**+\*\*please refer to the PDF**

Today we’re going to start with the interpretation part of the radiograph that we took with the appropriate dose , healthy exposure , processed and viewed the right way , and then we have to look at the images and figure out what we’re looking at .
are we looking at something anatomically normal , or variation of anatomy or pathological that we have to address either by active management or by prevention follow up .

lets now learn how does a regular anatomy looks like in a radiograph .. and we have to train our eyes that those radiographs are normal and differentiate them from pathological ones

the whole lecture will be about intraoral anatomy , and you have to be able to differentiate wither the radiograph that we’re looking at is a maxilla or a mandible, wither the part is anterior or posterior , and the geometry of the projections that we took in the previous lecture if its central or lateral ,is it a molar or premolar PA ,premolar bitewings or molar bitewings .
so all you have to do is to tell which is what and then you’ll be good to go .
Now we will start with the **central projection : \* Slide # 2
it’s a slide showing the maxilla**its anterior , with a little bit upward angulation , you probably expect some structure of the nose to appear on the radiograph (nasal fossa, nasal septum and the concha , nasal spine ,incisive foramen , nose , and the median palatine suture )
we have to keep in mind that there are variations in the thickness of the soft tissue , and the size of the nose , and all that effect how a radiograph would look like
if the for amen is too big or the foramen is too off to one side , that probably would raise the flag , it’s a question that’s worth asking .
**\*\*nasal septum** :it’s a bony structure , radio opaqe , in the middle of the nose ( in the mid of the central projection )

**\*\* inferior concha** :its not only cartilage and a little bit of bone , it has a lot of soft tissue
so that the septum appears really white , while the concha appears grayish and not that white not a dense piece of a cortical bone .
another term for concha is turbinate .

**\*\* nasal fossa** : it’s a real emptiness , looks black on a radiograph
the dr asked why it doesn’t appear pitch black ?
because there are soft tissues that lies between the film and the nasal fossa , so there is a little bit of superimposition .

**\*\* nasal spine**(it’s the famous anterior nasal spine ) :very important anatomical landmark , in orthodontics its something we use to trace cephalometric radiograph .
**Slide 3**
**\*\* incisive foramen** : it’s the end of the canal .
how to differentiate wither it was normal (foramen ) or pathological (cyst)
1- by its size
2- its effect on teeth
1-according to its normal size there is debate in science , some say if its less than 7 mm then its within normal ;and others say if its less than 1 cm then its normal , if its more than 1 cm then its turning pathological .
2-we have to know that the size of the incisive foramen does not change with age it will not affect the teeth and will not push them apart , but if it’s a cytic cavity , it will be large with fluids and osmotic pressure that will create a little pressure on teeth and push them apart .
**\*\* median palatine suture** :in embryo the palate comes from two shelves they meet in the midway , when they don’t they create the cleft palate , a remnant of that stays in and they call that the median palatine suture
**Slide 10 :**

this shadow is the shadow of the nose superimposed on the radiograph , we can see the two nostrils and the tip of the nose ,the radiograph is token from above , so the soft tissue of the nose gives a nice superimposition , the soft tissue superimposition is very important because sometime it does not always look clear and in a full nice shape . in this slide this gentleman has a big nose so the soft tissue superimposition is clear
**how to know if its superimposition or it’s a crack >**
we might mistake that for cracks or potential fracture lines .
the superimposition they go beyond structure , if the tooth is cracked the black line would impossibly extend both medially and distally
SO .. if it runs beyond a structure then its probably a superimposition
if its specific too a certain tooth or a certain piece of bone then it might be pathological and we also have too refer to the history and clinical examination .
**in slide 10** we couldn’t see the lip line because the radiograph was taken in an angle and the nose was really low .

**Slide 11**if the lip is thick enough and the exposure is low enough then we can see a line that represents the lip .We can also see another line that represents the actual nose

Always look for soft tissues , there has to be some imagination that’s why its called two dimensional ,and in the last few lectures we’re going to take that 2D radiography is limited by the superimposition , so people started to think outside the box , they started searching for an option that gives them 3D , because the head is 3D , so some tasks moved into three dimensional .

**Lateral projection**
If we move lateral we still see the nose and we start to see the sinus , and the lateral fossa that lies right distal to the lateral incisor and mesial to the canine eminence ( it’s a depression ) the bone in this area is thin .
this bone is thin( lateral fossa ) and beside it there’s thick bone , we see around the canine things are really white(thick bone ) and then a transitional black zone around the lateral incisor(thin bone ) , we might mistake it with an apical disease or other pathologies but actually its normal , an apical disease and other pathologies they primarily affect the lamina dura and cortical bone before any other signs , so you look at the tooth if the cortex is intact , here you should refer to the anatomy as one big differential diagnose .

There is a very famous contact between two nice cortices which is the floor of the nose and the floor of the sinus it has the shape of an invertred Y (slide 13-14)
we have to train our eyes that this is the normal and some think that it’s a huge sinus but its normal as we said . but that doesn’t mean that cyts do not exist in the sinus , they exist when we look at the walls of the sinus and see them pushed from their original place.

