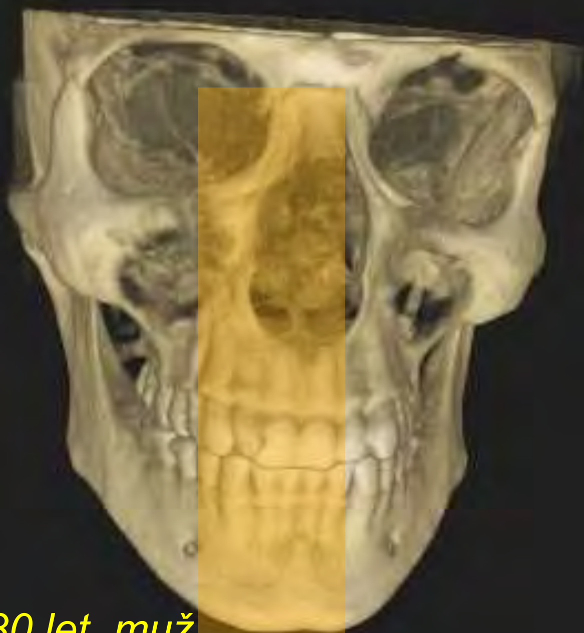


30 let muž

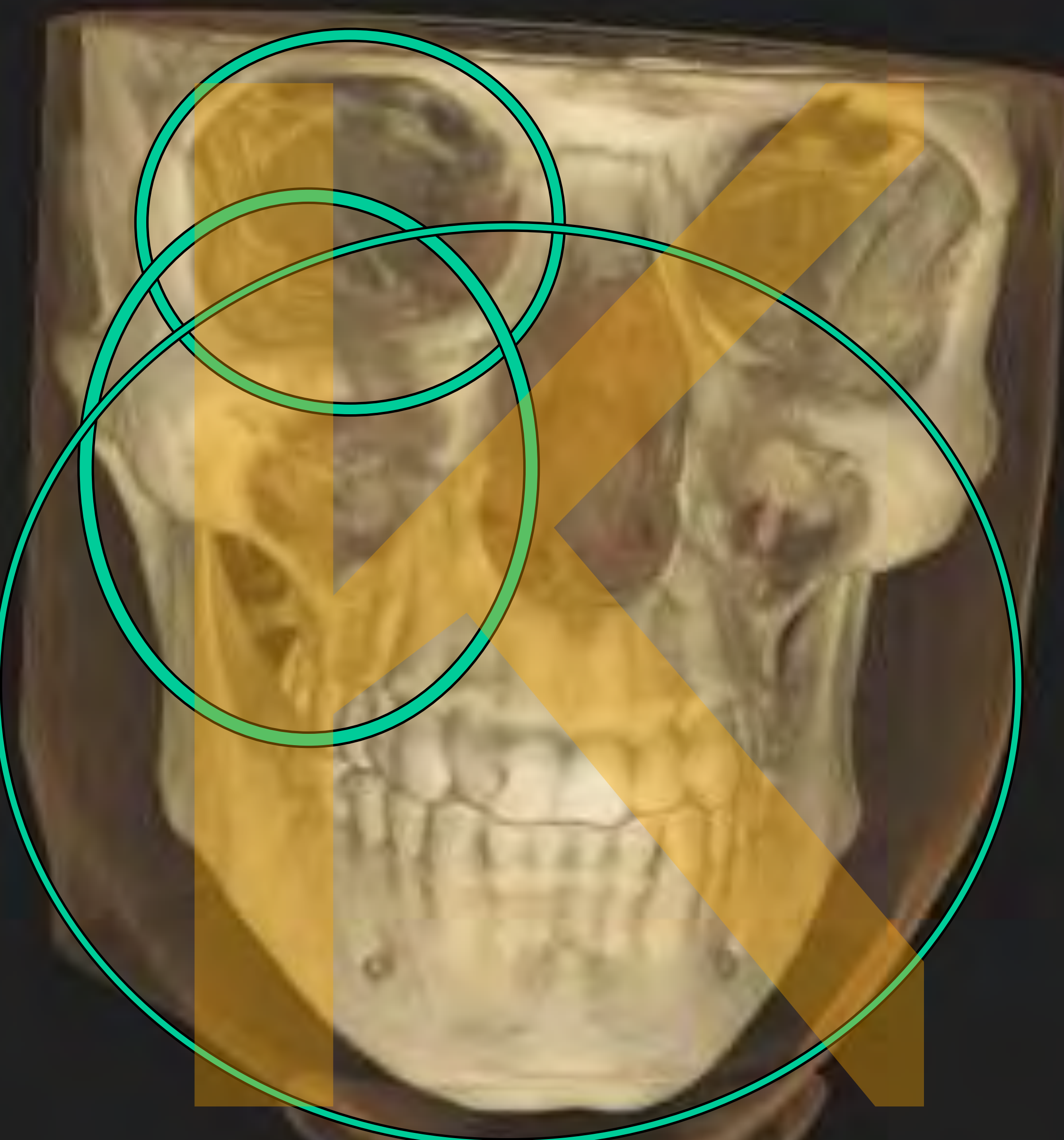
3D zobrazovací metody

Lebka s dutinami

Úpony šlach a napojení vazů na kost

Výstupy nervů a cév

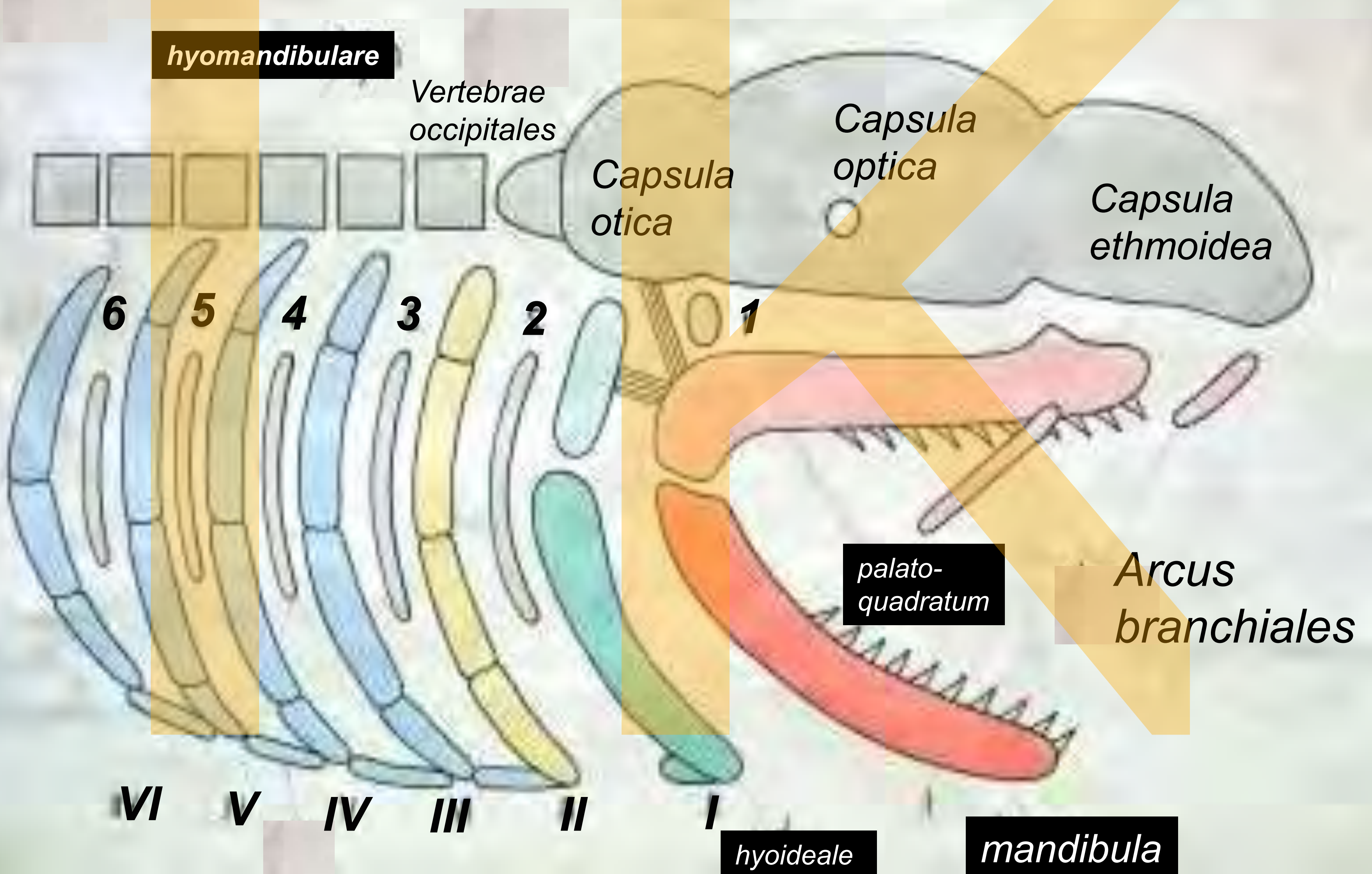
Topografické vztahy mezi strukturami



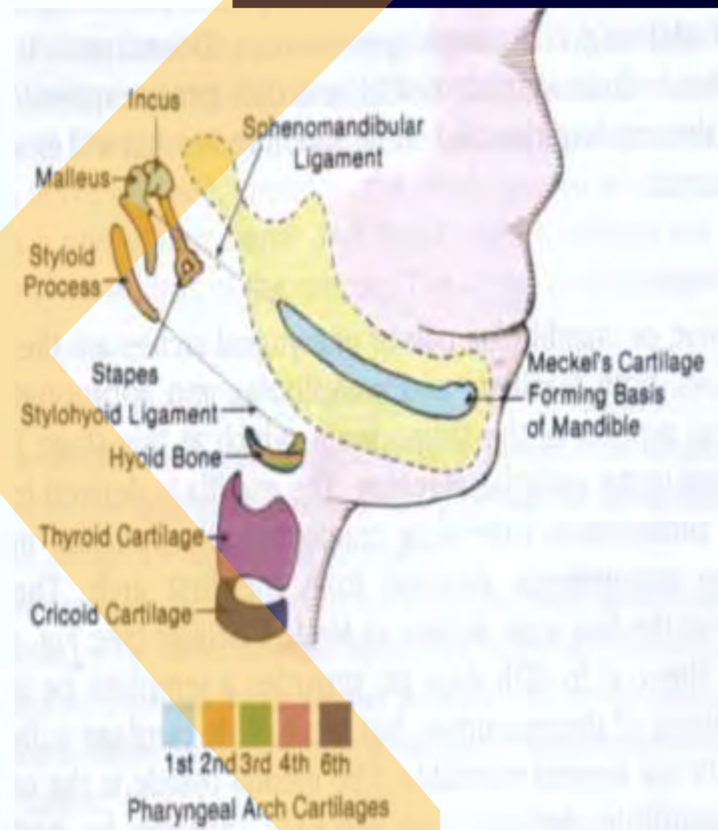
CBCT 90300

LEBKA A ŽABERNÍ OBLOUKY ŽRALOKA

Schema

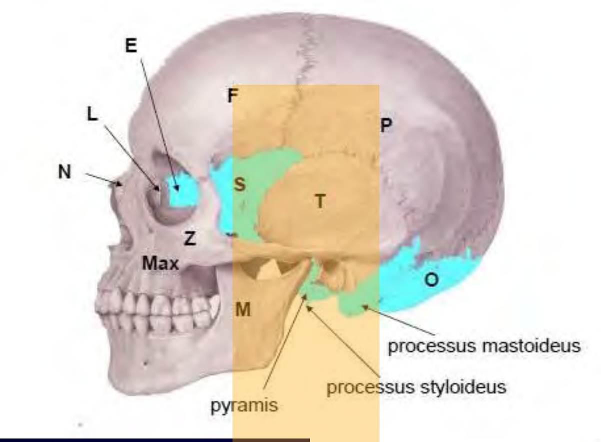


Neurocranium a Viscerocranium (splanchnocranium)



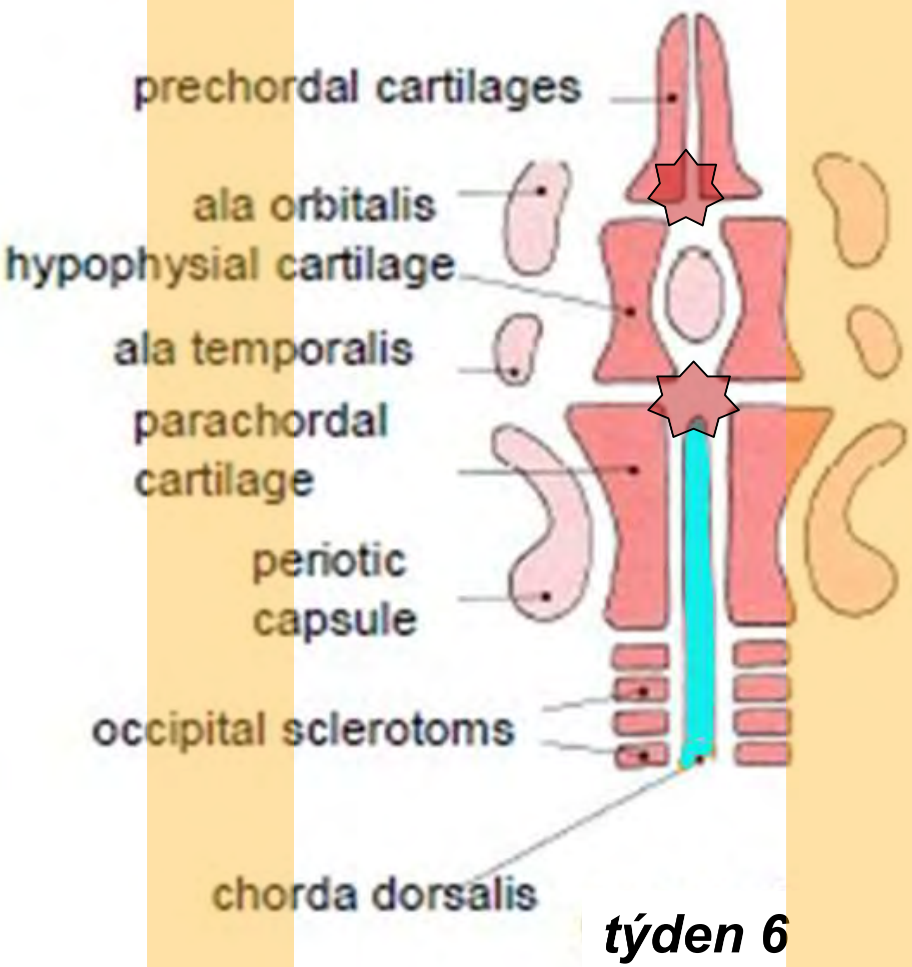
C Bones of the neurocranium (gray) and viscerocranium (orange)
Left lateral view. The skull forms a bony capsule that encloses the brain, sensory organs, and viscera of the head. The greater size of the neurocranium (cranial vault) relative to the viscerocranium (facial skeleton) is a typical primate feature directly correlated with the larger primate brain.

desmocranium chondrocranium



D Ossification of the cranial bones
Left lateral view. The bones of the skull either develop directly from mesenchymal connective tissue (intramembranous ossification, gray) or form indirectly by the ossification of a cartilaginous model (enchondral ossification, blue). Elements derived from intramembranous and endochondral ossification (desmocranium, chondrocranium) may fuse together to form a single bone (e.g., the occipital bone, temporal bone, and sphenoid bone).
The clavicle is the only tubular bone that undergoes membranous ossification. This explains why congenital defects of *intramembranous* ossification affect both the skull and clavicle *(cleidocranial dysostosis)*.

Vývoj kostí base lební

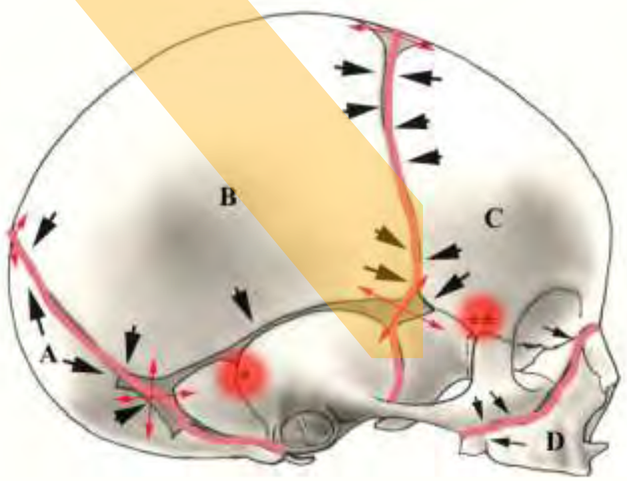


týden 6

Edwin Stephen Goodrich
1868-1946

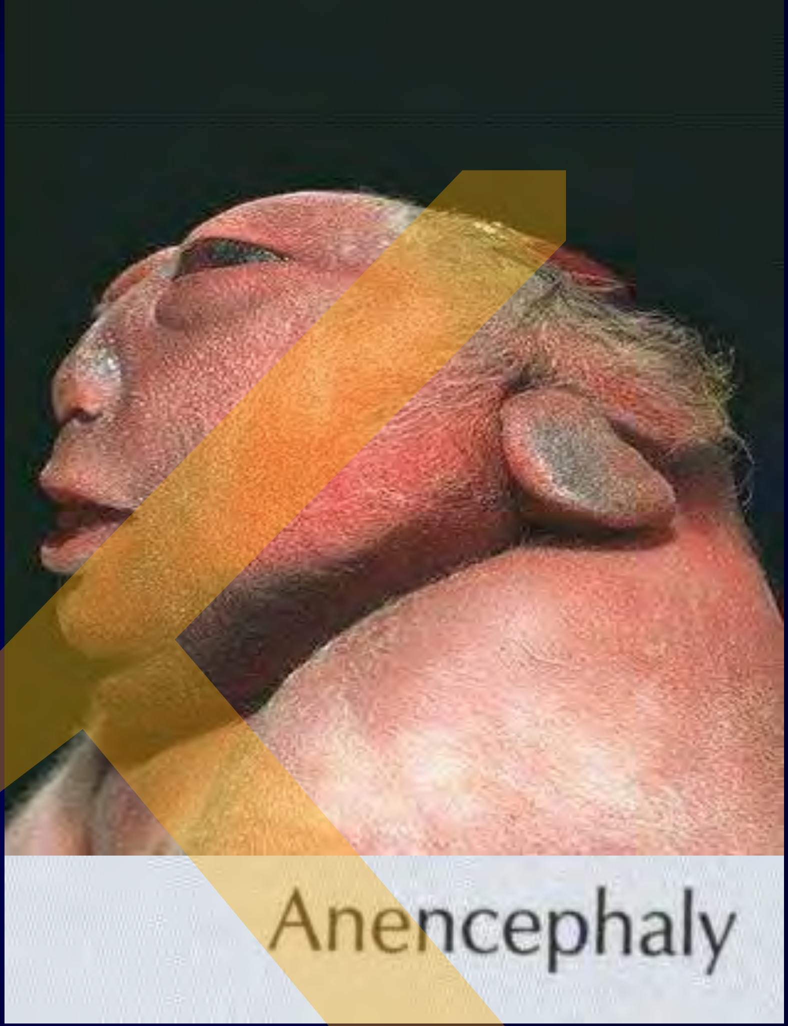
Studies on the Structure & Development of Vertebrates

The evolution of living organisms



Holoprosencephalia
příklad: Cyclopia

Cyclopia. S.S. Gellis and M. Feingold. Atlas of Mental Retardation Syndromes. 1968.



Acrania
příklad: Anencephalia


otocephalia, otoencephalia, agnathia

Postnatální růst ukončuje tvarové změny na kostech; později i uspořádání vnitřní struktur

Lebeční klenba (calvaria,cap) ! ? !

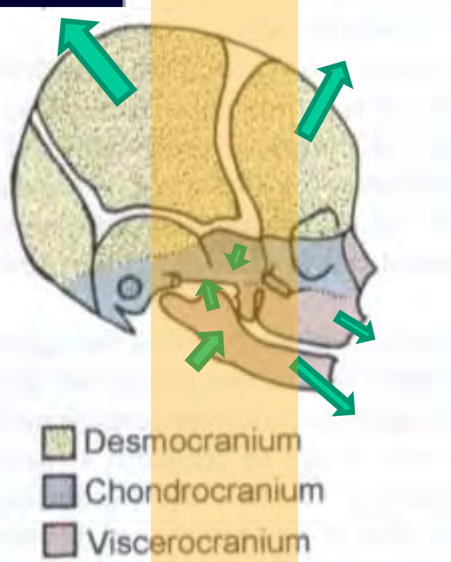
maxilla

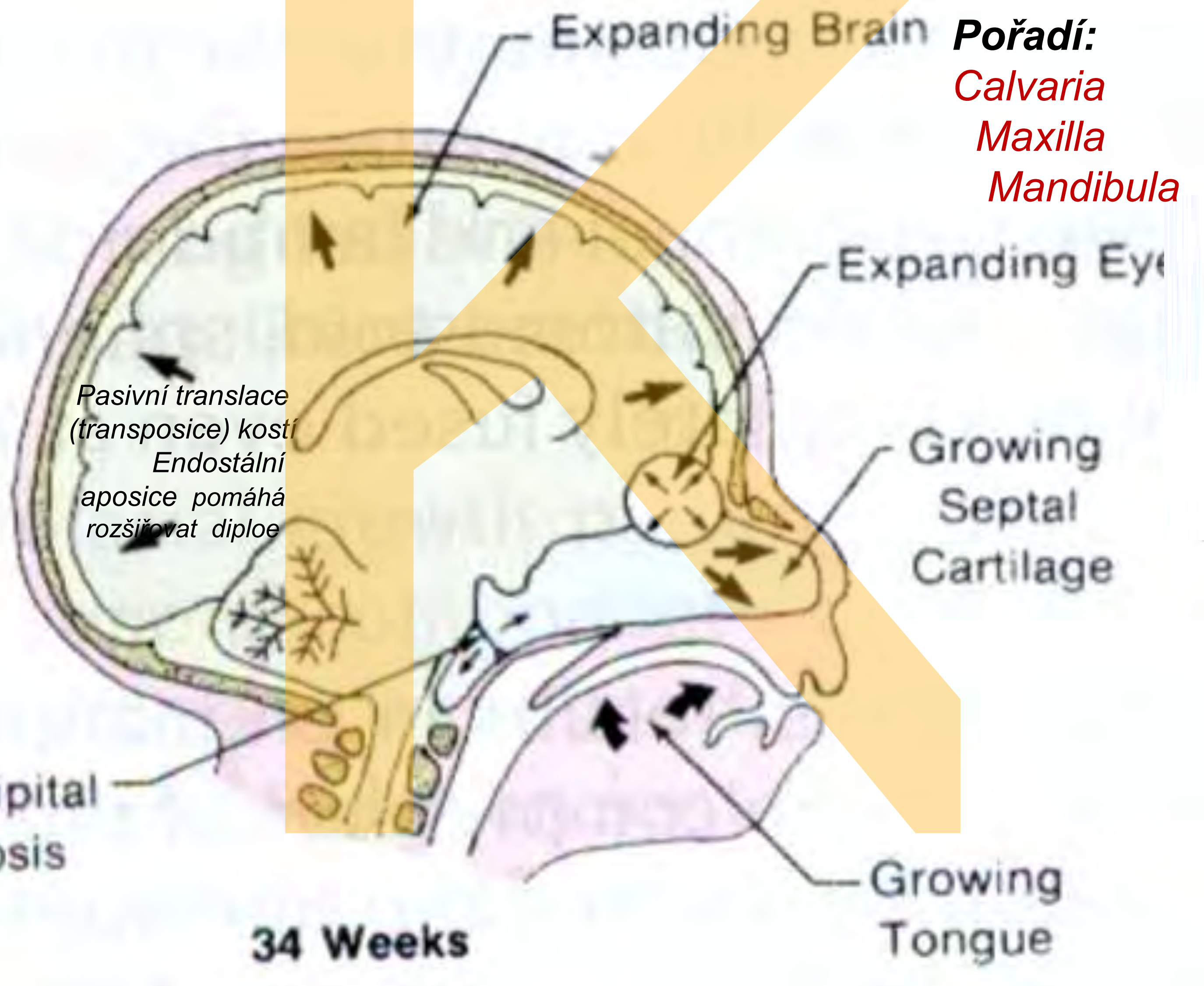
mandibula

Hlavní děje, které určují tvar lebky

zvětšování mozku; osifikace synchondrosis sphenooccipitalis; zvětšování očního bulbu, tah svalů; rostoucí nosní přepážka; prořezávání zubů

Growth types:
General – to 70% final size 6 yr
Cranial – to 80% final size 6 yr
Facial – to 80% final size 6 yr





Pořadí:
Calvaria
Maxilla
Mandibula

Mezi 6-18 rokem se šířka obličeje u chlapců zvětší o 21 mm u dívek o 18 cm

Postnatálně nejvíce roste hloubka nosu a nejméně výška horního rtu

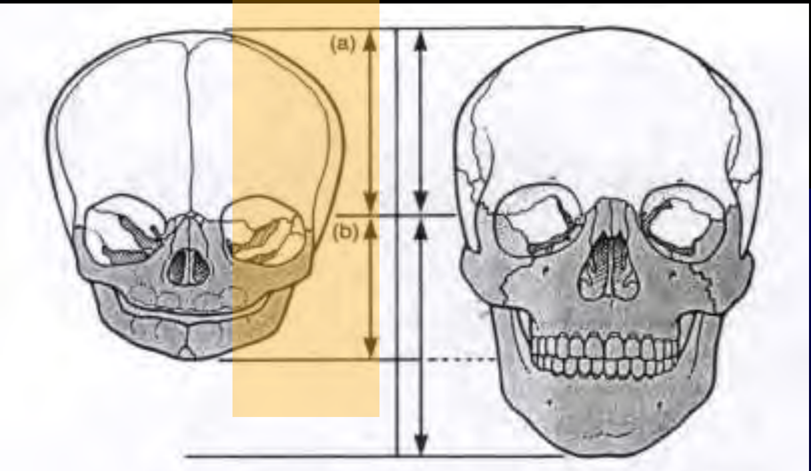
neonatus

1 rok

27 let

juvenilis

Změna tvaru



Growth of the skull. The height of the cranial vault (distance between planes a and b) is drawn the same in both the infant and adult skulls. Growth of the skull occurs almost exclusively within the bones of the facial region.

Šířka obličeje – začíná se zvětšovat dříve

Délka obličeje – ukončuje růst později

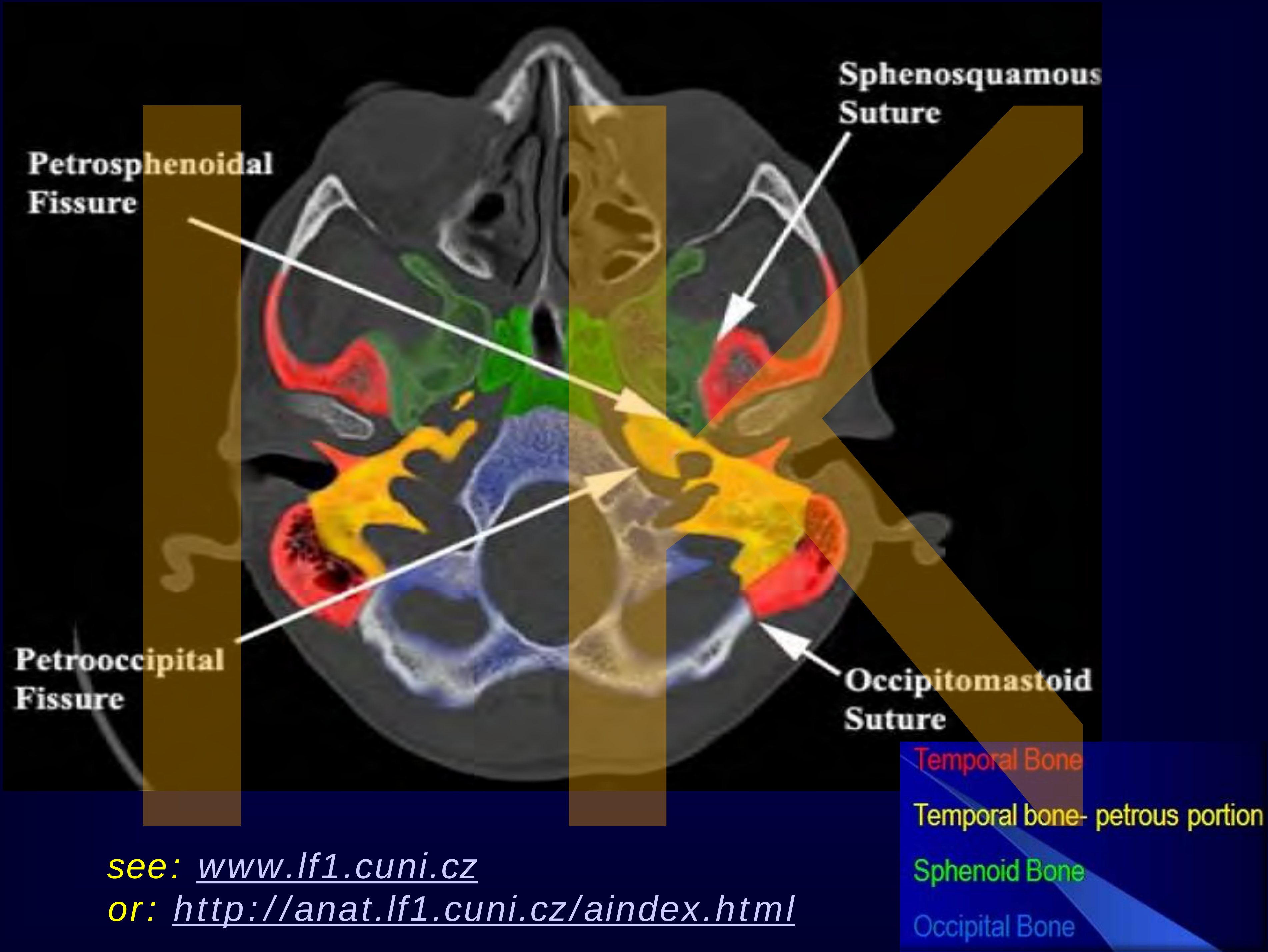
Růst lebeční baze

1 rok   os frontale (sinus frontalis)
4 rok cribriform lamina of ethmoidal bone
7 rok   spheno-ethmoid,-frontal; fronto-sphenoid

Resorptivní oblasti – okolo foramen lacerum , fossa jugularis, lamina medialis proc. pterygoideus

Pořadí:
Nazozygomaxillární komplex – roste ze sutur okolo maxilly
Crista infrazygomatica –
sutura palatina transversa

after Enlow 1968
Sedý 2013

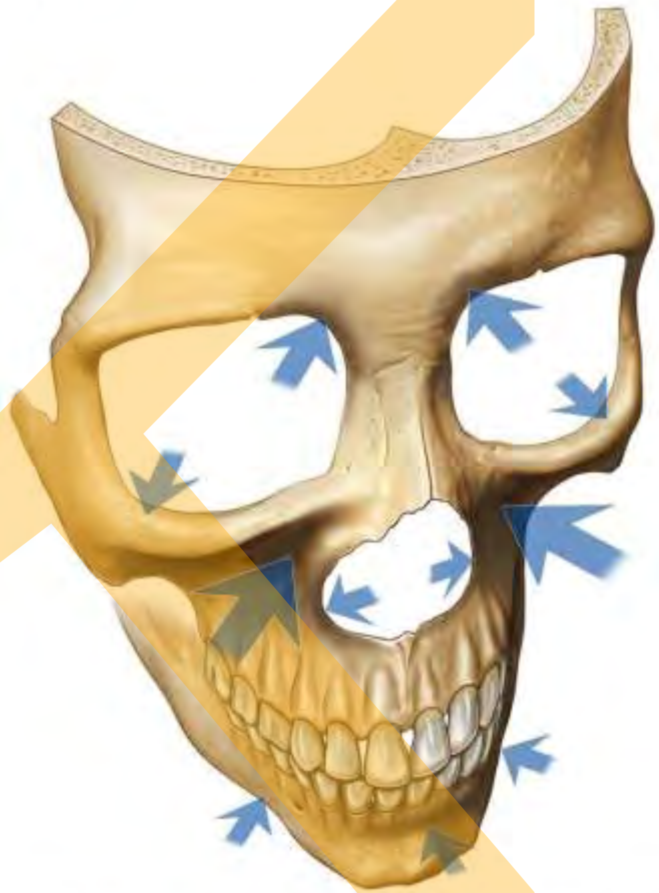


see: www.lf1.cuni.cz
or: http://anat.lf1.cuni.cz/aindex.html

PMC full text: Aesthetic Plast Surg. 2012 Aug; 36(4): 753–760.
Published online 2012 May 12. doi: 10.1007/s00266-012-9904-3

Fig. 4

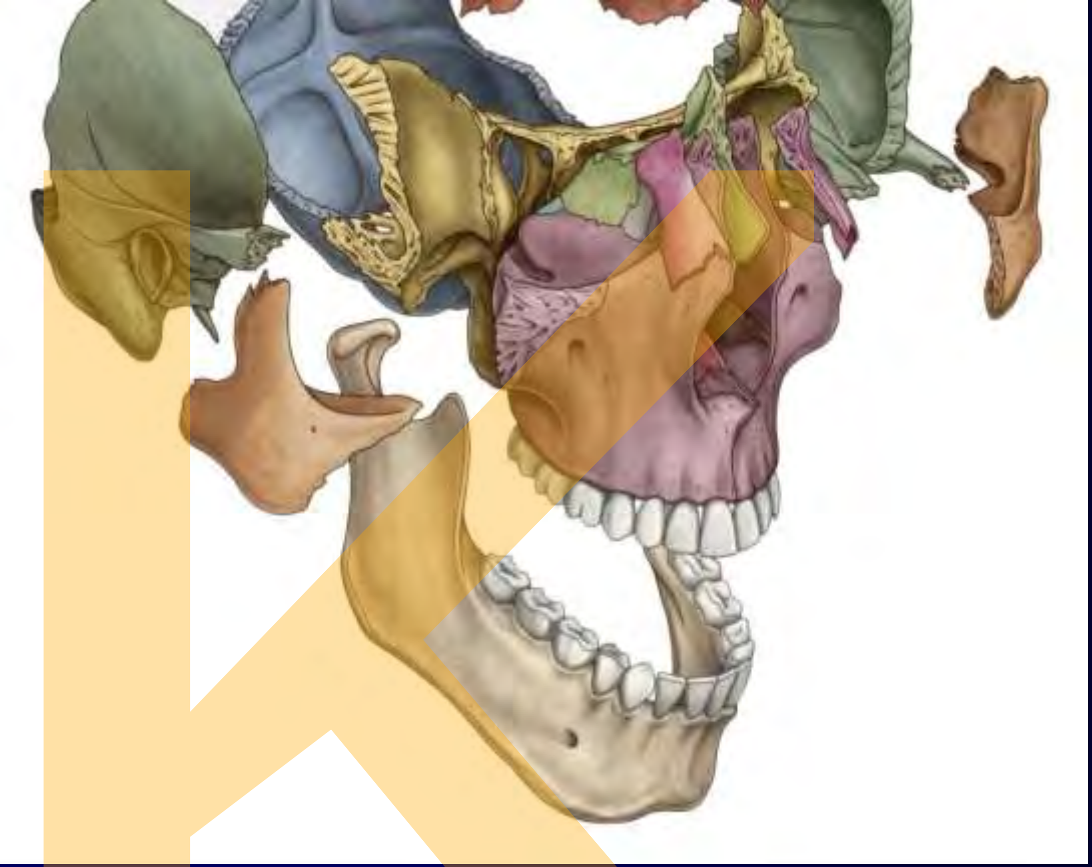
Fig. 5



Arrows indicate the areas of the facial skeleton susceptible to resorption with aging. The *size of the arrow* correlates with the amount of resorption

The loss of bone in the pyriform area weakens the support of the lateral crura. Deepening of the maxilla results in posterior positioning of the nasolabial crease and adjacent upper lip

Čelisti
γνάθος
(gnathos)



Maxilla
Střední a dolní obličejová etáž
Mandibula
Dolní obličejová etáž

TVAR
  genetické určení

VNITŘNÍ STRUKTURA
  tah a tlak úponů kolemčelistních svalů a vývoj zubů

UTVÁŘENÍ
  funkční zatížení a splývání dříve vyvinutých základů

PŘESTAVBA V ZÁVISLOSTI NA VĚKU
  měnící se funkční zatížení, dědičnost

Růst maxily

Podél osy procházející intraalveolárním septem

mezi lateral dočasným řezákem a špičákem

(„opening bridge“)

ventrokaudálně

Vliv sutur frontomaxillaris, zygomaticomaxillaris, pterygopalatina

Vliv sutur incisiva et intermaxillaris

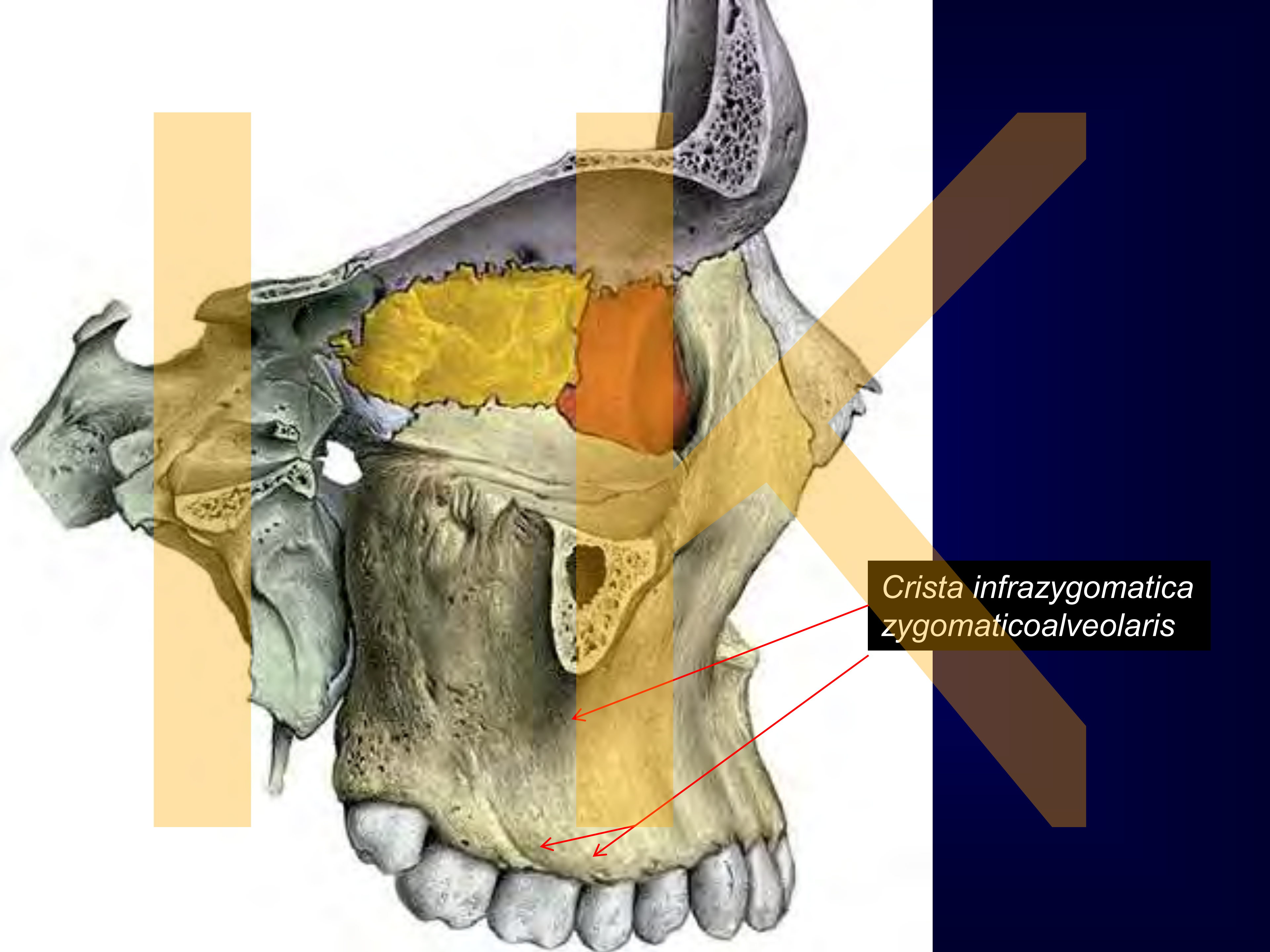
kaudálně

septum nasi

Vliv na okolní struktury

postnatálně

sutura palatina mediana (7-19 rok roste o cca 5 mm)

