

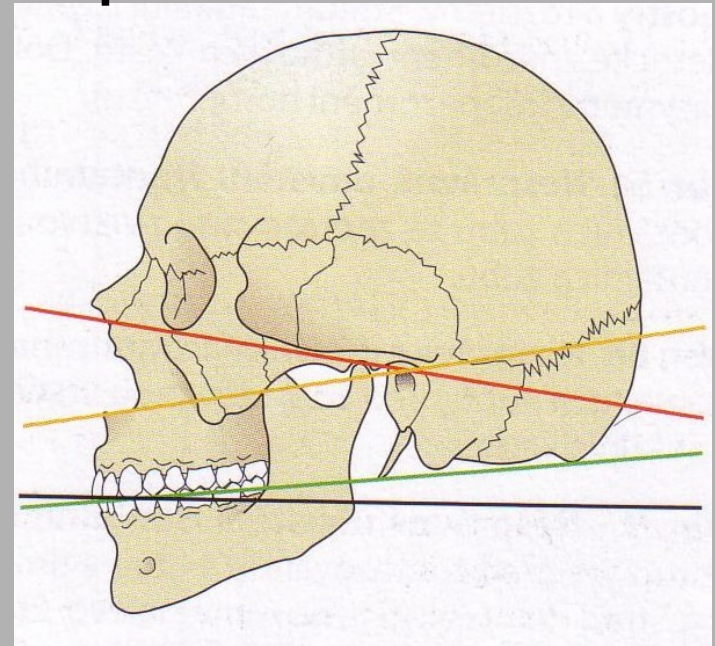
# Radiology for stomatologists

## Lecture



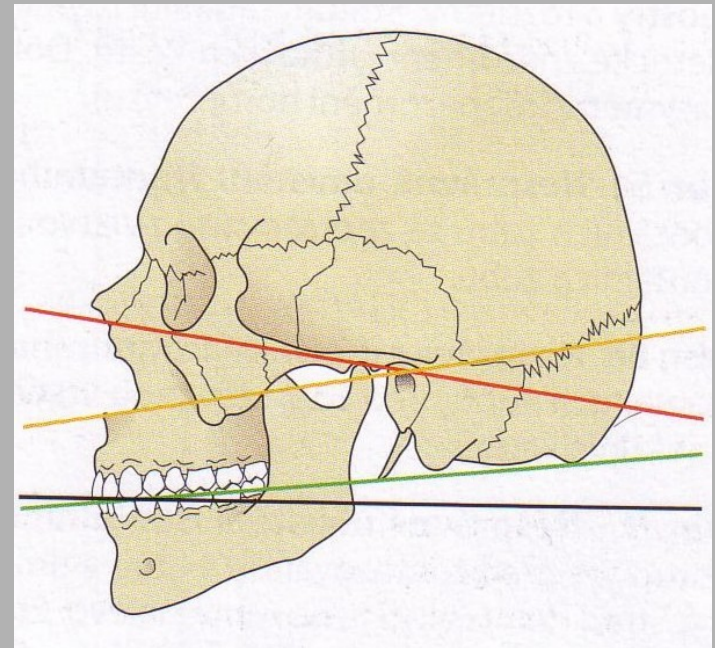
# Landmark lines

- **Frankfurt's** horizontal, anthropological basic plane, connects caudal part of orbit to external to auditory meatus.
- **Camper's** plane connects the external auditory meatus to caudal part of nose.



# Landmark lines

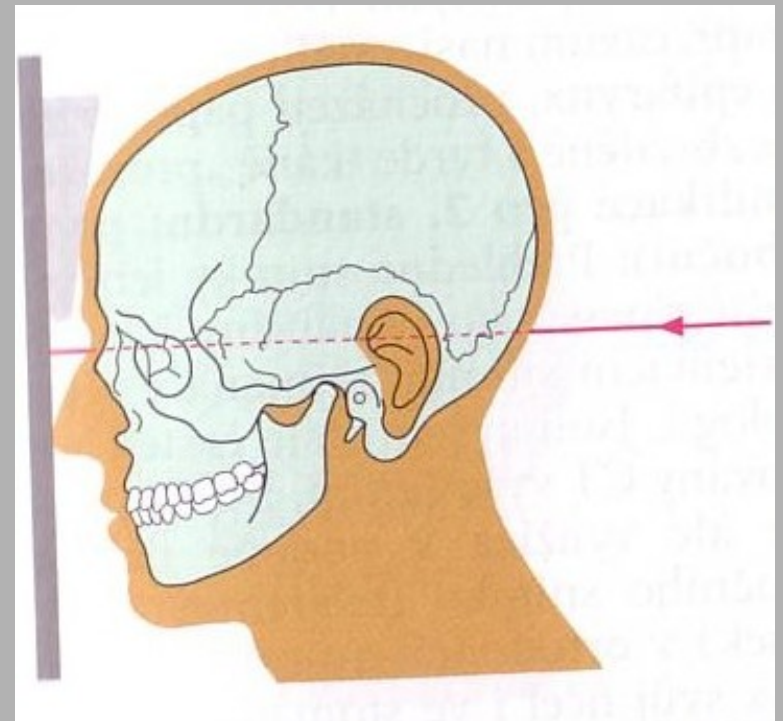
- **Occlusal** plane should be horizontally (black line) oriented or slightly inclined down (at small children)



# Extraoral skiagrams

- **Panoramatic:**
  - Picture of the cranium
  - Projection of the maxillar sinus
  - TMJ – Temporo-Mandibular Joint
  - Orthopantomograph (OPG)
- **Tomography (CT, MRI)**
  - Film or detector is placed out of the patient mouth.
  - Image of larger surface of mandibula, maxilla, soft tissues and the cranium

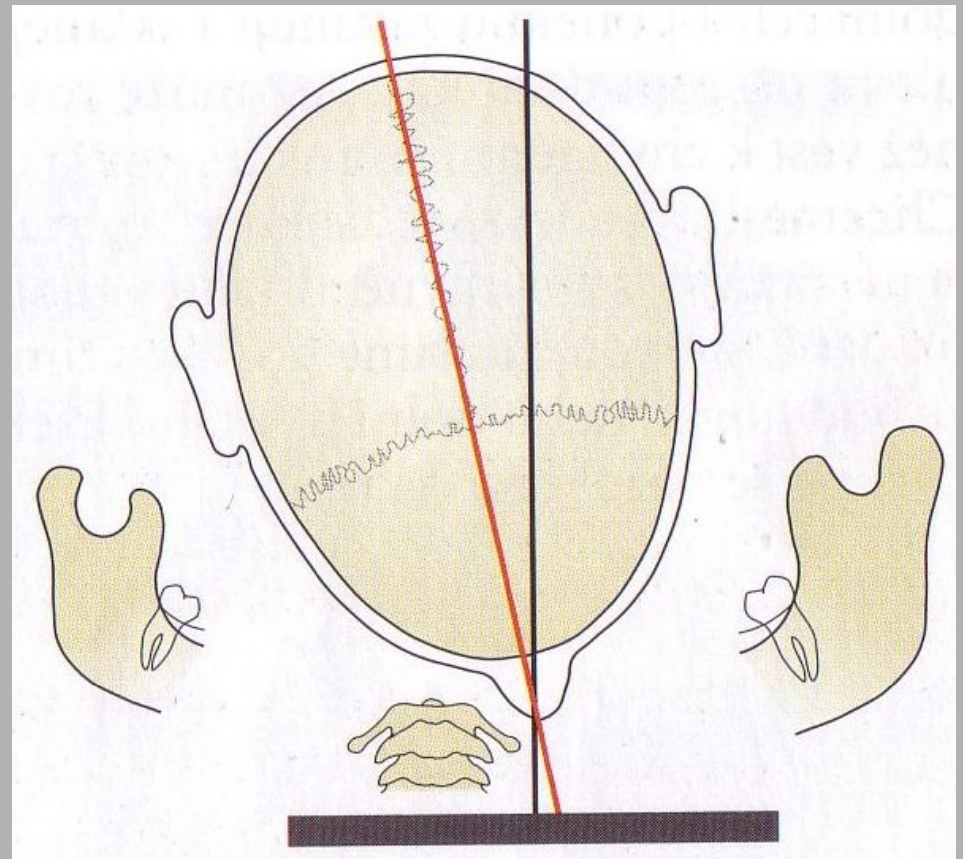
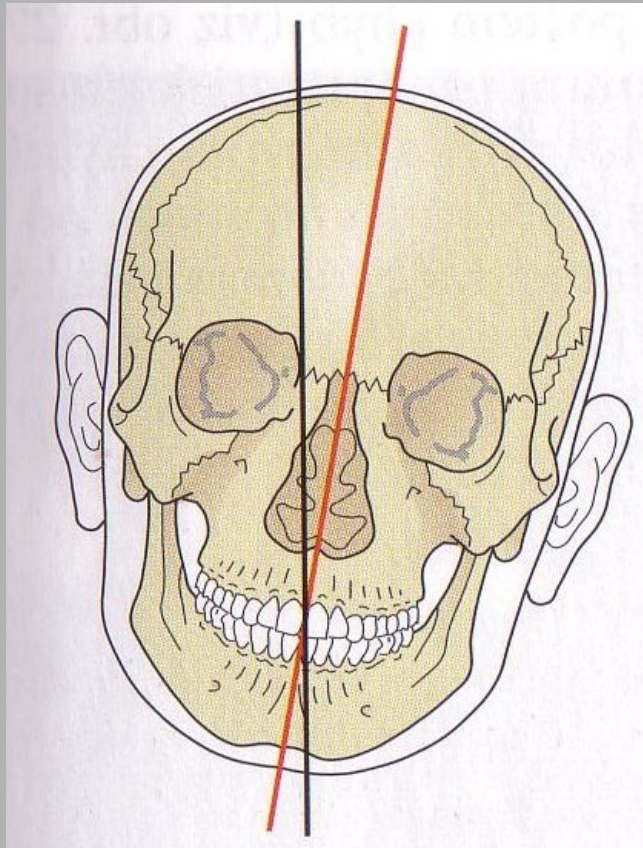
# Cranium – dorso-ventral and lateral projection



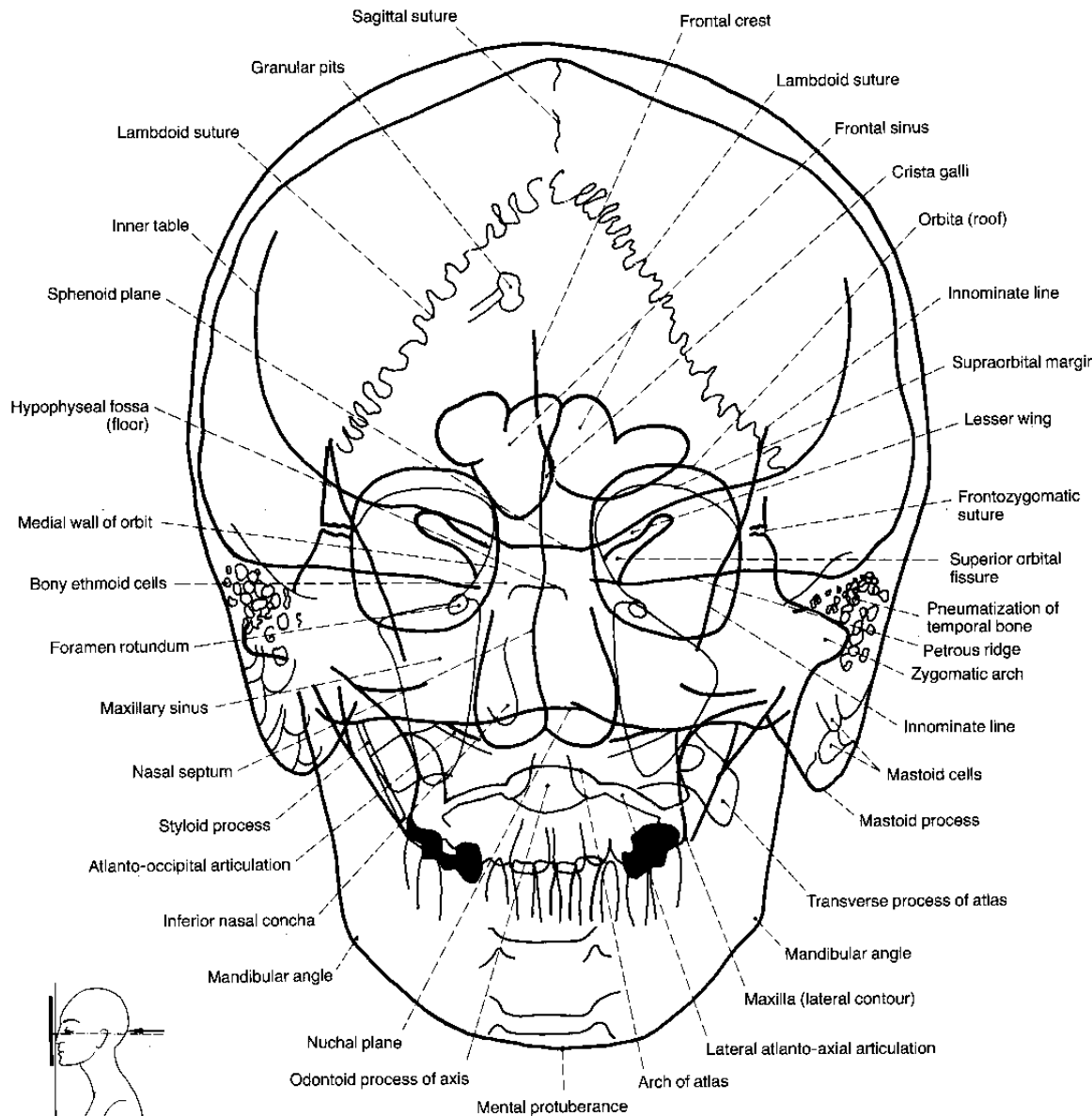
- Nose and forehead touch the cassette
- X-ray pass through the protuber. occipitalis perpendicularly to cassette

# Cranium – dorso-ventral and lateral projection

- Centre
- Tilting, etc.

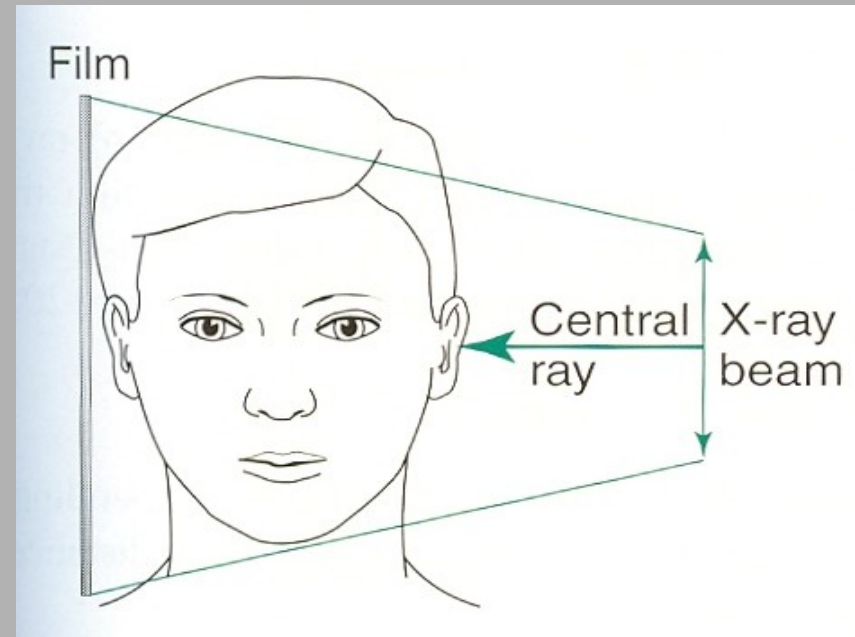
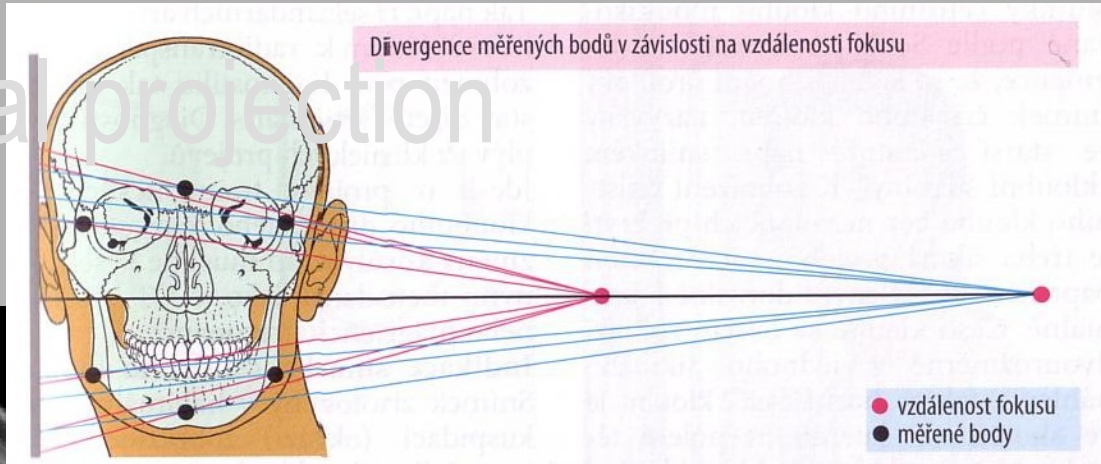


# Cranium – dorso-ventral and lateral projection



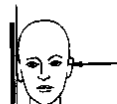
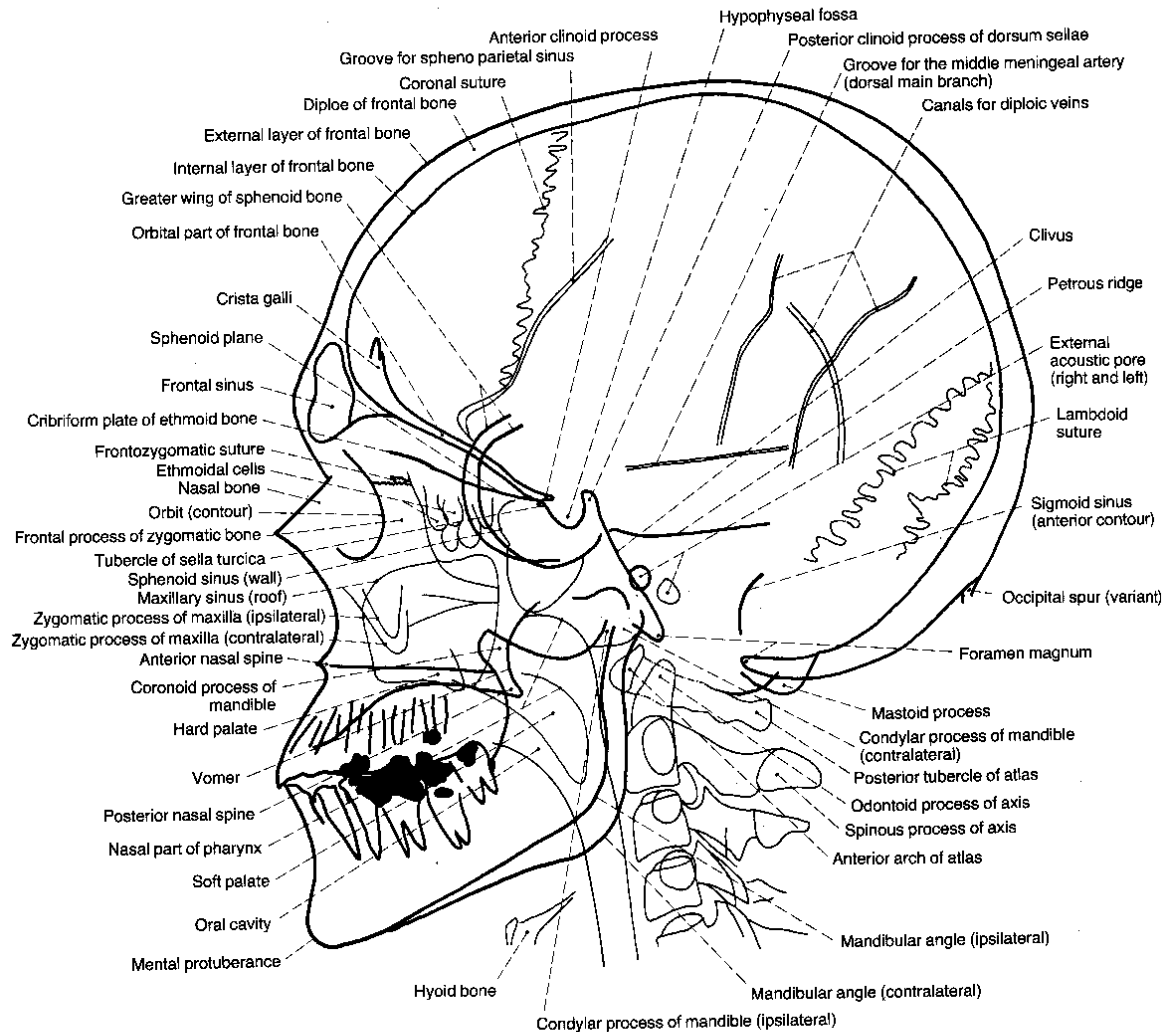


# Cranium – lateral projection



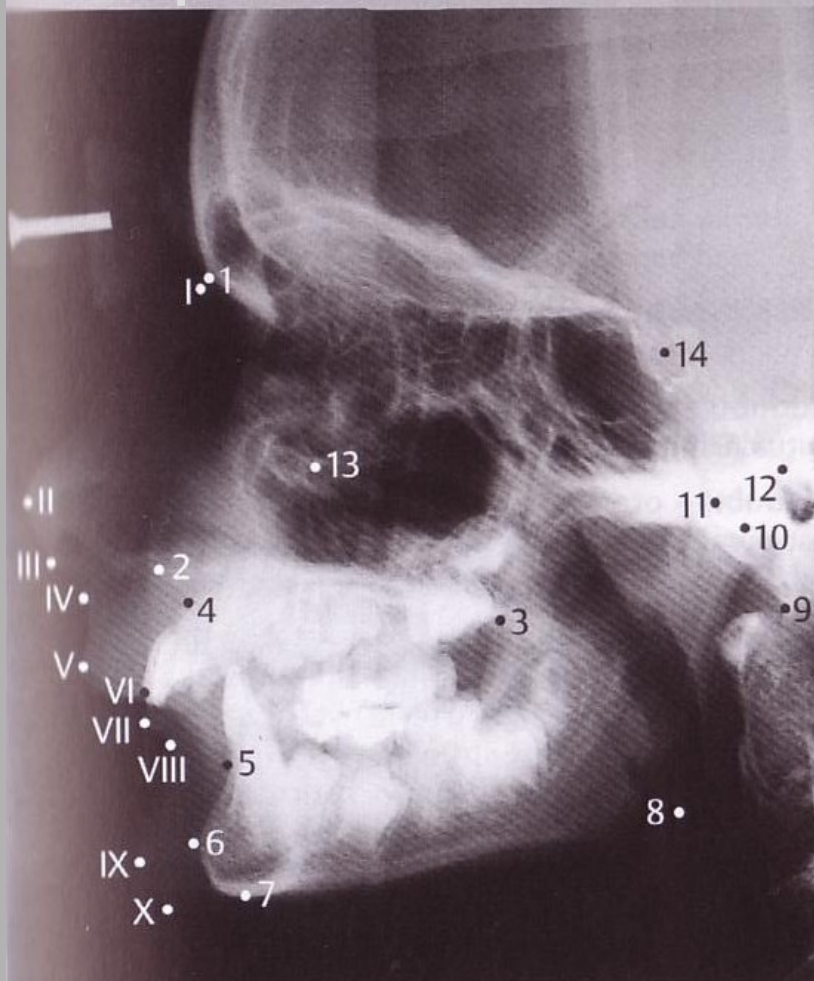
- Central beam goes through the acoustic meatus
- Perpendicular to the cassette

# Cranium – lateral projection



# Cranium – lateral projection

- splanchnocranium centre



## Skeleton Points

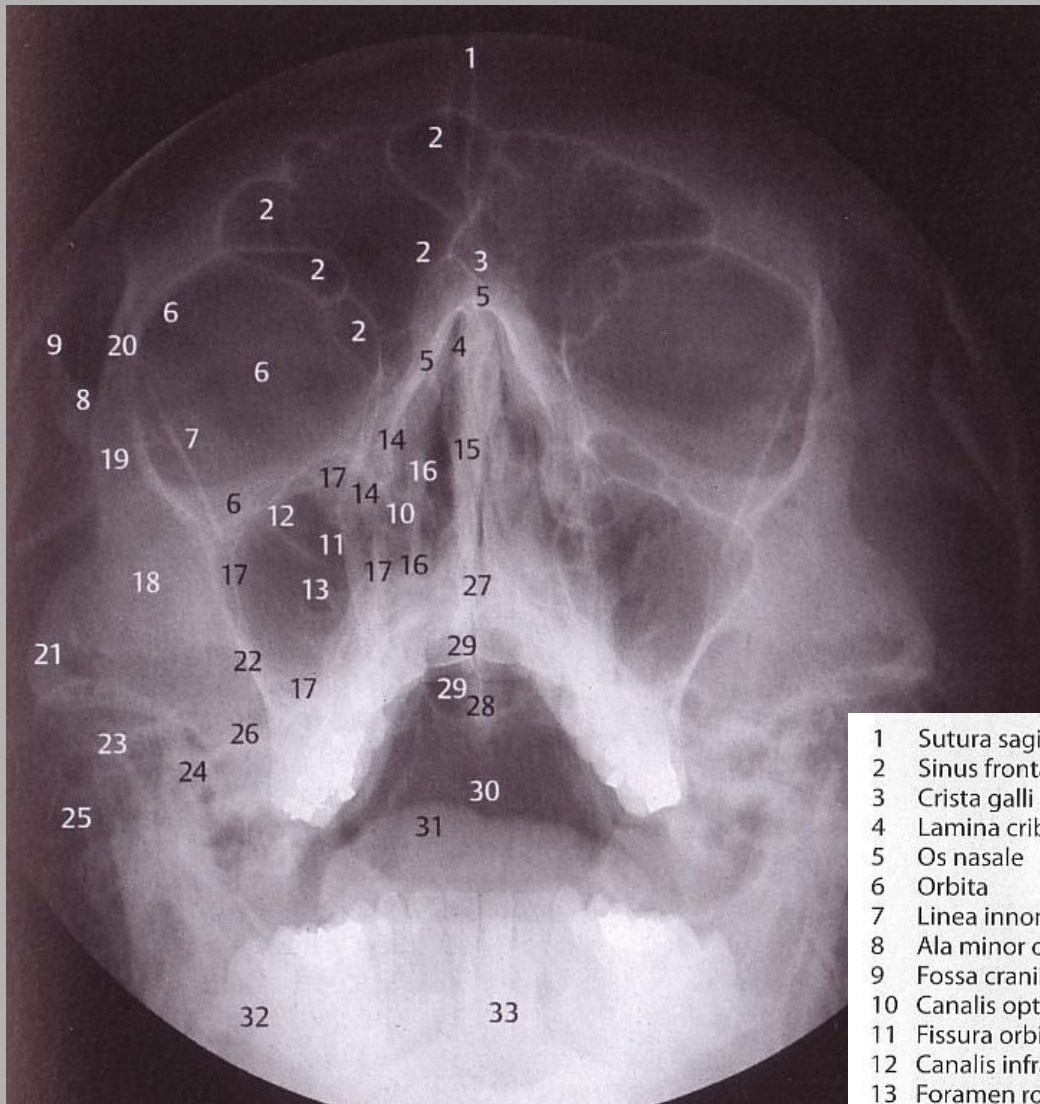
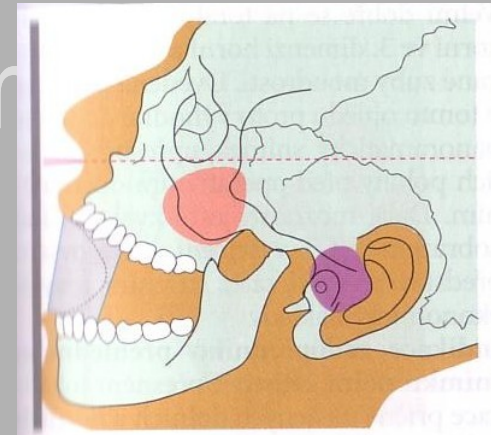
1	Nasion
2	Spina nasalis anterior
3	Spina nasalis posterior
4	Bod A
5	Bod B
6	Pogonion
7	Menton
8	Gonion
9	Basion
10	Articulare
11	Condylion
12	Porion
13	Orbitale

14 sella

## Soft Tissue Points

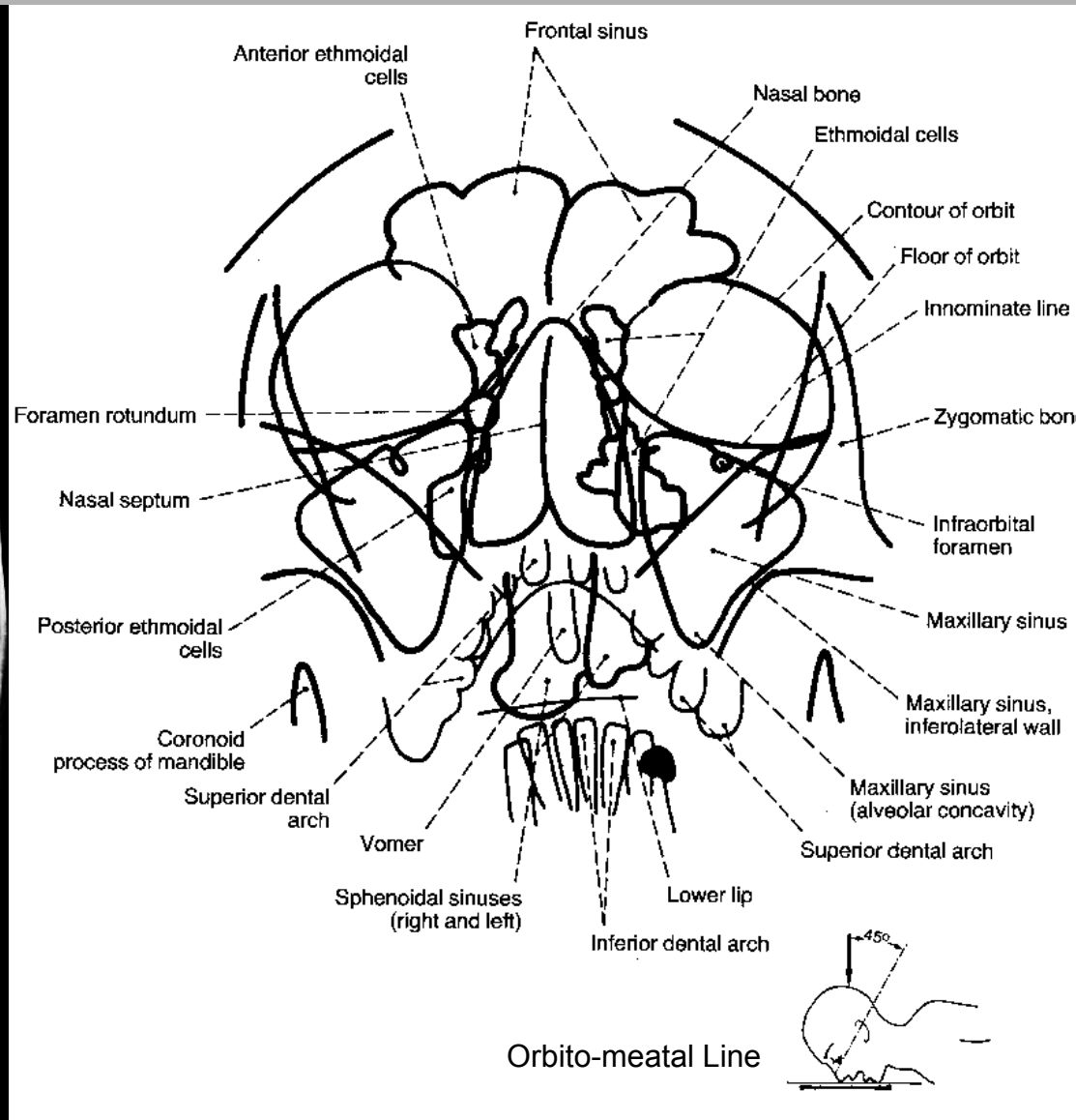
I	Kožní nasion
II	Špička nosu
III	Subnasale
IV	Subspinale
V	Labrale superius
VI	Stomion
VII	Labrale inferius
VIII	Submentale
IX	Kožní pogonion
X	Kožní gnathion

# Cranium – semiaxial projection



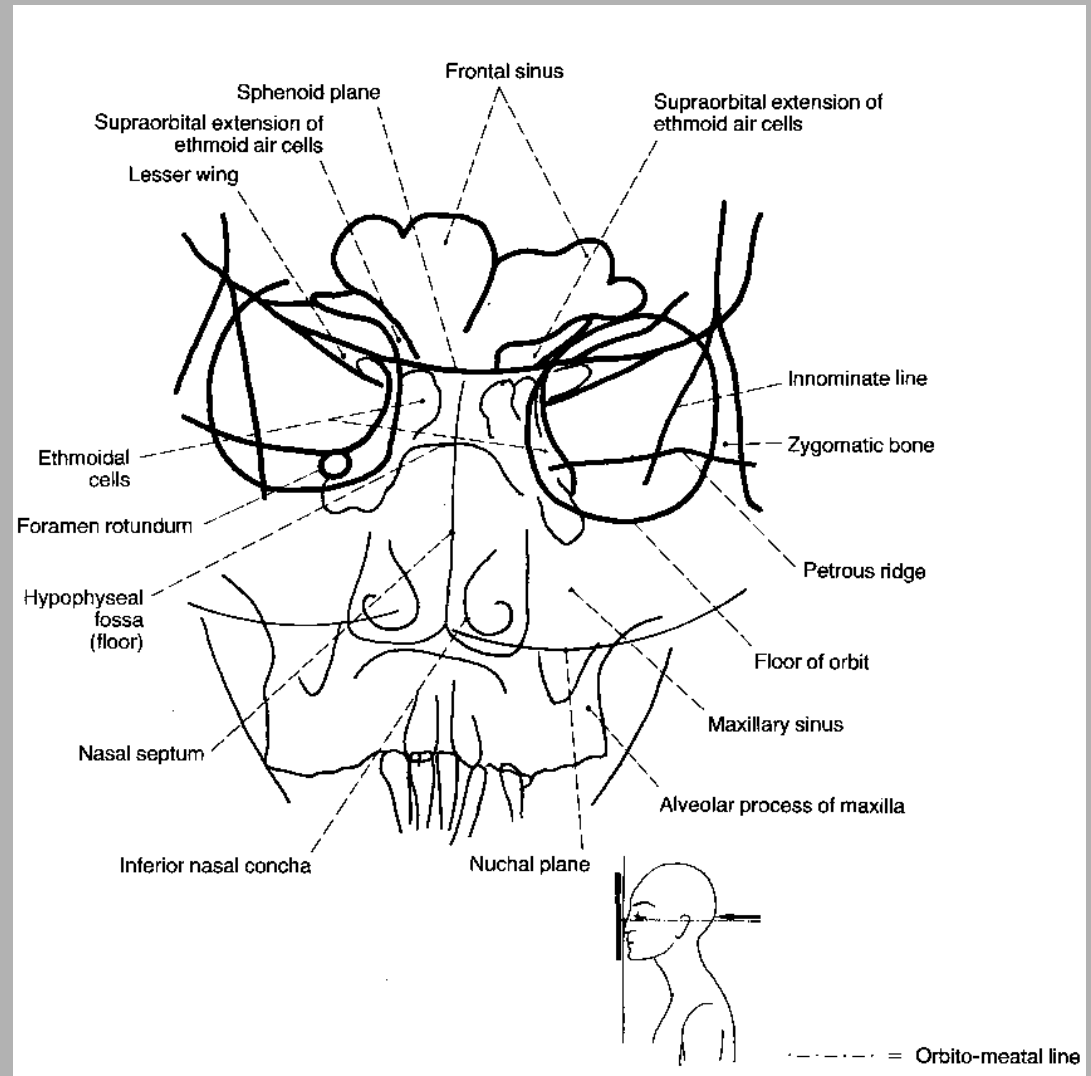
- |    |                                   |    |   |
|----|-----------------------------------|----|---|
| 1  | Sutura sagittalis                 | 18 | Os zygomaticum                                |
| 2  | Sinus frontalis se septi          | 19 | Processus frontalis ossis zygomatici          |
| 3  | Crista galli a falx cerebri       | 20 | Sutura zygomaticofrontalis                    |
| 4  | Lamina cribrosa ossis ethmoidalis | 21 | Arcus zygomaticus                             |
| 5  | Os nasale                         | 22 | Crista zygomaticoalveolaris                   |
| 6  | Orbita                            | 23 | Processus condylaris mandibulae               |
| 7  | Linea innominata (allae majores)  | 24 | Processus muscularis (coronoideus) mandibulae |
| 8  | Ala minor ossis sphenoidalis      | 25 | Celullae mastoideae                           |
| 9  | Fossa cranii media (ohraničeni)   | 26 | Pars petrosa ossis temporalis                 |
| 10 | Canalis opticus                   | 27 | Spina nasalis anterior                        |
| 11 | Fissura orbitalis superior        | 28 | Spina nasalis posterior                       |
| 12 | Canalis infraorbitalis            | 29 | Spina sphenoidalis                            |
| 13 | Foramen rotundum                  | 30 | Pars basilaris ossis occipitalis              |
| 14 | Labyrinthus ethmoidalis           | 31 | Dorsum linguae                                |
| 15 | Septum nasi osseum                | 32 | Massa lateralis atlantis                      |
| 16 | Conchae nasales                   | 33 | Dens axis (epistrophei)                       |
| 17 | Sinus maxillaris                  |    |   |

# Paranasal sinuses – Water's projection



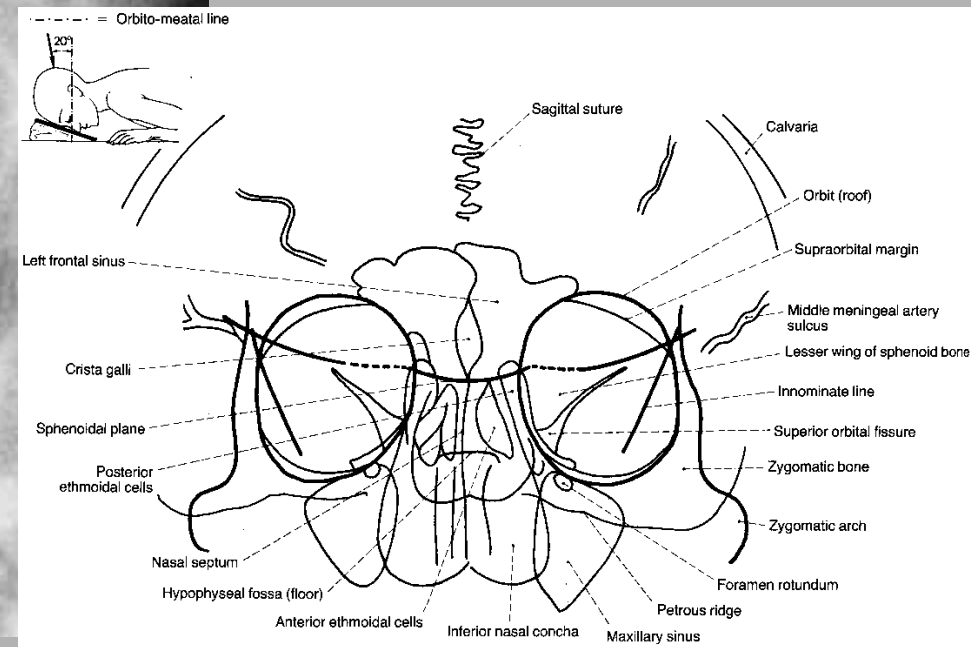
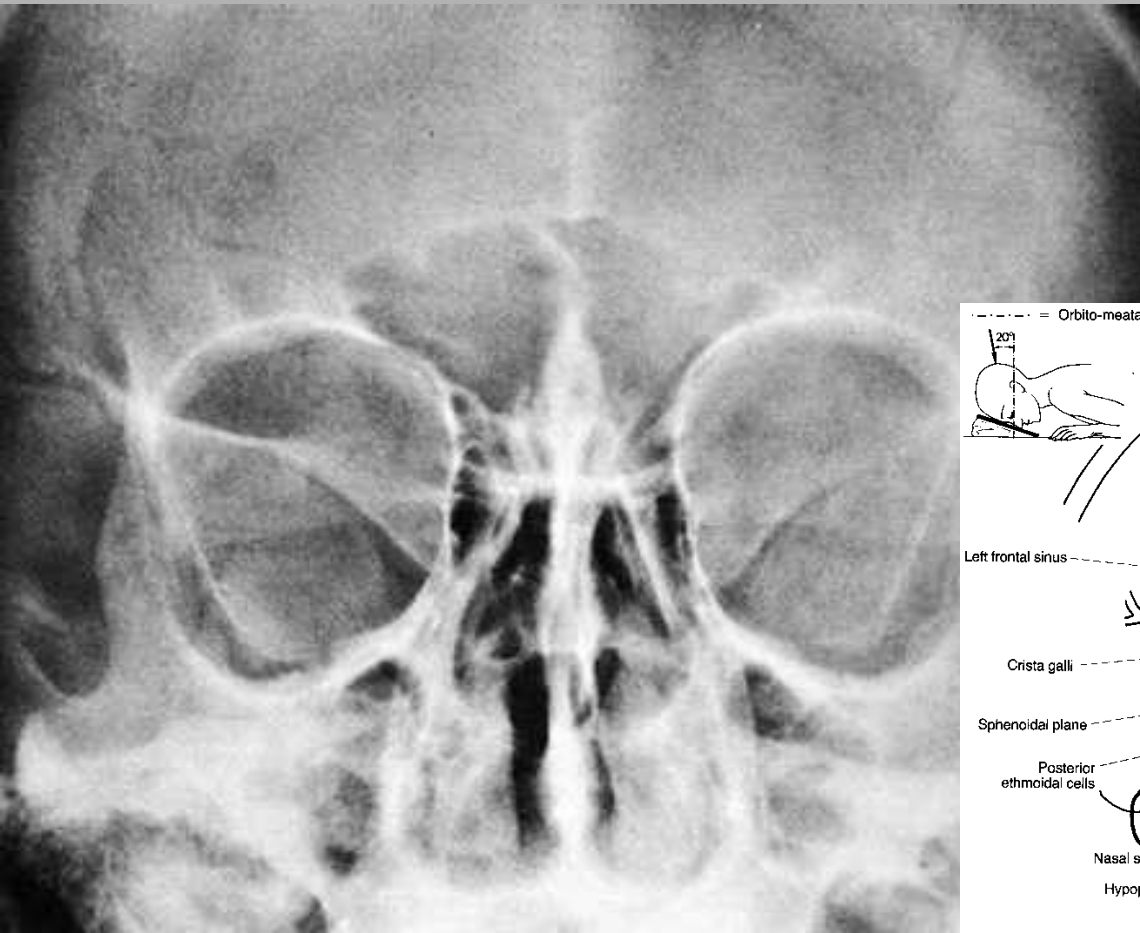
# Paranasal sinuses – dorso-ventral projection

- [http://rtg.misto.cz/\\_MAIL\\_/hlava/06.jpg](http://rtg.misto.cz/_MAIL_/hlava/06.jpg)

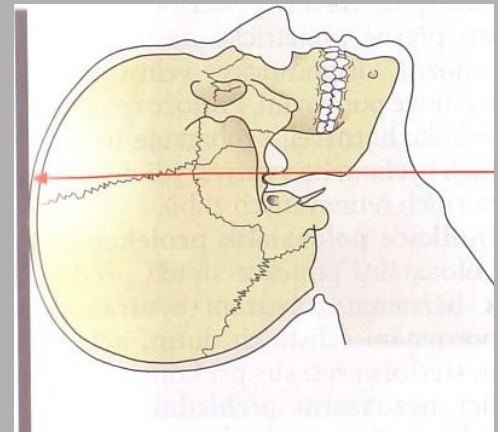
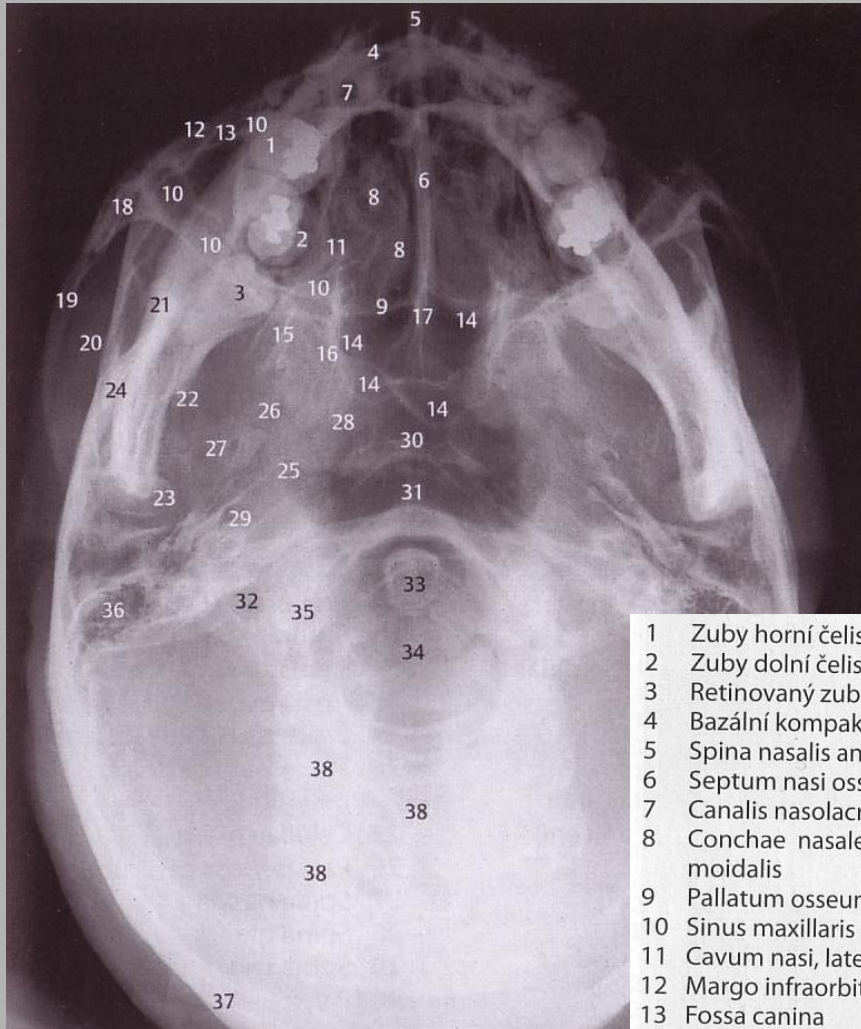


# Orbits – dorso-ventral projection

- [http://rtg.misto.cz/\\_MAIL\\_/hlava/09.jpg](http://rtg.misto.cz/_MAIL_/hlava/09.jpg)



