

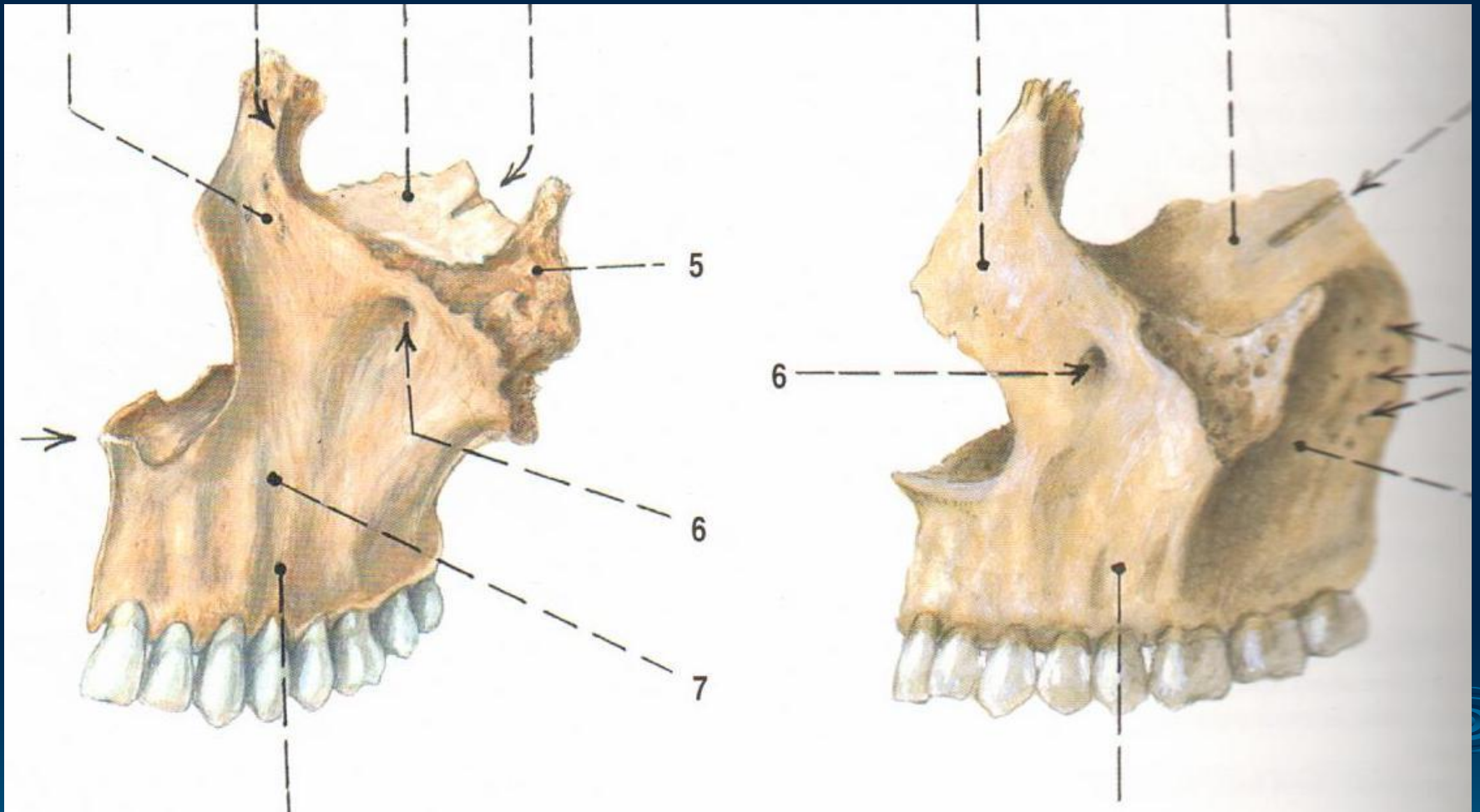
# MAXILLA

Upper jaw



- **Anatomy** (repetition), detailed description
- **Clinical notes**
- **Dentoalveolar topography**



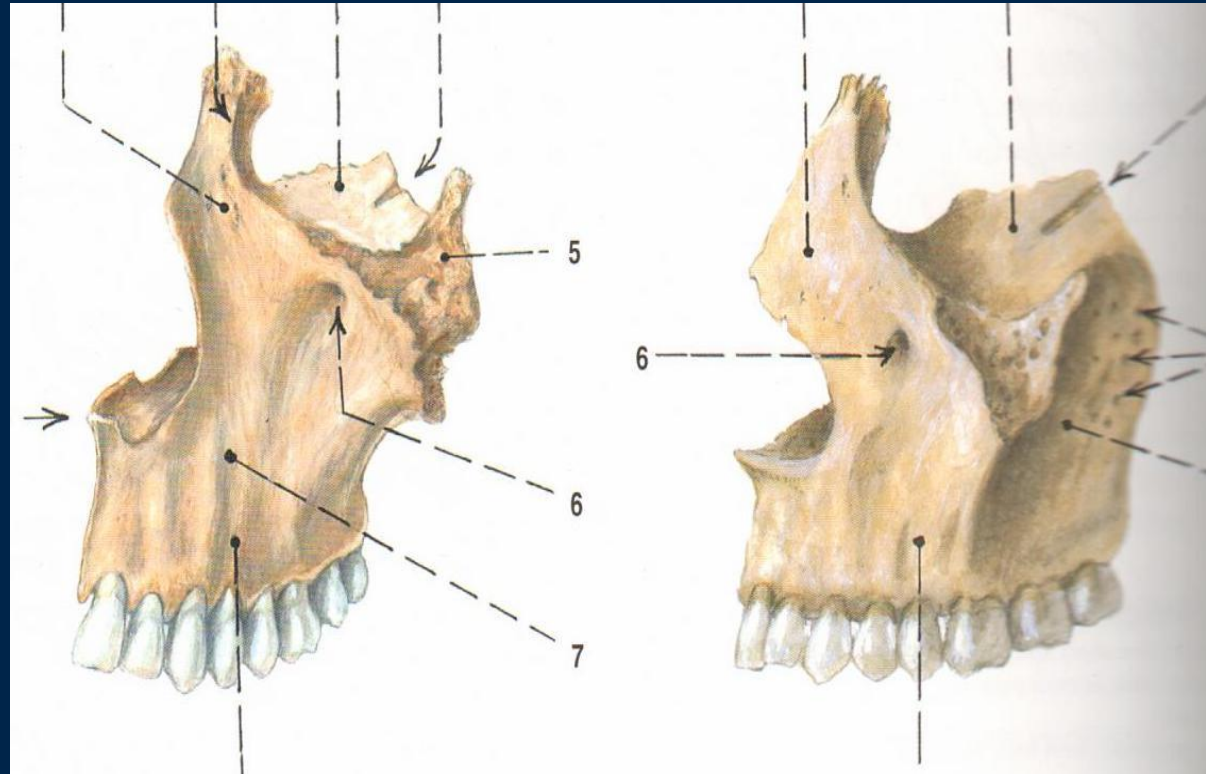




- Viscerocranial (splanchnocr.) bone
- Paired b.
- Irregular formed b.
- Pneumatized b.
- Osseous basis of ventral part of the face
- Consists of maxillar body and four processes