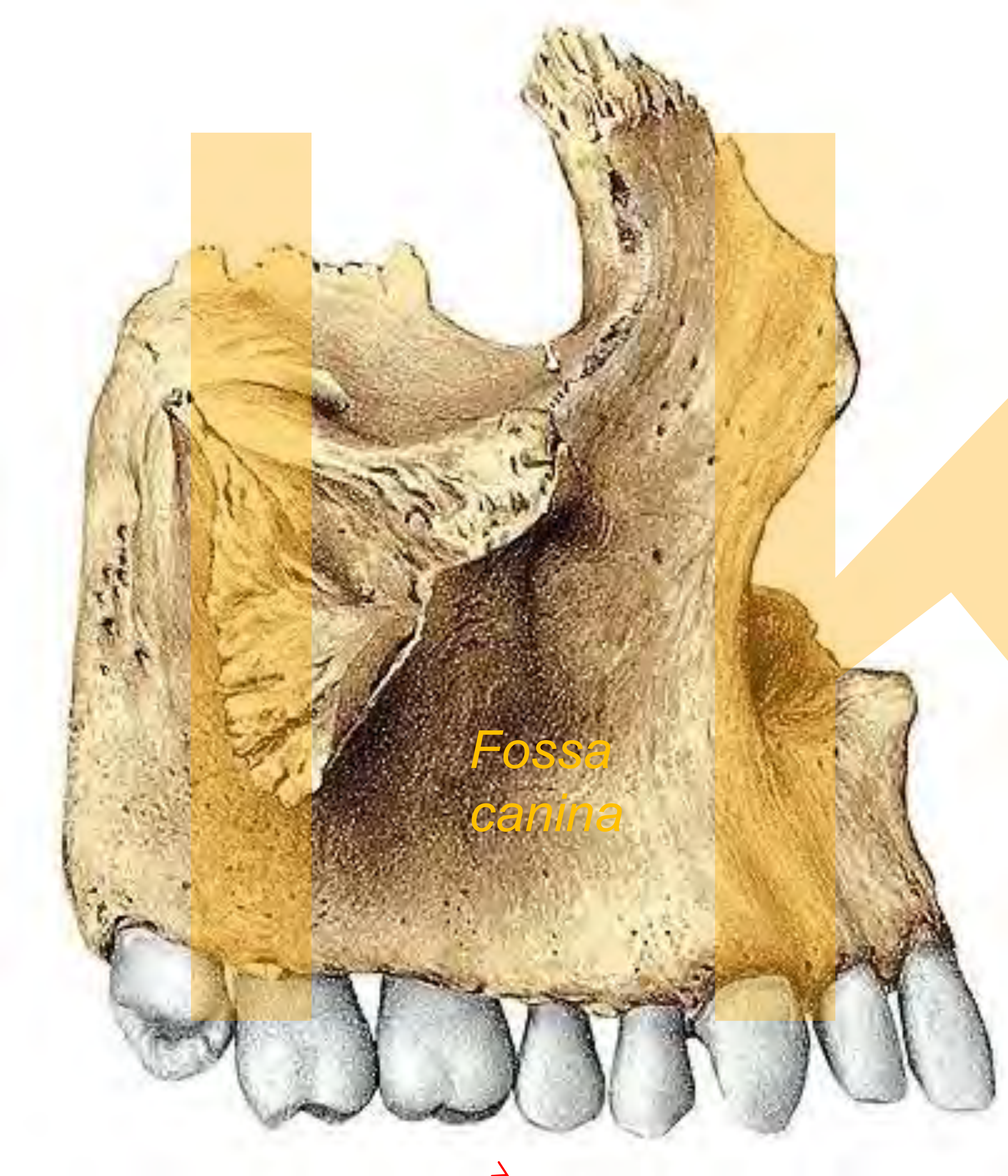

Crista infrazygomatica
zygomaticoalveolaris

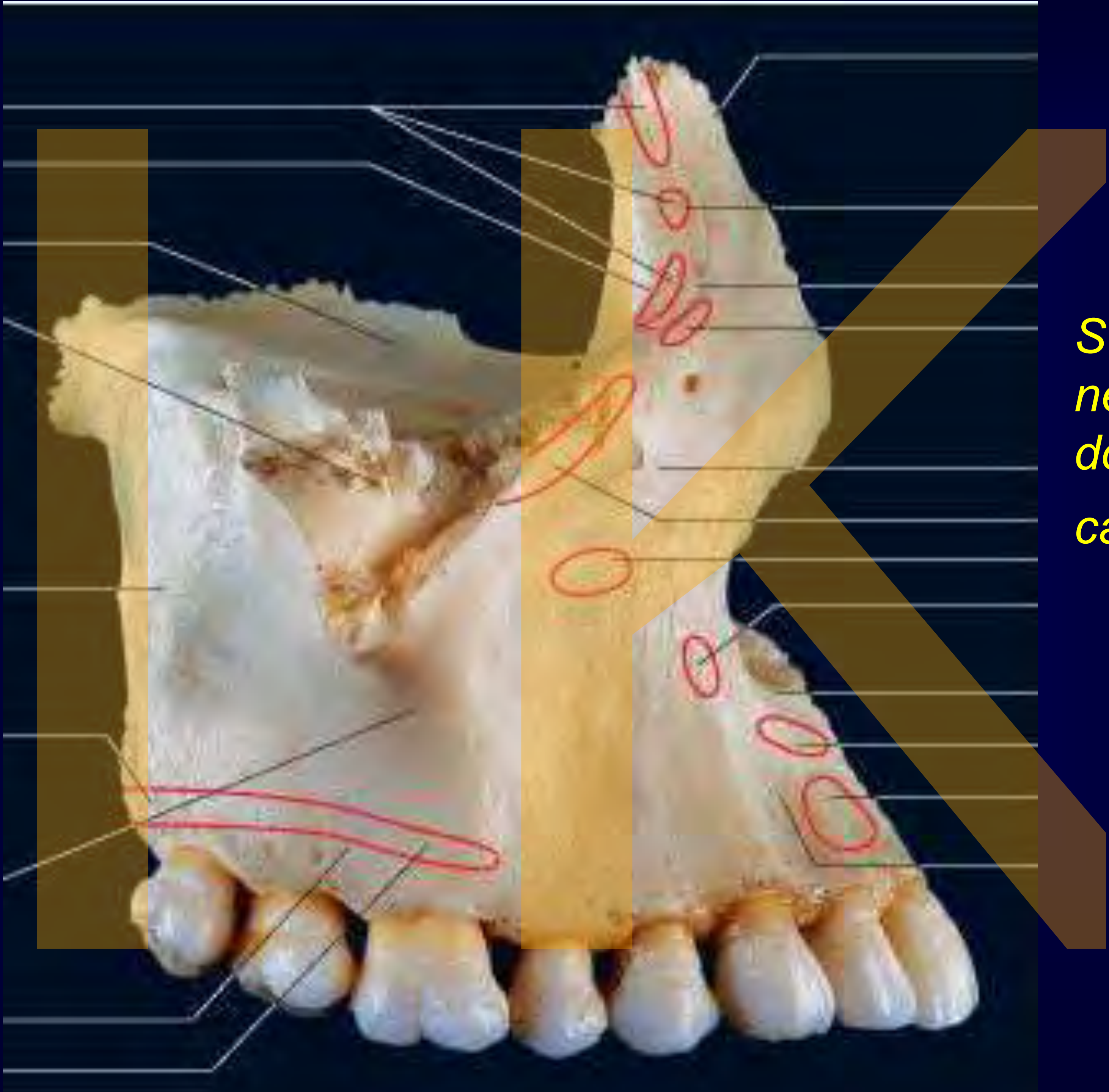
Maxilla

Corpus
Proc. frontalis
Proc. zygomaticus
Proc. Alveolaris
Processus palatinus

Sinus maxillaris (antrum Highmori) – otevřen do dutiny nosní jako hiatus maxillaris

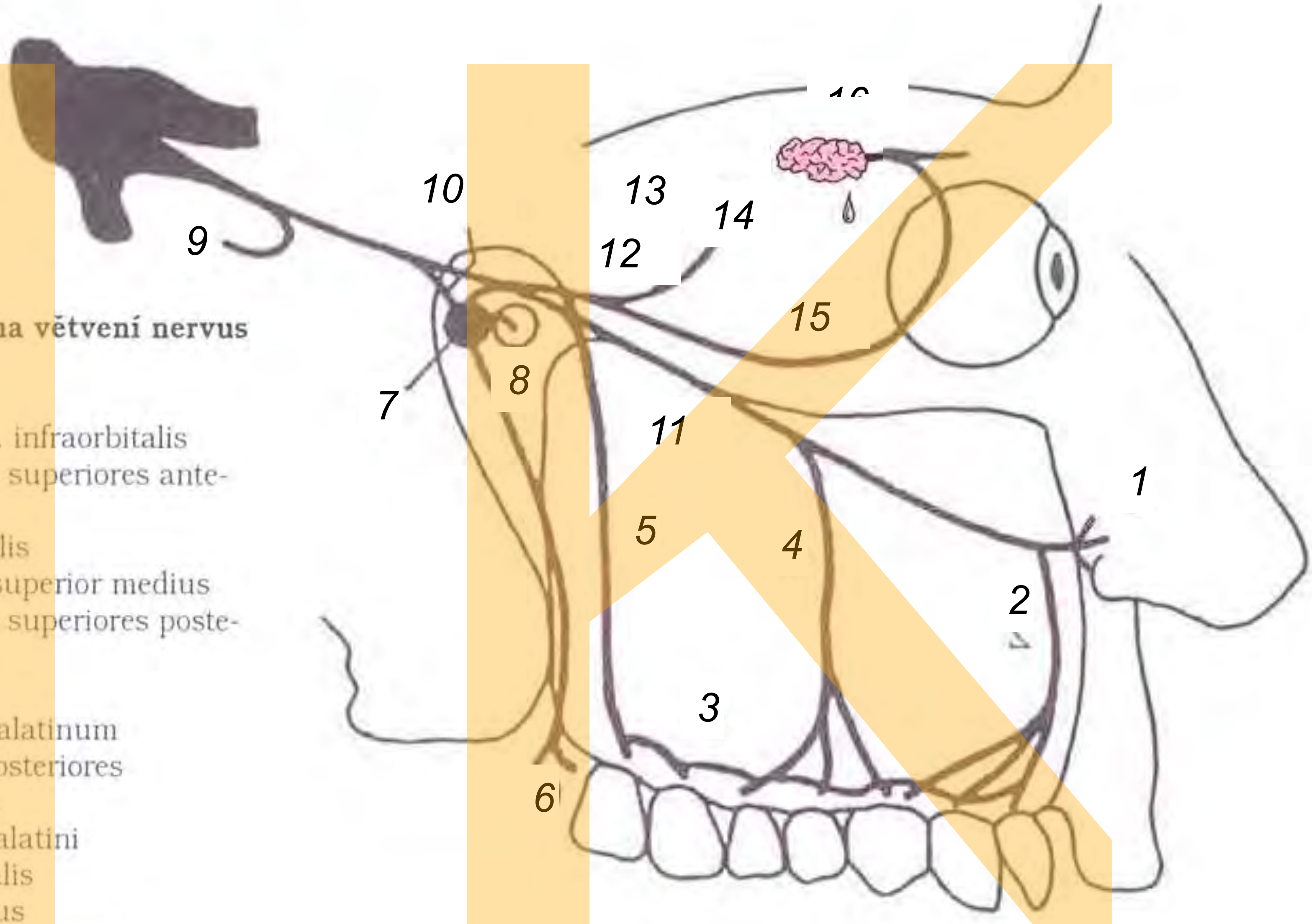
Fossa lacrimalis





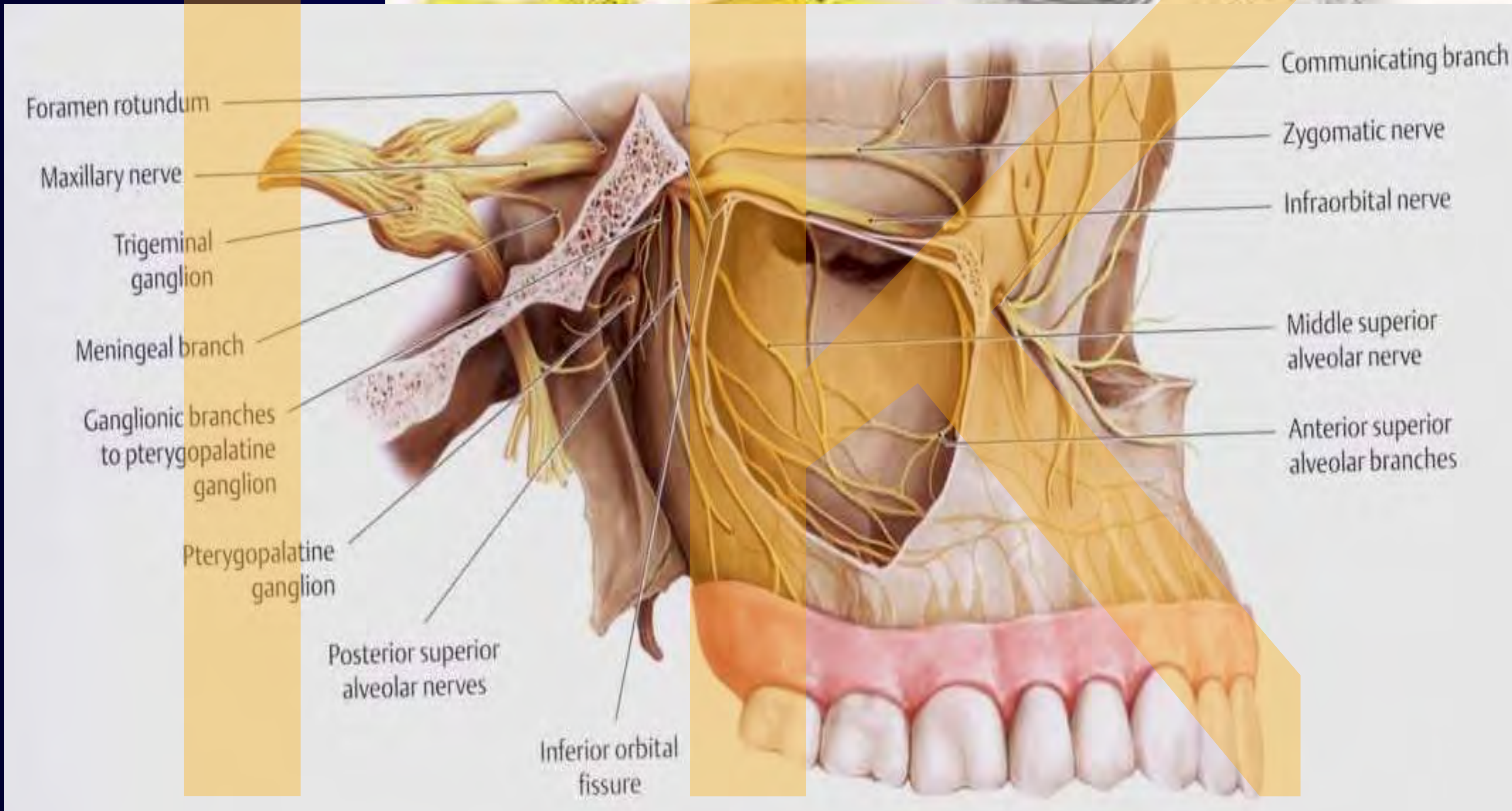
Svaly se neupínají do fossa canina !!

V_2



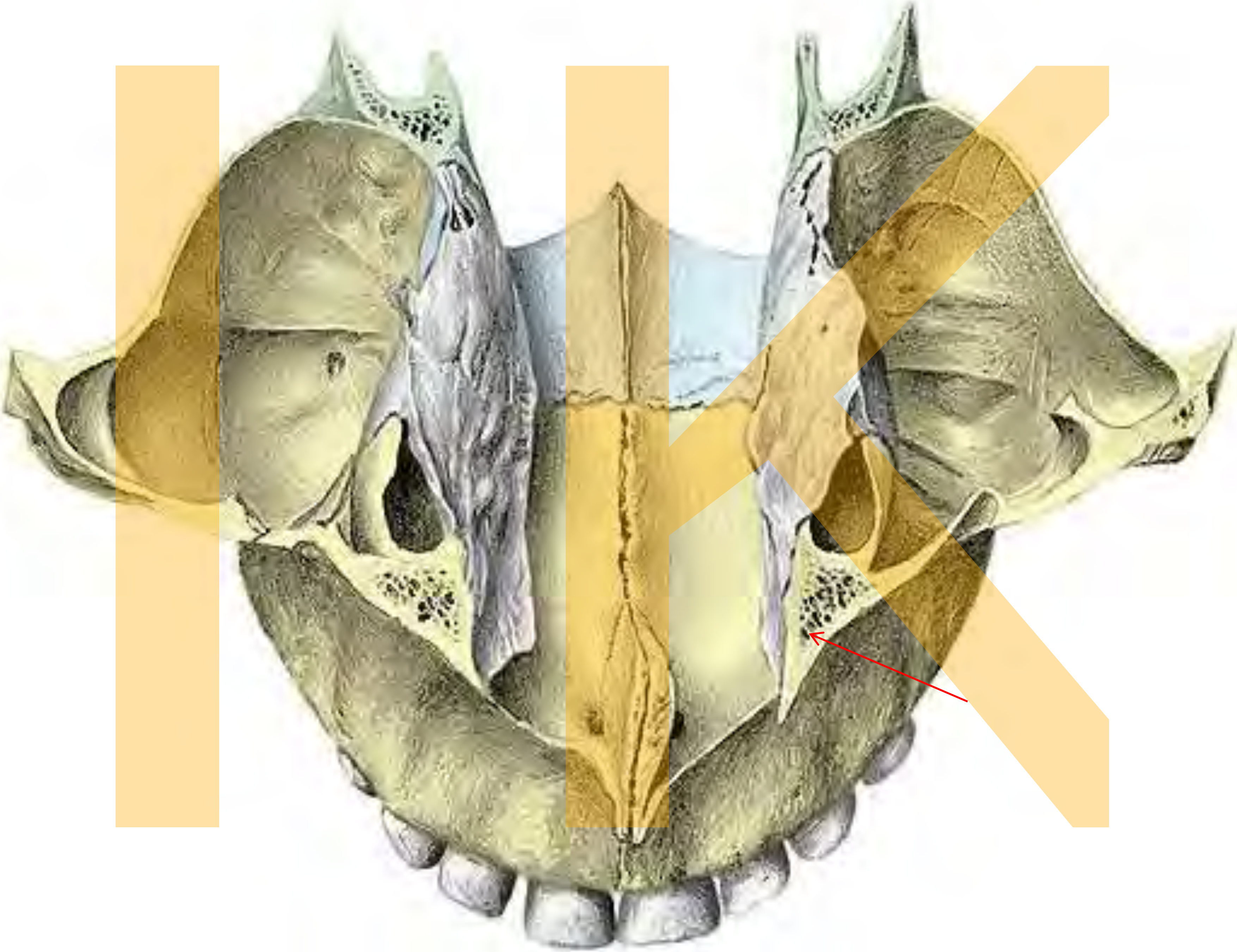
Obr. 31/II. Schéma větvení nervus maxillaris.

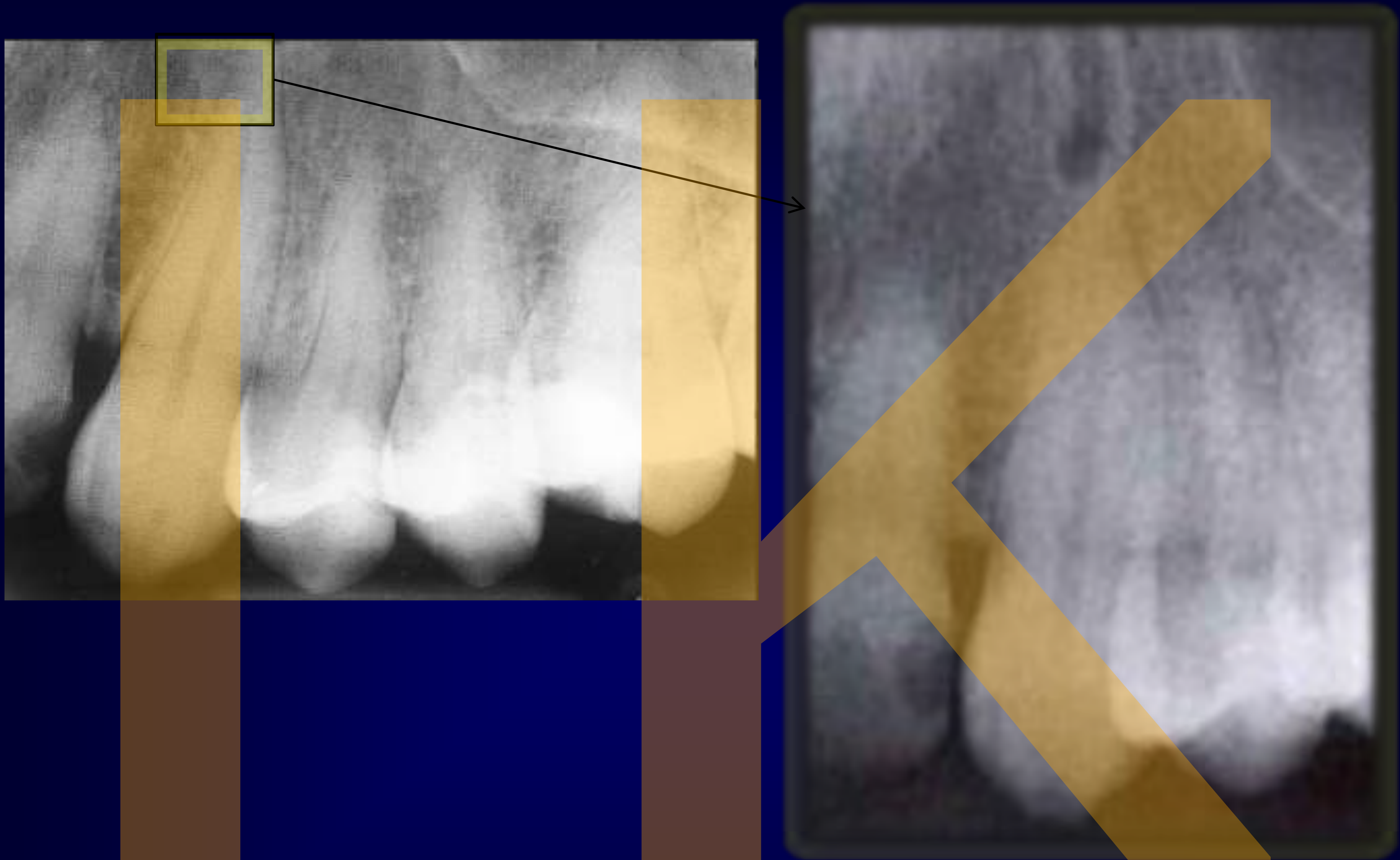
1 – rr. cutanei n. infraorbitalis
2 – rr. alveolares superiores anteriores
3 – plexus dentalis
4 – r. alveolaris superior medius
5 – rr. alveolares superiores posteriores
6 – nn. palatini
7 – ggl. pterygopalatinum
8 – rr. nasales posteriores
9 – r. meningeus
10 – nn. pterygopalatini
11 – n. infraorbitalis
12 – n. zygomaticus
13 – n. zygomaticotemporalis
14 – n. zygomaticofacialis
15 – r. communicans cum nervo lacrimali
16 – n. lacrimalis



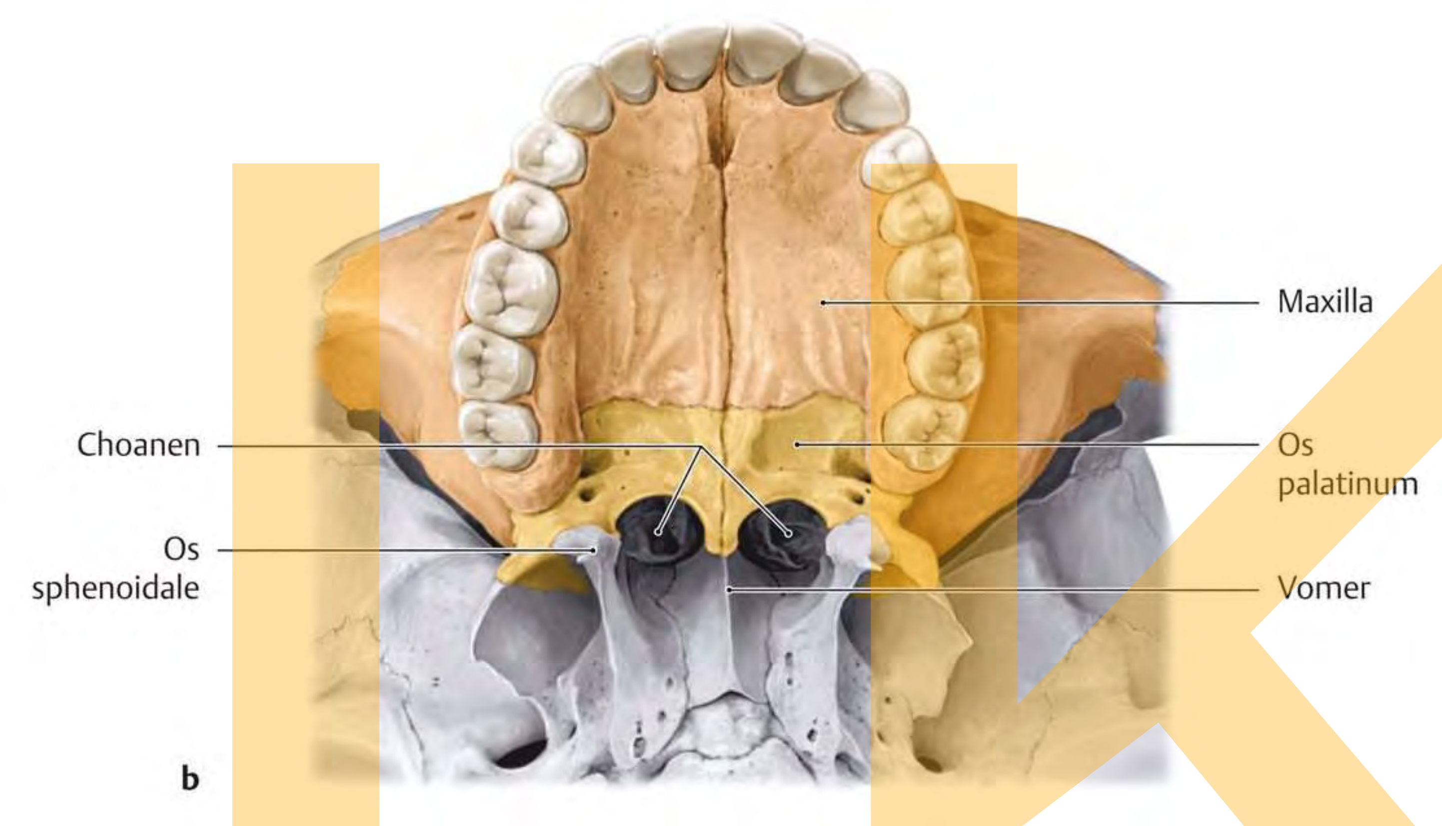
Foramen rotundum
Maxillary nerve
Trigeminal ganglion
Meningeal branch
Ganglionic branches to pterygopalatine ganglion
Pterygopalatine ganglion
Posterior superior alveolar nerves
Inferior orbital fissure
Communicating branch
Zygomatic nerve
Infraorbital nerve
Middle superior alveolar nerve
Anterior superior alveolar branches

(Pardanaudi)

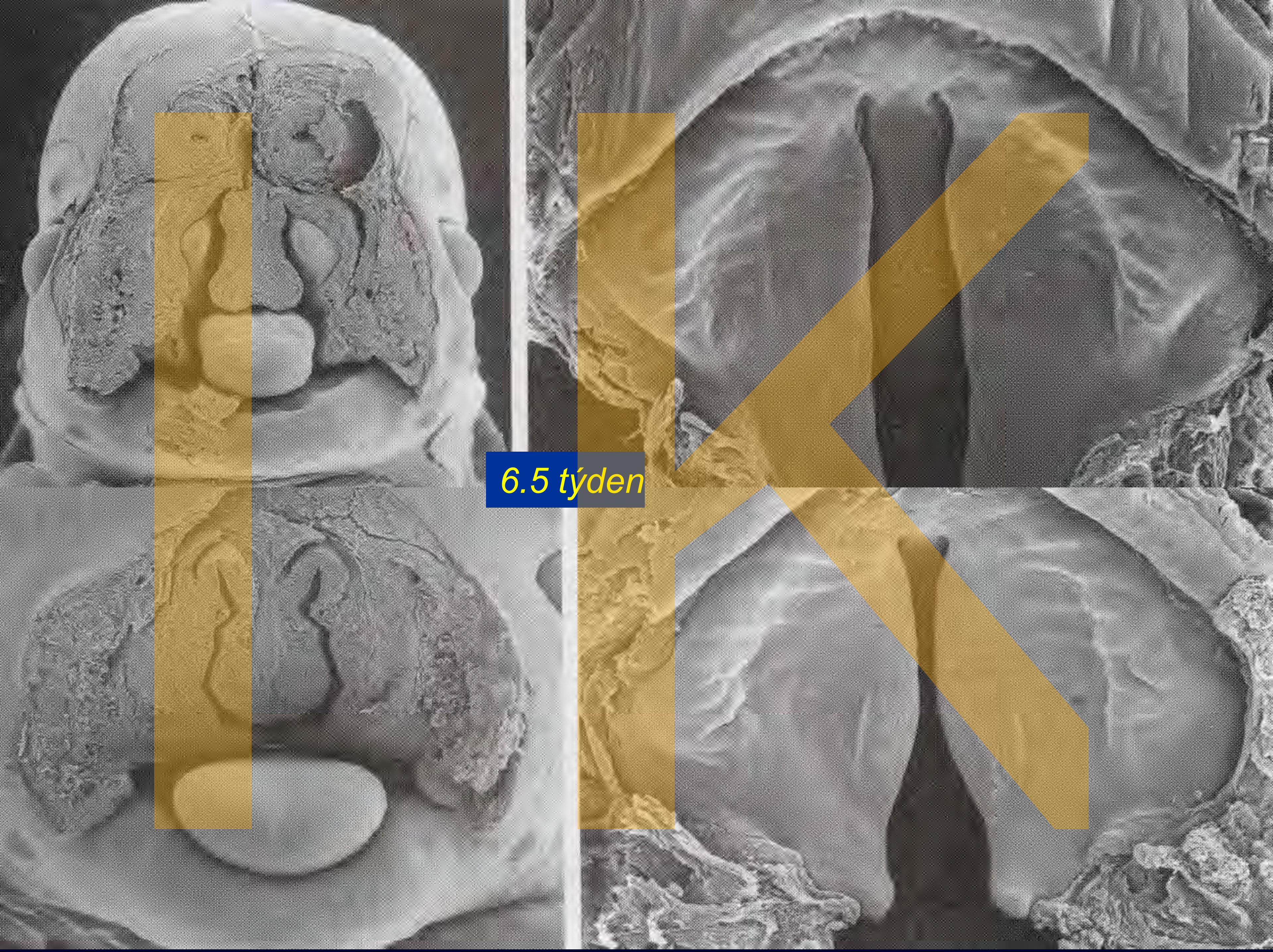


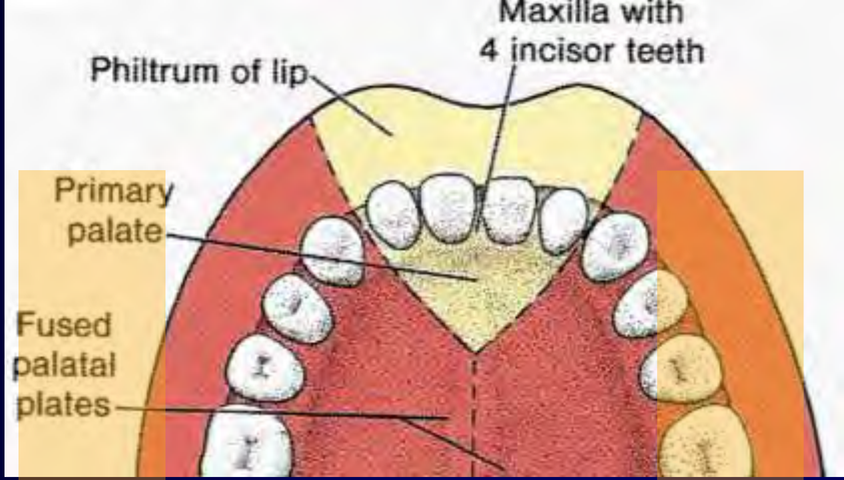


A M Shelley, V E Rushton & K Horner:
Canalis sinuosus mimicking a periapical inflammatory lesion
British Dental Journal 186, 378 - 379 (1999) Published online: 24 April 1999

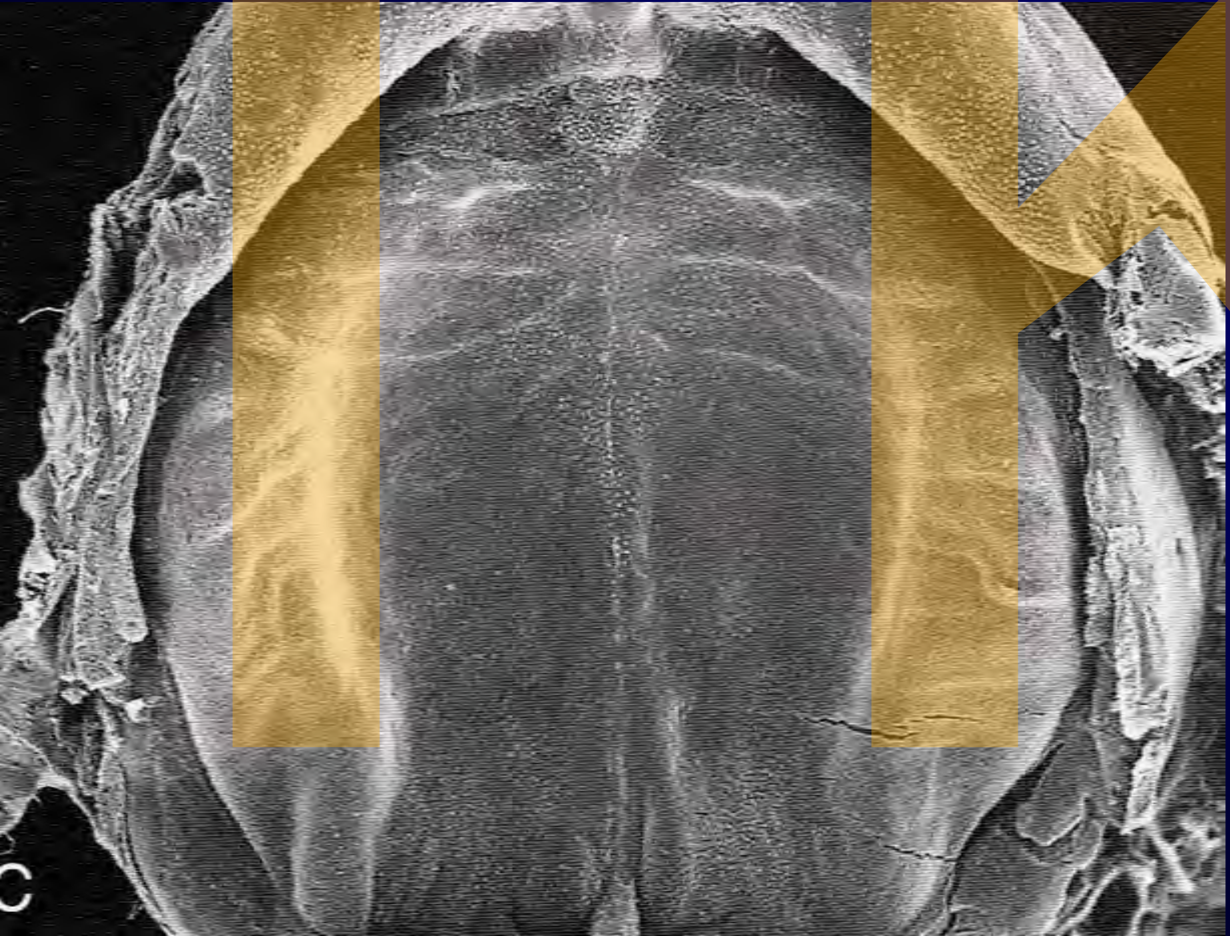


Palatum durum

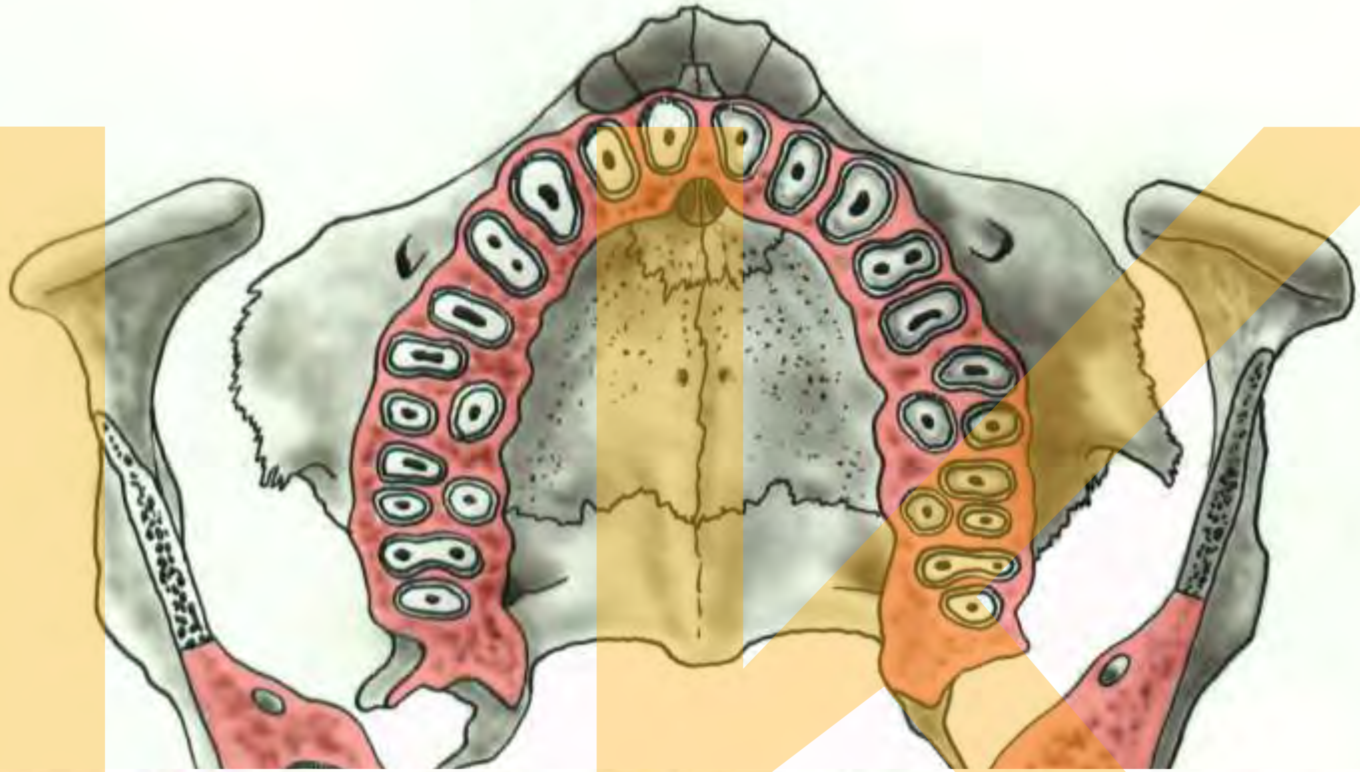

6.5 týden

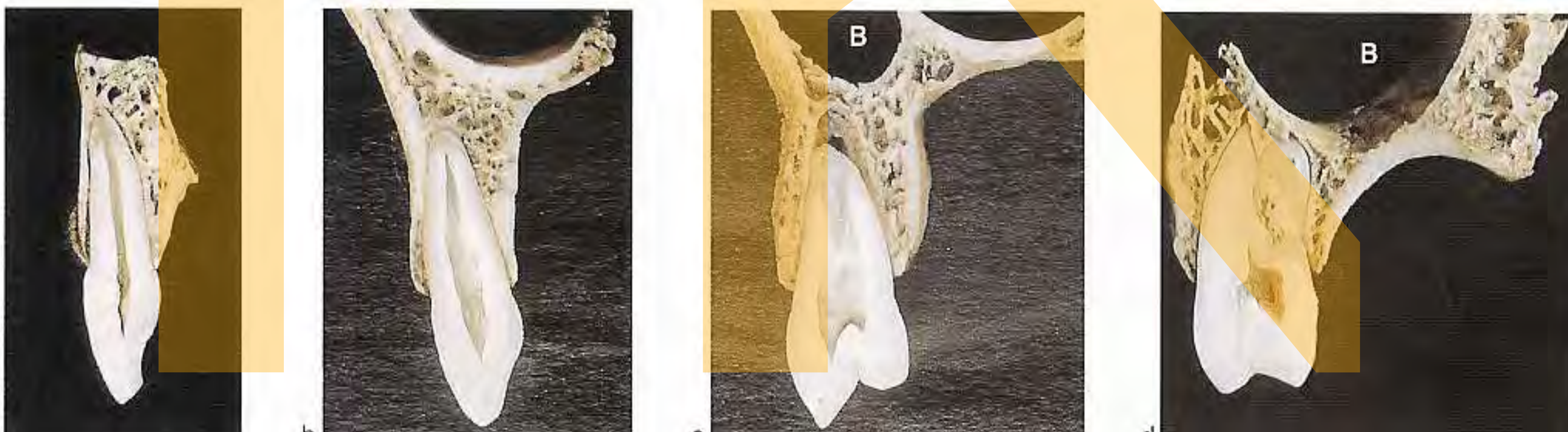


Patrové výběžky se spojují o týden později u žen než u mužů

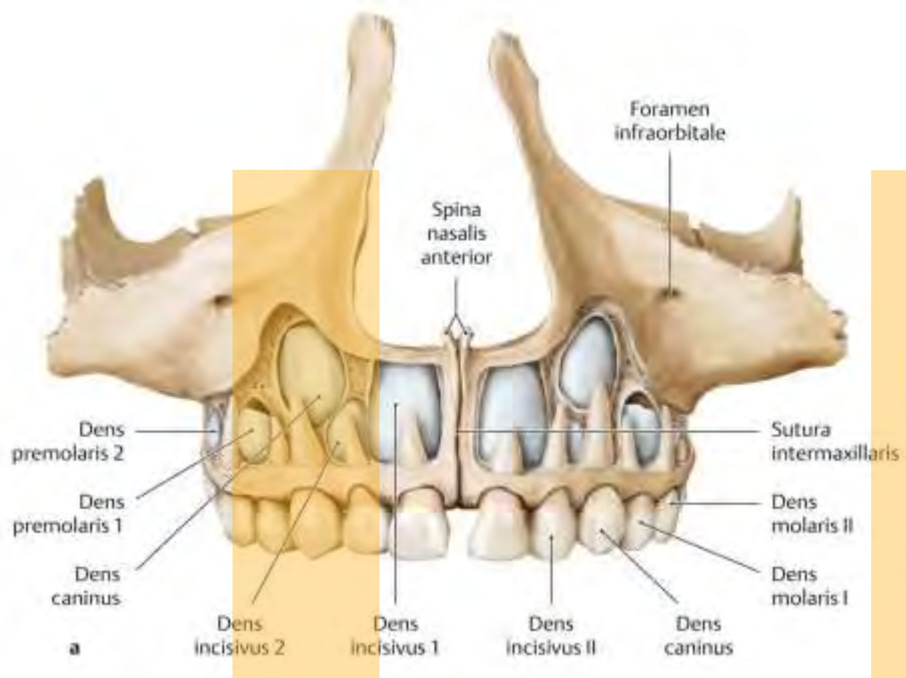


Týden 10





a b c d


Foramen infraorbitale
Spina nasalis anterior
Dens premolaris 2
Sutura intermaxillaris
Dens premolaris 1
Dens molaris II
Dens caninus
Dens molaris I
a
Dens incisivus 2
Dens incisivus 1
Dens incisivus II
Dens caninus

