

Facial skeleton,
jaws, sinuses, TMJ joint,
mastication muscles, gum,
periodontium, tongue,
pharynx, tonsils



By

Ivo Klepáček

JAWS

γνάθος (gnathos)

Premaxilla

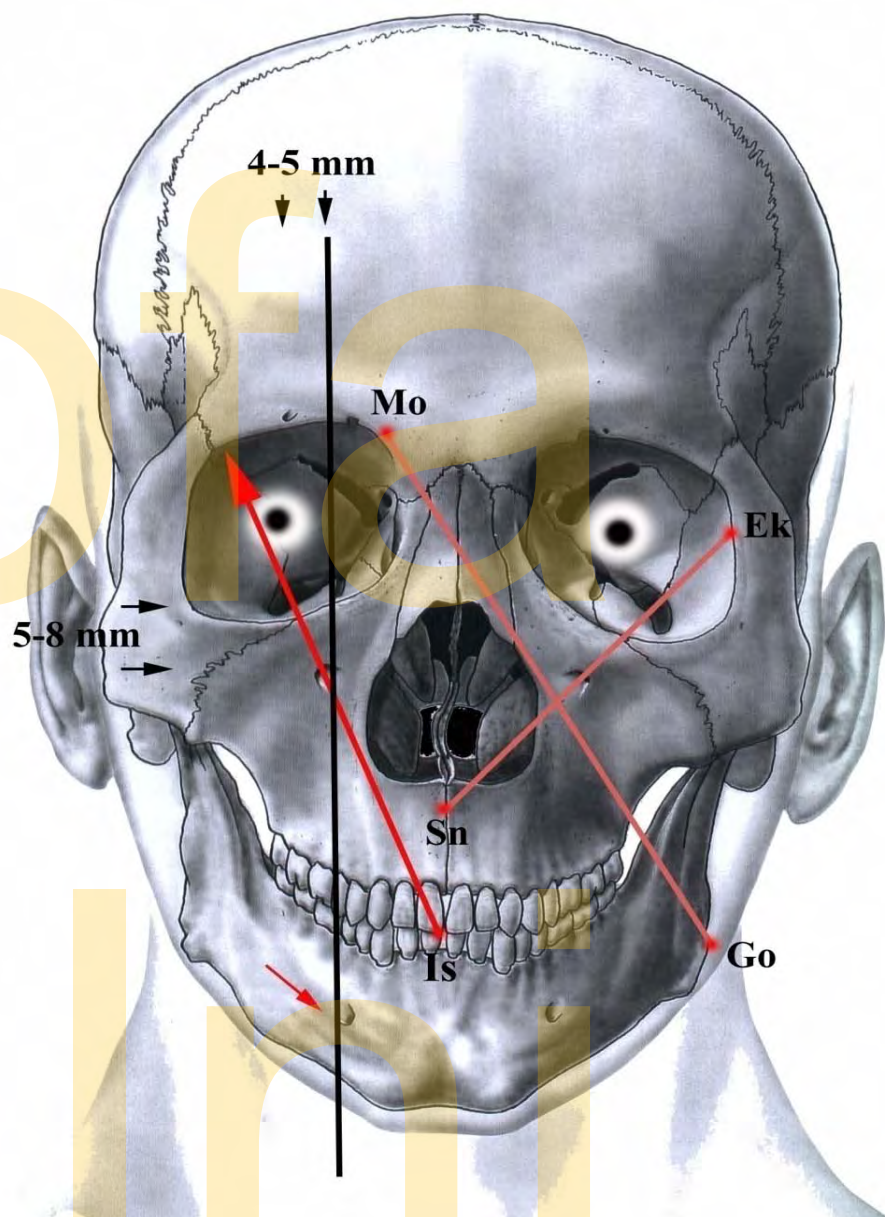
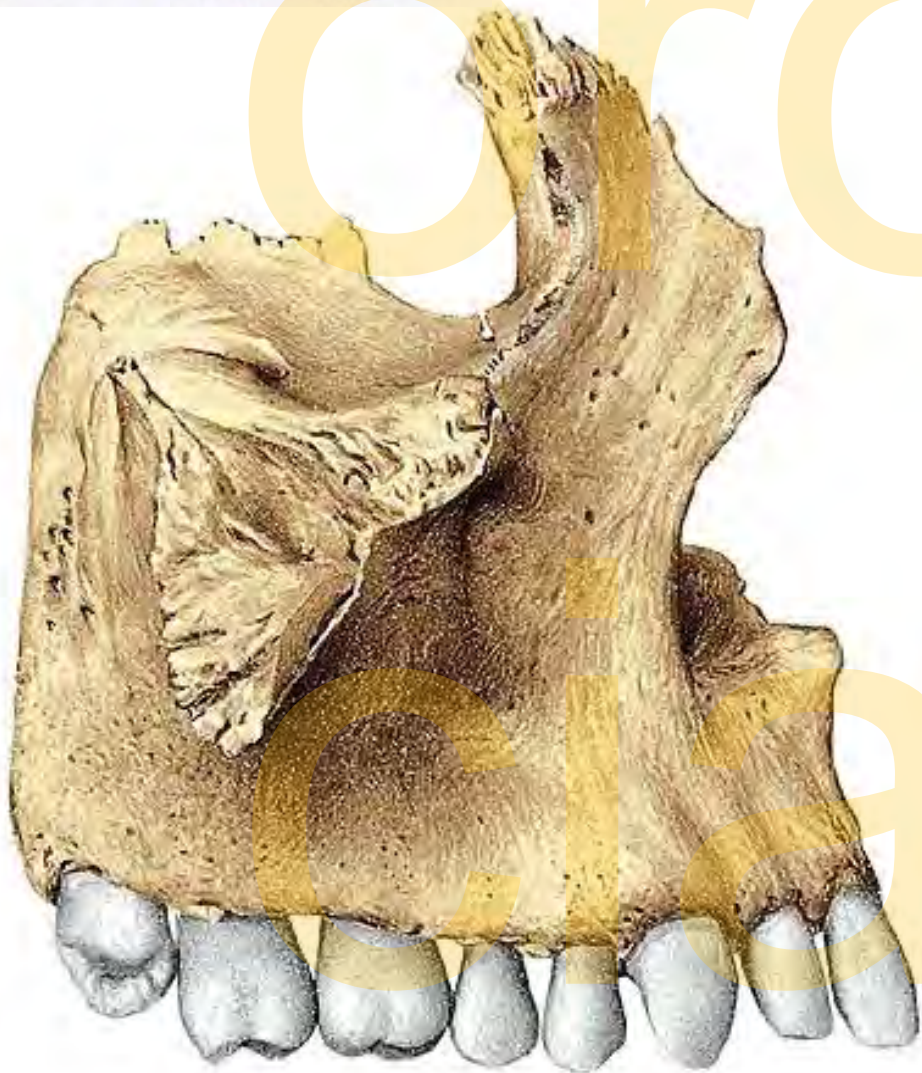
Maxilla