We distinguish 4 planes on maxillar body – facies

- anterior,
- orbitalis,
- posterior = infratemporalis and
- nasalis



We distinguish 4 processes

- zygomaticus, frontalis, palatinus, alveolaris

The body contains air-filled space, cavity – paranasal sinus



## Facies anterior

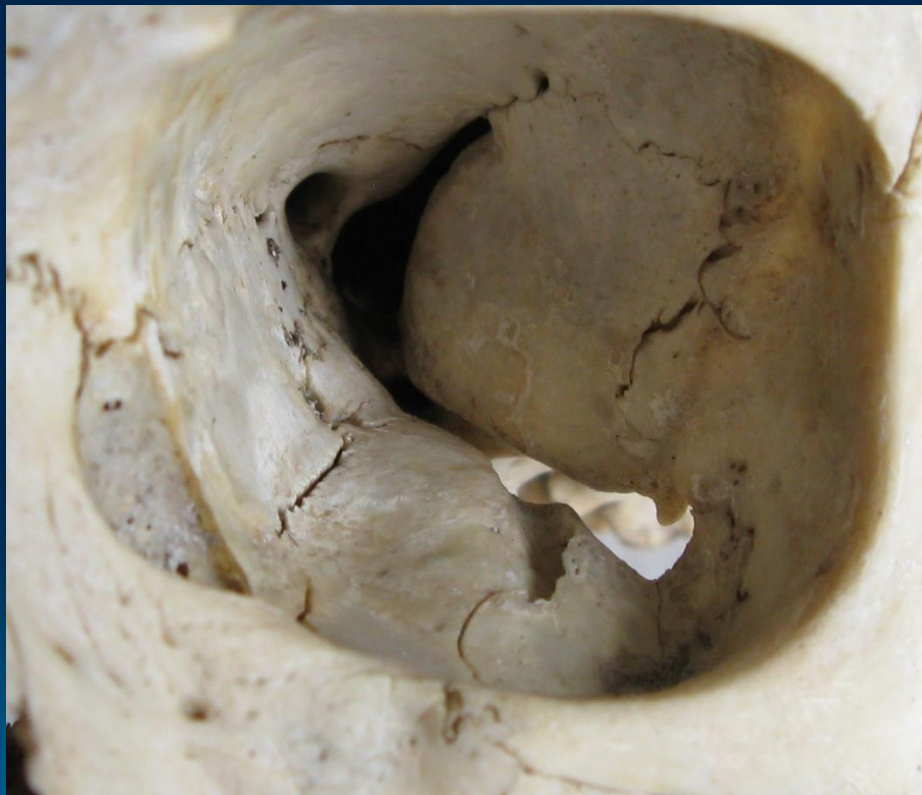
- **Margo infraorbitalis** (rim)
- **Foramen infraorbitale** (opening of canalis infraorbitalis, contains infraorbit. neuro-vascular bundle) – a landmark for the administration of the infraorbital local anest. block – *2 cm inferior to the midpoint of the lower margin of orbit*
- **Canine fossa, canine eminence** (ridge over root of canine)
- **Crista infrazygomatica** (to M1)
- **Incisura nasalis – apertura piriformis nasi**
- **Spina nasalis ant.** (short thorn in the middle line, over incisor roots)

# Facies orbitalis



- Together with facies orbitalis ossis zygomatici it forms an **orbital floor**
- **Sulcus infraorbitalis (infraorbital groove)** which is deepened into **canalis infraorbit.**
- In the course of **canalis infraorbitalis canales alveolares sup. ant.** divide themselves in the direction towards the roots of anterior teeth
- **Inferior orbital fissure** – separates from sphenoid bone

# Corpus maxillae - facies orbitalis - canalis infraorbitalis



**CAVE !**

Maxillary sinus disease can lead to dehiscence of the orbital floor → **secondary neuralgia of trigeminal nerve**



## **Facies post. (f. infratemporalis)**

- **Crista infrazygomatica**
- **Tuber maxillae**
- **Foramina alv. post. sup. (1-3) with canales alv. post. sup. leading in the direction of molar roots**



# Corpus maxillae - facies post. (tuber maxillae)



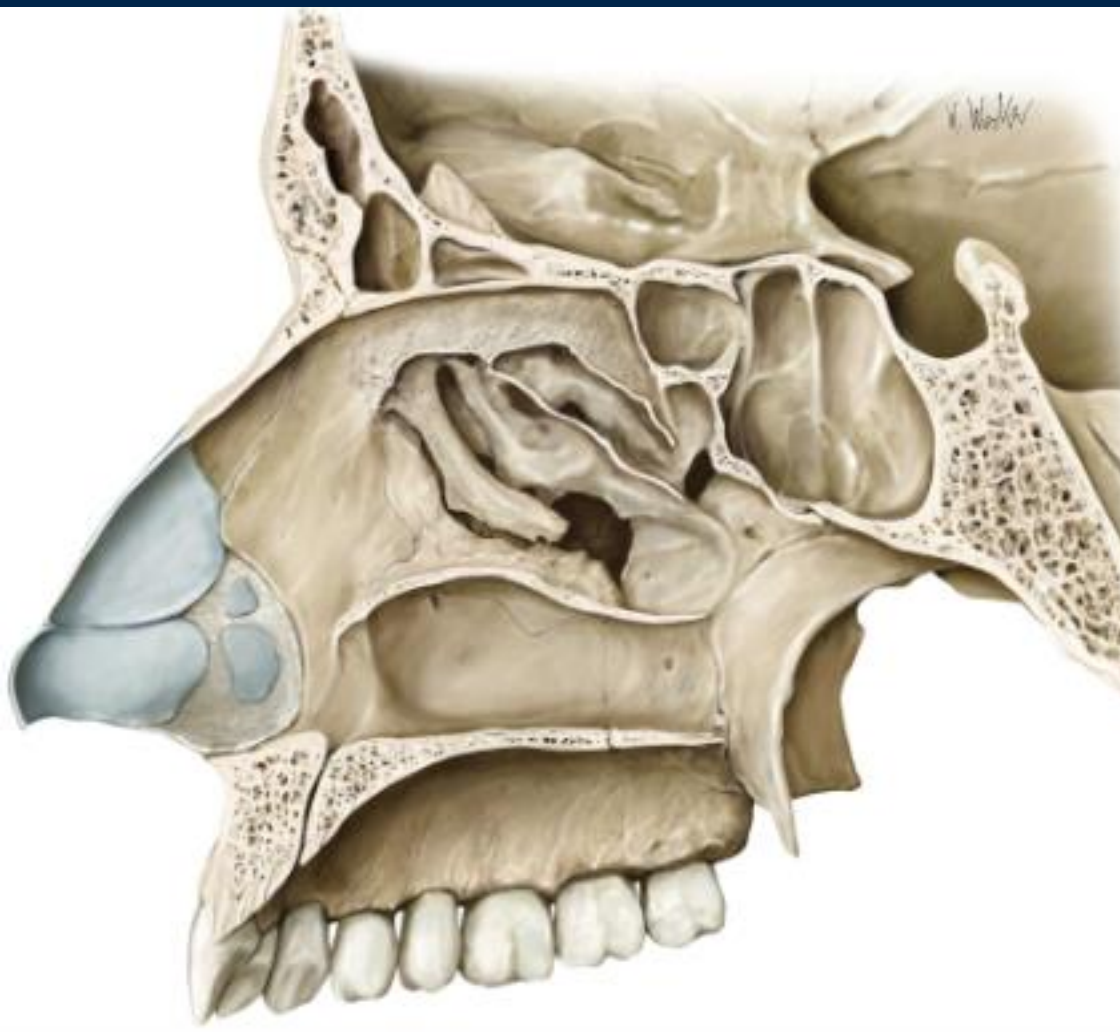
## CAVE!