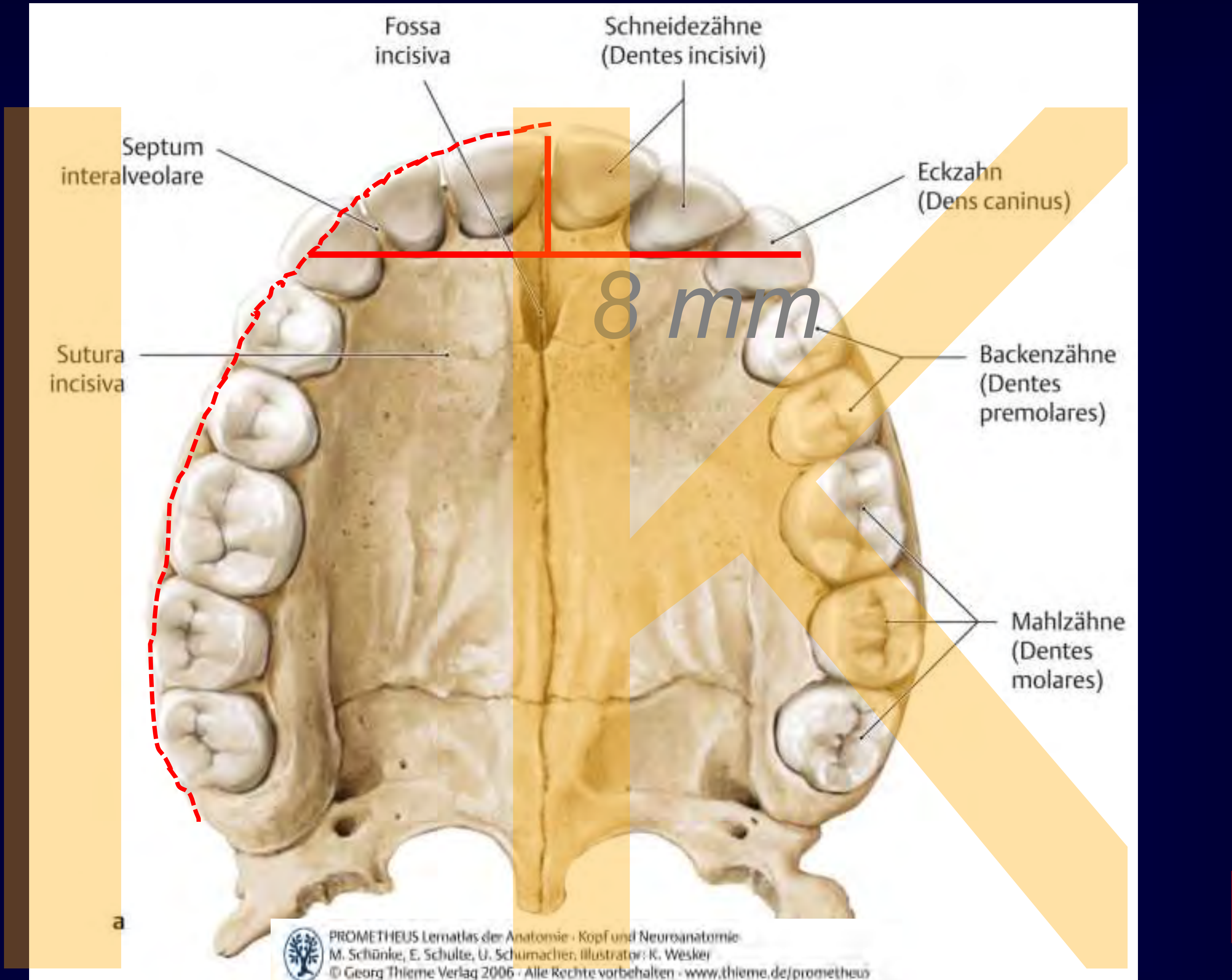
B


I1
I2

C

Erupce

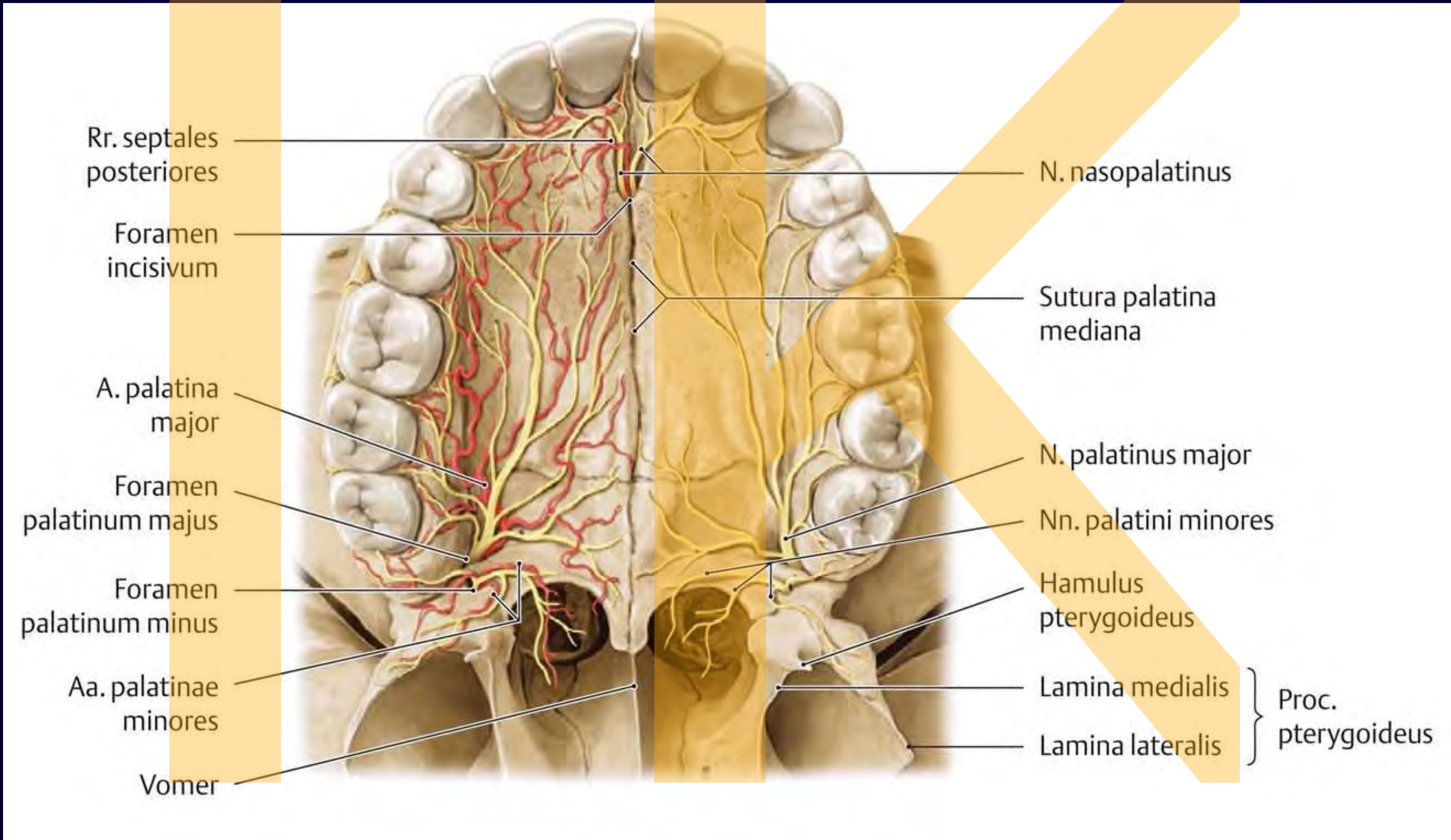

A



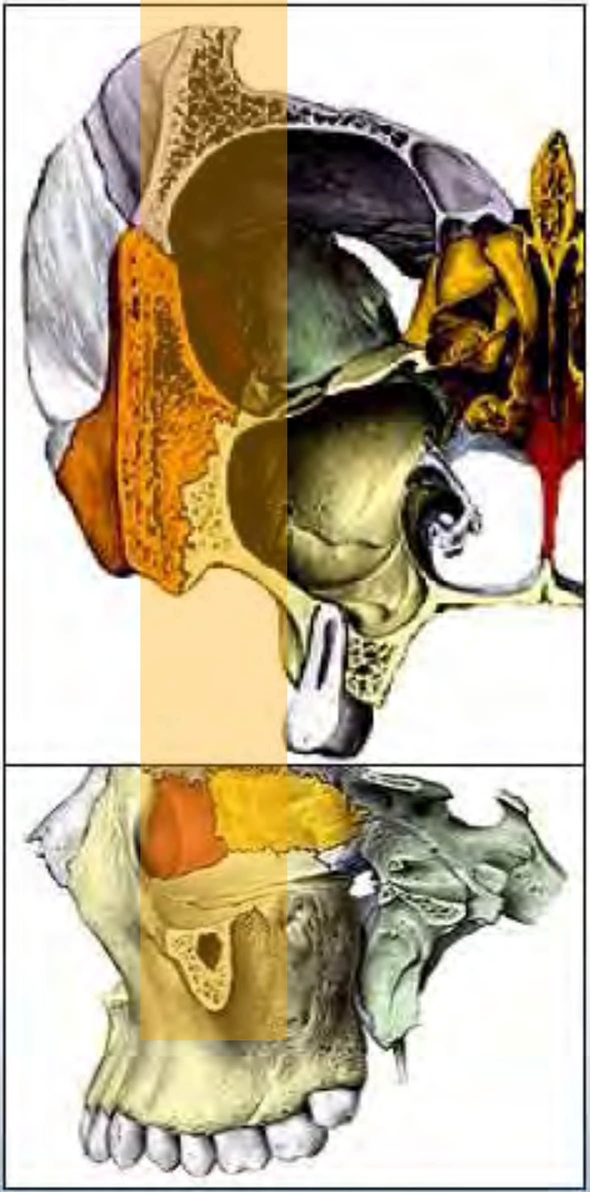
Hrbolková linie
Tubercular line

Vzdálenost od řezákového bodu ke spojnici mezi hroty špičáků
Distance between incisale point and line connecting tops of canini

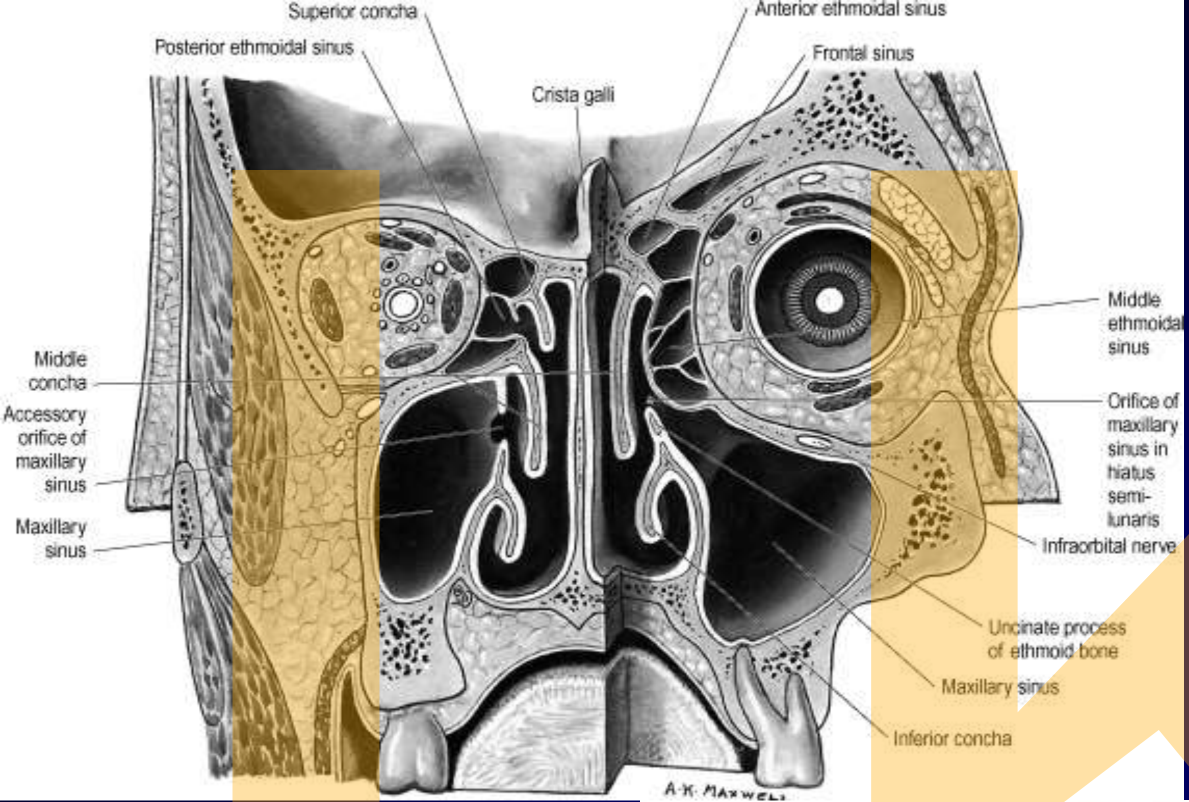
Sulcus palatinus major a jeho obsah



Sinus maxillaris



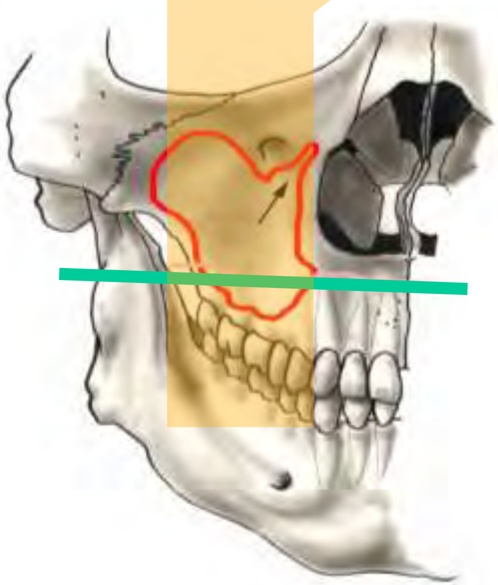
- antrum Highmori
- narození
  7x4x4 mm
- RTG
  4-5 měsíc
- bifasický růst
  0-3 let & 7-12 let
- 18 let: 34x33x23 mm
- topografie
  orbita - n. + vasa infraorbitalia
  pr. alveolaris – M1, M2, PM2, M3, C
  f. pterygopalatina & infratemporalis
  MNM – ostium + akces. ostia

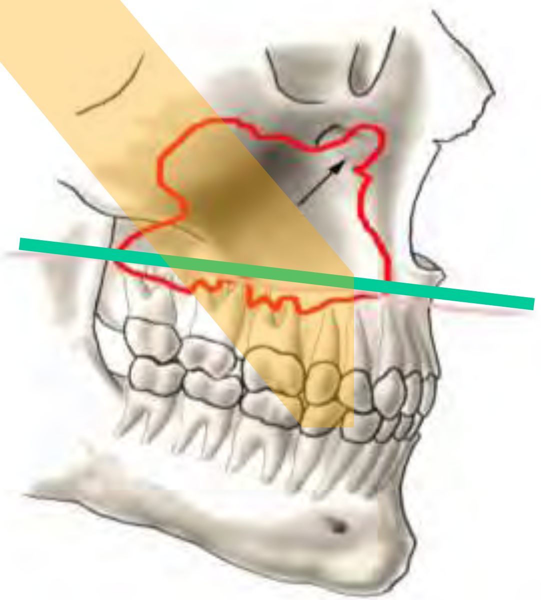


Stěna recessus frontalis je velmi tenká

„Maxillary duct Ductus maxillaris“

Linie patra palatum (palatal line)





Růst mandibuly

Růst kondylů

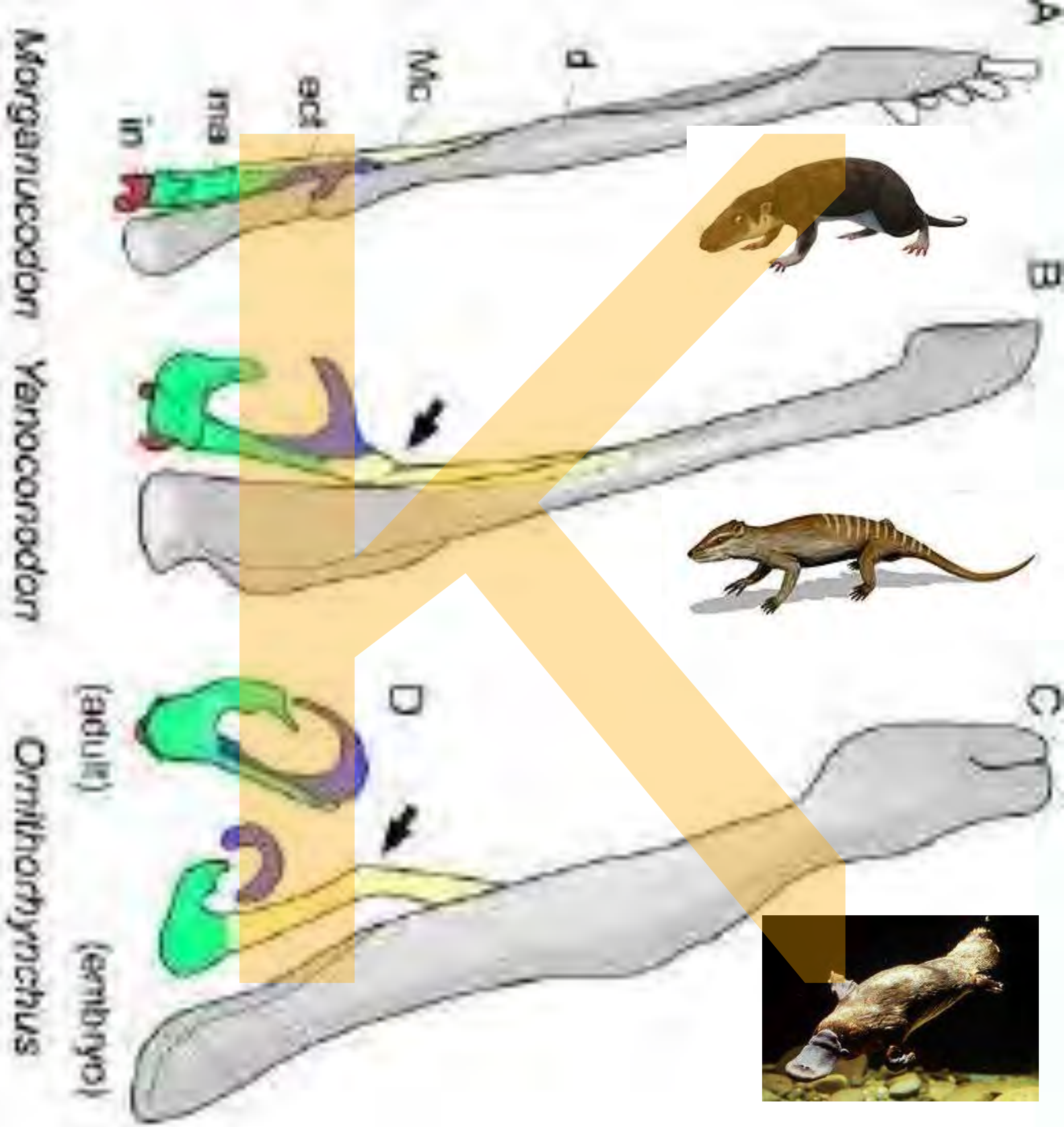
Relokace ramus mandibulae

Aposice na dorsálním povrchu ramus mandibulae

Foramen mandibulae ´mění´polohu:
Symphysis menti

Canalis mentalis

Figure 3. Evolution of the lower jaw skeleton in ancestral mammals (based on Luo et al., 2007). (A) Ventral view of the lower jaw of the most "primitive" mammal, *Morganucodon*. The ectotympanic and malleus are completely in contact with the dentary. By contrast, in *Yanoconodon* (B), the ectotympanic and malleus are connected anteriorly to the dentary via an ossified Meckel's cartilage, but these are mediolaterally separated from the posterior part of the dentary, facilitated by curvature of the cartilage (arrow). A similar condition is seen in an extant monotreme embryo, *Ornithorhynchus* (C). The middle ear bones of an adult *Ornithorhynchus* (D) demonstrate significant similarity to those of *Yanoconodon*. *Yanoconodon* seems to retain the embryonic pattern of *Ornithorhynchus* because of an earlier ossification of Meckel's cartilage, but otherwise its ectotympanic, malleus, and incus are almost identical to those of the adult *Ornithorhynchus*.

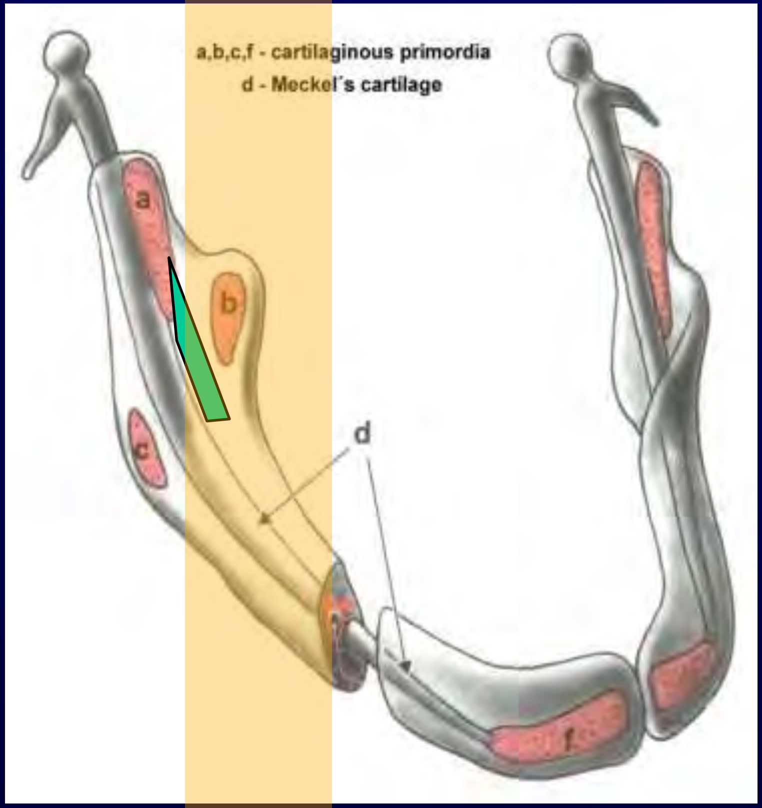


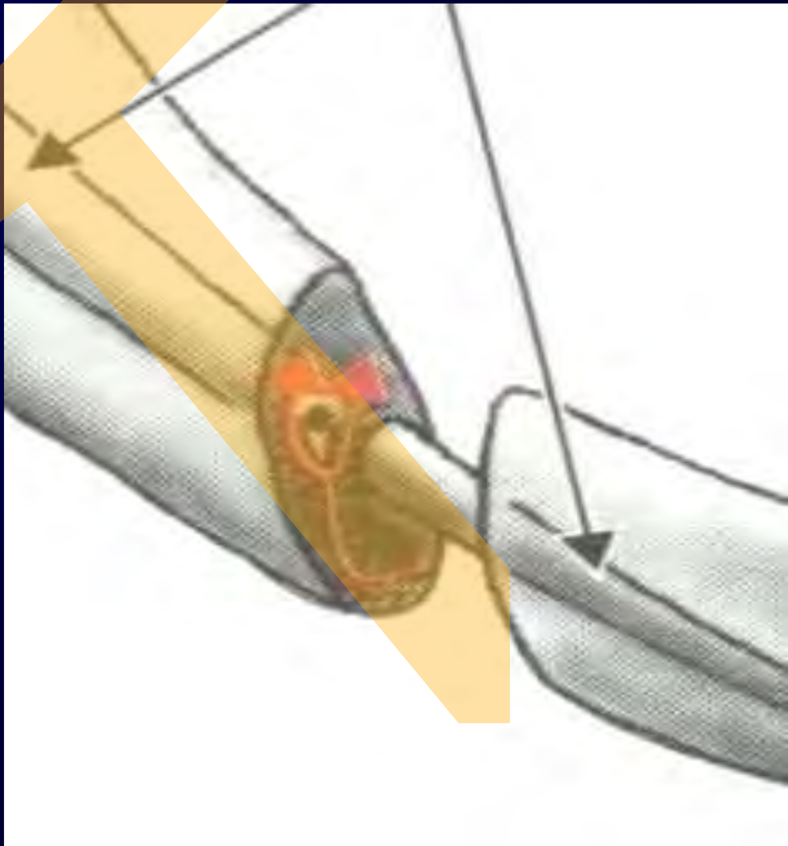
Pozdní triasový savec

Spodnokřídový savec

ptakopysk

Utváření canalis alveolaris inferior a těla mandibuly

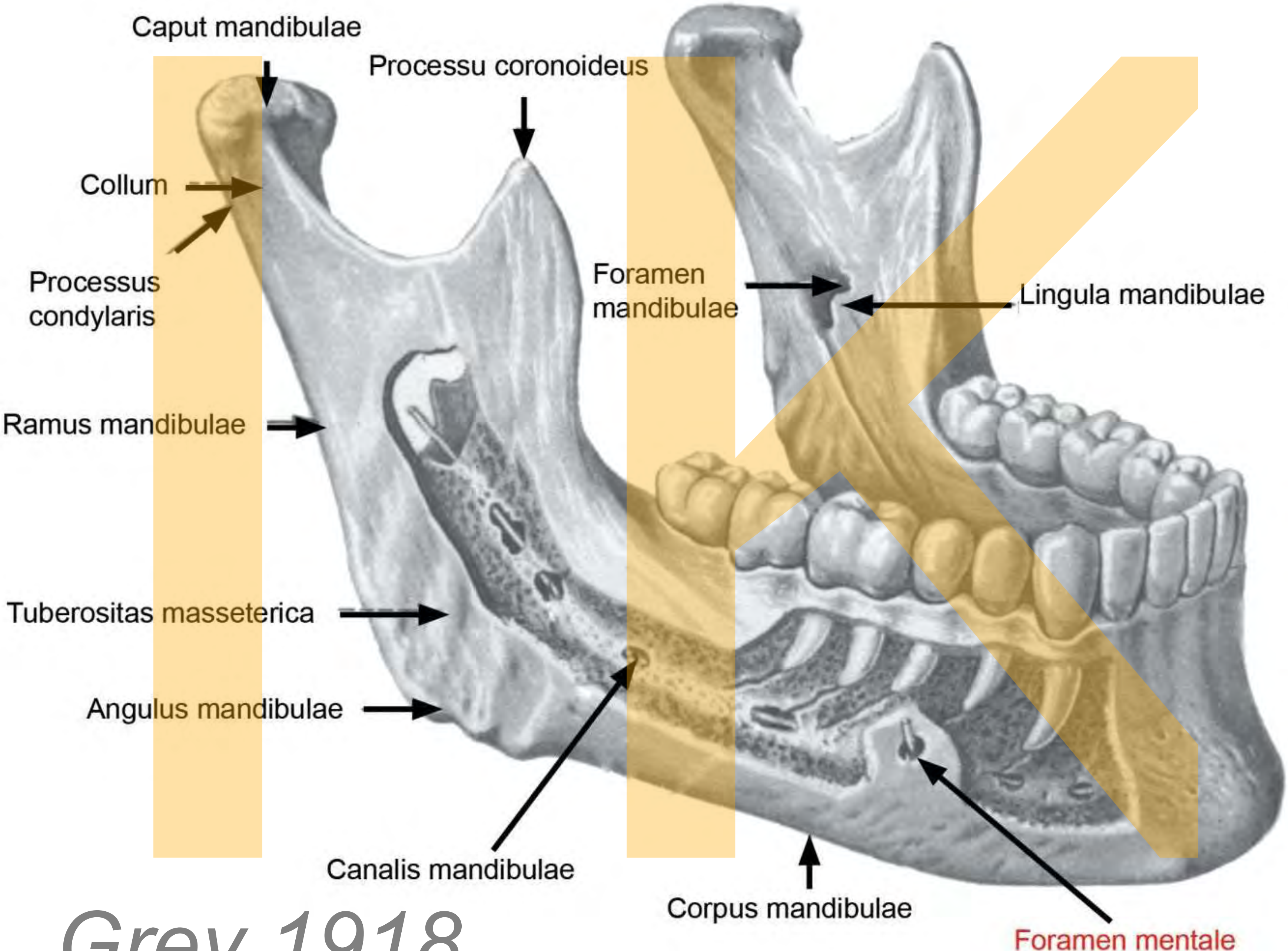




Druhotně vytvořená chrupavka

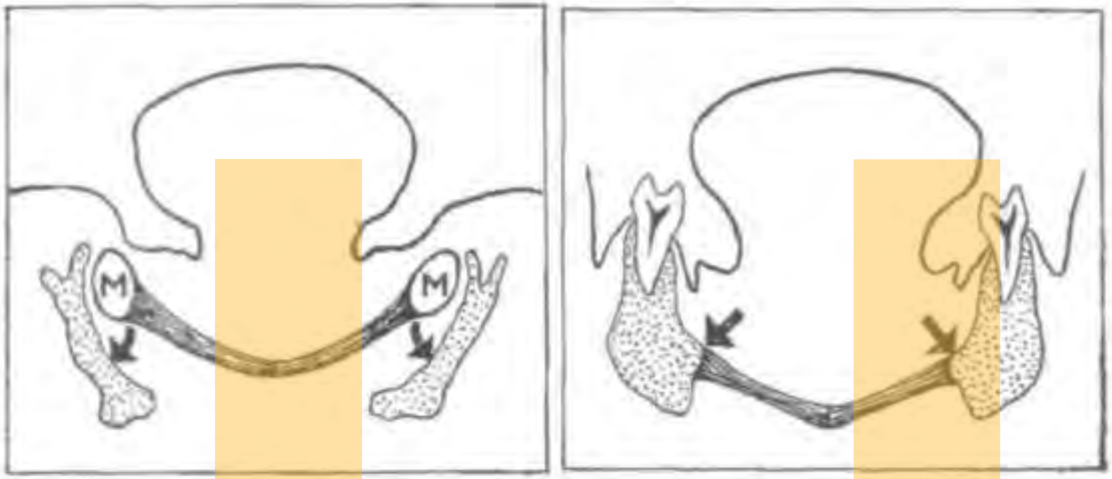
M.Doskočil: Chrupavka ve vývoji mandibuly. (cartilage in the development of the mandible) Cs.Stomatologie, 1:10-18, 1988

Klepáček, Mazánek et al. 200

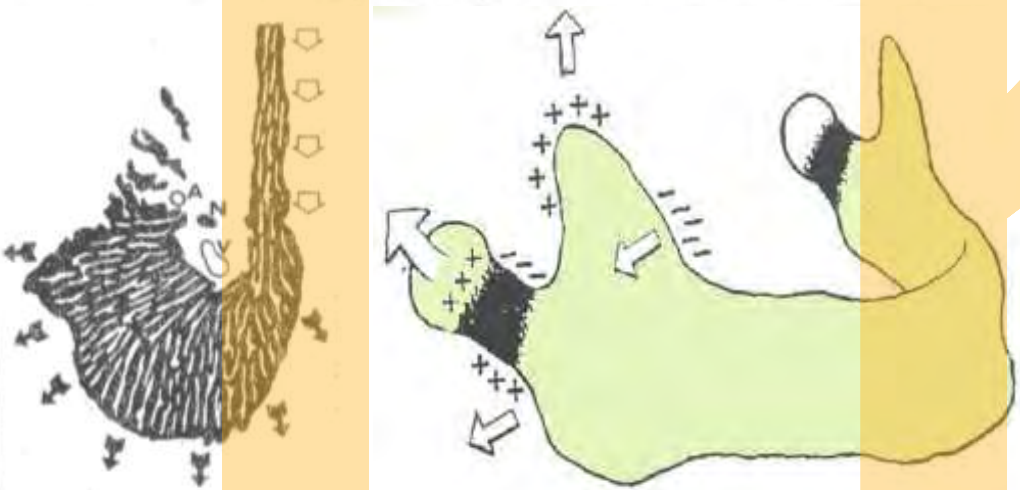

Caput mandibulae
Processu coronoideus
Collum
Processus condylaris
Foramen mandibulae
Lingula mandibulae
Ramus mandibulae
Tuberositas masseterica
Angulus mandibulae
Canalis mandibulae
Corpus mandibulae
Foramen mentale

Grey 1918

Meckelova chrupavka a chrupavčité deriváty v krčku dolní čelisti

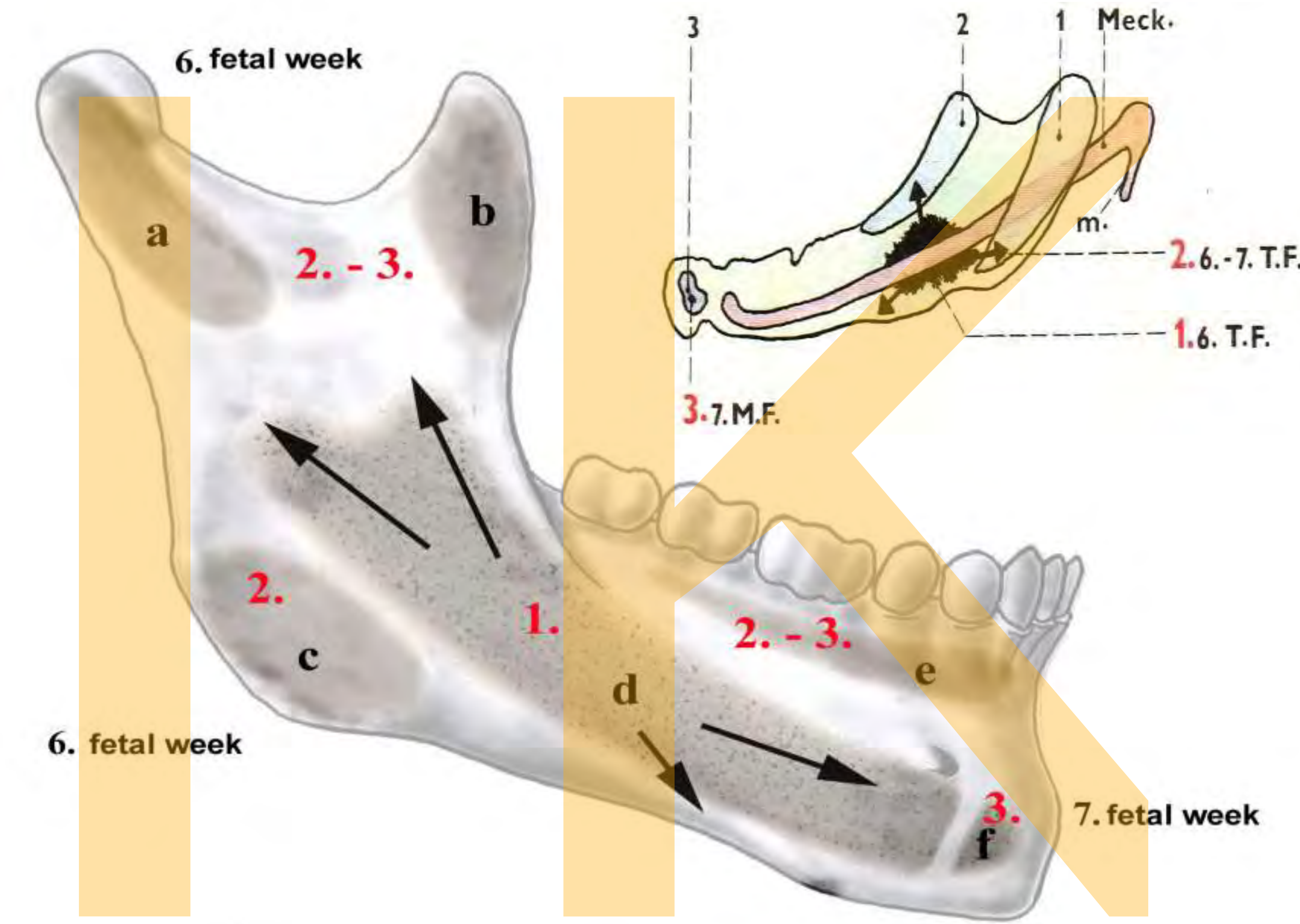


Obr. 2. Přesun úponu musculus mylohyoideus z Meckelovy chrupavky (M na obr. 2a) na mandibulu (obr. 2b). V předních partiích Meckelova chrupavka splyne s mandibulou. Schéma podle preparátu ze zárodku cca 60 dnů starého