Mandibula



Maxilla

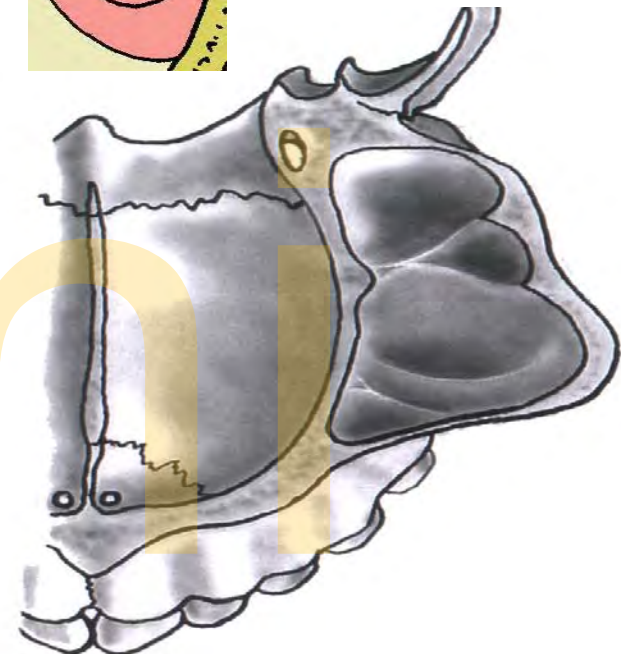
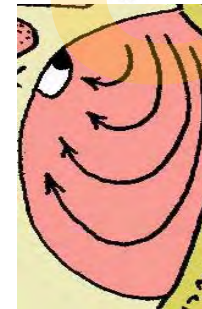
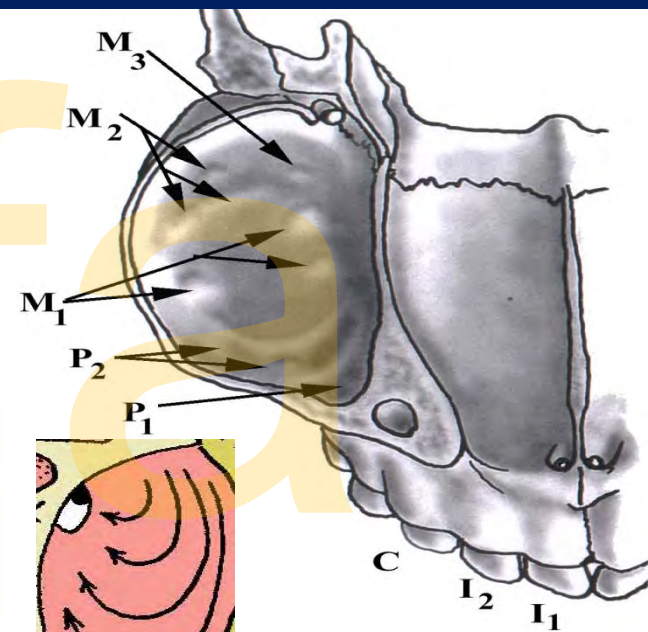
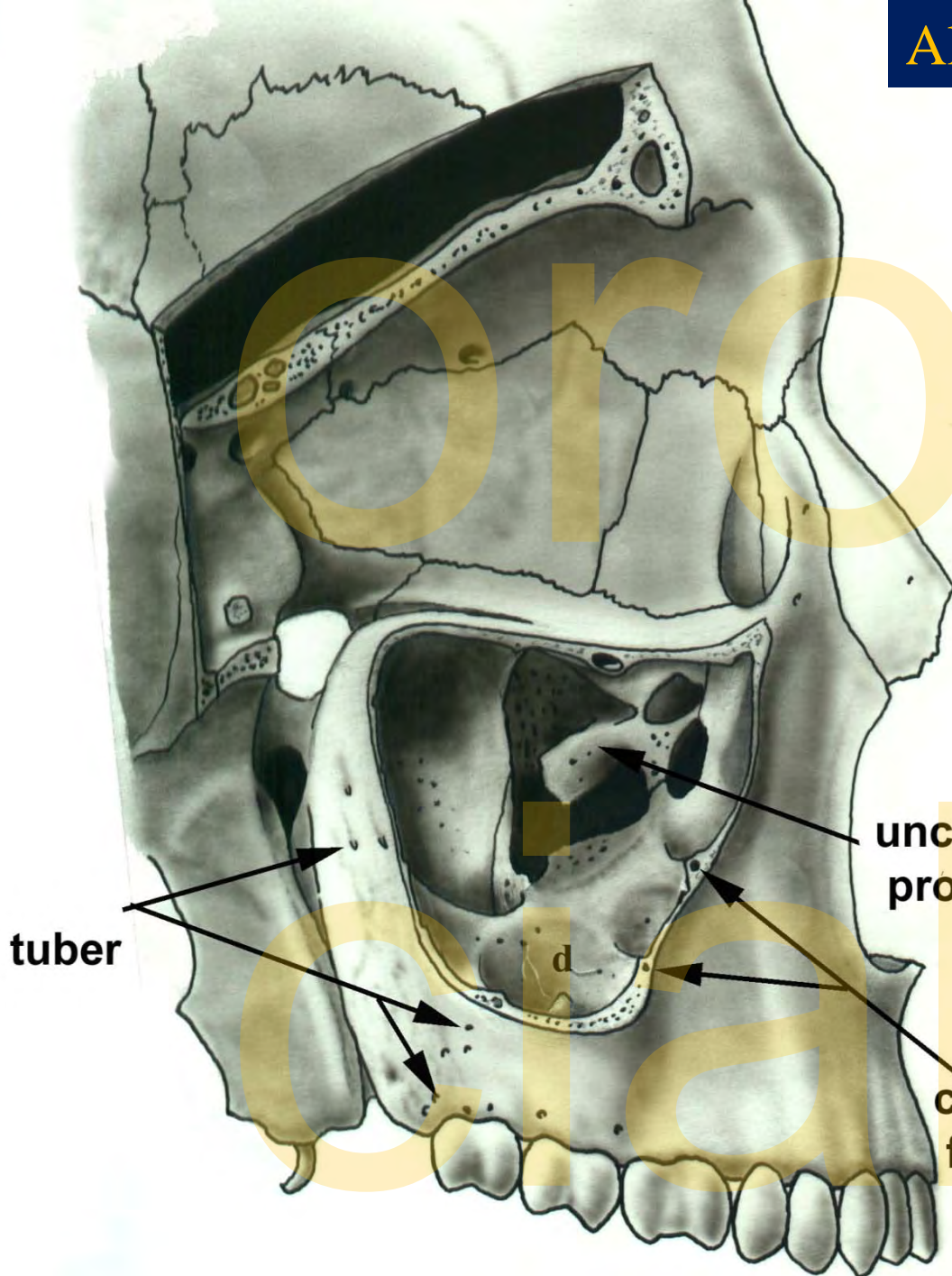
Corpus
Proc. frontalis
Proc. zygomaticus
Proc. alveolaris
Processus palatinus

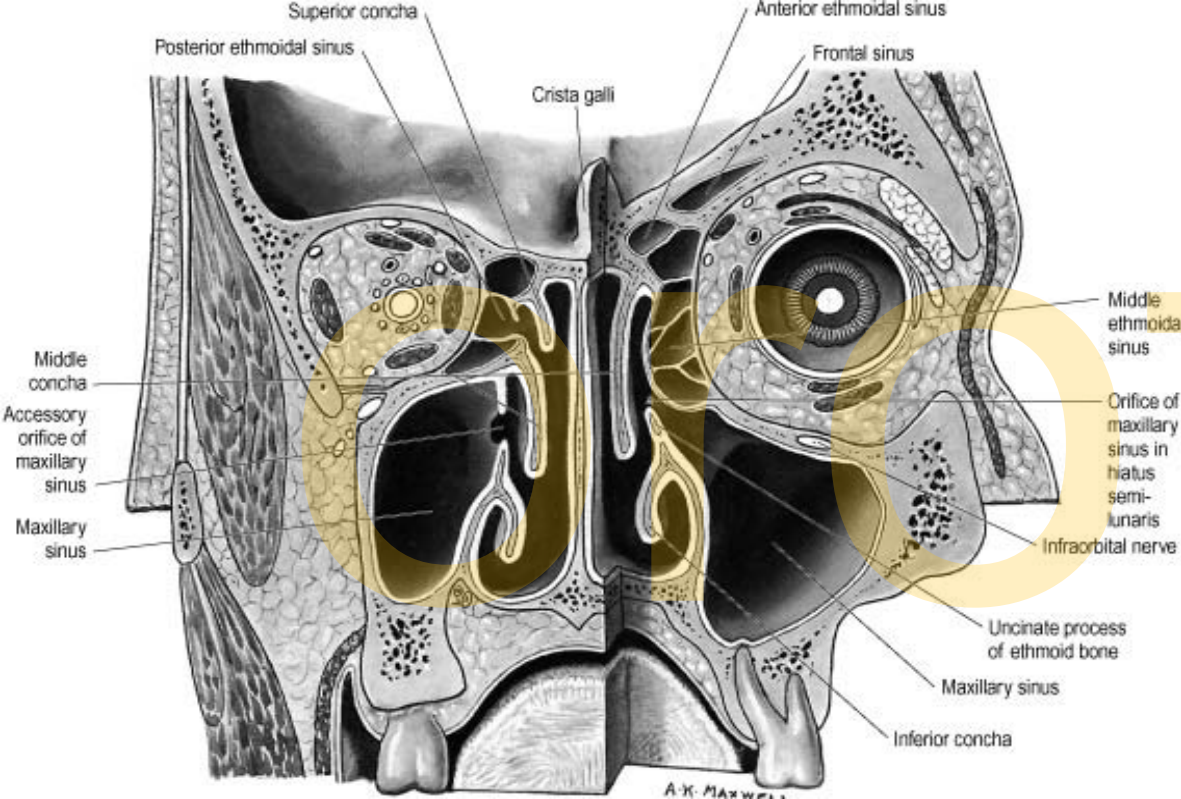


Sinus maxillaris (antrum Highmori) – open to nasal cavity as a hiatus maxillaris

Fossa lacrimalis

Alveolar recess – critical forms



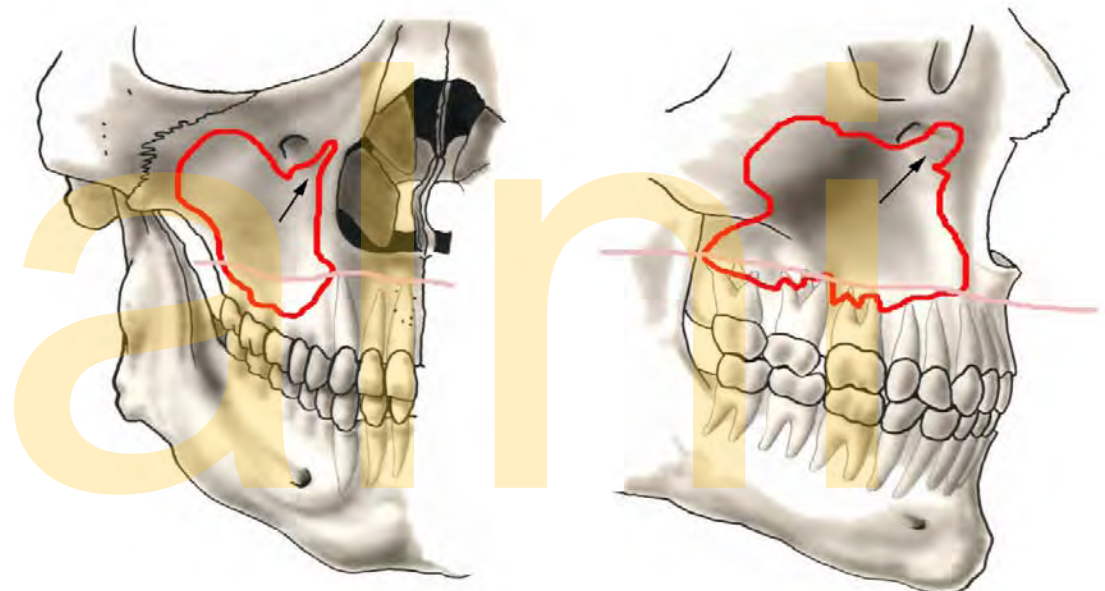


The wall of recessus frontalis is extremely thin

Maxillary duct
„Ductus maxilaris“

Level of hard palate
(palatal line) - pink

- first sign: 65 day gestation
- birth: 7x4x4 mm
- RTG appearance: 4-5 month
- bifasic growth:
 - 0-3 year
 - 7-12 year (permanent teeth)
- 18 year: 34x33x23 mm
- 15 ml