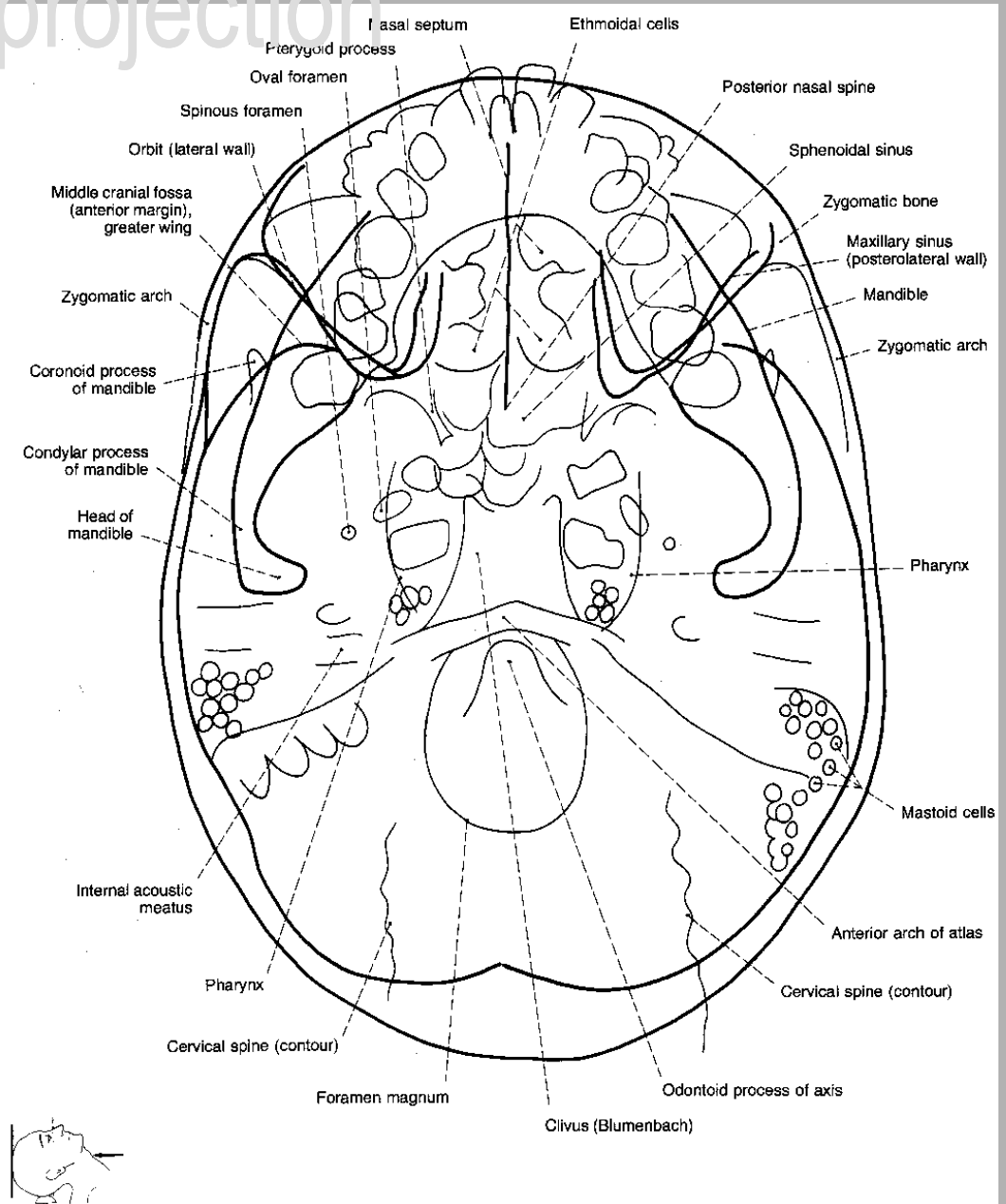
# Cranium – axial projection



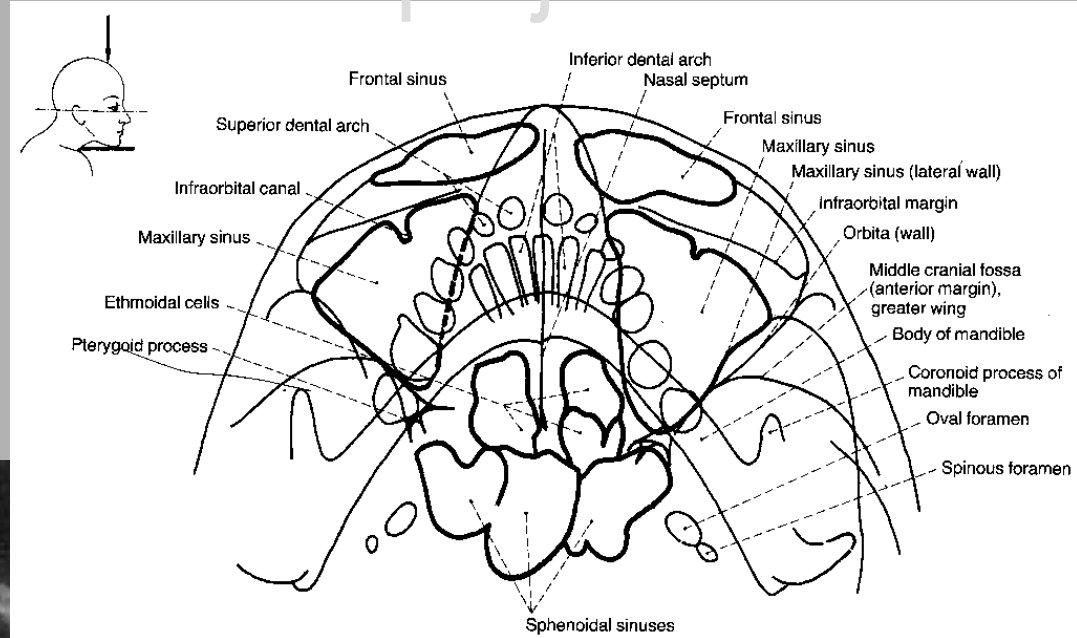
- |    |  |    |  |
|----|--|----|--|
| 1  | Zuby horní čelisti                         | 19 | Arcus zygomaticus                            |
| 2  | Zuby dolní čelisti                         | 20 | Fossa temporalis                             |
| 3  | Retinovaný zub 48                          | 21 | Processus muscularis (coroneidus) mandibulae |
| 4  | Bazální kompakta mandibuly                 | 22 | Lingula                                      |
| 5  | Spina nasalis anterior                     | 23 | Condylus mandibulae                          |
| 6  | Septum nasi osseum                         | 24 | Angulus mandibulae                           |
| 7  | Canalis nasolacrimalis                     | 25 | Sutura coronalis                             |
| 8  | Conchae nasales et labyrinthus ethmoidalis | 26 | Foramen ovale                                |
| 9  | Pallatum osseum (dorzální hranice)         | 27 | Foramen spinosum                             |
| 10 | Sinus maxillaris (ohraničení)              | 28 | Foramen lacerum                              |
| 11 | Cavum nasi, laterální stěna                | 29 | Canalis caroticus                            |
| 12 | Margo infraorbitalis                       | 30 | Dorsum sellae                                |
| 13 | Fossa canina                               | 31 | Tuberculum anterius atlantis                 |
| 14 | Sinus sphenoidalis                         | 32 | Foramen transversarium atlantis              |
| 15 | Processus pterygoideus, lamina lateralis   | 33 | Dens axis (epistrophei)                      |
| 16 | Processus pterygoideus, lamina medialis    | 34 | Foramen magnum                               |
| 17 | Spina nasalis posterior                    | 35 | Condylus occipitalis                         |
| 18 | Os zygomaticum                             | 36 | Celullae mastoideae                          |
|    |  | 37 | Os occipitale                                |
|    |  | 38 | Obratle krční páteře                         |



# Cranium – axial projection

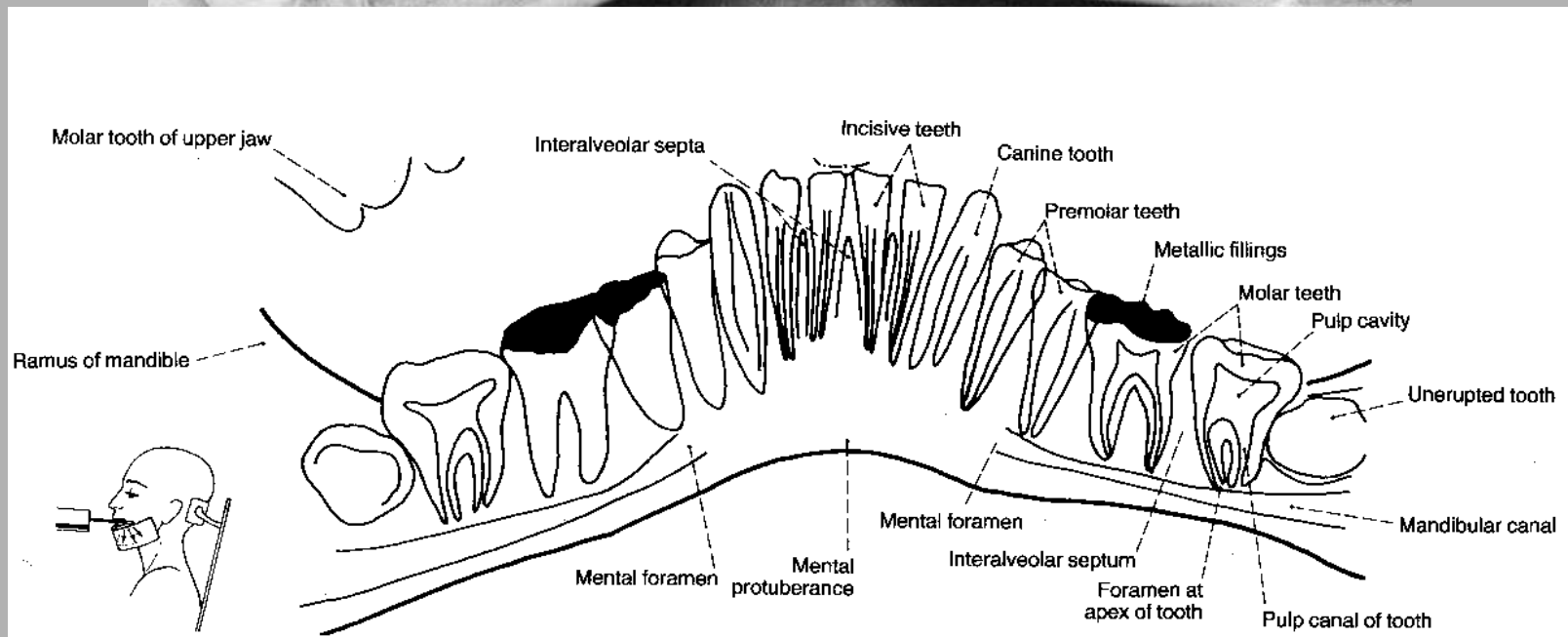


# Paranasal sinuses – axial projection

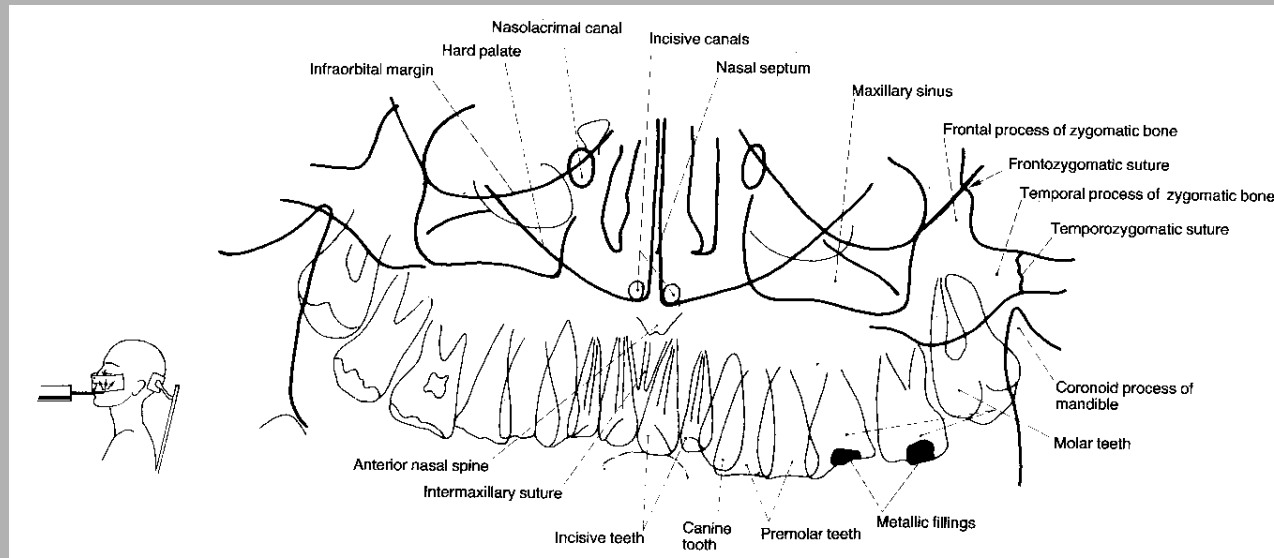


# Mandible – panoramic projection

- [http://rtg.misto.cz/\\_MAIL\\_/hlava/15.jpg](http://rtg.misto.cz/_MAIL_/hlava/15.jpg)

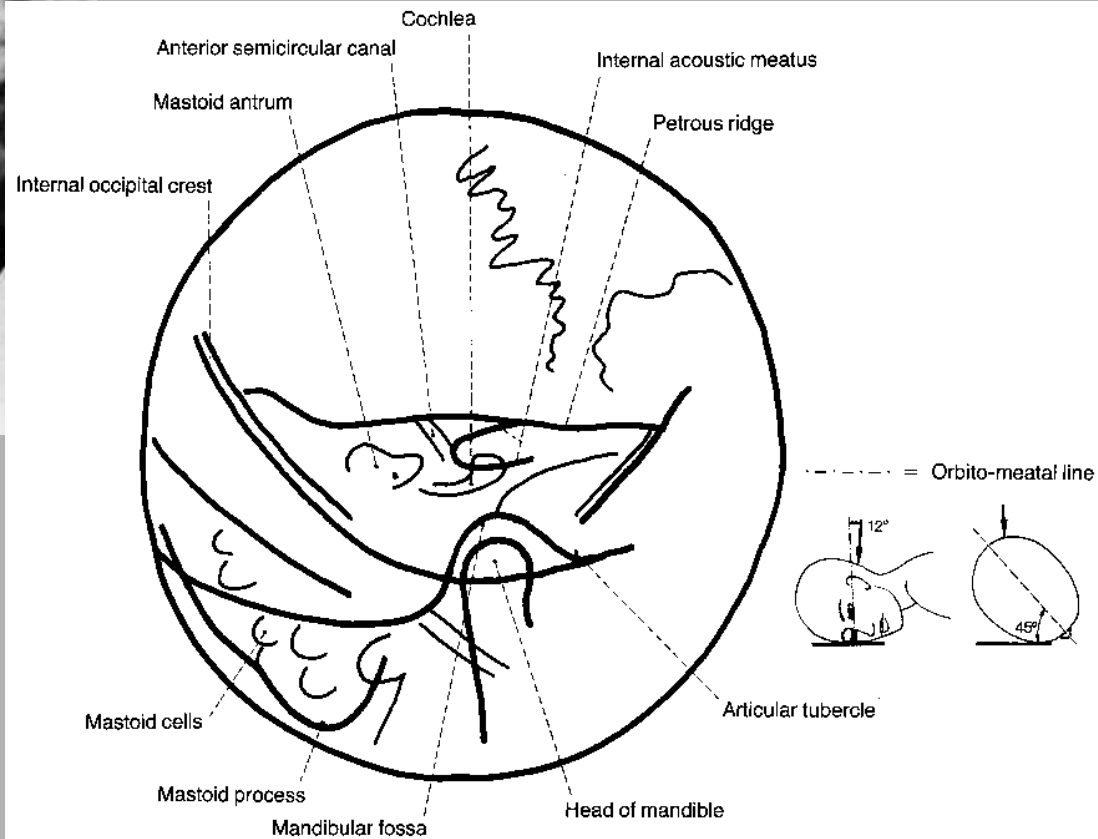


# Upper jaw – panoramic projection



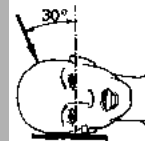
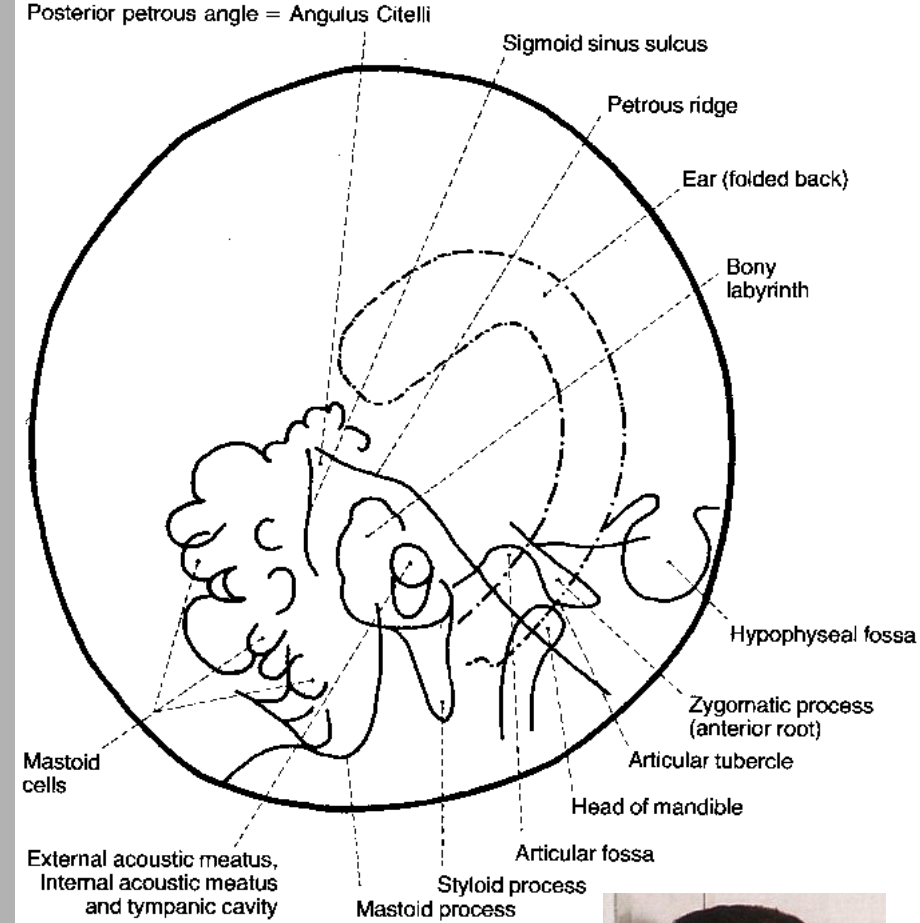
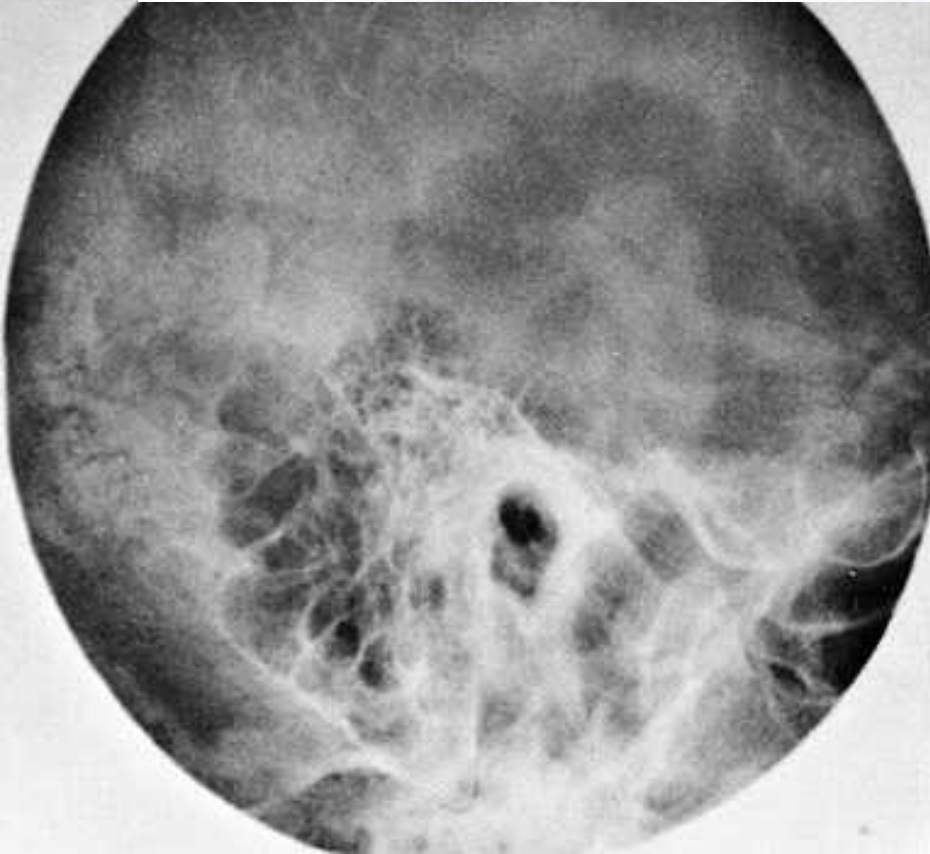
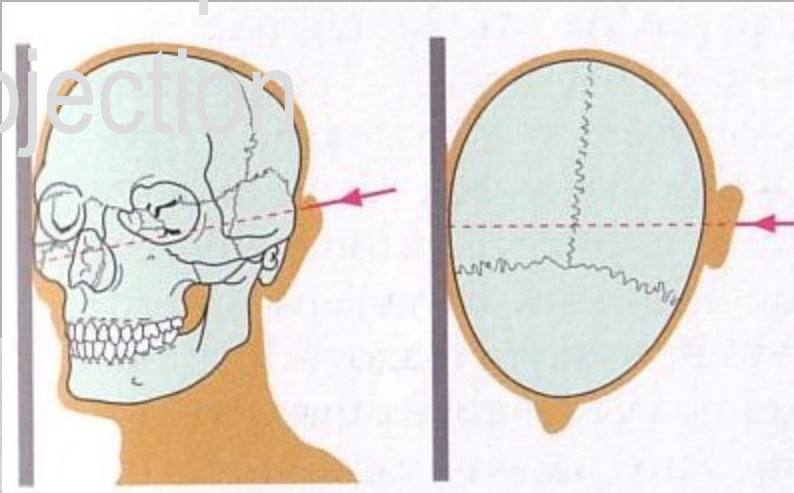
# Os temporale – Stenver's – semisagittal pr.

- [http://rtg.misto.cz/\\_MAIL\\_/hlava/11.jpg](http://rtg.misto.cz/_MAIL_/hlava/11.jpg)



# Os temporale – Schüller's – semilateral projection

[http://rtg.misto.cz/\\_MAIL\\_/hlava/12.jpg](http://rtg.misto.cz/_MAIL_/hlava/12.jpg)

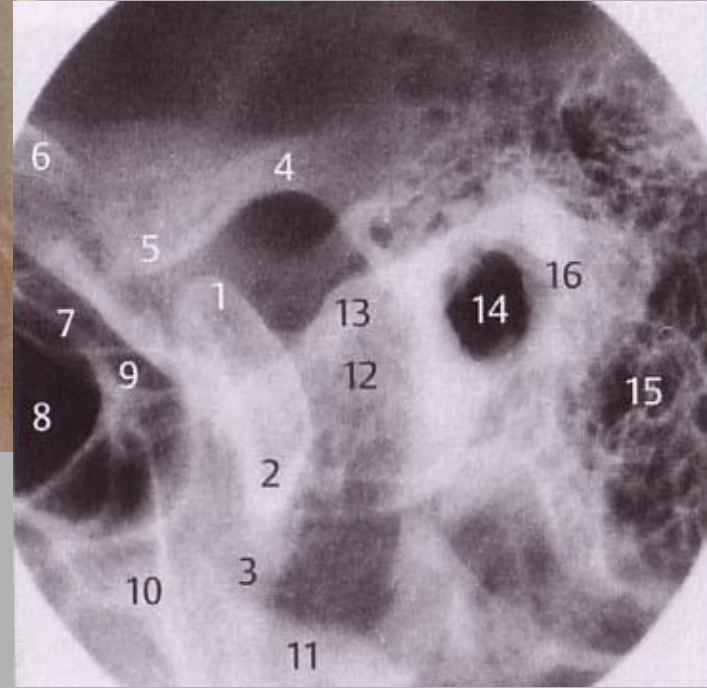
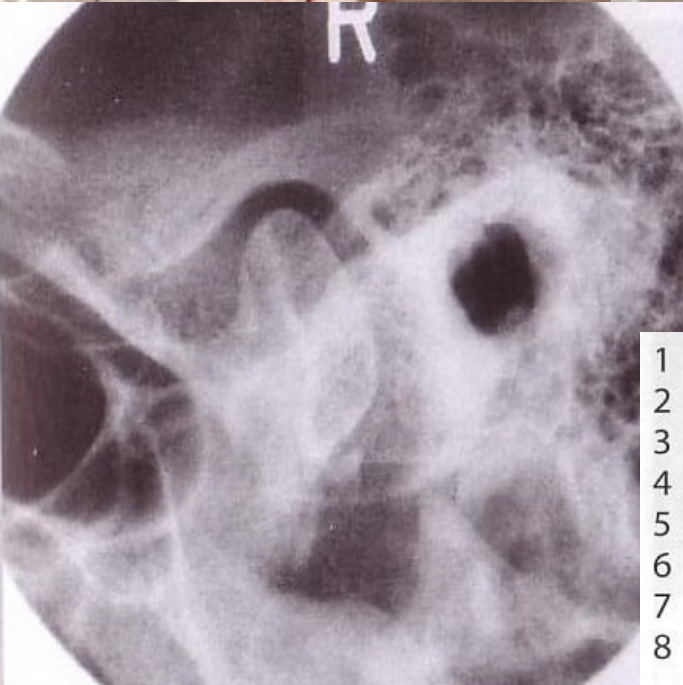


----- = Orbito-meatal line



# Os temporale – Schüller's – semilateral

projection

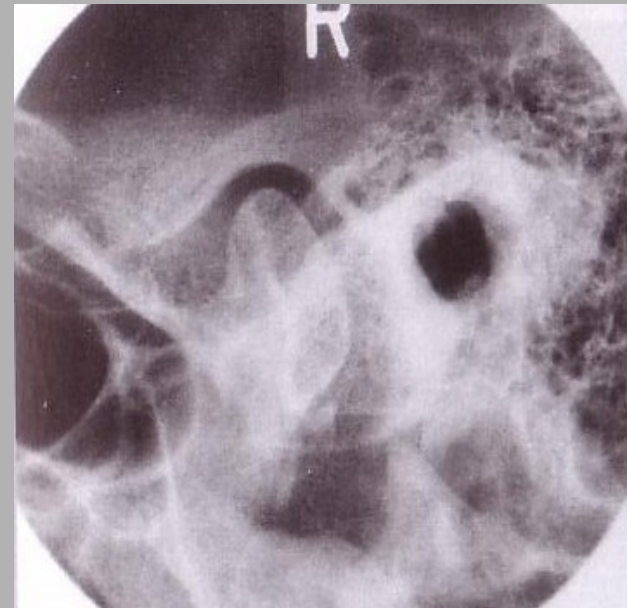
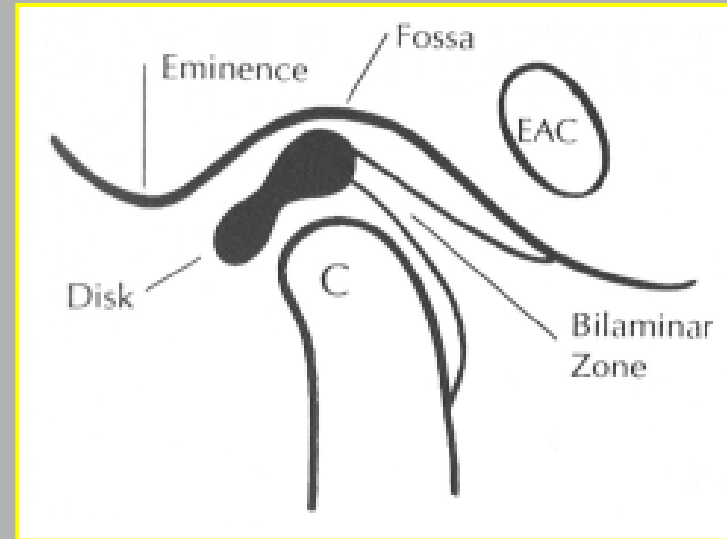


- 1 Kondylus, laterální pól
- 2 Kondylus, mediální pól
- 3 Processus condylaris mandibulae
- 4 Fossa glenoidalis, laterální části
- 5 Eminentia articularis, laterální části
- 6 Arcus zygomaticus
- 7 Sella turcica
- 8 Sinus sphenoidalis

- 9 Processus clinoideus posterior
- 10 Clivus
- 11 Pars petrosa (vzdálenější)
- 12 Pars petrosa (přilehlá)
- 13 Horní hrana pyramidy (přilehlá)
- 14 Porus acusticus externus
- 15 Celullae mastoideae
- 16 Pars tympanica ossis temporalis

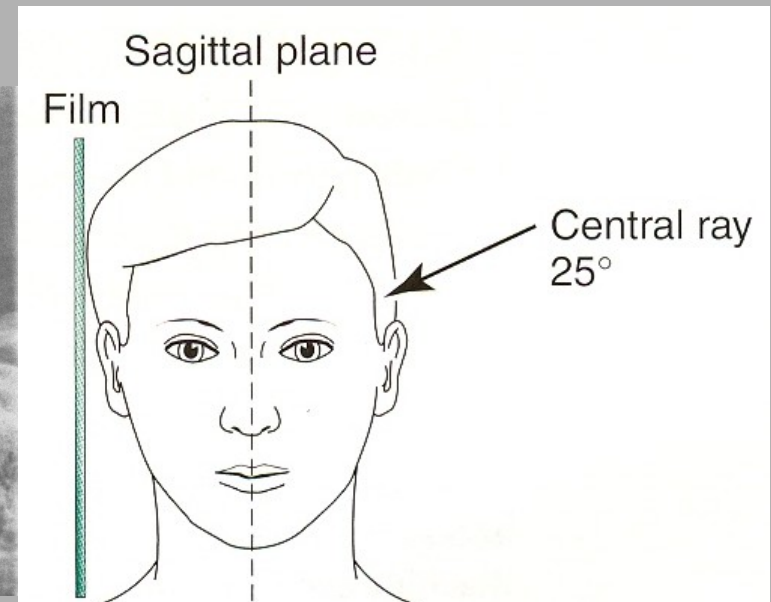
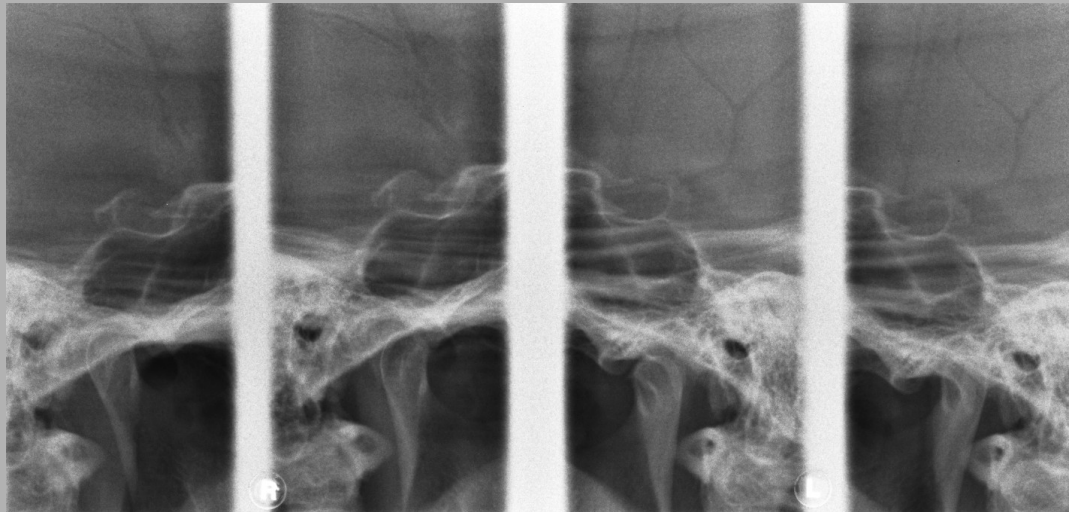
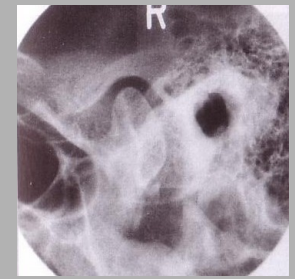
# Temporomandibular joint (TMJ)

- Intracapsul. disease = diskopathy
- Biconcaval disc, fibrocartilag. struct., cranial/caudal compartment of TMJ
- Correct position protect mandible joint (TMJ)
- Diskopathy =
  - disc dislocation
    - ✓ with
    - ✓ without reposition
    - ✓ adhere





# Temporomandibular joint - TMJ

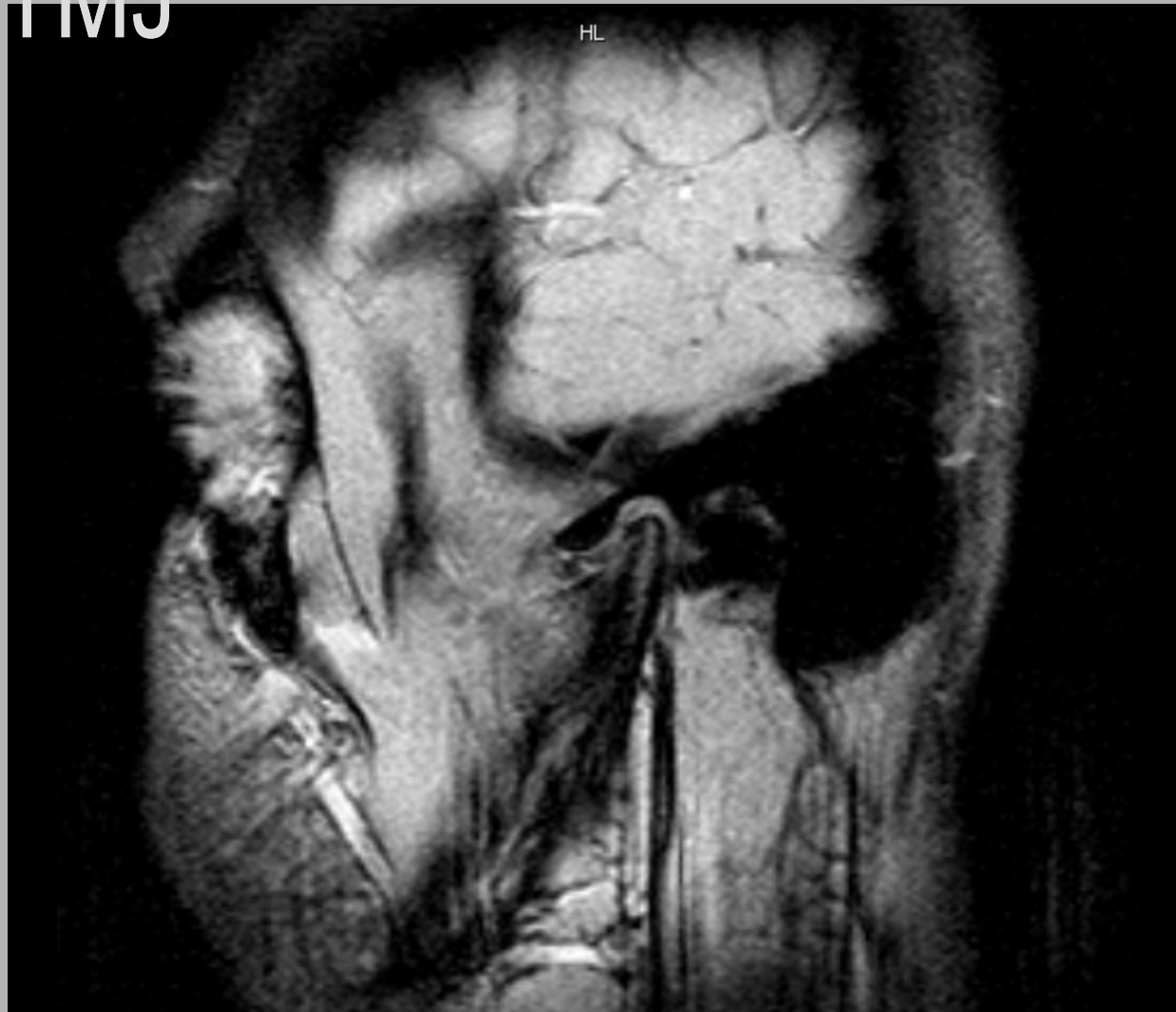


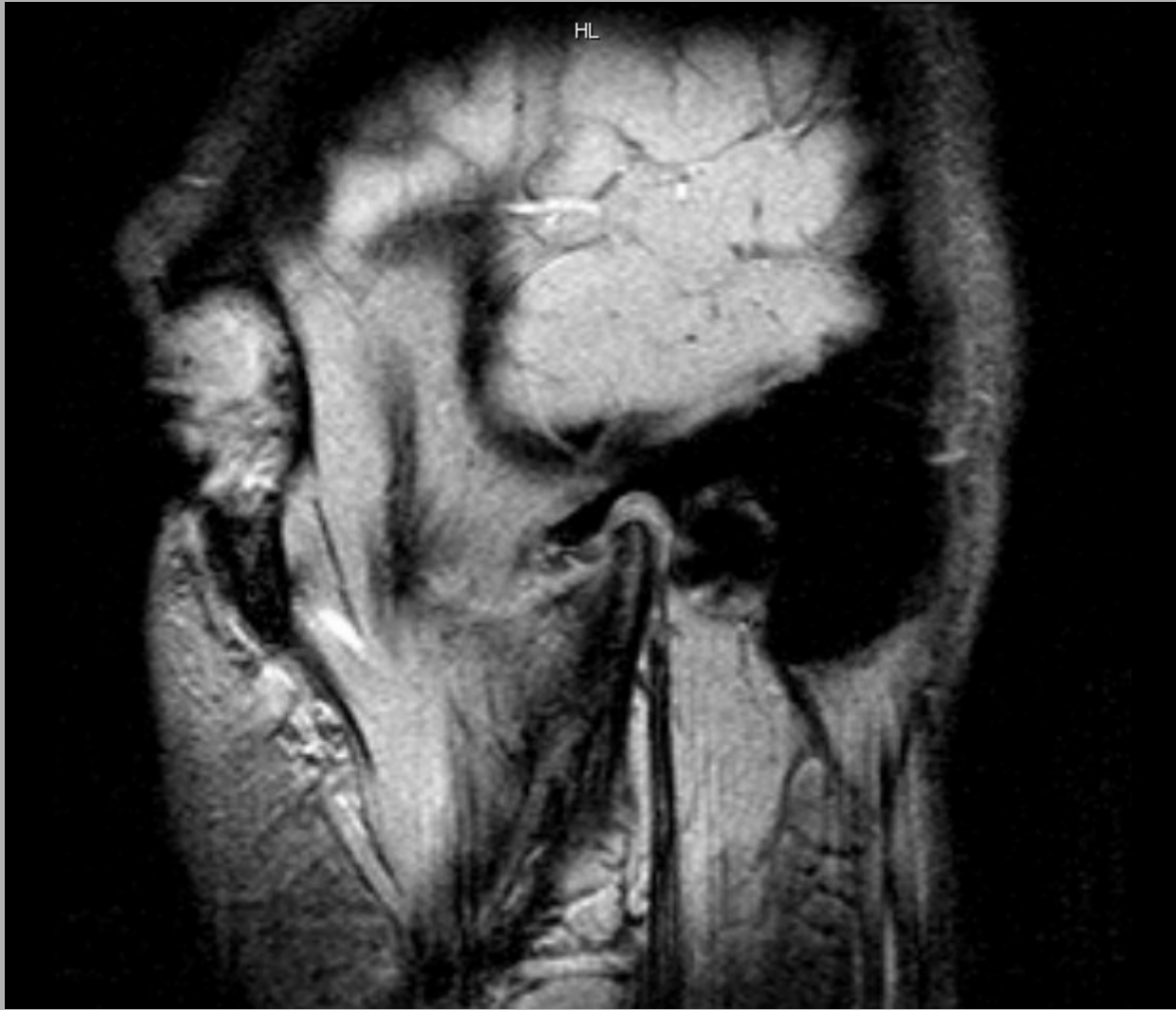
## serial radiogram TMJ

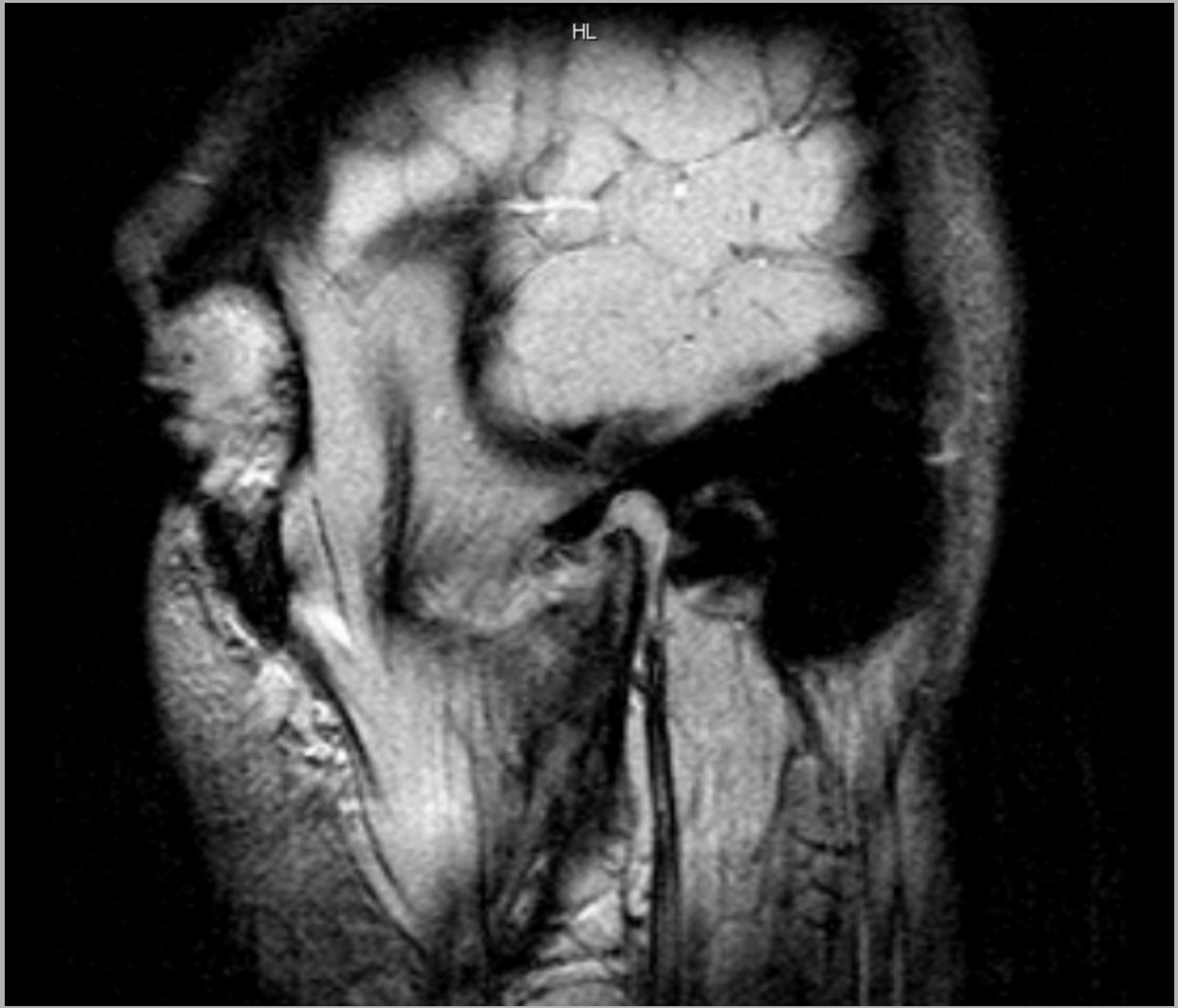
- x-ray beam pass vertical +25° to center of film
- entering 6-7cm over meatus acusticus.