- Alveolar foramens:  
a., v., n. alveolaris sup.  
post. - local anesthesia
- **Thin bone** → during  
molar teeth extraction  
can occur maxillary  
tuberosity fractures



## **Facies nasalis**

- Hiatus (sinus) maxillaris
- Canalis nasolacrimalis



**Reduction of hiatus maxillaris by surrounding bones:**

Pr. uncinatus

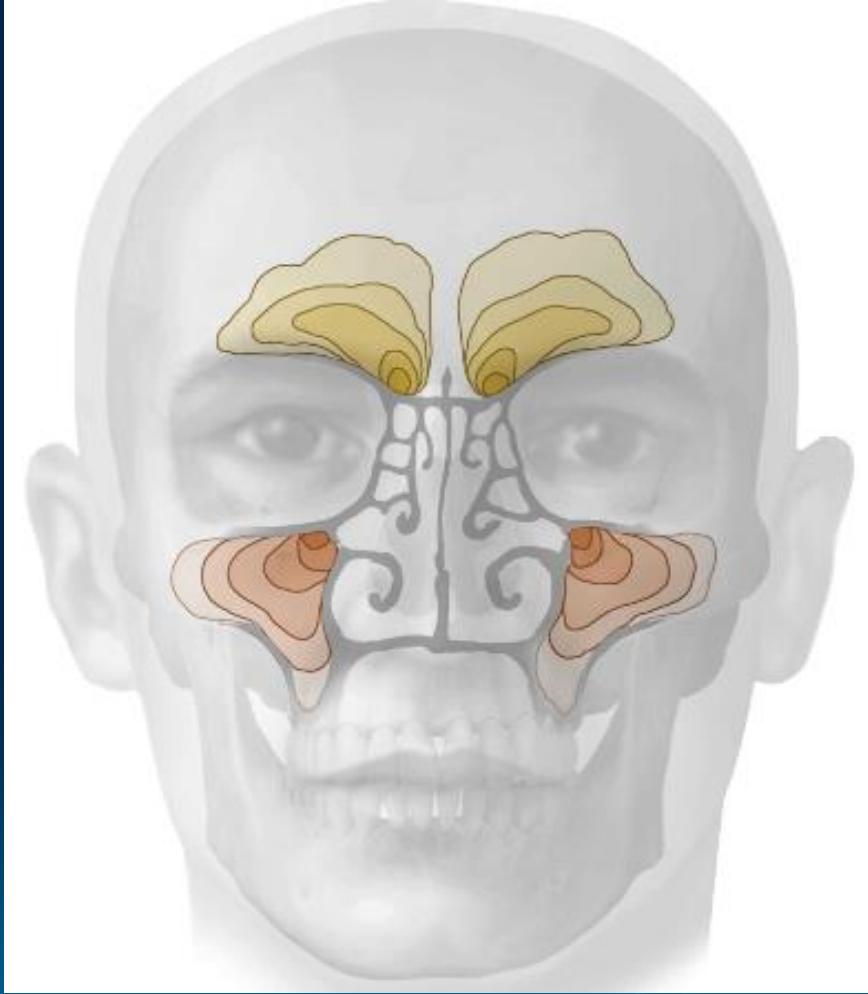
Bulla ethmoidalis

Conchae nasales

> Hiatus semilunaris et infundibulum

**The bottom of the sinus lies lower than the opening!**

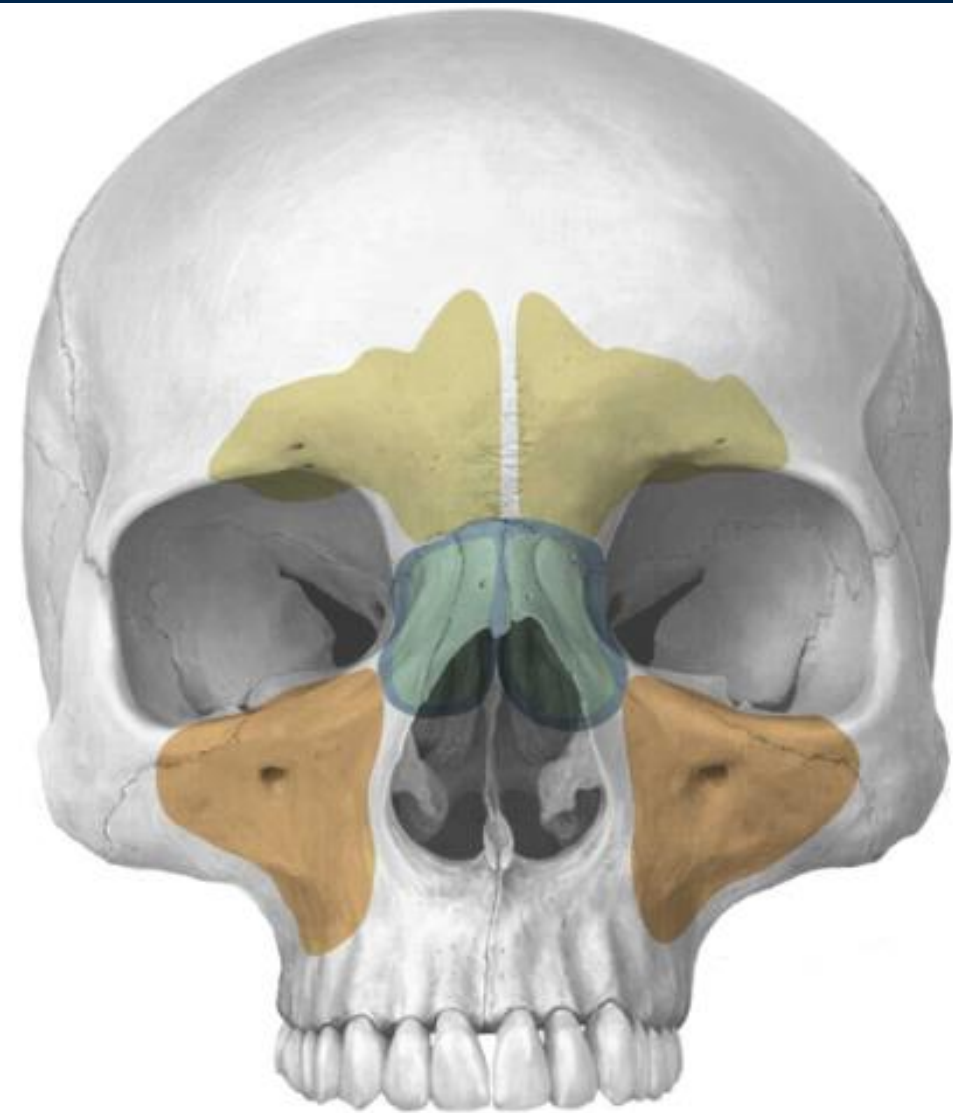
# Sinus maxillaris



1yo, 4yo, 8yo, 12yo, 20yo, 60yo

- Big cavity in maxillar body, also reaches into processus maxillae
- Largest of paranasal sinuses, paired, lined with mucous membrane