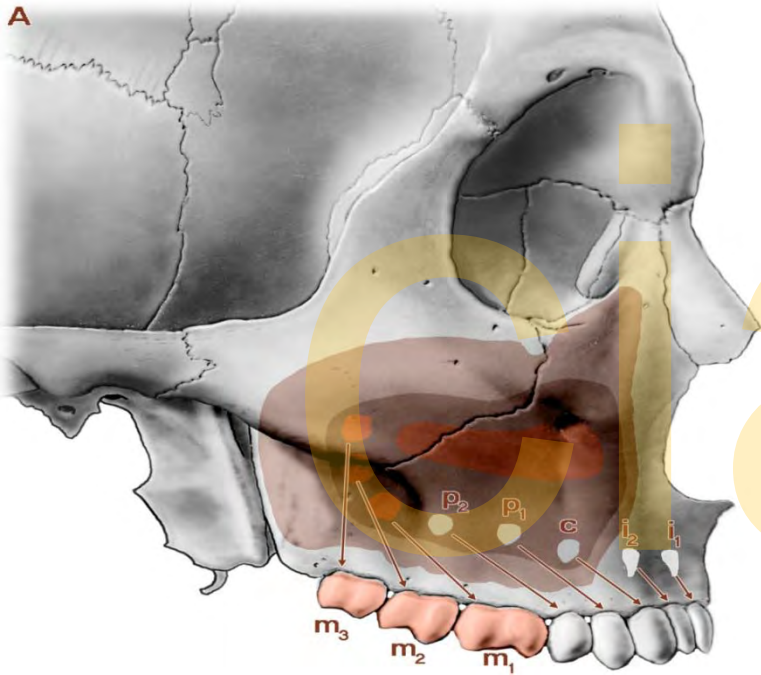
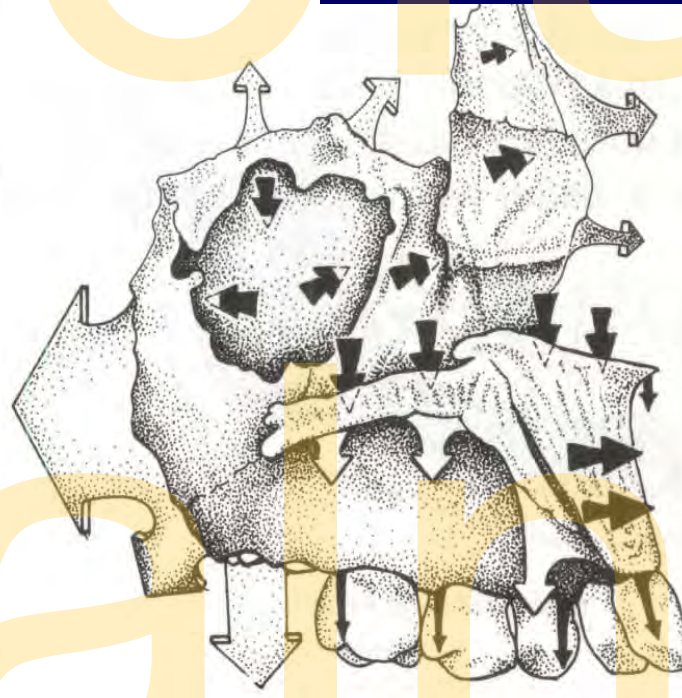
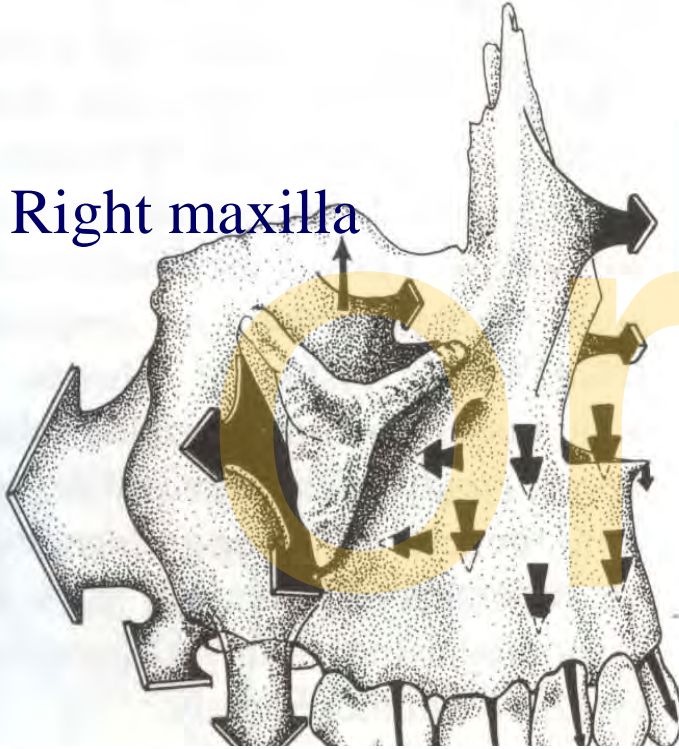


Maxilla growth

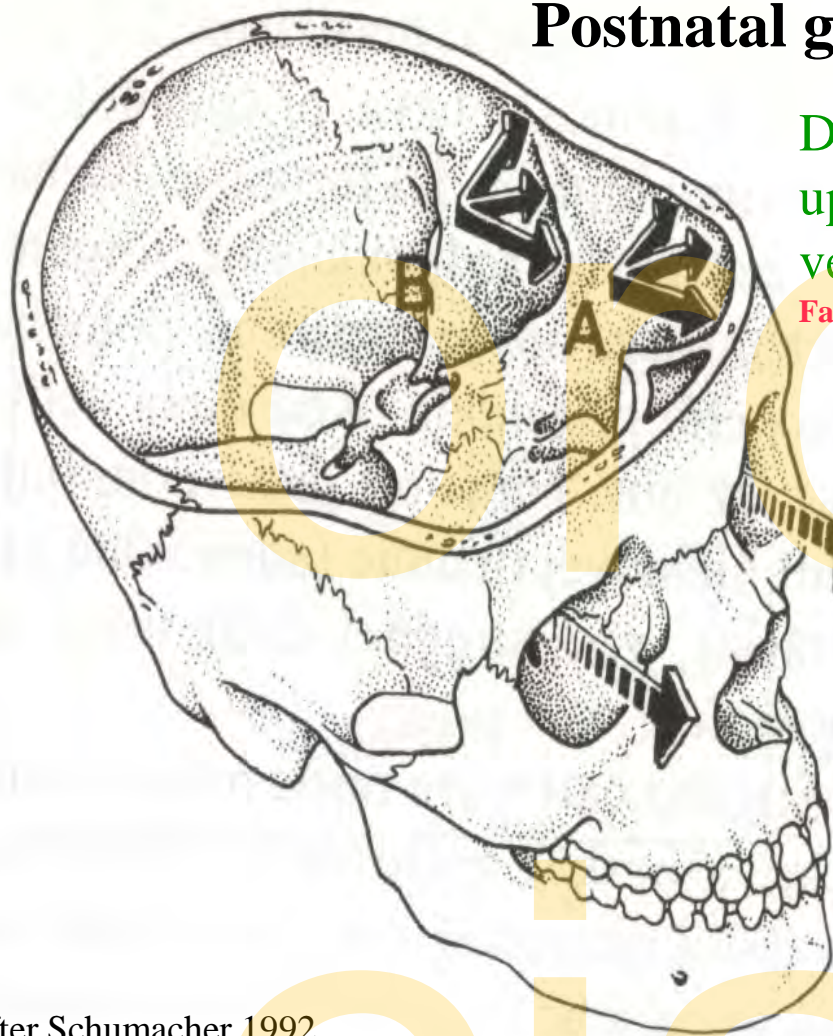
main factor - periosteal apposition

after Enlow 1966
Enlow et al. 1995
(podia D. H. Enlo

Right maxilla



Postnatal growth

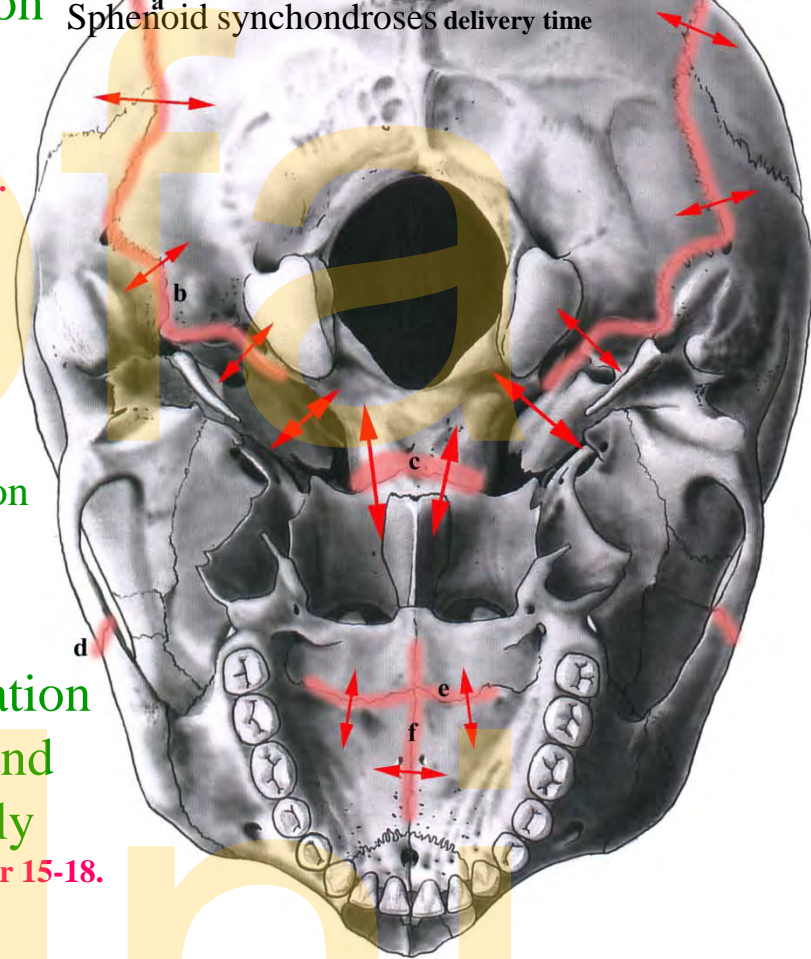


Dislocation
up and
ventrally
Fast to year 12.

Dislocation
ventrally
to year 7.

Dislocation
down and
ventrally
Slow to year 15-18.

