**Sheet OP # 10**

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Last time we started talking about the benign odontogenic tumors ( **epithelial lesions without odontogenic mesenchyme** ) and the **1st** one was the ameloblastoma

In this lecture we'll continue all other types of odontogenic tumors

**2nd Squamous Odontogenic tumour**

* Young adults
* Anterior to molars
* Painless swelling , ± Tenderness & loosening of associated teeth
* **Origin** : rest cells of malassez "like the radicular cyst (odontogenic epithelium )
* **Radiograph** : it's like a severe periodontal disease or lateral periodontal cyst .

Unilocular / semilunar radiolucency ( could be triangular in shape sometimes ) present between the roots of the teeth .

As the calcification increases the radio-opacity increases inside the tumor.

* When you take a biopsy you could notice that it’s a solid tissue.
* **Hist**:
* Elongated and rounded islands of normal appearing **well** differentiated stratified squamous epithelium .
* Surrounded by fibrous tissue Struma
* Inside the epithelial islands , Keratin, microcysts spaces, calcified structures could be found .

***3rd Calcifying epithelial odontogenic tumour (Pindborg tumour)***

* Rare ( less than 1% of these tumors )
* Mainly occur in Adults
* Slowly enlarging painless mass ( as its benign )
* 2/3 of the cases are found in the Mandible, in the molar & premolar region
* Its mainly a central tumor (within the bone) but In some cases , its formed inside the gingival "extra osseous so it's called peripheral Calcifying epithelial odontogenic tumour .
* **Prognosis :**

It’s a benign but locally invasive/infiltrative neoplasm like the ameloblastoma , but it has a lower recurrence rate ( less than 20% )

* **In radiogragh :**
* It can't be differentiated easily ( irregular radiolucent area )
* Can be multilocular or unilocular
* Radio-opaqe bodies are seen within the lesion due to calcification process ( the calcifications increase with time )
* Can be associated with unerupted teeth
* The border is well defined as it’s a benign lesion
* Differential diagnosis (odontogenic keratocyst , ameloblastoma , CEOT ,and other tumors ).
* As the lesion progresses, the calcifications increases and that gives the appearance of driven snow to the lesion (old lesions appear radio-opaque not radiolucent as the new lesions).
* Associated with impacted teeth
* So the presence of a radio-opacity will exclude the ameloblastoma and the keratocyst from the diagnosis
* **Histologically :**
* Unlike the ameloblastoma , this tumor is formed by sheets of large polyhedral epithelial Cells with abundant eosinophilic cytoplasm and prominent intercellular bridges ( connections between the cells)
* It contains features that could be misleading ( looks like a malignancy ) :

 (Pleomorphism, multinucleation, hyperchromatism ) of the nuclei

* Inside the lesion we could find amorphous amyloid-like material deposited from epithelial cells , the presence of the amyloid can be confirmed by the histopathologist by using the" Congo red stain" , this lesion is +ve for this stain so this test is a good diagnostic tool for this tumor .which appear like apple green color.
* The amayloid-like material can be calcified forming spherical calcifications (by time the no. of calcifications inside the lesion increases )

**4th Adenomatoid odontogenic tumour**

Benign tumor

* Start at the 2nd decade of life ( young patients mainly children )
* On radiograph it may be misdiagnosed as a dentigerous cyst as in this age many teeth could still be impacted ( like the canines )
* The difference between this tumour and the dentigerous cyst, is that its extended below the CEJ surrounding the crown and part of the root .
* It's an intraosseous tumor , its rarely to be extra osseous.

\***Radiograph**:

Unilocular radiolucency containing a tooth

Some parts of the lesion could be calcified (Faint flecks of radio-opacities are found inside the lesion ) and this can help to differentiate it from the dentigerous cyst .

Differential diagnosis ; include the dentigerous cyst and keratocyst in addition to this tumor .

* **Prognosis** :

Considered as a hamartoma so it’s a benign lesion and has no recurrence possibility .

Histopathology :

1. Surrounded by thick ,fibrous connective tissue wall so it is easy to inoculate in surgery.
2. Could be solid or cystic
3. Islands/ Whorls with central spaces surrounded by columnar epithelium called rosette , or ducts-like structures , the presence of ducts-like structures give this lesion its name (adeno)
4. Homogenous eosinophilic material that could be calcified .

