**Sheet 14 fourth year dr ibraheem**

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**Management of teeth with vital pulps and open apices**

*The completion of root development and the closure of the apex occurs 2-4 years after eruption of the tooth.*

*The less the maturity the involved tooth is the faster the resorption proceeds because of the larger diameter of the dentinal tubules in these teeth*

*These cases can be differentiated by the 1. shape and size of the canal system 2. appearance of the apex*

*The most common stimulation factor of root resorption is 1****. pulpal infection*** *(due to caries(mainly) or trauma )*

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*Other causes are : 2****. Pressure*** *because of :*

*A.impacted or erupting teeth*

*B. orthodontic movement*

*C. trauma from occlusion*

*D.pathological tissue such as a cyst or neoplasm*

*3.****Idiopathic resorption :****slow gradual shortening of the root and it may arrest spontaneously and the apex remains rounded*

*The communication between the root canal space and periapical tissues represents a real challenge*

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*As you know diagnosis is the first step in treatment its important because it will affect prognosis and it will affect the whole treatment plan .in our case diagnosis is dependent on 2 factors : 1. the root development stage 2. The condition of the pulp (most important) wether its vital or non vital*

*The diagnostic data is collected from1. subjective symptoms , 2.clinical and radiographic examination and 3. performing diagnostic tests “*

Diagnostic data is collected from thorough history of subjective symptoms not objective by clinical and radiographic examinations and also by performing diagnostic tests

Apical root resorption is asymptomatic, symptoms may arise from apical inflammation, these pts reports after many years when pulpal necrosis caused apical periodontits or discoloration causing either pain or compromise esthetic this the only cause that can enforce the pt to come to our clinic , remember they don’t have symptoms

In the radiograph there is also a dilemma, cz it might normally show periapical zone of radiolucency of immature tooth with a healthy pulp, so how we can differentiate btw this finding and the radiolucency from pulpal necrosis??

In this case we reach diagnosis by fistula and tracing the sinus tract

Ice and ethyl chloride are uses to test vitality but unfortunately, these are of very limited value compared to other thermal tests as co2snow ,PDMtest, and others they used to be very inferior

The most used test for assessing the NV supply in the pulp of a traumatized tooth is electric pulp test

-After trauma the pulp is in the state of shock this state might take from 3-6 months

-Vitality of the pulp is expressed by its circulation and not by its innervations

What happens is that even in an open or closed apex nerves might be damaged but blood supplyis still intact so the pulp is healthy but un responsive

-Positive response from the first test is a goodprognostic sign, if it gives negative (not vital) we should wait months(1,2,3 months) to make sure the pulp is not vital

(so we wait until other symptoms of non vitality develop)

These tests with yes or No response which are subjective and varies from person to other lack objectivity and gives false positive or false negative

So to avoid mistakes there should be no rush in treatment undertaken on the basis of negative responses

Laser Doppler flowmetry is an excellent test to reduce tooth mortality, it has many advantages, its objective, directly measure the blood flow which indicates the real situation of the pulp and don’t rely on sensory nerve response

Pulpitis is the inflammation of pulpal tissues..can be either reversible or irreversible, it might be symptomatic or asymptomatic (most important )

Asymptomatic irreversible pulpitis is a tricky situation , because the pulp is alive and don’t react normally to thermal stimuli whether hot or cold

Treatments is mainly depend on :1- diagnosis of the condition of the pulp( pulpal status >> vital or not)

2- the root development stage

-Many factors should be included in treatment planning: case selection, no .of trips required, risk of fracture, pulpal damage, restorability, financial restorations, dental argue , pt referral…. All these should be considered before treatment plan is put

- at the beginning of the 21 century, we had better understanding of the pathlogy and pathophysiology and their power of healing that should be reflected on our clinical management to develop more biocompatible treatment modalities aiming to increase tooth longevity not success rate.  
-in current endodontic status,pulpectomy(complete removal of pulp tissue) is always selected when the pulp just shows diagnostic or clinical signs of pulpitis. but whether it's reversible or not,doesn't represent the actual status of the pulp (example: when the coronal pulp is usually infected while the apical pulp remains vital with variant degree of inflammation)  
why this is important?  
because these clinically compromised dental pulps might still have stem cell potential that can be used as a resource of auto pulp regeneration  
  
note: unfortunately, data in lecture indicates that the reason of the dental RCT is simply deep caries and pulp exposures almost always mean RCT   
the fact that in current endodontic status, we don't care about the dental pulp and many of the pulps removed could have been saved through more conservative approaches

So,inpulpitis,the inflammatory reaction remains localized even after the bacteria invades the pulp space  
as found in histological sections,only 1-2 mm of the abscess can be seen-

-So from a clinical point of view,  
1- it's time to consider whether all diseased vital pulps require removal for optimal healing

2-where at least some pulp tissue appears vital specially in treated,immature and permanent teeth : all treatments should be oriented toward revitalization to form pulp dentine complex  
The concept of revitalization-revascularization is not modern

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**bioactive materials**

-the MTA mineral trioxide aggregate has been introduced to dentistry and it's a promising therapeutic cement that that has a history of clinical and experimental successes… it appears to perform better than any other material to which has been compared with >>> it produces dentine bridges…less inflammation …less hyperemia and less pulpal necrosis  
-MTA is applied direcrly on the exposed pulp ( unlike other materials,MTA needs humidity to set)  
  
-partial pulpotomy should be selected as an alternative to dirert pulp capping when the extent of inflammation is expected to be greater than normal( in traumatic exposures that lasted for more than 20 hours or mechanical exposures due to deep caries)  
-whilethe amount of pulp tissue to be removed depends on clinical judgment but only the infected tissues should be removed( clinical criteria of infected tissue is bleeding and biological markers that give the infected tissue a specific color so we remove all the discolored tissue)  
development and calcification and the tooth is asymptomatic