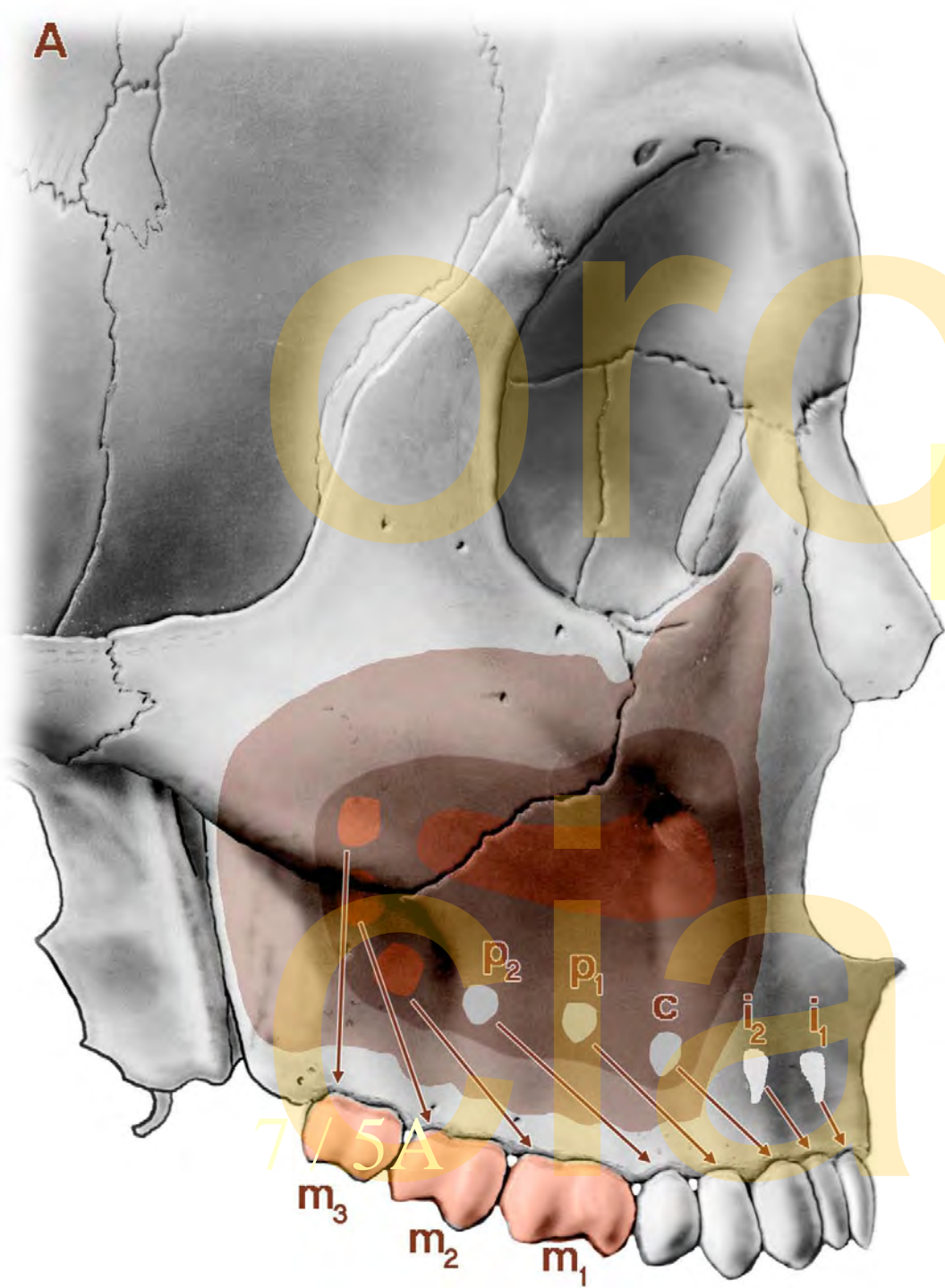
Synchondrosis sphenoccipitalis 17.year
Synchondrosis sphenothmoidalis after delivery
Intraoccipital synchondroses year 5
Sphenoid synchondroses delivery time



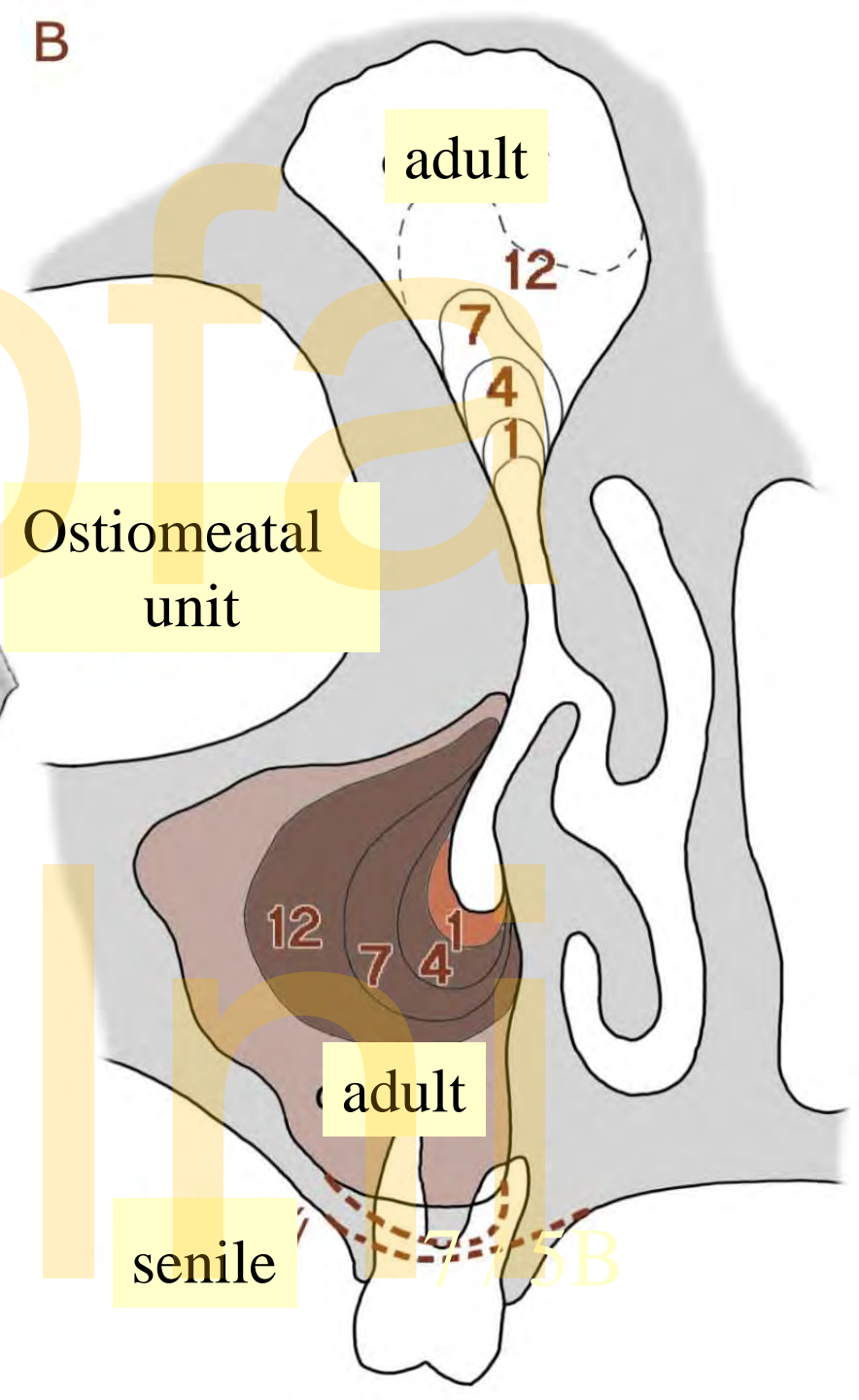
after Schumacher 1992

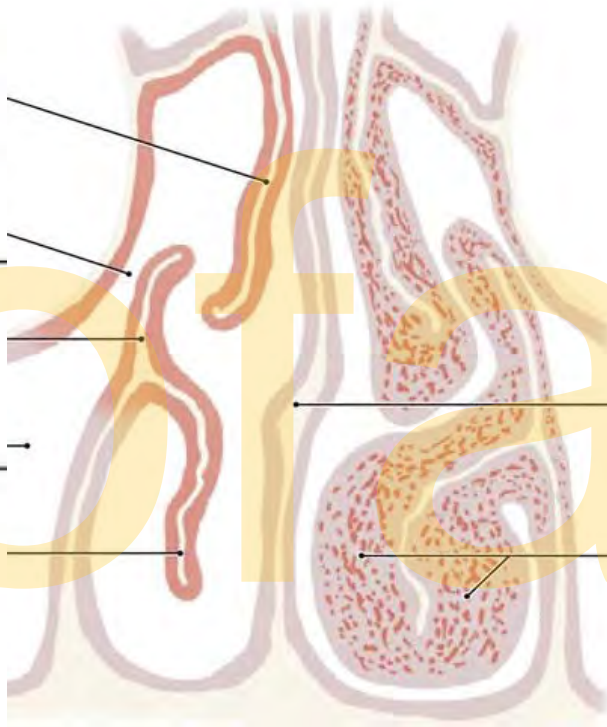
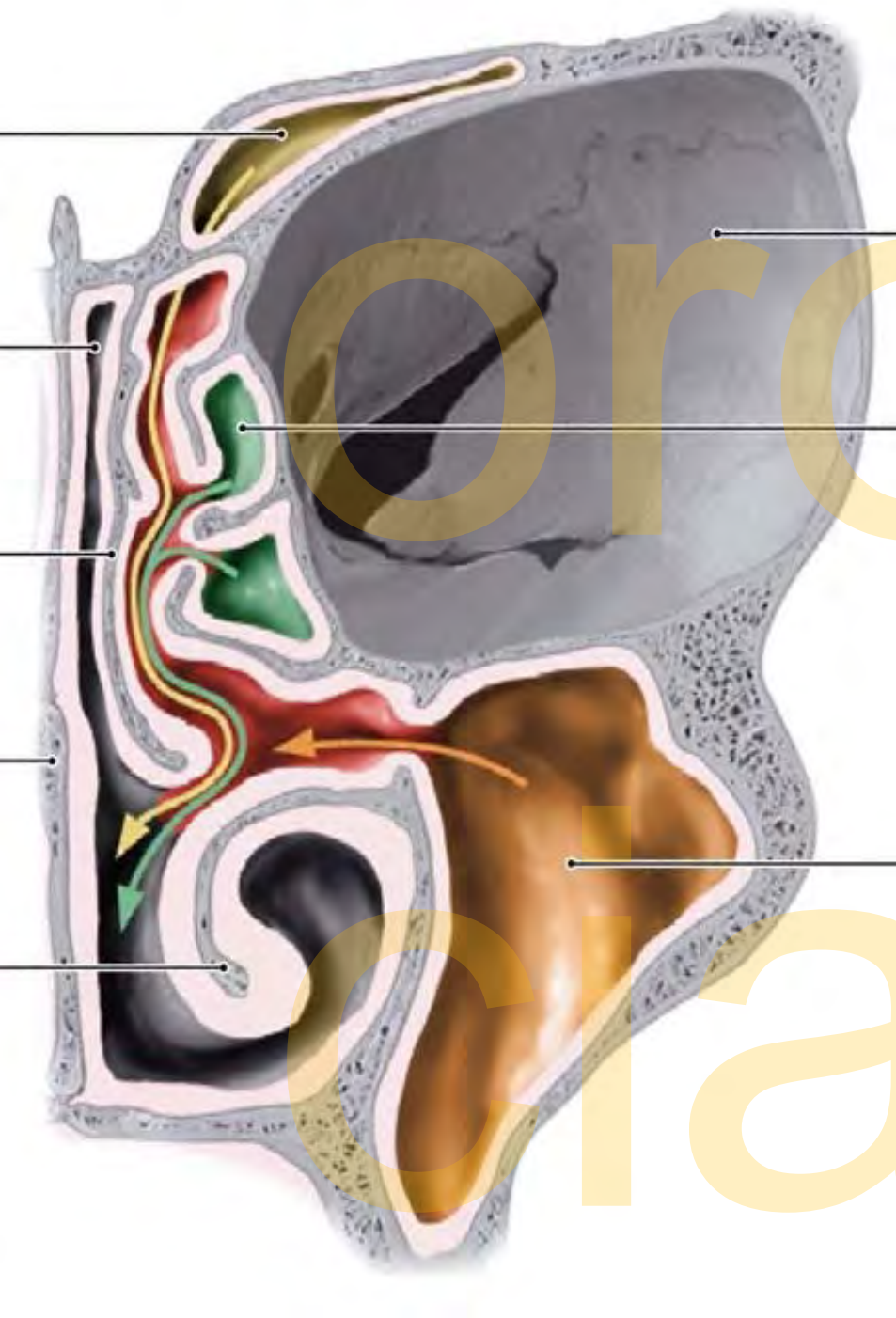
Expansion and growth of the synchondroses and sutures support middle face segments and base parts to year 7.

