**Extraoral radiographic procedures**

The doctor showed us a picture for a patient that has swallowed an intraoral film , it is important to have a radiograph from more than one side to localize where is the film. Plane radiographs are limited , I can see right and left , but I need another image to see anterior posterior .

Multiple uses of extraoral radiography : 1) foreign body localization 2) trauma cases 3) fractures 4) pathology 5) growth and development . ( they all need a much larger scan )

Another picture shows a lady holding a pineapple in one hand and a banana in the other one , if we take the image from one side we will see the pineapple, from the other side will see the banana only , so there is a missing structure that you can’t see if you just think in one imaging geometry ( one shot ). Always think about at least two sides that are perpendicular to each other ( 90 degree ) .

Another example , little ulna with fracture , you can’t see that it is anteriorly displaced unless taking an image with lateral angle view , the same thing goes with mandible , maxilla and anything in the body as well.

In ortho , we need something systematic and standardized to be able to compare 1) growth and development 2) effect of the treatment , to see a real change . in order to do that they produced a cephalostat in which the patient put his head with rods inside his ears . cephalostat has 1) a ruler , to play with film distance and magnification 2) a mounted x-ray beam ( fixed in place ) . I take an image when the patient is biting on his teeth , then after one year I will take another one in that same position ( all things are standardized ) to be sure if there is an actual growth or just a magnification . this is the idea of cephalometry . there is a specific distance between the midline of the patient and the film and specific distance between the midline and the source as well ( standardization ) .

In good cephalometry we should see the hard tissues , maxillary and mandibular teeth in maximum intercuspation and soft tissues (nose , chin ) to do tracing . also it is magnified in a standard way by using the ruler , for example 1.2 cm , 20 % magnification .

Regarding Head position , there are two techniques ( debate ) :

1. Some people Put the patient head inside and make the Frankfort plane parallel to the floor ( horizontal ) .
2. Others suggested a natural / neutral head position : the head position is governed by the tension of the muscles , when you are relaxed ( e.g when you are sitting at the sea ) and looking to the horizon the muscles will be in a resting tension , you can achieve this clinically by bringing a mirror and asking the patient to look at his own eyes .

In addition , the patient must not open his mouth , if doing so the analysis will not be correct . so we ask him to bite on his teeth all the way .

How are both soft and hard tissues seen together in the same cephalometry ?

Normally , one of them will be seen and the other will be very light because they have different exposure .

here the exposure setting is selected to go through the bones . soft tissues need less exposure , so half the circle of the anterior portion of the x-ray tube is covered by metal wedge ( lead ) to reduce the number and energy of the entered photons ( similar to filtration ) to see the soft tissues , this is called differential collimation . differential because the metal covering only the anterior half , while the posterior half have full number and energy . the purpose of that , to include both soft and hard tissues in one image , reducing the dose and saving time and money.

Cephalometric errors occur in these cases : if there are aprons , motion , film storage errors , and ear rings .

Posteroanterior (PA) cephalogram : the anterior part of the face is facing the film ( receptor )

You can notice the big difference between cephalometry and panorama . in cephalometry , less dose, less details and there is much more superimposition .

**Multiple skull views >> next lecture**