- condyl head
- fossa glenoidalis
- close mouth
- open mouth

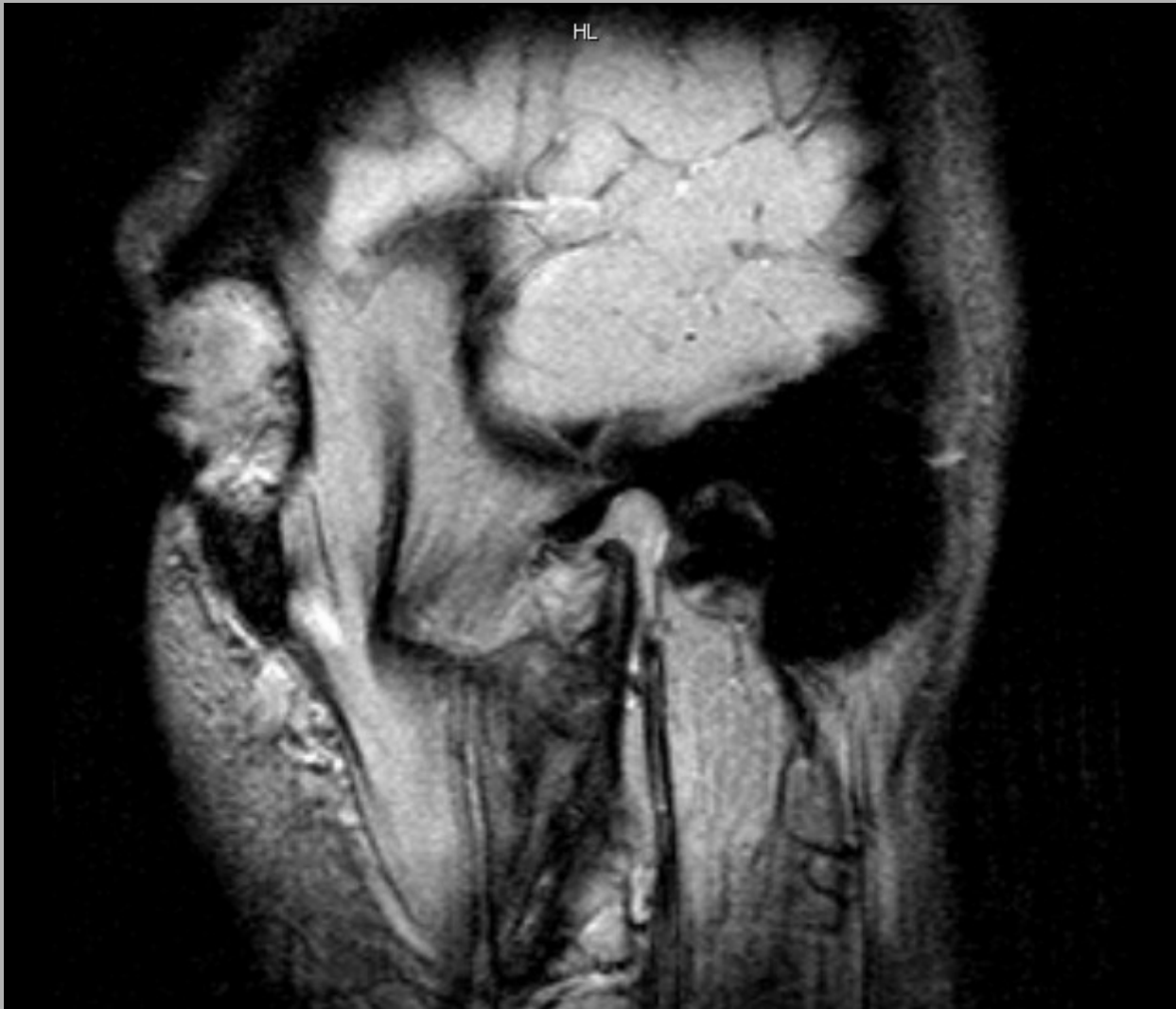
# MRI - TMJ



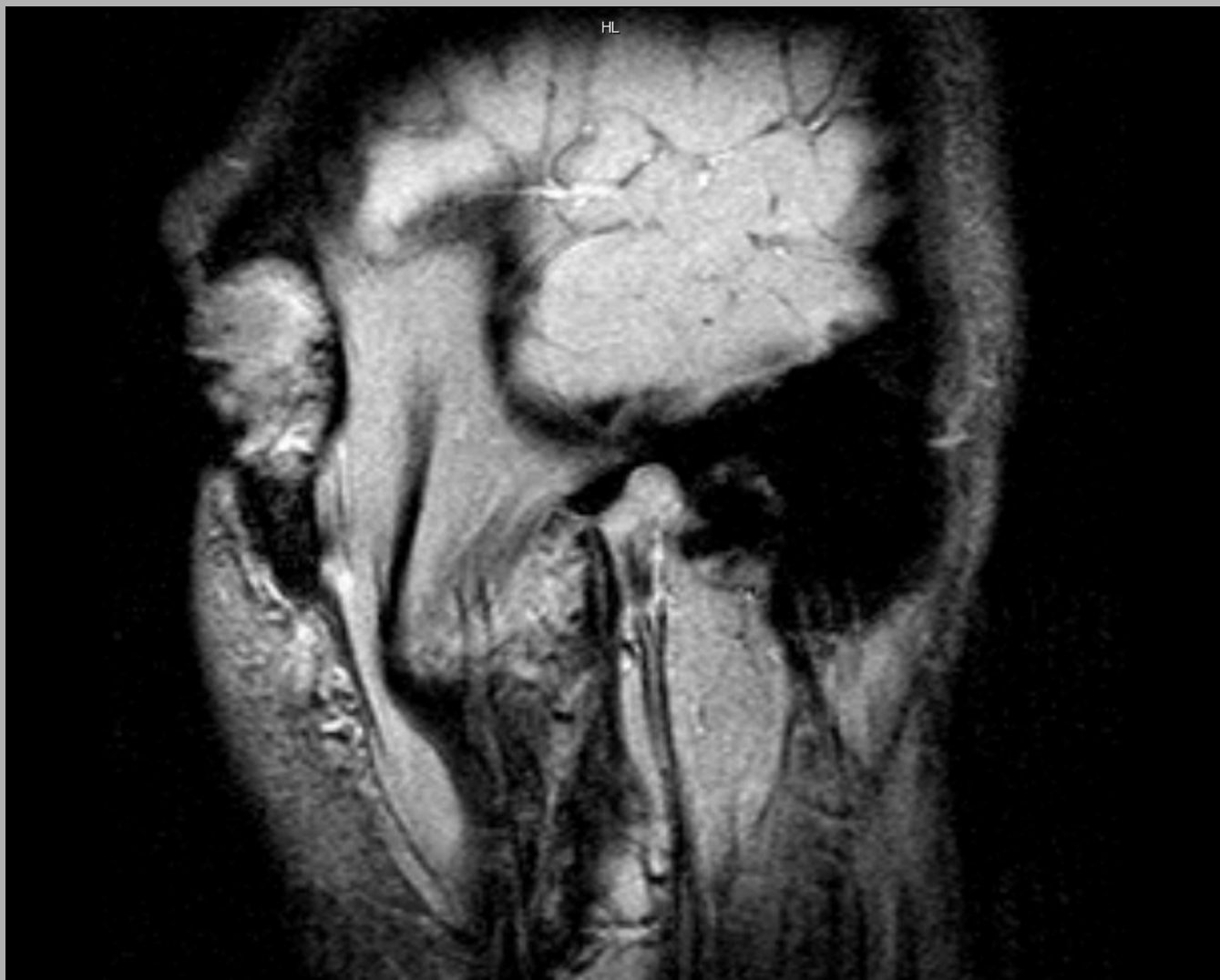




HL



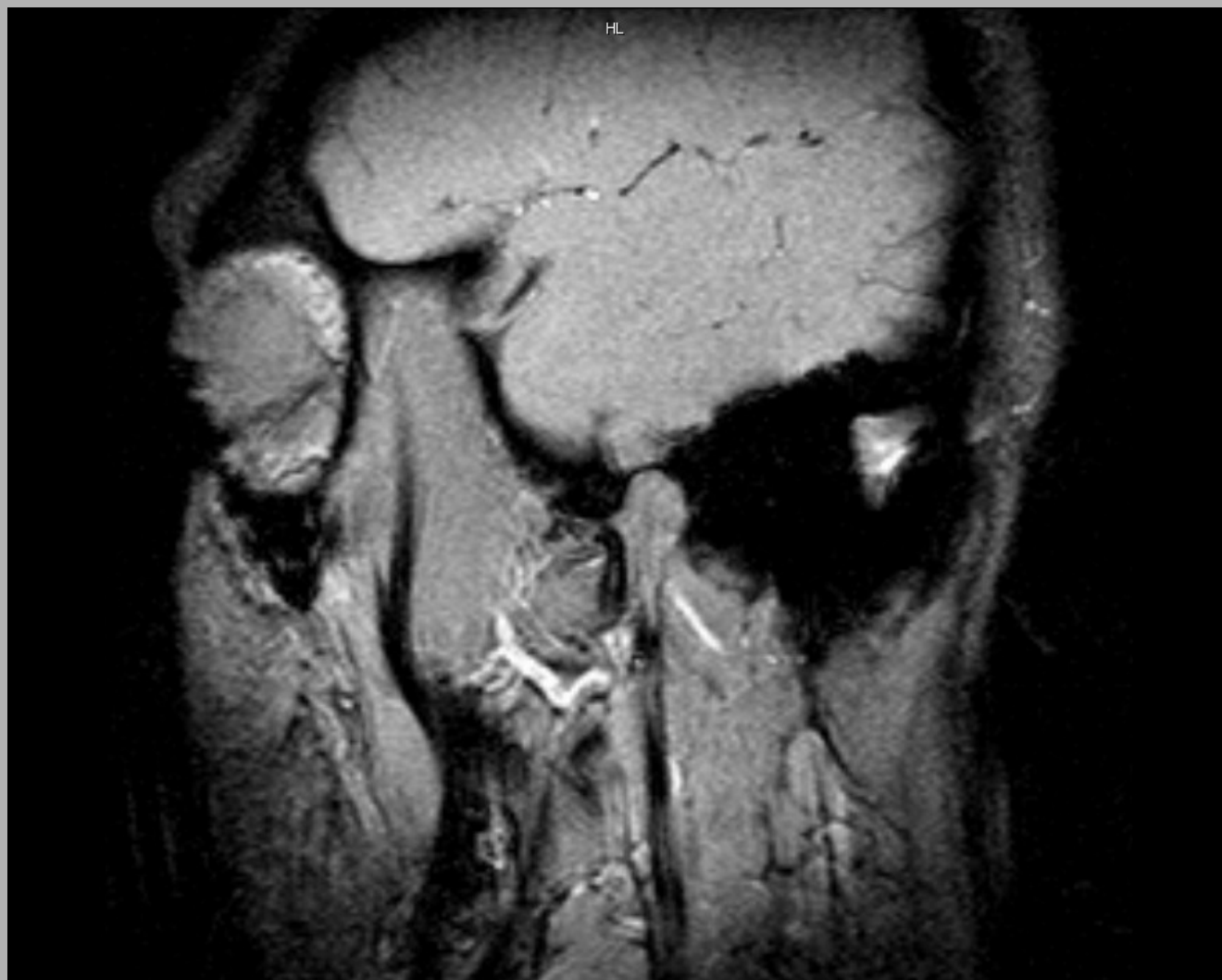
HL



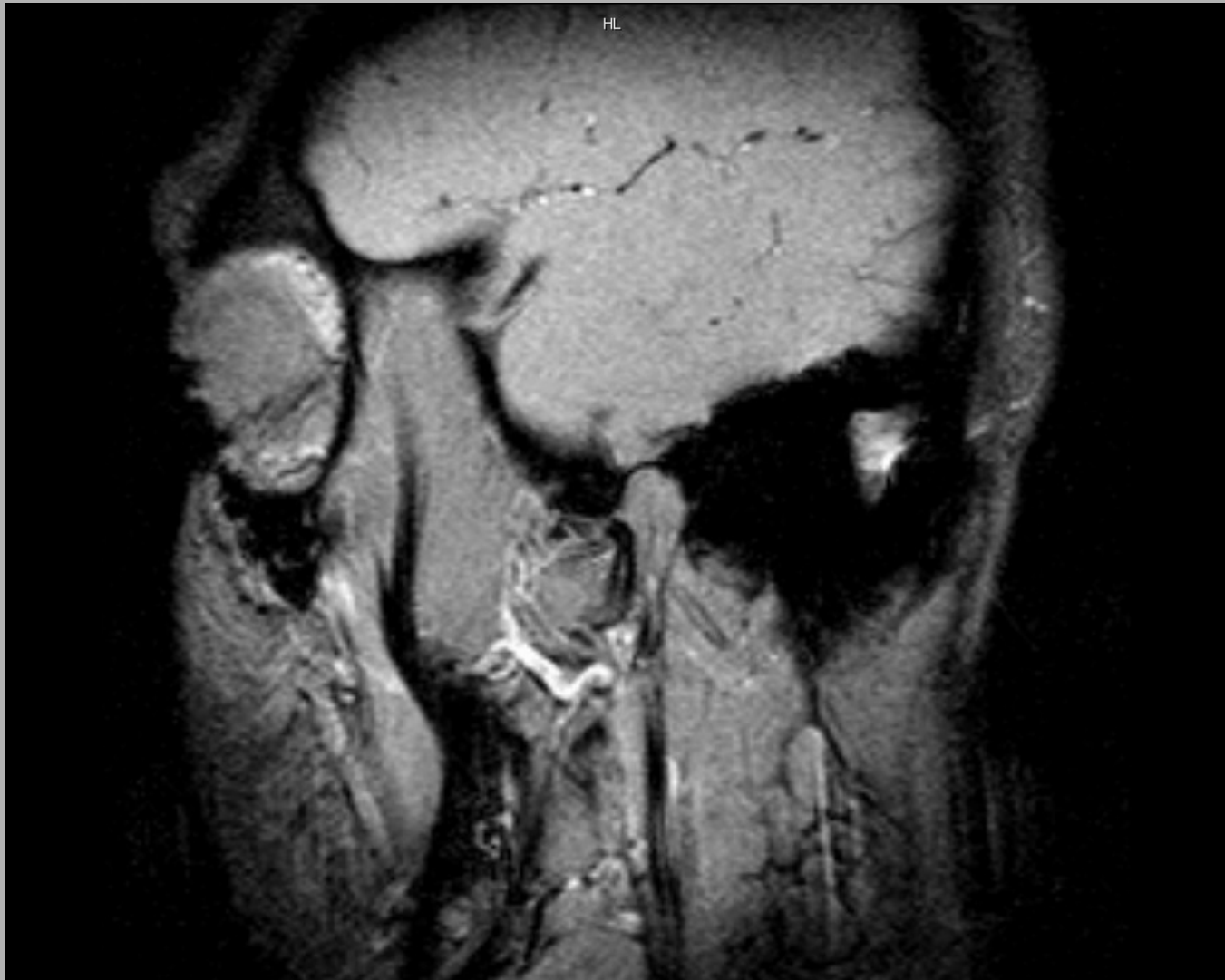


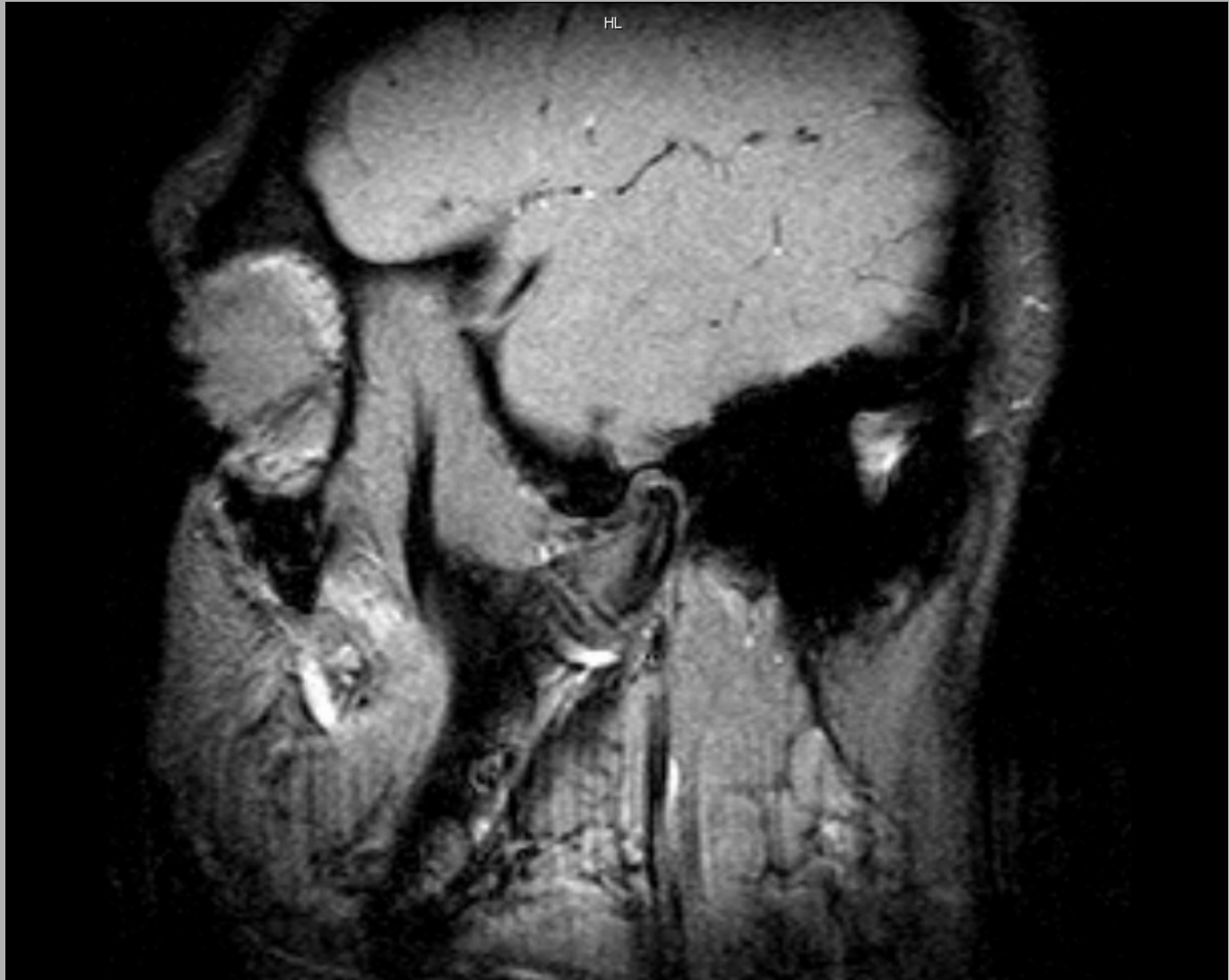




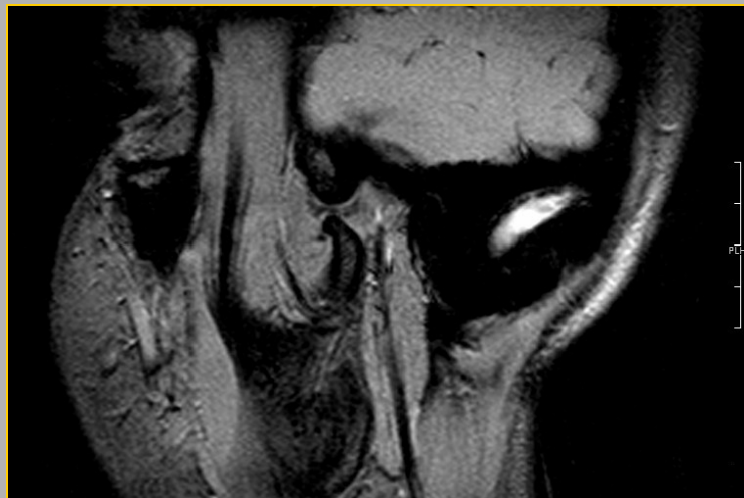
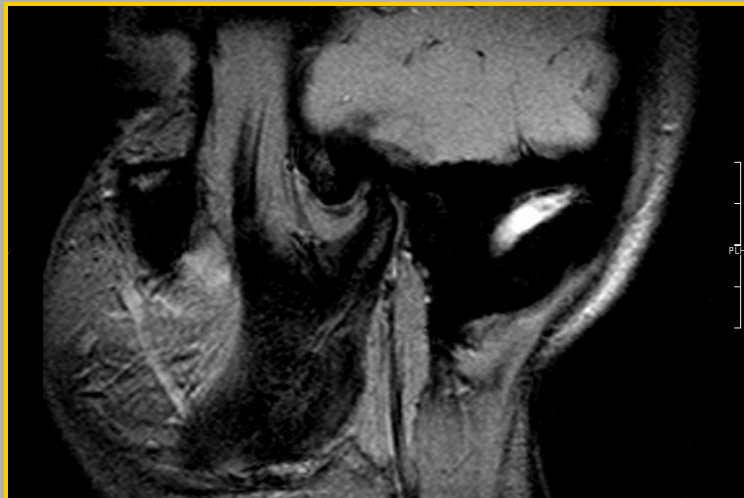


HL

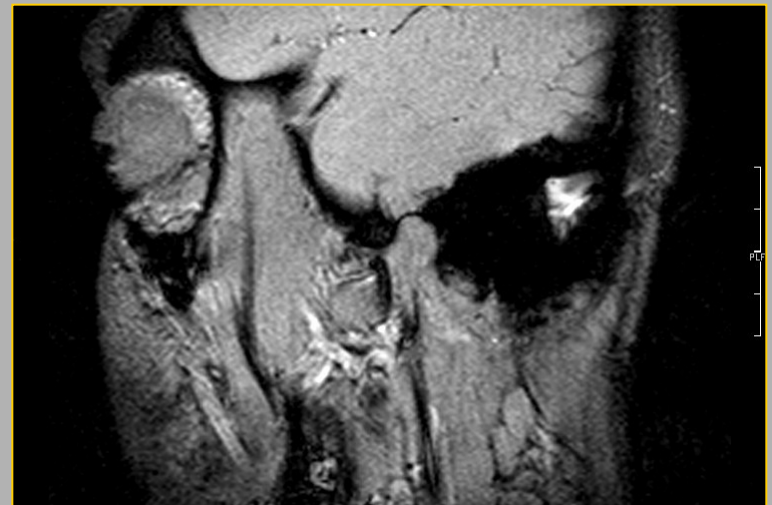
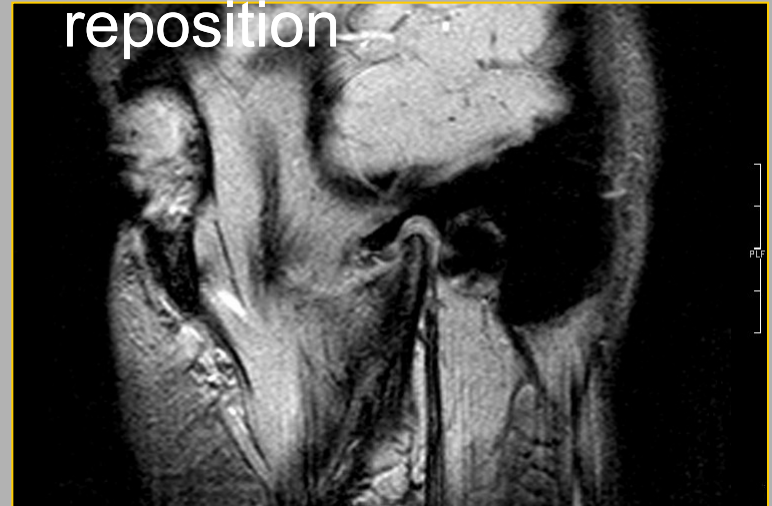




Ventral position with reposition

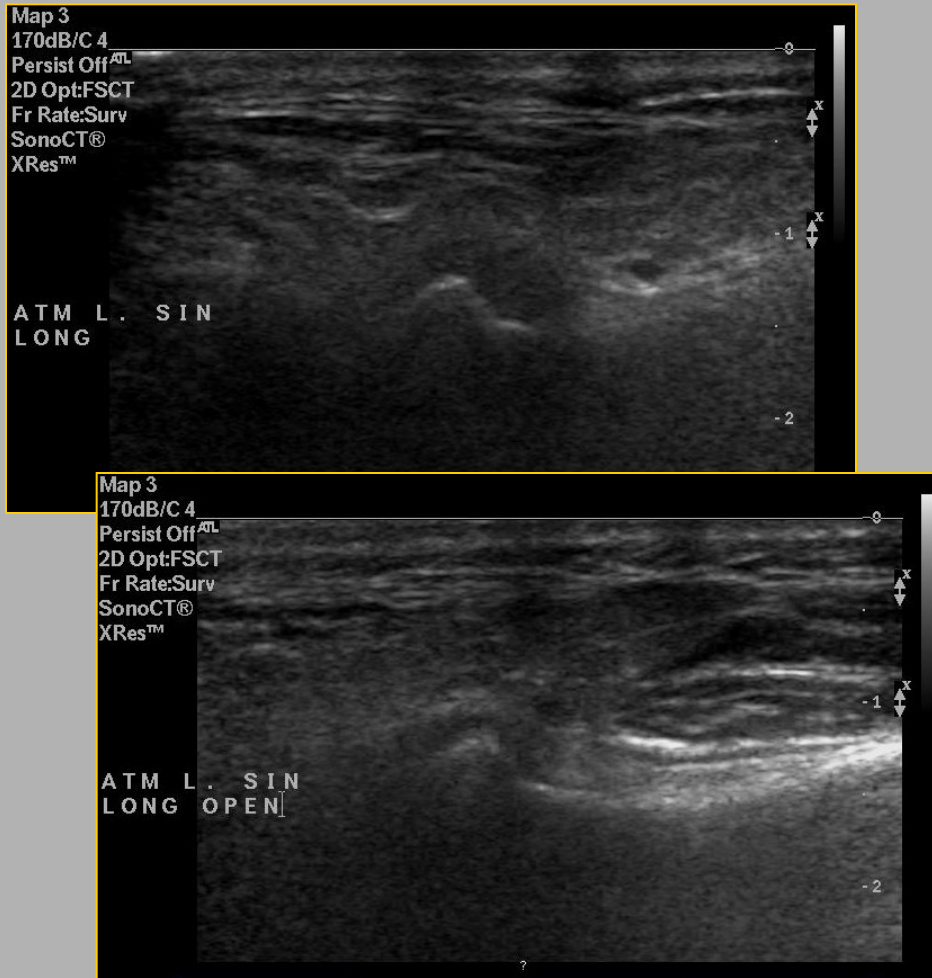


Ventral position without reposition

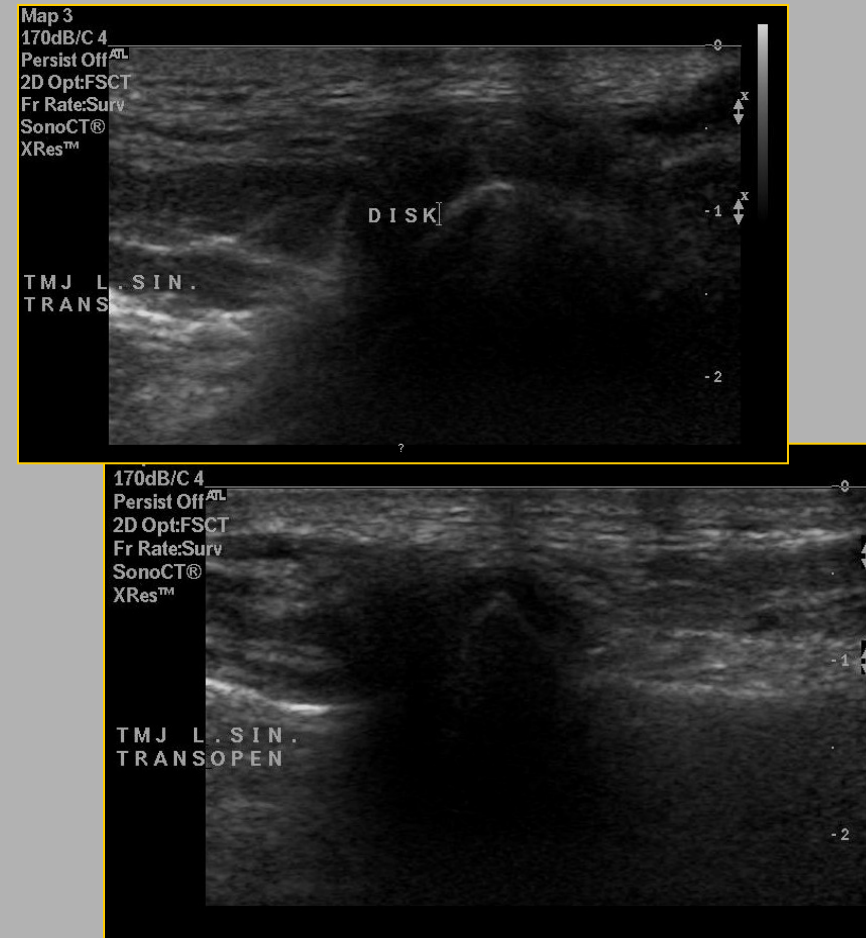


# Sono - TMJ

Ventral position with reposition



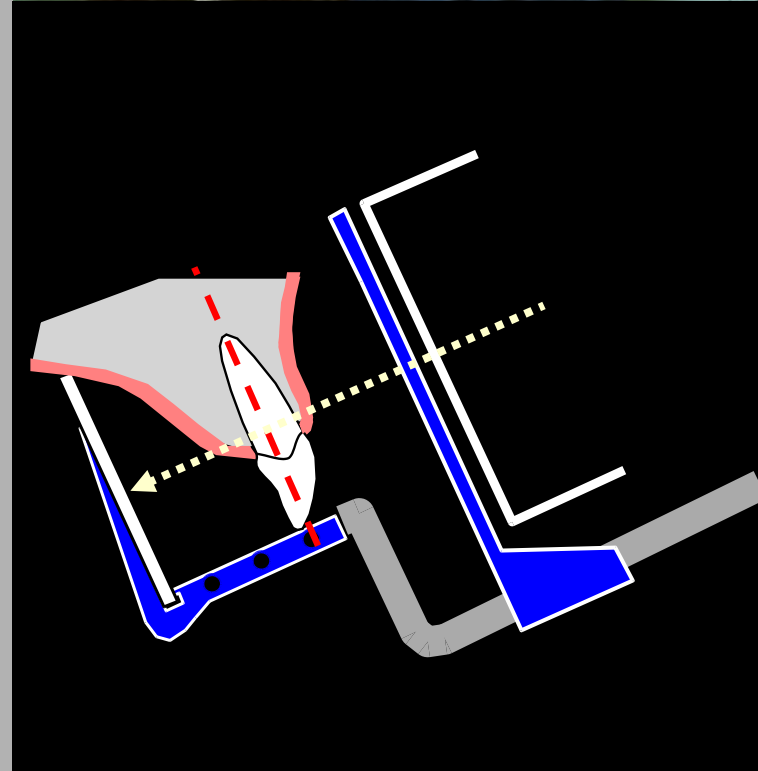
Ventral position without reposition





# Intraoral X-ray device

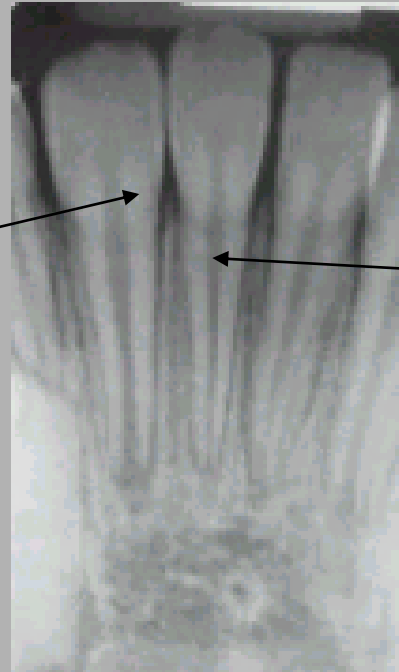
- voltage of X-ray tube
  - 50-90 kV
- filtration of primary beam
  - 1,5 mm Al -  $U < 70$  kV
  - 2,5 mm Al -  $U > 70$  kV
- body tube
  - length of body tube = 10-30 cm



# X-ray - attributes

- Electromagnetic radiation of short wavelength produced when high-speed electrons strike a solid target
- Ability to pass through tissues where is partially absorbed

Radio-opacity  
(light)

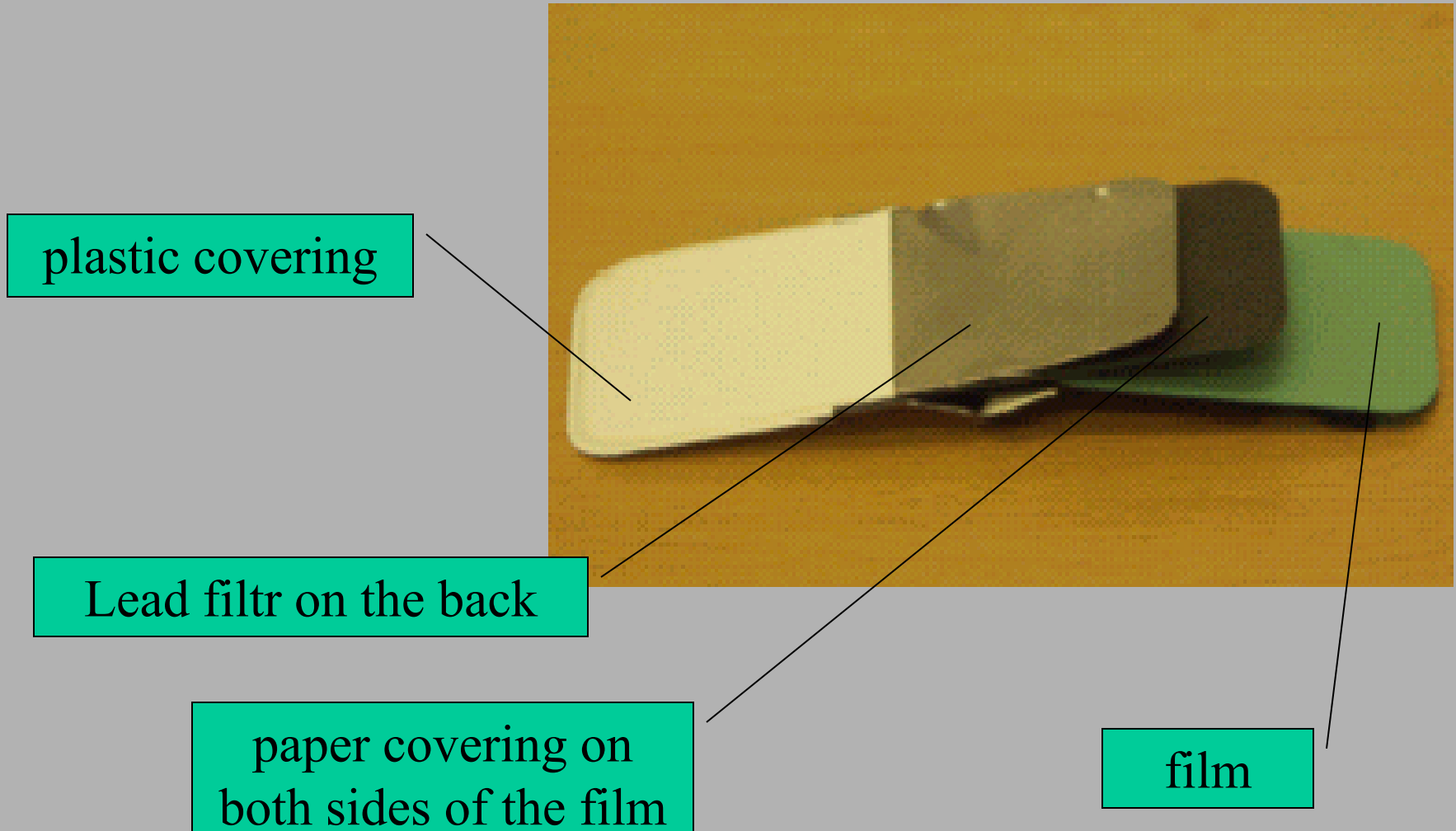


Radiolucency  
(dark)



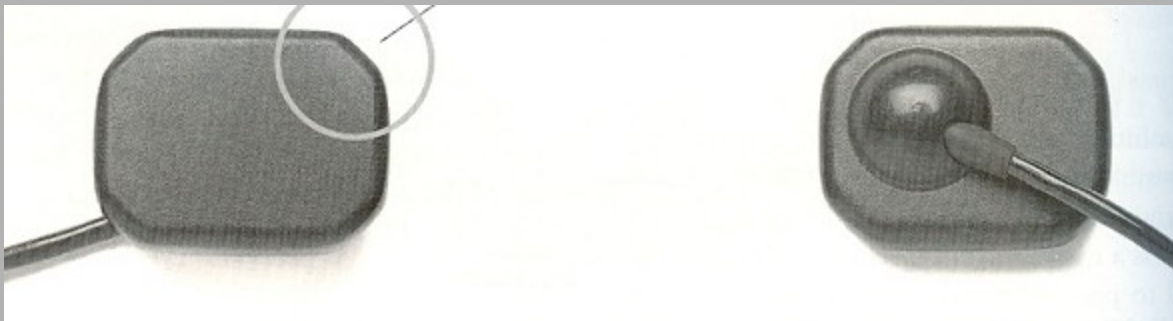
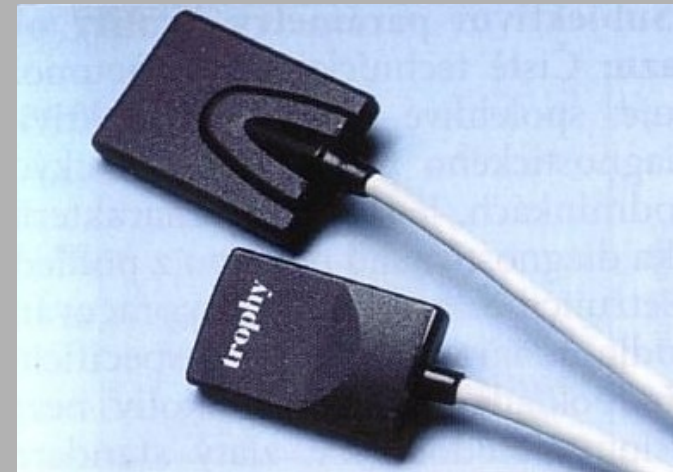
# Films for intraoral exposure

- dental films



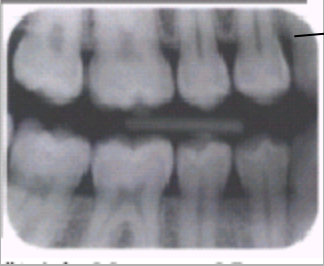
# Conventional and digital technique

- Digital:
  - CCD (charged coupled device) as a sensor



# Films for intraoral exposures

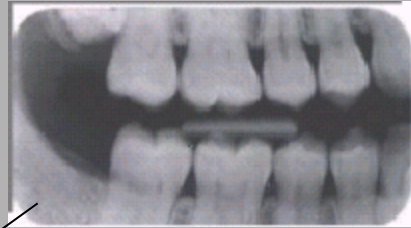
- standard formats



classic 31x41 mm

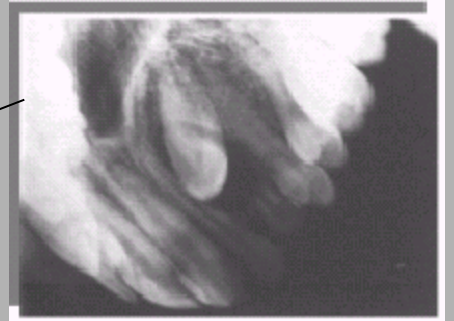


child 22x35 mm



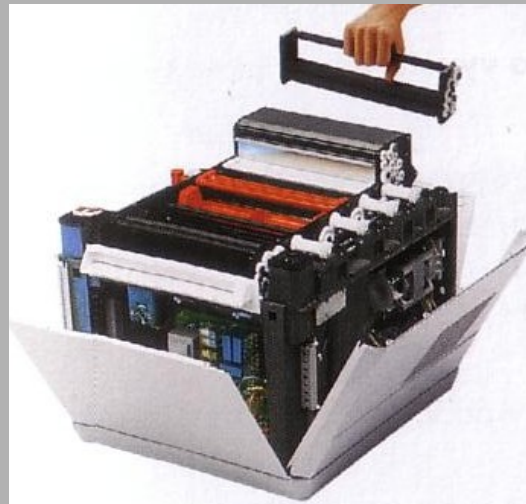
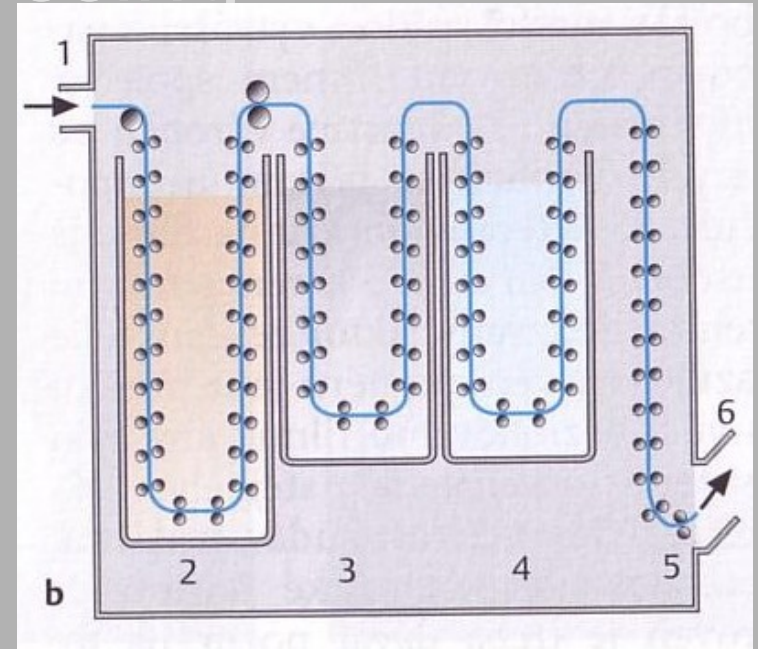
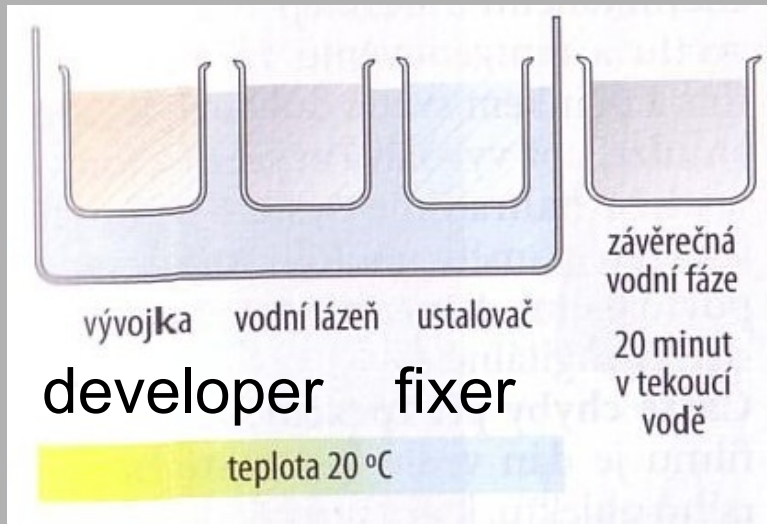
special 27x54 mm

special 57x76mm

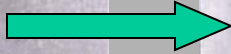
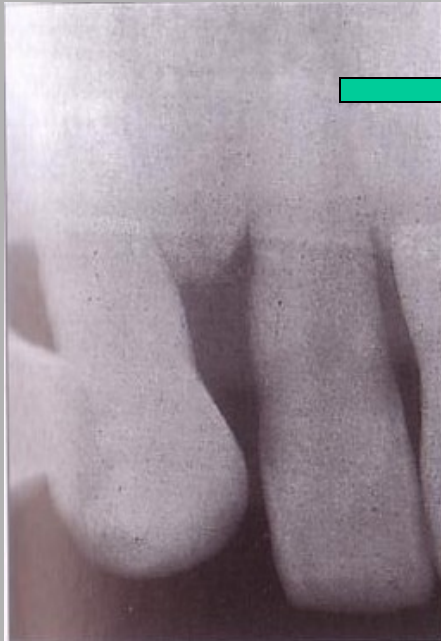


- The film covering is larger than film (over 1 mm)

# Conventional film processing



# Conventional film processing - artifacts

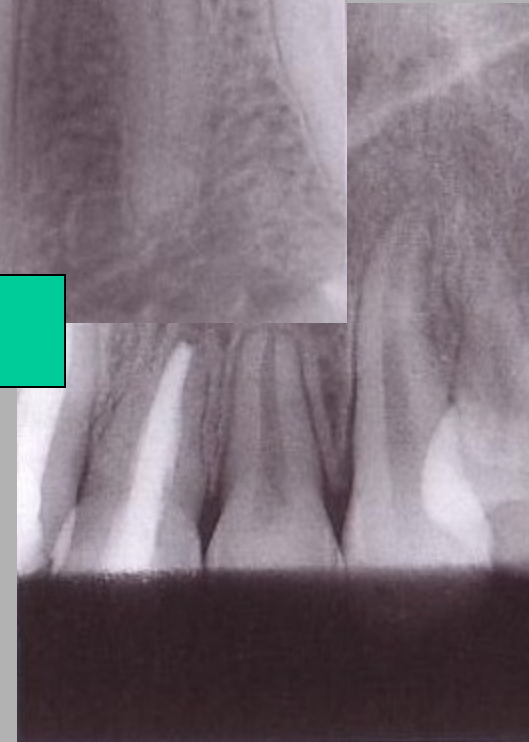


correct temperature



cold chemicals  
film is grainy

little developing liquids



# Conventional film processing - artifacts

too fast taking film out of the cover



developer



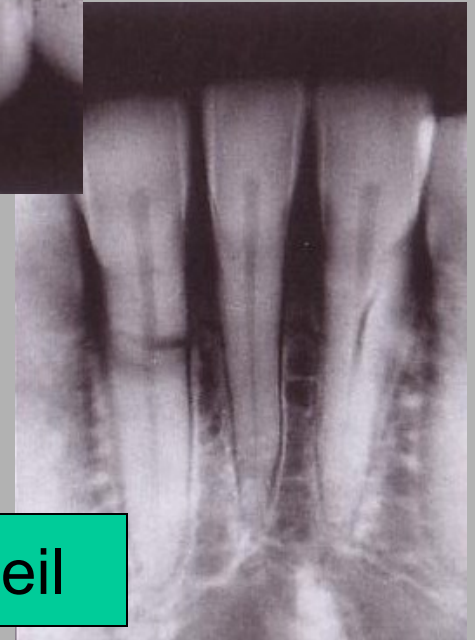
dirts



drop of water



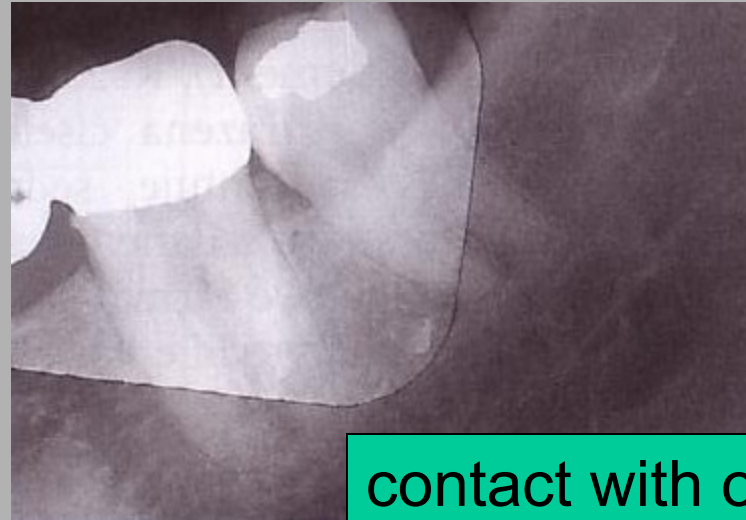
neil



# Conventional film processing - artefacts



fingerprint



contact with other film

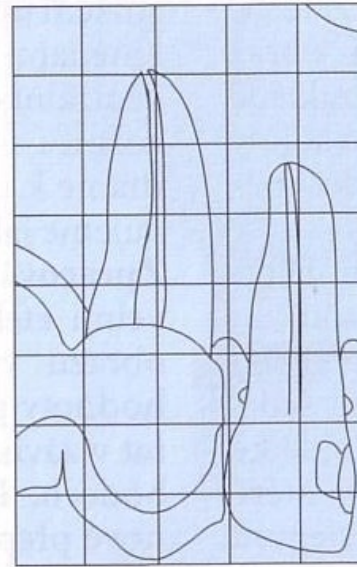
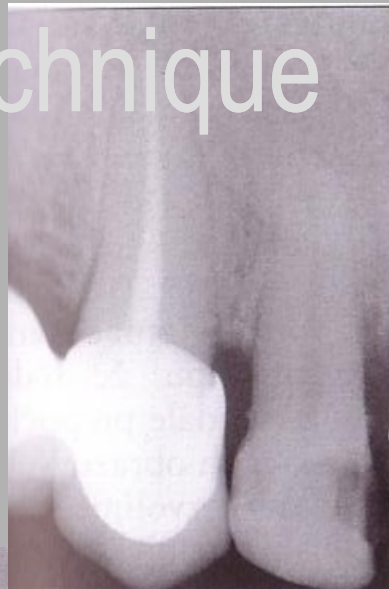


too high temperature during developing

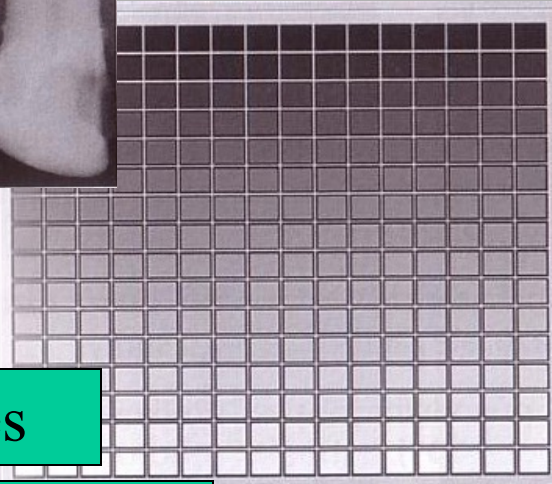


broken emulsion layer up

# Digital technique



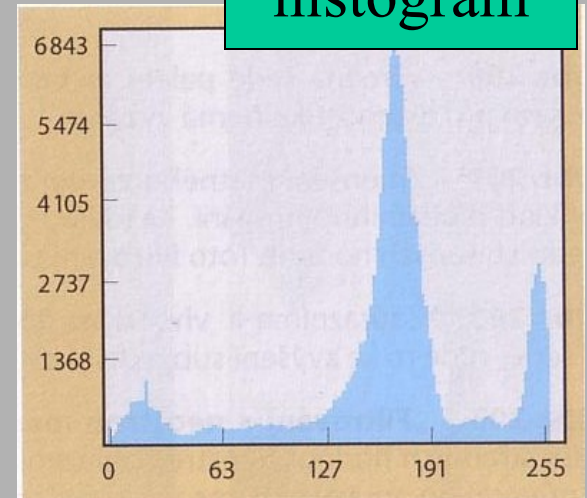
5	5	5	5	4
4	4	4	5	5
4	5	5	5	4
3	4	5	5	5
7	5	4	5	3
7	7	7	5	7
2	5	6	5	0
0	0	0	0	0



256 gray shades

no transitive shades

histogram





# Digital technique - advantages

- filmless performance
- friendly inspecting and storage of pictures
- repeated exposure without medium changing
- lower dose?

# Basic types of radiogram

# Basic types of radiogram

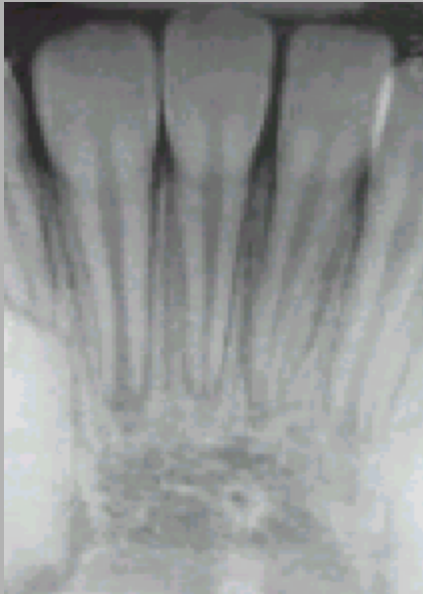
## Bitewing



## Panoramic - OPG



## Periapical

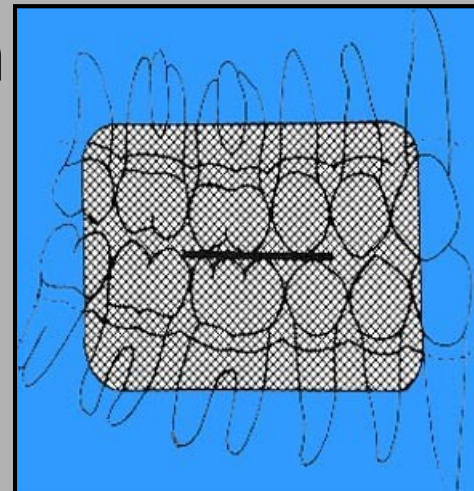
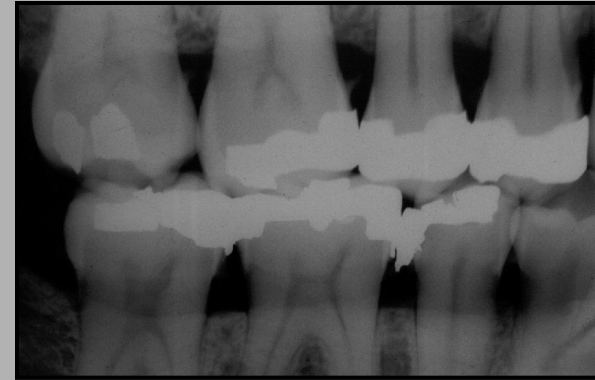


# Bitewing

Shows crowns of upper and low jaws simultaneously.

Indications:

- examination of the occlusal line
- examination of:
  - tooth caries
  - tooth loss
  - monitoring pictures, e.g. cured teeth
  - assessment of periodontal status



Usually of posterior teeth but can be anterior teeth.