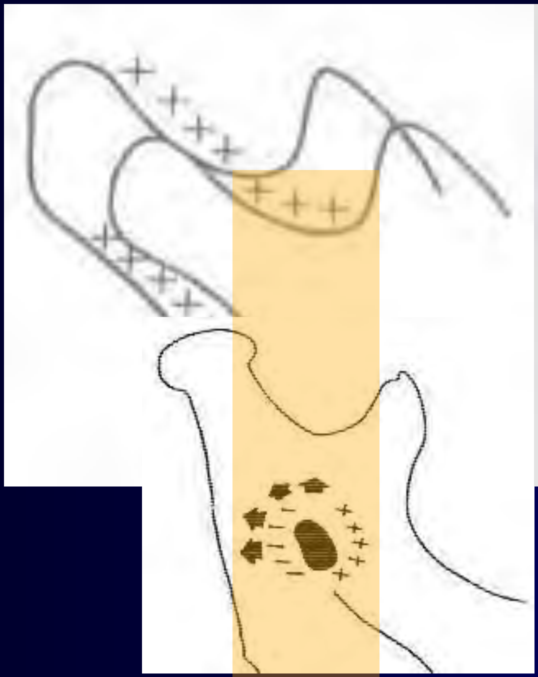


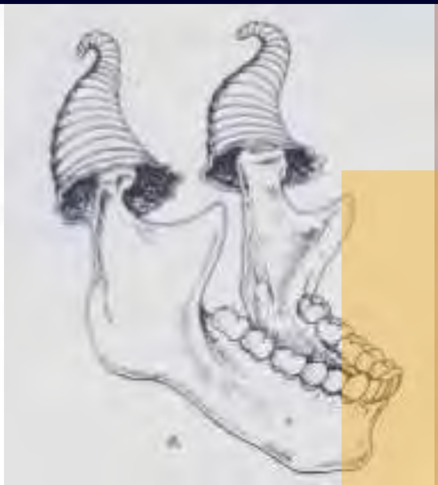
Obr. 3. Přesun musculus genioglossus z Meckelovy chrupavky (M na obr. 3a) na mandibulu (obr. 3b) tím, že v bradové krajině Meckelova chrupavka a s mandibulou splyne. Schéma podle preparátu ze zárodků cca 58 dnů starého

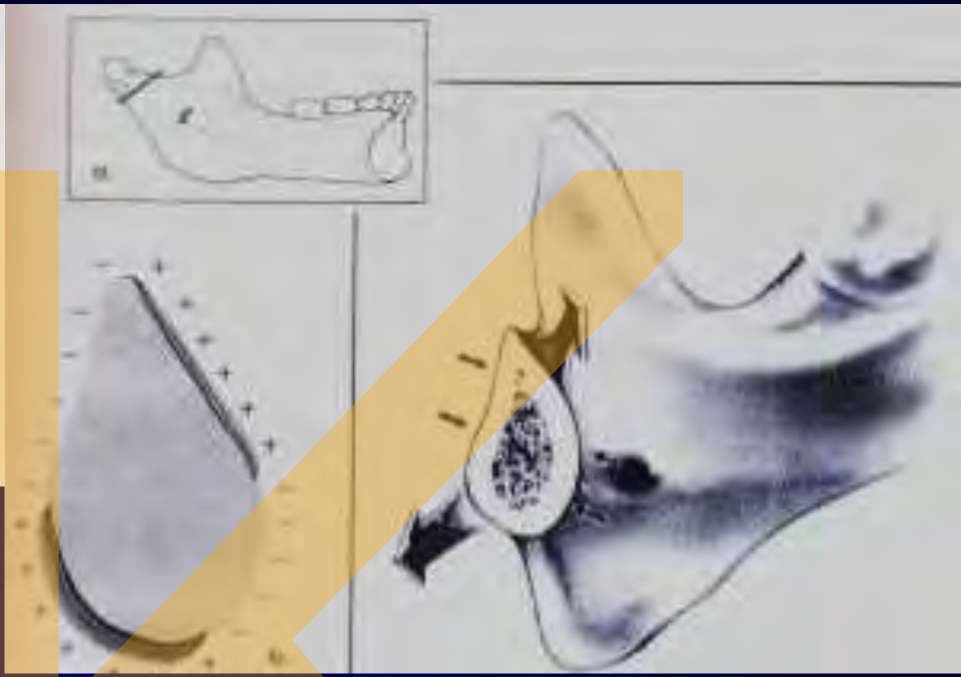
M.Doskočil: Chrupavka ve vývoji mandibuly. (cartilage in the development of the mandible) Cs.Stomatologie, 1:10-18, 1988



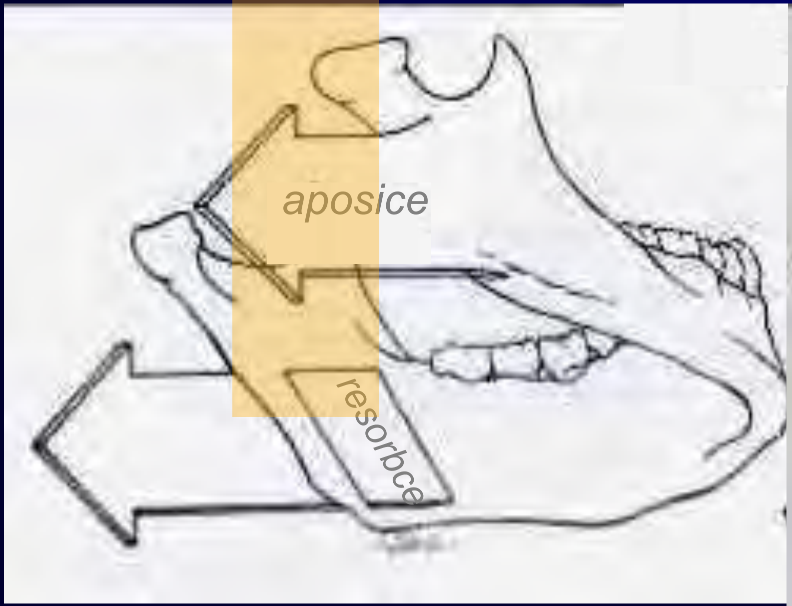
6. fetal week
a
b
2. - 3.
2.
c
1.
d
2. - 3.
e
3.
f
6. fetal week
7. fetal week
3
2
1
Meck.
m.
2. 6.-7. T.F.
1. 6. T.F.
3. 7. M.F.

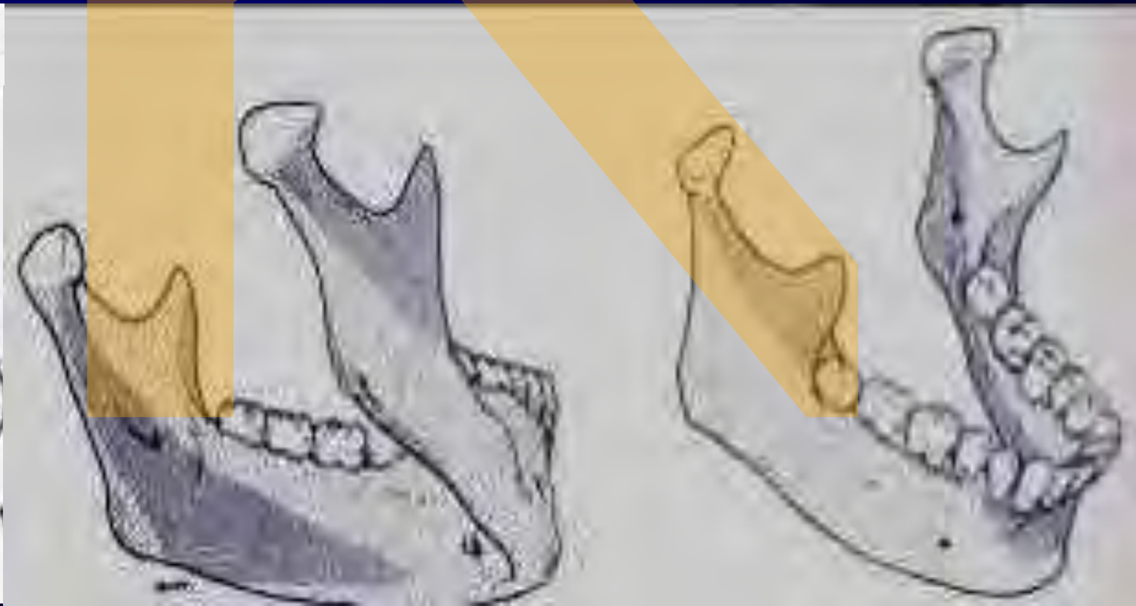




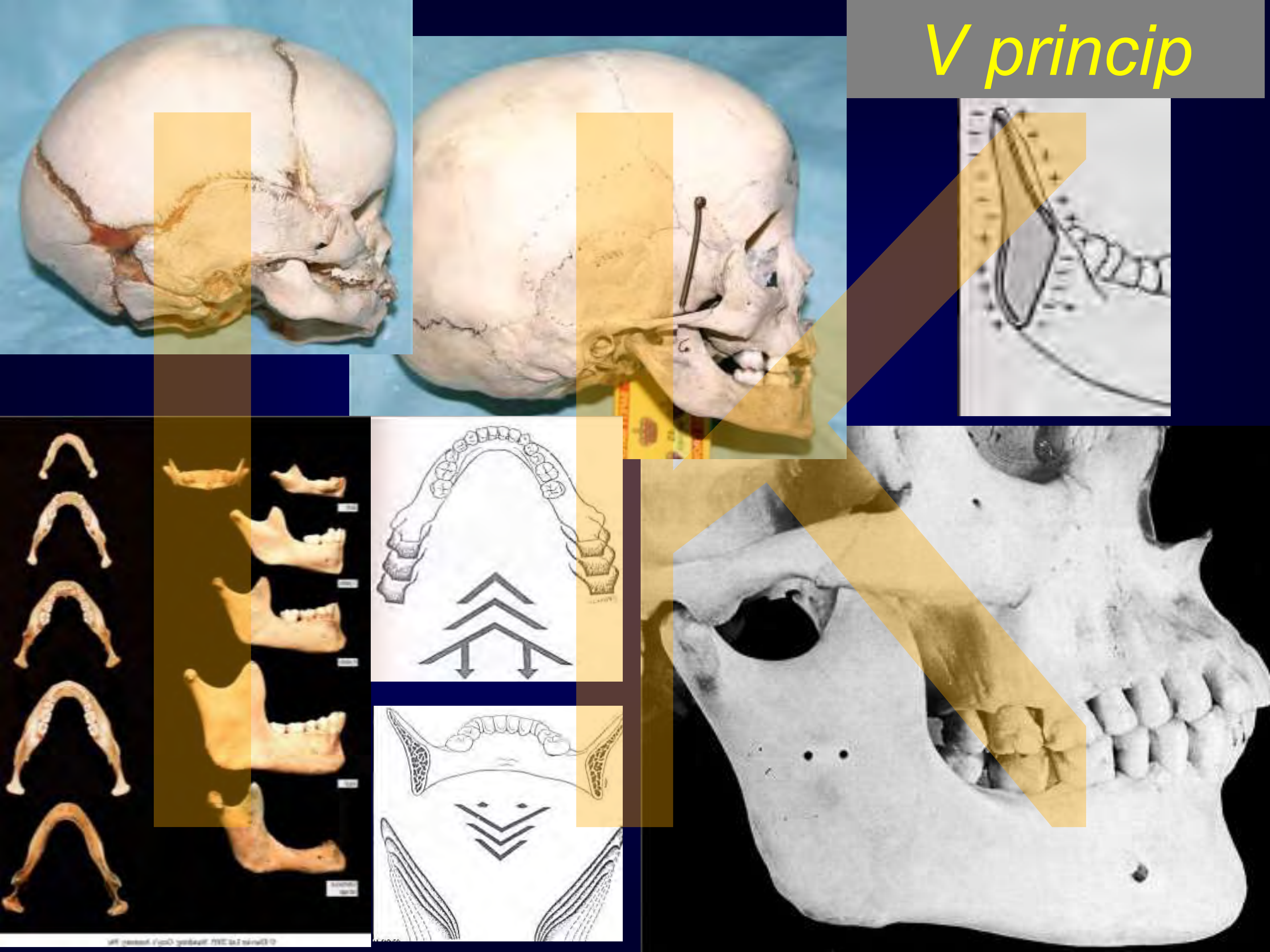


Přírustky u žen jsou mezi 9-18 rokem až o polovinu menší než u mužů





V princip



Růst mandibuly

růst sleduje spirální osu - mandibular logaritmic spiral growth pattern

Růst kondylu

Remodelace chrupavky (direction of growth influences insertion of lateral pterygoid muscle)

Relokace ramus mandibulae

Vertikální růst a vznik alveolů

Aposice materiálu na dorsální hranu ramus mandibulae

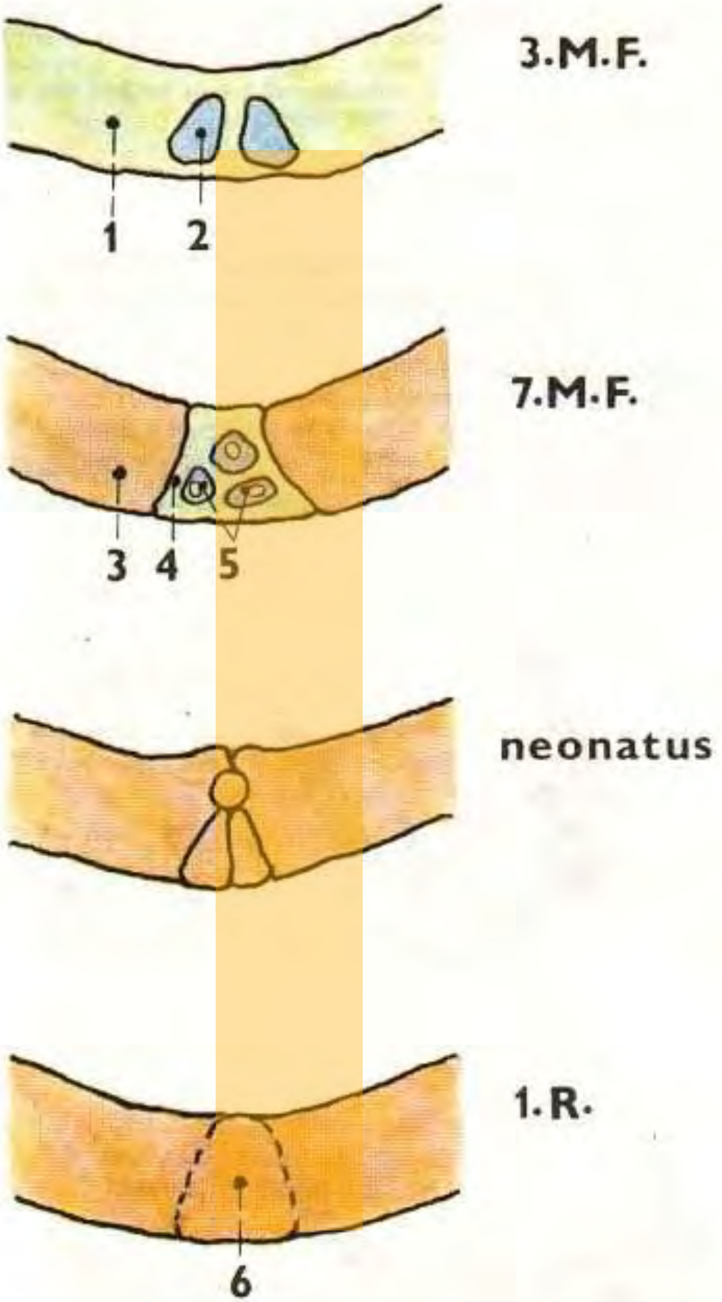
Reposice foramen mandibulae: *(z polohy při horním okraji alveolu do úrovně oklusní plochy poslední stoličky 3 – 15 let*

vymizení symphysis menti

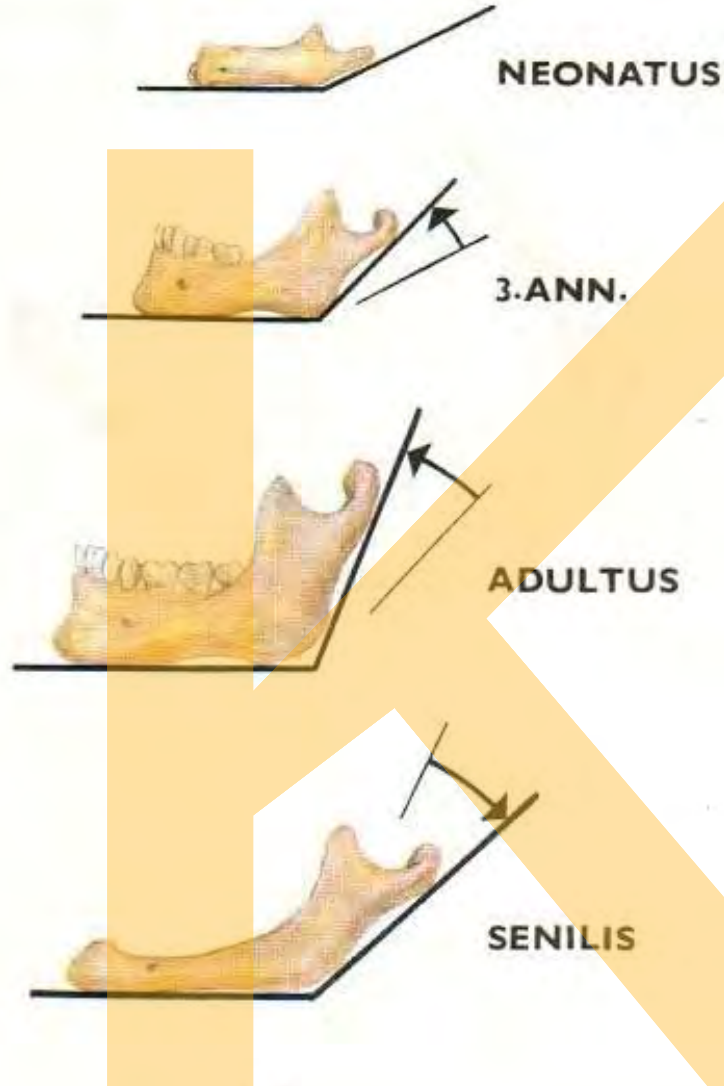
Vymizí okolo 6 postnatálního měsíce (ventrally)

prodloužení canalis mentalis

Interstitiální růst



B

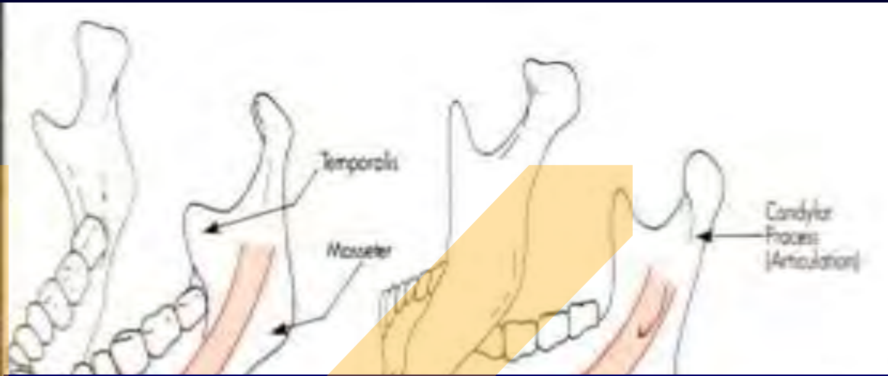


C

C. změny relativní výšky těla a ramene mandibuly, utváření pars alveolaris a úhlu ramene u novorozence, 3letého dítěte, u dospělého, a ve stáří na bezzubé mandibule

Podle Čiháka 1997

Tzv. totální rotace matrix - přestavba čelisti



Rotace matrix *(matrix rotation, apparent rotation):*

(´posun´ povrchové vrstvy čelisti vzhledem k okolním pevným strukturám)

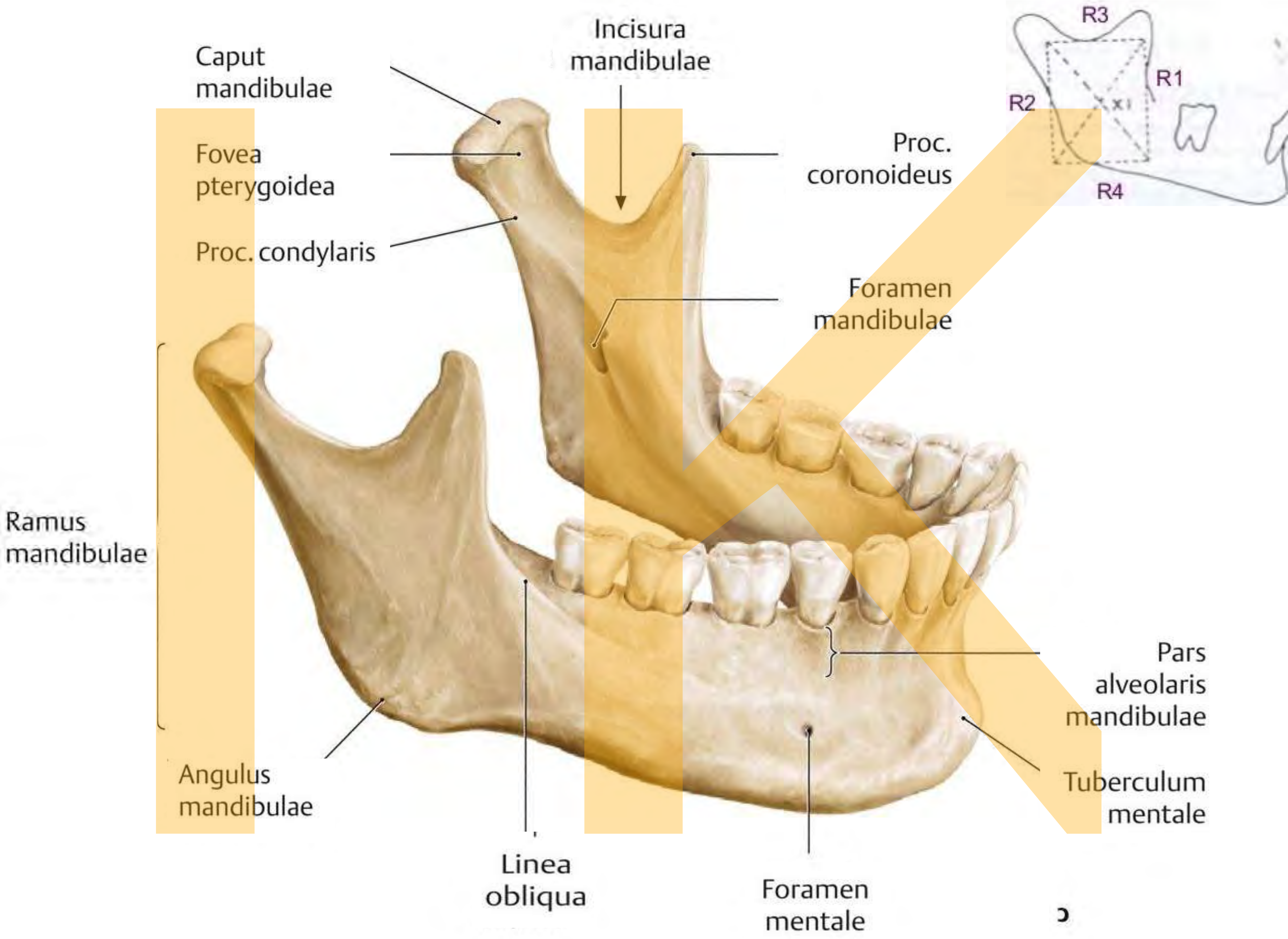
Vnitřní rotace matrix *(intramatrix rotation, angular remodelling)*

(´rotace´ spongiosy uvnitř čelisti)

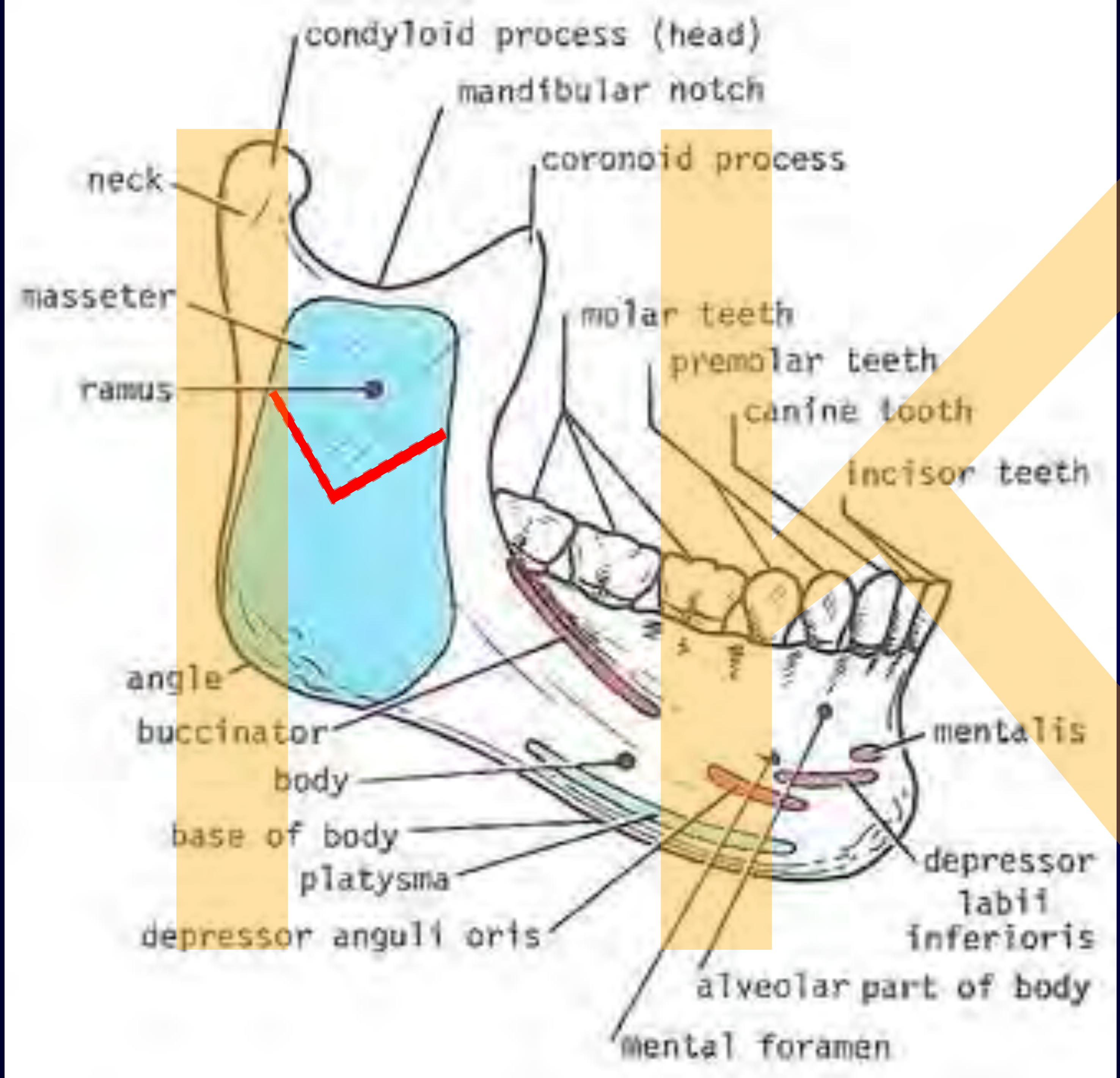
Rotace obrysů čelisti během vývoje:

Kolem kondylové osy

Kolem imaginární osy procházející podélně tělem dolní čelisti

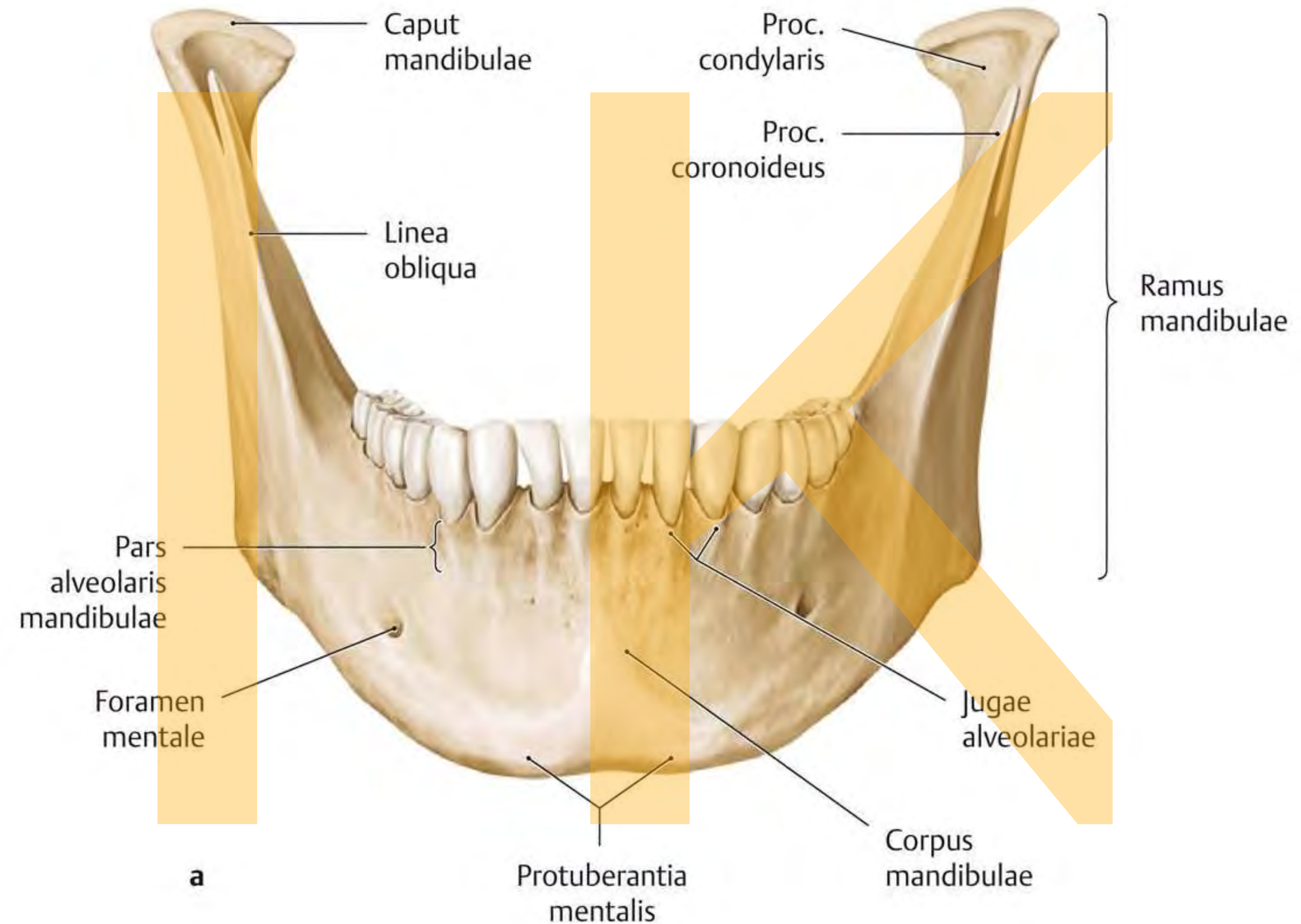


Caput mandibulae
Incisura mandibulae
R3
R1
R2
R4
Fovea pterygoidea
Proc. coronoideus
Proc. condylaris
Foramen mandibulae
Ramus mandibulae
Pars alveolaris mandibulae
Angulus mandibulae
Tuberculum mentale
Linea obliqua
Foramen mentale

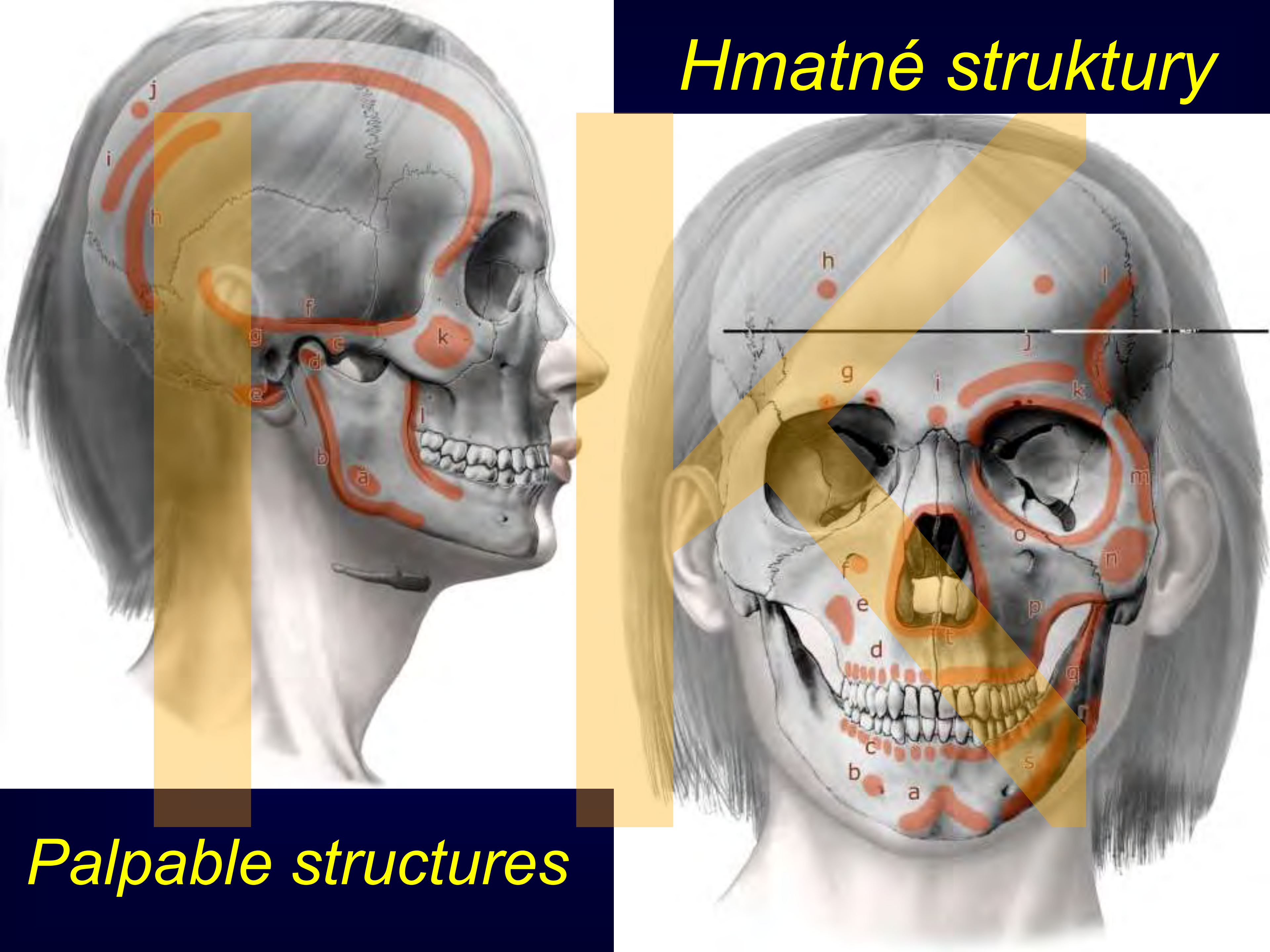


Červená lomená linka –

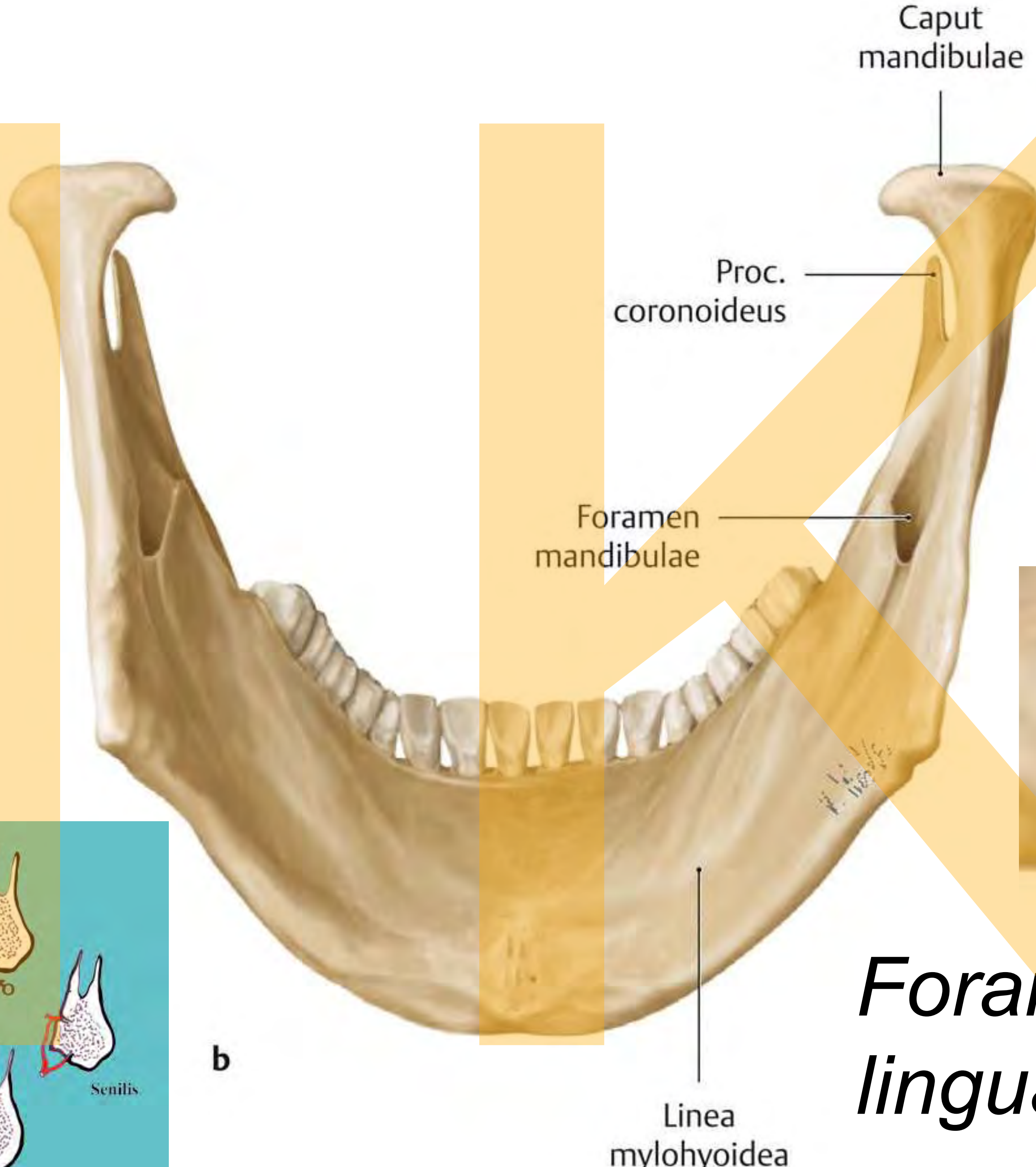
přibližný rozsah úponu hluboké části masseteru