A



B

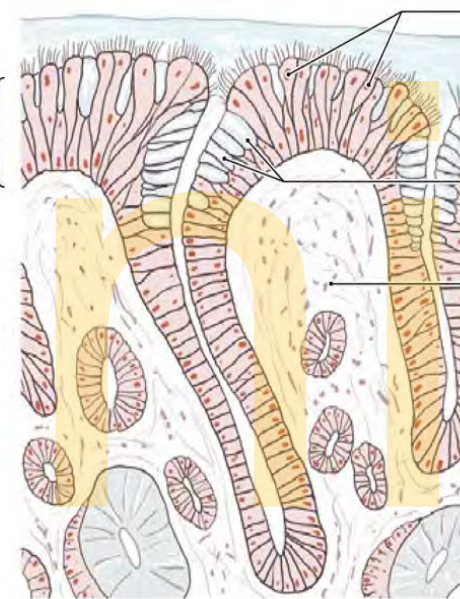




Septum nasi,
Vomer

angeschwollene
Schleimhaut
der unteren
Nasenmuschel

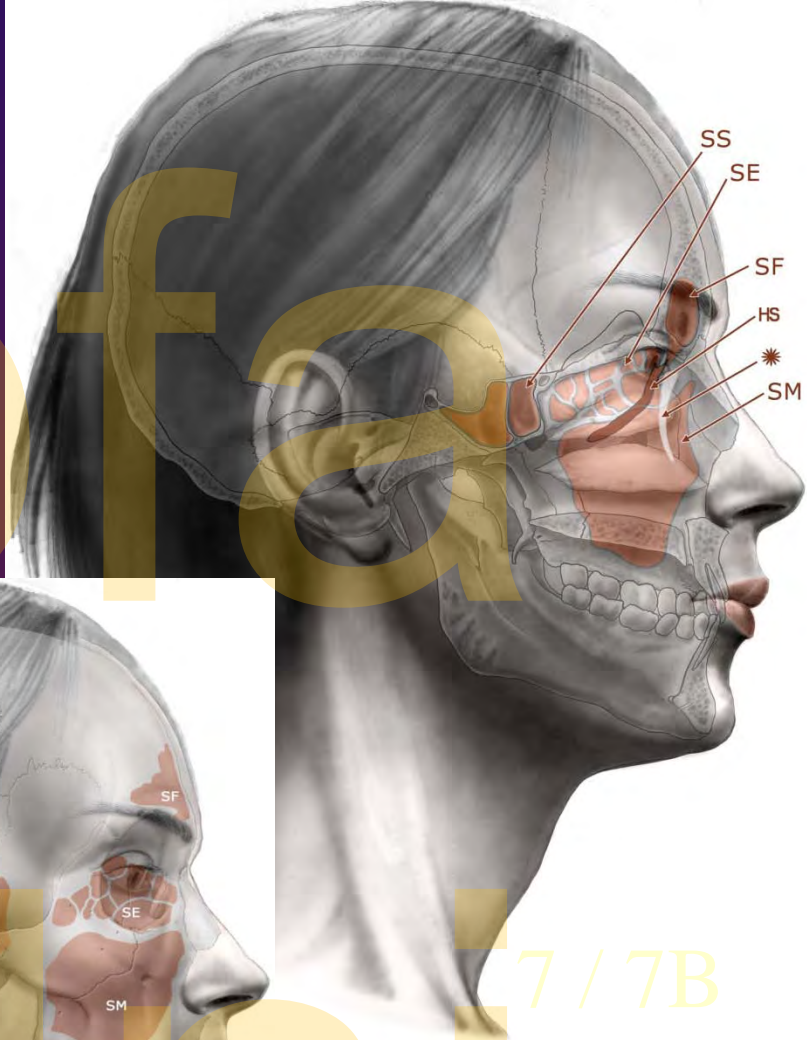
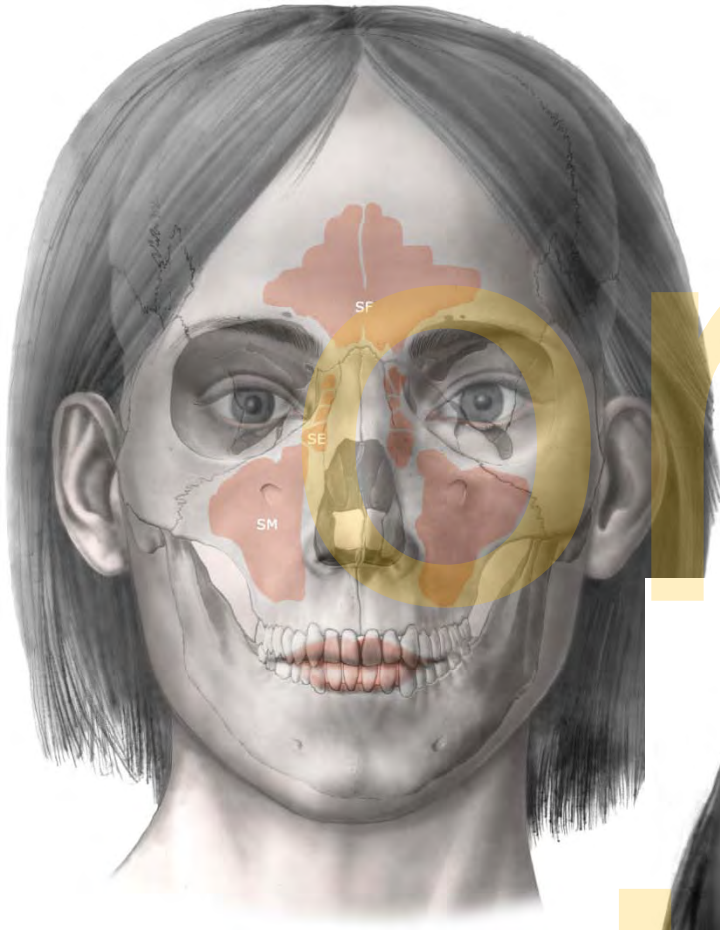
mehrrichtiges
Flimmerepithel
(„respiratorisches Epithel“)