- Opening (ostium) in the lateral nasal wall – drainage may be complicated, because the ostium of sinus is higher than the floor of the sinus cavity !!!
- The size varies according to individuals and their age
- Pyramid shaped, three walls, a roof and a floor, apex points into zygomatic arch

# Sinus maxillaris, antrum Highmori



Capacity: **15 (25) ml**

*Patological content in the right  
maxil. sinus*

# Sinus maxillaris – decrease of floor



## The toothed jaw

Variable layer of spongy bone between sinus and roots of teeth



## The toothless jaw – thinning of bony floor

**CAVE!** before implant application, maxillary sinus lift (augmentation) is needed

# Sinus maxillaris - septa

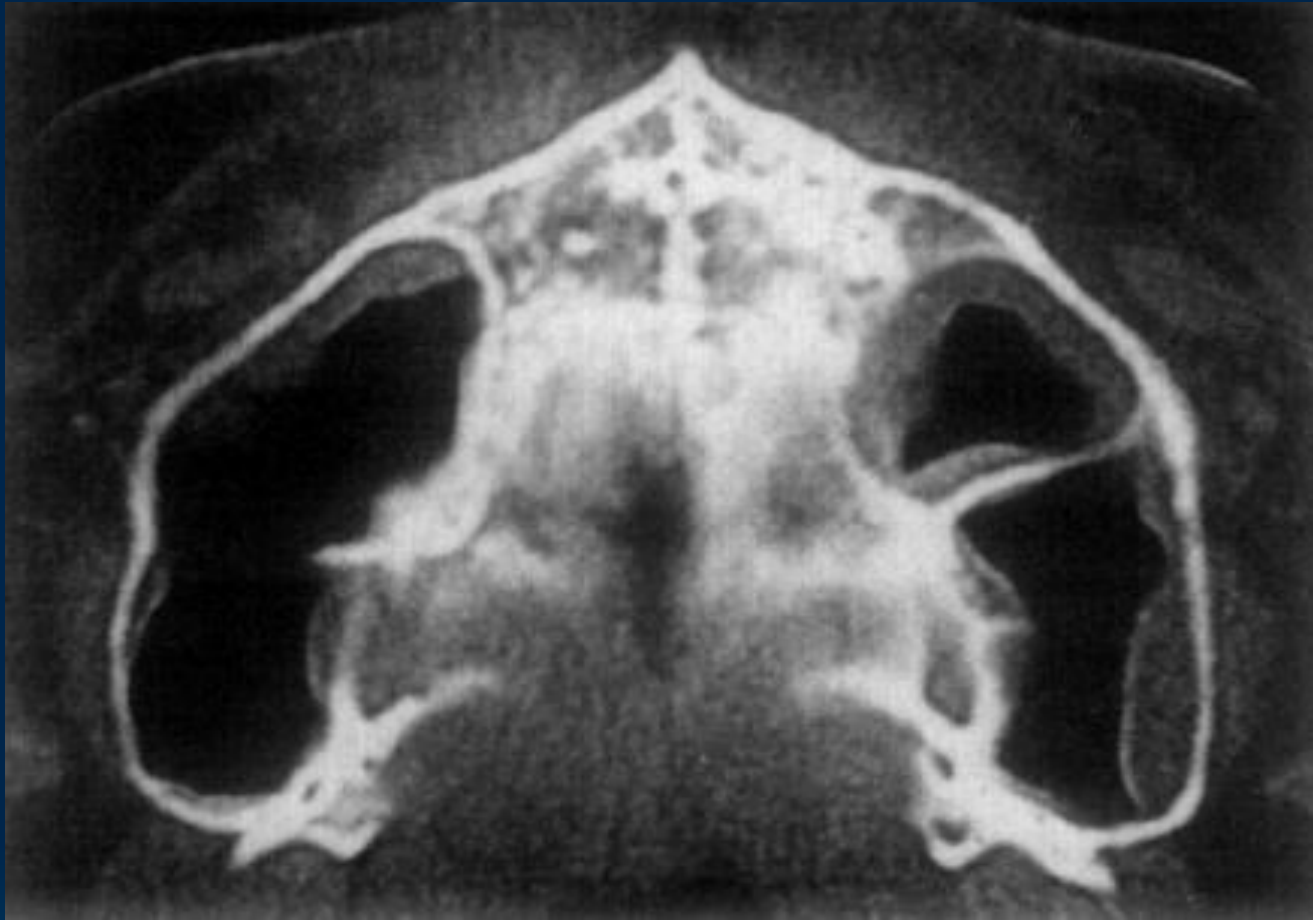
Full septa, incompl. s.