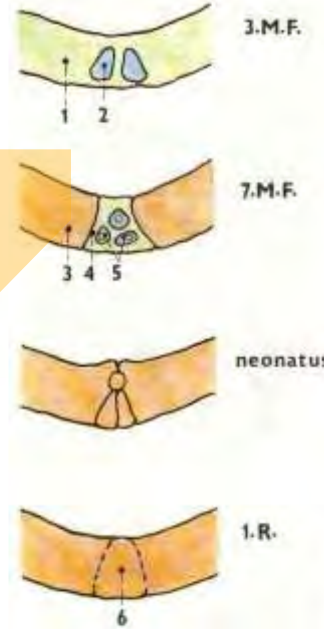

Caput mandibulae
Proc. condylaris
Proc. coronoideus
Linea obliqua
Ramus mandibulae
Pars alveolaris mandibulae
Foramen mentale
Jugae alveolariae
Corpus mandibulae
Protuberantia mentalis
a

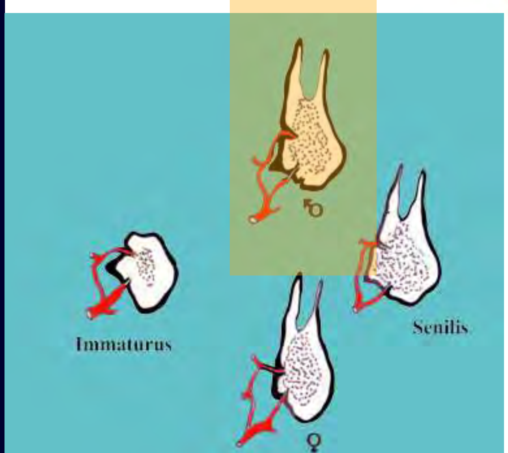
Hmatné struktury



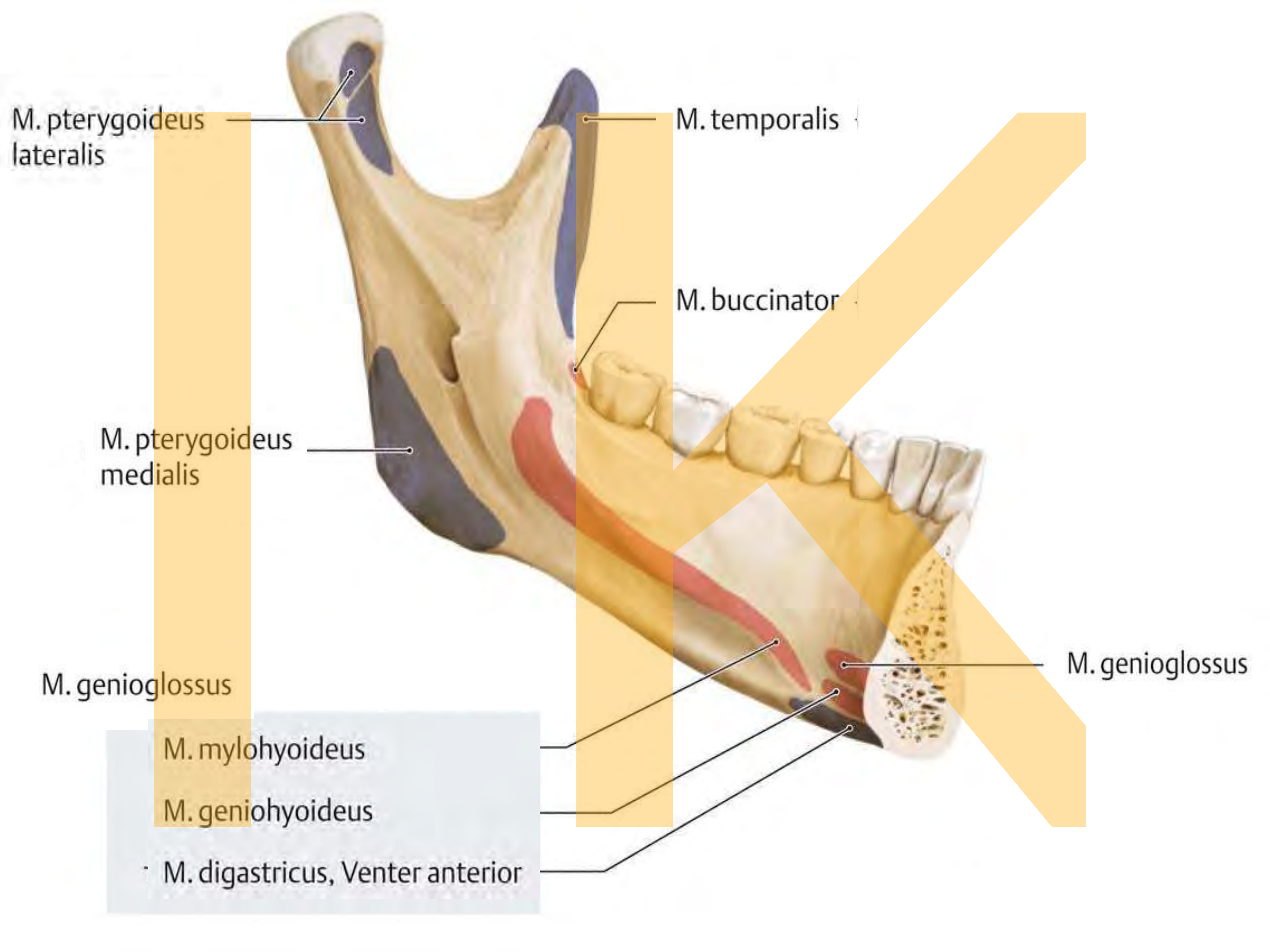
Palpable structures





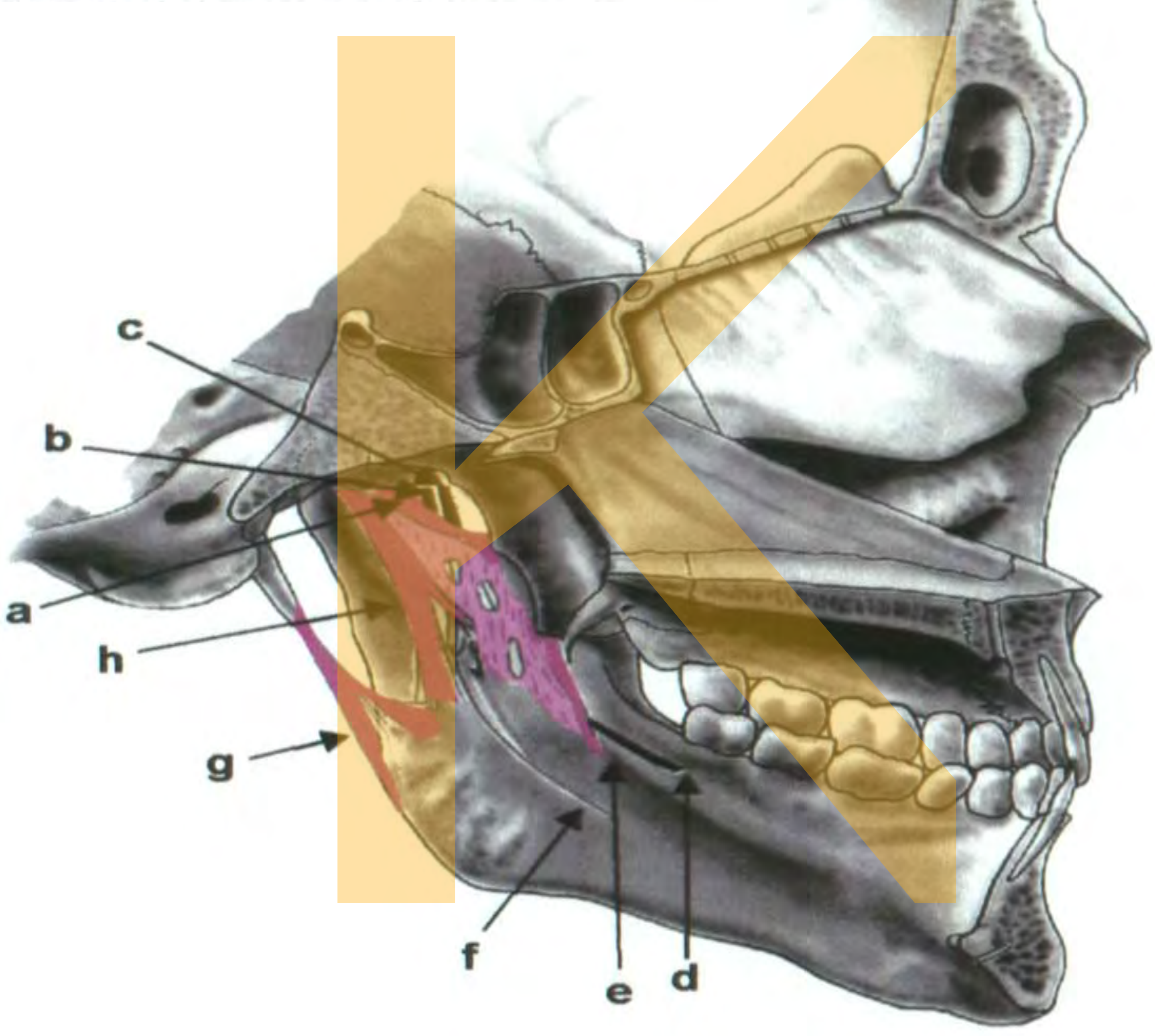


Foramen linguale ? _ _

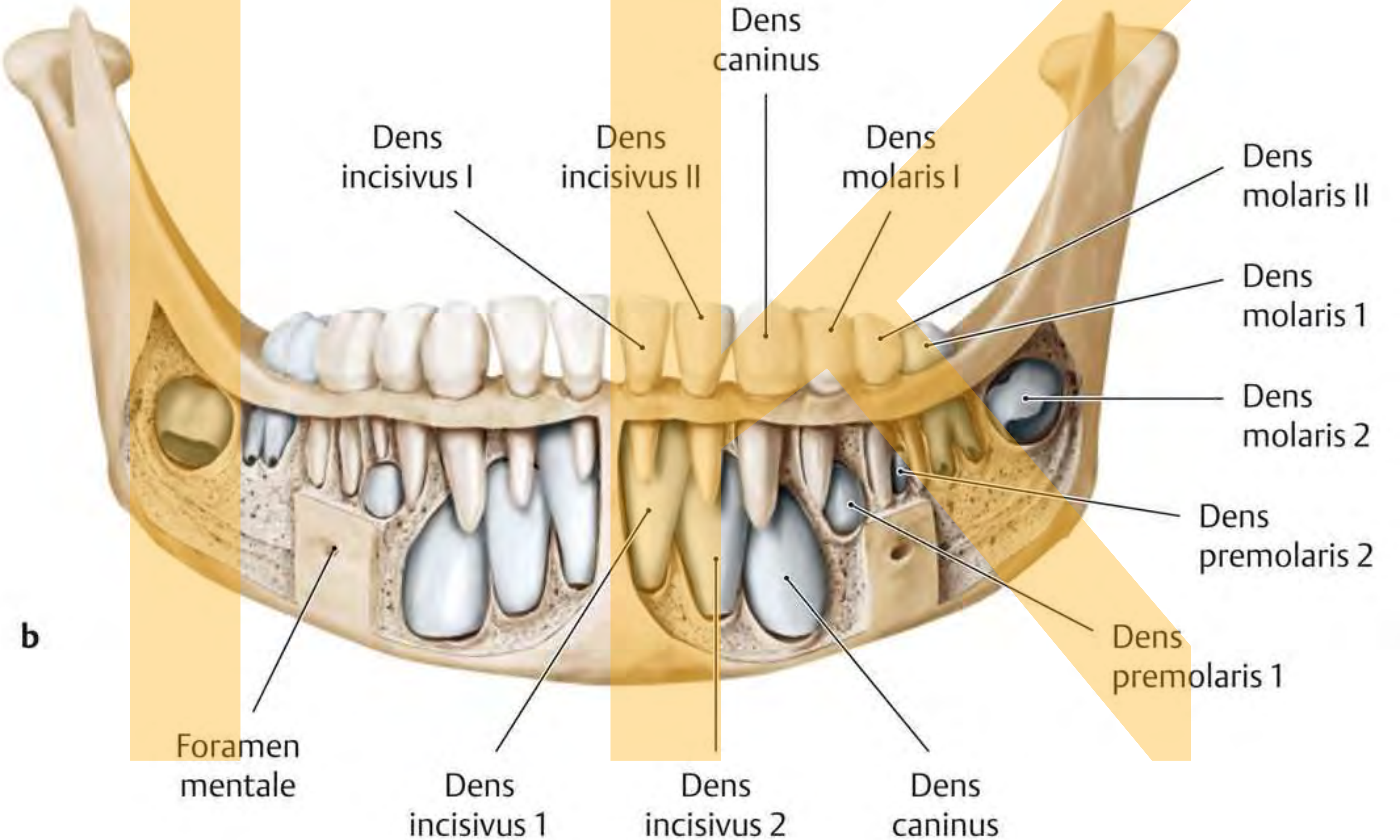

M. pterygoideus lateralis
M. temporalis
M. buccinator
M. pterygoideus medialis
M. genioglossus
M. genioglossus
M. mylohyoideus
M. geniohyoideus
M. digastricus, Venter anterior

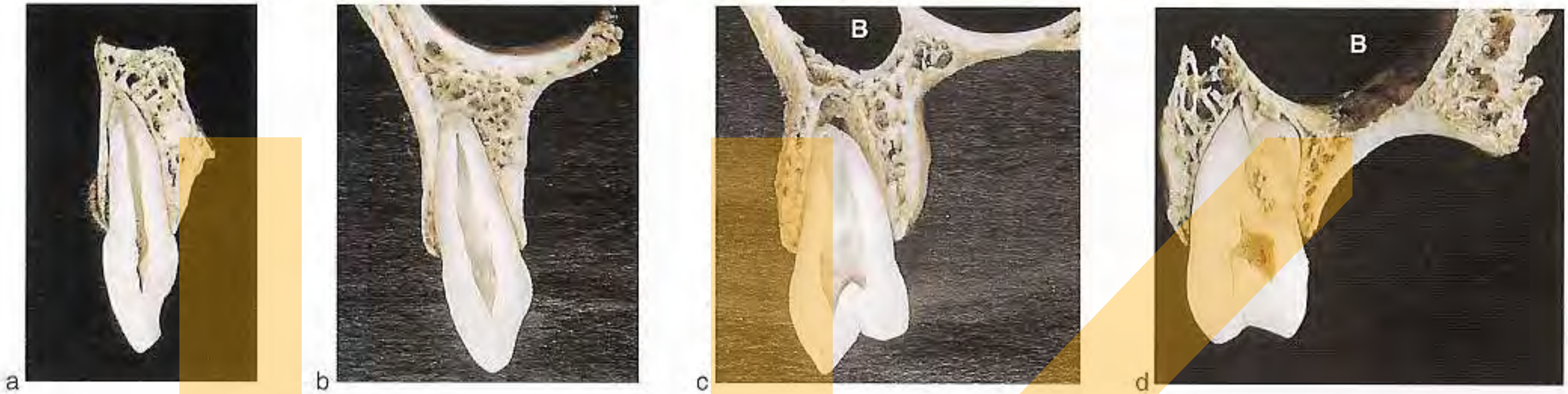
a - lig. pterygospinale, b - n. alveolaris inferior, c - n. lingualis, d - n. lingualis raphe buccopharyngea, f - n. mylohyoideus, g - lig. stylomandibulare, h - lig. sphenomandibulare

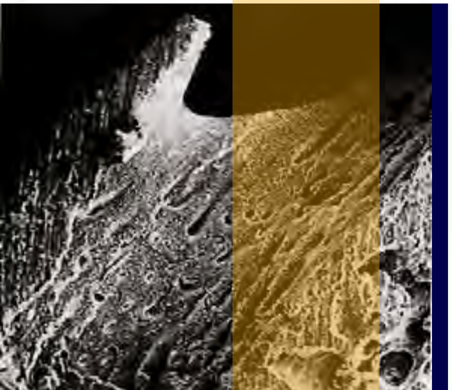
Eaglův syndrom – osifikace vazu společně s osifikací lig. stylohyoideum dráždí n. IX



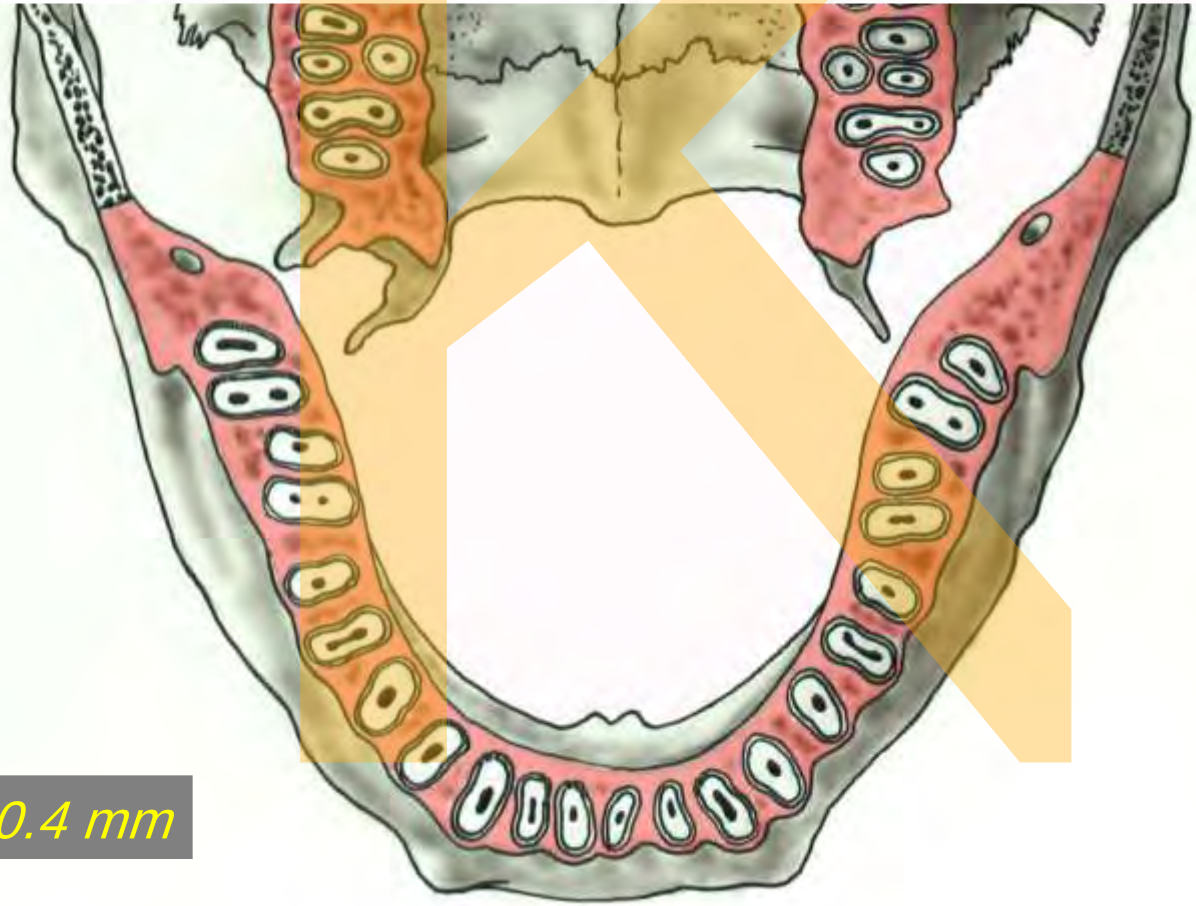
Eruptio dentorum

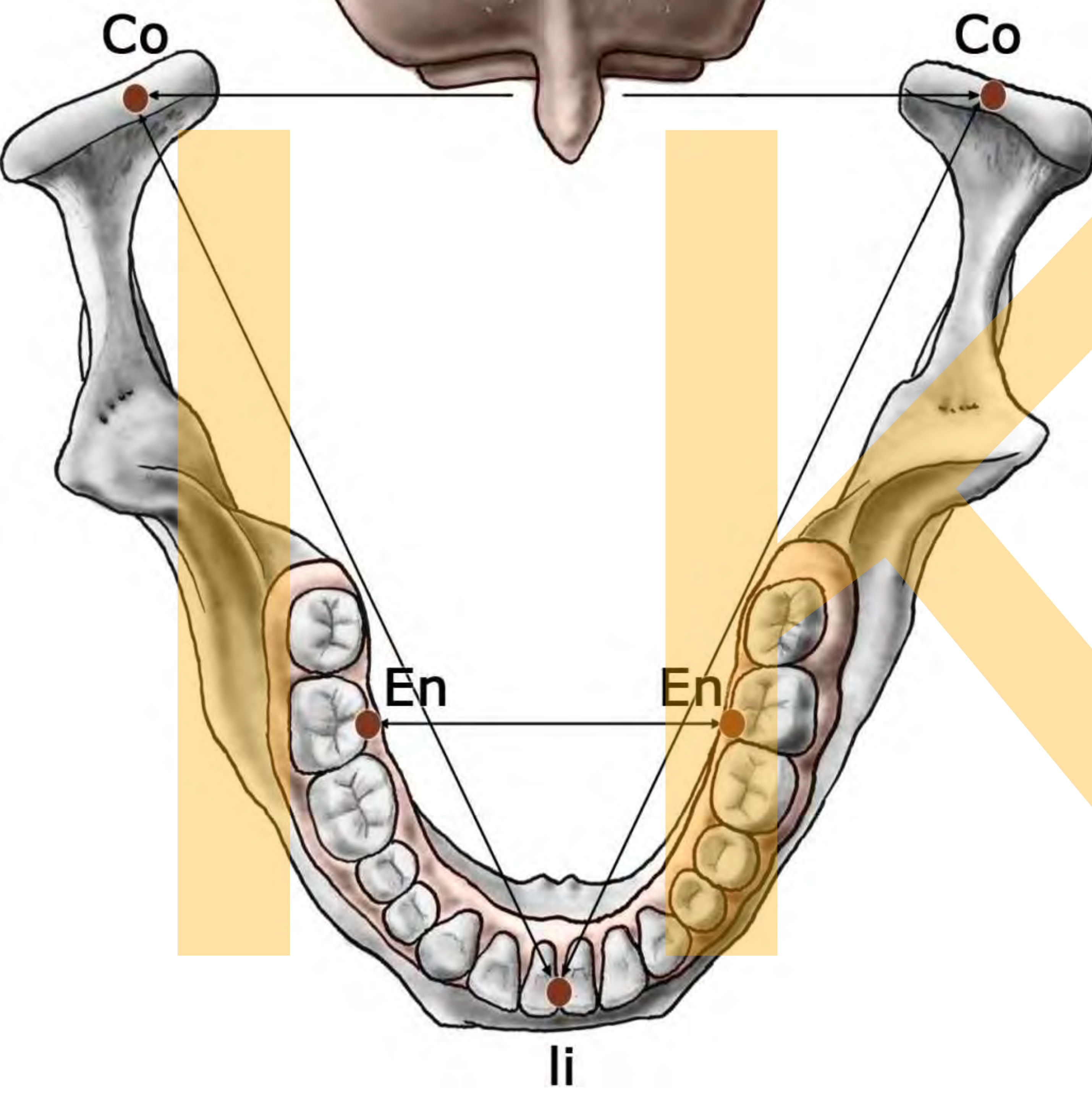






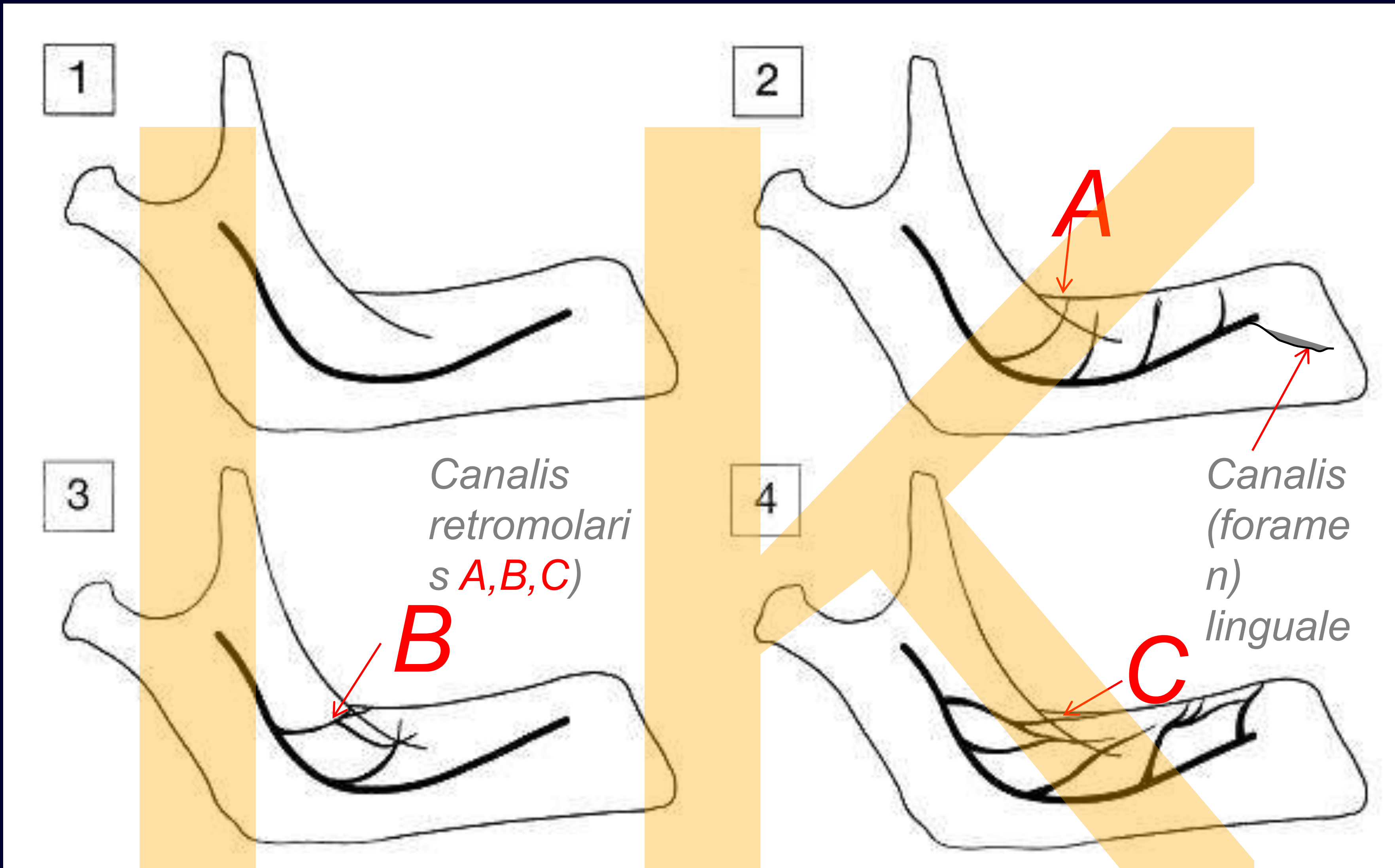
0.1-0.4 mm

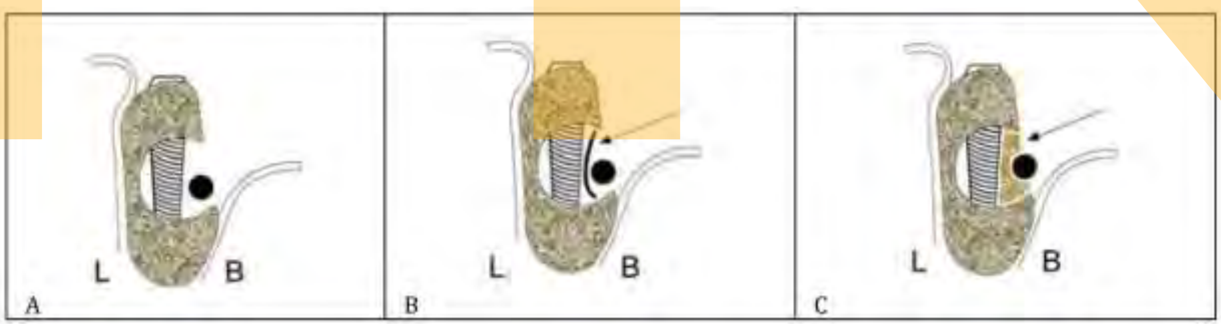




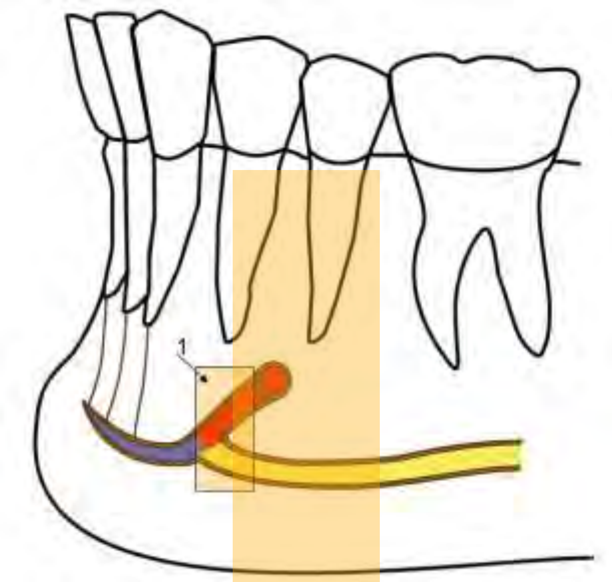
En-En – šířka čelisti mandible width

Co-Ii-Co – Bonvillův trojúhelník Bonvill triangle

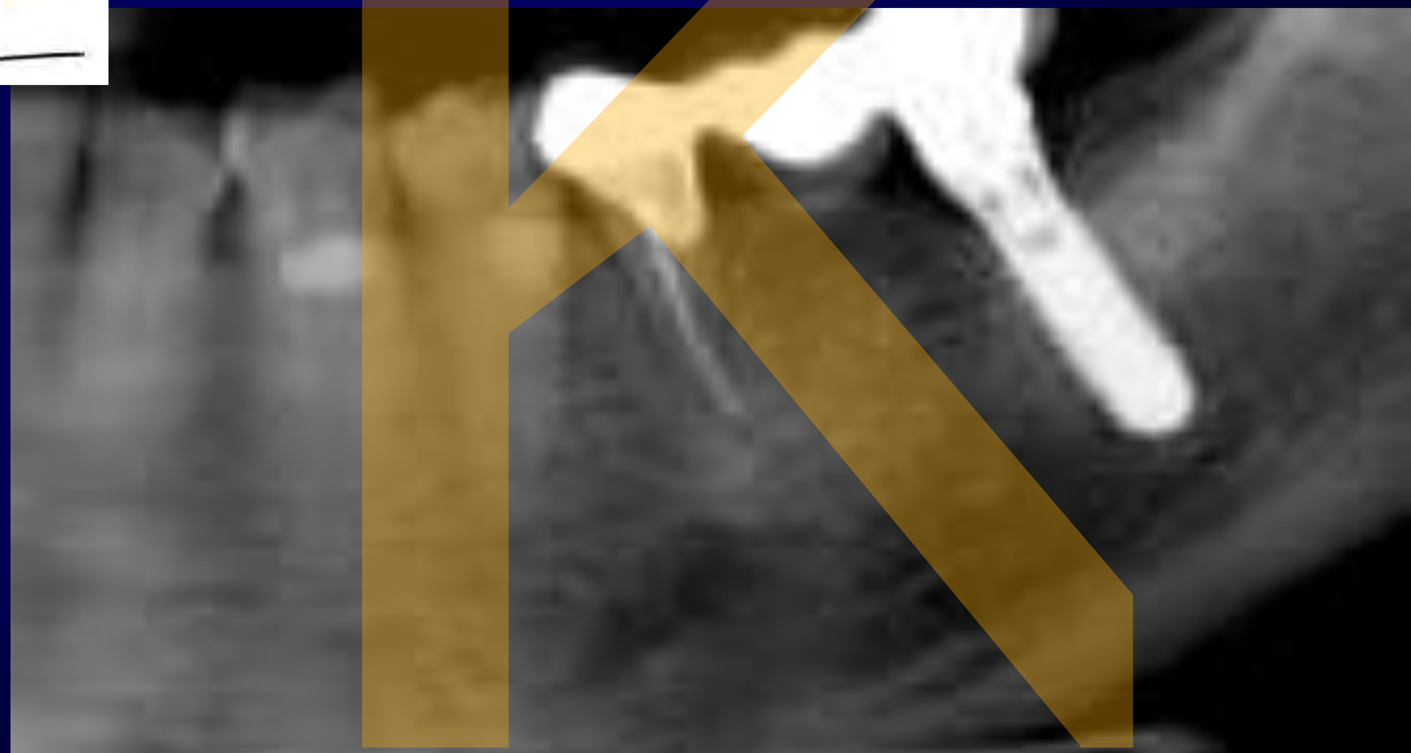




After Lang et al. 2002

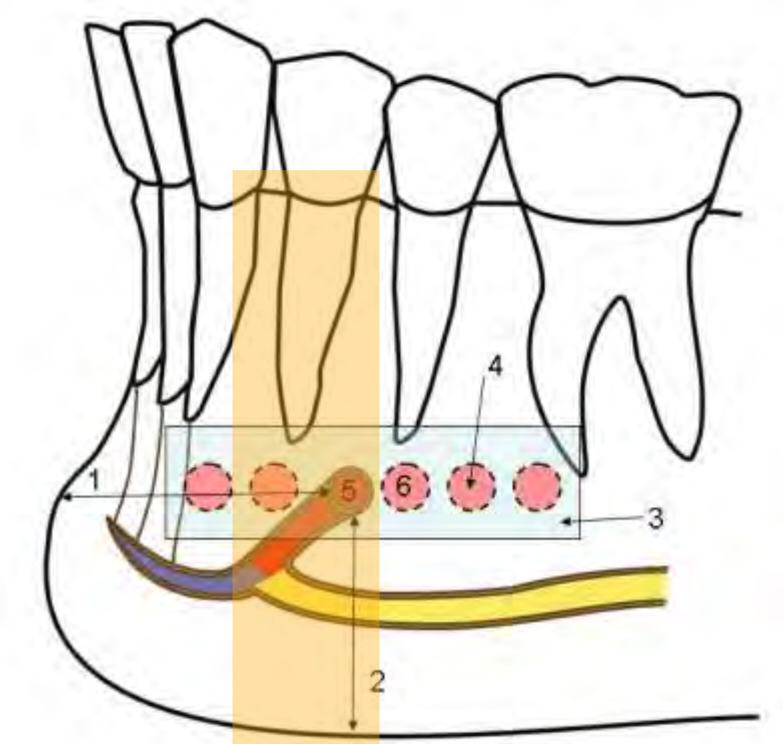


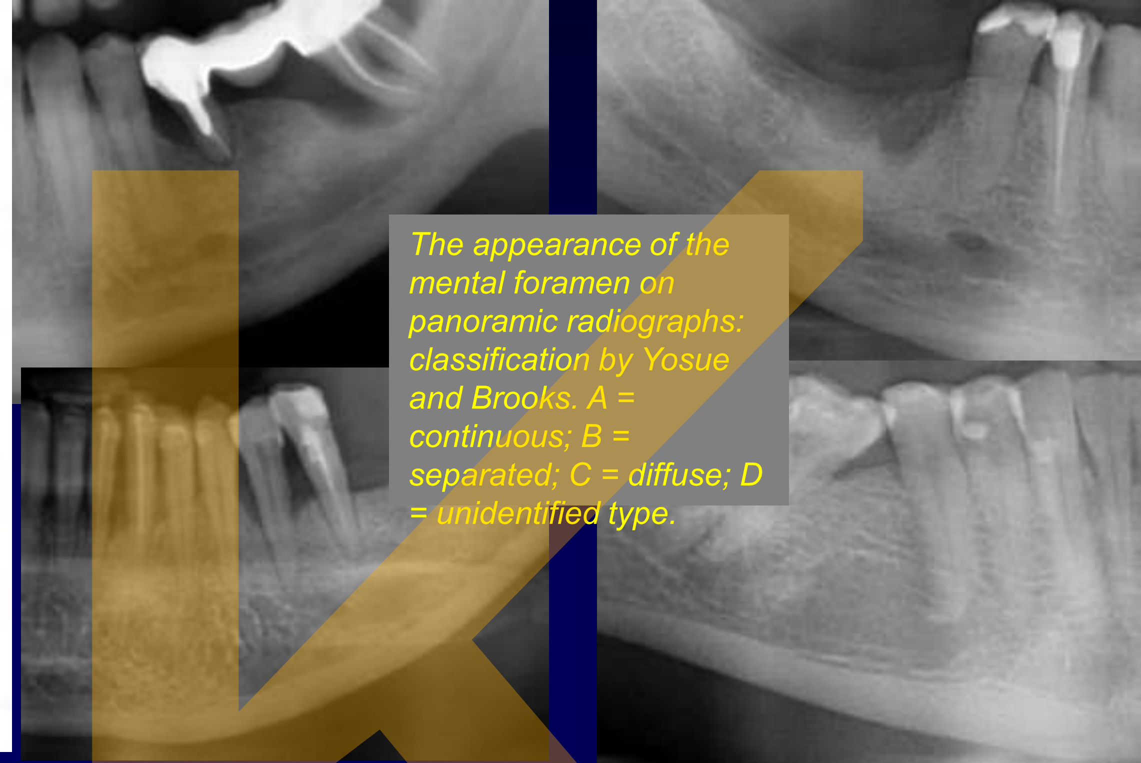
The anterior loop (AL) of the mental nerve: length variations from the most anterior loop point to mental foramen.
Colours: blue = MIC, red = mental canal (the anterior opening of the mandibular canal) yellow = mandibular canal.
1 = length of the AL (0.00 to 10 mm).



Panoramic radiograph showing extension of the mental nerve beyond the mental foramen boundary as an intraosseous anterior loop (arrows).

Juodzbalys G, Wang HL, Sabalys G.: Anatomy of Mandibular Vital Structures. Part II: Mandibular Incisive Canal, ***Mental Foramen*** *and Associated Neurovascular Bundles in Relation with Dental Implantology.*
J Oral Maxillofac Res. 2010 Apr 1;1(1):e3. doi: 10.5037/jomr.2010.1103. eCollection 2010.