kinozilien-
tragende
Epithelzellen

Becherzellen

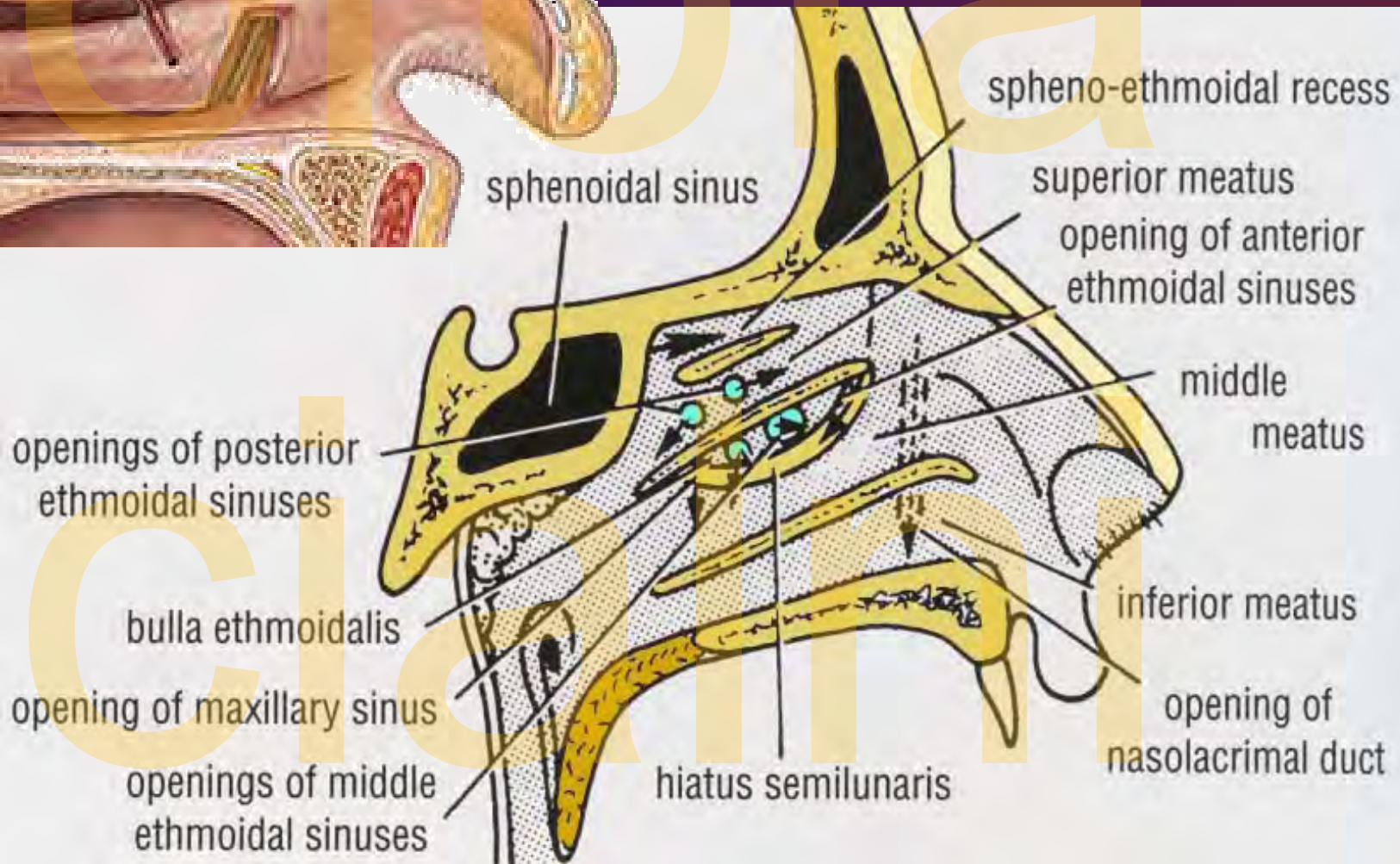
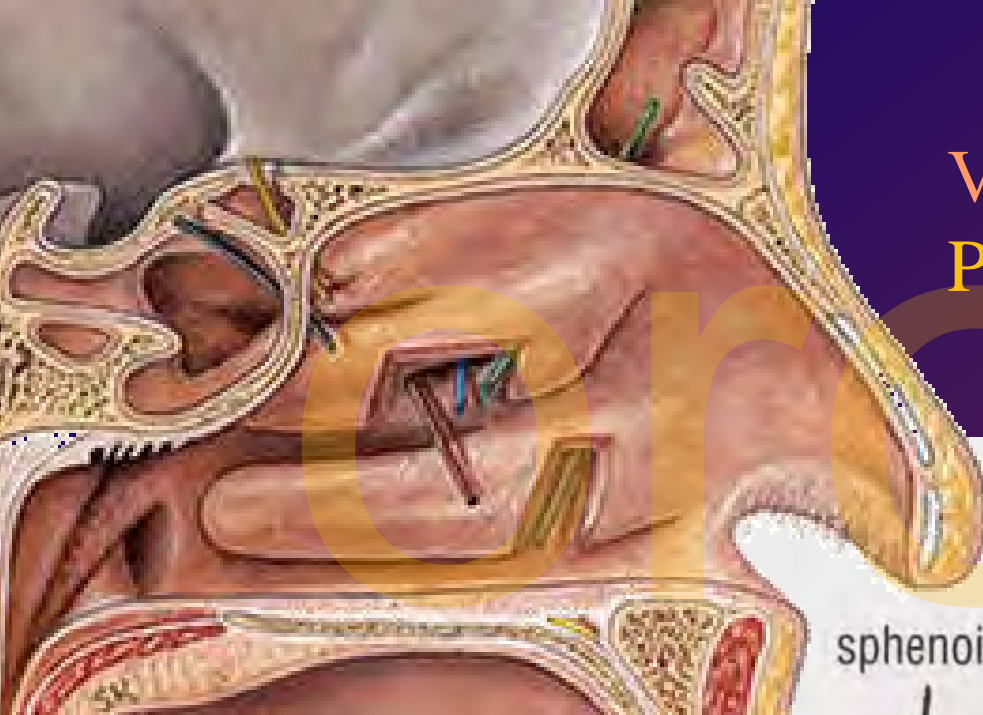
bindegewebige
Lamina propria



SE – sinus ethmoidealis, SF – sinus frontalis, SM – sinus maxillaris, SS – sinus sphenoidealis, HS – hilus maxillaris (canalis semilunaris); * - ductus nasolacrimalis