25% - 35%

Most often in the  
bottom area







**CAVE! Clinical significance:**

- separated maxillary sinus puncture
- dental implants

## Corpus maxillae - facies ant.

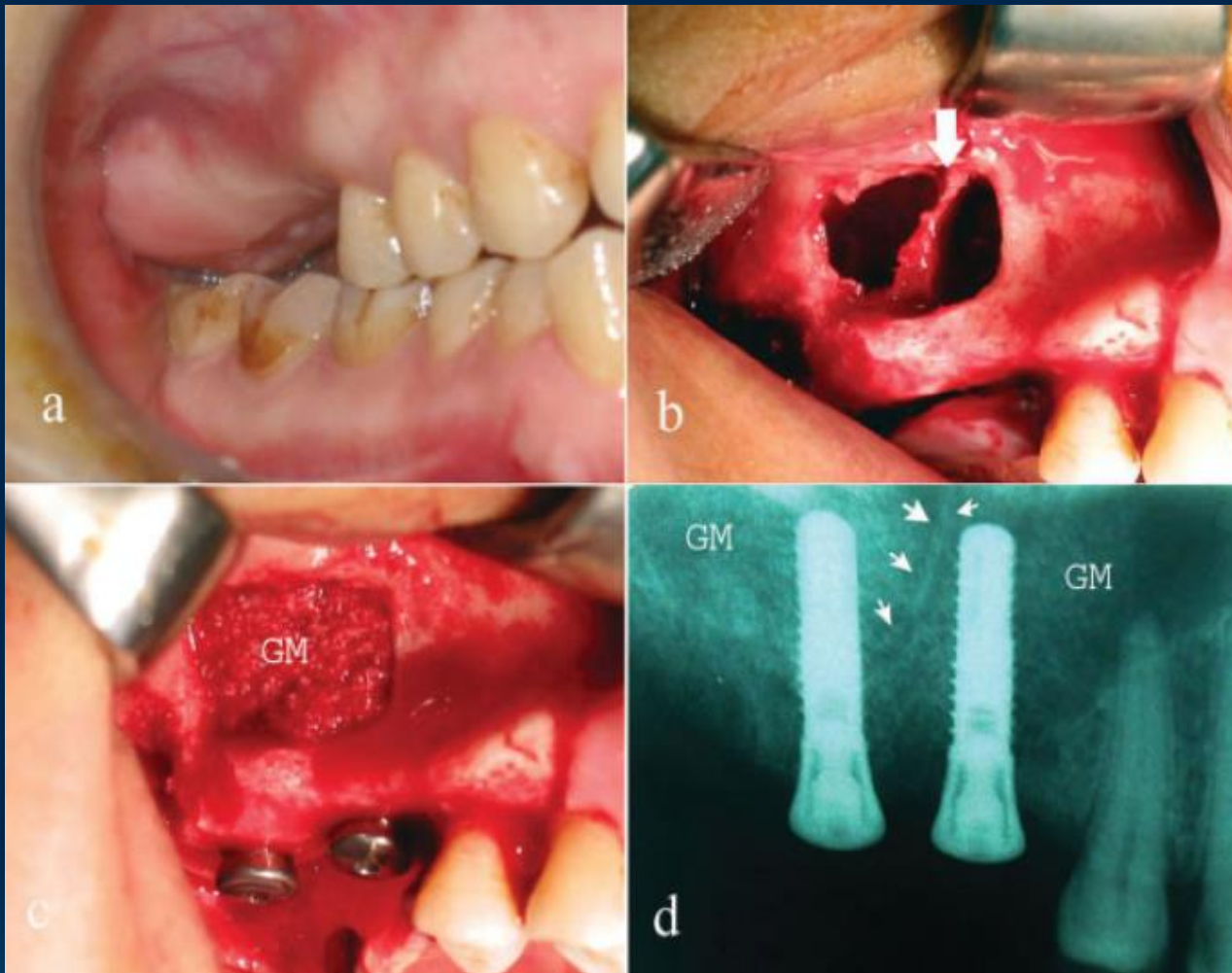


### **Caldwell-Luc antrostomy**

Intraoral procedure for entering the maxillary antrum through the canine fossa above the maxillary premolar teeth

**FES** functional endoscopic surgery

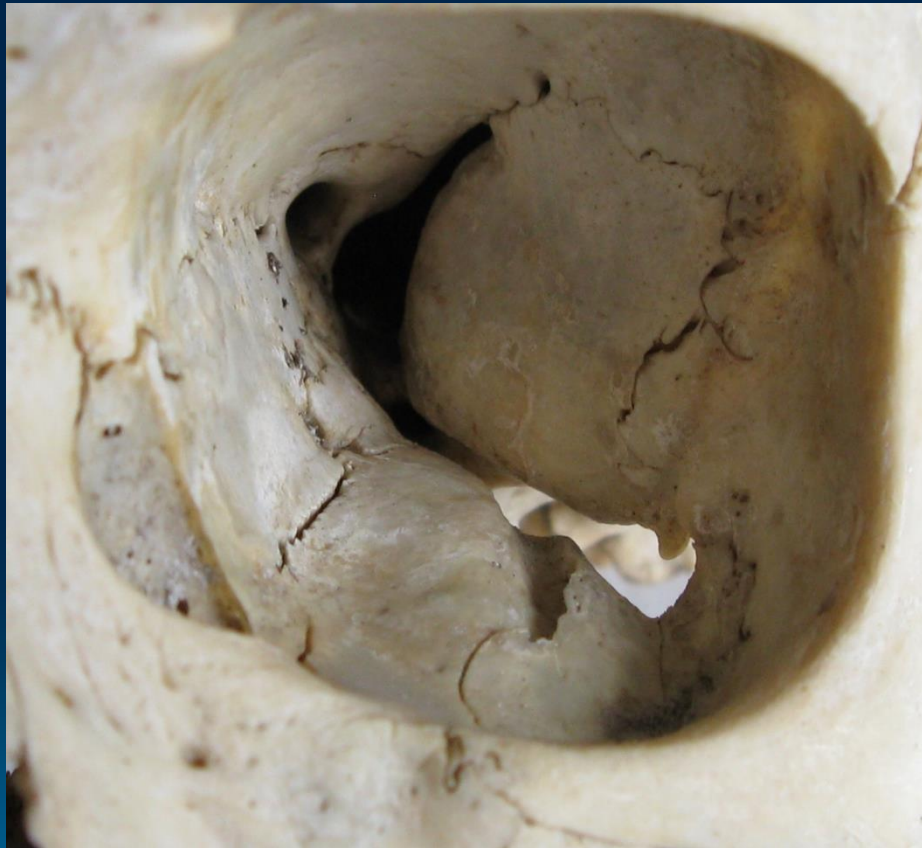
**FESS** functional endoscopic SINUS surgery – usually to enlarge the ostia and provide adequate drainage



A intraoral imaging of implantation area    B complete septa separating the sinus into 2 compartments    C two dental implants and graft material in sinus    D septa between the implants

**Anatomic evaluation of maxillary sinus septa: surgery and radiology. Koymen et al., 2009. Clinical Anatomy 22:563-570.**

**Processus frontalis** – forms the medial orbital rim; on its dorsal margin, it has *crista lacrymalis ant.* (*sulcus lacrymalis*)



## Processus alveolaris – form of a half of a horseshoe

- **Functional extension of a bone**, conditioned by the presence of teeth (after loosing of teeth, proc. alv. is reabsorbing and diminishing)
- **Juga alveolaria** – on the external side, they mark the position of roots of teeth
- **Alveoli dentales** –  
on caudal side
- **Septa interalveolaria**
- **septa intraalveol.**  
= interradicularia