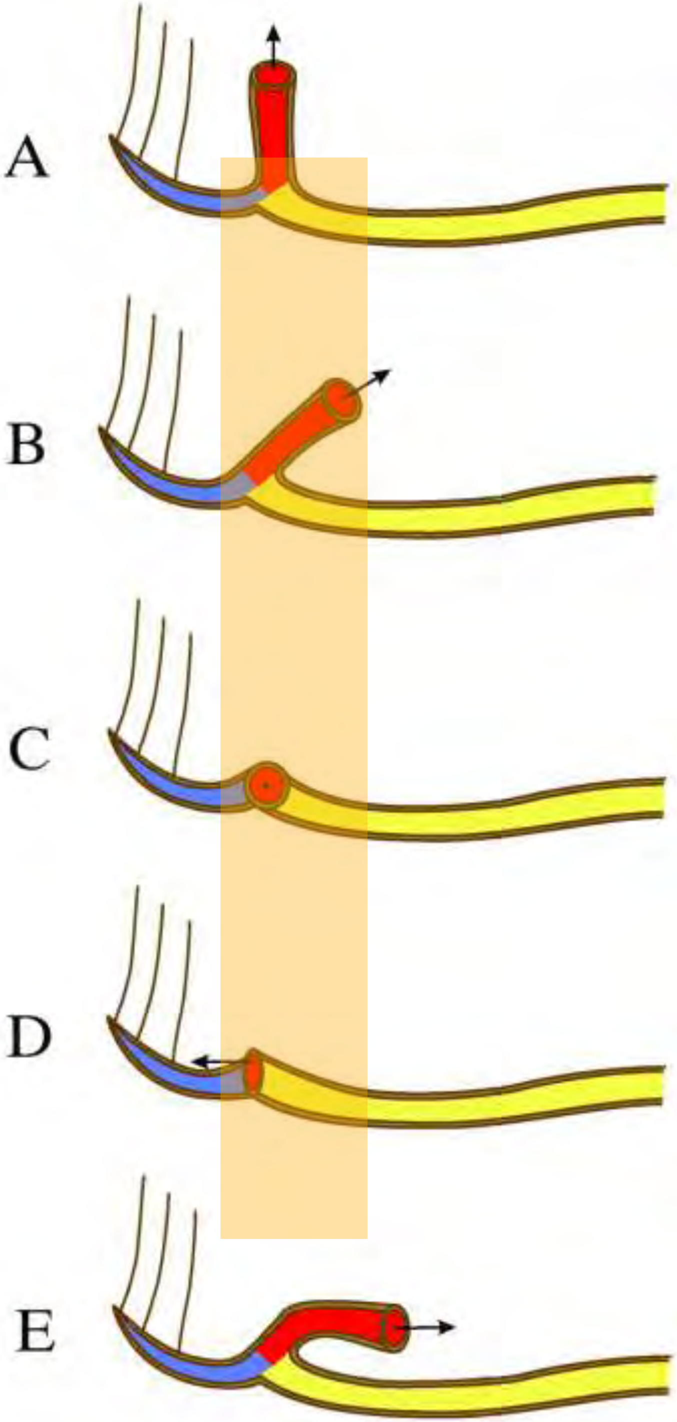


The appearance of the mental foramen on panoramic radiographs: classification by Yosue and Brooks. A = continuous; B = separated; C = diffuse; D = unidentified type.

Anatomical variations of the mental foramen *(MF) position in the horizontal plane in relation to the roots of teeth.*

Colours: blue = MIC, red = mental canal (the anterior opening of the mandibular canal) yellow = mandibular canal.

1 = distance from MF to midline of the mandible (approximate distance 28 mm); 2 = distance from MF to the inferior border of the mandible (14 to 15 mm); 3 = possible MF location zone in the horizontal plane in relation to the roots of teeth; 4 = the shape of MF can be round or oval, the diameter is 1.68 to 3.5 mm; 5 = prevalence location of MF in the horizontal plane for Caucasian population; 6 = prevalence location of MF in the horizontal plane for Mongoloids and African people.



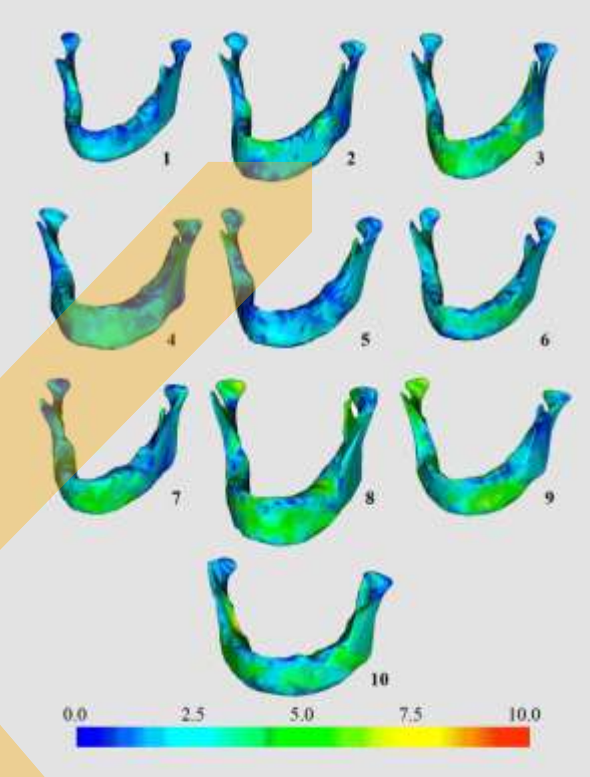
Modře: krajina mezi otvory

Interforaminósní oblast

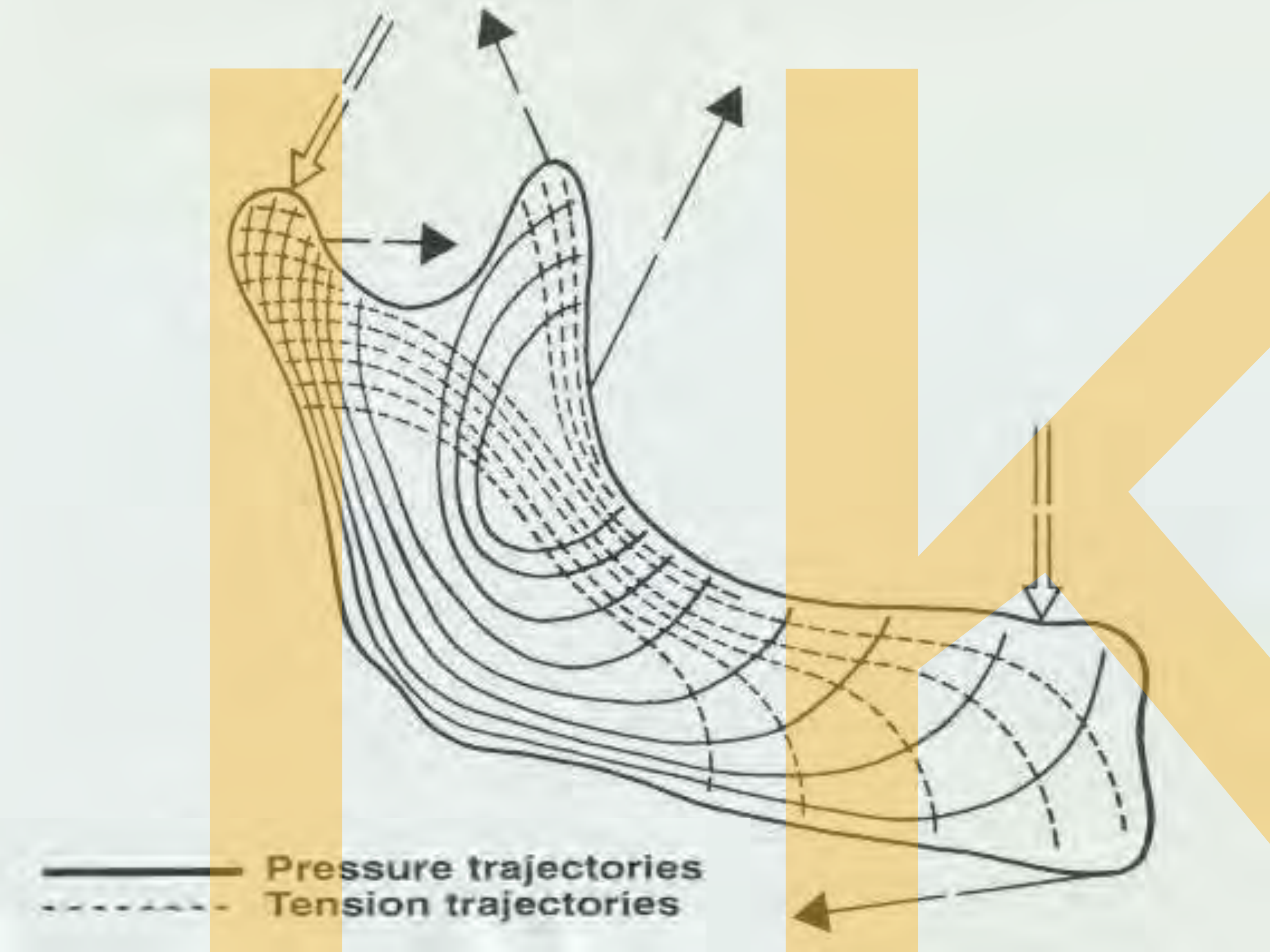
Emergence patterns of the mental canal and mental foramen opening

Colours: blue = MIC, red = mental canal (the anterior opening of the mandibular canal) yellow = mandibular canal.
A = superiorly, B = posterosuperiorly; C = labially; D = mesially (anteriorly); E = posteriorly.

Hustota spogiosy

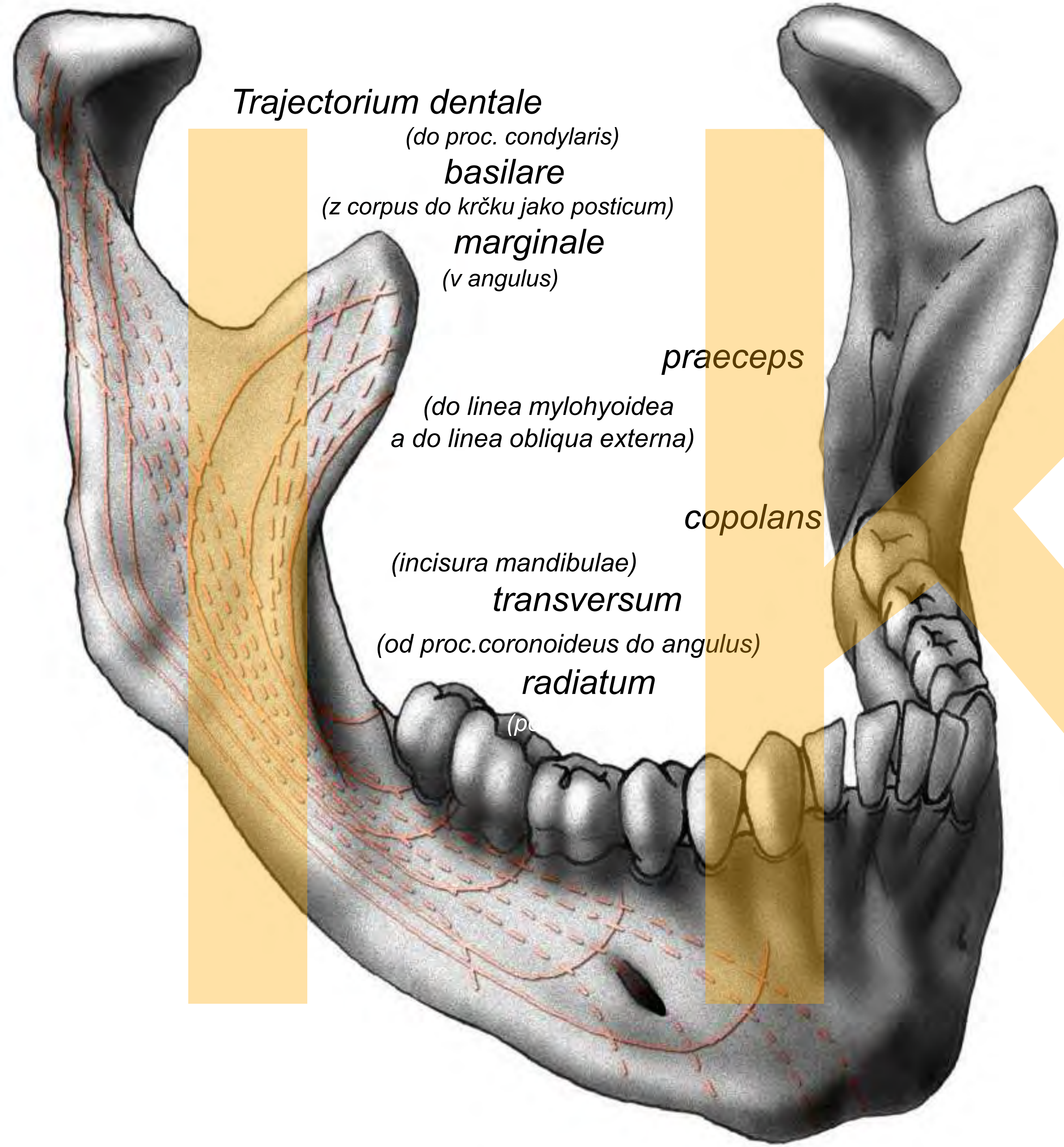


Přestavba vnitřní struktury podle funkčního zatížení

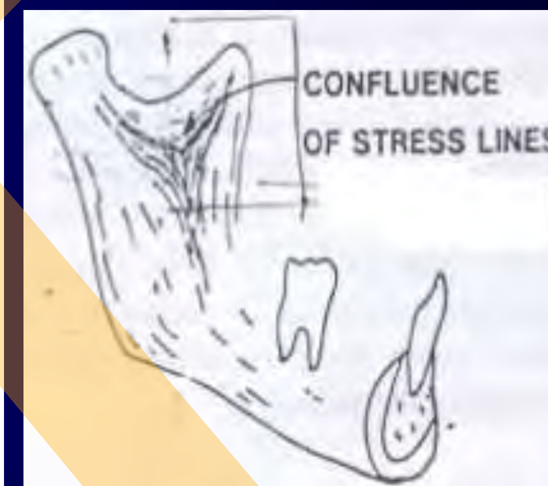


Tlakové a tahové linie uvnitř mandibuly

Tillmann et al. 1983)



Transfer of pressure and load in mandible



after Lang
1995

Růst čelistí: **anteriorotace** <u>Fysiologická</u>

(ventrokaudální) <u>Totální</u> (celková) zahrnuje i vliv okolních struktur

(matrix rotation, apparent rotation)

rotace hmoty matrix: (intramatrix rotation, angular remodelling)

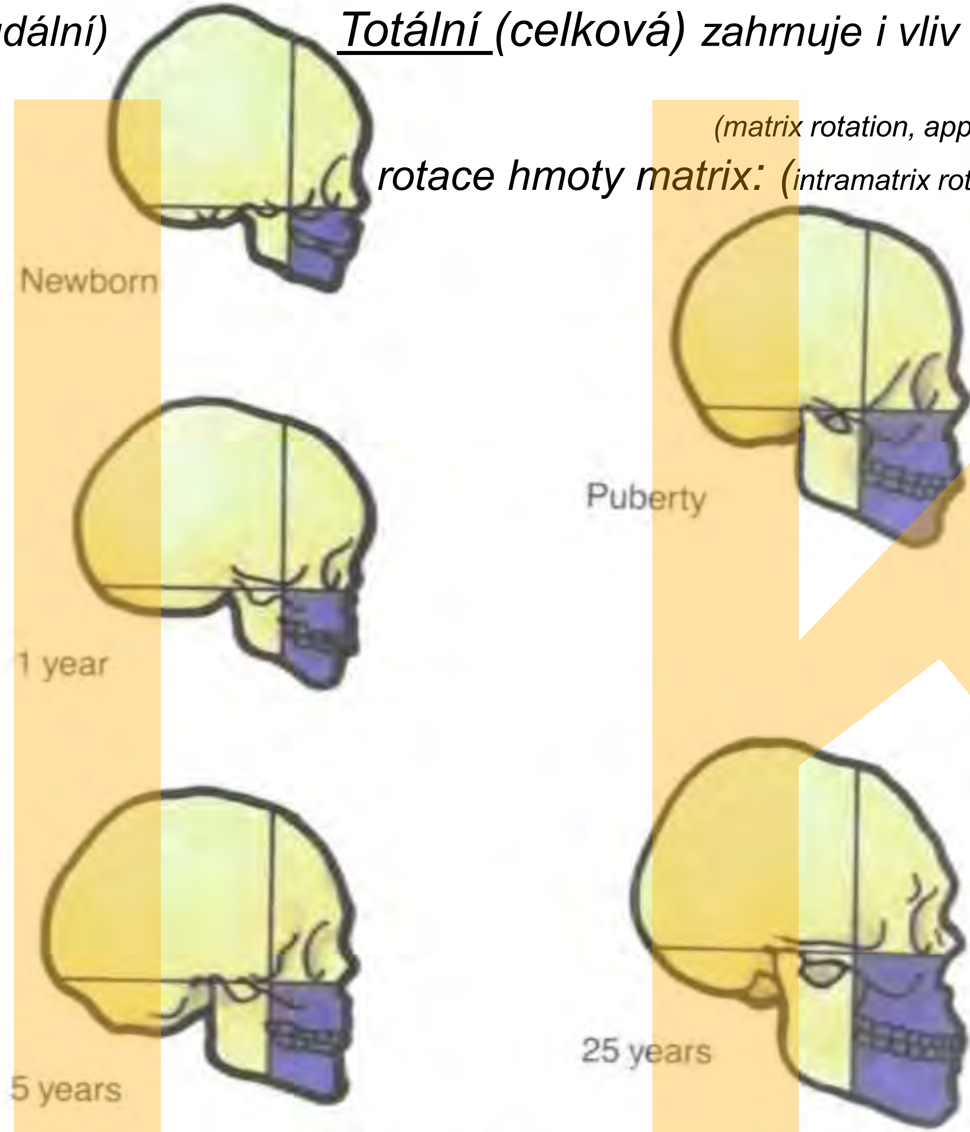


FIG. 3.3. Growth of the face relative to the skull from infancy to adulthood. Newborn, 1 year, 5 years, puberty, 25 years. At birth, the skull is relatively large and mature when compared to the face. The relative proportions between the face and the skull continue to change until adulthood as the face becomes more and more prominent. Final dentition (the third molars) is attained prior to adulthood. (After Lowrey, 1986.)

Postnatálně:
Šířkové rozměry obličeje se zvětšují málo a končí dříve
Výškové rozměry obličeje se zvětšují hodně a končí pozdě

Po 40 roce resorpce převažuje nad aposicí

Mandibula roste nejdéle

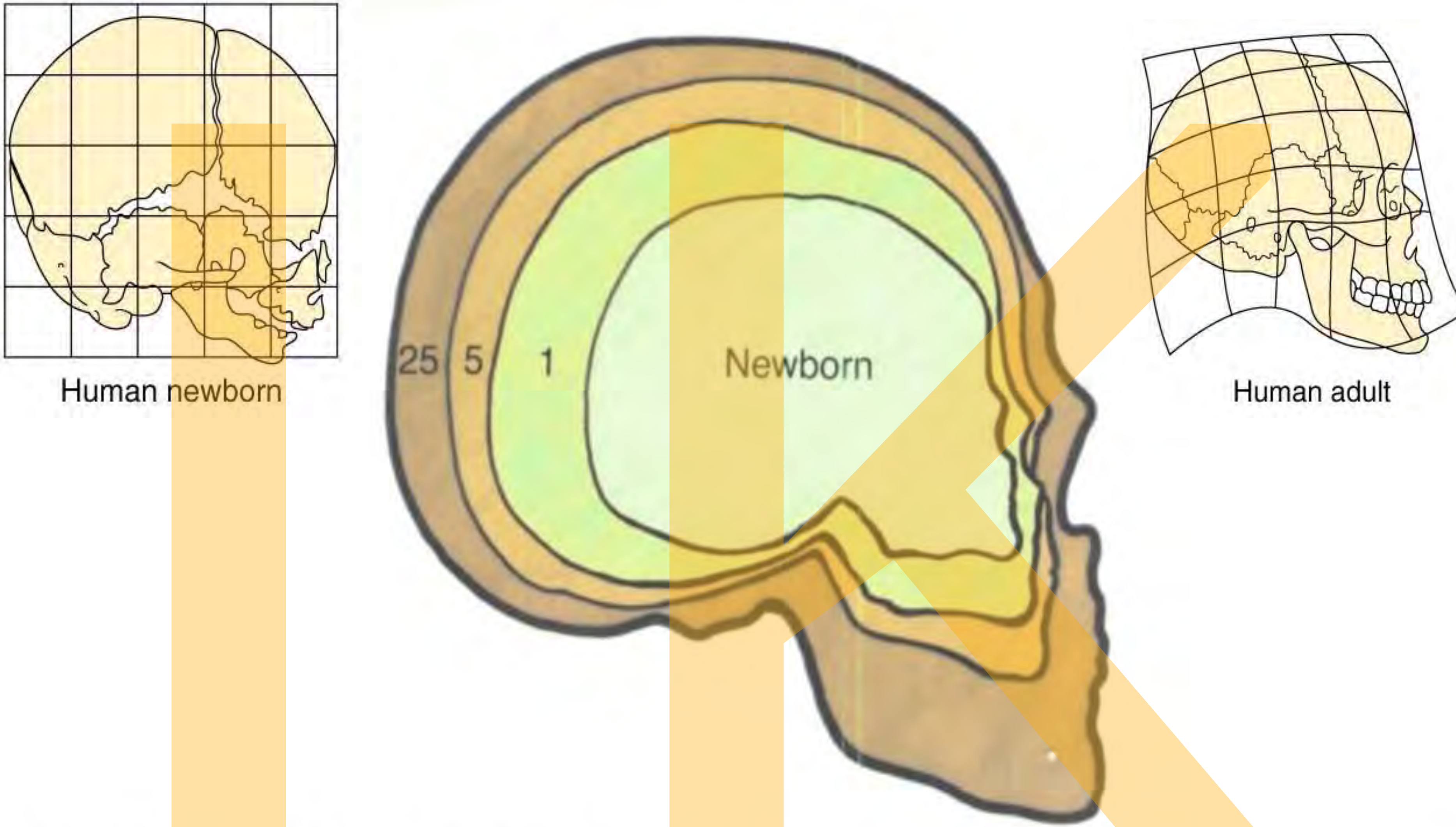


FIG. 3.2. Growth of the skull from infancy to adulthood. Newborn, 1 year, 5 years, 25 years. The majority of the skull's growth takes place in the first 5 years of life with only slow changes from 5 years to maturity. Skull growth is essentially complete by age 12. (After Lowrey, 1986.)

cranial growth *size about 90%*

very low pubertal spurt 5-7 year *final size*

facial growth *6 year cca 80%*

pubertal spurt is proportional *final size*

skeletal (general) growth *about 6 year*

pubertal spurt accelerate *cca 70%*

final size

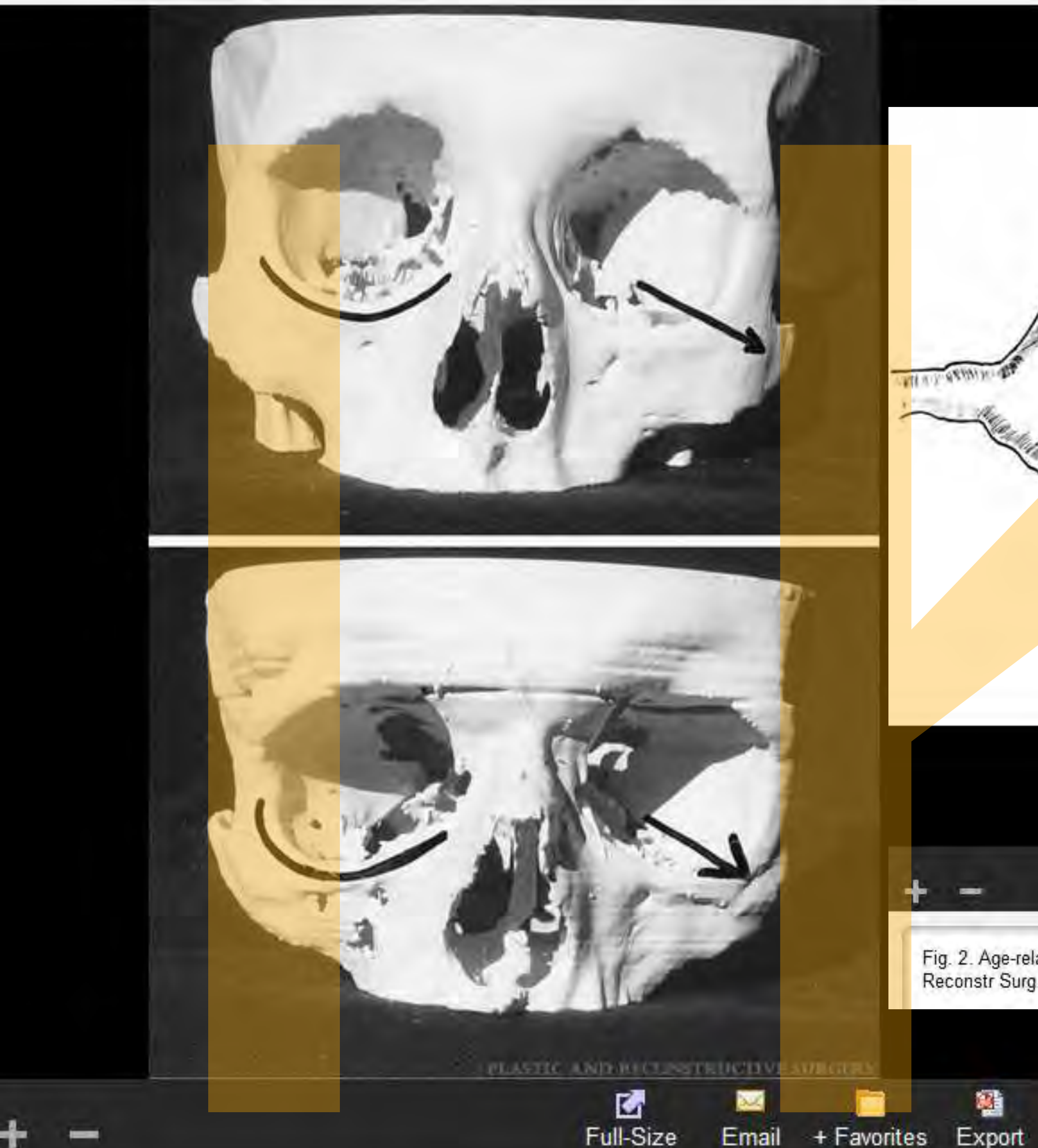


Fig. 1. Age-related retrusion of the inferior orbital rim. Reprinted with permission from Plast Reconstr Surg. 2000;106:479–488.

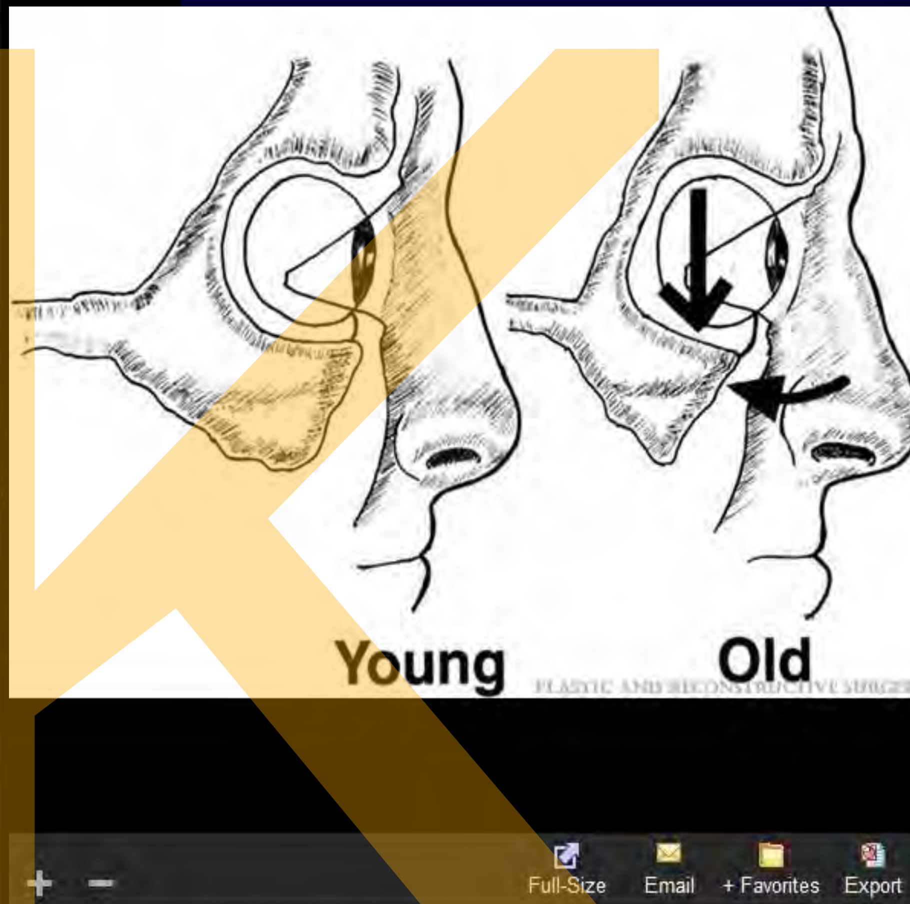
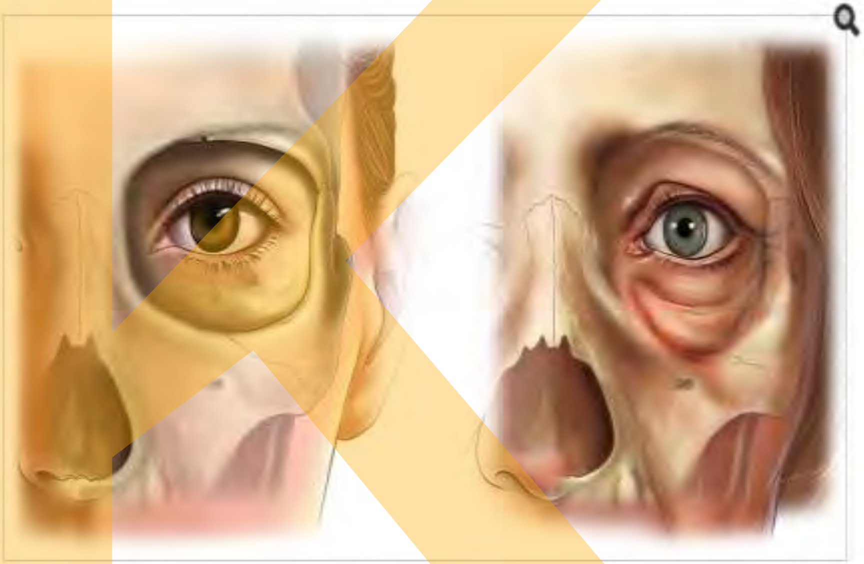


Fig. 2. Age-related enlargement of the orbital aperture. Reprinted with permission from Plast Reconstr Surg. 2000;106:479–488.

Fig. 6

The *darker areas* are those of the greatest bone loss. The stigmata of aging, manifested by the facial soft tissues, corresponds with the areas of weakened skeletal support

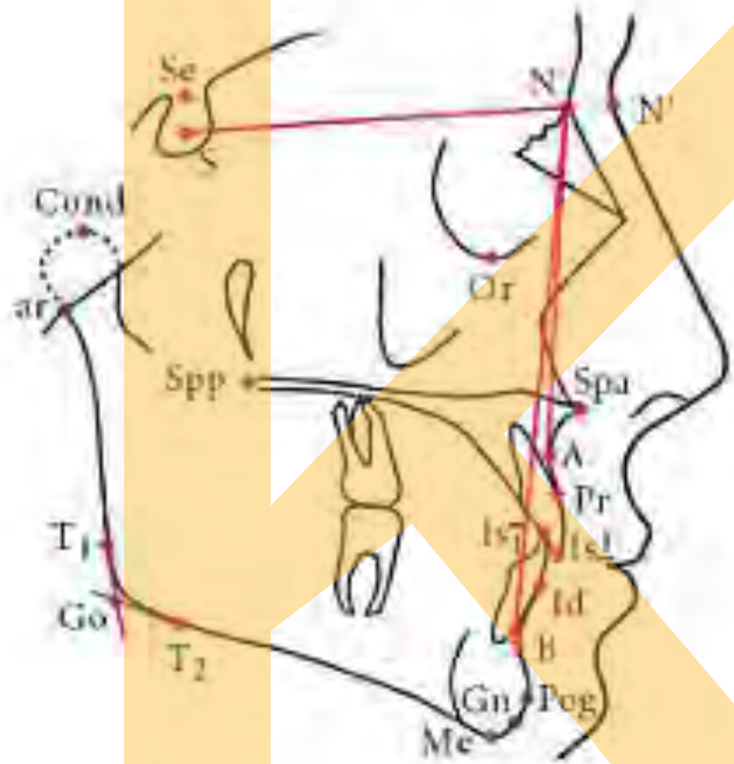
Fig. 1



Orbital aging. The superomedial and inferolateral aspects of the orbit have the greatest tendency to resorb. This contributes to the stigmata of periorbital aging such as increased prominence of the medial fat pad, elevation of the medial brow, and lengthening of the lid cheek junction

Sagitální analýza vztahů bází čelistí

① S-N-A
② S-N-B
③ A-N-B



Potřebné referenční body:

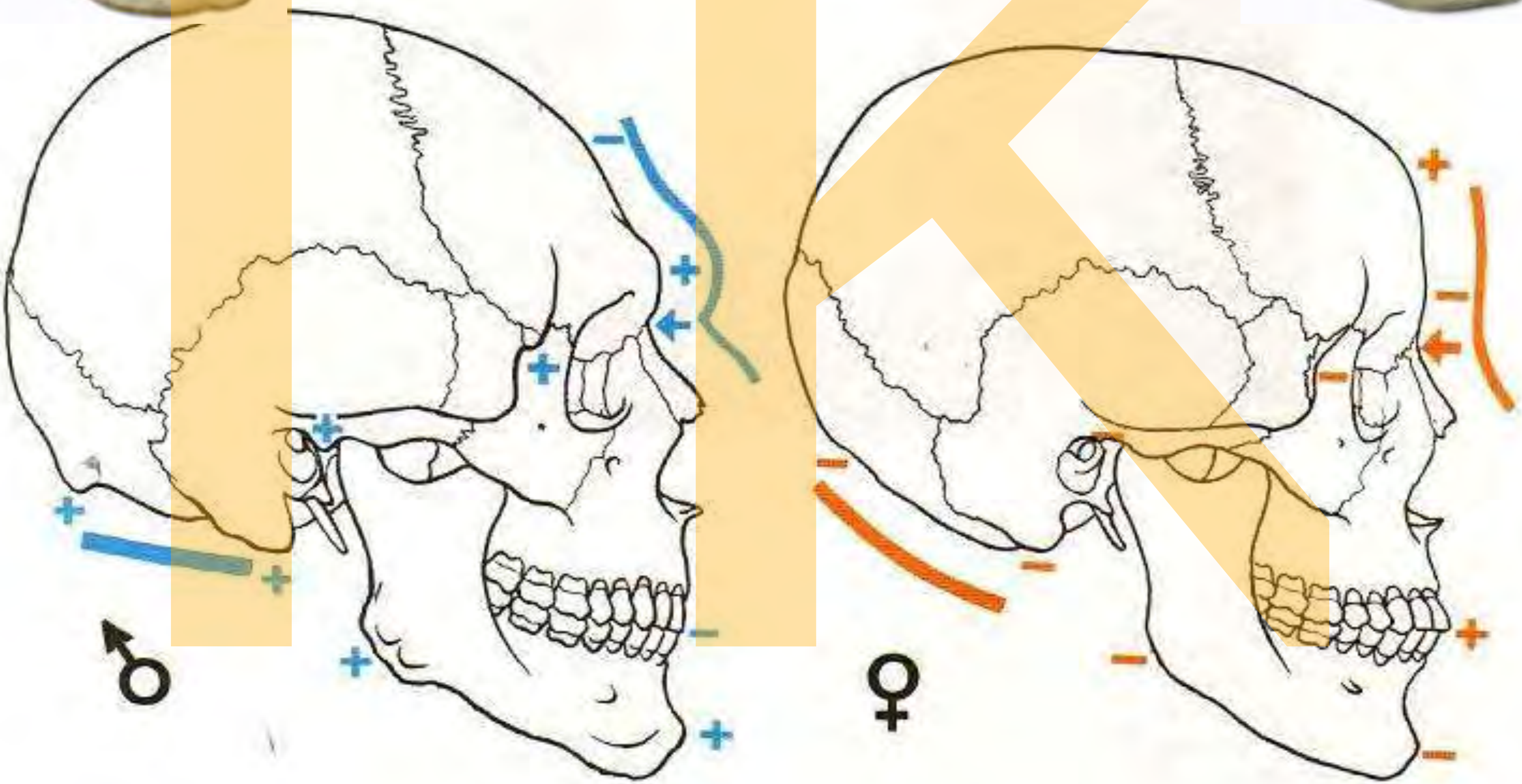
S	střed selly
N	nasion
A	bod A
B	bod B

Měření	Norma	Zvětšený	Zmenšený	Poznámky
S-N-A	81°	prognátní HČ	retrognátní HČ	
S-N-B	79°	prognátní DČ	retrognátní DČ	
A-N-B	2°	skeletální II. třída	skeletální III. třída (ANB < 0°)	závislé na SNMeGo (viz str. 138)

Růstová tendence

	Strukturální vodítka vzestupná větev ← dlouhá krátká → canalis mandibulae ← přímý zahnutý → symfýza ← úzká široká → spodní okraj corpus mandibulae ← „antegonial notching“	
ve směru hodinových ručiček = vertikální růstová tendence = posteriorotace mandibuly	**neutrální**	**proti směru hodinových ručiček = horizontální růstová tendence = anteriorotace mandibuly**
• úhel selly > 122° • kloubní úhel > 142° • horní čelistní úhel < 50° • dolní čelistní úhel > 75° • vztah výšky obličeje < 58 %	• horní čelistní úhel cca 50° • vztah výšky obličeje 60 % ± 2 %	• dolní čelistní úhel < 70° • vztah výšky obličeje > 63 %

Pohlavni rozdíly v utváření lebky muže a ženy



věk	Obvod hlavy
při narození	34 cm
6 měsíců	43 cm
1 rok	47 cm
3 roky	50 cm
10 let	53 cm
18 let	56 cm

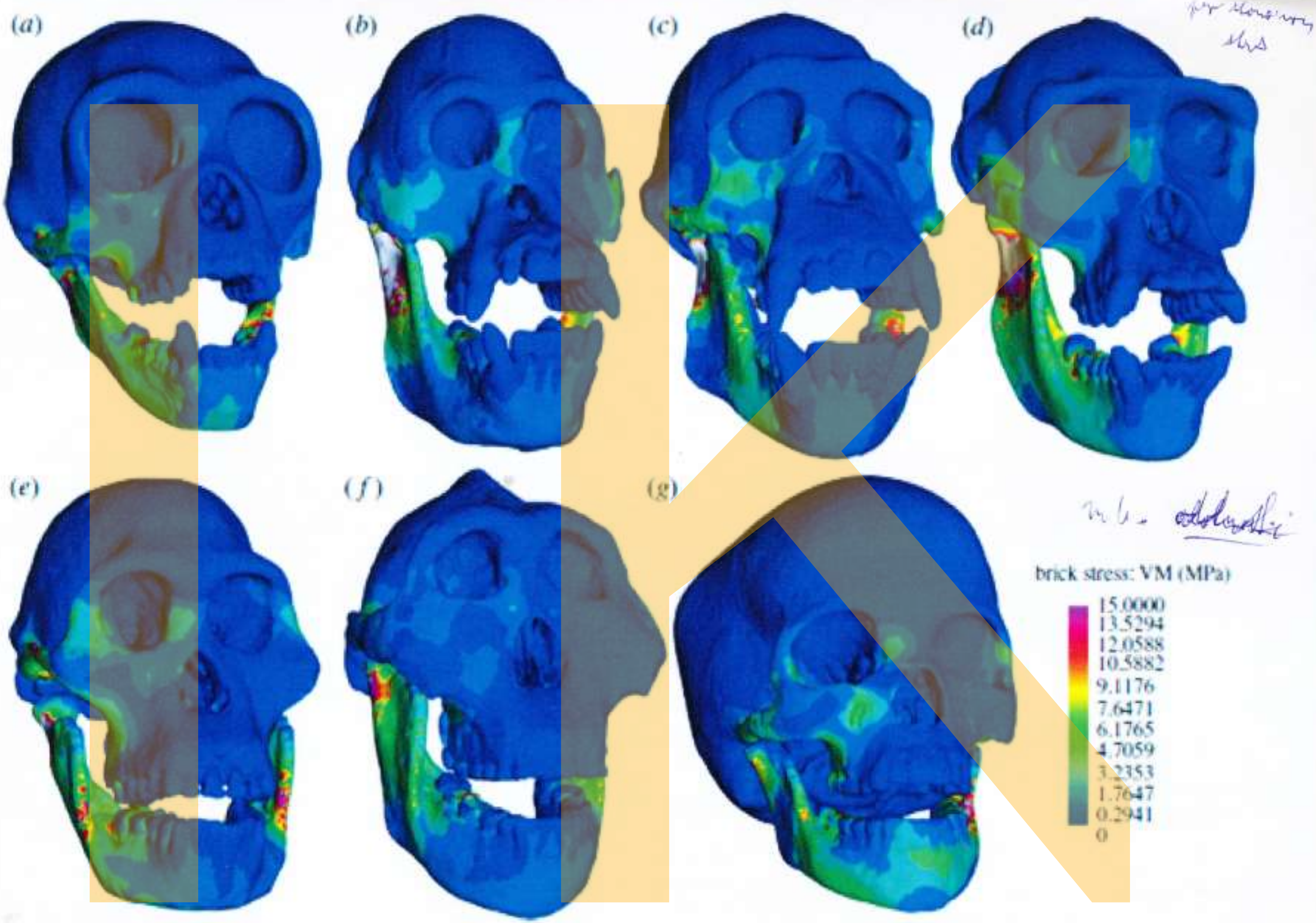
Proporční růst

•***Relation between head/body***:
newborn 1/4, adult 1/8

•***Relation between body/muscles***:
22 % in month 3, 35 % after *yr* 3, 40 % adult man.

energie

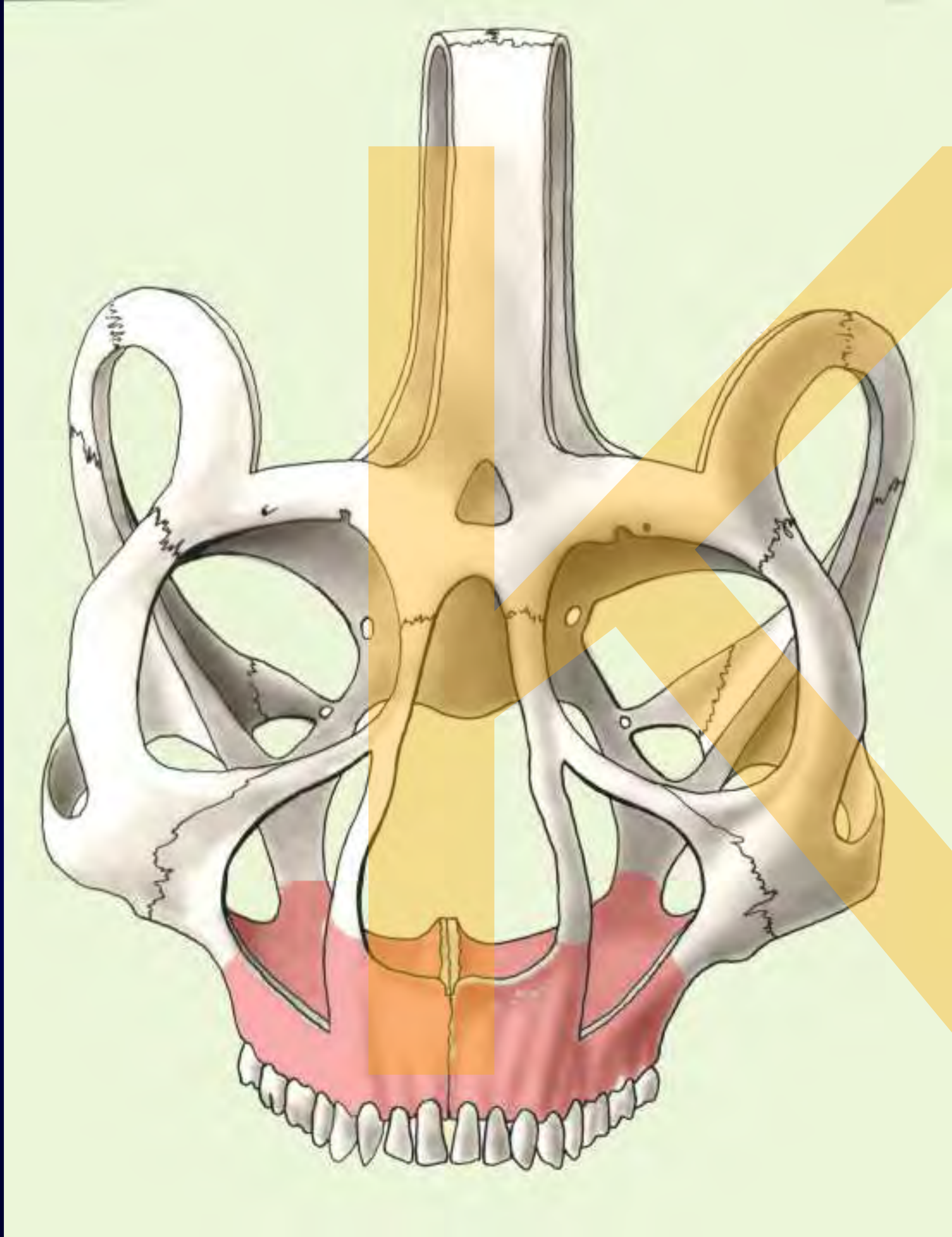
•***newborn***: 40 % energy on growth (110 kcal/kg daily);
•***toddler***: 3 % energy on growth (60–90 kcal/kg daily).