# Periapical exposures

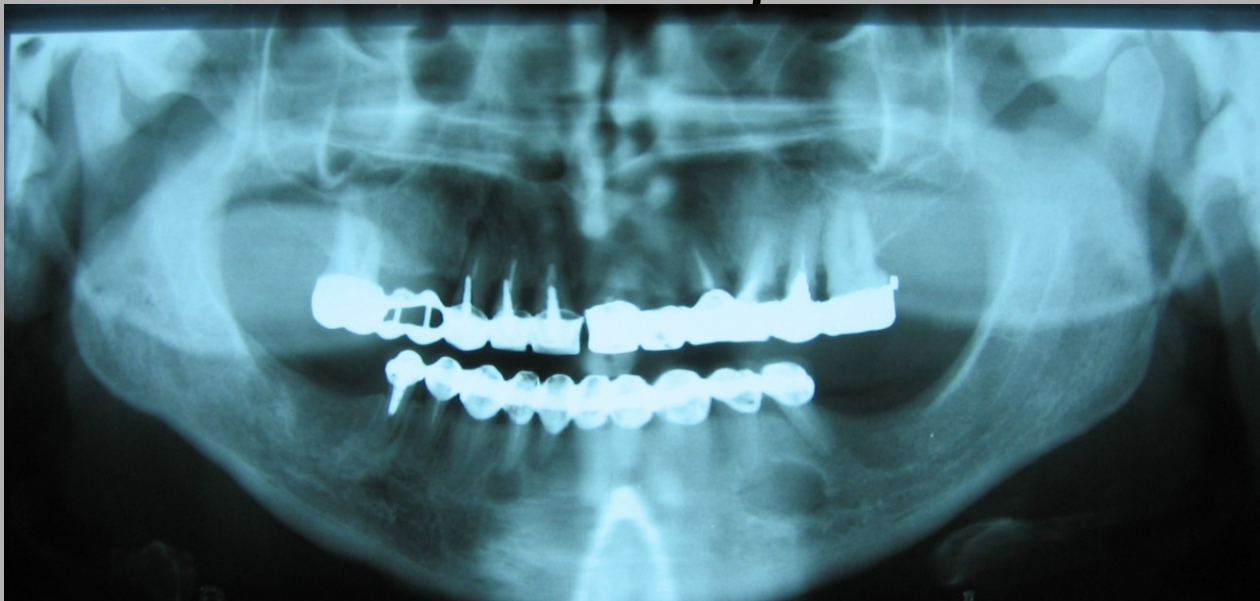
## Indications:

- apical infection detection
- trauma – tooth and alveolus
- root assessment
- orthodontia – diagnostics, plan, therapy, follow up



# Ortopanthomography - OPG

- one exposure demonstrates:
- jaws
- teeth
- joints
- alveolar recesses of jaw cavities

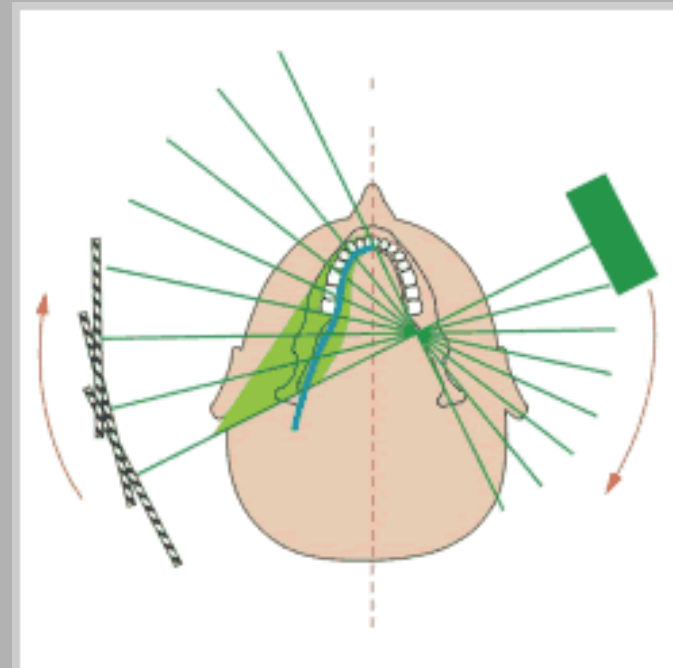
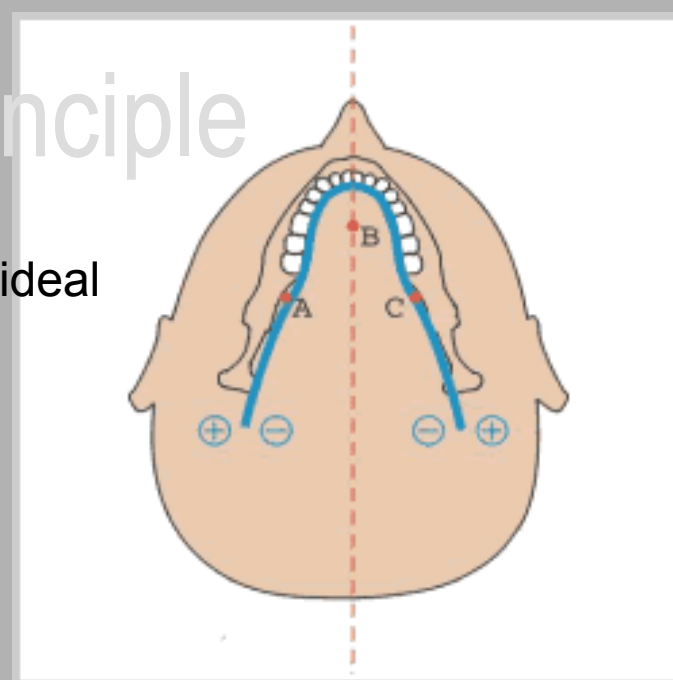


# Ortopanthomography - OPG

- comfort
- low radiation dose
- better than intraoral RTG STATUS  
(traditional series of teeth)

# Ortopanthomography - principle

- X-ray tube goes around the head on the track of ideal teeth occlusion - parabola
- There are 3 rotatory centra very next to the teeth occlusion





# Ortopanthomography - assessment

- Wisdom teeth
- TMJ
- Maxilar sinus
- Fractures and other skeleton pathology
- Orthodontia

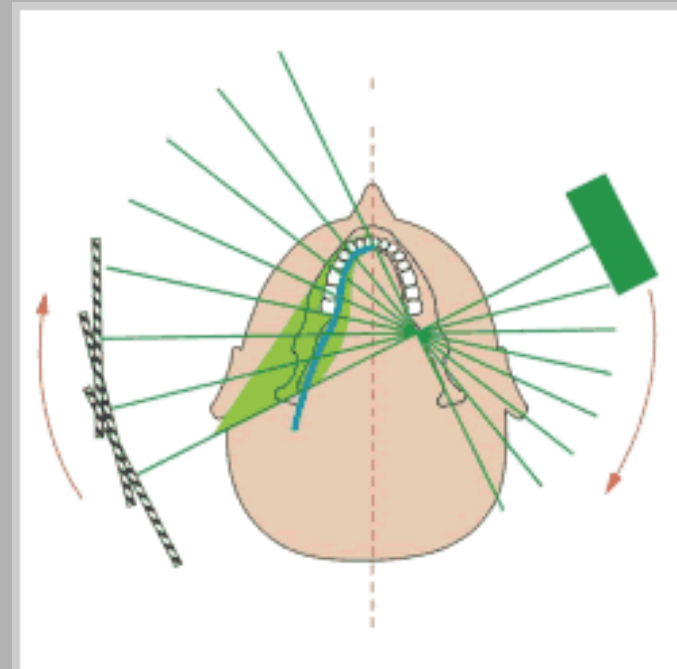
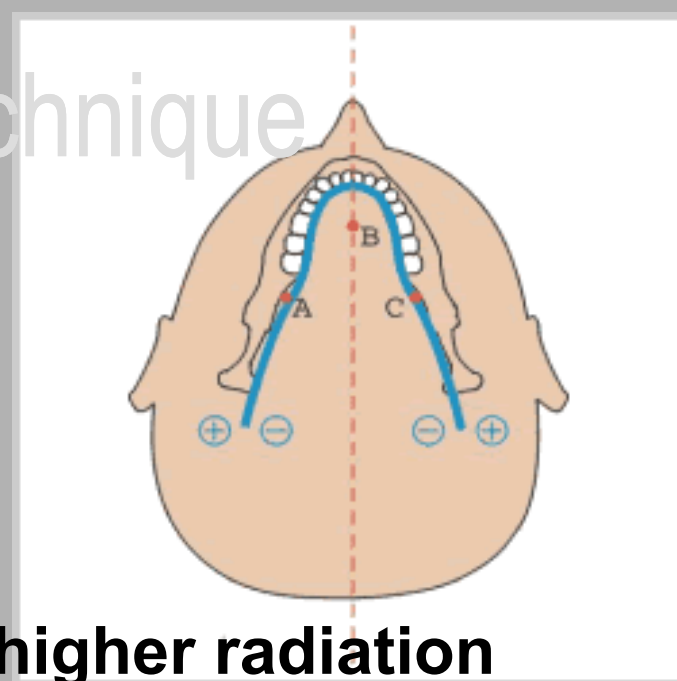
# Ortopanthomography - technique

- **leyer thickness**

- ✓ from 9 mm (frontal part)
- ✓ till 20 mm (in the area of TMJ)

– **thinner leyer = less artefacts, higher radiation dose**

- defocus
- zoom
- possibility of mesuring

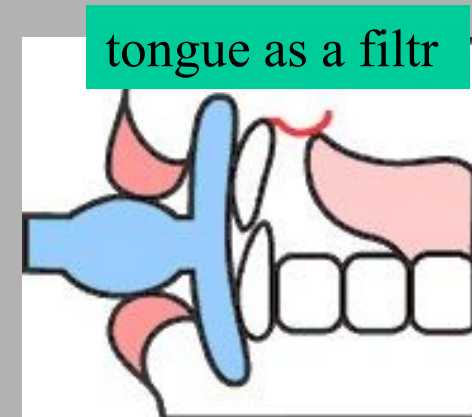
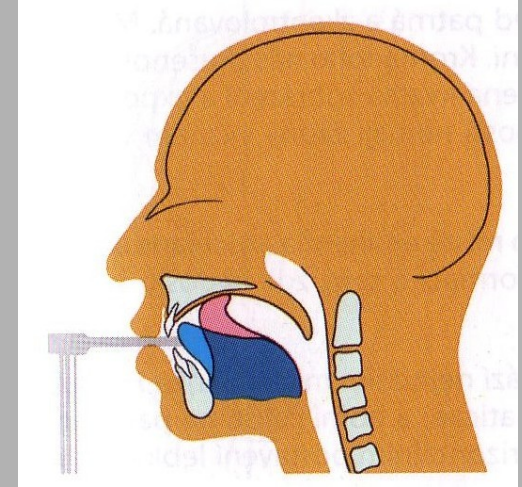


# Zonograms

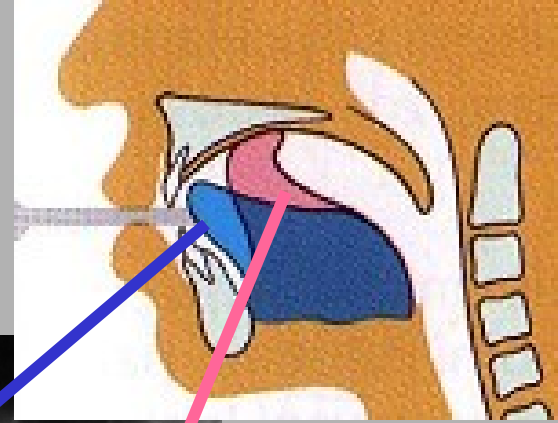
- = panoramic RTG exposures of different layer thickness
- variable layer thickness during exposition
- combination of zoom in (detail) technique
- to better exposure
  - reduction of cervical vertebra summation
    - ✓ reduction of rotating velocity of X-ray tube
    - ✓ increase the exposition parameters in the point of (x-ray) passing

# Burn-out effect

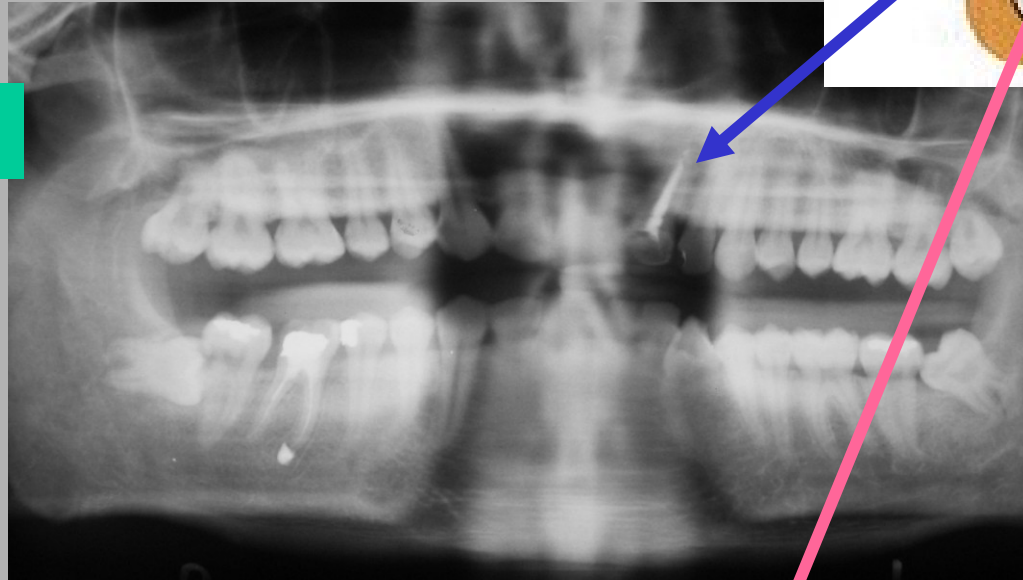
- incorrect tongue position
- x-ray beam is not reduced
- = „overexposition “ of structures
- **negative contrast of air** suppresses:
  - maxillar tooth roots
  - structures of maxilla
  - boundary of nasal and maxillar cavities
- **it is NOT possible to ASSESS**



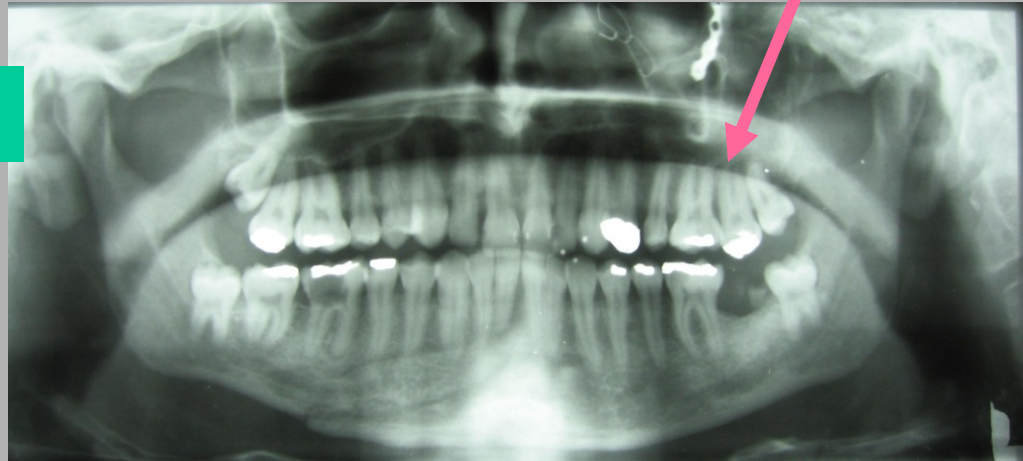
# Burn-out effect



overexposed picture



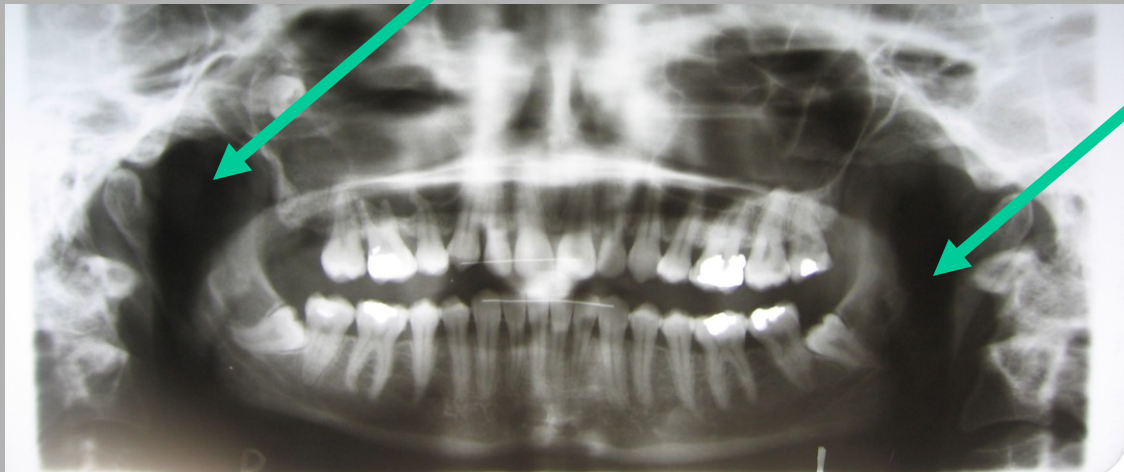
tongue as a filter



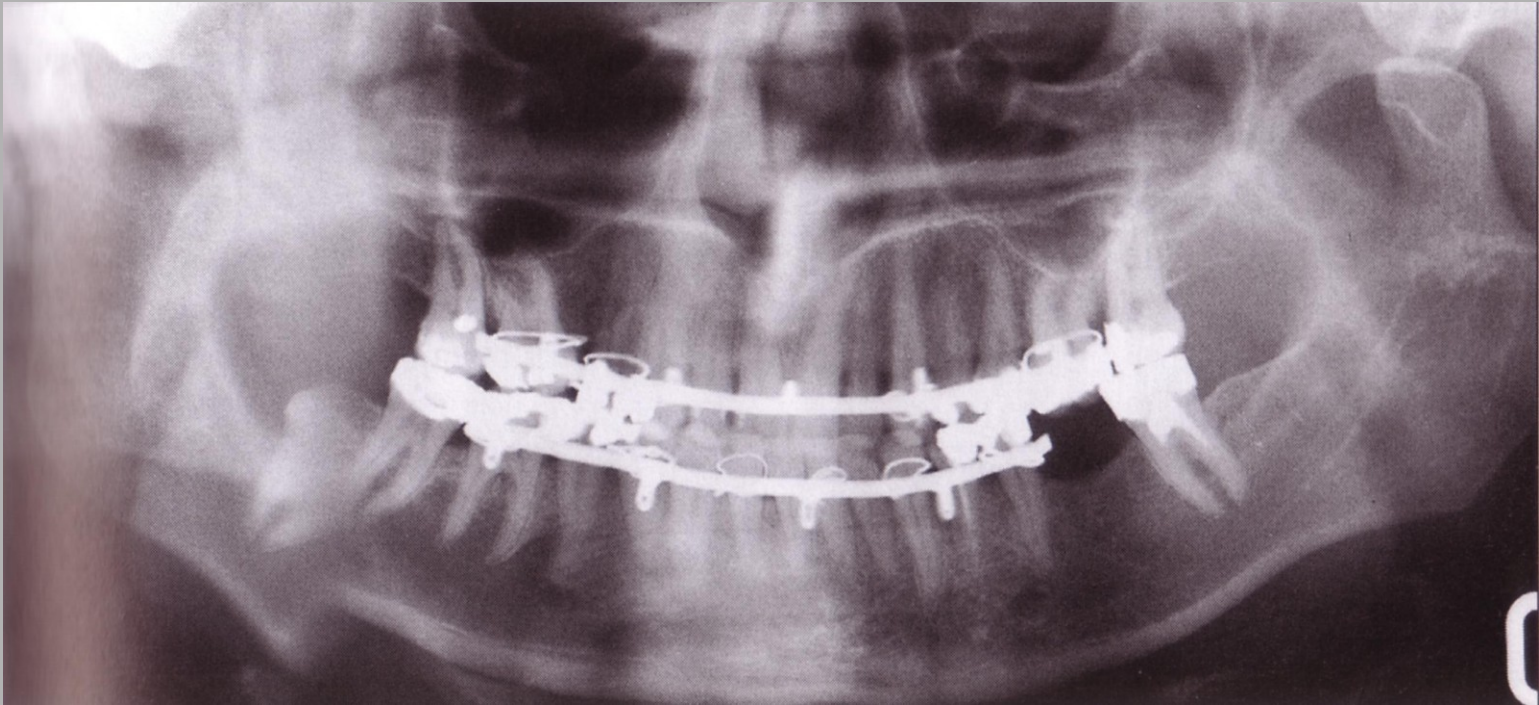
# The breathig

„Don't move and breathe calmly during the examination.“

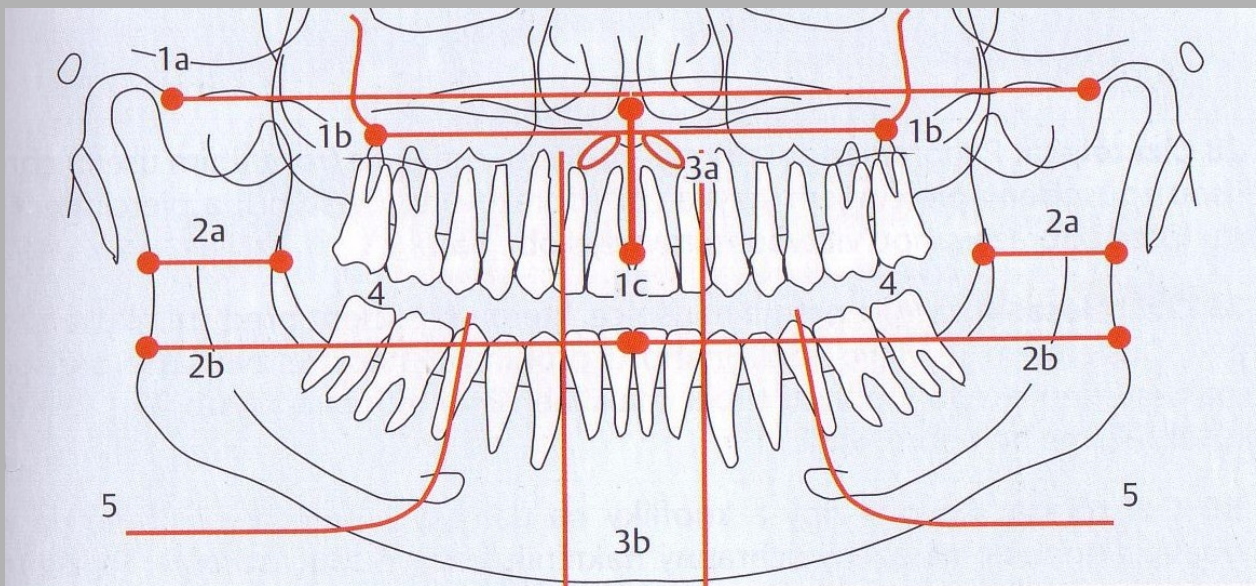
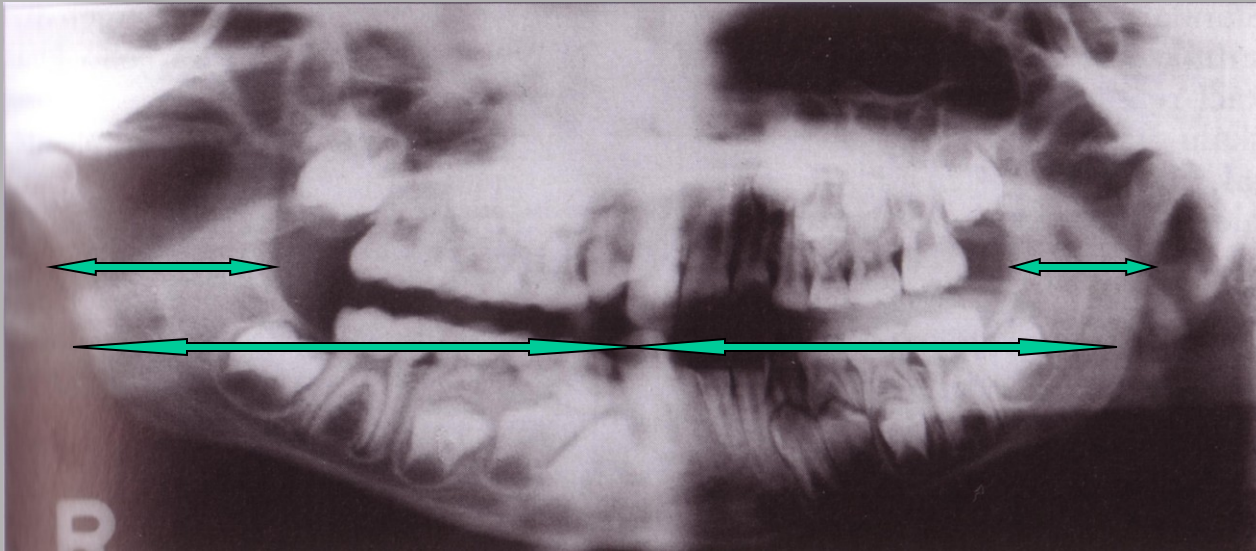
- deep breath and hold breath
- epipharynx is filled up with the air
  - incorrect exposure of lateral part of picture



# Movement artefacts



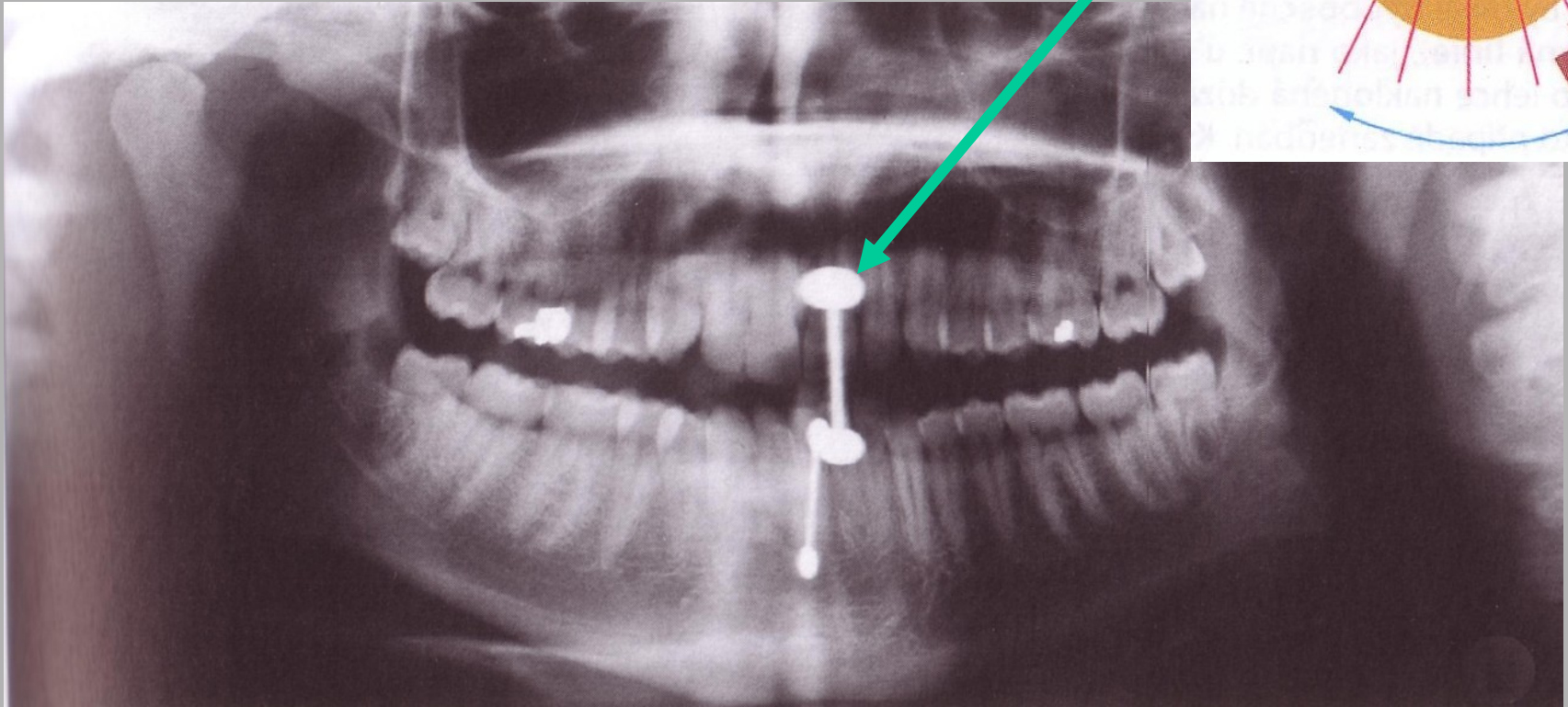
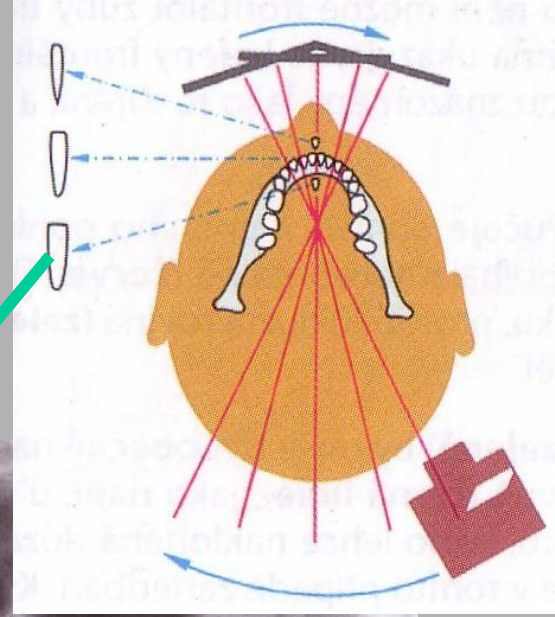
# Asymmetry of exposure





# Pictured layer

piercing - tongue



piercing - lip

# Ortopanthomography - mistakes

- The head hang (down)
- the roots of caudal incisors are deviated of the plane
- out of focus



# Ortopanthomography - mistakes

- Tilting the head back
- the root of cranial incisors are deviated of the plane
- out of focus



# Ortopanthomography - mistakes

- The head is too close to the film
- The teeth in both jaws
  - are smaller
  - out of focus
- The cervical vertebrae could summate with mandible arms



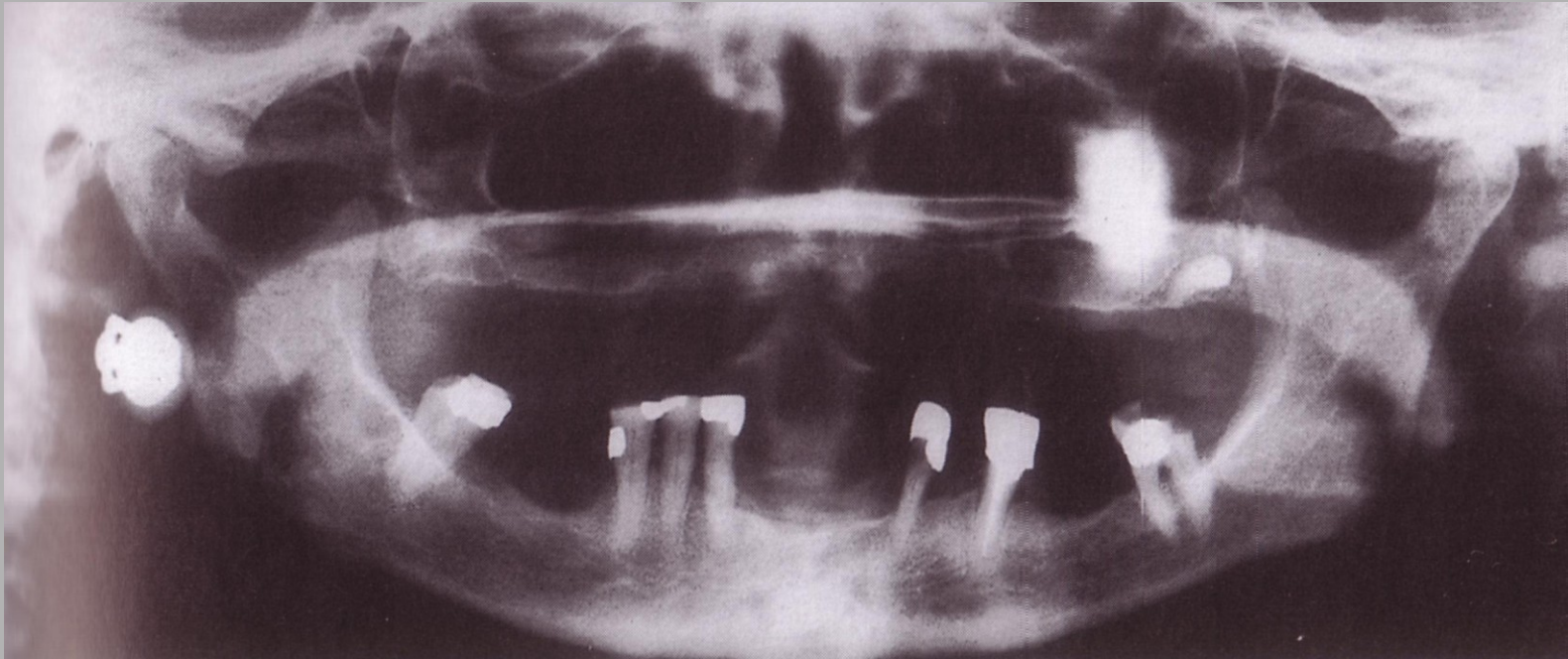
# Ortopanthomography - mistakes

- The head is far from the film
- maxillar and manbidular teeth are
  - out of fucus
  - larger
- there are not on the picture mandible joints



# Alien body - artefacts

- Ear rign on the right.
- Artefact in the area of the left tuber maxillae.



# Alien bodies - artefacts

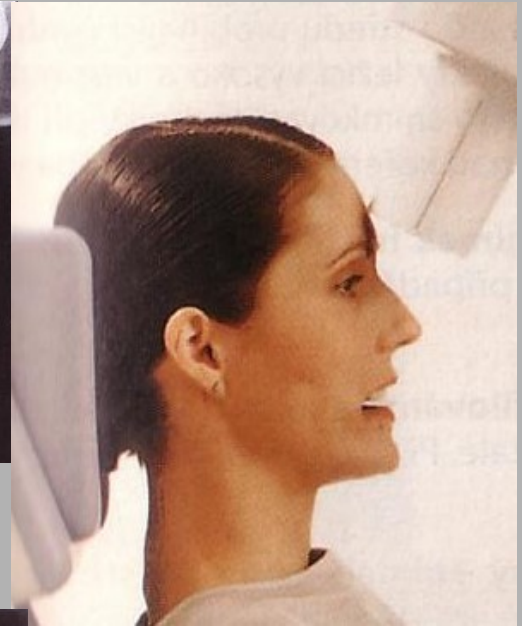
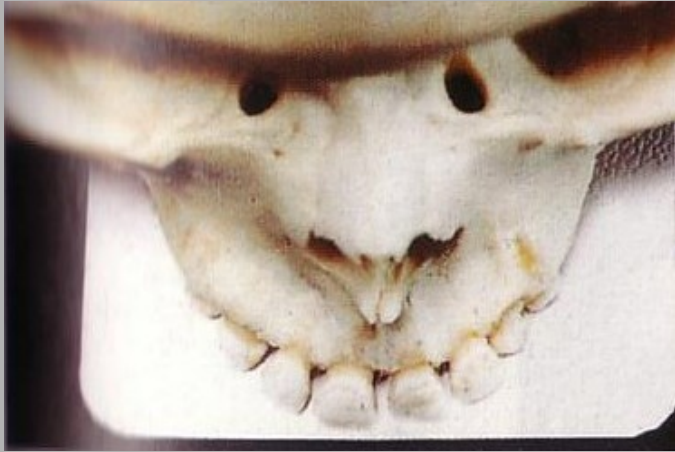
- Metal zips, buttons, glasses, carelessly attached protect collar
- = disturbing artefacts







# Occlusal exposure of upper and low jaw



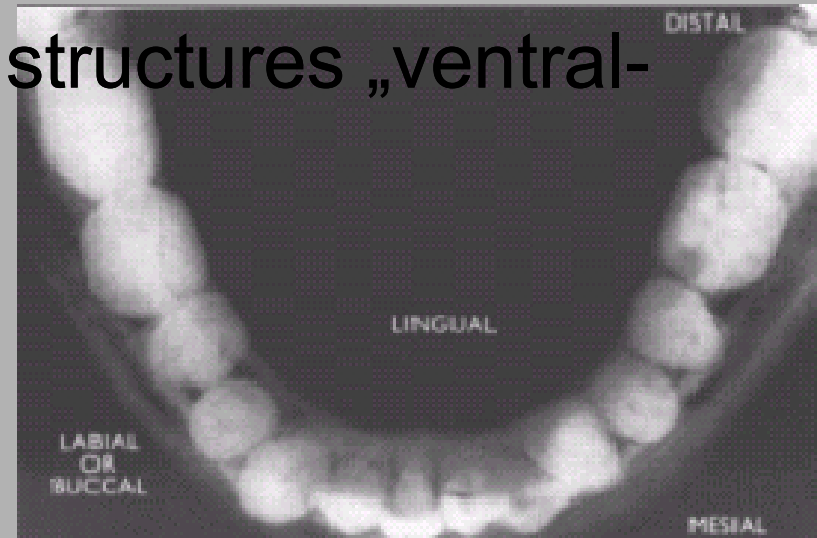
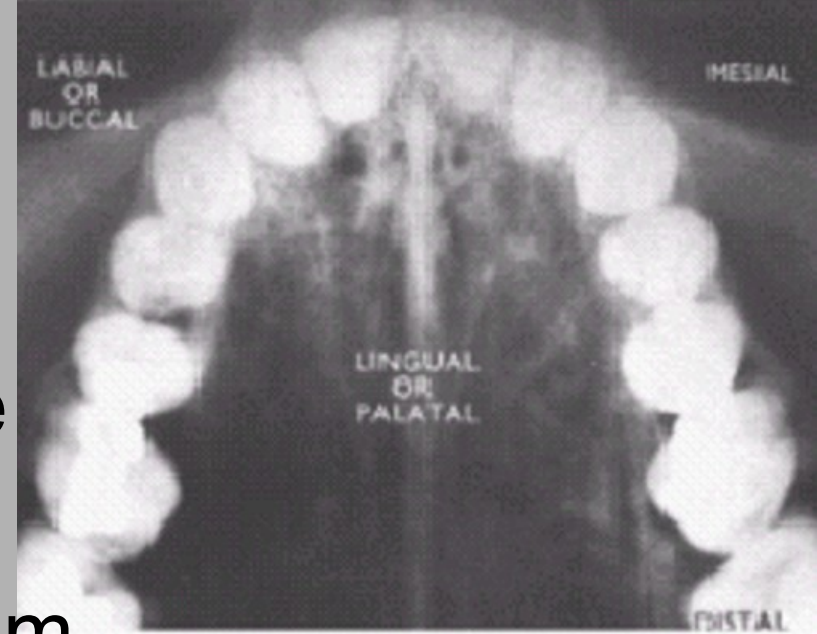
# Teeth arch

- Parabole
  - frontal part (curved part of parabole)
  - distal part (arms of parabole)



# Topography

- buccal – towards cheek
- lingual – towards tongue
- labial – towards lip
- palatal – towards palatum
- distal
- mesial
  - label the ventral located structures „ventral-medial“

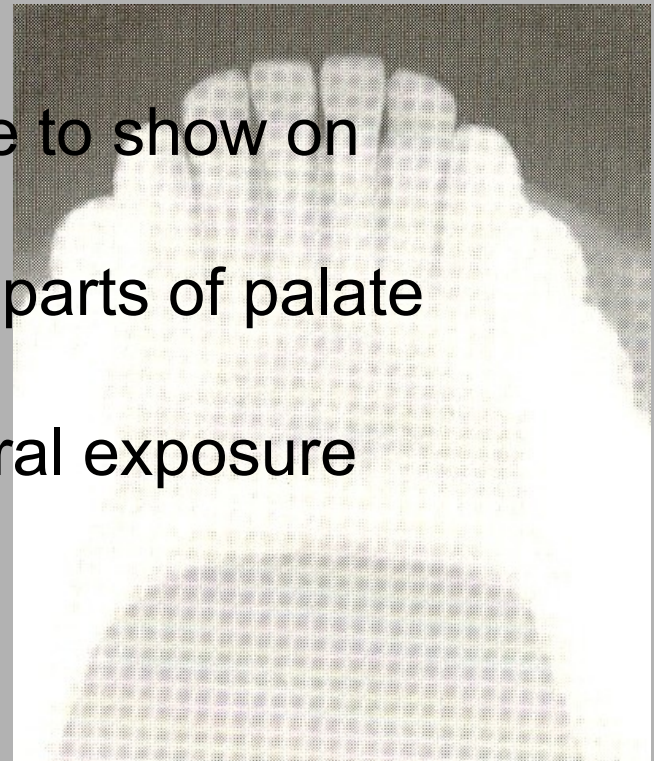
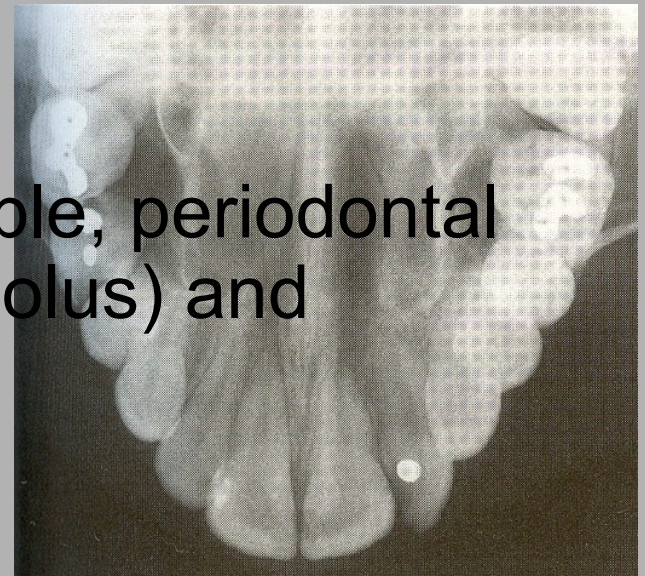


# Occlusal exposures

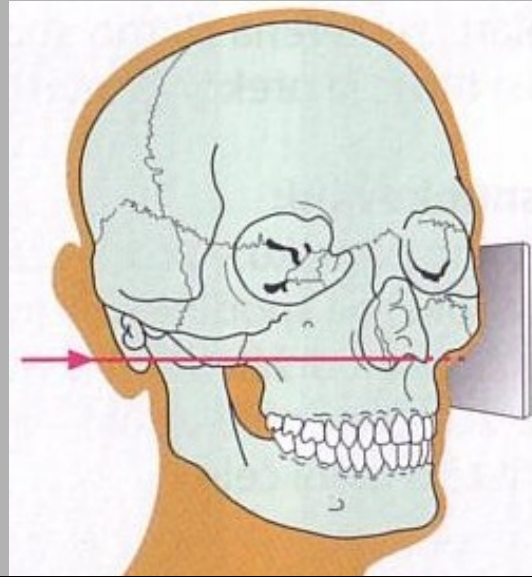
Pictures of maxillary arch, mandible, periodontal ligaments, tooth sockets (alveolus) and adjacent bone

Indications:

- teeth development monitoring
- redundant teeth
- pathology which is not possible to show on intraoral exposures
- contours of buccal and lingual parts of palate skeleton
- no possibility to perform intraoral exposure
  - limitation of mouth opening
  - no cooperation (children)

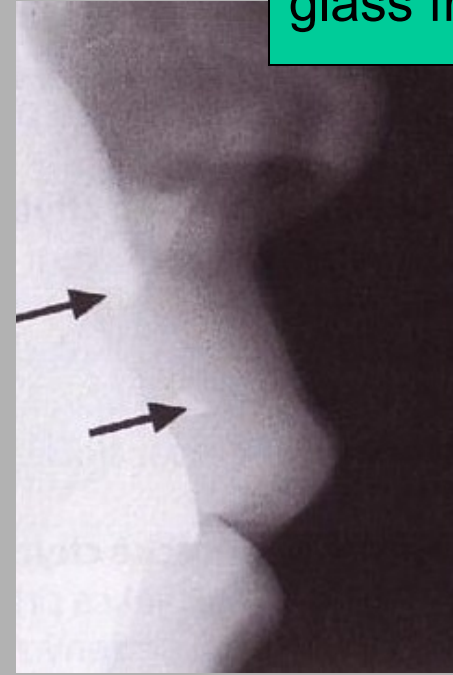


# Extraoral lateral exposure of frontal upper frontal part



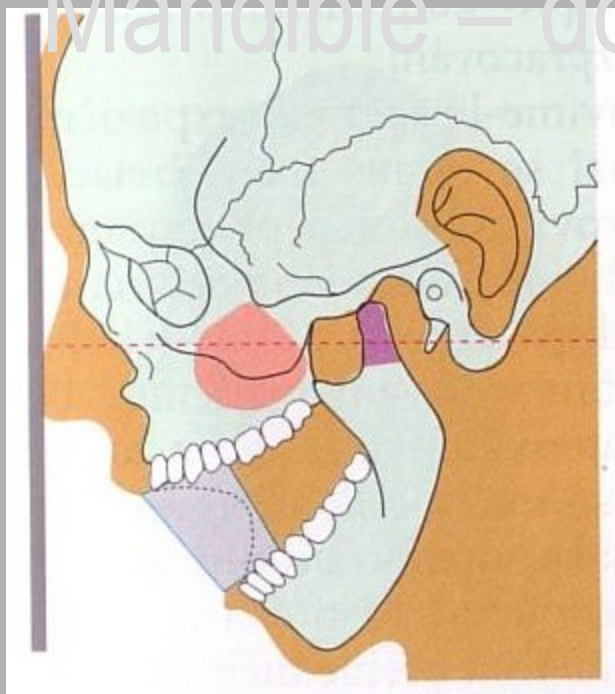
spina nasalis anterior  
perpendicular to film

glass fragments

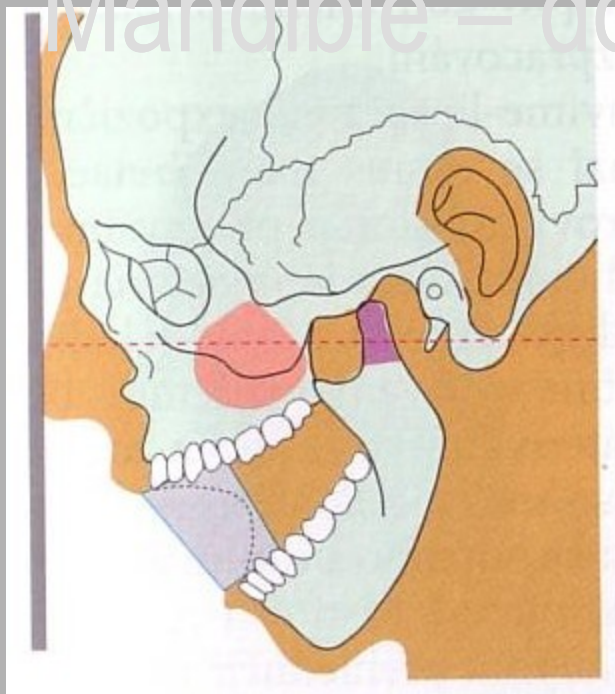


- depiction of nasal bones
- alien particles

# Mandible – dorso-frontal projection

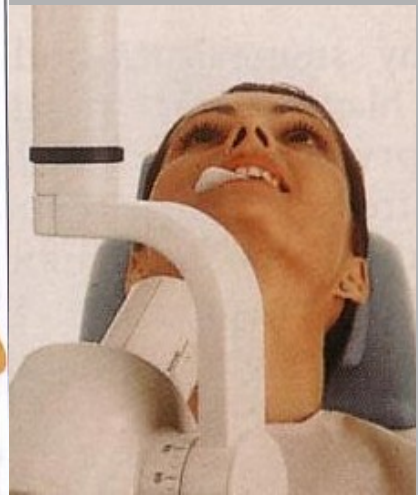
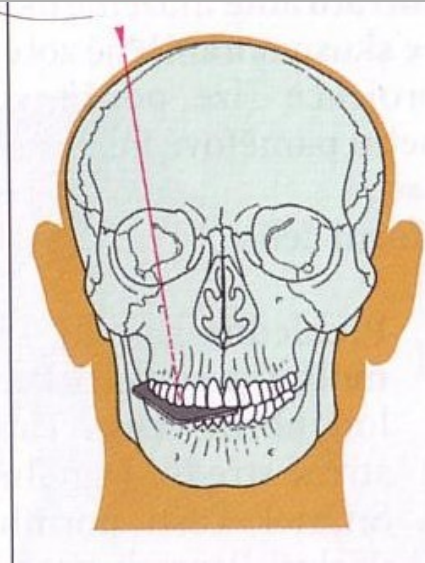
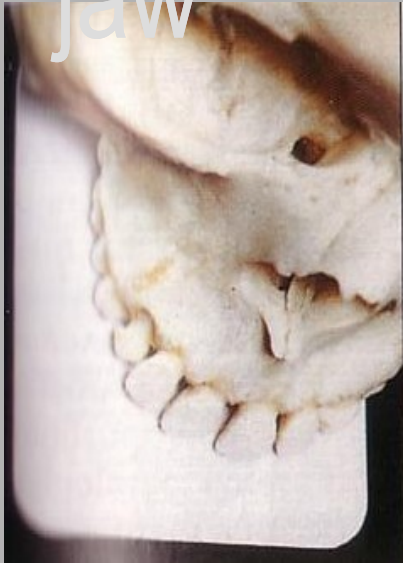


