**Endo-perio lesions**

If necrotic pulp is not treated PA inflammation will establish, PA inflammation is the extension of the pulpal inflammatory process to the apex, and the PA area is where the reaction to what’s happening within the root canal system will take place. This will affect: first, the PDL resulting in thickening and widening around the apex of the tooth on the radiograph. This (PDL) is also the last structure to get its architecture and function back.

When pulp is affected, the attachment apparatus will become now the vital organ of the tooth. so, the viability of the tooth within the arch (function and durability) will now be dependent on the attachment level of the apparatus, that’s why we should maintain this apparatus. The tooth can survive without pulp but it can't survive without the attachment apparatus specially when the pulp becomes necrotic or infected.

“I think he presented a case but I couldn’t clearly get what he was saying”

So the apparatus is the vital organ and will affect the retention of the tooth.

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. usually the accessory canals are not seen or not visible on the radiograph and in the majority of cases they become visible following obturation of the root canal system but their presence can be suspected if a lesion appears on the lateral, middle, or furcation aspects of the tooth. Physiologically these lateral canals are covered with tissues of periodontium. As for their distribution, they are present at every level; 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.

 Following a periodontal disease lateral canals are exposed to the septic environment of the periodontal pocket and oral cavity, when the periodontal lesions are deep resorption can be seen within the root canal system opposite to the lateral canals.

The pulpal floor of an infected molar is more permeable than that of a non-infected tooth this means that there is a constant flow of material directly through the pulpal floor between the pulp and adjacent tissues, this means that the inflammation of severe intensity in this region will involve the thin bone of the furcation and the marrow spaces which are susceptible to invasion in this area. So, the radiographic appearance (radiolucency) of the furcation is usually due to an inflammatory products extending through the pulpal floor through auxiliary or lateral canals.

3- communication between pulp and periodontal tissues might also occur through dentinal tubules; despite their very small diameter, bacteria and their products can penetrate these tubules toward the pulp and cause damage.

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.

pulpal inflammation does not always lead to extensive periodontal damage but bacteria or their toxins making their exit through the apical foramen toward the periodontium can cause **periodontal changes**. also, bacteria might come through the crestal extension of the periapical granulomatous lesion.

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. This process is similar to the induction of acute inflammation of the pulp following cavity preparation, also deep scaling especially in furcation area can cause loss of blood supply in small area that can produce pain spasms and ultimate death of pulpal cells; a phenomenon similar to cardiac angina attack (what happens practically is that we will have a small area of infarction in the body of the pulp followed by coagulation necrosis).

But of course not all periodontal treatment of teeth will result in pulpal inflammation and necrosis.

As for the classification of endo-perio diseases, they are classified on the basis of their etiology, clinical symptomatology, or primary location of the lesion and therapeutic treatment of the lesion.

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.

 What happens is that periapical lesion can find a pathway resulting in what's appears to be a periodontal pocket.

The doctor showed a photo of a case showing furcation involvement, but what we see is not a true furcation invasion, this is a sinus tract, not a true periodontal pocket, which means that there is epithelium proliferation, but No periodontal pocket formation.

The doctor insisted on the idea that you shouldn’t be surprised or astonished when some facebook pages put some cases and say that this is a huge perio lesion that was treated by endo, there’s not such a thing, you shouldn’t like or comment on such posts.

So, the radiolucency in the furcation area heals perfectly following the endodontic treatment, and the what’s so called “pocket” will also close (means that probing Depths will back to normal from mesial, buccal, to distal “all sites”).

the doctor showed a video explaining the idea more, and I quote “In periodontal pocket of pulpal origin, a sinus tract will drain into periodontal element, when the pocket is probed it’s narrow, typically, on probing the sulcus depth within normal limits, with the exception of one very narrow area that can be probed some distance down the root surface of the tooth, in many cases it can be probed all the way to the apex of the tooth. Usually, the break in the attachment is only about 1 mm wide, and probing 1 mm to either side of the lesion will be within normal limits.”

Root scaling of class I shouldn’t be scaled; else the removal of periodontal tissue might interfere with the healing process.

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.

Another video: “typical periodontal lesion is conical in contour, probing will reveal wide pocket that not necessarily extend toward apex, the probing may start from a sulcus depth that is within normal limits, then gradually steps down a slope to the apical extent of the lesion and finally steps up again on the other side to a sulcus depth within normal limits”.

Symptoms might simulate endodontic disease, like a draining sinus tract that will simulate periodontal pocket rather that a PA lesion, loss of bone and/or soft tissue support might lead to sensitivity so you might be confused with irreversible pulpitis, tenderness to percussion mobility and swelling. All these symptoms might be confused with endodontic diagnosis. Also a toot with severe periodontal lesion but with no Restoration, caries-free or only minimal restoration, no fracture, and normal response to electric pulp tester; mostly indicates class II endo-perio lesion.

**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 that appears to be continues from the crestal bone to the apex when examined or viewed radiographically and clinically. In fact, they are two separate lesions that are joined,

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.

These combined lesions could be primarily pulpal in origin with secondary apposition of periodontal disease, or primarily periodontal disease with extension to the pulpal tissue, or it could be pulpal and periodontal lesions in which disease processes exist independently in both tissues. In fact, knowing the exact origin in these cases is not possible in most cases.

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 (I couldn’t get the rest, sorry.)

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, and also (something I couldn’t hear at 17:50) might be applied both during canal treatment and after initial phase of periodontal treatment. 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.

If you assume the lesion received a good treatment, does treatment of combined perio endo lesions lead to total pocket depth reduction? Primarily the answer is yes as shown in the literature. And as for tooth ( 19:50, he said percentages, not sure for what nor about the numbers, I didn’t find it in last year’s sheet or the one before last year’s, it’d be nice if any of you can hear it)

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.

He showed a case of a patient with hopeless teeth, application of a regenerative strategy was done.

“a study was conducted, a long-term clinical trial was to **compare** clinical- and patient-based outcomes following periodontal regeneration or extraction and replacement of hopeless teeth with chronic perio-endo lesions and/or attachment loss to or beyond the apex.

The conclusion was: Regenerative therapy can be applied at hopeless teeth and has the potential to change their prognosis; it is a suitable alternative to extraction of severely compromised teeth with intra-bony defects to or beyond the root apex.”

p.s. combined endo perio lesion is the presence of both lesions in the same tooth but should not necessarily be joined “physically”.

Diagnosis in endo perio lesions is the most important thing.

I couldn’t hear clearly the previous couple of minutes, I attended the lecture and searched for the subject on pubmed, thus, these were not his exact words.

https://www.ncbi.nlm.nih.gov/pubmed/21777268

 بسم الله نبدأ:

1-الريكورد كان سيء

2- لهيك تم الاستعانة بشيت السنة الماضية والسنة اللي قبلها.

3- بعض الكلمات ما قدرت افهمها وغير موجودة بشيت السنة الماضية أو حتى اللي قبلها, تم وضع الدقيقة اللي انحكت فيها, اذا حد قدر يسمع الريكورد ويلقطها بكون منيح.

4-عملت جهدي تطلع أحسن ما يمكن وبعتذر اذا ما كانت مفيدة.

5-شكرا لجمانا قصاد لانه ملاحظاتها ساعدوني اتأكد من اشياء ما كانت موجودة بالشيتات.

6-مرة واحد سلق بيض انحبس ليش؟

7-لانه اتّهم بالسلقة هاهاهاهاا