From left to right: White-handed gibbon, orang-utan, chimpanzee, gorilla, *Australopithecus africanus, Paranthropus boisei* and human.

Patrová deska

Palate plate



Podle Deffeze 1985

Přenos žvýkacího tlaku na struktury lebky

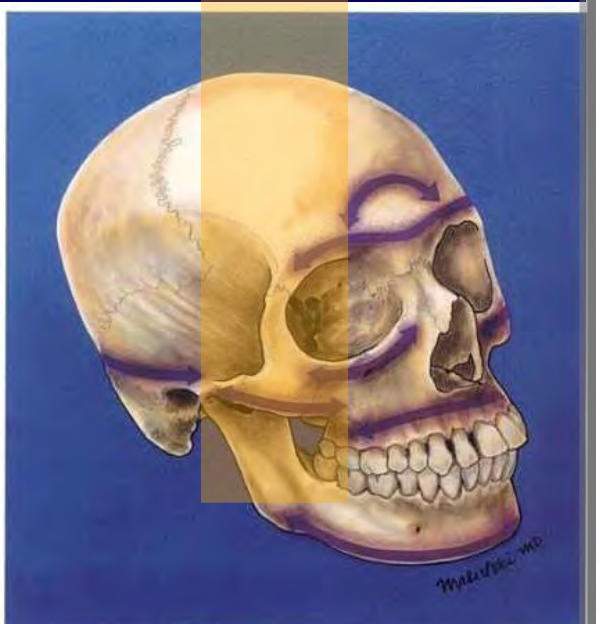


FIG. 4.8. Horizontal buttresses of the skull. The purple areas represent areas of thicker facial bone that are less likely to fracture than intervening areas.

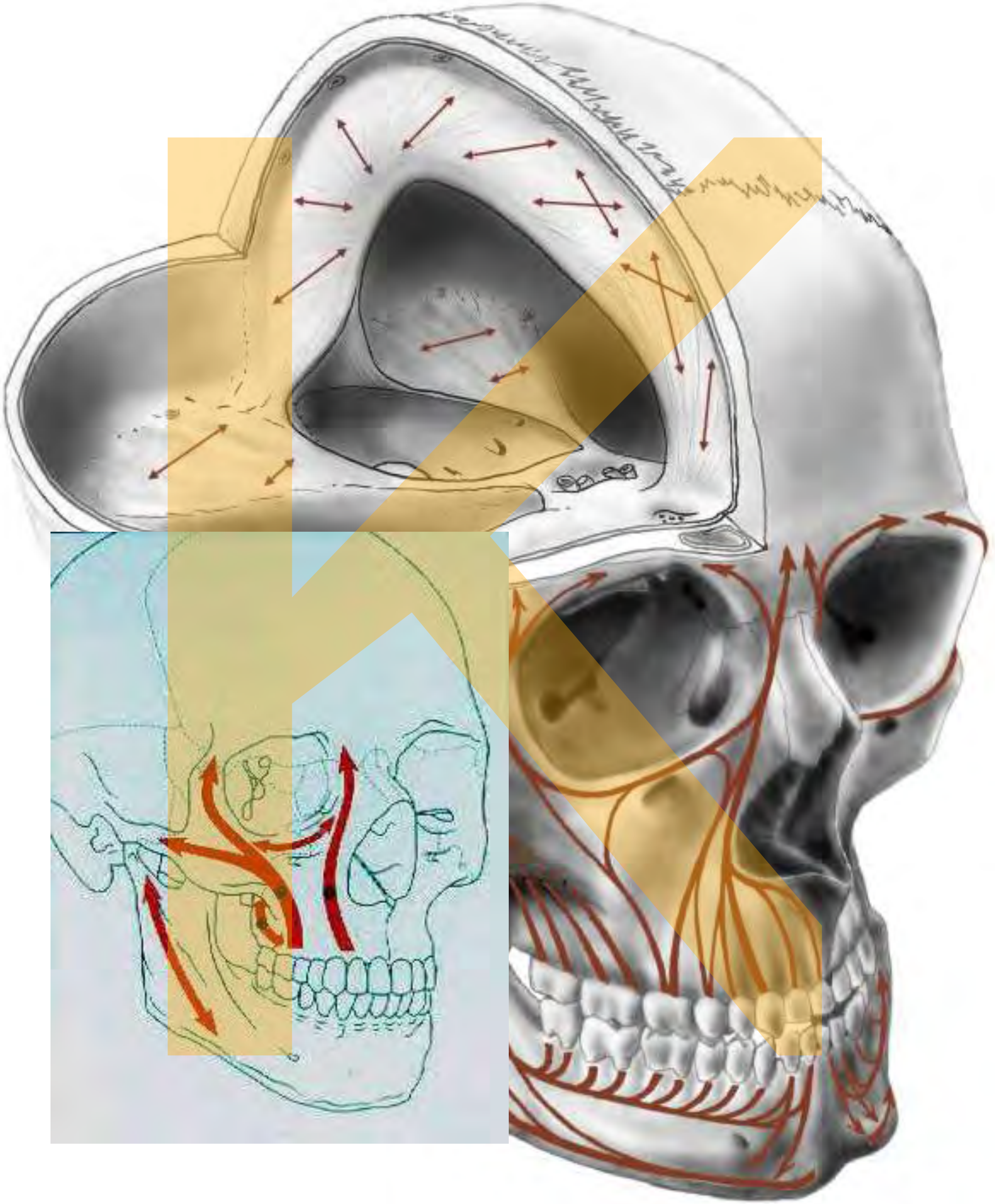
svislé a příčné pilíře

FIG. 3.9. Vertical buttresses of the skull. The purple areas represent areas of thicker facial bone that are less likely to fracture than intervening areas. Depending on the development of the sinuses, the buttress may follow the supraorbital rim and skirt the frontal sinus.

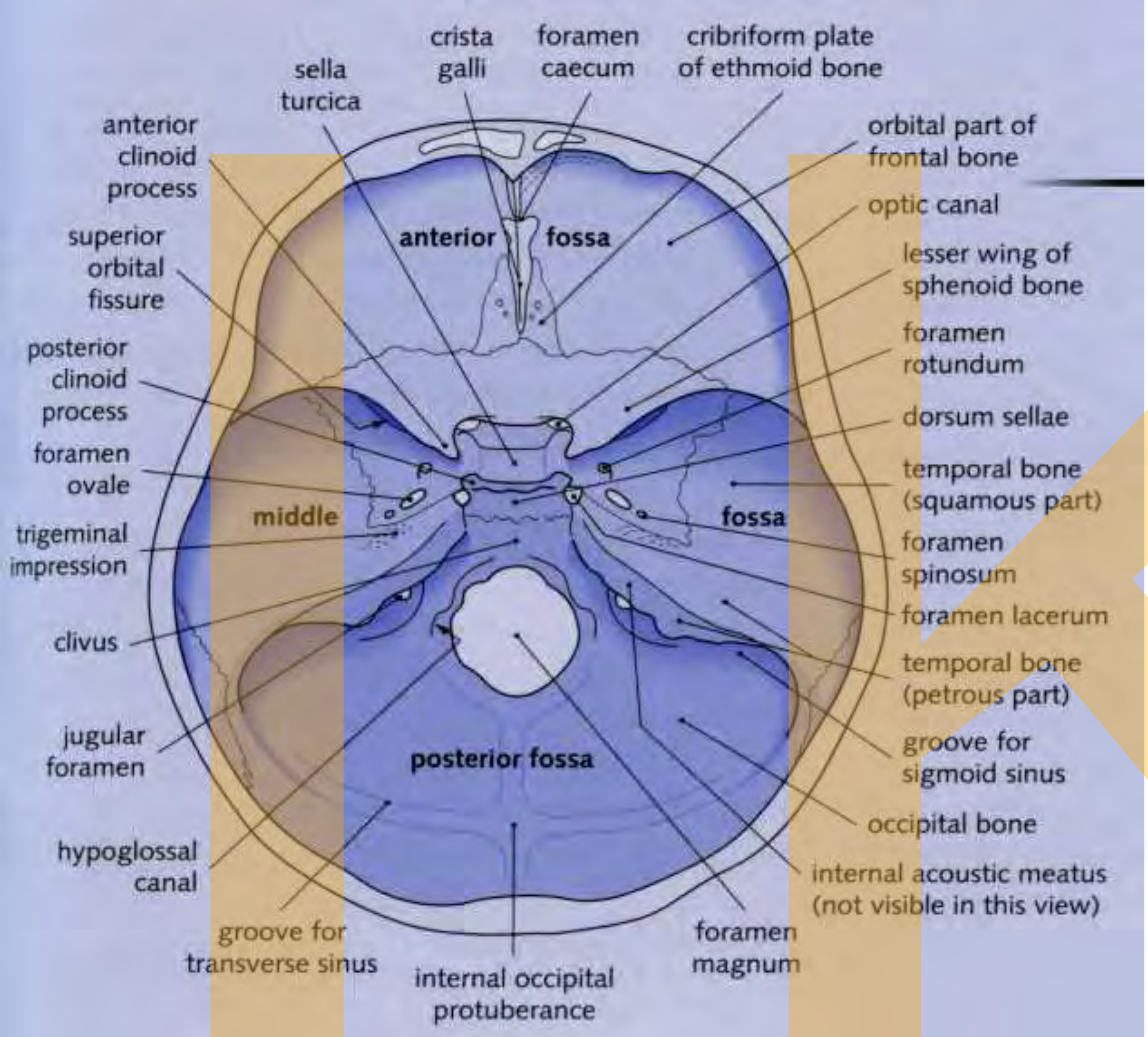
Přenos žvýkacího tlaku na struktury lebky

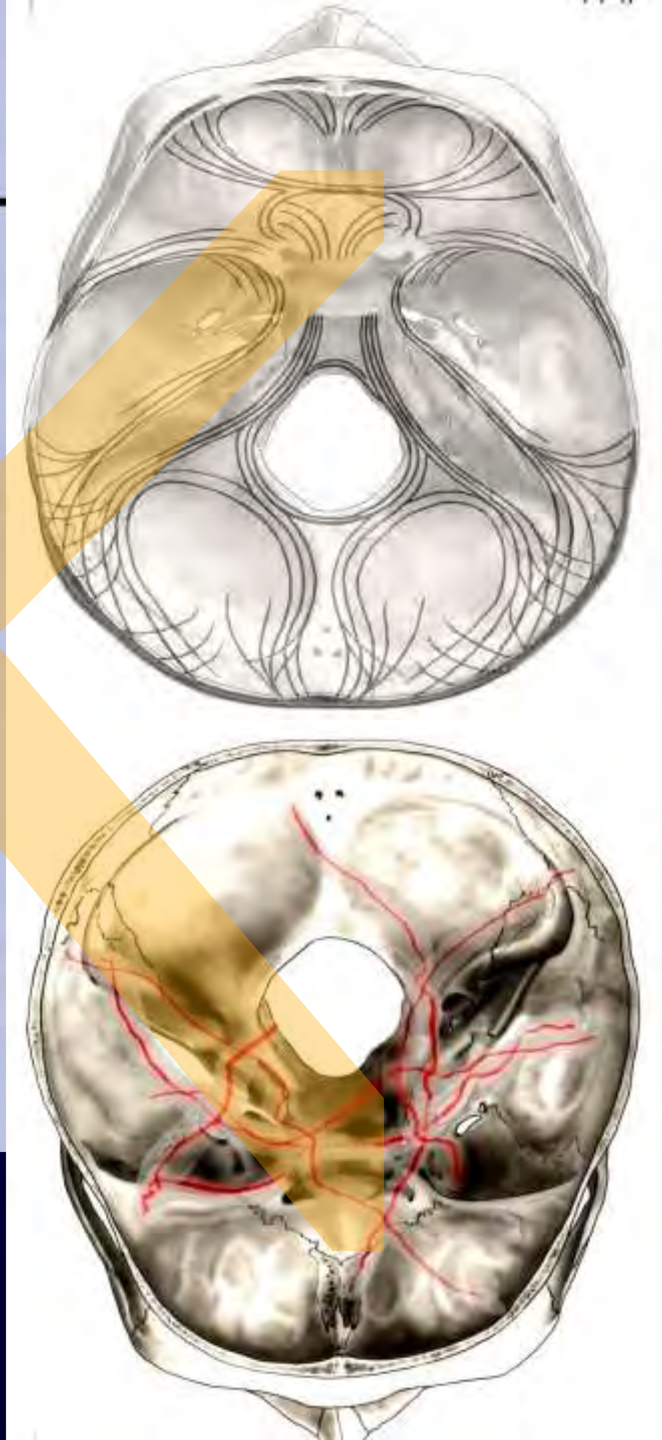
Three buttresses allow face to absorb force

- Nasomaxilární (mediální) pilíř
- Zymaticomaxilární (laterální pilíř
- Pterygomaxilární (zadní) pilíř



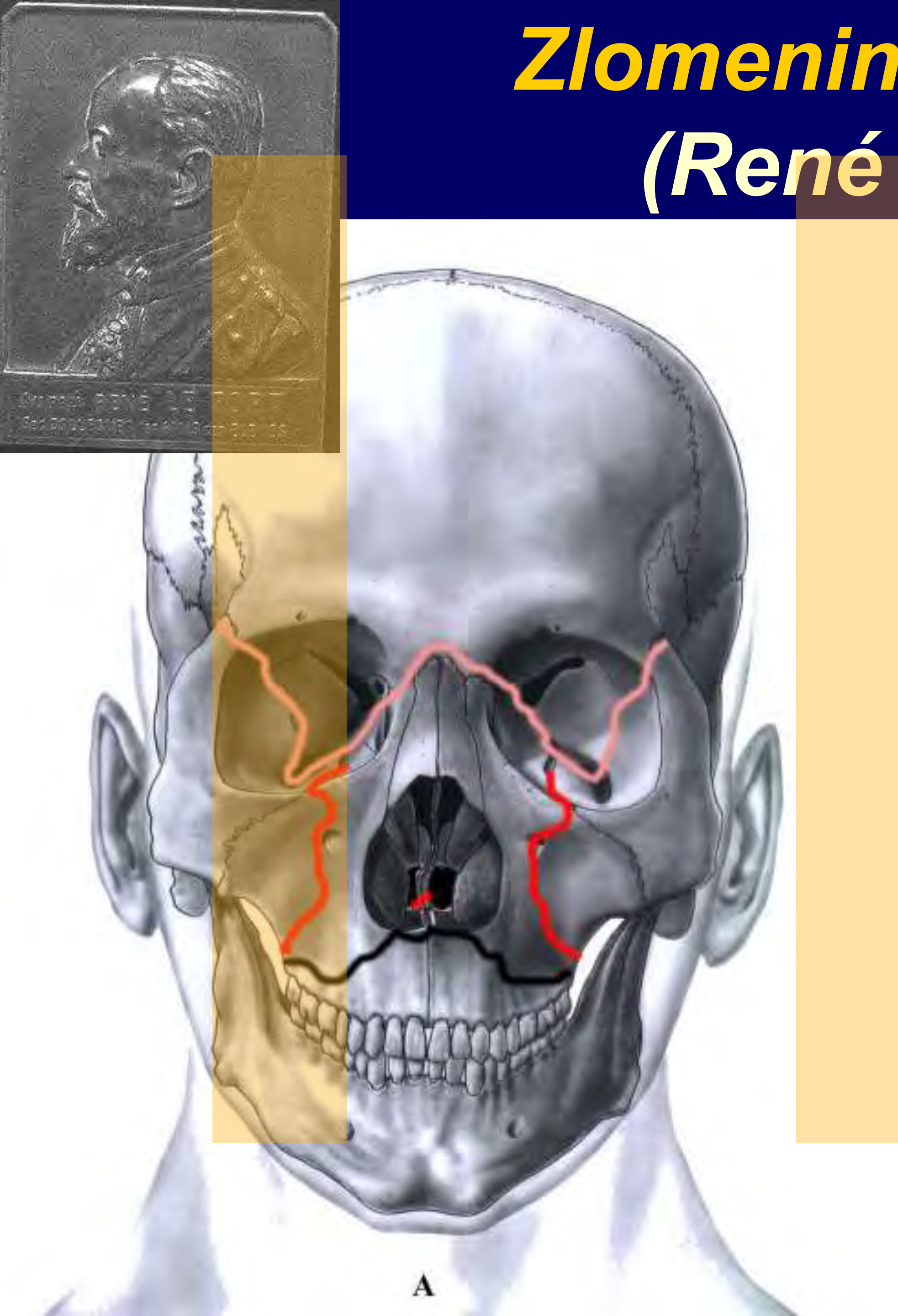
Tahové a tlakové linie v lebeční basi





Tahové a tlakové linie a hlavní linie lomu v lebeční basi

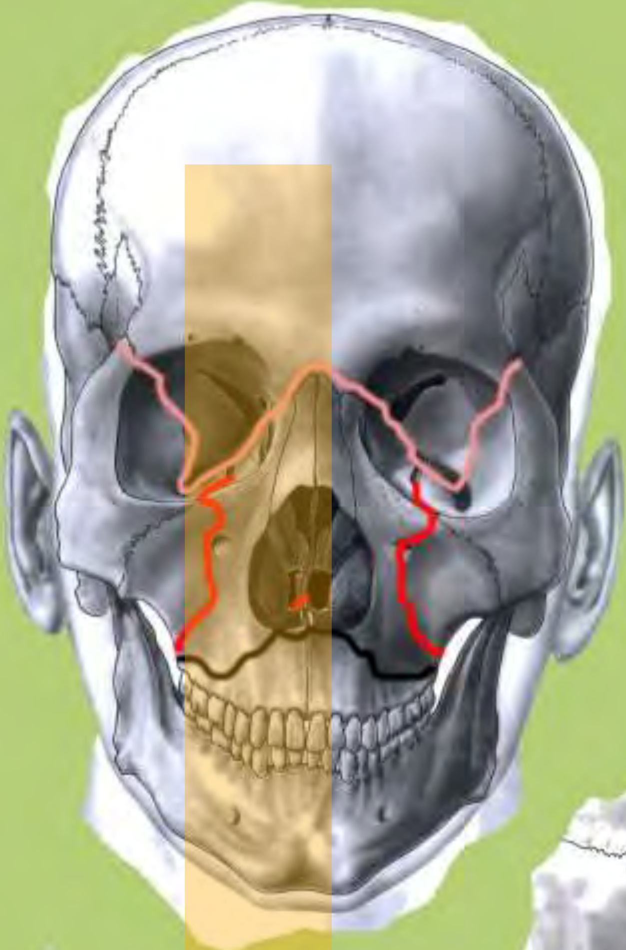
Zlomeniny podle Le Forta
(René Le Fort 1902)

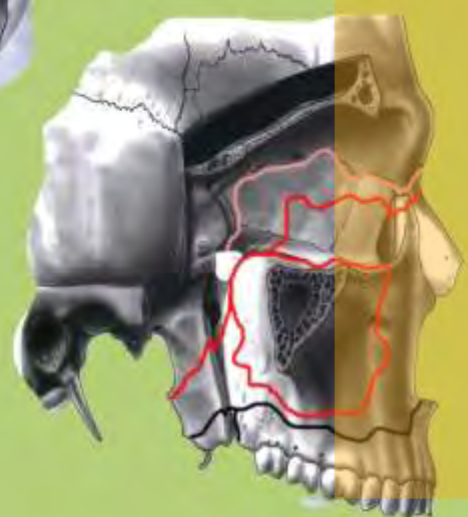


Lomem postižené části lebky :

- *Mediální stěna orbity*
- *Laterální stěna orbity směrem k sutura frontozygomatica*
- *Processus pterygoideus*
- *Basální část septum nasi*
- *arcus zygomaticus*

Le Fort I
Geren fracture
Subzygomatic

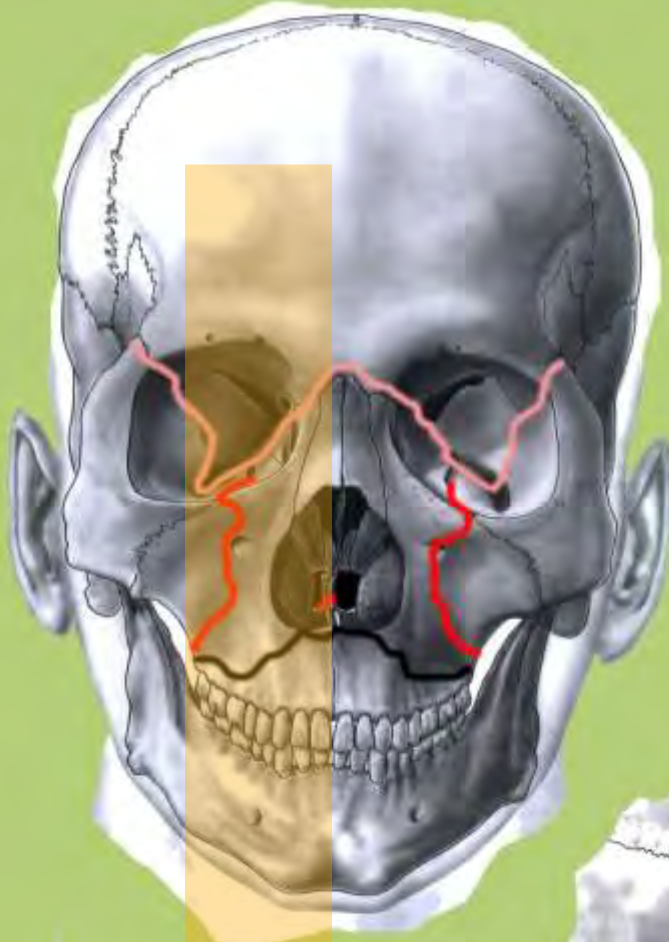


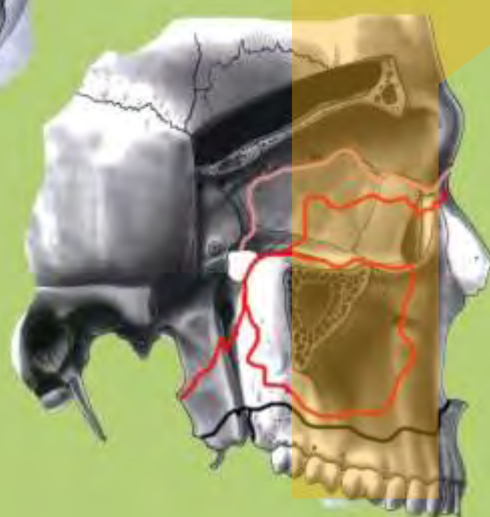


Le Fort fractures

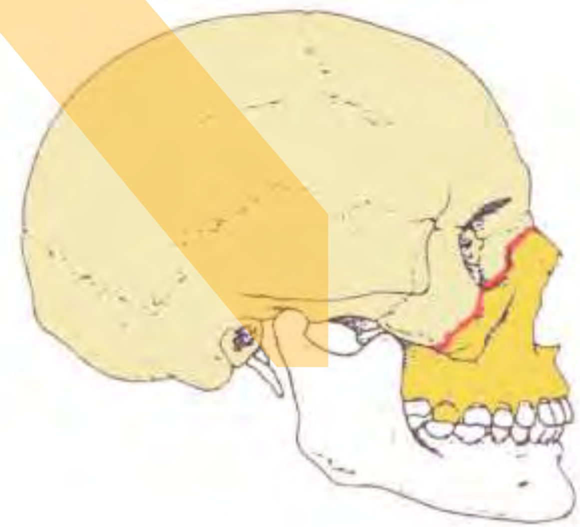
Le Fort I

Le Fort II Pyramidal, central, upper subzygomatic



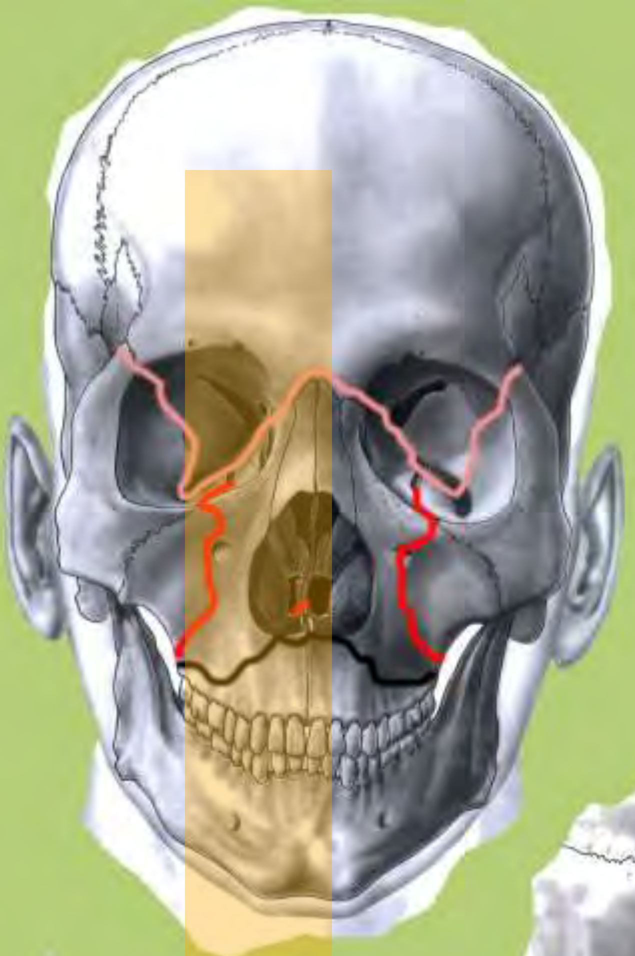


Le Fort II

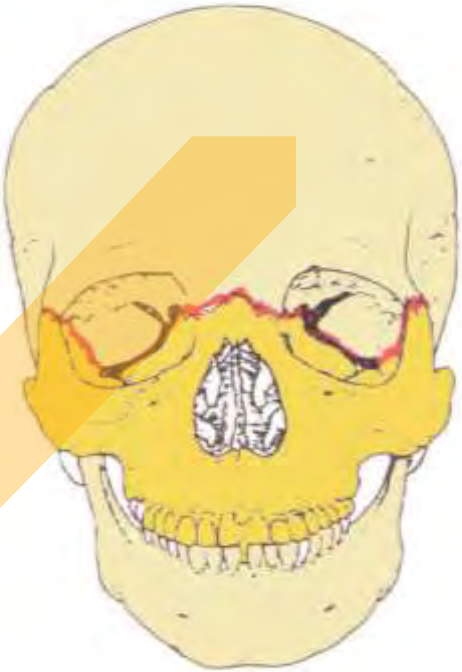


Le Fort fractures

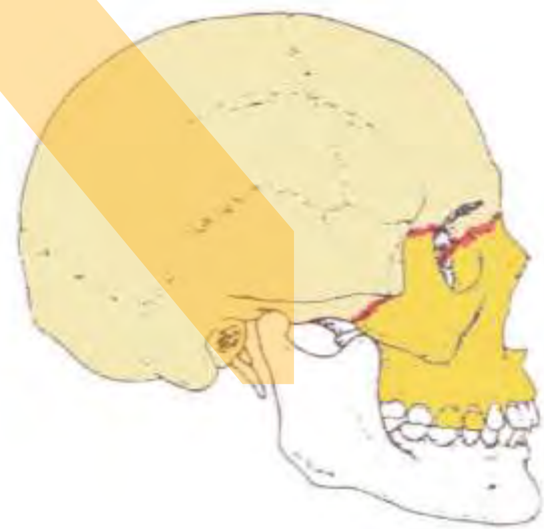
Le Fort III
Suprazygomatic fracture



Le Fort fractures

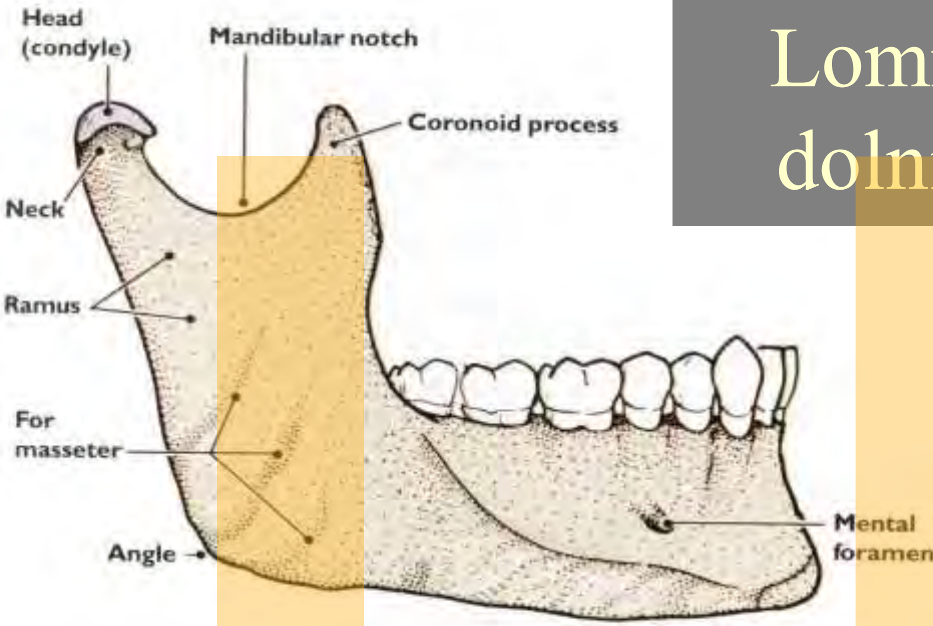


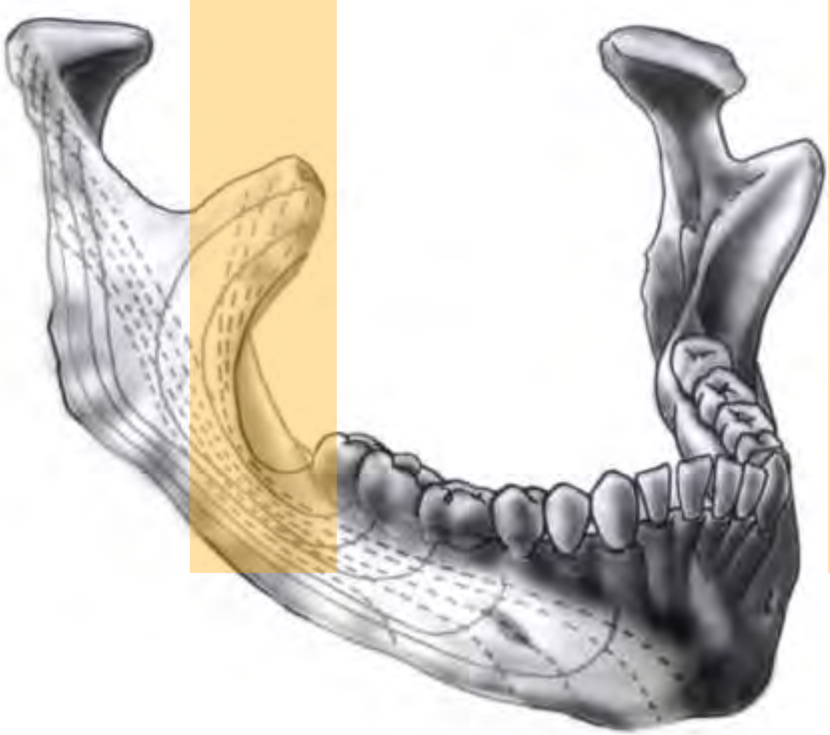
Le Fort III

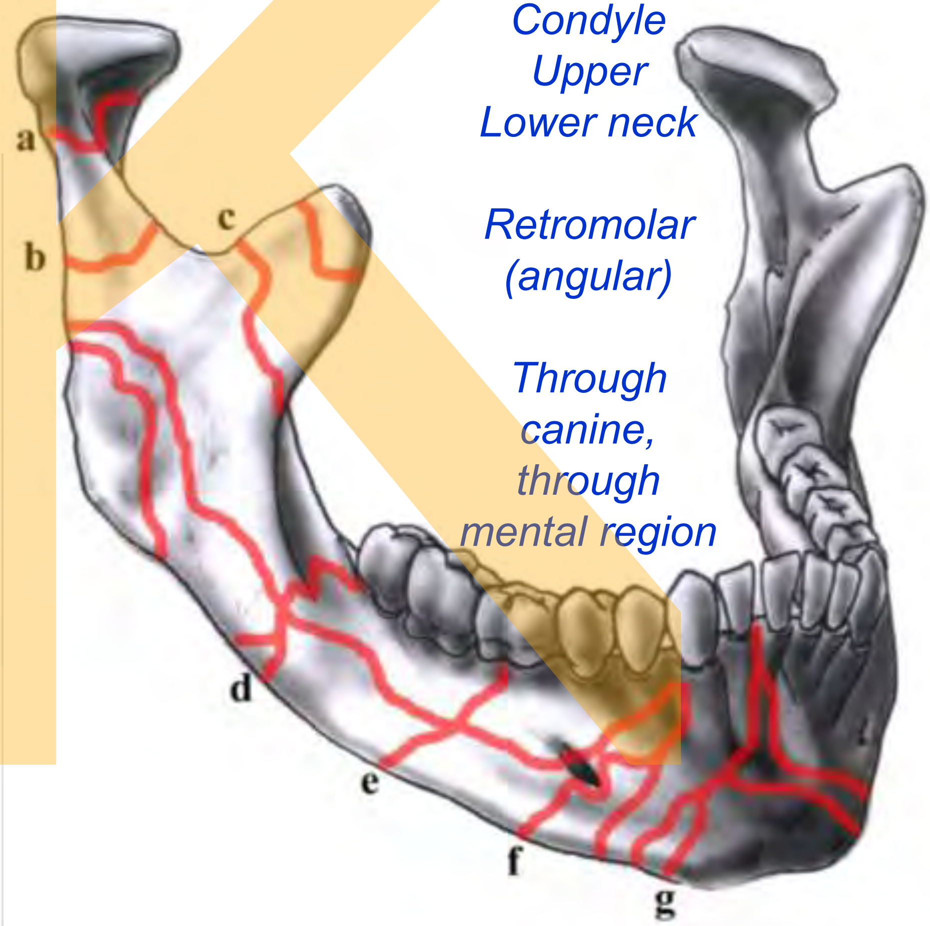


Lomné linie dolní čelisti

Trakční (tahové) a tlakové linie





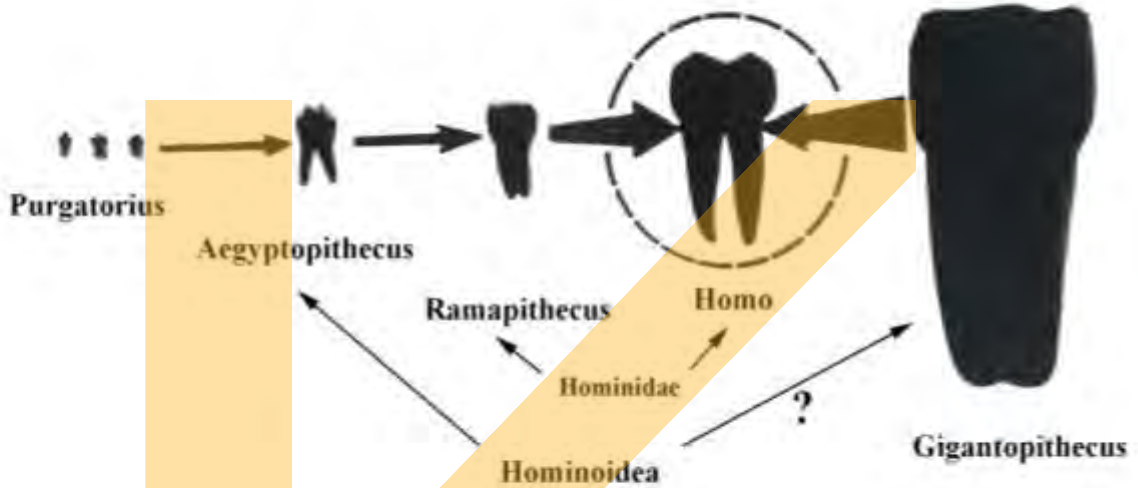


Condyle
Upper
Lower neck

Retromolar
(angular)