# Mandible – dorso-frontal projection



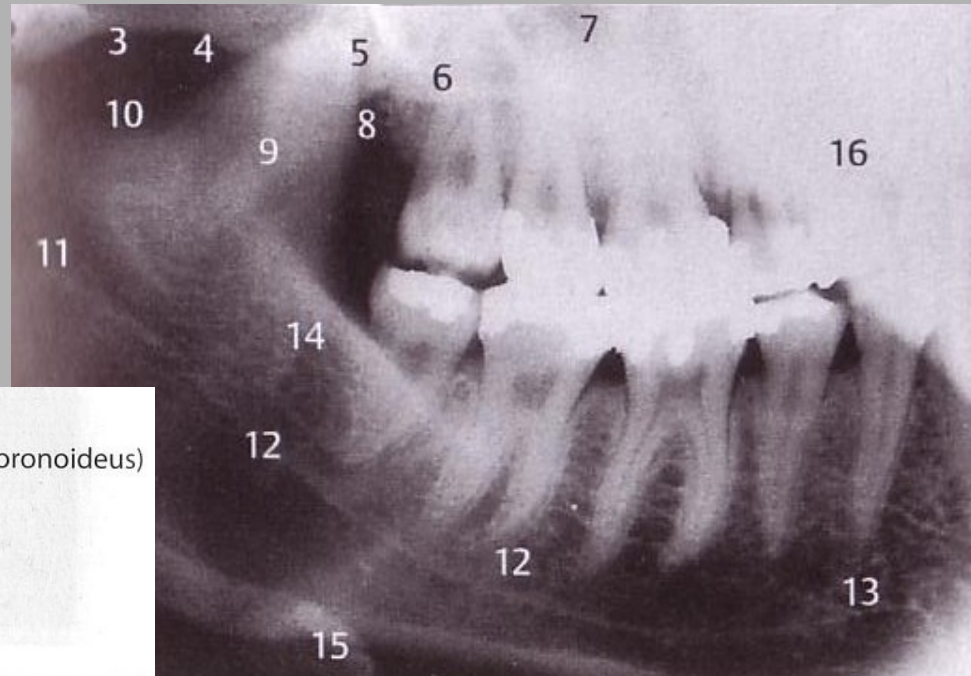
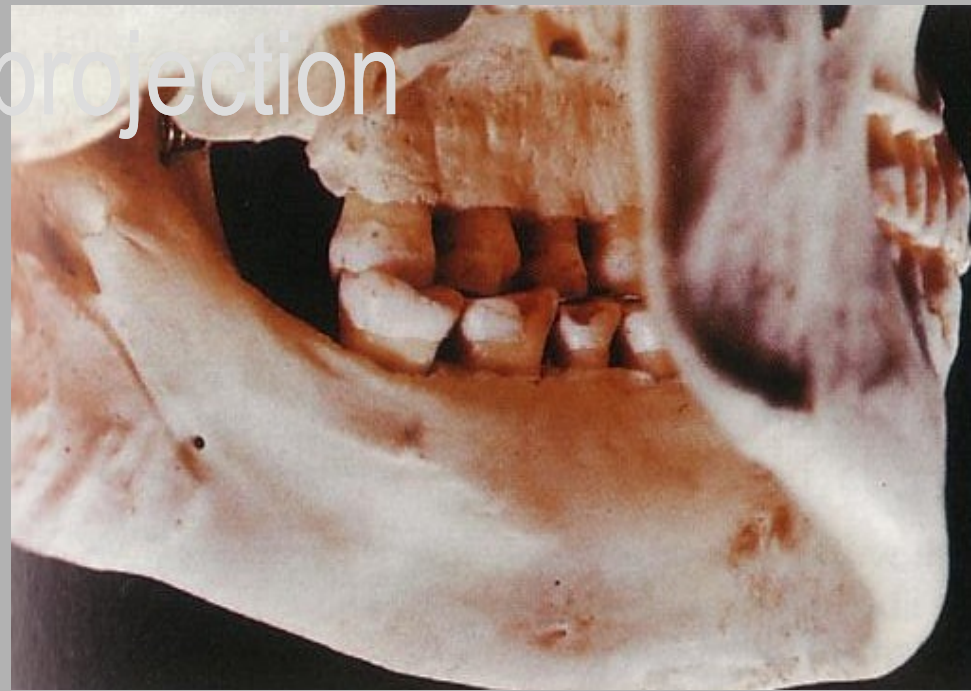
- |    |  |    |   |
|----|--|----|---|
| 1  | Crista frontalis   | 15 | Margo inferior, orbita                        |
| 2  | Squama ossis temporalis                                  | 16 | Sinus maxillaris                              |
| 3  | Pars petrosa ossis temporalis                            | 17 | Cavum nasi                                    |
| 4  | Eminentia arcuata  | 18 | Concha nasalis inferior                       |
| 5  | Processus mastoideus ossis temporalis                    | 19 | Septum nasi osseum                            |
| 6  | Sinus sphenoidalis v superpozici s částí sinus frontalis | 20 | Dens axis (epistrophei)                       |
| 7  | Crista galli   | 21 | Articulatio atlantoaxialis                    |
| 8  | Planum sphenoidale                                       | 22 | Spina nasalis anterior                        |
| 9  | Articulatio atlantooccipitalis                           | 23 | Processus condylaris mandibulae               |
| 10 | Processus transversum atlantis                           | 24 | Kondylus, facies articularis                  |
| 11 | Processus pterygoideus ossis sphenoidalis                | 25 | Angulus mandibulae                            |
| 12 | Eminentia articularis                                    | 26 | Processus muscularis (coronoideus) mandibulae |
| 13 | Arcus zygomaticus  | 27 | Canalis mandibulae                            |
| 14 | Os zygomaticum   | 28 | Foramen mentale                               |
|    |  | 29 | Corpus vertebrae cervicalis III               |

# Semiprofile exposures of upper and low jaw



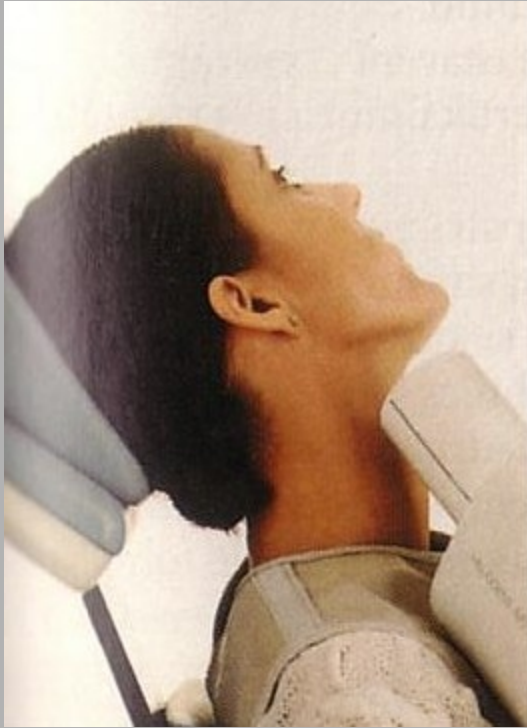


# Mandible – lateral projection



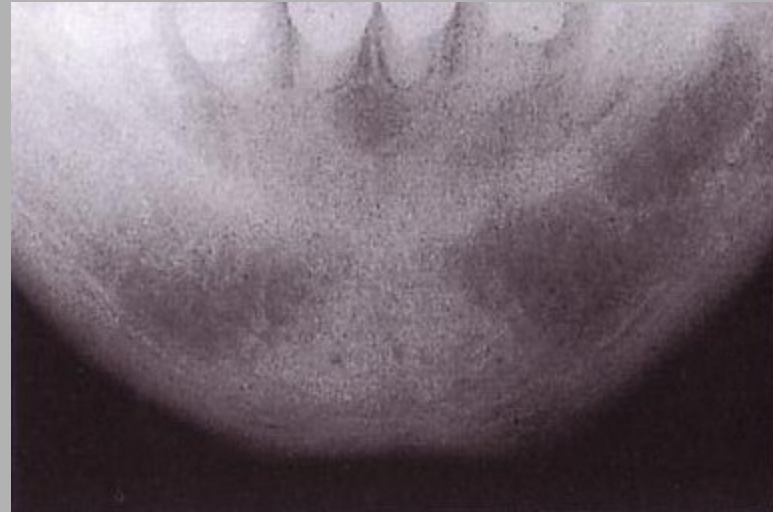
- |   |   |    |                                    |
|---|---|----|------------------------------------|
| 1 | Kondylus                                  | 9  | Processus muscularis (coronoideus) |
| 2 | Eminentia articularis                     | 10 | Incisura semilunaris               |
| 3 | Arcus zygomaticus                         | 11 | Lingula                            |
| 4 | Sutura zygomaticoalveolaris               | 12 | Canalis mandibulae                 |
| 5 | Processus pterygoideus ossis sphenoidalis | 13 | Foramen mentale                    |
| 6 | Os zygomaticum                            | 14 | Crista temporalis                  |
| 7 | Sinus maxillaris                          | 15 | Os hyoideum                        |
| 8 | Tuber maxillae                            | 16 | Angulus mandibulae (blíže ohnisku) |

# Caudal wisdom tooth



- The head is tilted on healthy side and back
- The x-ray beam passes through the wisdom tooth towards cranio-ventral oriented film cassette which is on the reverse side

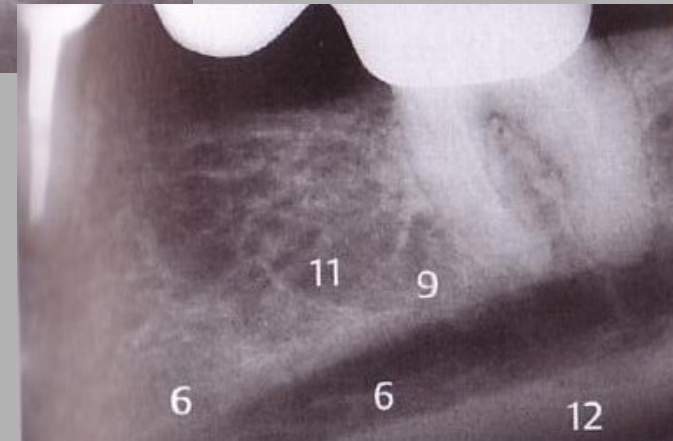
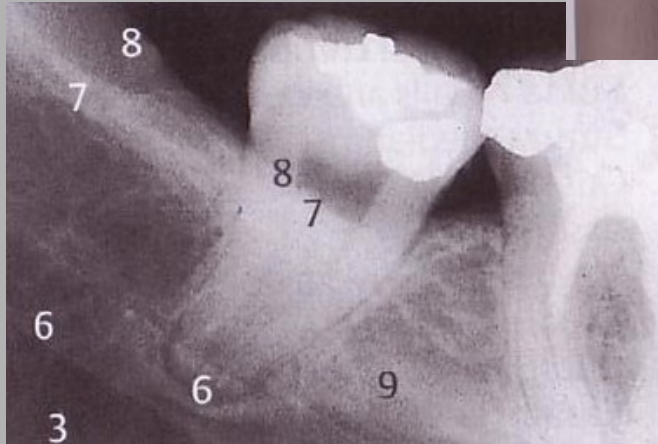
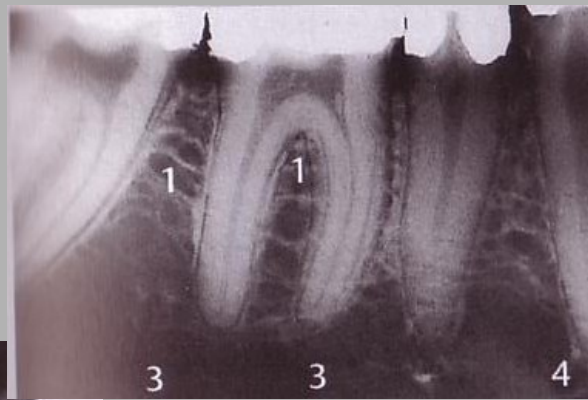
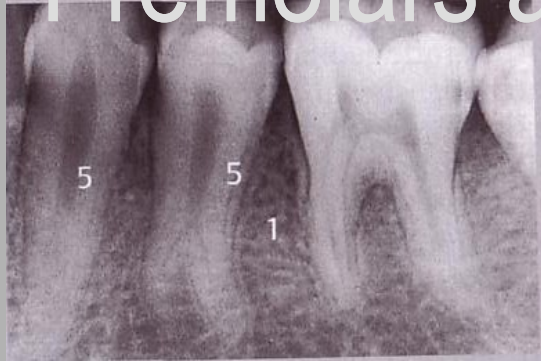
# Chin exposure



- horizontal placed film
- imaging toothless chin

# Premolars a molars

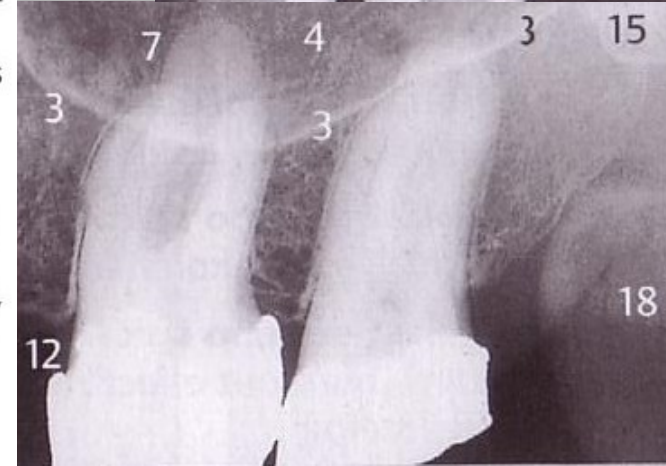
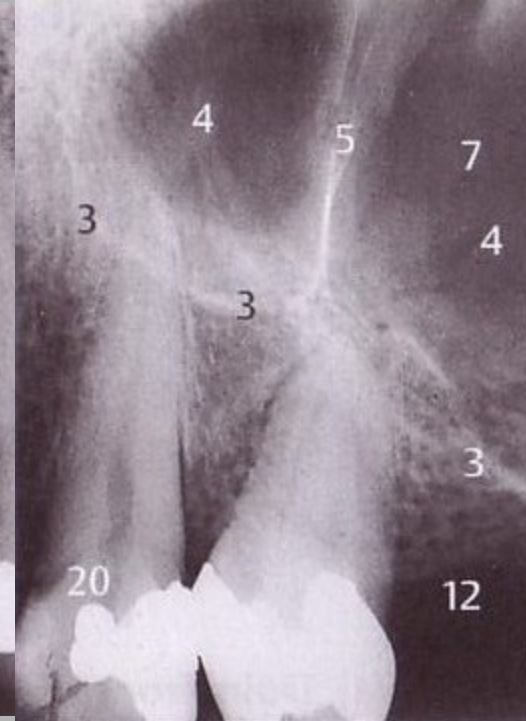
Anatomy



- 1 Typická trámčitá struktura alveolárního výběžku dolní čelisti
- 2 Projasnění – subtrakční efekt fovea submandibularis
- 3 Typická trámčina corpus mandibulae
- 4 Foramen mentale
- 5 Taurodontizmus
- 6 Canalis mandibulae
- 7 Linea obliqua interna (pokračování crista temporalis ramus mandibulae)
- 8 Linea obliqua externa (margo anterior ramus mandibulae)
- 9 Linea mylohyoidea
- 10 Trigonum retromolare (crus mediale a crus laterale)
- 11 Ohraničená struktura kosti po extrakci
- 12 Bazální kompakta dolní čelisti
- 13 Aproximální nánosy zubního kamene

# Molars, premolars, area of the tuber

Anatomy

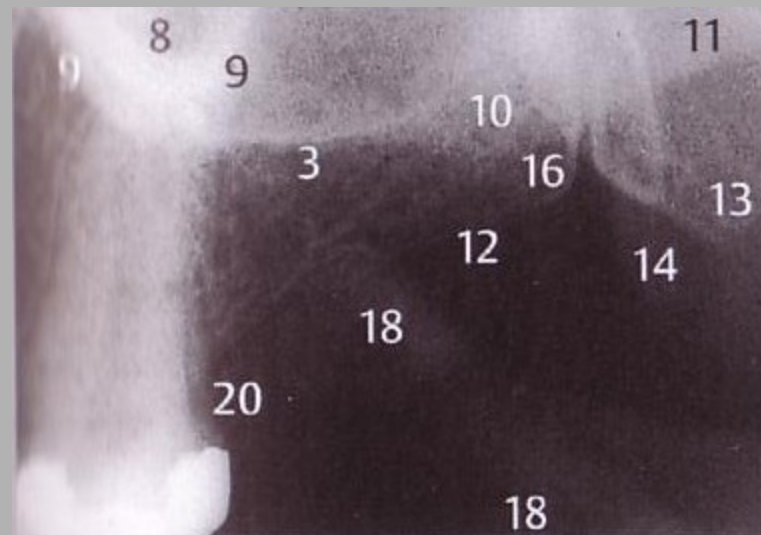
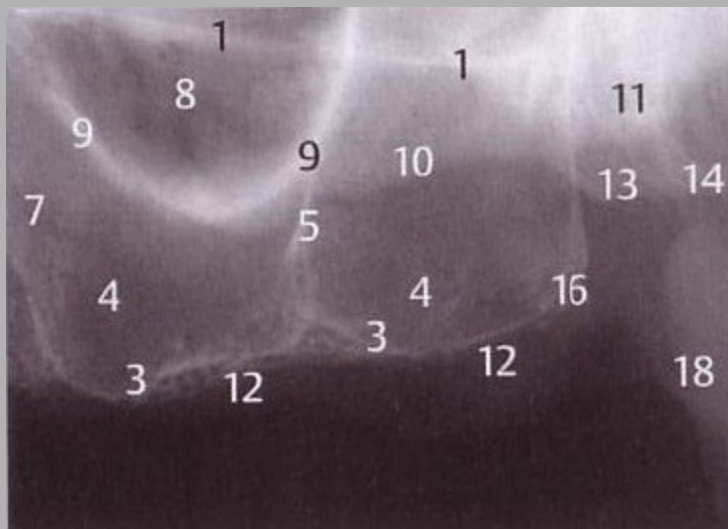


- 1 Laterobazální ohraničení nosní dutiny
- 2 Spodina nosní dutiny
- 3 Laterobazální ohraničení čelistní dutiny
- 4 Spodina (dno) čelistní dutiny
- 5 Septum sinuum
- 6 Anteriorní výběžek čelistní dutiny
- 7 Alveolární výběžek čelistní dutiny
- 8 Recessus zygomaticus čelistní dutiny
- 9 Processus zygomaticus čelistní dutiny
- 10 Corpus ossis zygomatici
- 11 Arcus zygomaticus
- 12 Alveolární hřeben

- 13 Lamina lateralis processus pterygoideus
- 14 Hamulus laminae medialis processus pterygoideus
- 15 Processus pyramidalis ossis palatini
- 16 Tuber maxillae
- 17 Sutura zygomaticomaxillaris
- 18 Processus coronoideus (muscularis)
- 19 Hroty kořenů 1. horního premoláru, delší kořen je palatinální
- 20 „Burn-out effect“
- 21 Sekundární kaz

# Molars, premolars, area of the tuber

Anatomy



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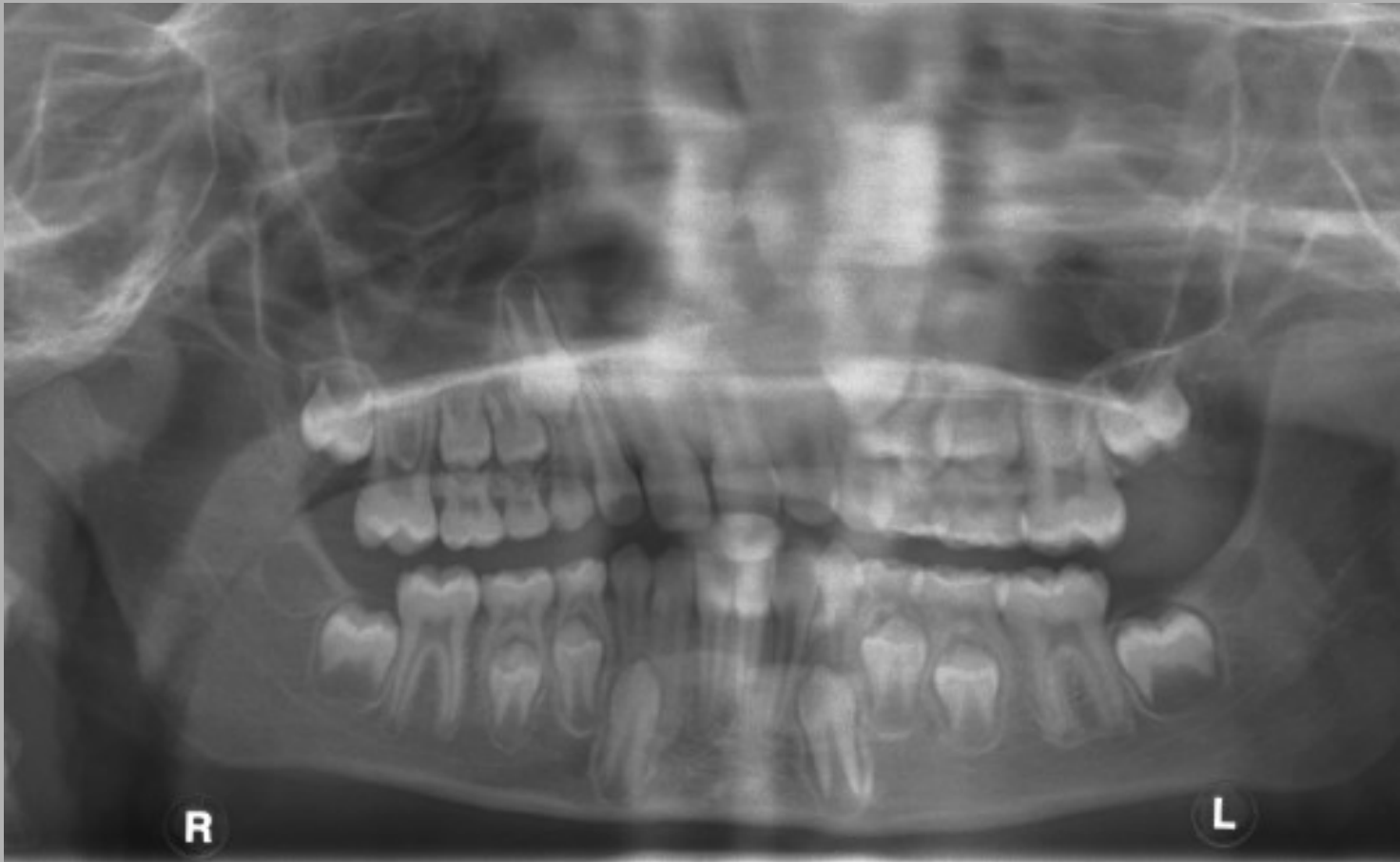
# Literature

- Pasler F.A., Visser H.: Stomatologická radiologie. Kapesní atlas. 2007. ISBN 978-80-247-1307-6.
- [http://rtg.misto.cz/\\_MAIL\\_/index.html](http://rtg.misto.cz/_MAIL_/index.html)





# Retentio dentes

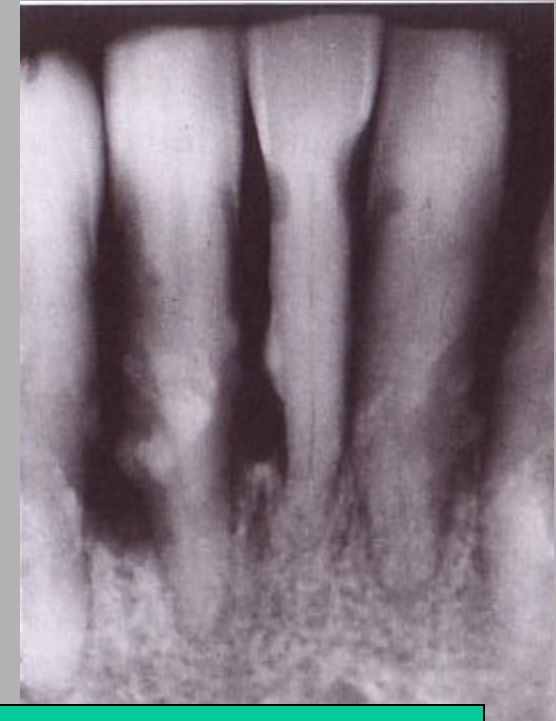


# Tartar

tartar is composed of mineralized tooth plaque + generalized bone reduction as a consequence of parodont pathology



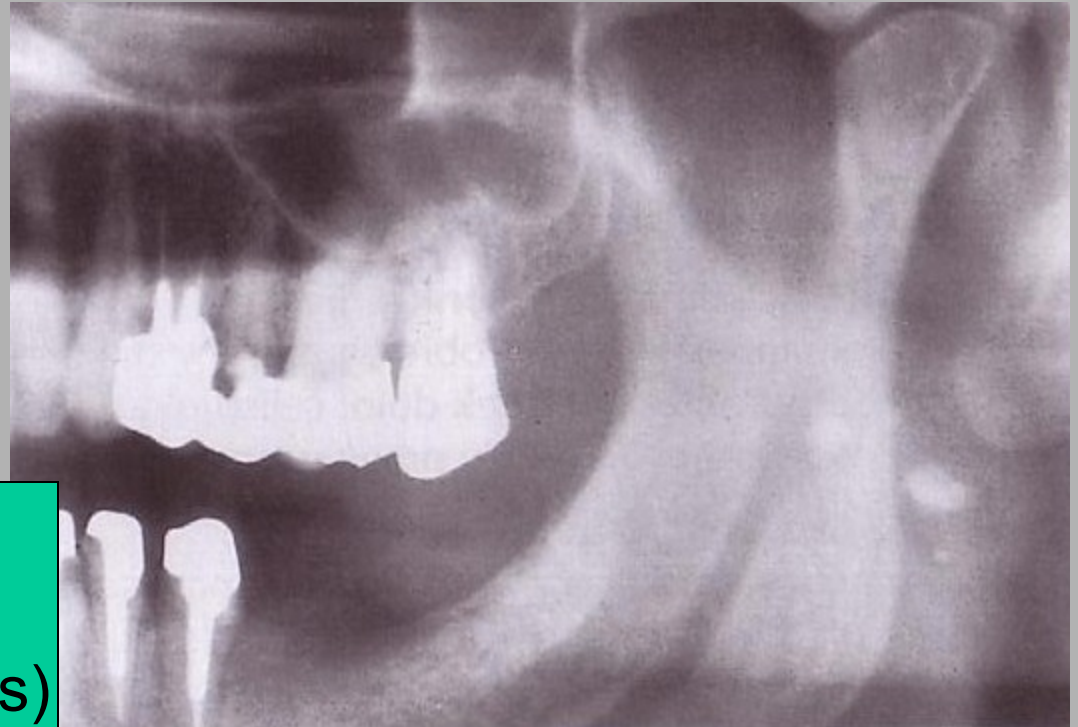
- origins in area of outfall of main salivary glands
- calcium phosphate
  - x-ray opacity



parodontitis marg. profunda  
sublingual tartar

# Concrements

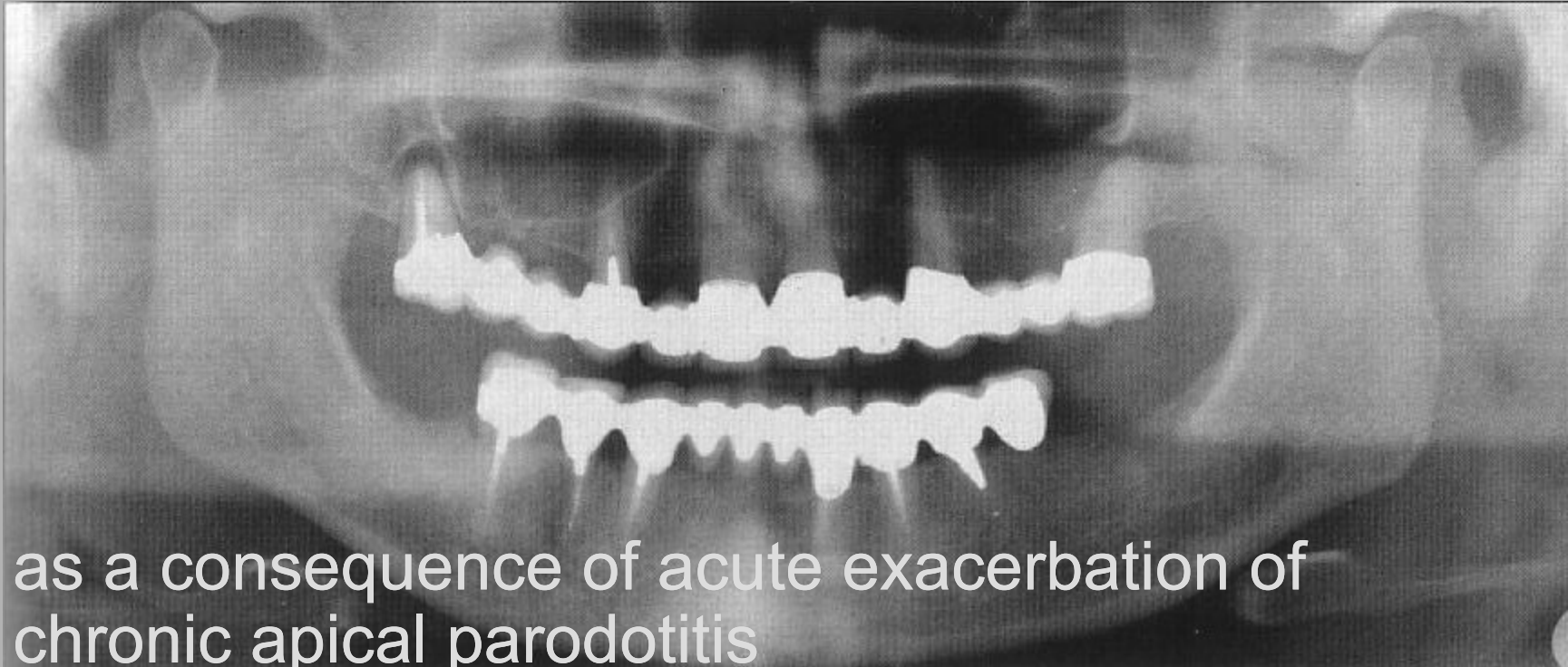
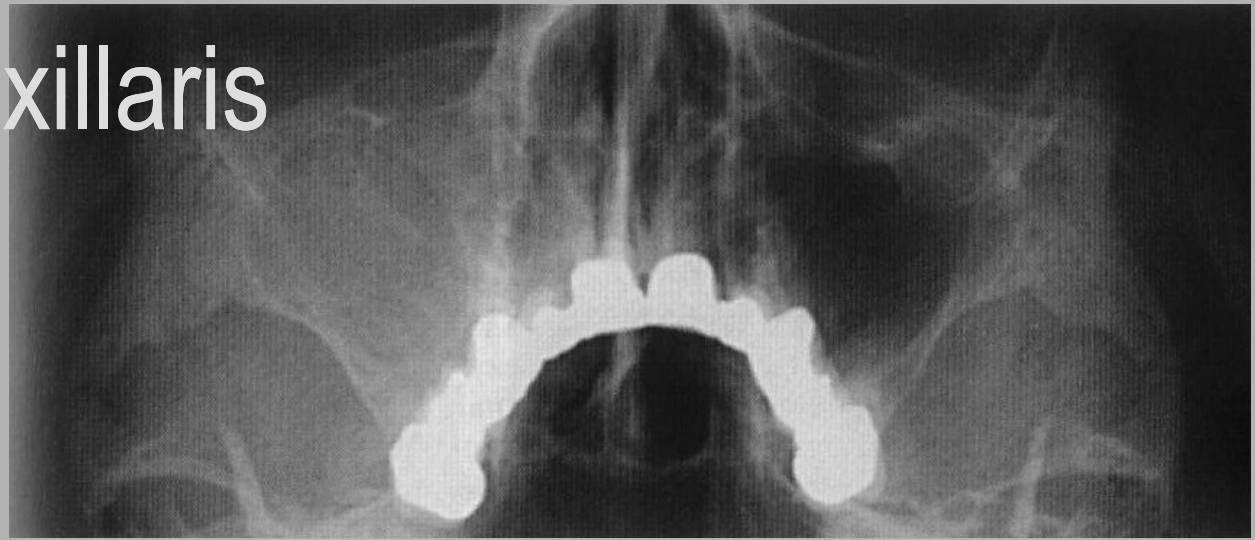
calcified cervical lymph. nodes



calcification of gl. parotis  
as a consequence of  
parotitits epidemica (mumps)

# Sinusitis maxillaris

w, 57 y



- as a consequence of acute exacerbation of chronic apical parodontitis

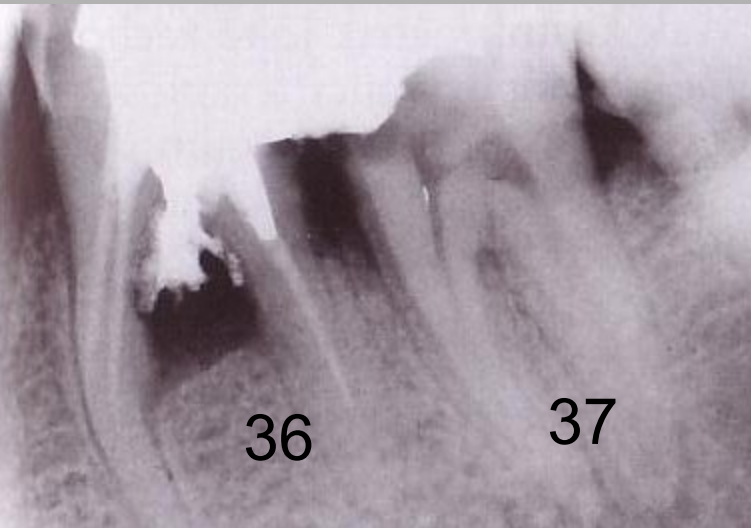
# Sinusitis maxillaris

- w, 17 y
- acute catarrhal etiology

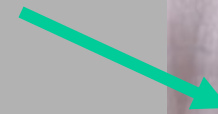


# Marginal periodontopathy

bone reduction between 35,37  
as a consequence of amalgam overhang  
caries 34,37,38



mezial posttraumatic  
central granuloma



oversupply of root filling  
injury to the desmodont and mesodont of tooth root  
etiology: via falsa  
= interradicular bone loss

11

# chronic. apical periodontitis



# periodontitis chronica





# Marginal periodontopathy

traumatic occlusion

etiology: fixed bridgework

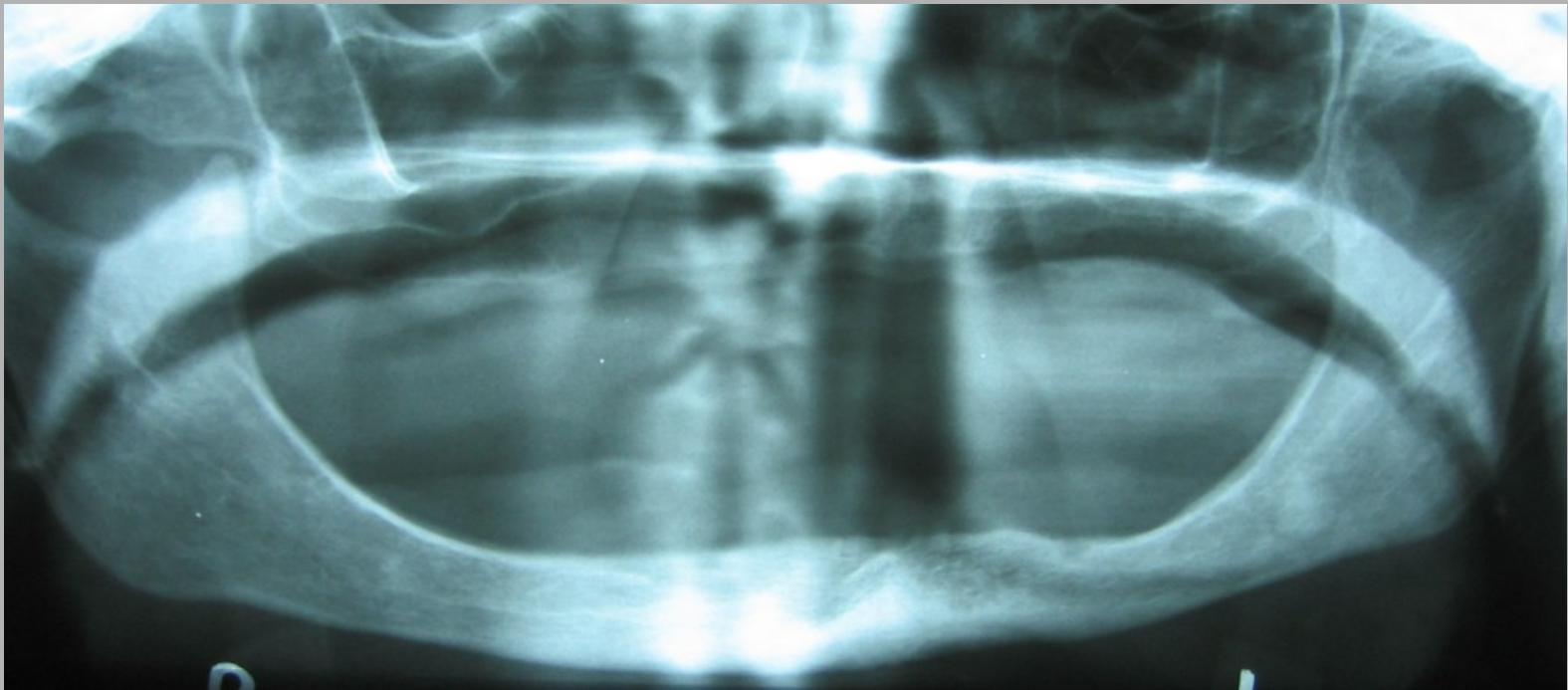
massive bone reduction

sclerotic reactive zone - apically (36,37)



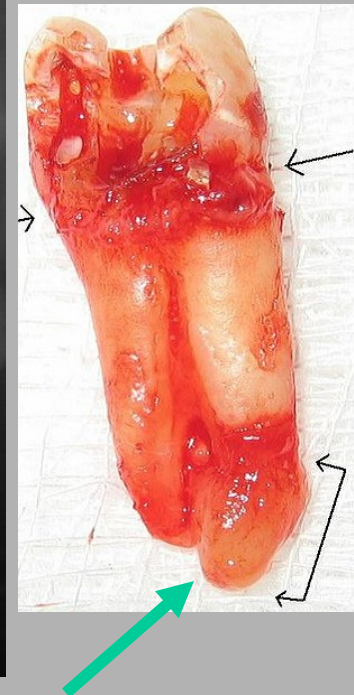
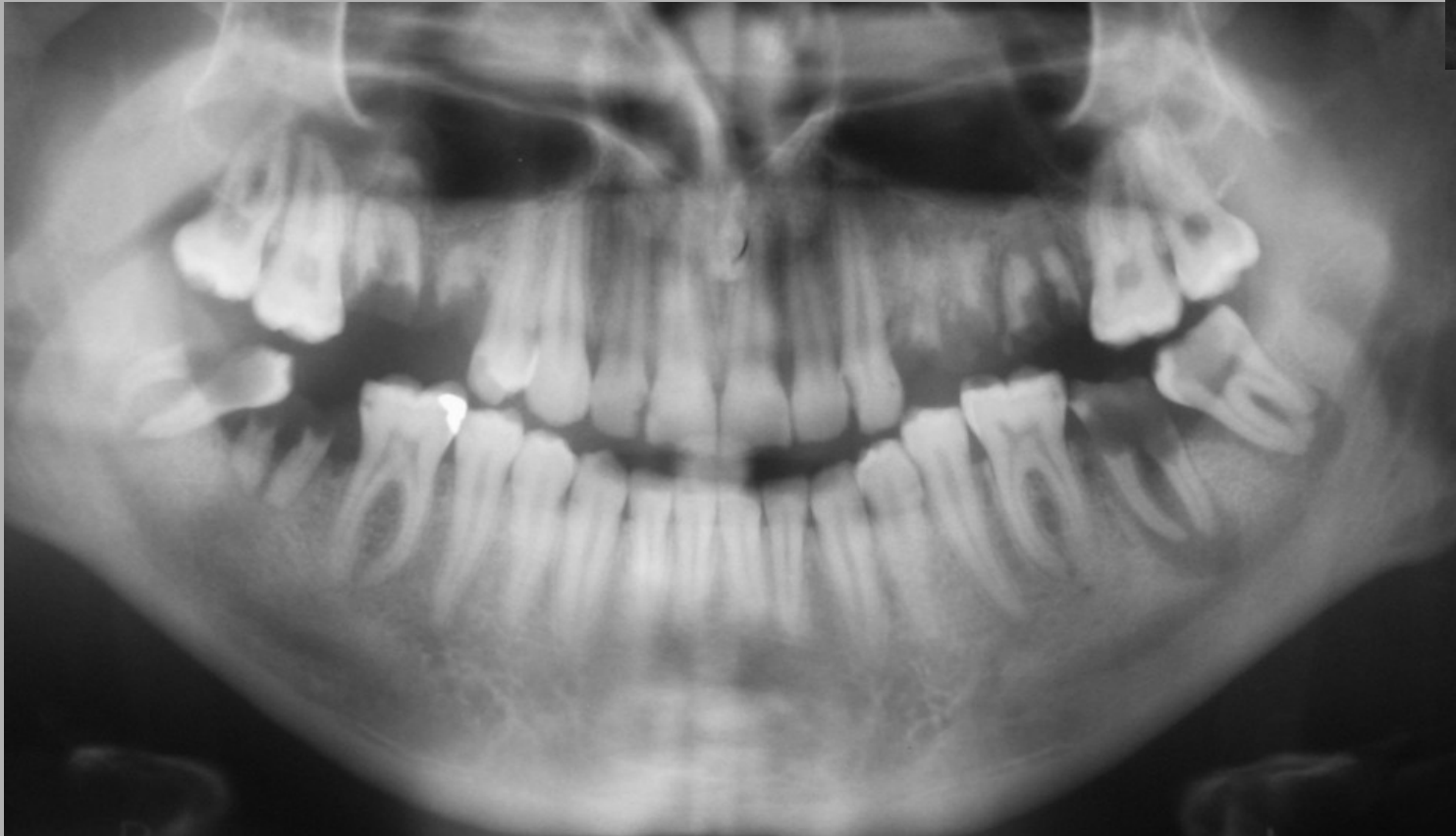
# Marginal periodontopathy

alveolar and mandible bone reduction  
old age

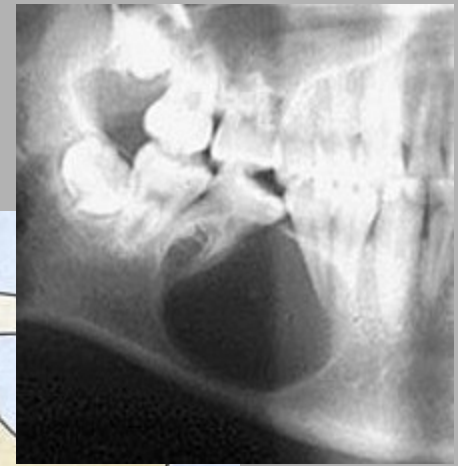
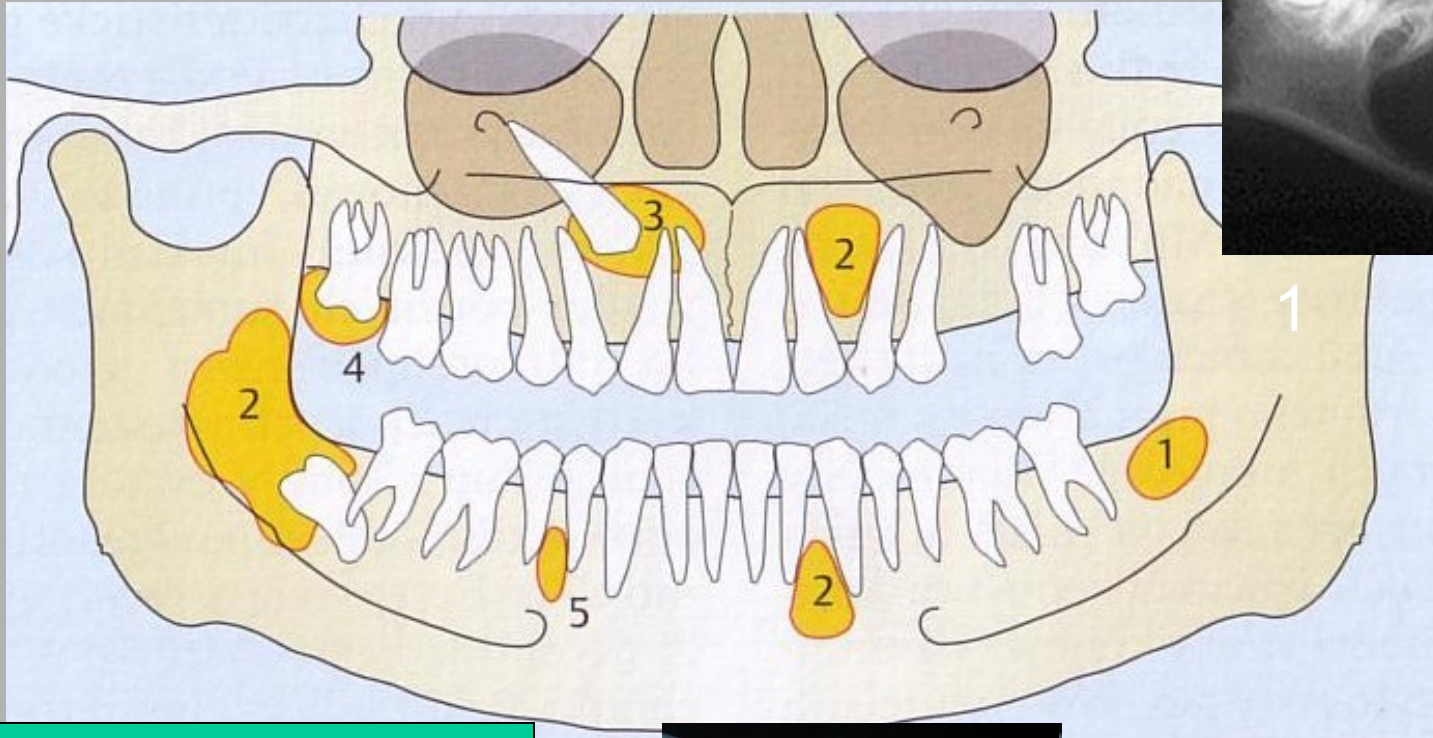


# Periapical abscess

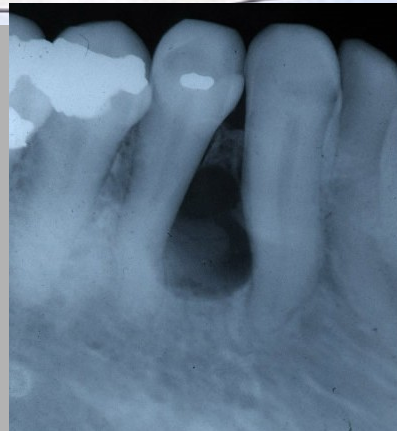
A **periapical abscess** is the result of a chronic, localized infection located at the tip, or apex, of the root of a tooth.



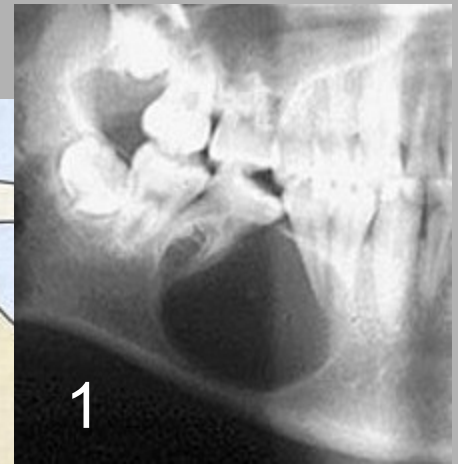
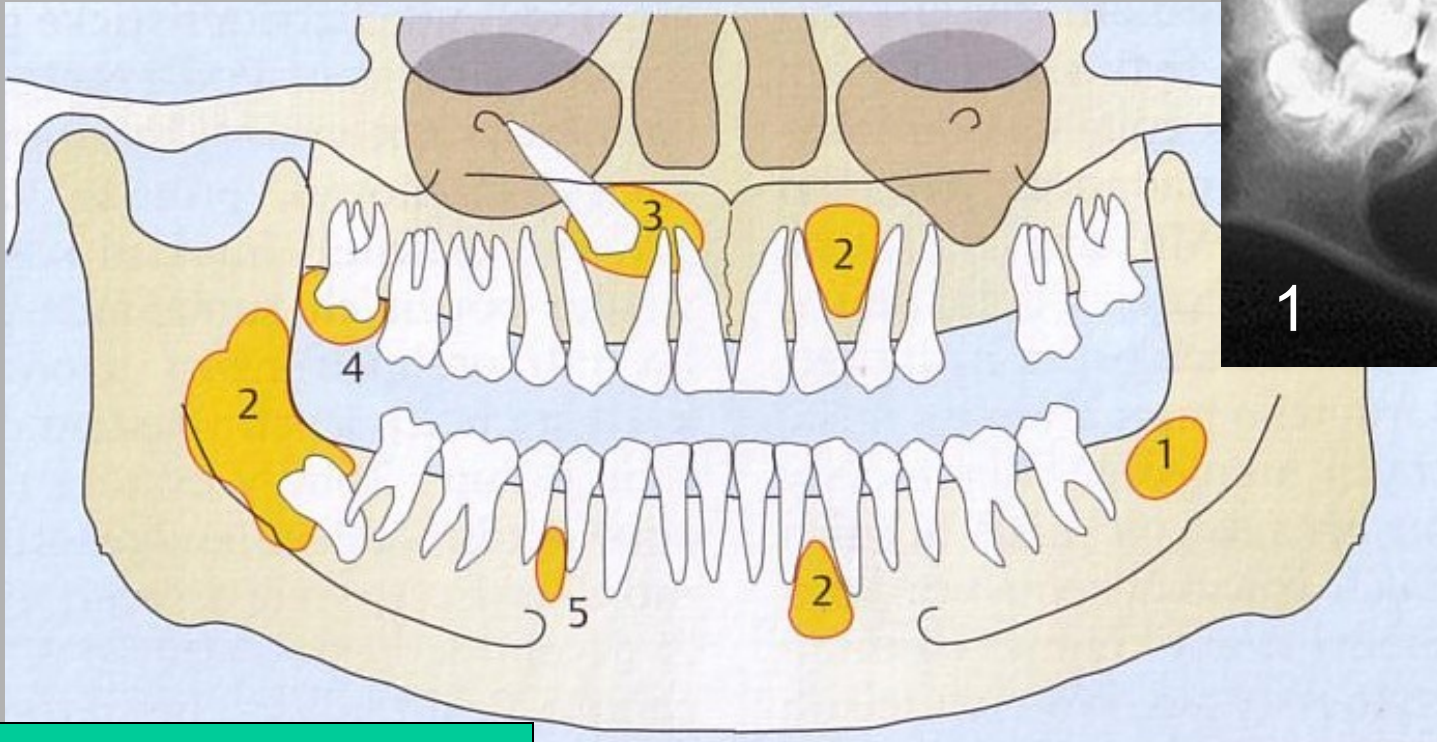
# Cysts – odontogenic



1. primordial c.
2. keratocyst
3. folikular c.
4. lateral parodontal c.