**Proc. Palatini** of both upper jaws form anterior  $\frac{3}{4}$  of palatum durum

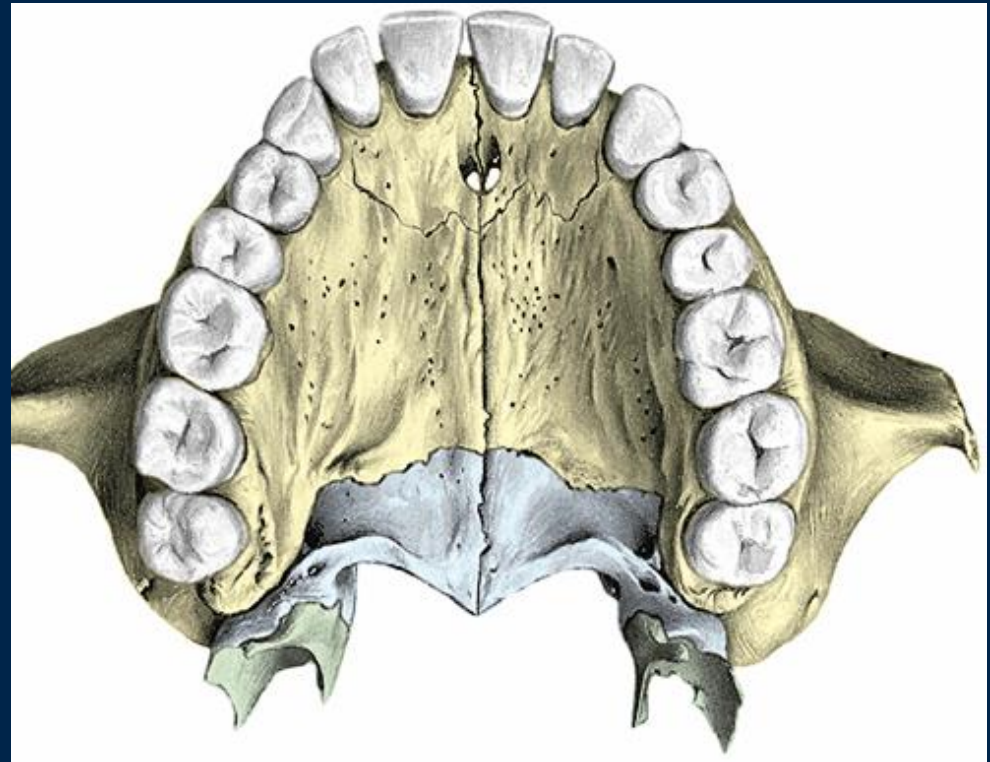
Connected together in sutura palatina mediana, sometimes the bone mass – torus palatinus protrudes

Sulci palatini conditioned by presence of palatal vessels and nerves

Foramen incisivum – in ventral part of sutura palat. med. (for a. and n. nasopalatini)

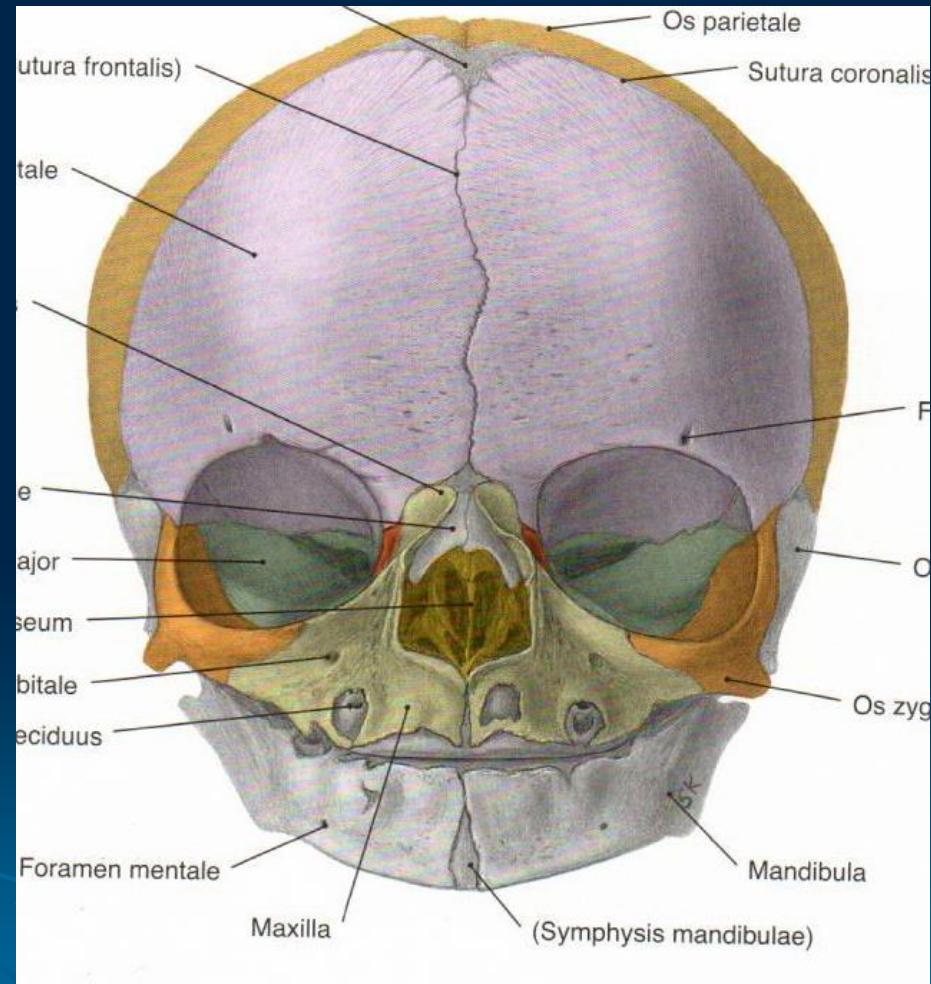
Os incisivum, premaxilla, sutura incisiva (usually obliterates in childhood)

Facies cranialis proc. palat. is an integral part of the bottom of nasal cavity, crista nasalis + vomer



# Newborn maxilla

- is low
- without a developed proc. alveolaris
- in its basis, there are crowns of deciduous teeth embeded
- sinus maxillaris is only outlined by a little depression, into which mucous membrane of nasal cavity invaginates during the jaw growth



?





# Dentoalveolar topography

**Important for** anesthesia, extraction, injury, implantology, endodontic treatment ...

1. Dental and skeletal arch
2. The rate of the spongy and the compact bone
3. The relationship between the roots of the teeth of upper jaw and neighbouring structures

# 1. The position of alveolus in the skeletal arch



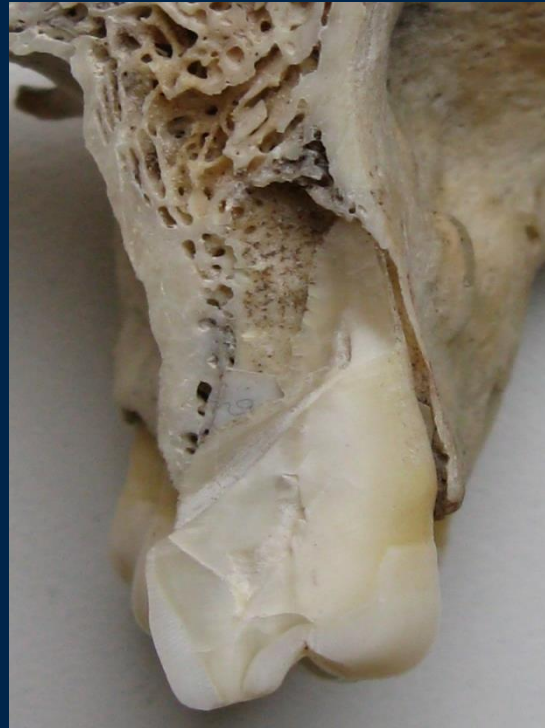
- The dental and skeletal arch are asymmetric !
- Roots of the teeth:
  - 1-5 excentric towards vestibular part
  - 6-7 in alveolar process axis
  - 8 takes a natural place, deviates from the arch