Through
canine,
through
mental region

ZUBY
DENTES

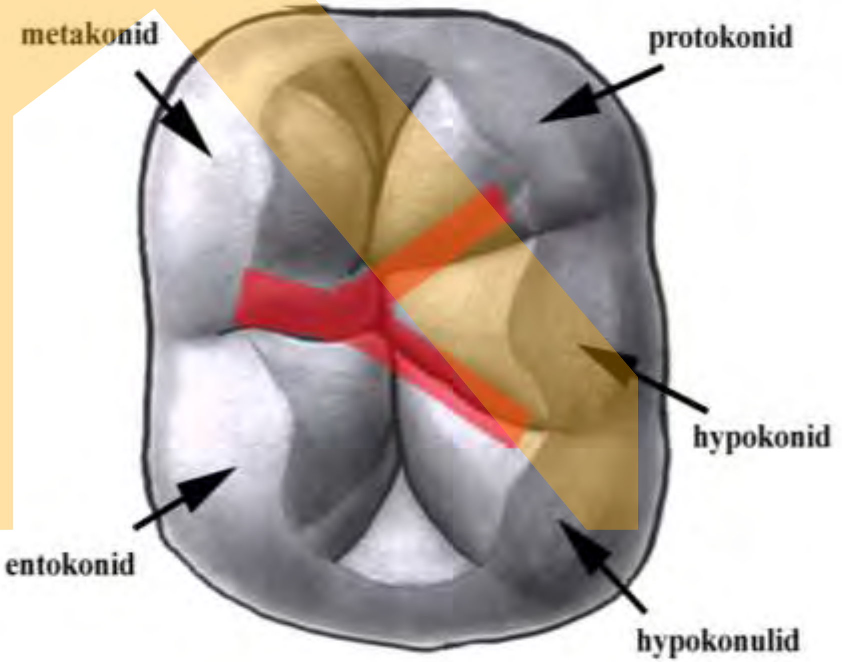


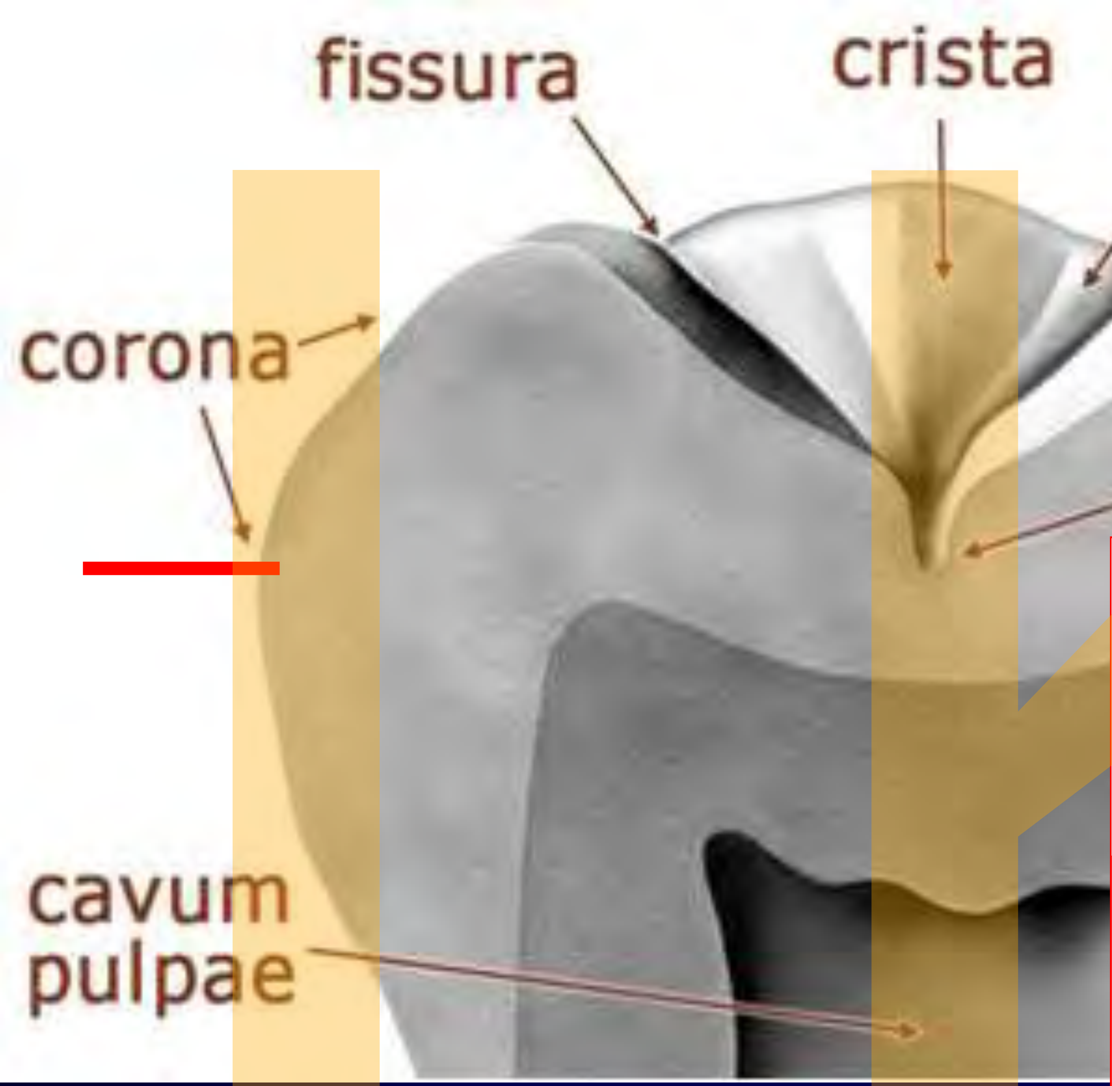
zub

dens, dentis lat.

odoús (ὀδούς), odóntos (ὀδόντος) řec.

(dens incisivus, caninus, premolaris, molaris (Y5 vzorec)

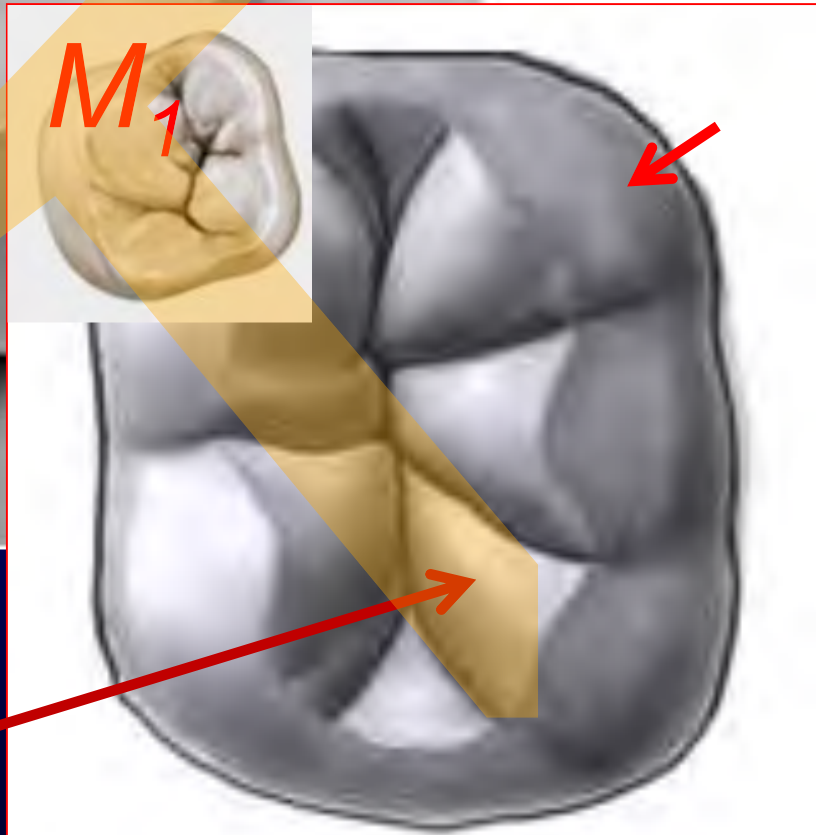




Gingivální ohraničení žvýkací plochy

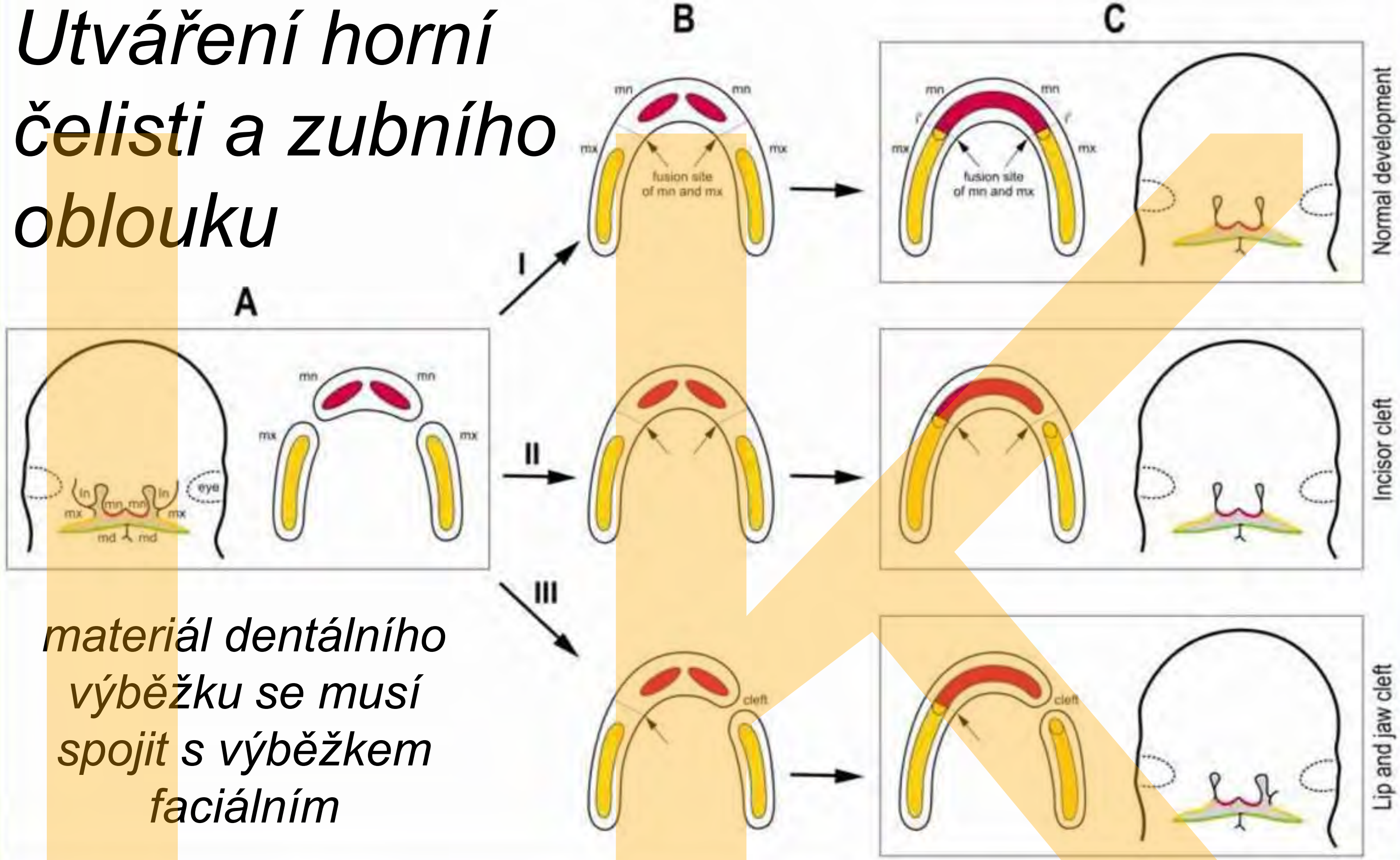
Prominentia *(Vypouklá plocha hrbolku)*

určuje směr klouzání hrbolků druhého oblouku při žvýkání



Sklovinná lišta spojuje hroty hrbolků a valy

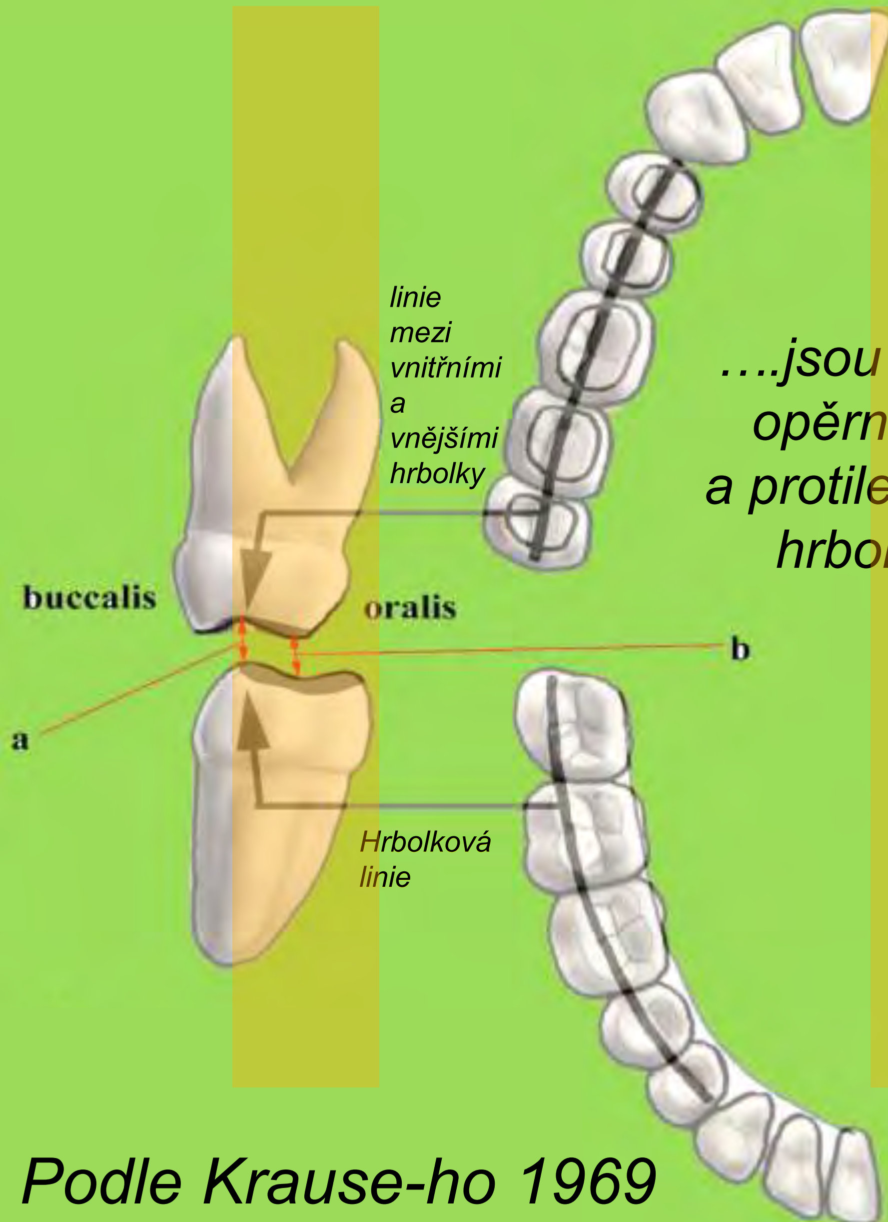
Utváření horní čelisti a zubního oblouku



materiál dentálního výběžku se musí spojit s výběžkem faciálním

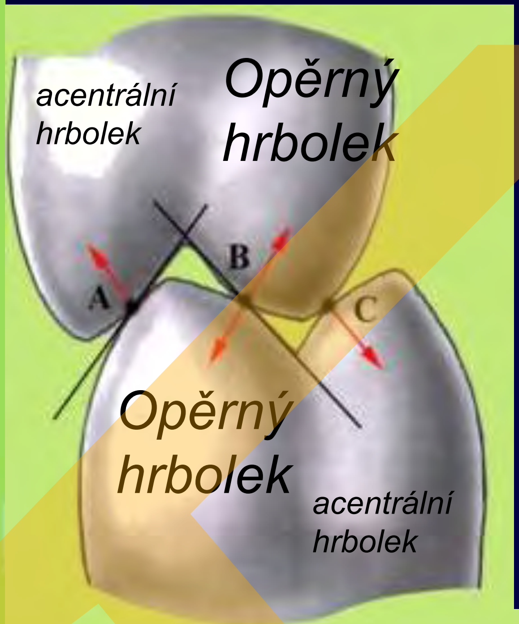
The early development of the human upper jaw and dental arch in a scheme. The scheme shows frontal aspect of the embryonic human face and the oral aspect of the upper jaw arch before **(A)** and after the critical period of the fusion of the facial processes **(B)** and dental epithelium **(C)**. In the 5th week old embryo **(A)**, the medial nasal (mn) and the maxillary (mx) processes are not yet fused. **(B)** During normal development **(I)**, the facial processes fuse giving rise to a continuous upper lip and jaw arch. Origin of the upper jaw cleft results from failing fusion of the mn and mx **(III)**. During normal development **(I)**, the fusion of the facial processes is followed by a fusion of their dental epithelia and formation of a continuous dental lamina in week 6-7 human embryo. At the site of the fusion of the dental epithelia, the germ of the lateral incisor (i2) emerges, containing material from both the mn and mx under **(C/I)**. Developmental anomalies of i2 (duplication, hypoplasia, absence) are typically associated with a presence of the upper jaw cleft **(C/III)**. However, incisor anomalies also frequently occur in normally formed upper jaw arch. This can be explained by a defect in fusion of the two incisor components **(C/II)**. Red, yellow and green – dental epithelium of the respective mn, mx and mandibular process (md).

Okluzní kontakty protilehlých zubů v interkuspidaci

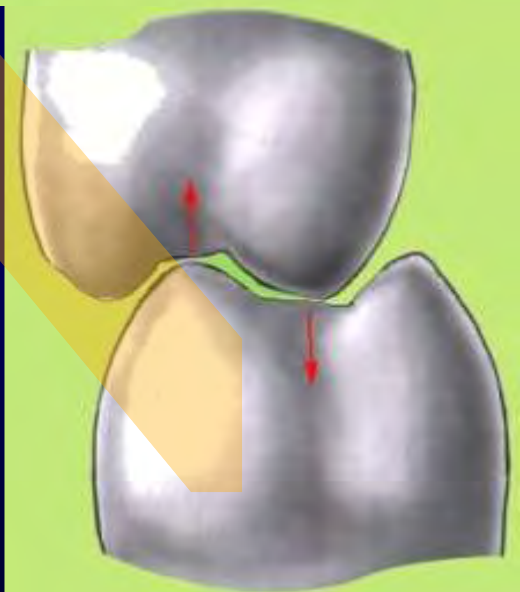


….jsou mezi opěrnými a protilehlými hrbolky

Podle Krause-ho 1969



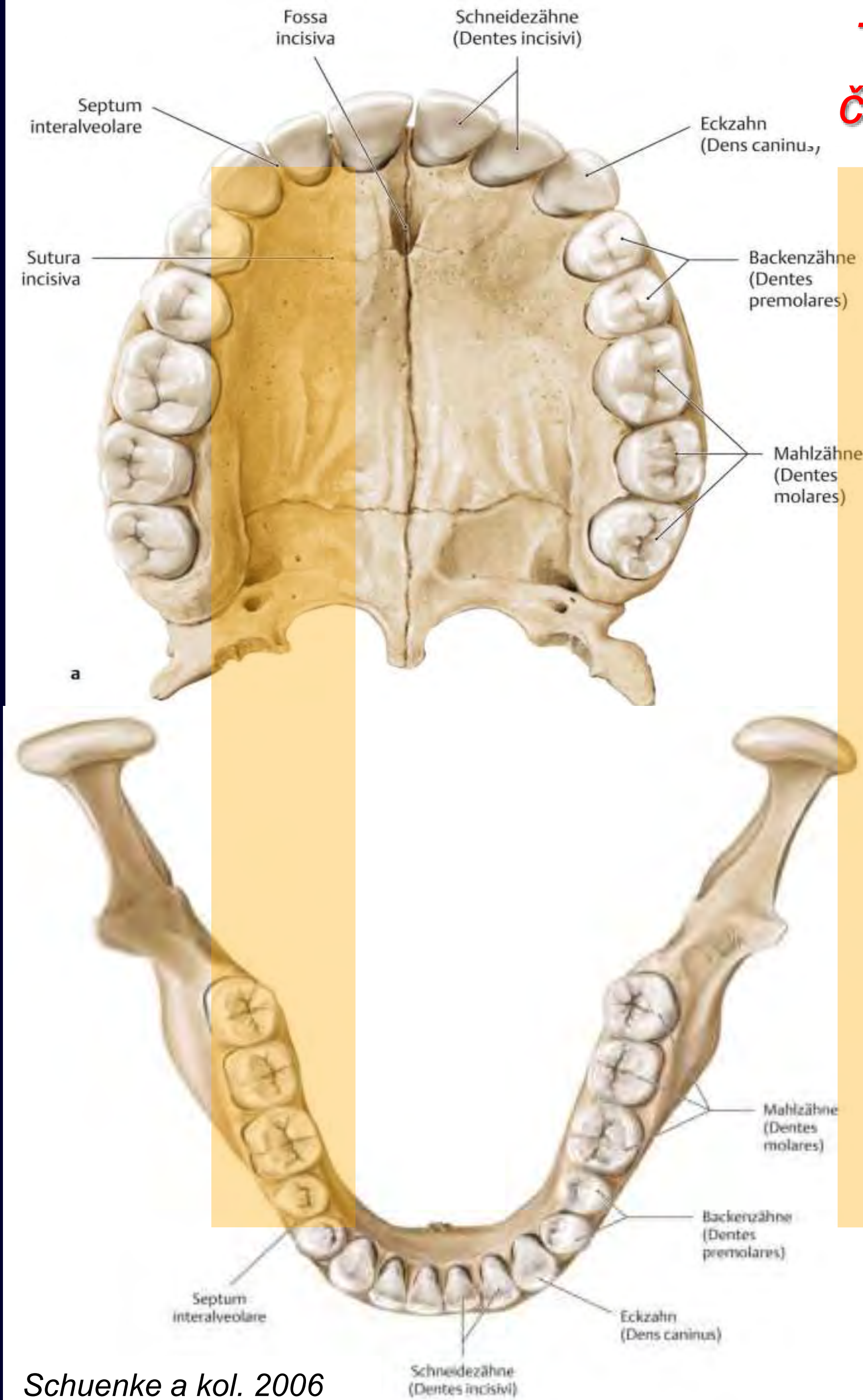
Centrální okluze
(body v kontaktu se stávají zarážkami (jsou v maximální interkuspidaci)
(point centric)



Dynamická okluze
(hroty hrbolků se pohybují mezi IKP a RKP a lehce i do stran)
(free centric)

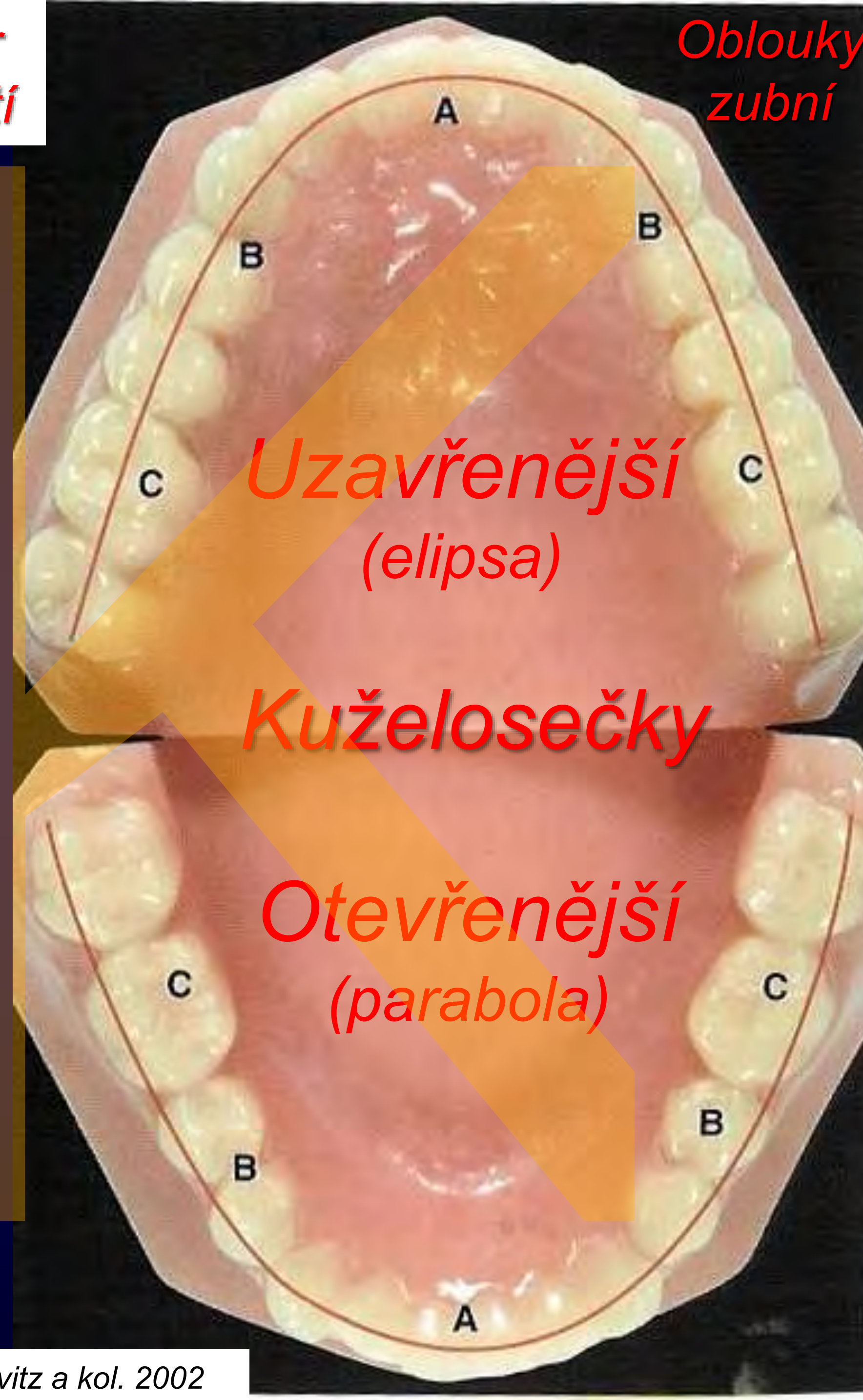
podle Ashe a Ramfjorda 1982

Tvar čelistí



Schuenke a kol. 2006

Oblouky zubní

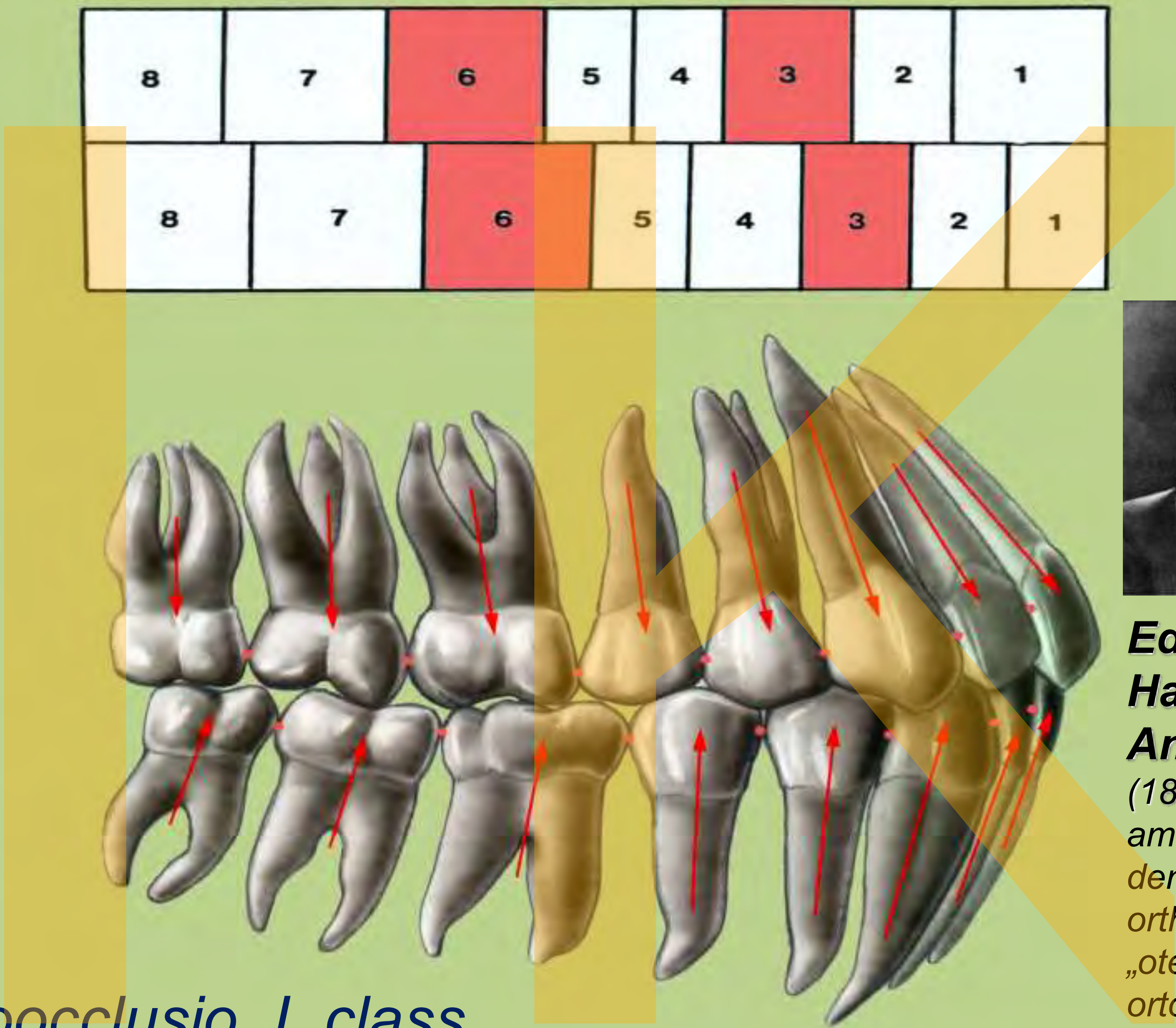


Uzavřenější
(elipsa)

Kuželosečky

Otevřenější
(parabola)

Berkovitz a kol. 2002



Edward Hartley Angle
(1855 – 1930)
americký dentista a orthodontista
„otec moderní ortodoncie“

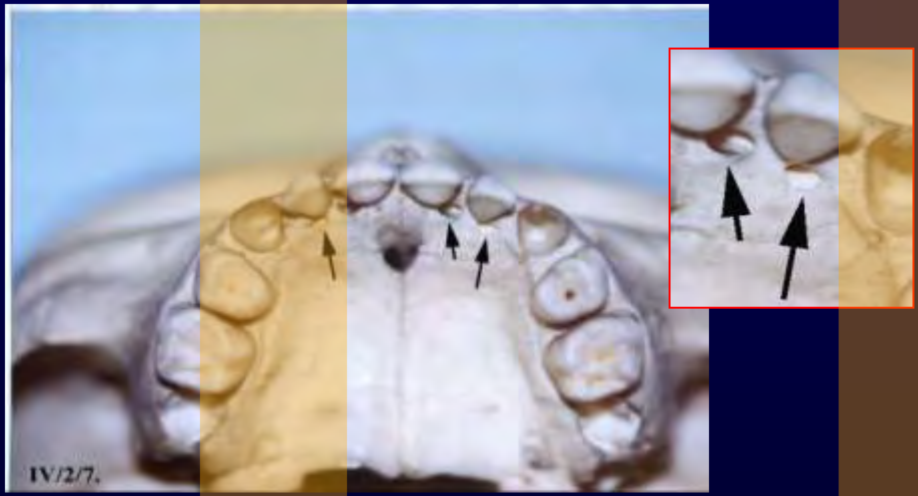
Normoocclusio I. class

Obvyklý okluzní vztah mezi zuby protilehlých oblouků


a
b
c
B
d
B
e
f
g
A
h
A

Zvýšení skusu
a formování vztahu mezi zubními oblouky
při prořezávání a zařazování zubů do dentice

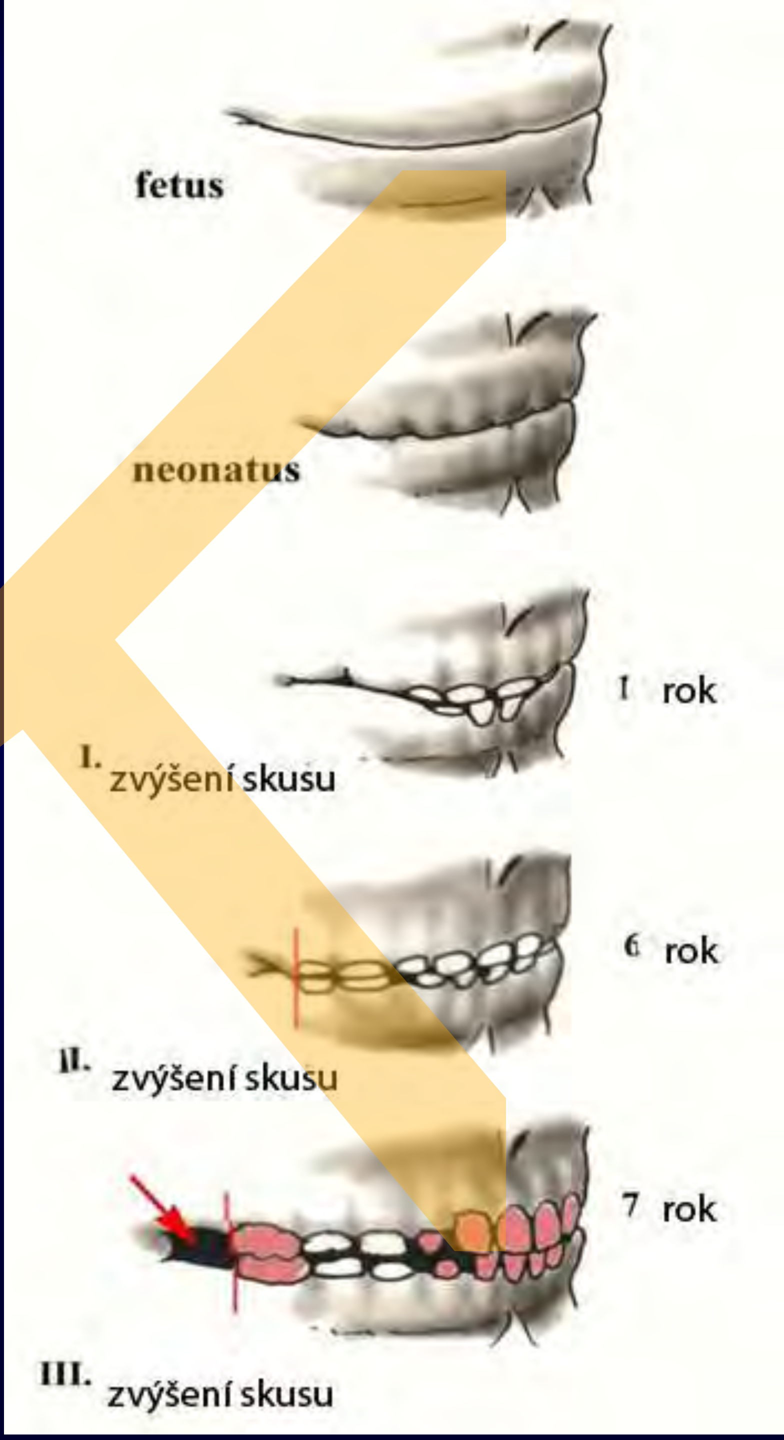
skus - vzdálenost mezi alveolárnimi hřebeny či okraji alveolů



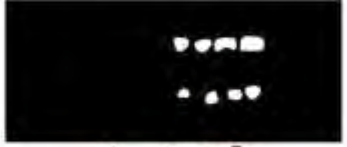
I.

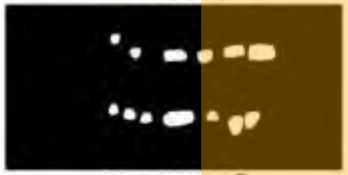
II.

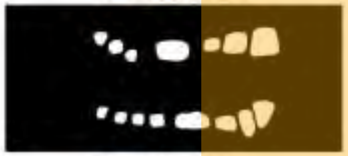
III.



Ash, M. M. and Stanley J. Nelson, S. J.: Dental Anatomy, Physiology, and Occlusion. 8th edition. 2003


5 měsíců


7 měsíců


neonatus


6 měsíců (+- 2 měsíce)

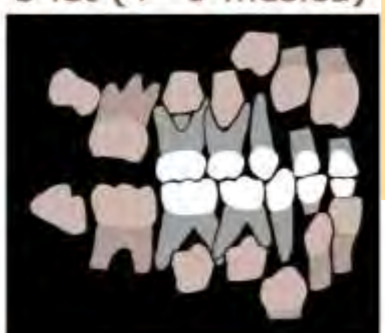

1rok (+- 3 měsíce)


2 roky (+- 6 měsíců)

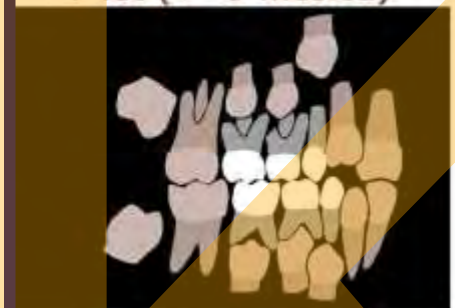

3 roky (+- 6 měsíců)


4 roky (+- 9 měsíců)


5 let (+- 9 měsíců)


6 let (+- 9 měsíců)


7 let (+- 9 měsíců)


8 let (+- 9 měsíců)


9 let (+- 9 měsíců)


10 let (+- 9 měsíců)


11 let (+- 9 měsíců)


12 let (+- 9 měsíců)


15 let (+- 9 měsíců)


21 let (+- 9 měsíců)


35 let (+- 9 měsíců)

Deciduous Teeth	Medial Incisor	Lateral Incisor	Canine	First Molar	Second Molar
Eruption (months)[a]	6 to 8	8 to 10	16 to 20	12 to 16	20 to 24
Shedding (years)	6 to 7	7 to 8	10 to 12	9 to 11	10 to 12

[a]In some normal infants, the first teeth (medial incisors) may not erupt until 12 to 13 months of age.

Permanent Teeth	Medial Incisor	Lateral Incisor	Canine	First Premolar	Second Premolar	First Molar	Second Molar	Third Molar
Eruption (years)	7 to 8	8 to 9	10 to 12	10 to 11	11 to 12	6 to 7	12	13 to 25

deciduous teeth

central I - 6-8 months
Lateral I - 8-10 months
first molars - 1 year
canines - 18 months
second molars - 2 years

permanent teeth

first molars - 6 years
central i - 7 years
lateral I - 8 years
first premolars - 9 years
second premolars - 10 years
canines - 11 years
second molars - 12 years
third (wisdom) M - 30 years

Zdroje

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Own archive

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or: http://anat.lf1.cuni.cz/aindex.html