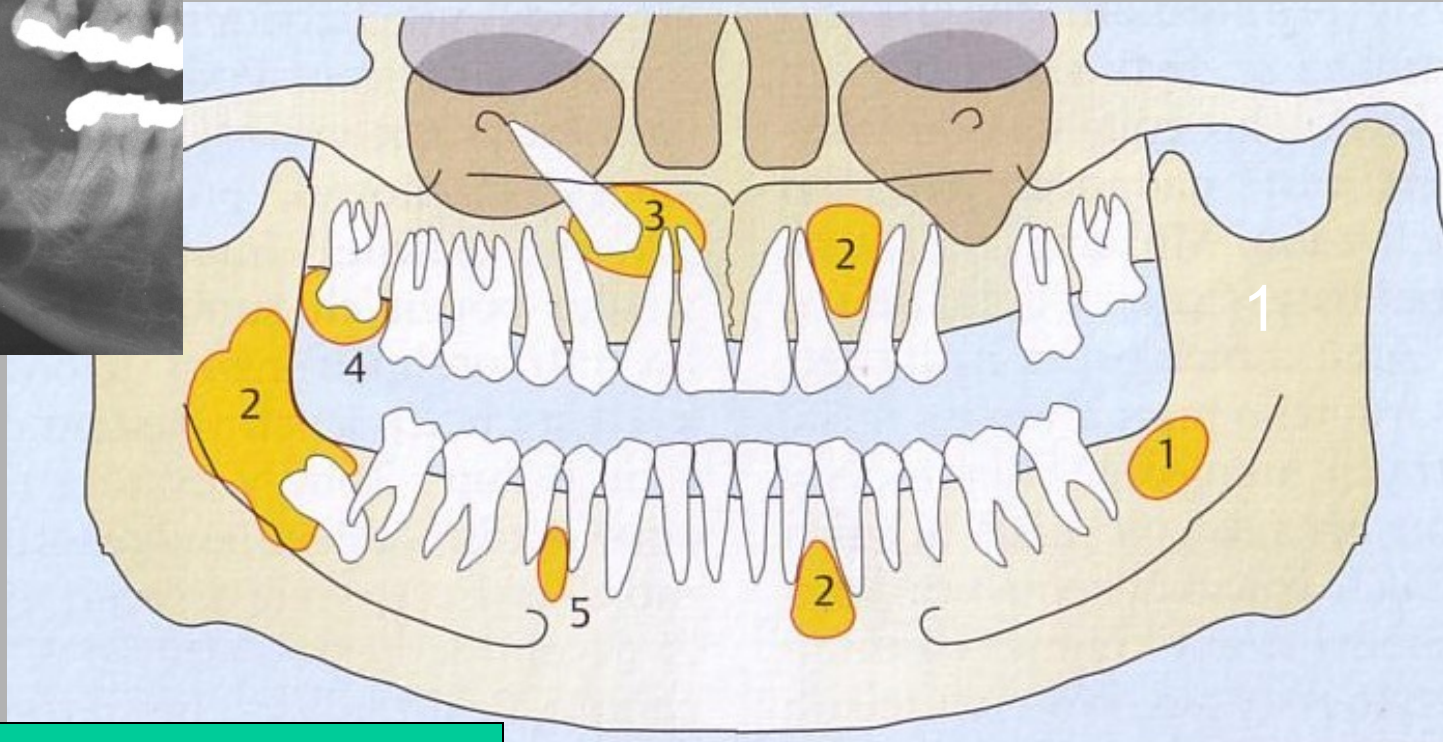
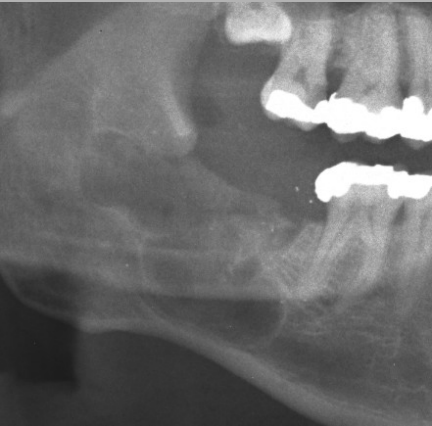
# Cysts – odontogenic



1. primordial c.
2. keratocyst
3. follicular c.
4. lateral periodontal c.

**A primordial cyst** is a developmental odontogenic cyst. It is found in an area where a tooth should have formed but is missing. Primordial cysts most commonly arise in the area of mandibular third molars.

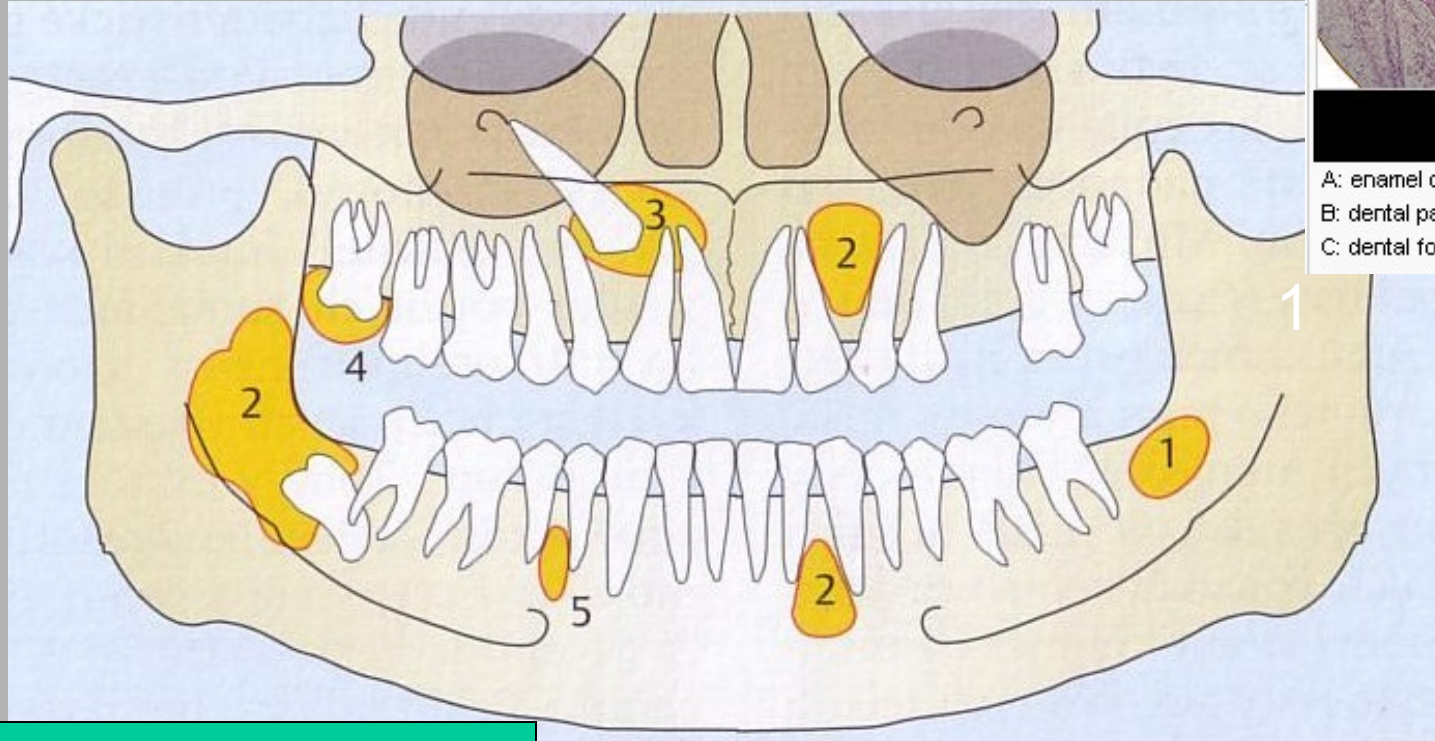
# Cysts – odontogenic



1. primordial c.
2. keratocyst
3. follicular c.
4. lateral periodontal c.

**Keratocyst** is a benign but locally aggressive developmental cystic neoplasm. It most often affects the posterior mandible.

# Cysts – odontogenic

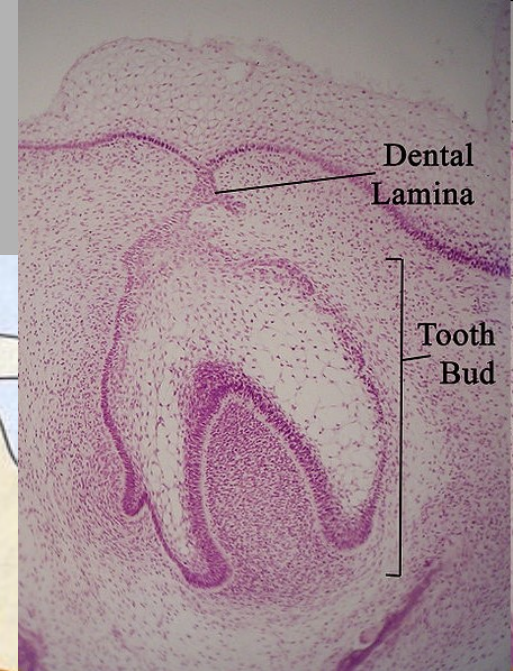
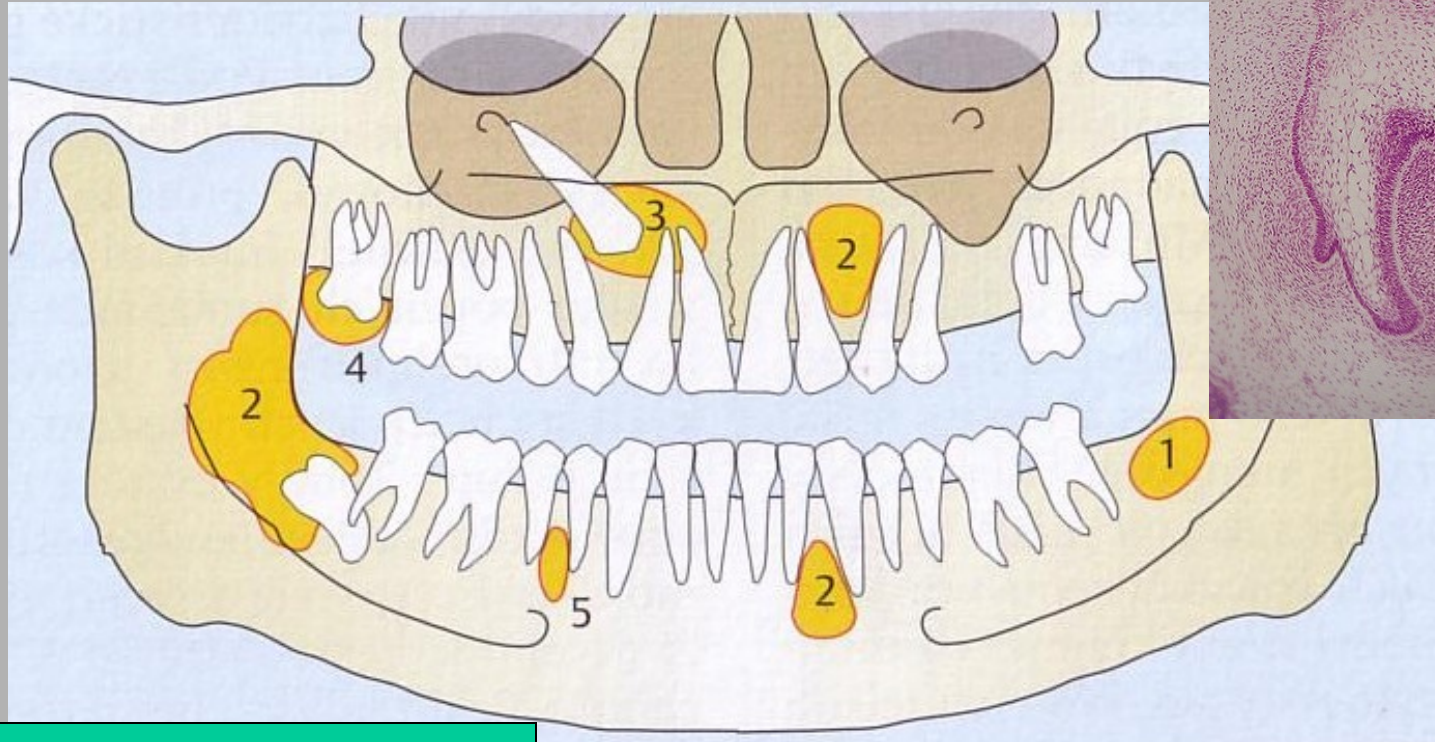


1. primordial c.
2. keratocyst
3. follicular c.
4. lateral periodontal c.

**A follicular cyst** is a cyst of dental follicle

The **dental follicle** is a sac containing the developing tooth and its odontogenic organ.

# Cysts – odontogenic

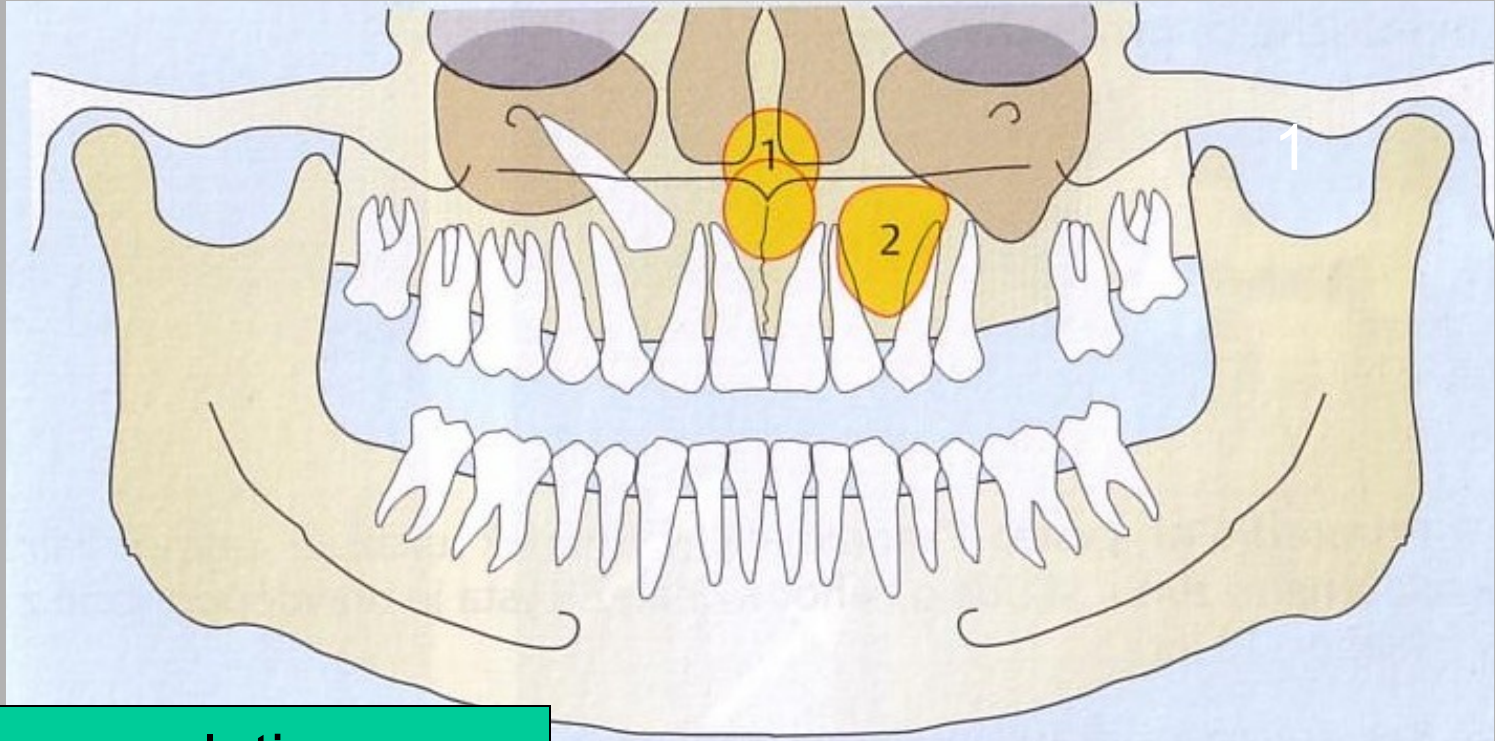


1. primordial c.
2. keratocyst
3. folikular c.
4. lateral parodontal c.

The **lateral periodontal cyst** is a cyst that arises from the rest cells of the dental lamina. It is more common in middle-aged adult males. Usually, there is no pain associated with it, and it usually appears as a unilocular radiolucency (dark area) on the side of a canine or premolar root. Microscopically, the lateral periodontal cyst appears the same as the gingival cyst of the adult.

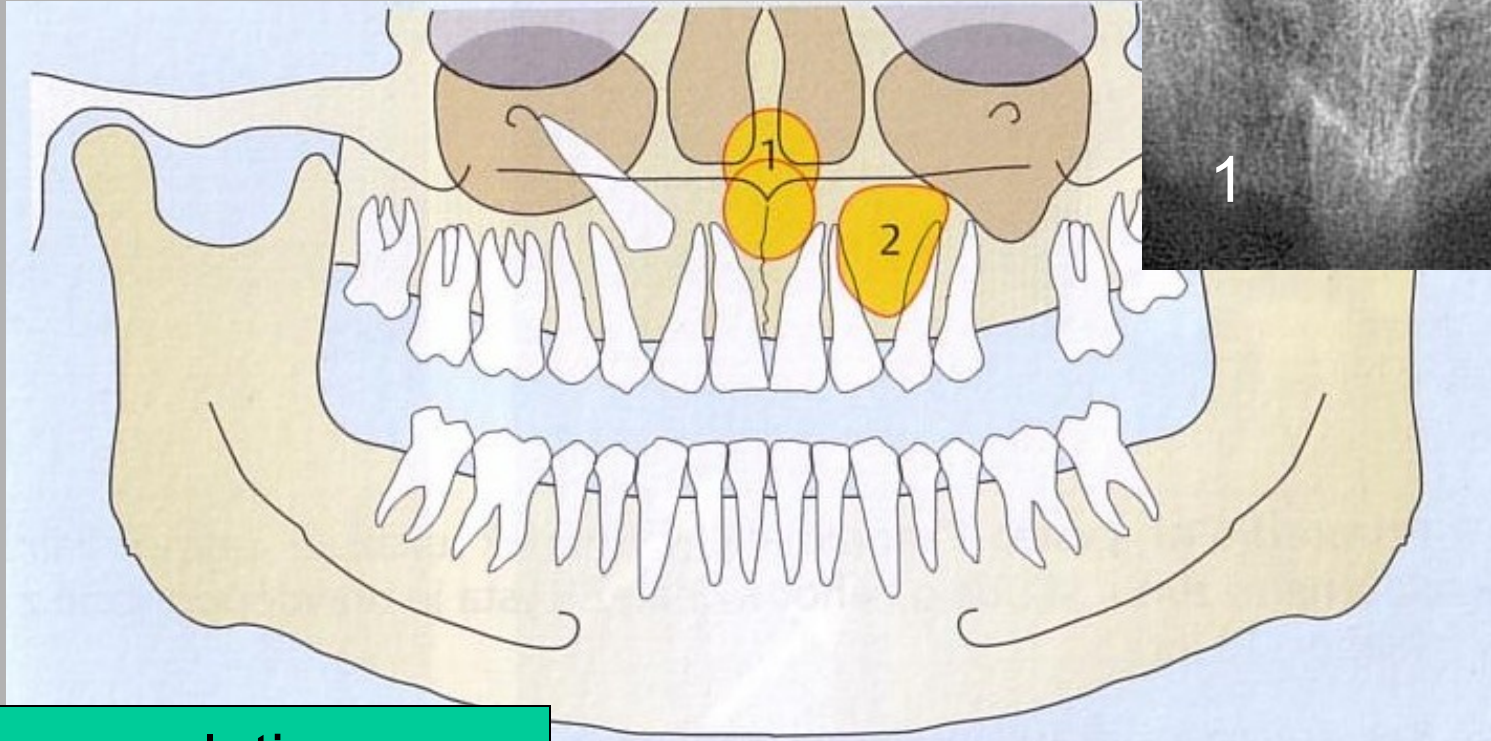


# Cysts – non-odontogenic



1. nasopalatine c.
2. nasolabial c.

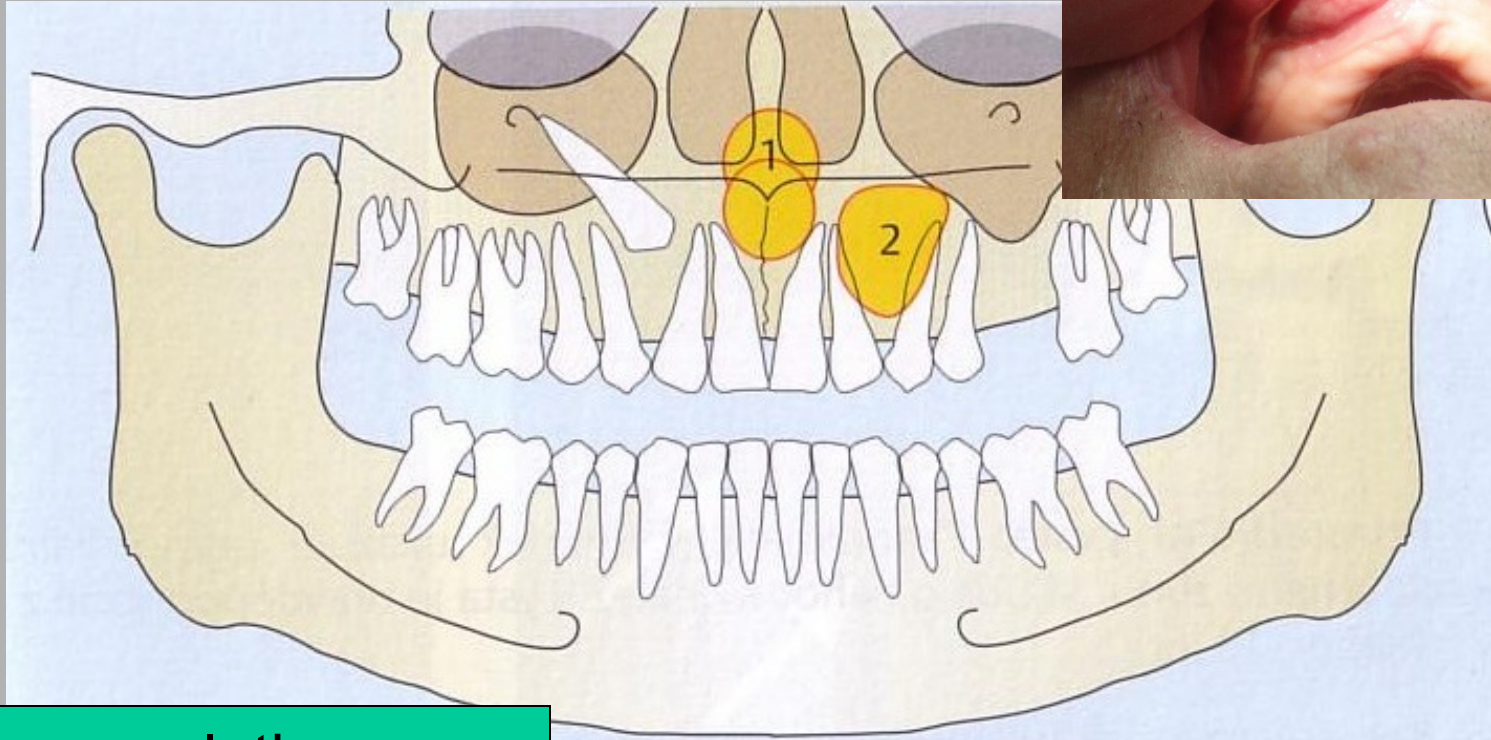
# Cysts – non-odontogenic



1. nasopalatine c.
2. nasolabial c.

**Nasopalatine cyst** occurs in the median of the palate.

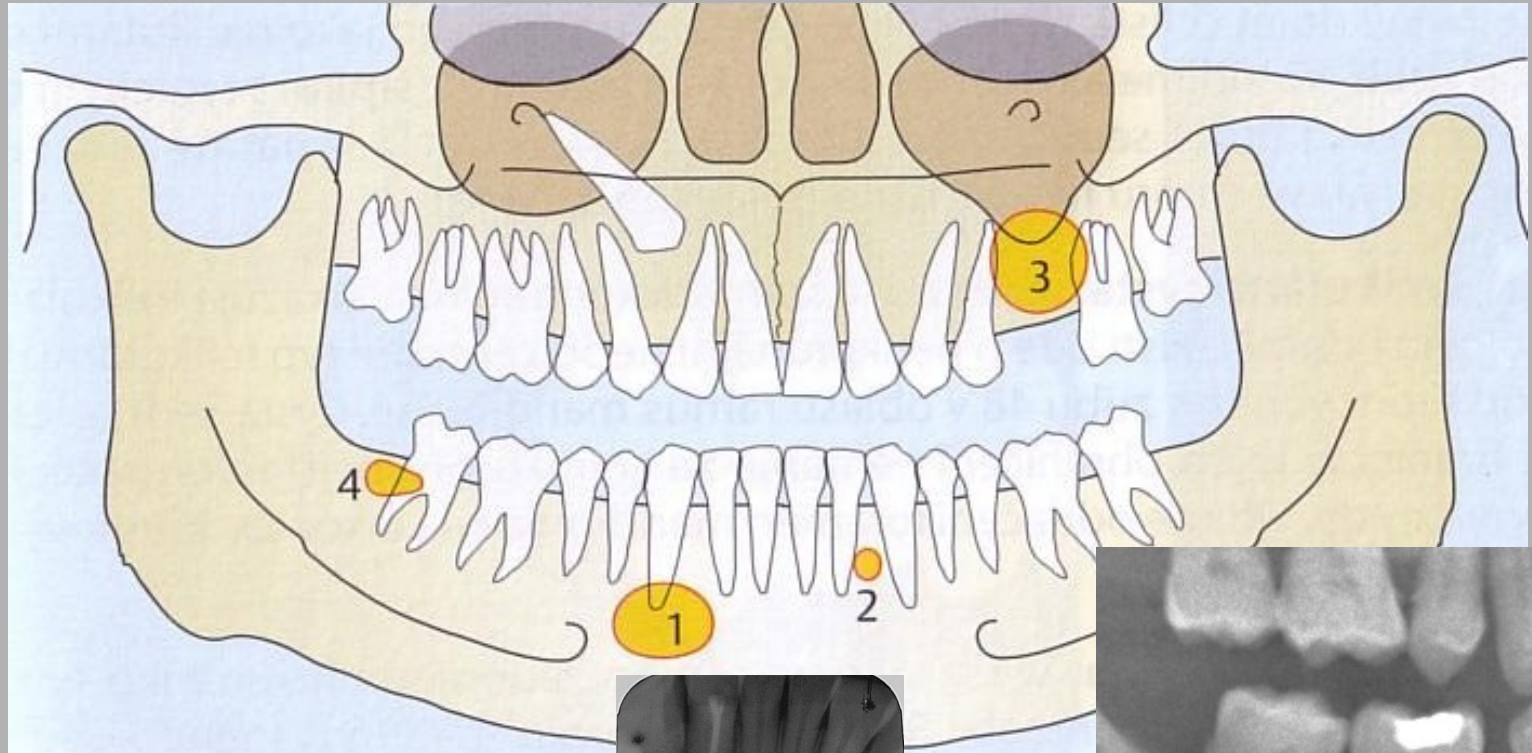
# Cysts – non-odontogenic



1. nasopalatine c.
2. nasolabial c.

**Nasolabial cyst** is located superficially in the soft tissues of the upper lip. Unlike most of the other developmental cysts, the nasolabial cyst is an example of an extraosseous cyst.

# Cysts - inflammatory

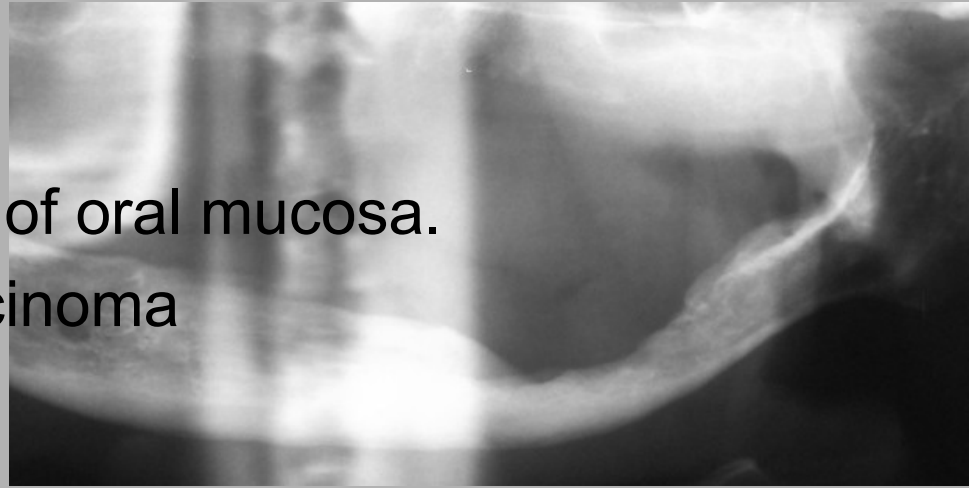


1. apical radicular
2. lateral radicular
3. residual lateral
4. paradontal (Craig's) - wisdom tooth

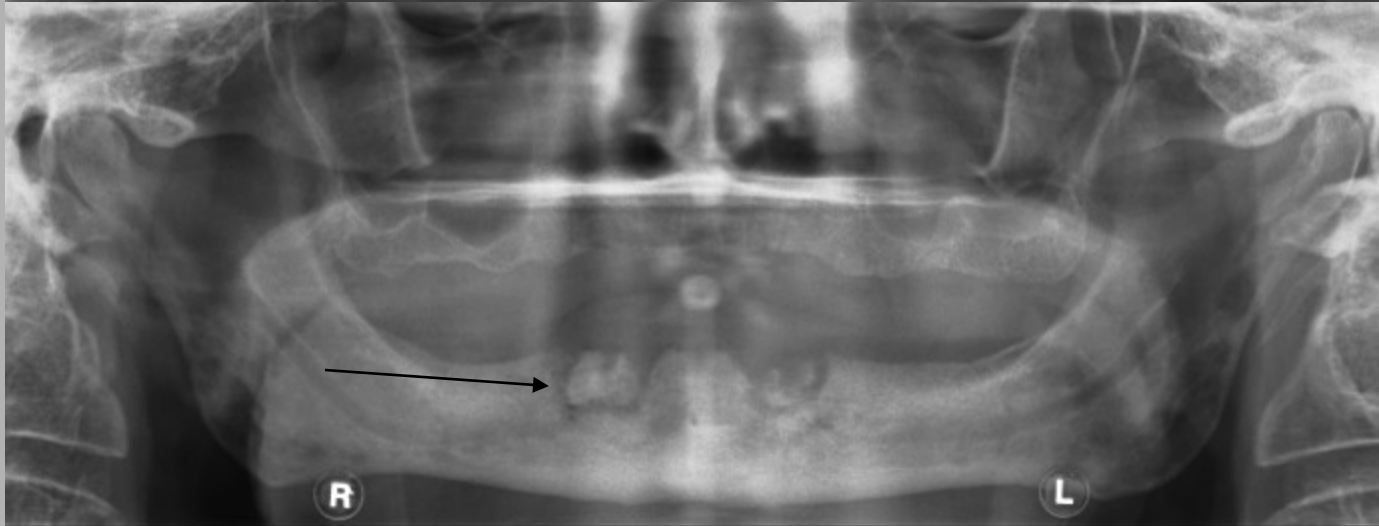
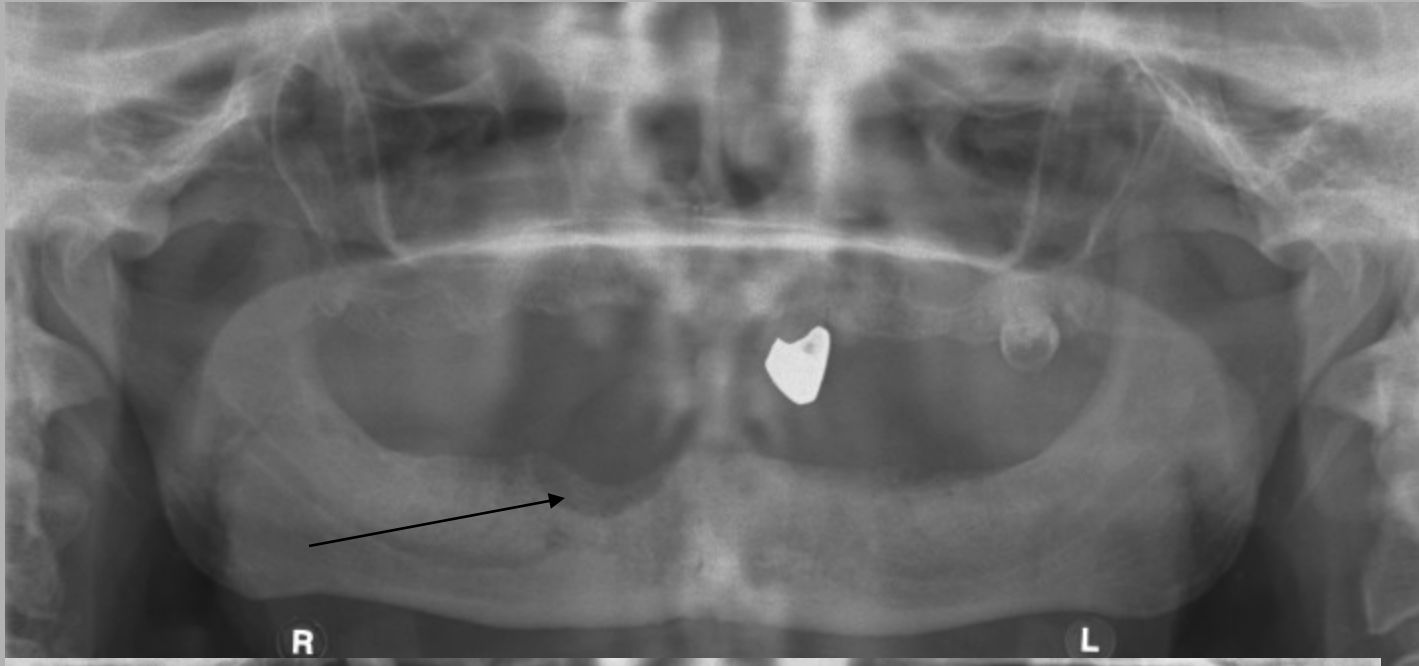


# Carcinoma

- the most often carcinoma of oral mucosa.
- intraepitelial mucosal carcinoma
- infiltration of:
  - adjacent bones
  - lingual part of mandible
- osteolysis
- paresthesis
- smokers, older age

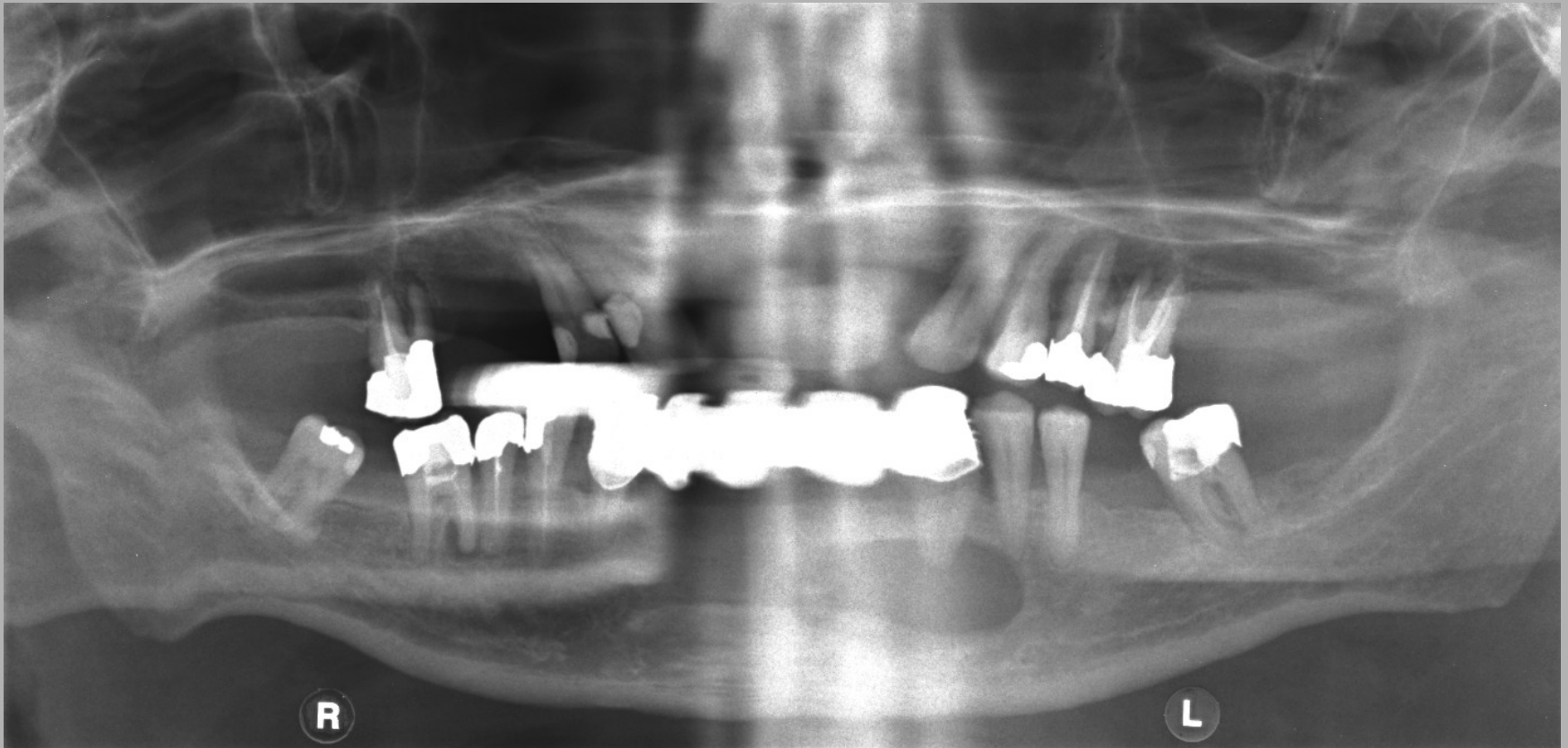


# Osteonecrosis mandibulae

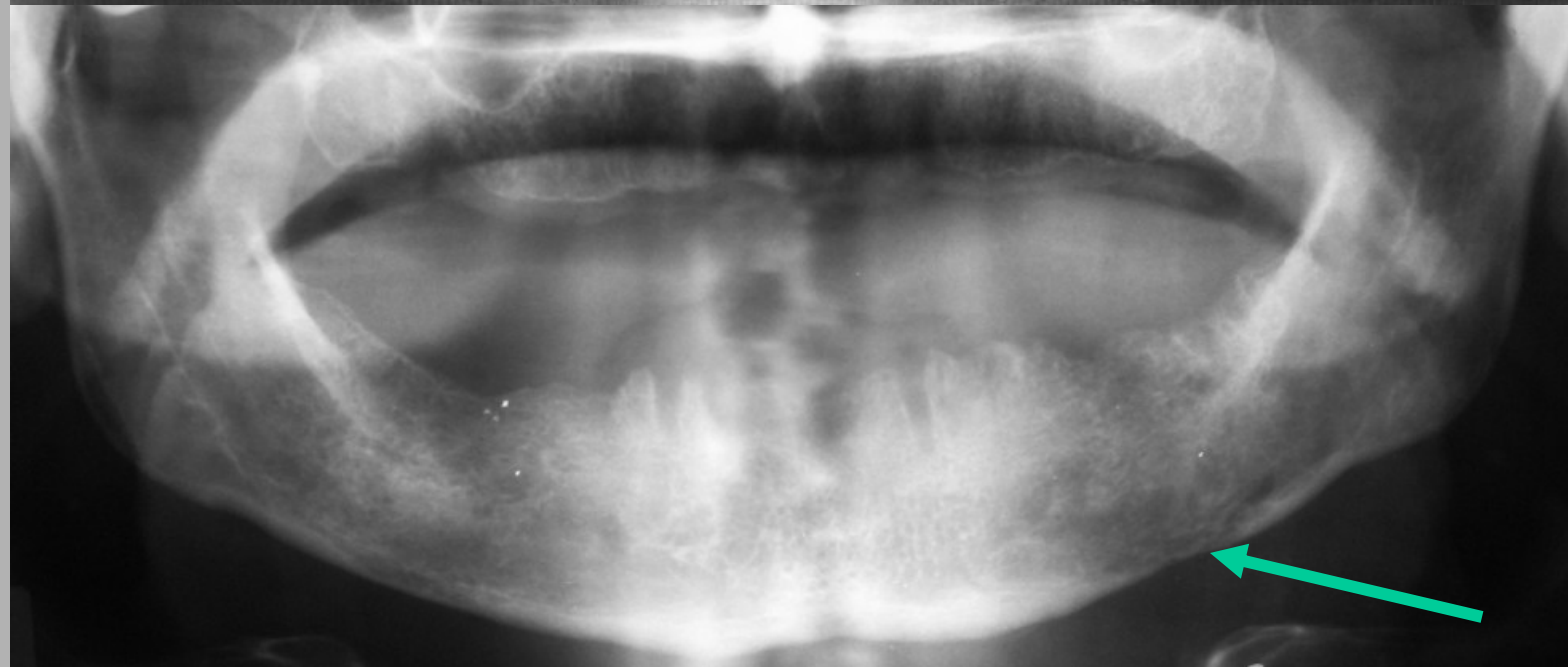
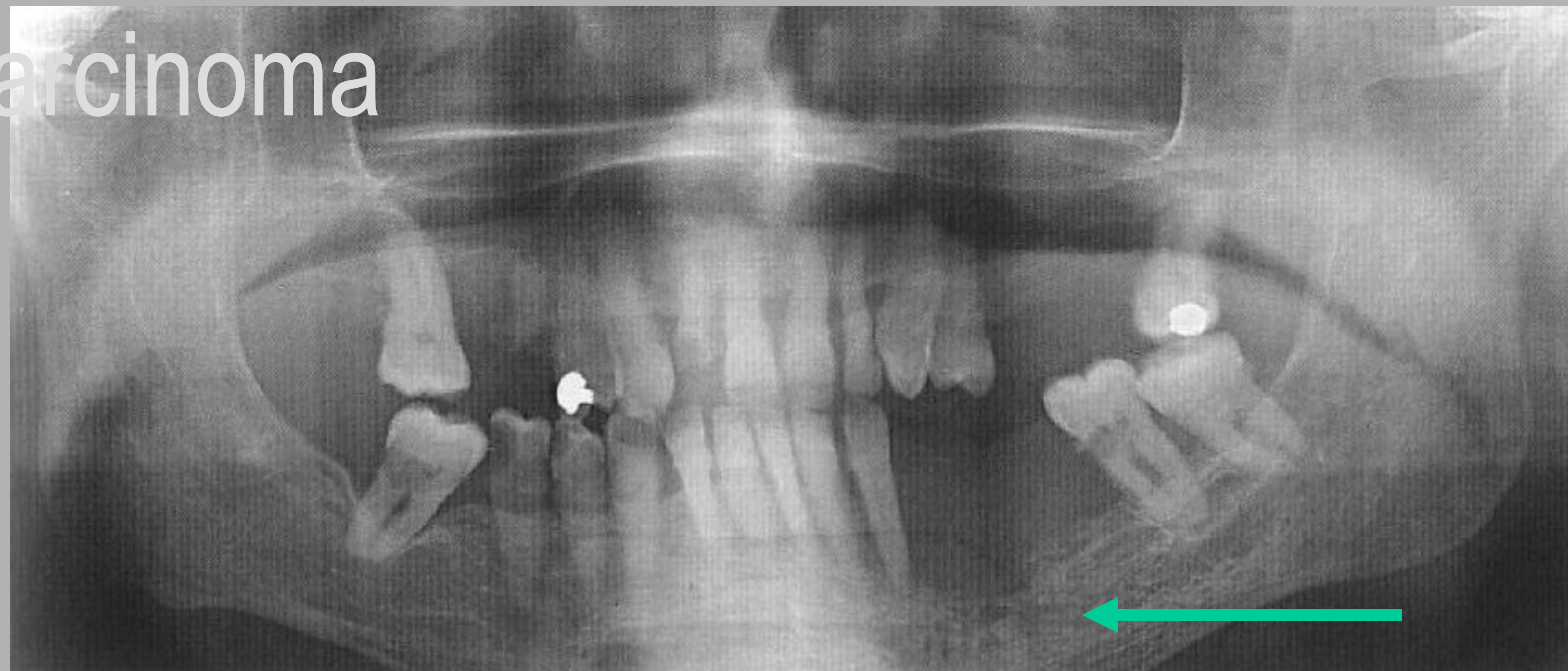


# Radicular cyst

- cystis radicularis -234 purulenta
- after intraoral incision excretion of pus and blood.