*The benign odontogenic tumors epithelial lesions* ***with*** *odontogenic mesenchyme*

**1-Ameloblastic fibroma/fibrodentinoma/fibro-odontoma:**

* Contains both epithelial (ameloblastic) + mesenchymal (fibroma) tissues
* Both components are neoplastic.
* We have to differentiate between this tumor and the ameloblastoma !
* Young patients 2nd decay of life **VS** *(ameloblastoma 3rd decay)*
* Slowly growing , painless mass
* Mainly found in the mandible ( in the molars area )

**Radiograph** :

* uni/multilocular radiolucency ( uni- is more usually here *. while ameloblastoma multi- is more common)*
* associated with unerupted teeth so the differential diagnosis should include the keratocyst and the dentigerous cyst

note : we should always send a biopsy to the lab in these cases even if it looks as a benign lesion!

|  |  |
| --- | --- |
|  | Age : older than 3 less than 6  |

**Histology** :

* It's not a cystic lesion ( solid tissue )
* Thin strands & cords of odontogenic epithelium
* loose cellular fibromyxoid connective tissue ( looks like the dental papilla or the immature pulp tissue )
* The stellate reticulum is less abundant unlike the *ameloblastoma( which has stellate reticulum in the center and its epithelium is surrounded by fibrous tissue)* where as in this lesion the epithelium is surrounded by cellular tissue.
* Peripheral layer of cuboidal or columnar Cells enclosing Stellate Reticulum which is like what's found in the ameloblastoma
* This tumor is different than the ameloblasoma in ( the prognosis , the surrounding tissue , the abundance of stellate reticulum )
* As Ameloblastic fibroma contains dental pulp like structures + ameloblasts , formation of dentin like material could happen so it's then called Ameloblastic Fibro**denti**noma.
* Sometimes , the process continues to form enamel , dentin and cementum forming an odontome complex or compound forms , so it's
* called ameloblastic fibro-**odontoma**
* Prognosis : all types of this tumor are not aggressive , the local recurrence rate is low , and it's **not** an invasive tumor.

**2-Odontoamloblastoma**

* This tumor is basically like an ameloblastoma which contain an odontoma
* Its behavior is like the ameloblastoma (invasive and has high local recurrence rate ) so it's more dangerous than the ameloblastic fibro-odontoma .

**3-Calcifying cystic odontogenic tumour/cyst**

 The Solid form of it: **Dentinogenic Ghost cell tumour**

**Clinically :**

* Usually the patients are < 40 years old
* Occur in the anterior region
* Slowly enlarging painless swelling
* 25% extraosseous

**Prognosis :**

The soild form is more aggressive than the cystic form .

Radiograph :

* Well defined uni/multilocular radiolucency containing radiopaque flecks
* May be associated with unerupted teeth

So the differential diagnosis of tumors that contain radio-opacity and radiolucency include many tumors

The radiolucent margin around the lesion (fibrous connective tissue around it ) indicate that the lesion is benign .

So the radiograph is a good diagnostic tool to determine if the lesion is benign or malignant depending on the margins , whether it was well or poor defined .

**Histopathology** :

( this lesion is easy to be diagnosed depending on the histopathological features of it)

* Cystic cavity that’s lined by basal ameloblast-like Cells & Stellate Reticulum

Unlike the unicystic ameloblastoma, this lesion contain **inside** the stellate reticulum " within the lining EPL" ;ghost cells

ghost cells : large epithelial cells that contain keratin" then it calcified"

* Dentine or odontome could be formed within this lesion" it is calcified".

\*note that the odontome could be associated with many odontogenic tumors \*

Prognosis : the soild form is more aggressive than the cystic form

**4-Odontogenic fibroma & myxoma**

-This tumor is Mesenchymal in origin (Periodontal Ligament, Dental Follicle , Dental Papilla ) and its usually associated with a tooth or replacing a missing tooth.

-The myxoma is infiltrative and has higher recurrence rate than the fibroma

-We studied the fibroma in the CT ( the fibroepithelial polyp ) before, but here the fibroma is present within the bone ( Odontogenic fibroma ) or a myxoid tissue ( Odontogenic myxoma )

* **Odontogenic fibroma :**

**Clinically:**

* Slowly enlarging, painless benign tumor may associated with un erupted teeth.
* Appear mainly in the Mandible and could be present in the gingiva rarely (Extraosseous)

**Radiograph :**

Well defined radiolucency , uni/multilocular

**Histopathology** :

* Fibrous connective tissue (collagen & spindle-shaped fibroblasts)
* Strands of odontogenic epithelium ( like rest cells of malassez ) could be found inside the CT
* Calcifications could be found also

If extraosseous; the presence of the odontogenic epithelium and the calcifications indicate that the lesion is peripheral odontogenic fibroma rather than fibrous epulis

Recurrence rate is less than myxoma

* **Odontogenic myxoma:**

**Clinically:**

* More common compared with fibroma
* Could be present either in Mandible or Maxilla
* Slowly enlarging, painless (but the growth rate is higher than the fibroma )
* Tooth displacement could happen

**Radiograph :**

* Well defined *multilocular* radiolucency, “soap bubble” or ( tennis racket) appearance ,
* Could cause resorption for the adjacent root