## 2. The rate of the spongy and the compact bone

- The layer of **compact bone** is thinner than in the lower jaw
- Roots of the 1-5 are surrounded by the compact bone on labial side. On palatal side, there is a **variable layer of retroalveolar spongy bone**.
- The width of the alveolus depend on the shape of palate



# Incisivi, canini, premolars



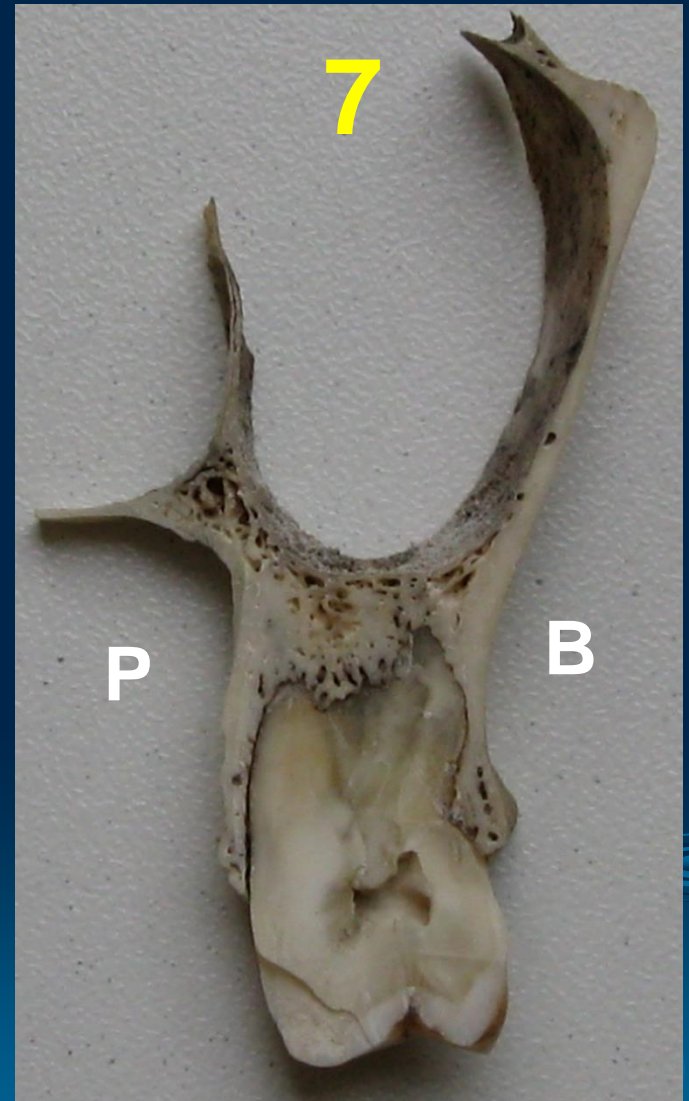
Compact bone and variable thickness of spongy bone on palatal side

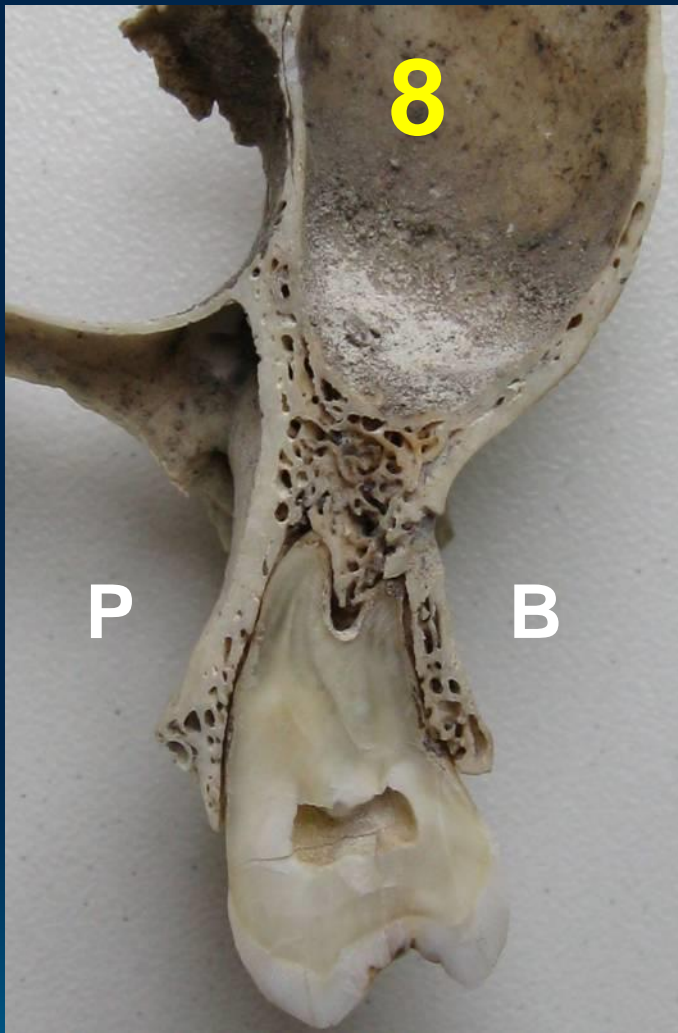
# Molars



Compact bone only

- Roots of the molars are surrounded just by thin layer of the compact bone (except infrazygomatic crest – M1)

