and bacteria are trapped and multiply. In such uncommon cases, acute lesions can occur, and

unlike the chronic counterpart, acute periodontal abscess usually have definite discomfort associated with them. In either situation, the radiographic appearance generally has a wider area of bone loss coronally and

a narrow defect near the apex of the tooth (Fig 2). Periodontal abscess rarely infects the pulp unless the apical foramen is involved.

ENDODONTIC ABSCESS

Compared to periodontal abscess, one study found endodontic abscess to be the most common dento-alveolar abscess, followed by pericoronitis, then periodontal abscess. Lesions of endodontic origin typically involve a single tooth with a necrotic pulp. Infection can present as either an acute abscess or chronic fistula. Acute abscesses usually have significant throbbing pain associated with them. Infection usually follows a path of least resistance where a draining sinus can form usually on the palatal aspect of maxillary molars, and on the buccal side of mandibular molars. Chronic fistulas can occur with little or no discomfort. If the infection in either case drains through the sulcus, it may be possible to confuse the



Fig 3

endodontic lesion with a periodontal lesion, i.e. retrograde periodontitis. The biggest difference is that periodontal lesions probe with generally wide probings around several probing points around the tooth, while endodontic lesions generally have narrow and

deep probings at a single point around the tooth. Radio-graphically, this is supported by a wider area of bone loss apically with a narrow area of bone loss coronally (the opposite of a periodontal lesion) (Fig 3).

COMBINED LESIONS

For either periodontal or endodontic lesions, if the infection is not treated in a timely manner with a

root canal, or with non-surgical or surgical periodontal scaling and root planing, the periodontal lesion can involve the apex of the tooth (Fig 4), and the endodontic lesion draining through the sulcus can cause periodontal destruction.



Fig 4

To add to the complication, consider that **pulp vitality testing**, which is one of the best ways of determining endodontic need, does not always give the correct pulpal diagnosis. This is particularly so for **multi-rooted teeth** where one root may be necrotic, necessitating endodontic treatment, while the other canals may still be vital and give a positive vitality test. Although relatively accurate when used independently, Weisleder et al found that combining tests provides the most accurate diagnosis, i.e. combining EPT with Endo-Ice or CO2 gives 97% accuracy. Even so, this means that 3% of the time, necrotic teeth indicated they were vital (possibly multi-rooted teeth), which was disproven by lack of hemorrhage on test cavity.

DIAGNOSIS OF COMBINED LESIONS

The key to **diagnosing** a combined lesion is to have an adequate history and to rule out periodontal versus endodontic origin by making note of the following factors:

Factors indicating Periodontal cause:

1. A vital pulp.
2. Periodontal disease on other teeth.
3. A history of food impaction.
4. Class II occlusion and super-eruption where mandibular anterior teeth occlude at the palatal gingival margin of the maxillary teeth.

5. Cumulative negative effect on the pulp of years of periodontal therapy.
 - Vigorous scaling and root planing can remove cementum and allow etiologic agents to enter and inflame the pulp. Although generally reversible, palliative endodontic therapy may be necessary.

Factors indicating Endodontic cause:

1. A non-vital pulp.
2. Lack of periodontitis on other teeth.
3. Any restorations in the tooth, even in-tact full coverage restoration
 - Realize again the cumulative negative effect on the pulp of multiple treatments to the tooth: i.e. multiple restorations prior to full crown preparation. This taxes the reparative potential of the pulp.
4. A history of endodontic treatment which could be failing.
5. A history of bruxism which could indicate there is a fractured root, particularly in a prior endodontically treated root with a post.
6. A history of trauma which may indicate a necrotic pulp despite lack of coronal restoration.

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Fig 2