

## Endo-perio lesions

It's the PA tissue and its response that will determine the success of your treatment and the fate of the tooth.

Canal anatomic and physiologic characteristics that contribute to this biological interdependence of pulp and periodontal tissues includes embryologic origin, vascular circulation, innervations, lymphatic system, anatomic defense, and repair mechanism.

Pathways of communication between the pulp and PDL and might lead to endo-perio lesions:

1-PA foramina.

2-accessory canals: during the formation of the root sheath a break might develop in the continuity of the root sheath producing a small gap, and dentinogenesis does not take place opposing to that defect and the result will be a small accessory canal between the dental sac and the pulp. in anterior teeth they are more frequently noted in the apical region around 17% while in posterior teeth a great many accessory canals are seen in the furcation area (20-70%) and account for the frequent presence of furcation radiolucencies in molar teeth.

3- communication between pulp and periodontal tissues might also occur through dentinal tubules

4-anatomical anomalies such as the **enamel pearls** which are small enamel droplets formed on the surfaces of or between the roots and they contain many opening through which pulps of these teeth could be affected

5- radicular groove in the crown of upper central and lateral teeth can also results in untreatable periodontal disease that can affect the pulp hemostasis

6- iatrogenic factors such as perforation.

periodontal changes: establishment of the periapical inflammation that may develop into periodontal pocket draining via the gingival sulcus of the tooth.

As for the effect of periodontal lesions on the pulp, pulpal response to mild periodontal disease can demonstrate fibrosis, calcification and debris in number of blood vessels. 55-60% of these diseased teeth "with mild perio disease", (after pulp culture) were found to have bacteria and its toxins in concentrations higher than that in unaffected teeth this means that the roots of periodontally affected teeth act as a reservoir for bacteria.

But how exactly would periodontal lesions affect the pulp?

In deep periodontal pockets extending to the apex of the tooth can affect the vitality of the pulp causing damage ranging from hyperemia to necrosis.

Just as products from inflamed pulpal tissue can cause periapical inflammation, periodontal disease can cause pulpitis, this is what we call retrograde or secondary pulpitis which is usually associated with periodontal disease and a vicious circle can establish >> periodontal disease results in inflamed pulp and vice versa.

Also the effect of periodontal treatment should be considered, deep root planning can cause removal or loss of cementum, in addition of sensitivity this also can lead to inflammatory changes or hemorrhages

Our classification here is according to the primary origin;

- **Class I Endo-Perio lesion:** that is primarily or pure endodontic, due to inflammation or necrosis of the pulp. In other words, the primary cause of that lesion is pulpal (endodontic) in origin, but Symptoms clinically and radiographically simulate periodontal disease.

- **Class II Endo-Perio lesion:** the primary or pure periodontal in origin, but Symptoms clinically and radiographically simulate endodontic disease.

- **Class III (combined) Endo-Perio lesion:** both endo and perio diseases exist in the same tooth; and here we have two subcategories; (I) the lesion is pure or primary periodontal but treatment requires endodontic therapy, or (II) the lesion is pulpal or primary endodontic but treatment requires surgical periodontal therapy.

**Regarding class I:** The most significant sign is isolated pocket in a clean mouth. It means that there is no other periodontal disease in other areas of the mouth as it is very rare to have severe periodontal disease around one tooth only while all other teeth are relatively normal.

Basis for diagnosis; is loss of vitality; the electric pulp test shows negative response. Also, in case of pulpotomy, pulp capping, large restorations, deep carious lesion, or considerable diminishing of the pulp canal space, all these are strong signs or indications that an endodontic lesion is present.

To sum up, **Class I** endo-perio lesion looks **as if** periodontal therapy is needed, the primary cause is endo and this requires endodontic therapy only. it heals rapidly and has an excellent prognosis

**Regarding class II:** which is pure perio. Periodontal probing will show increased pocket depth with plaque and calculus formation and the bony lesion is usually more widespread and generalized than in the case of class I. So mouth must be examined for the existence of periodontal disease in other areas as this (existence of perio disease in other areas) would be a very good indication that class II endo-perio lesion is present. Pulp testing should indicate vital pulpal response

**Treatment:** periodontal treatment must be performed to this tooth, because unless perio treatment is performed the disease process will continue and we will have more complications and also it may progress around root surface to apical region.

**Regarding class III:** a true combined were both endo and perio disease exist in the same tooth, any portion of the periodontium could be affected by an extensive pulpal damage. any tooth with 2 thirds or more bone loss is potentially a case of combined endo perio disease of (pulpal periodontal syndrome).

a lesion extended from the apex toward the crestal bone is a PA lesion, while a lesion extending from the gingival sulcus toward the apex is a periodontal lesion.

Diagnosis: if the patient does have periodontal disease in multiple areas of the mouth, thin this is a good diagnostic sign of class III. Teeth with combined lesion might have features of inflamed or necrotic pulp tissue and increased pocket depth, and this will create a variability of diagnostic signs and symptoms including no pulp response in pulp sensitivity testing, increase in probing depth, sinus tract and pus

Treatment: we have a wide spectrum of different therapeutic options, periodontal and endodontic treatment with surgical or no surgical procedures, with or without local or systemic antibiotics

So whenever we have combined lesion we must do combined treatment.

Prognosis: when both periodontal and endodontic diseases are present in the same patient then the treatment and prognosis will change. If endodontic therapy is only performed the periapical lesion will heal to a point where the periodontal lesion begins. On the other hand, if periodontal treatment is only performed the crestal lesion will heal to the point where the periapical lesion begins.

Most importantly that root canal treatment is always performed first or at least at the same time of periodontal treatment because endodontic component has better chance of resolution.

To prevent periodontal complications, we can use non-setting calcium hydroxide for treatment in order to induce fast remission of symptoms in these cases and to improve the micro environment in the lesion.

In general, if you perform periodontal treatment and there was no improvement, then perform endodontic therapy

does treatment of combined perio endo lesions lead to total pocket depth reduction?  
Primarily the answer is yes

We have a subcategory which requires endodontic therapy and root amputation to gain healing for a periodontal only problem. Typical indication for root amputation is if we have severe periodontal defect around only one root of a multi rooted teeth while the other roots have healthy support or maybe slightly inflamed, here we can amputate and use one of these teeth as abutments. Also, perforation and crown root fracture are also considered as true/combined endo perio lesions, can also be treated by repair of the perforation site (depending on accessibility and the need of the tooth, root amputation, apicectomy of the perforation site, hemi section or extraction depending on the case. "some cases of vertical root fracture require extraction for example"

-Endo-perio vs implant-perio relationship:

Unlike natural teeth implants lack PDL, periodontal treatment should be undertaken prior to dental treatment.

An implant can wait but a missing tooth can irreversibly be gone, so we have to think of every option available to save a tooth rather than replacing it with an implant.