**Slide 16**
when there is thick soft tissue we can see the nasolabial fold and some parts of the nose
usually in the middle east its not that easy to see these structures because we are petite people , where as afro-Caribbean they have really thick soft tissue that appears clear on a radiograph .
one of the students asked why we didn’t conider the space as a sinus the dr answered
because : 1- it’s a typical appearance of the sinus
2- the radiograph is taken after vitality test for the teeth
3-lamina dura is intact ,we have to look for the sinus then we look for the cyst
we will take that lesions they either come from within the sinus then they go to the dento-alveolar area , or they come from the dento-alveolar area then they go to the sinus
then the lesion it either does a complete interruption to the floor or pushing and spacing to the floor , if the lesion is coming from above it will push it downward and vice versa .
soo you have to identify the anatomy then identify the lesion , then the relationship between the anatomy and the lesion .

**Slide 17**
the pic on the left represent pathology because the lamina dura isn’t intact and the sinus is surrounding the roots ,

**molar projection**when you go further back ,we see more structures related to the sinus such as the septum and molar projections and the maxillary tuberosity .|

**Slide 20** we can see a very important landmark an inverted J shaped radio-opacity which is the malar process of the zygoma (the zygomatic process) .

the dr asked how to differentiate between the floor of the sinus and the malar process? the sinus goes all the way to the end of the maxilla and its shape is nice thin sharp cortex and continuous .

however the J shaped structure is thick and its superimposed on the actual intraoral structures
we can find septi which is simple variation of normal that’s important for a surgeon if he’s doing sinus lift , sometimes if we’re doing an implant we need good amount of bone and good quality of bone , if there isn’t enough bone we can add synthetic or natural bone by digging a hole in the sinus in the pocket side they open a window and push the mucosa of the floor of the sinus and then the add bone . That’s why anatomy is important not only to figure out disease but also for pre-operative surgical procedures.

**Slide 23**

The red line is pointing to a radiolucent track which represents a neurovascular bundle , it’s a variation of normal and its important in orthognathic surgery , if it was right behind where you wok you might need to change your technique a little bit while doing the surgery , or it might stop your surgery .

\*\*maxillary sinus :if you don’t put boundaries for it , it will expand, and fill all the space and this is called **pneumatization .**the air filled sinus will enlarge and invade the little alveolar process and it’s a variation of anatomy no need to worry about unless, if you’re doing a surgery .

When we go further back we can see the malar process, pterygoid process ,coronoid of the mandible(in the maxillary projection)

**slide29:**

All the way to the hamular process with a big mouth opening .(very posteriorly positioned radiograph)

 malar process might be seen in premolar projection and sure will appear in a molar projection .

**\*\*MANDIBLE:**

Nice developed mental ridges(in men), Genial tubercle around the lingual foramen , and the mental fossa .

The mental fossa is like the lateral fossa in the maxilla ,thin piece of bone and more lucent in radiographs.

The tubercle is two dimentional so everything will be superimposed ,you will see the lingual foramen and the genial tubercle around it (inner mandible) , mental ridges (outer mandible) and that might be confusing .

**Slide 36**: the canine has two roots with very difficult extraction

**Slide 37** : well developed mental ridges which indicates that this is a guy nit a lady because males have more developed ridges than females,
**slide 38 :**mental fossa . the doctor points at an area which is blackish compared to another area
the slide shows a depression on the labial aspect of the mandible overlying the roots of the incisors

**slide 39** :

the slide represents two pictures ,
the one on the right ; the orange arrows identifies nutrient canals, its anatomical because the lamina dura is intact. ( normal with no disease )
 on the other hand the picture on the left it shows an apical disease because the lamina dura isn’t intact .. these teeth need vitality testing and the doctor said that these teeth arents vital because lamina dura isn’t there . (disease)
if we go more distally we might see the mental foramen , that depends on the patients anterior width , because its a **lateral canine**?but you might as well see the mental formen.

**Slide 40-45**
you can see the mental ridge ,lingual foramen might appear if we’re a bit too anterior,

also the anterior lobe of the inferior alveolar nerve canal and how it shows in the mental foramen
the inferior alveolar nerve has a very good chance that it bifurcates and then unites or it bifurcates and goes out of the two foramens , but most commonly it goes in the anterior lobe then goes back .

**slide 46**
when we go backward we can see the mental foramen ,the mandibular canal , the myelodyoid ridge and the area underneath it , it’s (area) a concavity and the mandible there is really thin ( same as the lateral fossa and the mental fossa ) and the posterior mandible is a really common area for disease so always make sure that we are aware of this relatively radiolucent area out there .
the area that’s down the line (interal oblique line ) is actually more black which is typical because its thin

how to differentiate it if it has some diseases ?
1-it has to affect the inferior border of the mandible
2- it has to affect the cortex of the ID? canal

**slide 56**
the mandibular canal .
why its important if we’re doing an active surgery , extraction a third molar ?
we should know the relationship of this canal to the third molar
to know the **risk of paresthesia** , or if we have to **change the method of extraction or change the surgical technique , to know the duration of the surgery .**

 **Mylohyoid ridge , submandibular gland fossa ,external oblique ridge , mandibular canal ,** these cortices they are the least to resorb or the resorb to a really low extent , even if it’s a really thin mandible you’re still going to see these anatomical land marks .

Done by aya abd al-azeez and Noor AlQaisi
Sorry for being late