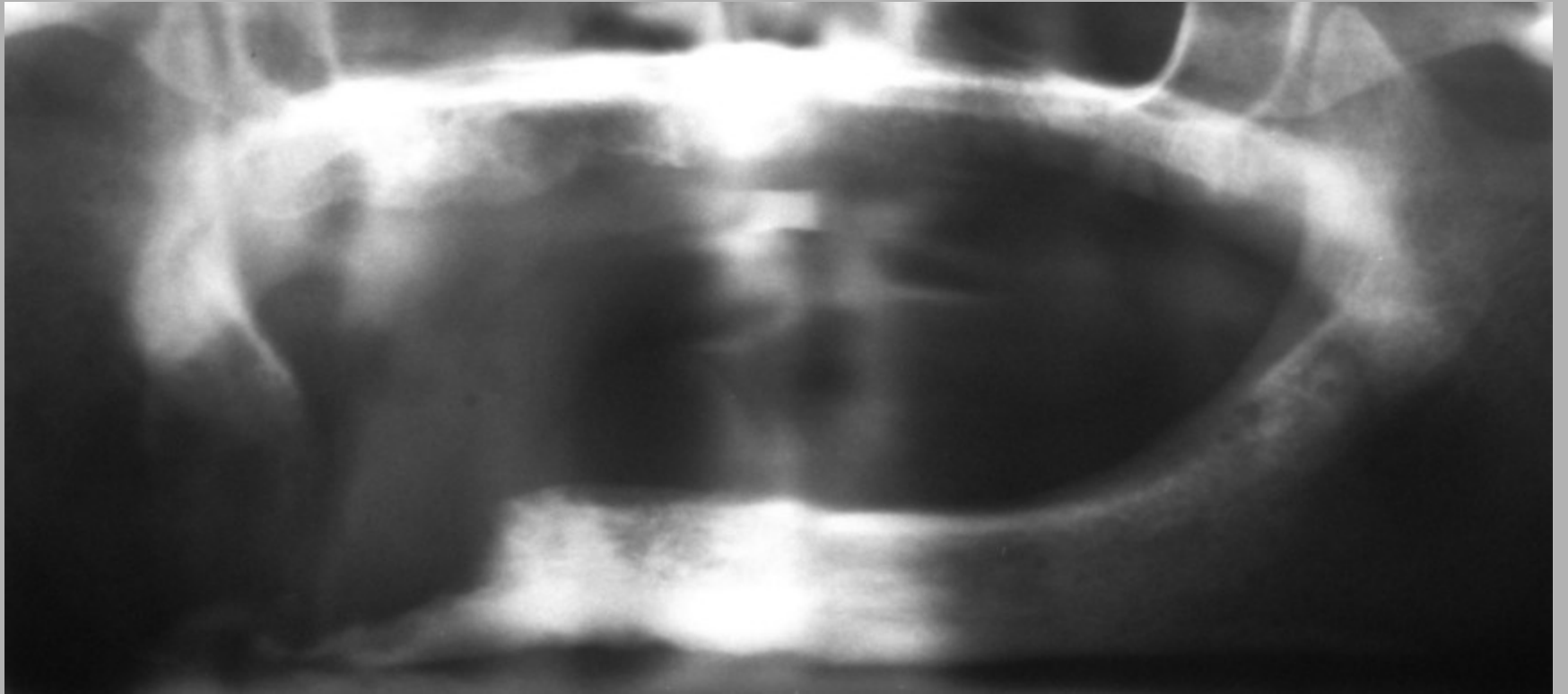


# Carcinoma





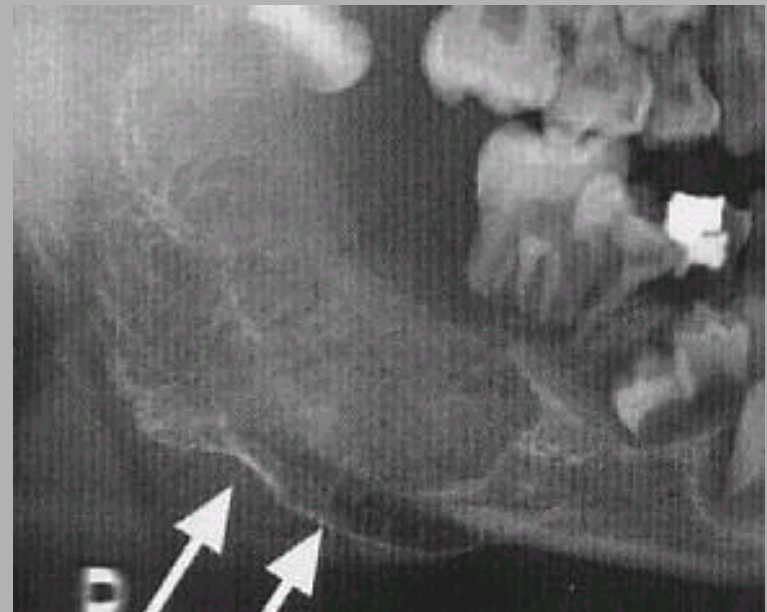
# Carcinoma



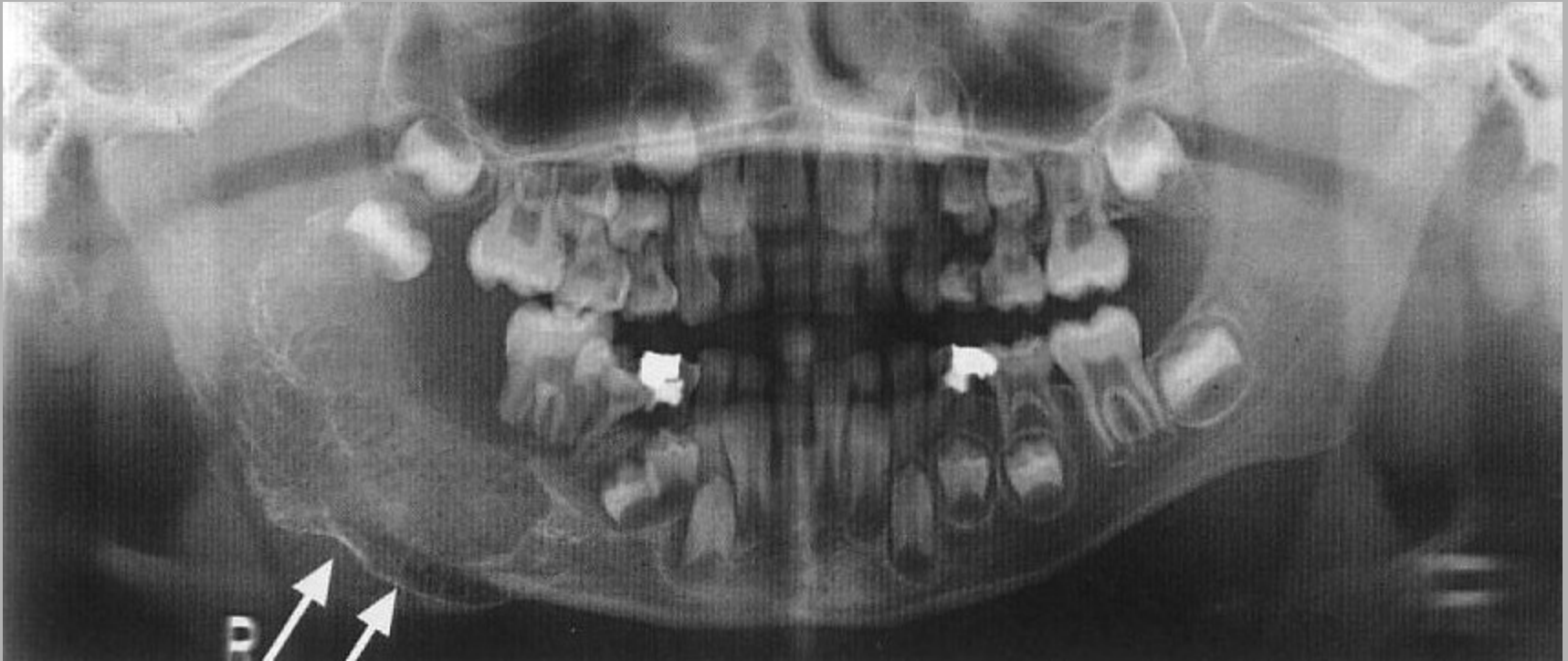
# Ewing sarcoma

- children 10-20 y
- high grade malignant
- fast grow
- soon metastatis
- angle of mandible
- painfull
- X-ray: „slices of onion“
- Dif.dg.
  - osteosarcoma
  - endosteal hemangioma

gold diagnostic standard  
MRI



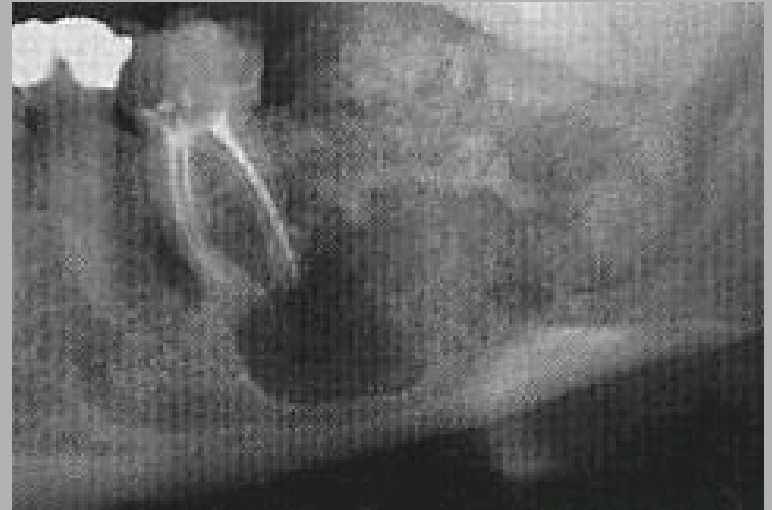
# Ewing sarcoma



boy, 7 y  
difficulty clinics  
oedema of low jaw  
movement of teeth  
periost reaction

# Osteosarcoma

- 2. and 3. decennium
- mesenchymal tumor
- histologic
  - osteoblasts
  - chondroblasts
  - fibroblasts

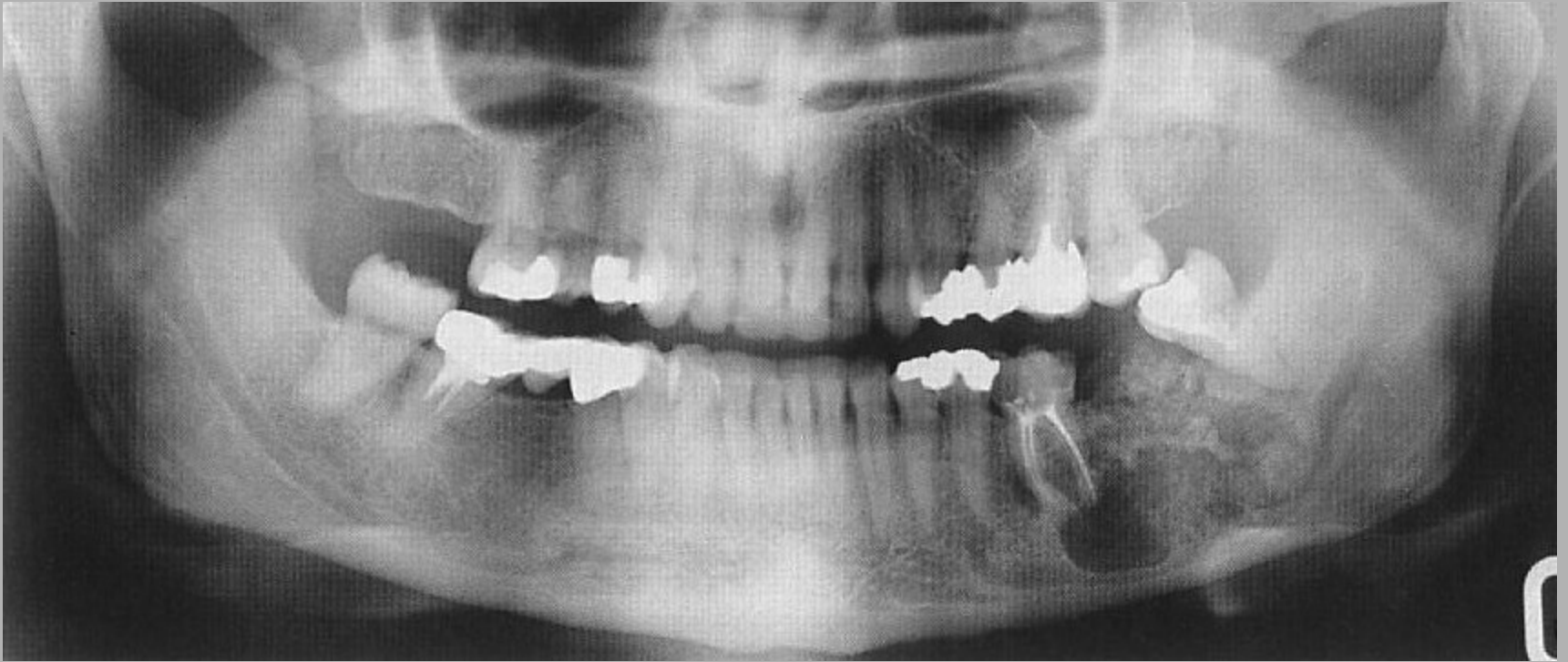


## RTG

- osteoblastic + osteolytic
- various image

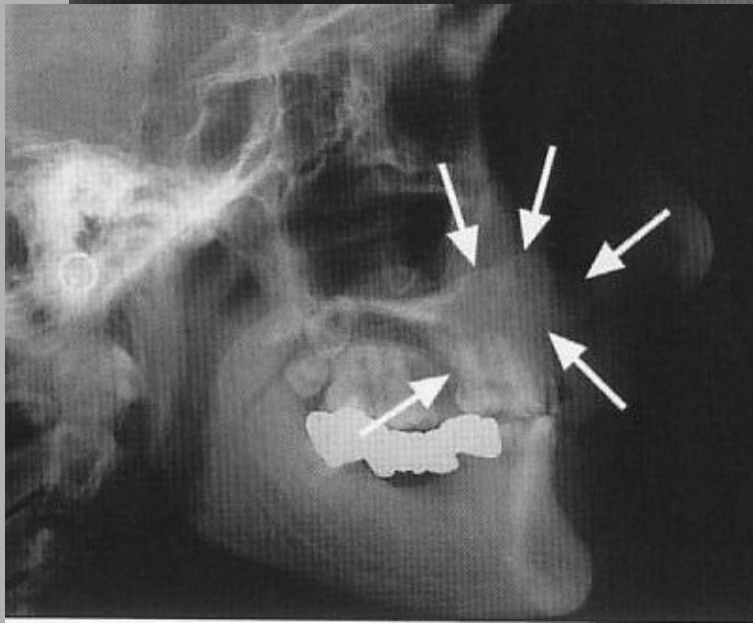
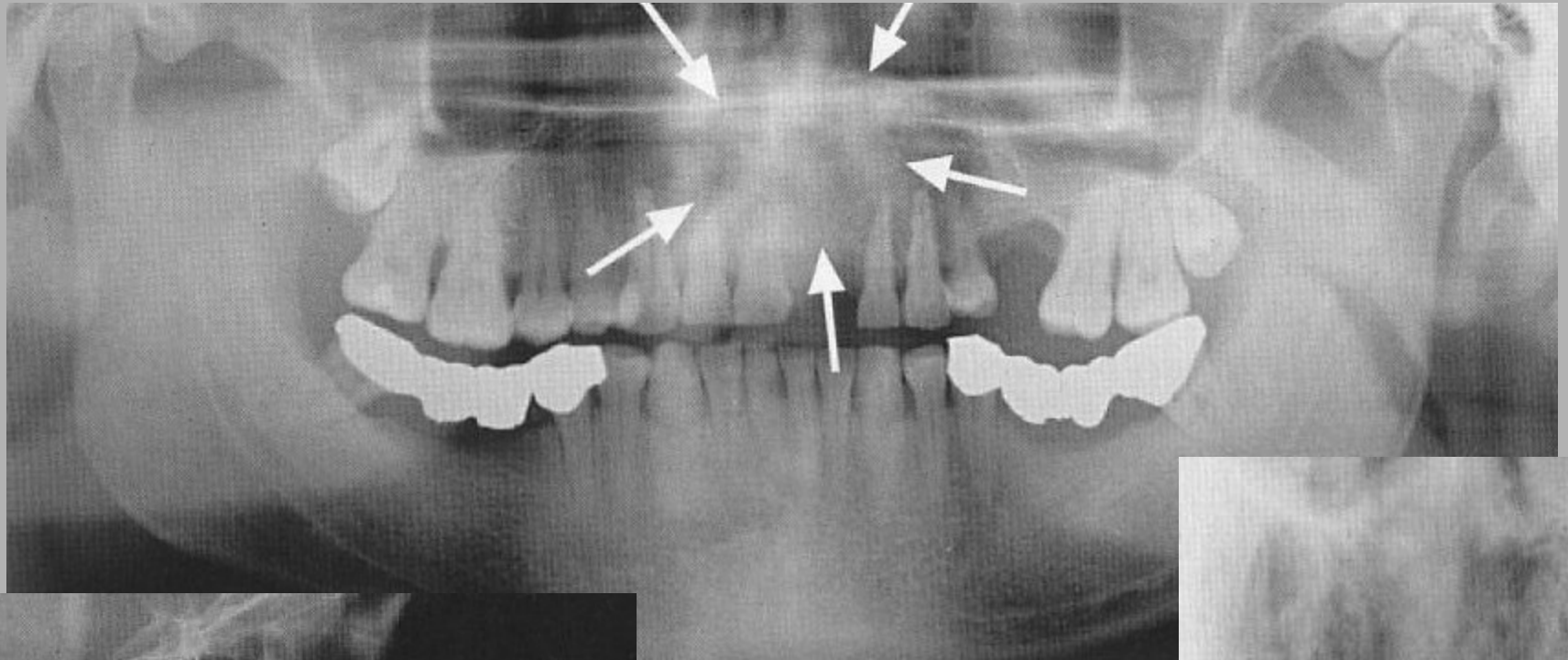


# Osteosarcoma



w, 29 y

# Osteosarcoma

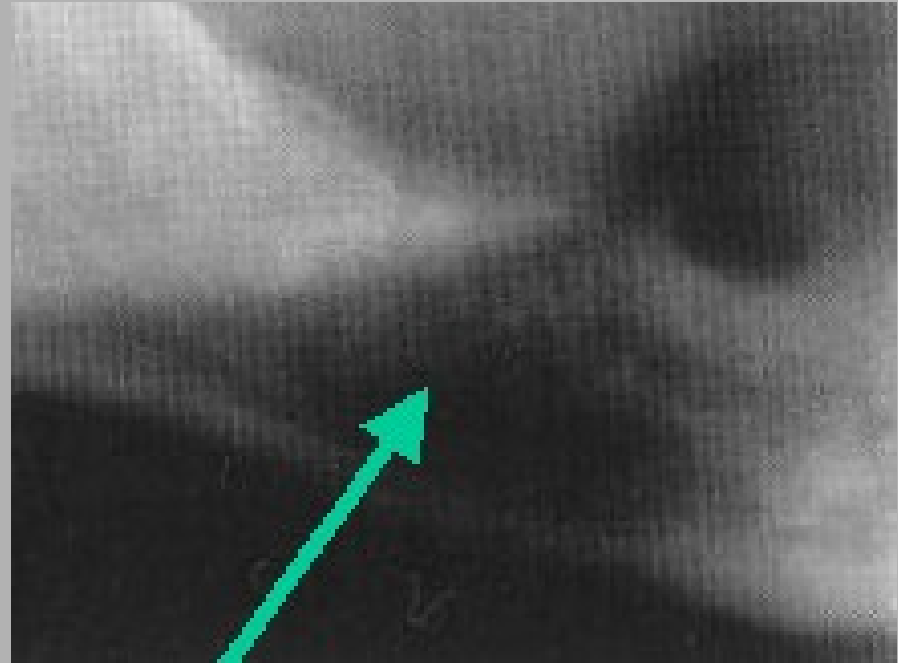


m, 40 y

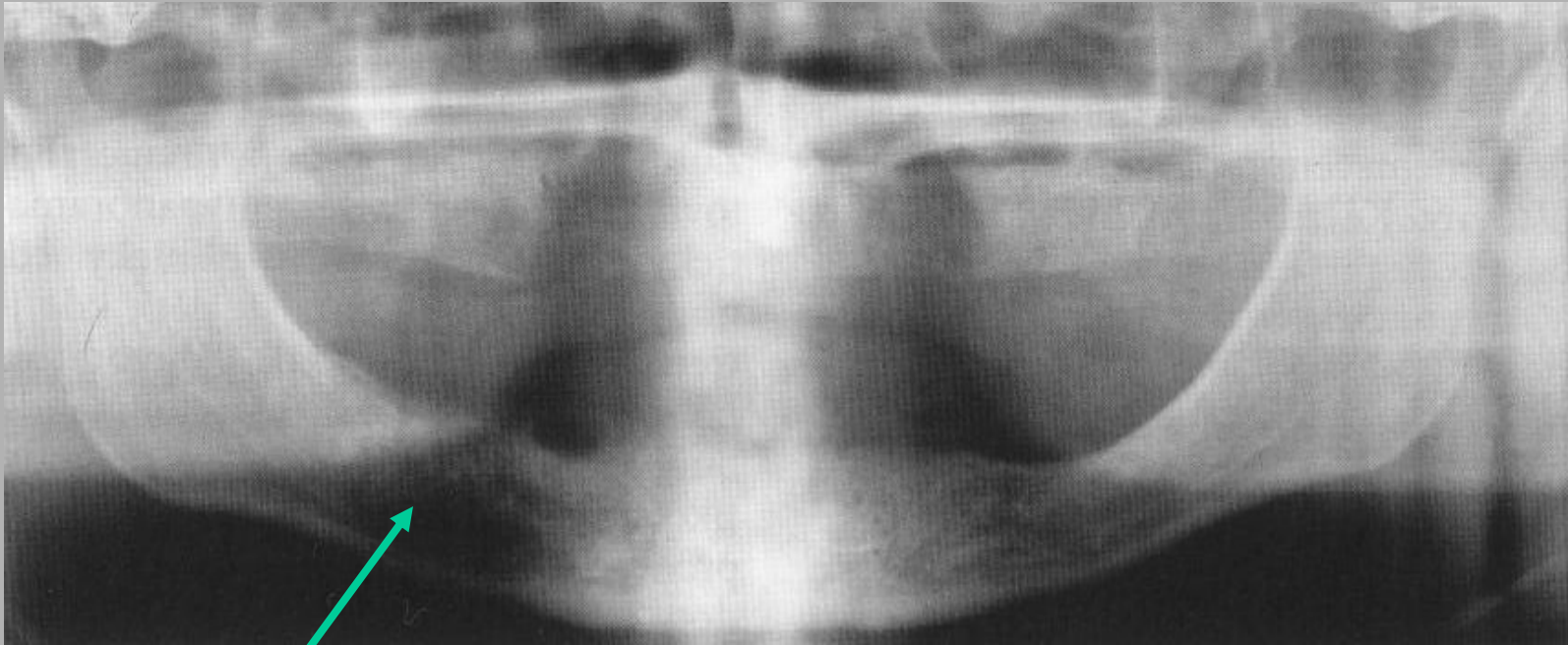


# Metastasis

- carcinomas of:
  - mamma
  - lung
  - gl. thyreoidea
  - prostate
- blood spread
- clinics:
  - pain in the bones
  - „reasonless“ teeth release
  - paresthesis of lower lip
  - pathological fracture
- suspicion = scintigraphy



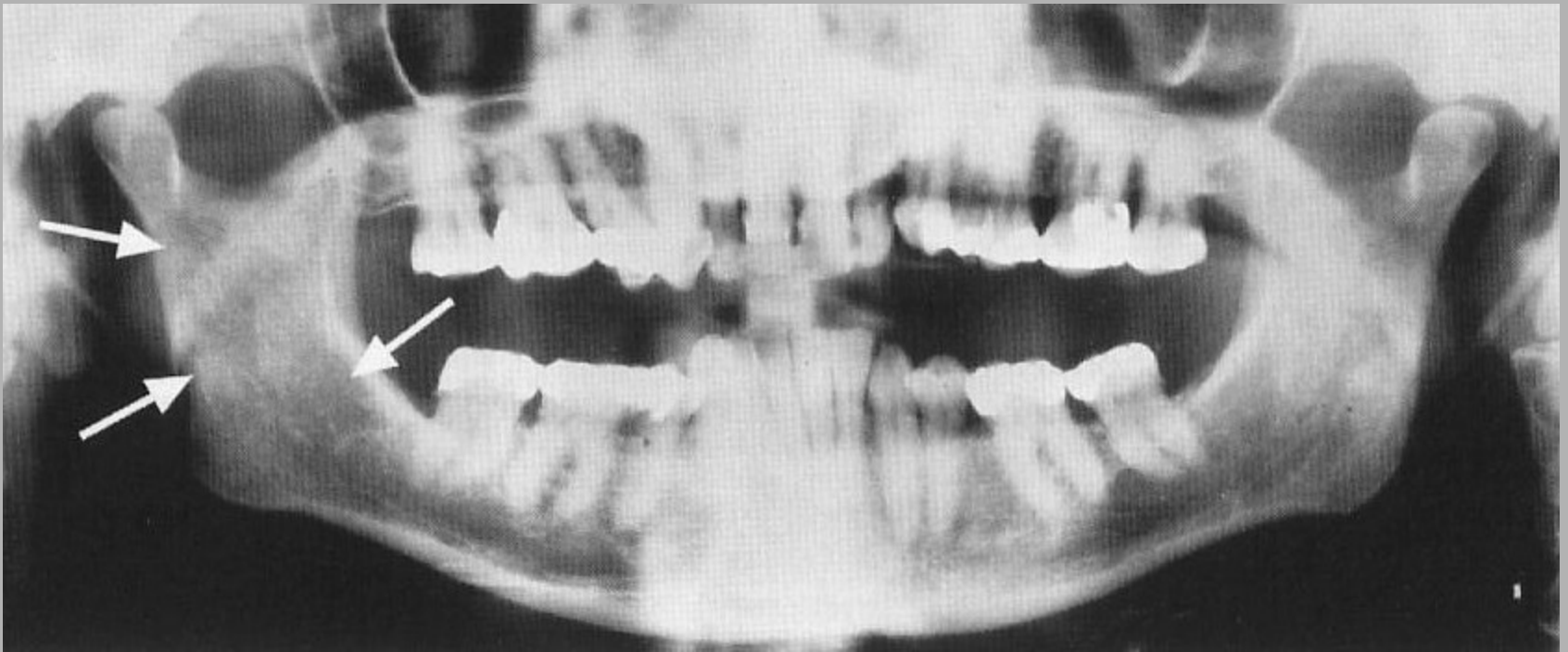
# Metastasis



- m, 69 y
- prostate carcinoma
- transparency



# Metastasis



- bowel carcinoma
- spotted, blurred

# Odont. myxoma

- age 10-50 y
- w/m 1:1
- jaws (only)
- most often in lower jaw - caput of mandible
- growth
  - fast
  - endosteal
  - muscle infiltration (occasionally)
- good bounded, irregular translucency
- often relaps



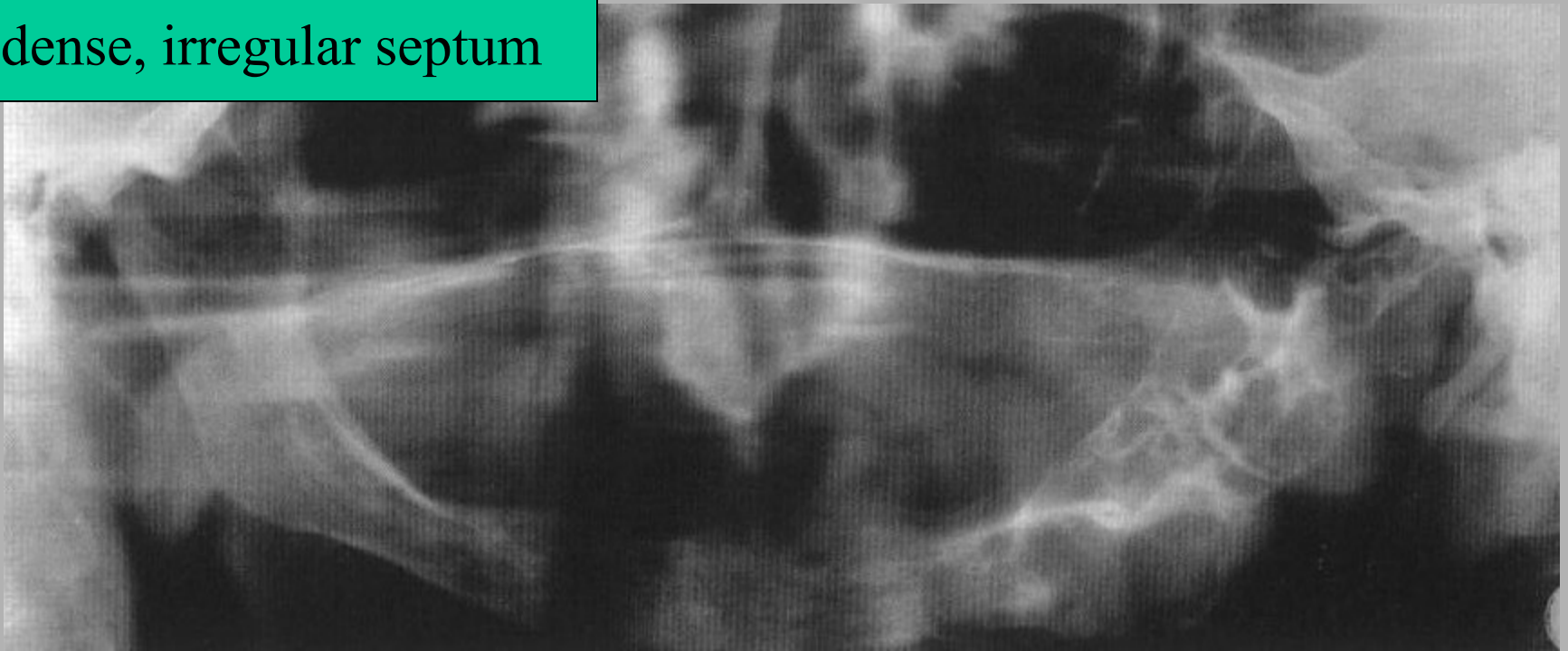
# Odont. myxoma

w, 34 y

structure - net



dense, irregular septum



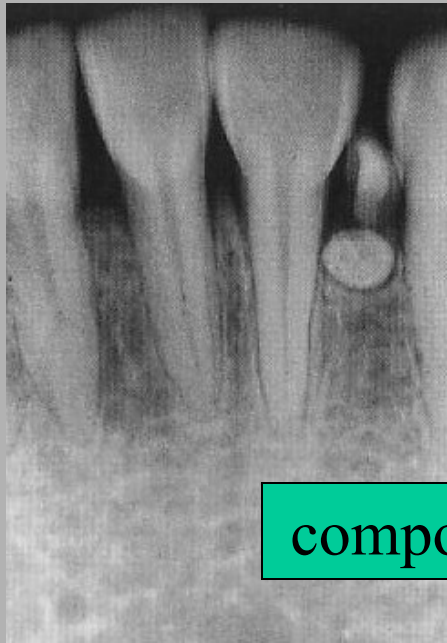
# Odont. myxoma

boy, 13 y



# Odontoma

- similar to the hamartomas
- conglomerate of various teeth tissues
  - composite odontoma
    - ✓ contains several developed teeth
  - complex odontoma
    - ✓ contains basic teeth tissues in amorphous mass



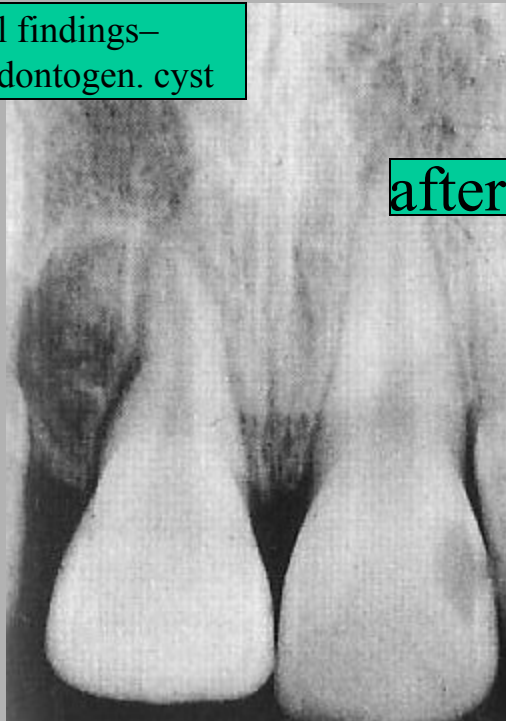
composite



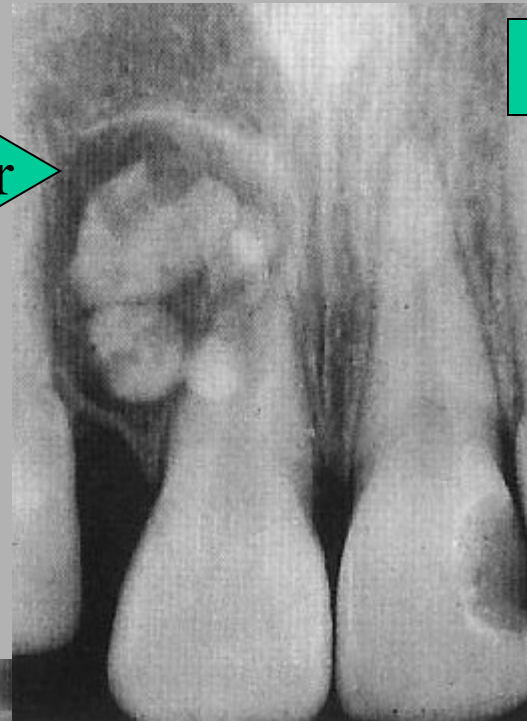
complex

# Odontoma

incidental findings—  
susp. calc. odontogen. cyst

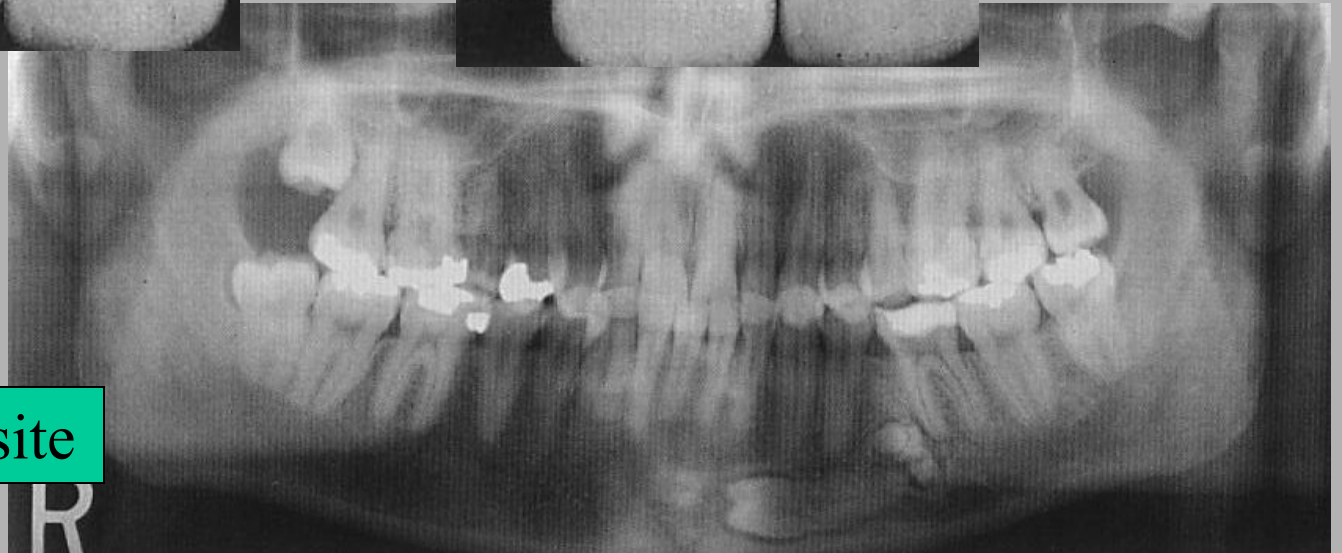


after 2,5 year



composite

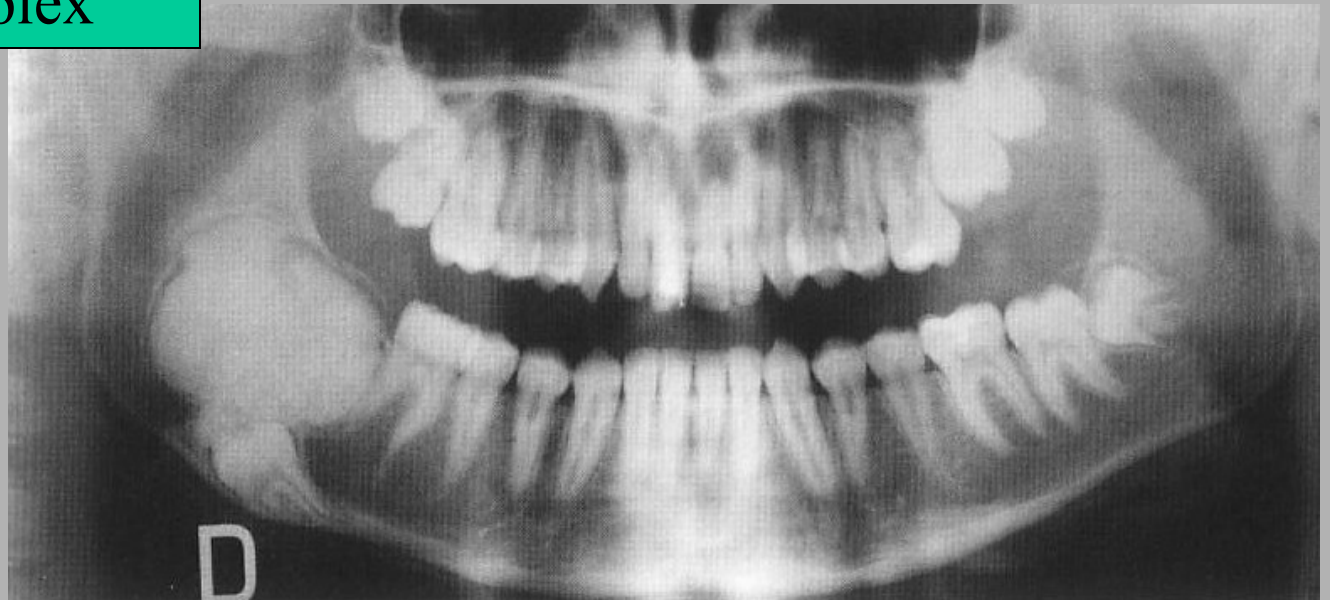
composite



# Odontoma

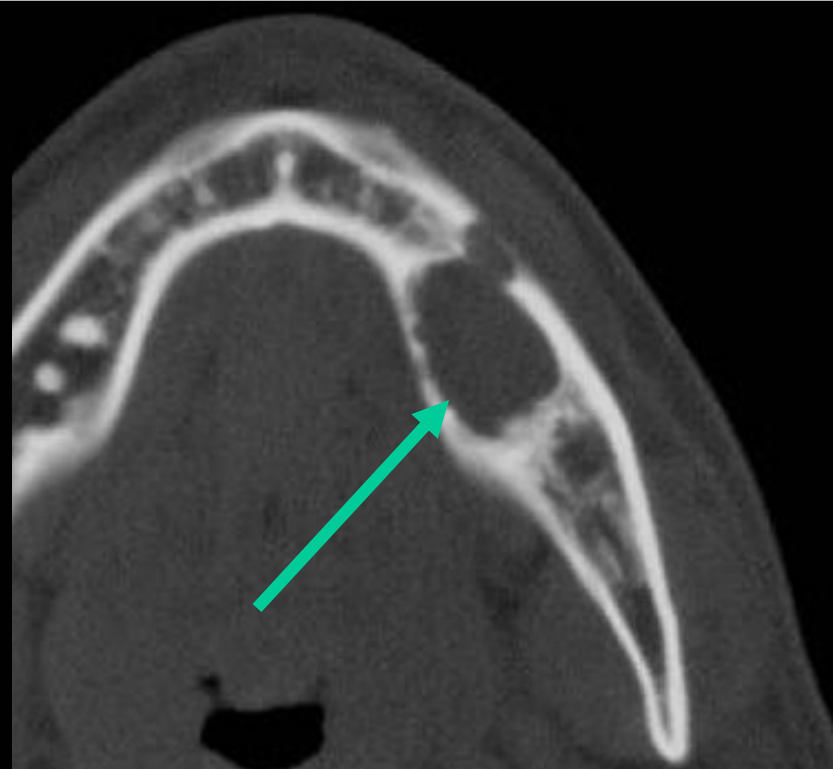
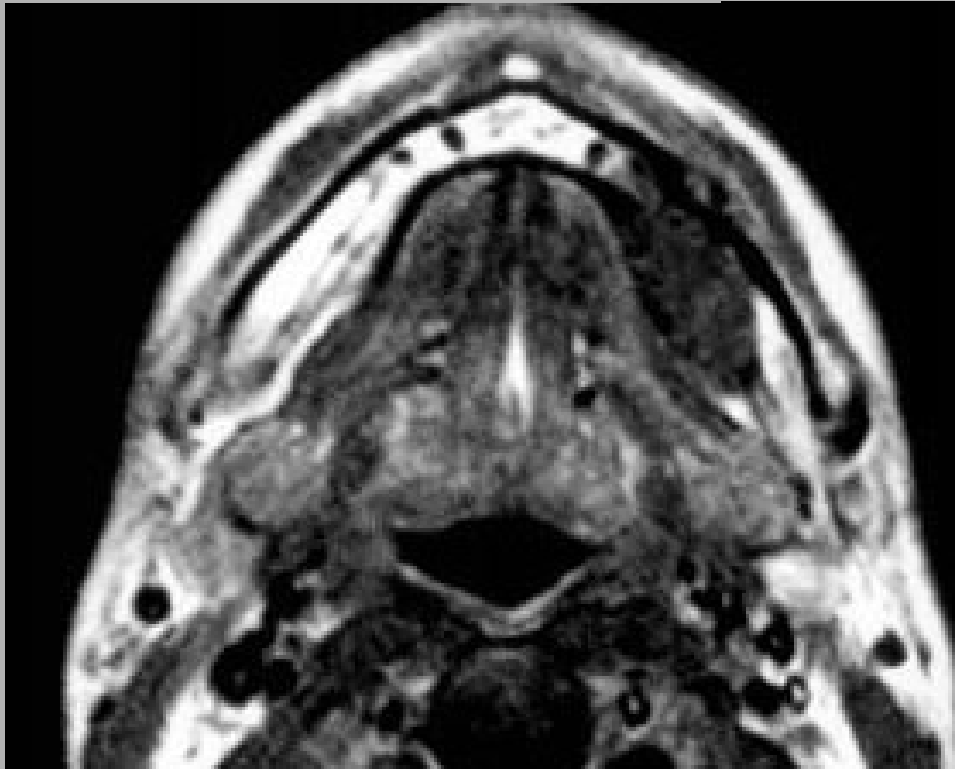


complex



# Fibroma

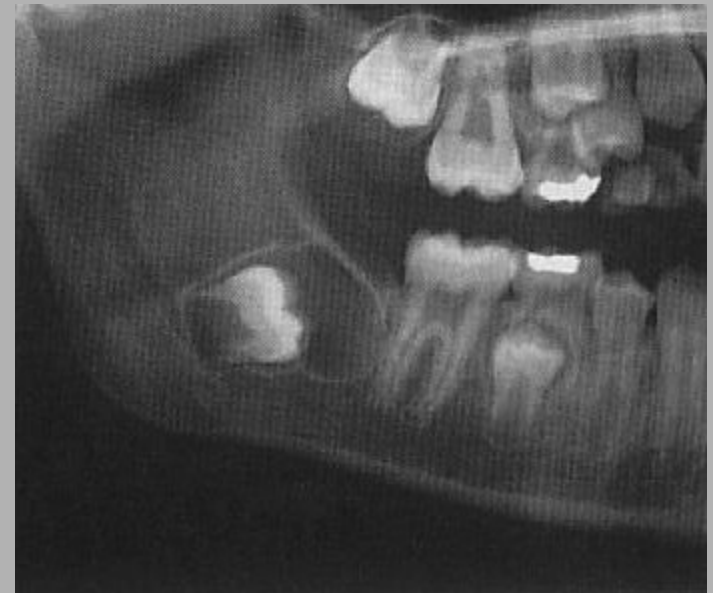
- **Fibromas** (or **fibroid tumors** or **fibroids**) are benign tumors that are composed of fibrous or connective tissue.