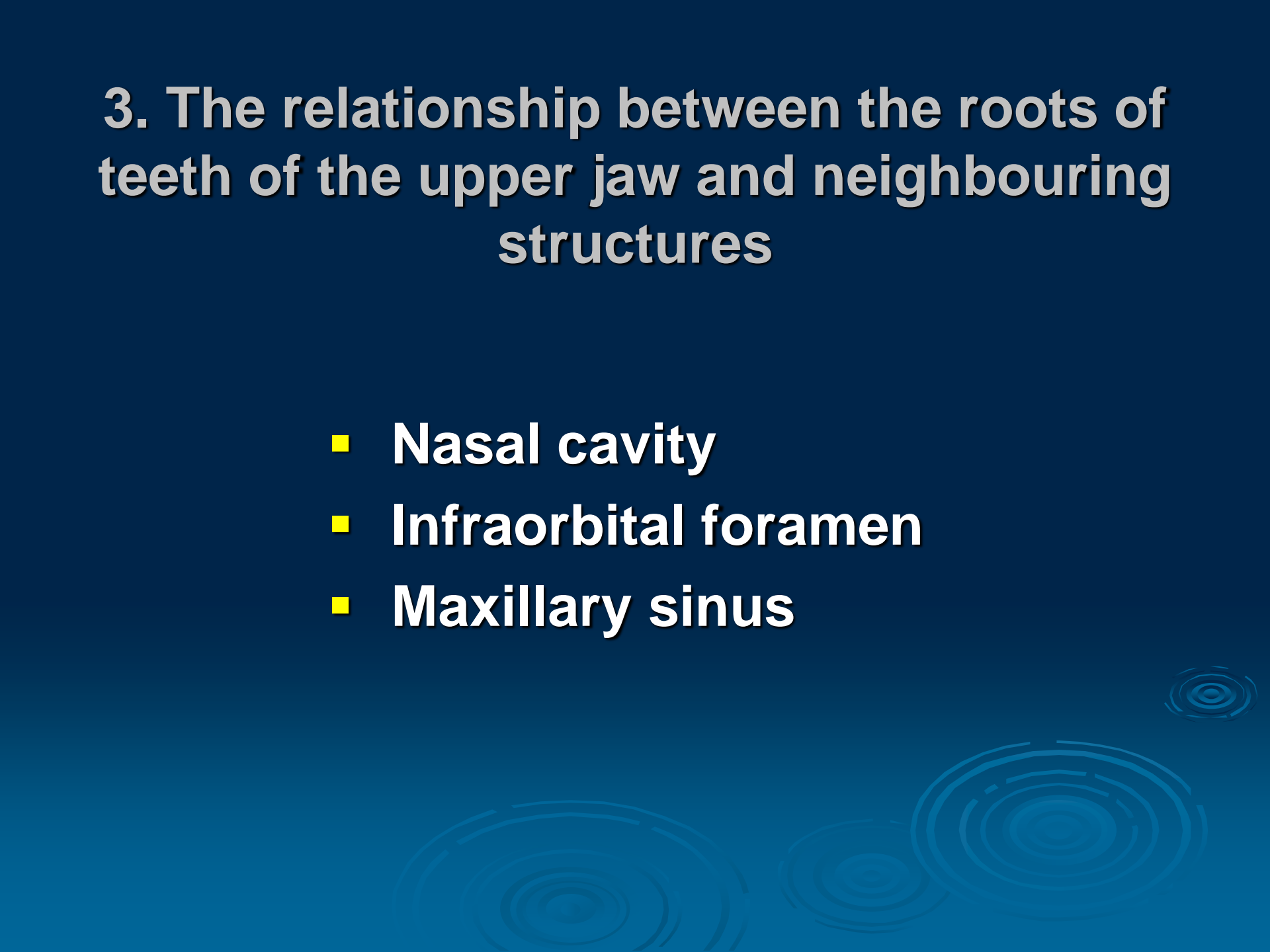




**tuber maxillae area:**

**Bucally and palatally  
compact + spongy bone**

### **3. The relationship between the roots of teeth of the upper jaw and neighbouring structures**

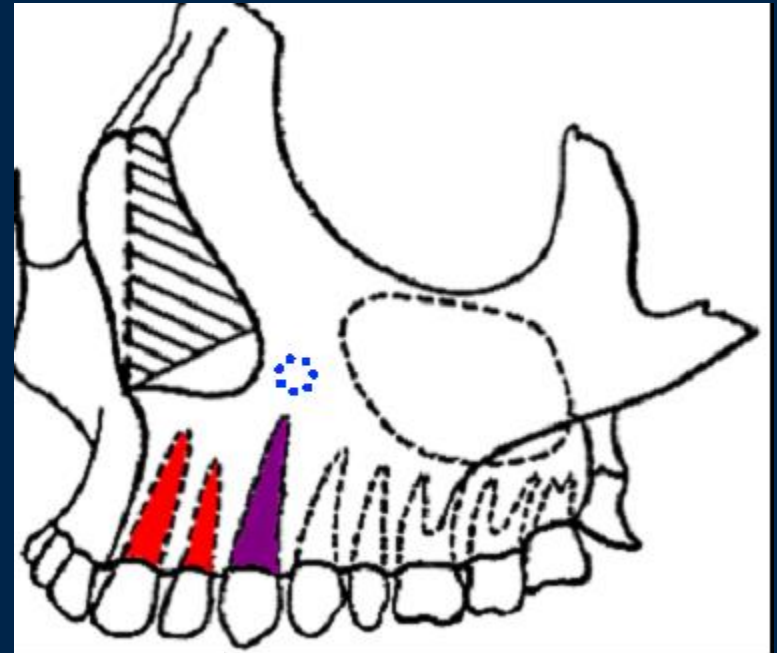
- **Nasal cavity**
  - **Infraorbital foramen**
  - **Maxillary sinus**
- 

# Nasal cavity

## Infraorbital foramen

- Variable layer of spongy bone between nasal cavity and roots of incisivi

- Root of 3 localized between nasal cavity and sinus maxillaris



### CAVE!

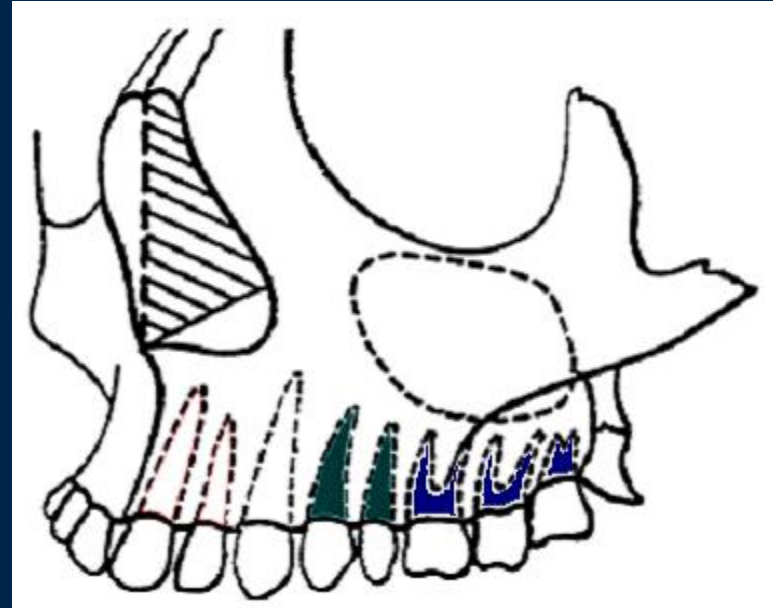
Radices 1,2: periapical inflammation may lead to **abscess of the floor of nasal cavity**

Radix 3: relation to a., v., n. infraorbitalis and - possible trombophlebitis of cavernous sinus



# Maxillary sinus

Variable layer of spongy bone between maxillary sinus and roots of posterior teeth



## CAVE!

- Periapical inflammation developing at the root apices of maxillary molars and premolars are very close to the floor of the maxillary sinus - **sinusitis** or **empyema**
- Potential **oro-antral communication** by the extraction