7 / 7B

Vyústění paranasálních dutin Paranasal cavities - openings



Odříznutá concha nasalis media
Removed middle nasal concha

Lamina
cribrosa
Fossa cranii
anterior

Concha nasalis superior,
Os ethmoidale

Fossa hypophysialis

Sinus sphenoidalis

Foramen sphenoplatinum

Corpus,
Os sphenoidale

Sinus frontalis

Crista galli

Os frontale

Os nasale

Bulla ethmoidalis

Os lacrimale

Proc. uncinatus

Proc. frontalis
maxillae

Concha nasalis inferior

Maxilla,
Proc. palatinus

Cavitas oris

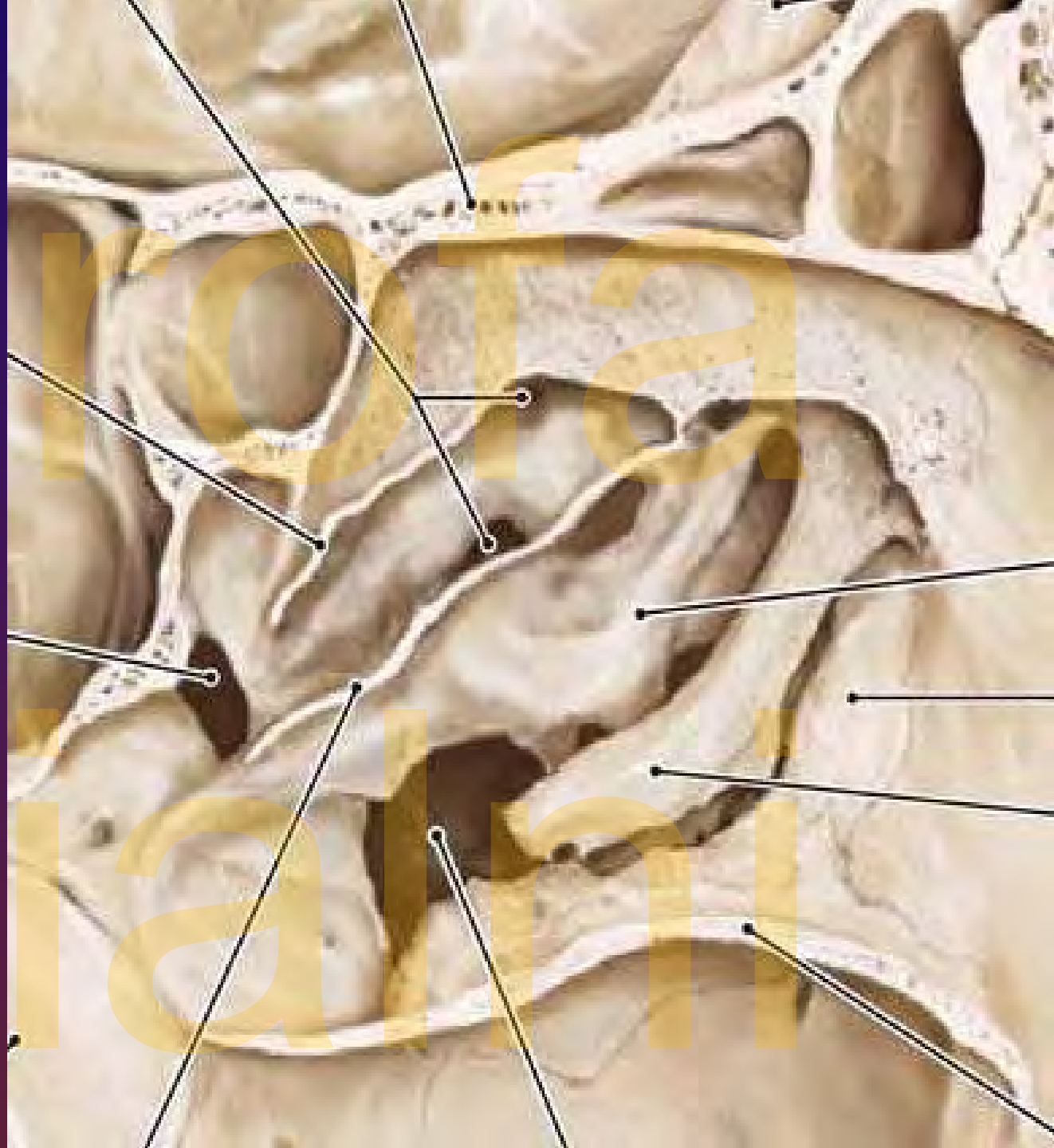
Proc. pterygoideus,
Lamina medialis

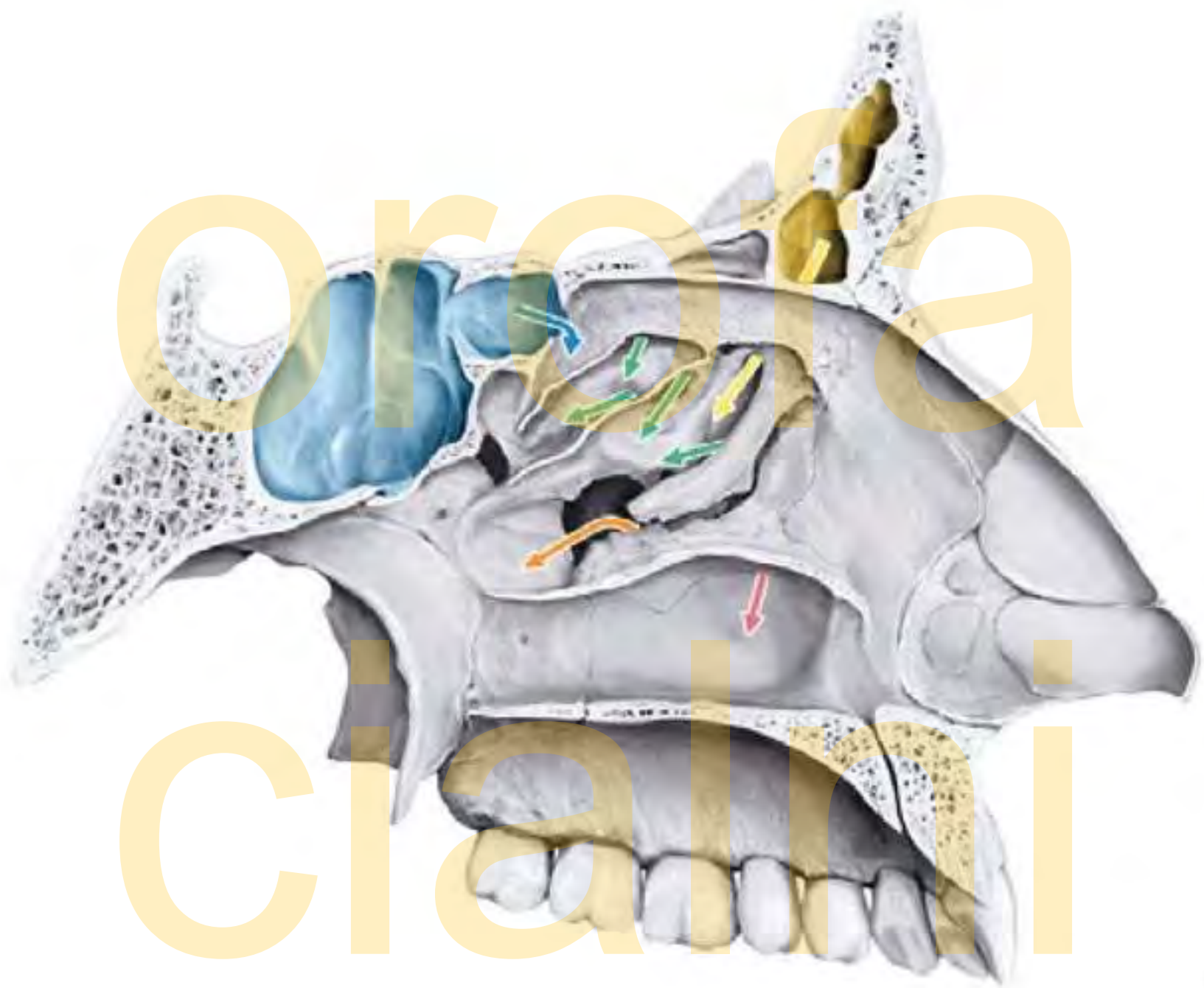
Concha nasalis media,
Os ethmoidale

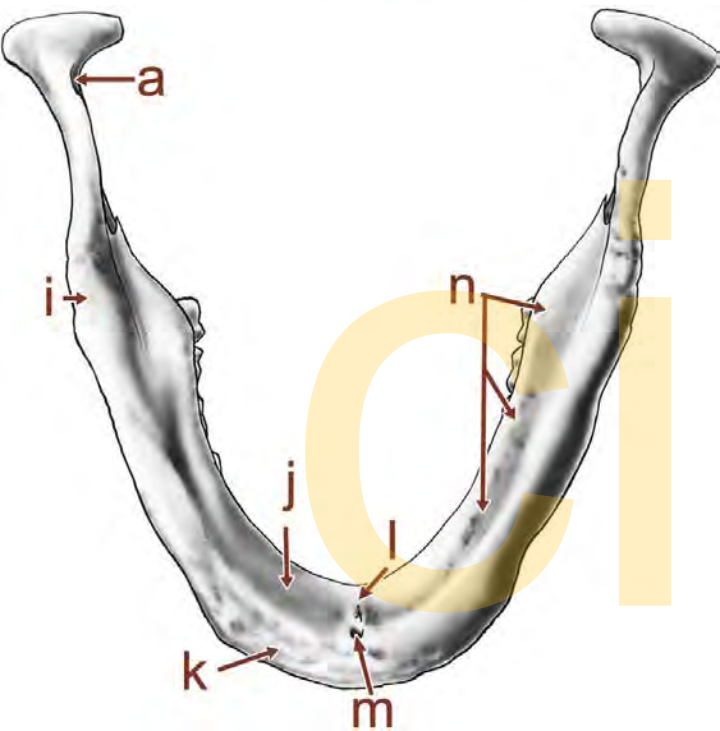
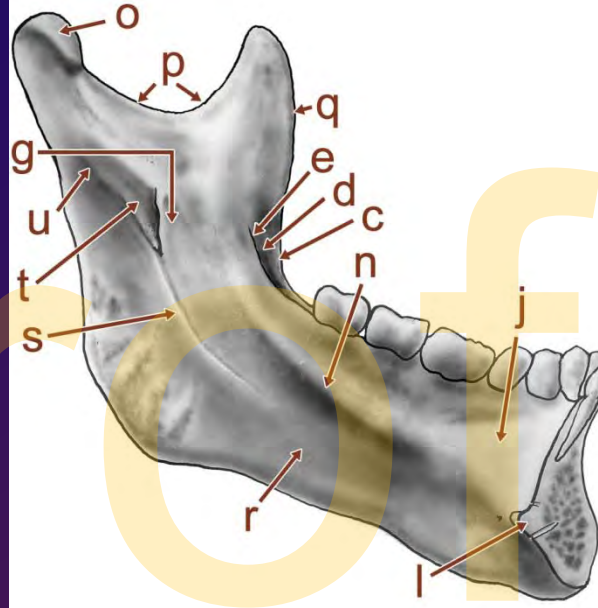
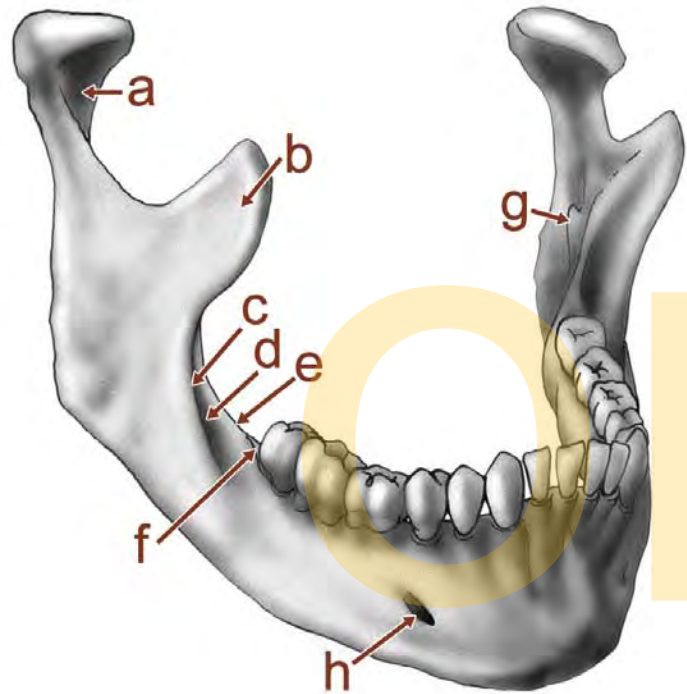
Os palatinum,
Lamina horizontalis

Hiatus
maxillaris

Processus
uncinatus a hiatus
maxillaris
Uncinate process
and maxillary
opening







Lower jaw - profile.

a – fovea pterygoidea, b – processus coronoideus seu muscularis, c – fossa retromandibularis, d - linea (crista) obliqua, e – crista temporalis, f - trigonum retromolare , g – linea mylohyoidea, h – foramen mentale
 Lower jaw - from below.

a - fovea pterygoidea, b – angulus mandibulae et tuberositas pterygoidea, c – spina mentalis, d – linea mylohyoidea, e – foramen nutricium (canaliculus suprarentalis or foramen linguae), f – fossa digastrica, g – fovea sublingualis, h – fovea submandibularis

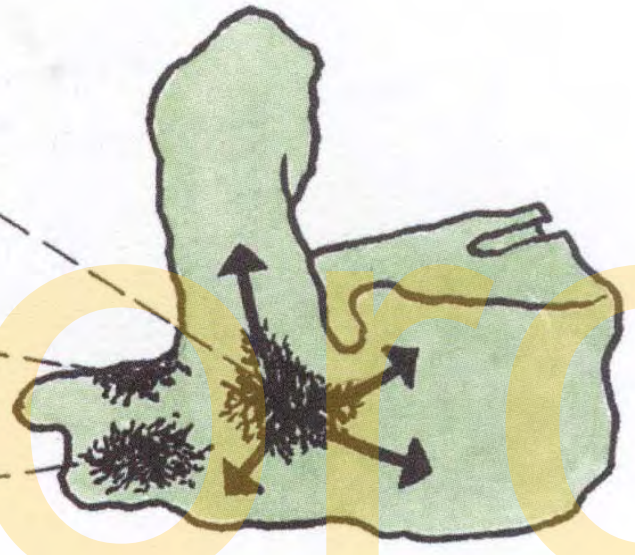
Inner side of mandible.

a - caput mandibulae, b – margo anterior, c – fossa retromandibularis, d – crista temporalis, e – trigonum retromolare, f – area where mucosa develops small tubercle (typical for gummy people - tuberculum retromolare, g – linea mylohyoidea, h – fovea sublingualis, i – spina mentalis, j – fovea submandibularis, k – sulcus mylohyoideus, l – fossa colli mandibulae, m – linea (crista) colli mandibulae, n – lingula, o – incisura mandibulae (semilunaris)

1. 6.T.F.

3. 7.T.F.

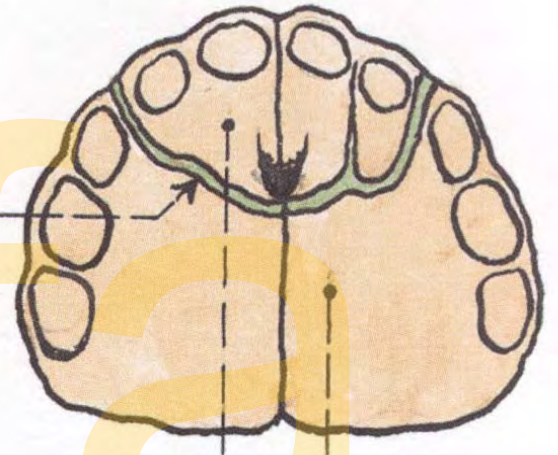
2. 7.T.F.