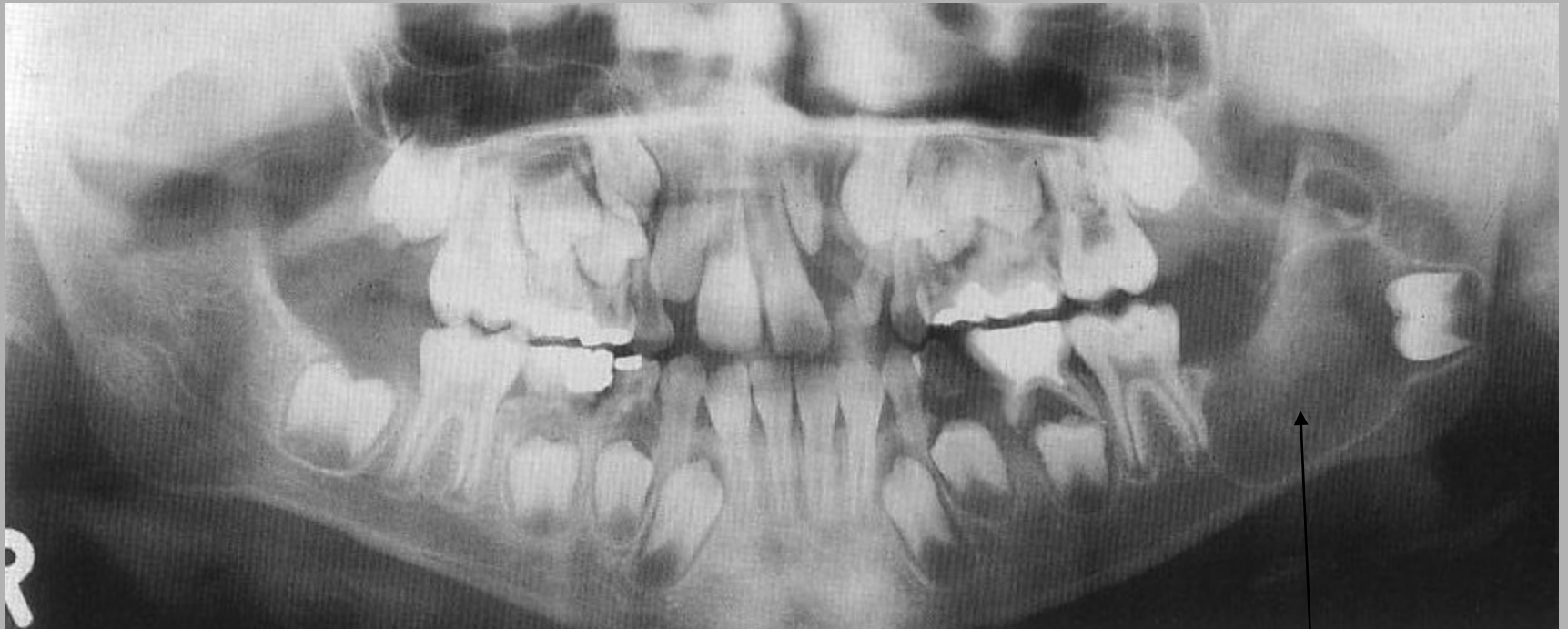


# Ameloblastic fibroma

- The **ameloblastic fibroma** is an odontogenic tumor arising from the enamel organ or dental lamina
- tumor with odontogennal epithelium and ectomesenchyma
- benign
- 10-20 y, boys
- in molar mandible region
- dif.dg.
  - follicular cyst
  - ameloblastoma
- don't recidivate

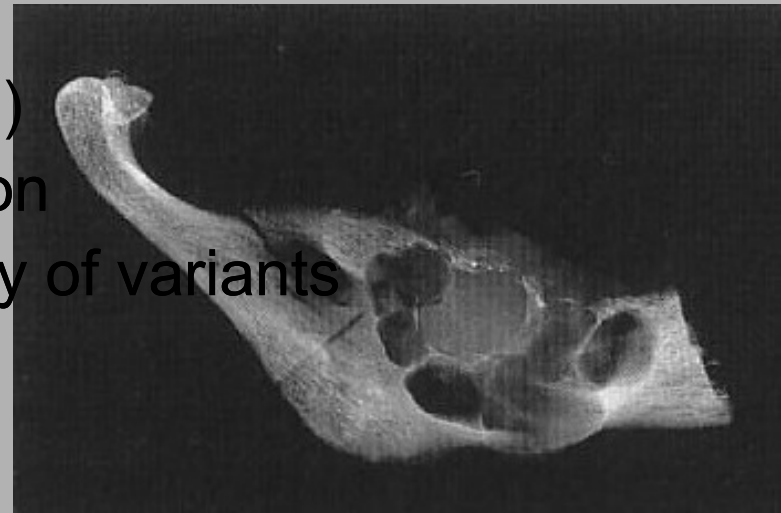


# Ameloblastic fibroma

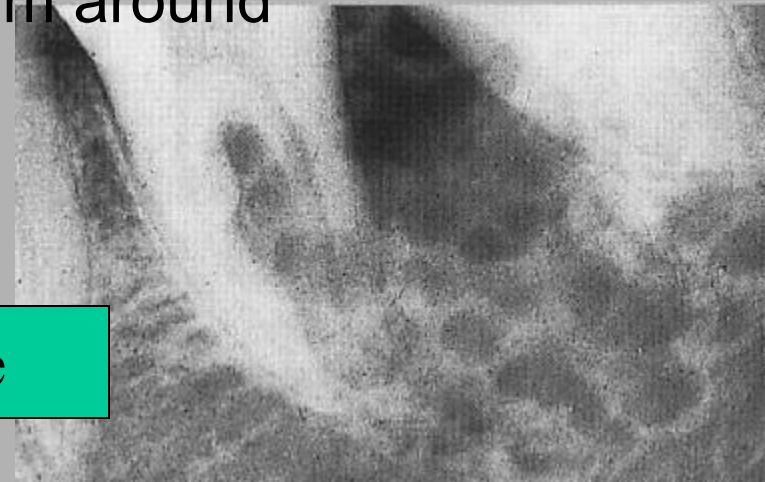


# Ameloblastoma

- is a rare, benign tumor of odontogenic epithelium
- m/w 1:1
- in a region of caudal molars (80%)
- long-term relaps = radical resection
- variable histological image – many of variants
- RTG
  - multilocular
  - multicystic
  - bubble transparency with septum around
  - compacta thin out
- slow growth, painless
- oedema, facial asymetry

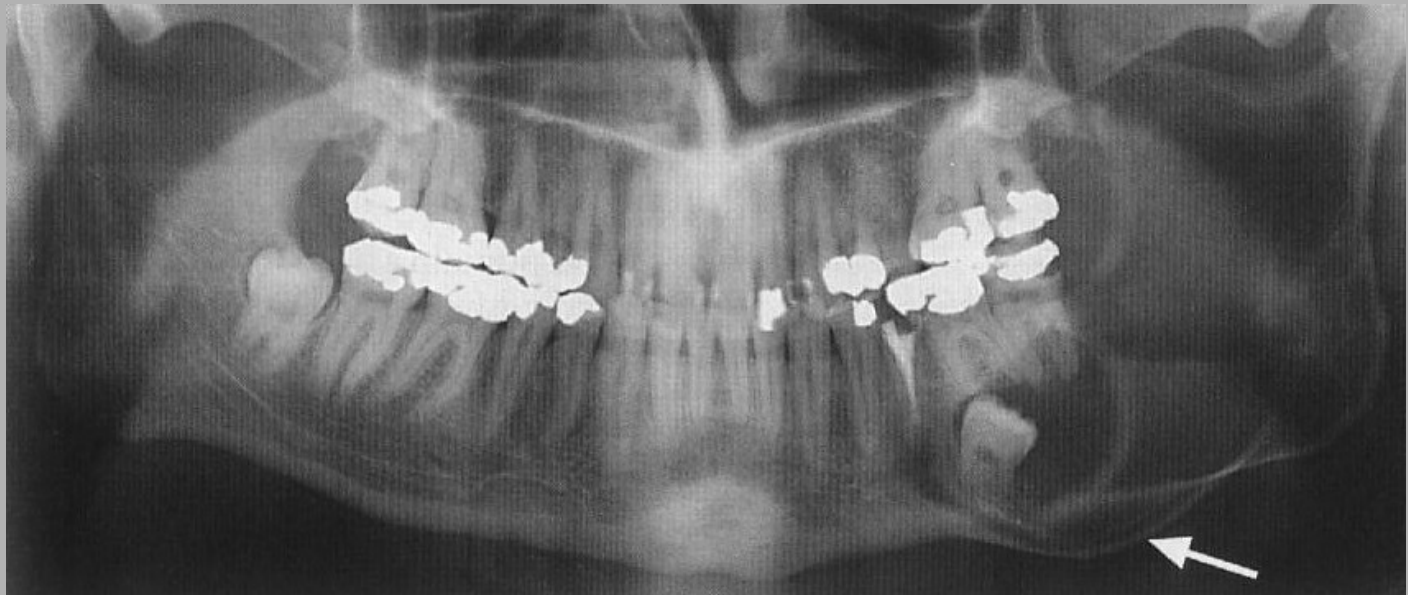


„honeycomb“ structure



# Ameloblastoma

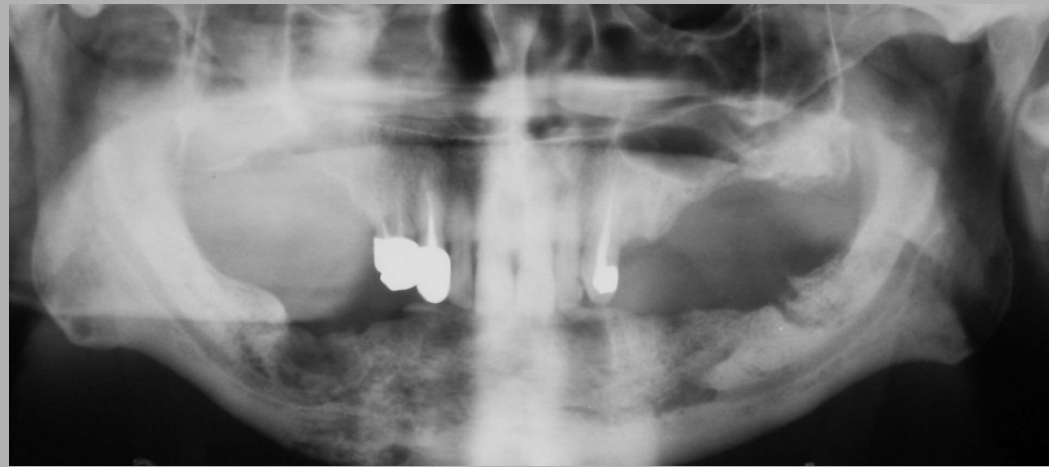
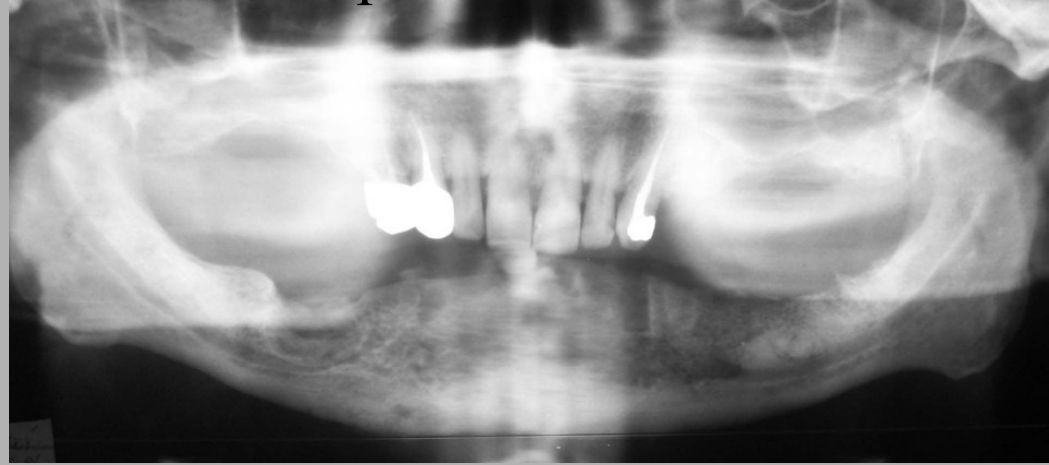
- dif.dg.
  - follicular cysts
  - keratocysts
  - ameloblastic fibroma
  - odontogennal myxoma
  - central eosinofil granuloma



# Myeloma

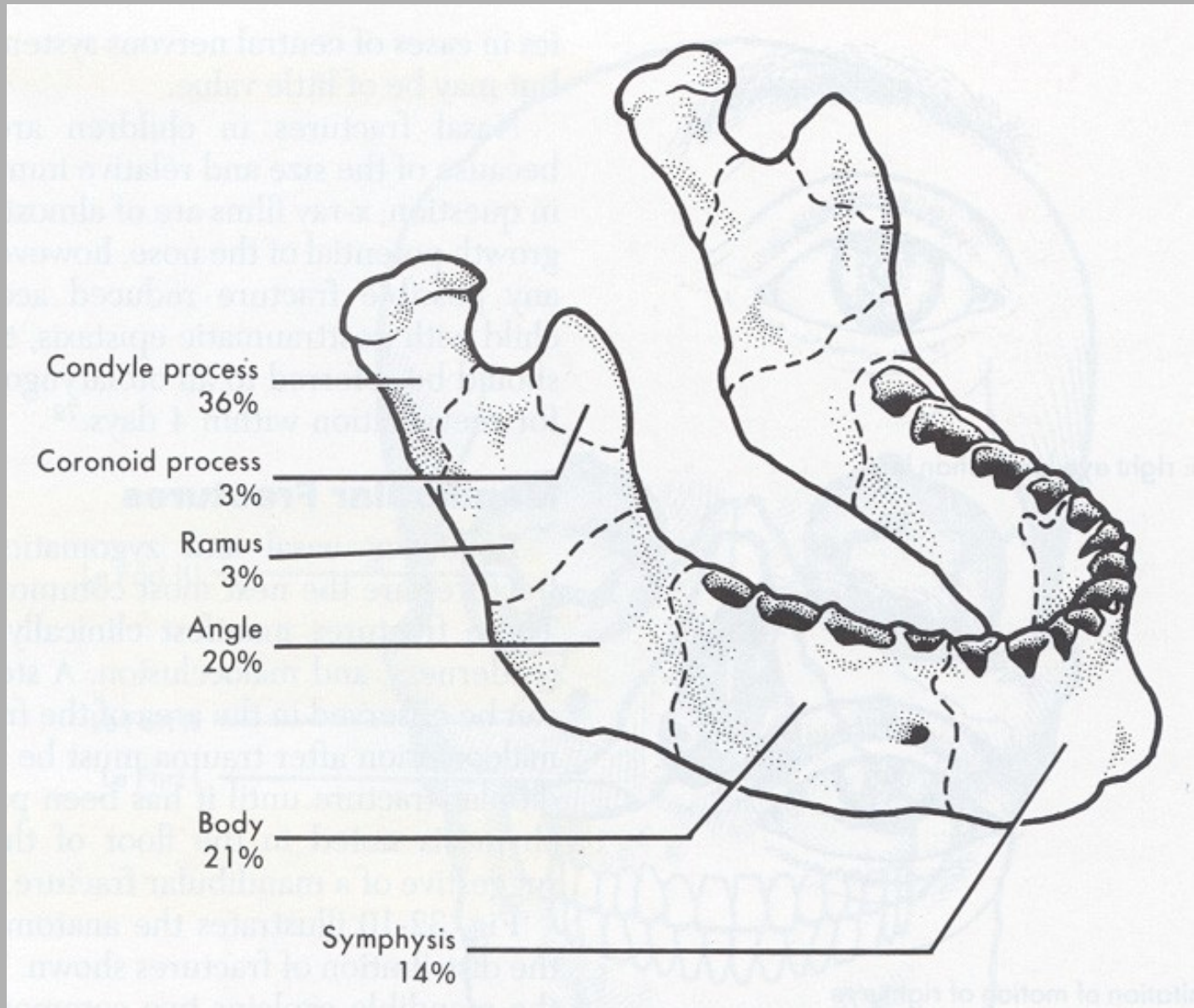
is a cancer of the white blood cells known as plasma cells.

- Hypercalcemia (corrected calcium  $>2.75$  mmol/L)
- Renal insufficiency attributable to myeloma
- Anemia (hemoglobin  $<10$  g/dL)
- Bone lesions (lytic lesions or osteoporosis with compression fractures)
- Frequent severe infections ( $>2$  a year)
- Amyloidosis of other organs
- Hyperviscosity syndrome

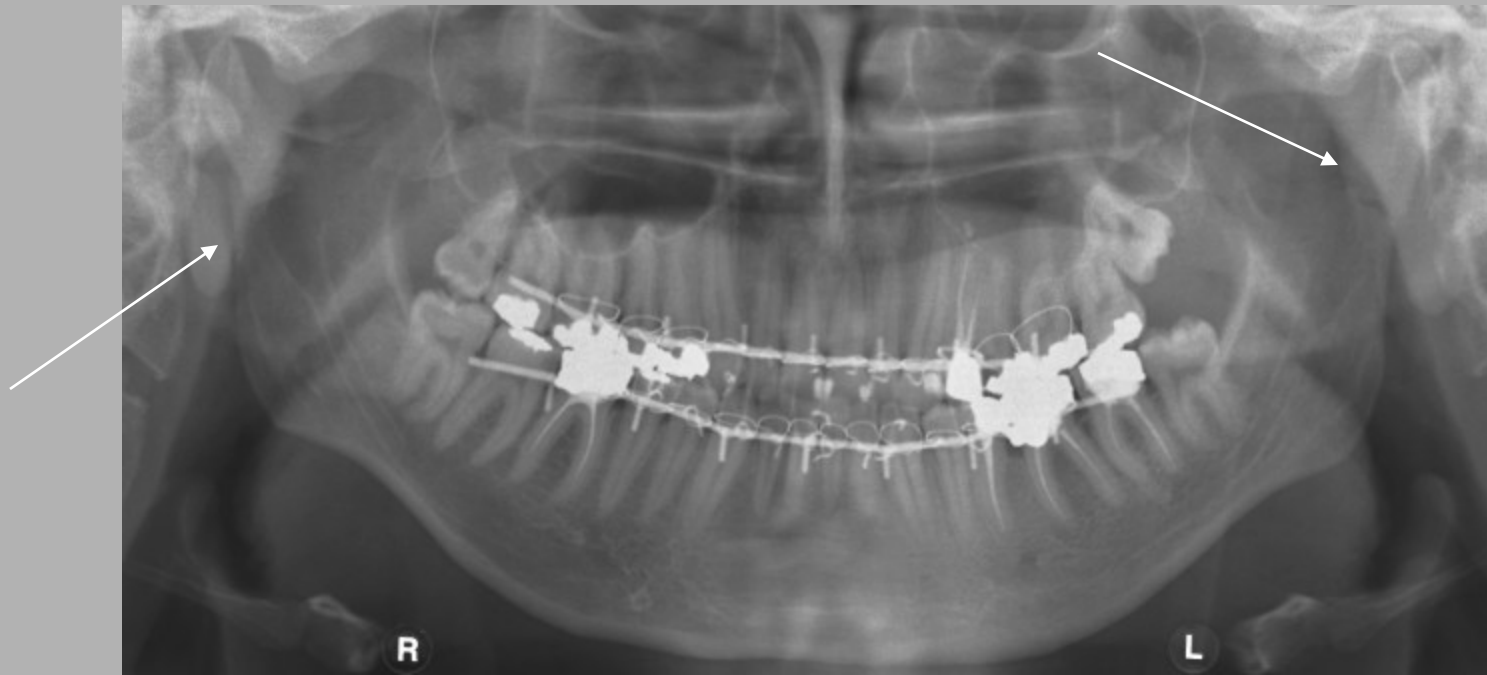




# Mandible fractures



Fract. processus articul. mandibulae bilat.





mandible angle - sutura

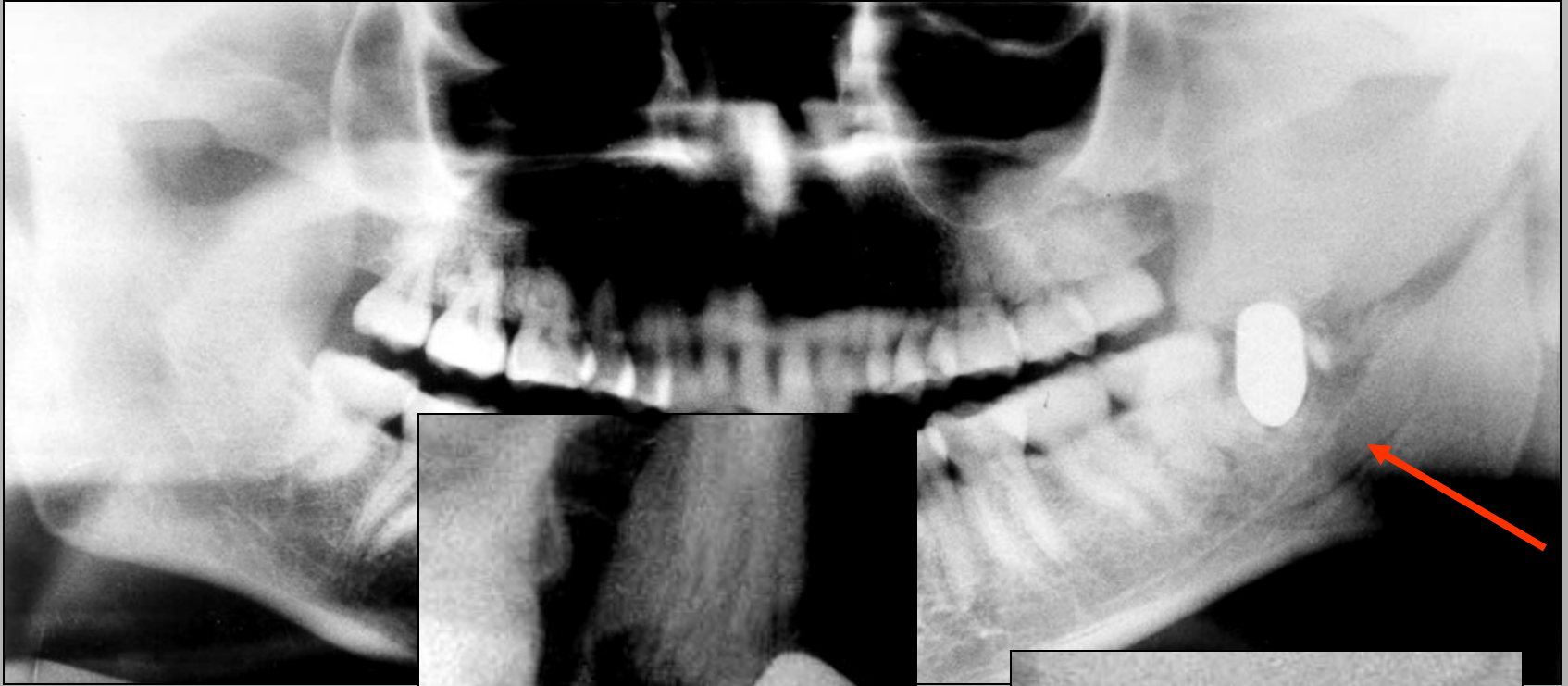


# Body

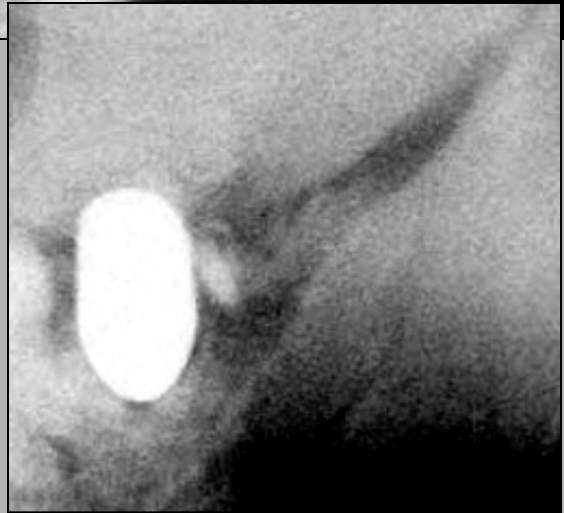


symphysis

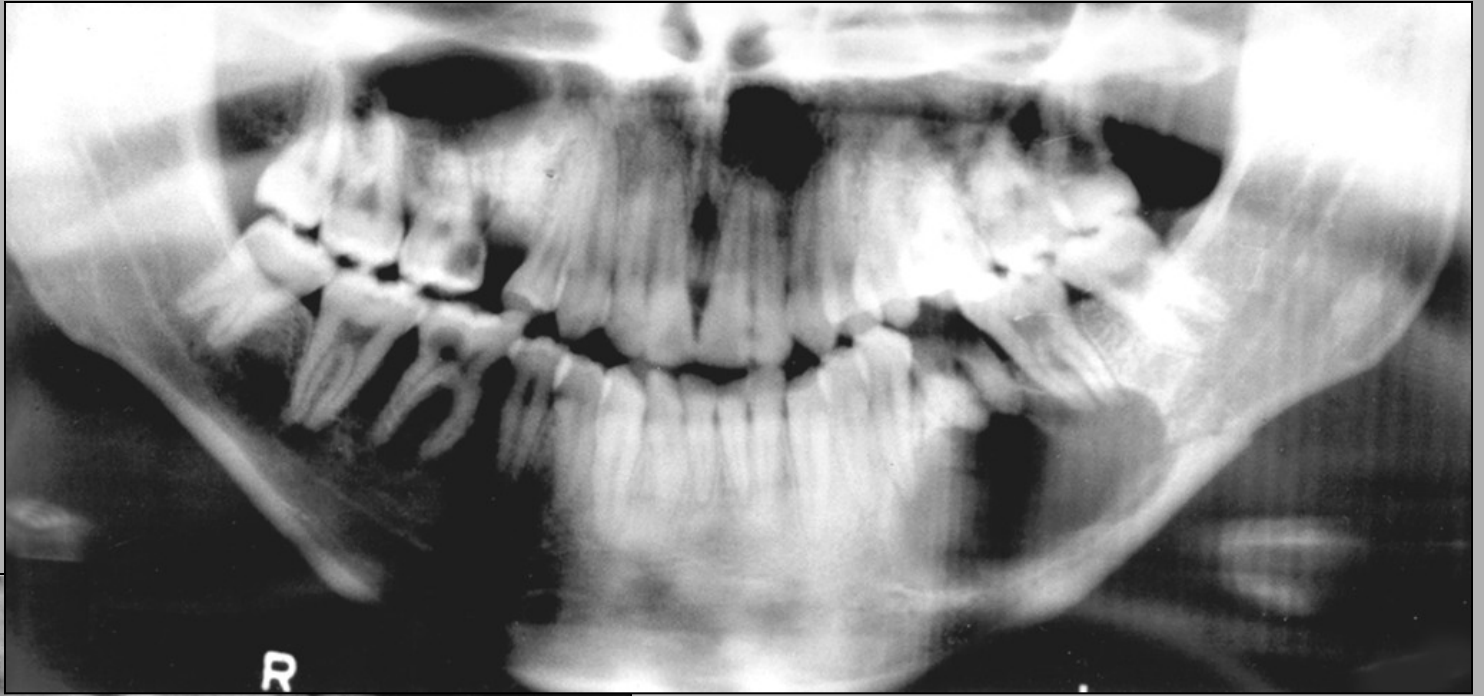




bullet



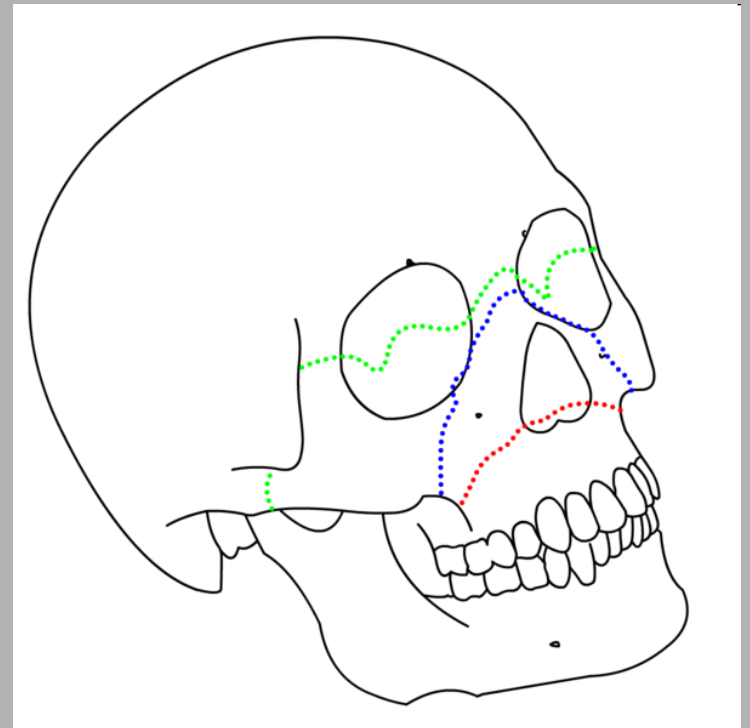
# Pathological fracture apical cyst





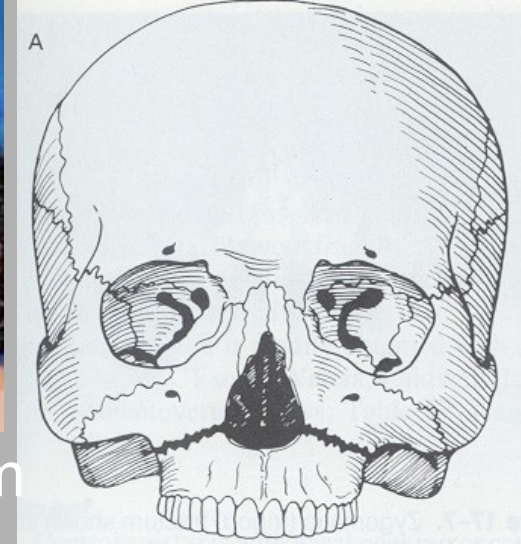
# Le Forte

- high energy trauma
- Classification: **Le-Forte I-III**
- all types Le Forte involve processus pterygoideus



# LeFort I

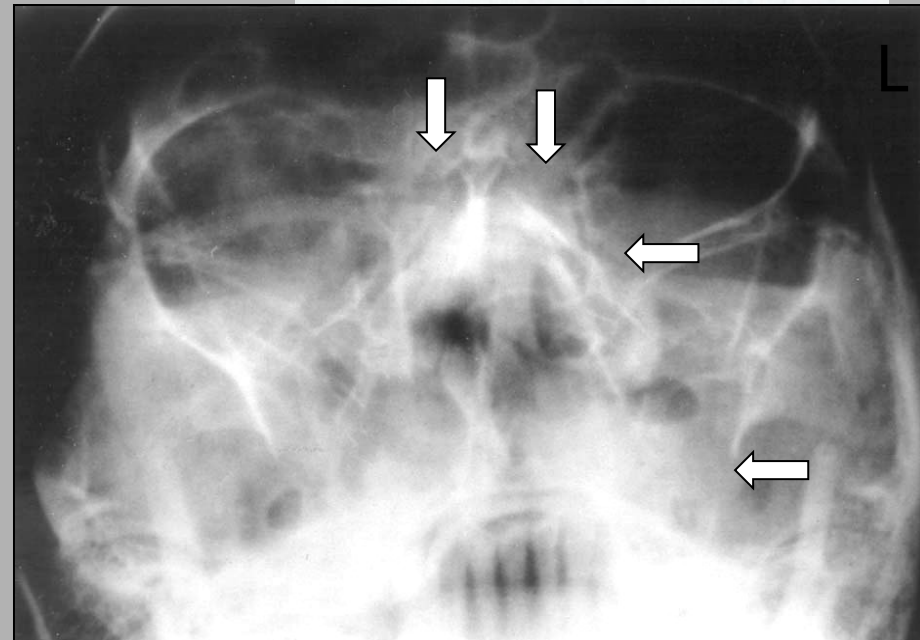
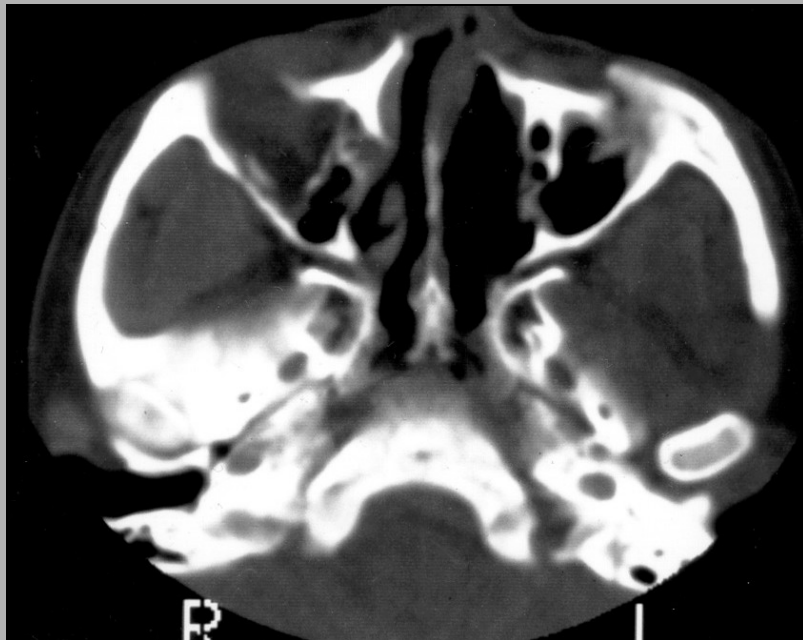
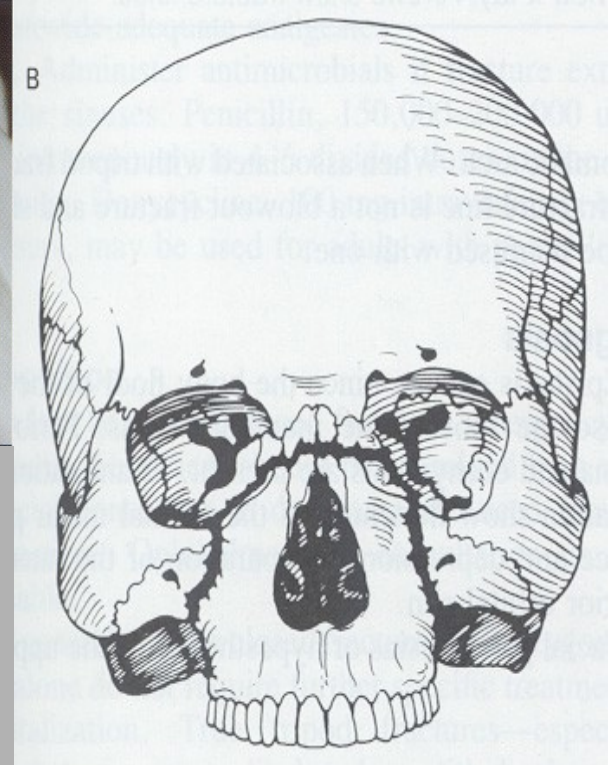
- horizontal fracture
- 'floating palate'
- The fracture extends from the nasal septum, travels horizontally above the teeth apices
- crosses below the zygomaticomaxillary junction, and traverses the pterygomaxillary junction to interrupt the pterygoid plates.



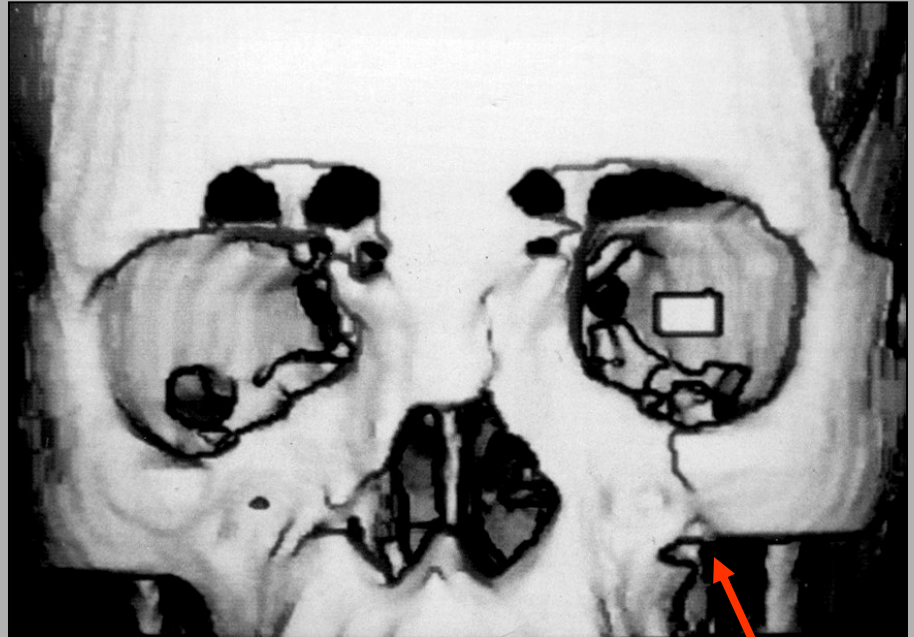
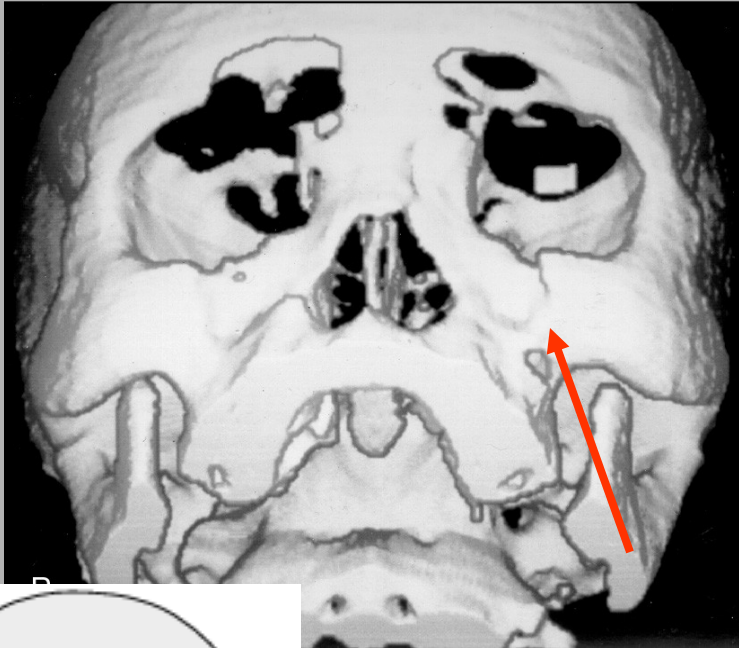


# LeFort II

- ✓ Maxilla
- ✓ Medial portion of orbits
- ✓ nasal bones



# LeFort II



CT 3-D reconstruction



# LeFort II

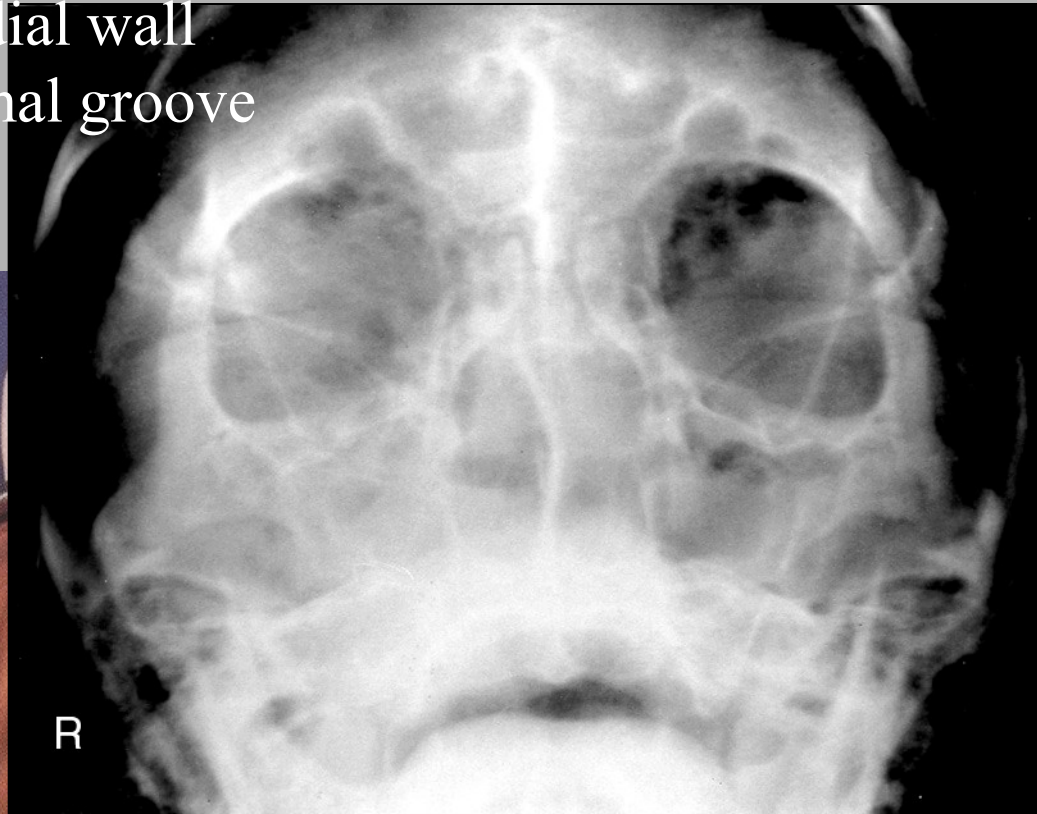
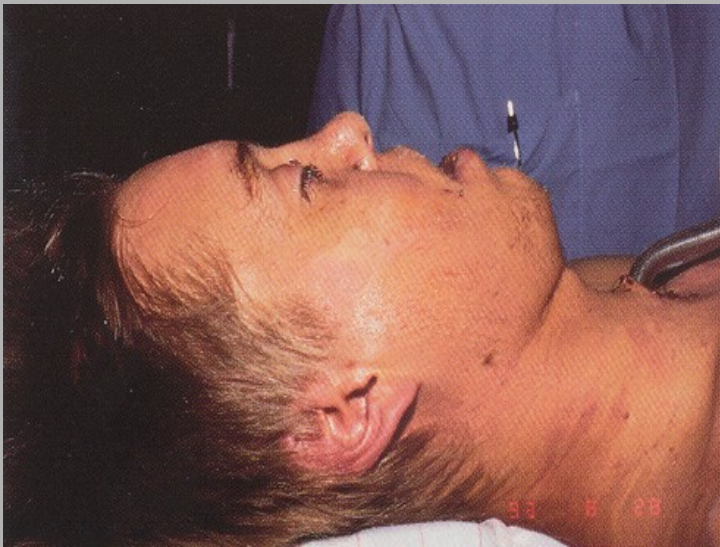
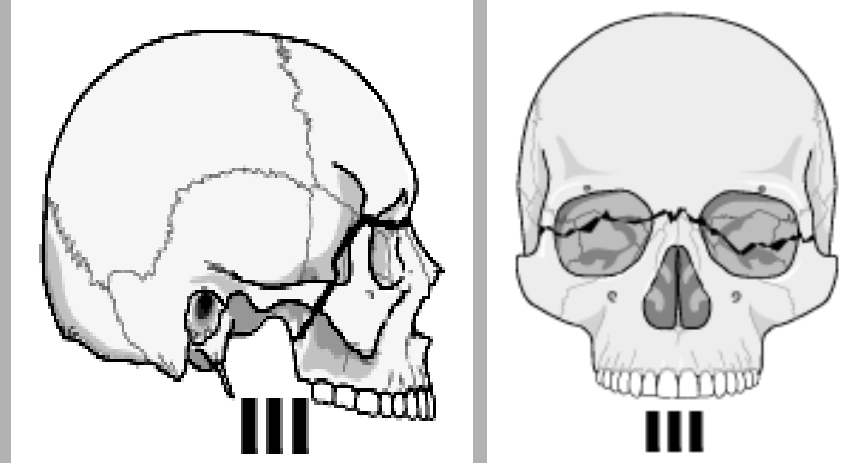


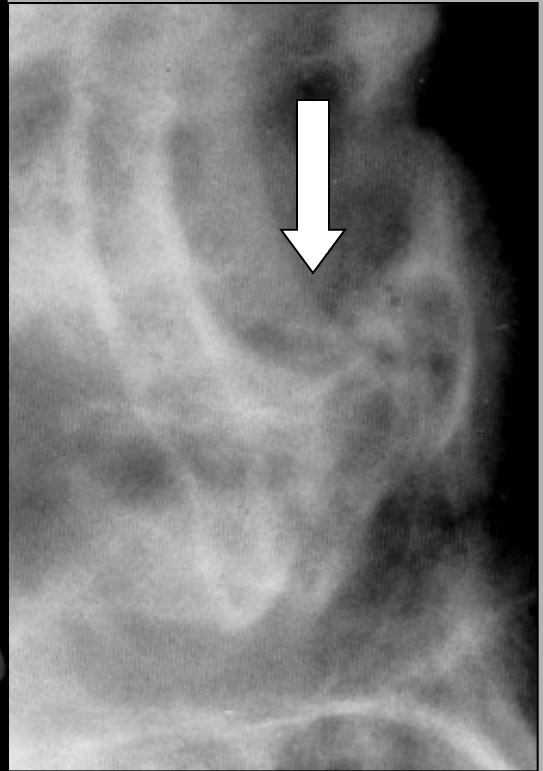
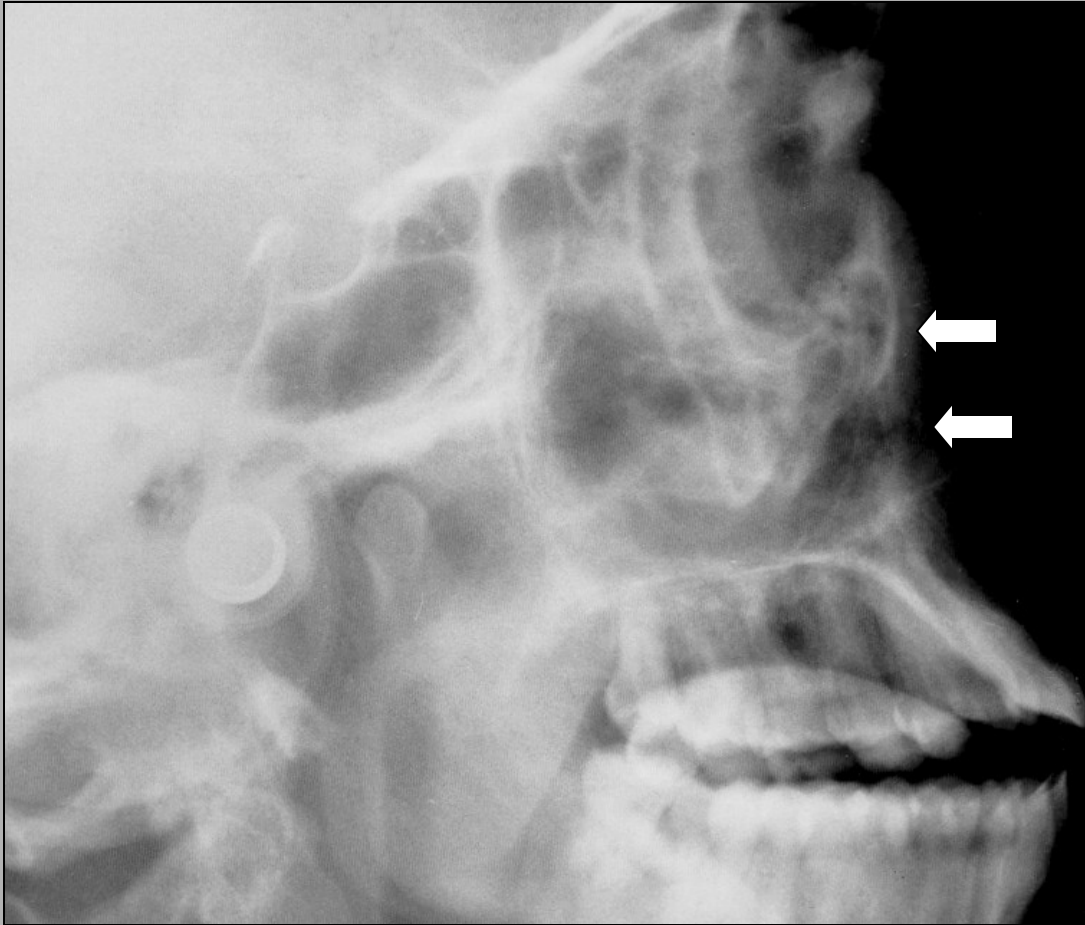
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# LeFort III

- fractures (transverse)
- known as craniofacial dissociation
- involve the zygomatic arch
- start at the nasofrontal and frontomaxillary sutures
- extend posteriorly along the medial wall of the orbit through the nasolacrimal groove and ethmoid bones.

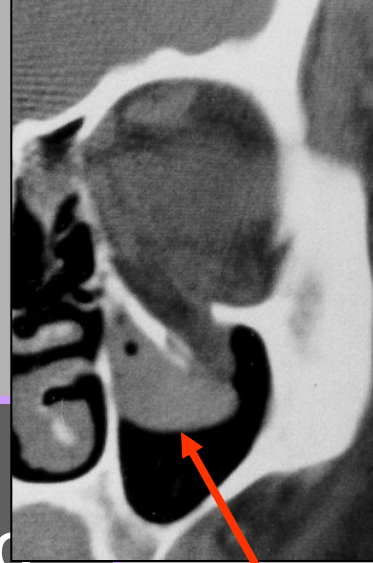






# „Blow-out“ fraktura

- Síla se přenáší přes tenké dno orbity, kde dochází k fraktuře v blízkosti infraorbitálního kanálu.
- Měkké tkáně přesahují okraj orbity.
- Afekce maxilárního sinu.
- Dislokace dna orbity.
- Polypoidní denzita při horním okraji maxil. sinu při herniaci obsahu orbity.
- Parestezie tváře.



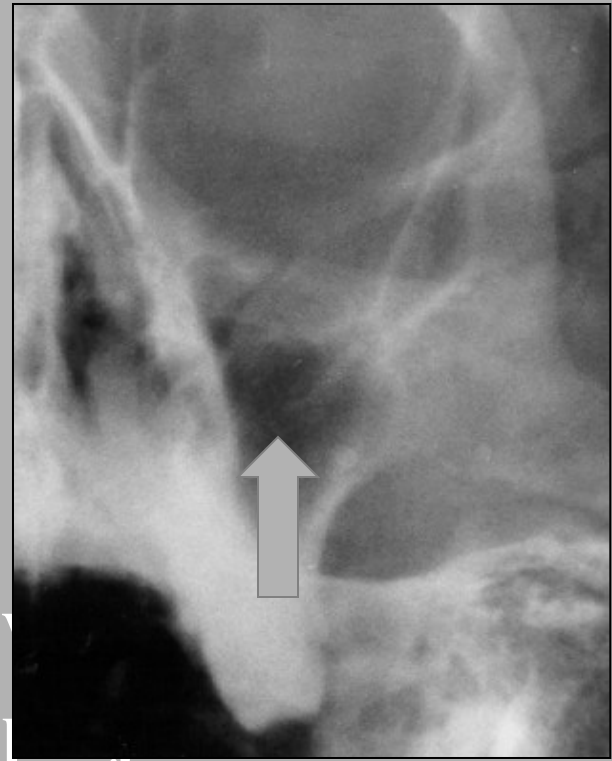


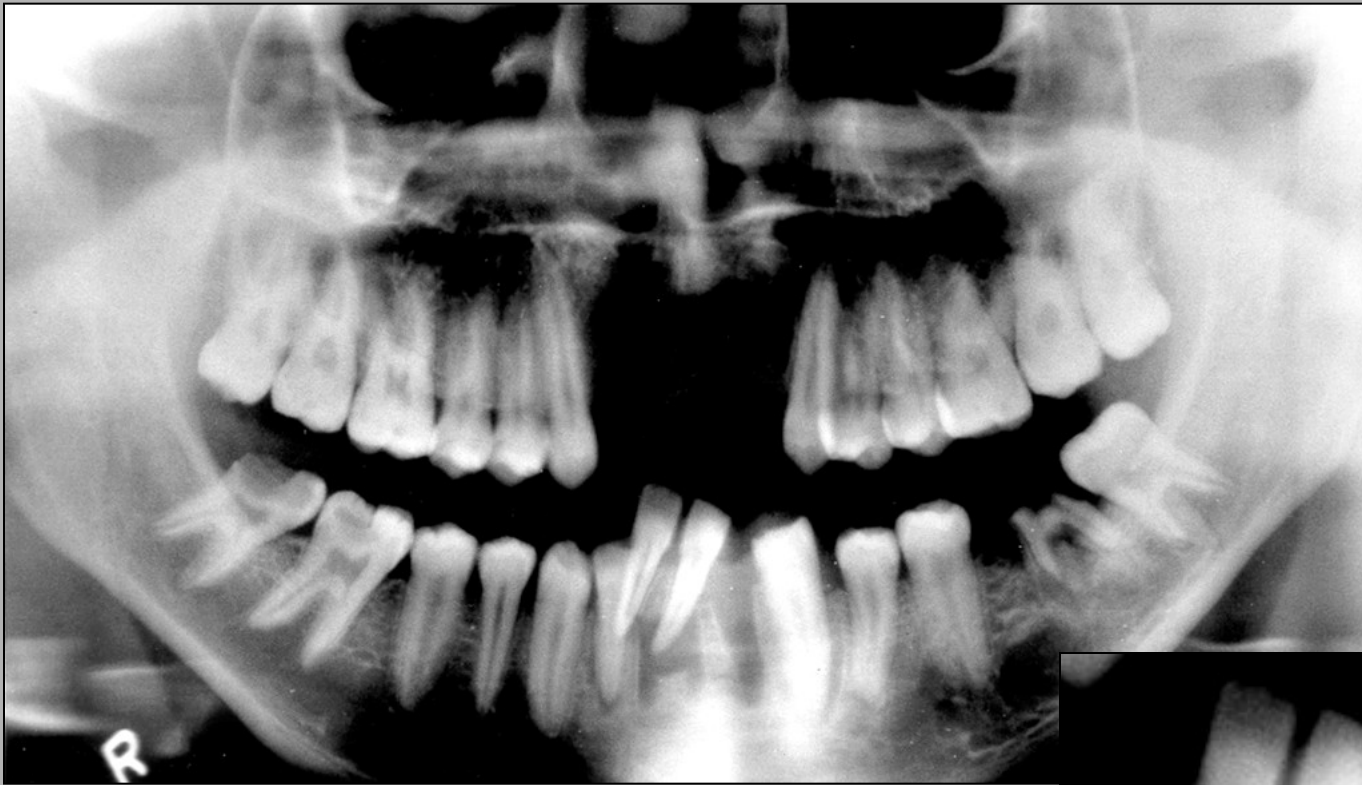


# Orbita



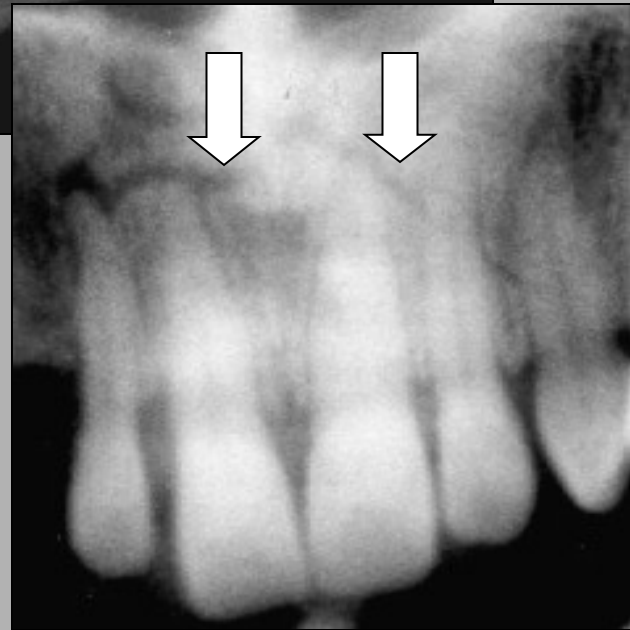
„Blow-out“ fract.





**Subluxation.**





Alveolar fract.

# Periodontics:

- Alveolar bone height
- Alveolar bone health
- Generalised vs localised alveolar bone loss
- Peri-radicular infection