**Histologically :**

* Mucoid material surrounded by thin fibers so it's easy to be ruptured , so it can't be removed by inoculation , safety margins should be taken to ensure the complete removal of this tumor
* angular cells with long anastomosing processes
* no capsule present so this lesion is infiltrative inside the bone

**mixed tumours** of both fibroma and myxoma can be found and its named according to the dominant tissue as Fibromyxoma "myxoma is more" or myxofibroma" fibroma is more"

**prognosis** :

the presence of the myxoid tissue makes the prognosis worse than the fibroma as it has high recurrence rate ( 25% )

**5-Benign Cementoblastoma**

**Only true neoplasm of cementum**

• Clinically:

* Young patients < 25, occurs in males more than females
* Radio-opaque mass **attached** to the root , usually it occurs in the lower 1st molar & premolar
* Slowly enlarging
* Sometimes gives rise to pain and swelling
* The Tooth is vital
* ( if we see radio-opacity around non vital tooth **osteosclerosis** is the main diagnosis)

Treatment : surgical extraction and removing of the tooth (using a flap ) , simple extraction could cause fracture of the tooth or incomplete removal of the tumor .

* Radiogragh :
* Well defined radio-opaque mass in the late stage , but in the first stages it could appear as radiolucent mass . ( with time the radio-opacity increases )
* Thin radiolucent margin surrounding the lesion ( benign )
* Attached to the roots of a tooth ( continuous with the periodontal ligament )
* Resorption of related roots could happen
* **Histopathology** :
* Capsule ( fibrous connective tissue )
* Mass of calcified material ( Cementum with many reversal lines)
* Spaces that represent Peripheral zone of un-mineralized tissue containing cementoblasts

Now we'll take about the Malignant odontogenic tumours :

1-Malignant ameloblastoma:

• Typical histology of benign ameloblastoma but it undergone aspiration to the lung leading to pulmonary ameloblastoma with the same histopathological features of the ameloblastoma in the mandible, it occur mainly with the lesions that was removed surgically more than one time

• it's an aspiration process not true metastasis which occur through the blood/lymph.

**2-Ameloblastic Carcinoma:**

• Ameloblastoma that contain follicles , surrounded by columnar cells , has stellate cells at the center but contains features of malignancy :

Hyperchromatism , polymorphism , high mitotic activity , invasion to the surrounding tissues .

Could spread to the lymph nodes ,

3-Primary intraosseous squamous cell Carcinoma

Originated from the odontogenic epithelium of the mucosa

Signs of malignancy are present within the lesion.

**4-Clear Cell Odontogenic Carcinoma:**

Rare tumor

Malignant tumor that infiltrate to the lymph nodes

**Histopathology :** large cells with clear cytoplasm that looks like the histopathological image of renal cell carcinoma

the patient should be examined for assurance that he doesn’t have renal cell carcinoma

**5-Malignant change in odontogenic cysts:**

• Clinically & Radiographically a Cyst exist

• **Histopathology :** part of the cyst contains malignant features

• **Pathogenesis:**

\_ Carcinoma change in a cyst

\_ Cystic degeneration in a Carcinoma

\_ Carcinoma invading the cyst

**6-Odontogenic Sarcomas:**

• E.g: Ameloblastic Fibrosarcoma

• Fibrosarcoma tissue and Non-neoplastic odontogenic epithelium

• ± dental hard tissue

**Tumours of debatable origin:**

1-Congenital gingival granular cell tumor (Congenital epulis):

(The typical Grandular cell tumour usually develop in the tongue and it consists of large, closely packed granular cells and the surface epithelium show hyperplasia so it could be misdiagnosed as SCC)

• **Origin : unknown**

• **Clinically:** same as the grandular cell tumor in the tongue but it appear in a Newborn's gingiva

Anterior maxilla

Mainly female newborn

Pedunculated swelling from crest of alveolar ridge

Up to several Cms in size

• **Hist:**

Looks like the grandular cell tumor but it has Atrophy of overlying epithelium rather than hyperplasia

 Diagnosis : S100 –ve unlike the GCT which is S100 +ve

Treatment : local excision

**2-Melanotic neuroectodermal tumour of infancy**

• **Origin:** neural crest

• **Clinically:**

 < 6 months newborn

brown or black pigmented swelling come from inside the maxilla

mainly occur in Anterior Maxilla but can occur in Extra-oral sites : (brain , skull , testis )

• **Radiogragh:** radiolucent area with tooth buds displacement

• **Histopathology:**

\_ Two cell types ( the first type looks like the melanocyte and the second type looks like lymphocyte ) with dense Fibrous CT stroma

**The presence of the melanocyte like cells give the lesion its name and it helps in the diagnosis**

**GOOD LUCK :D**

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