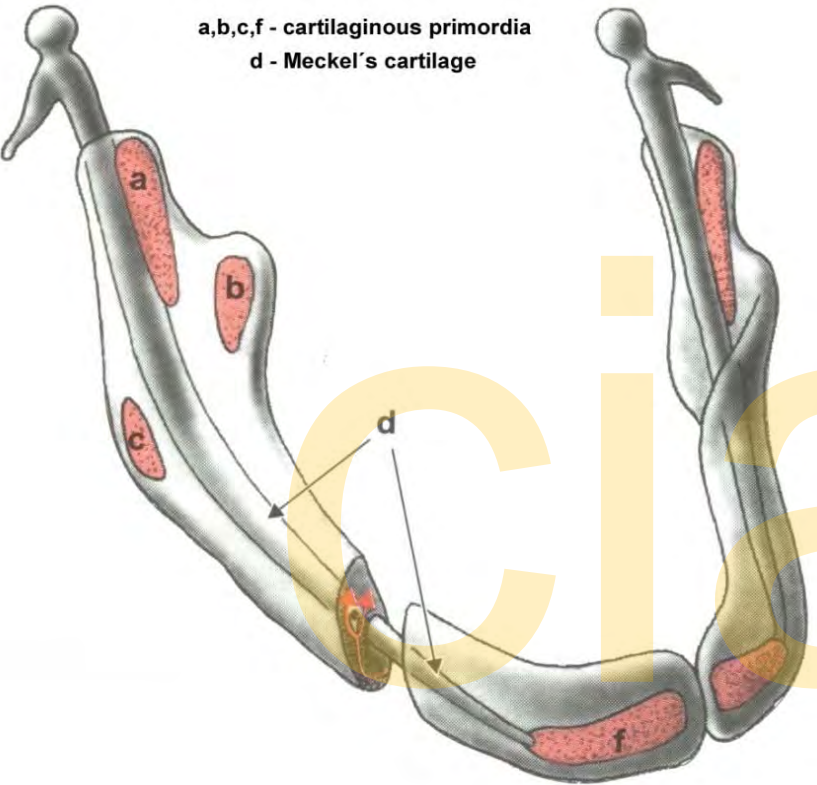
2.R.

1

2



a,b,c,f - cartilaginous primordia
d - Meckel's cartilage



6. fetal week

a

b

2. - 3.

2.

c

1.

d

2. - 3.

e

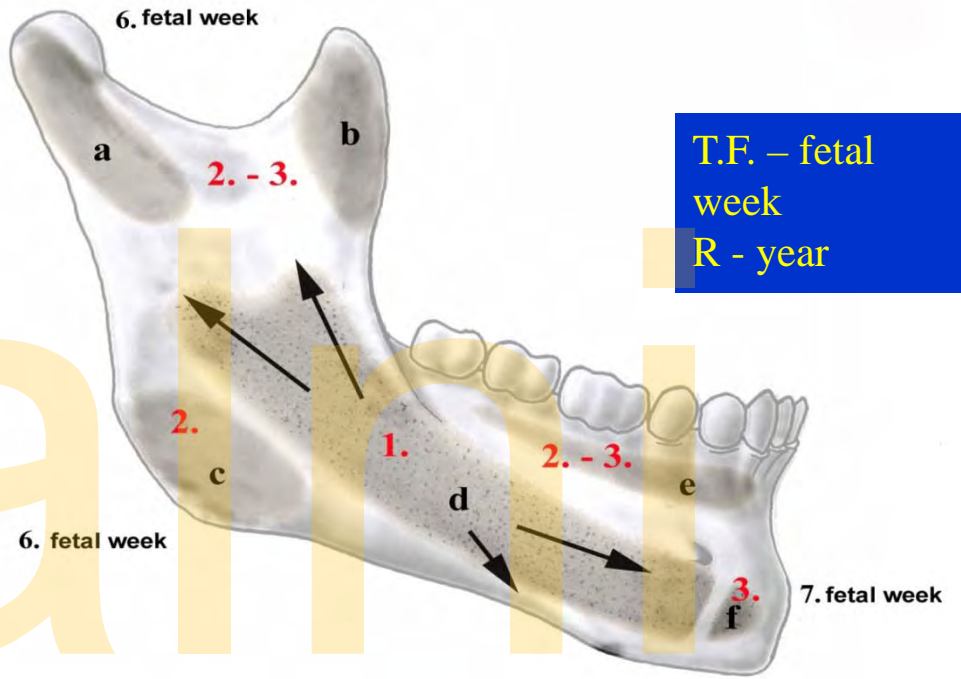
3.

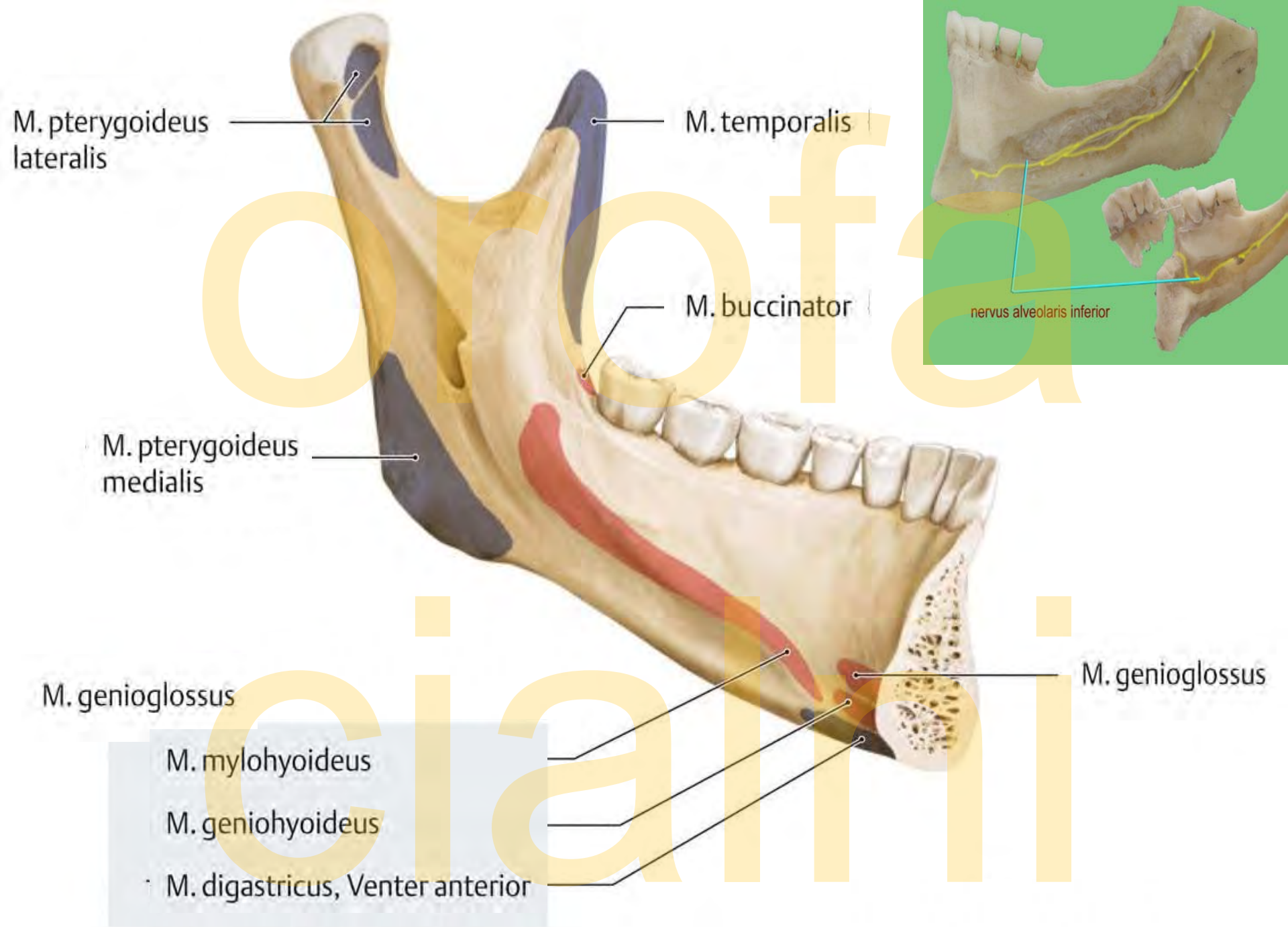
f

6. fetal week

7. fetal week

T.F. – fetal week
R - year





M. pterygoideus lateralis

M. temporalis

M. buccinator

M. pterygoideus medialis

nervus alveolaris inferior

M. genioglossus

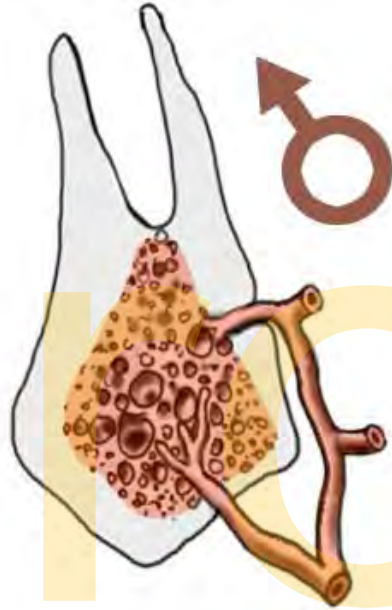
M. genioglossus

M. mylohyoideus

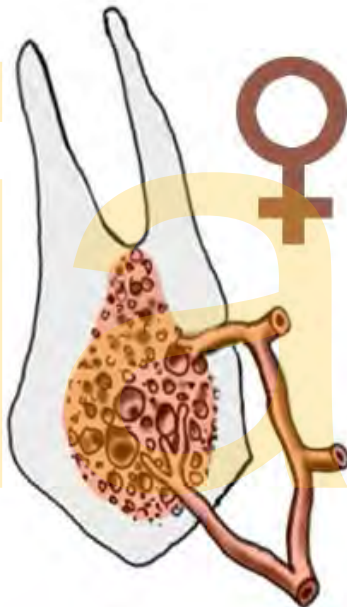
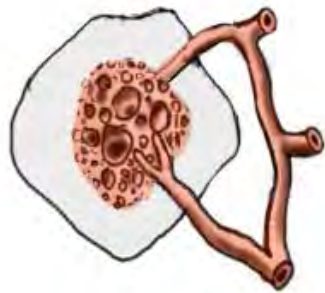
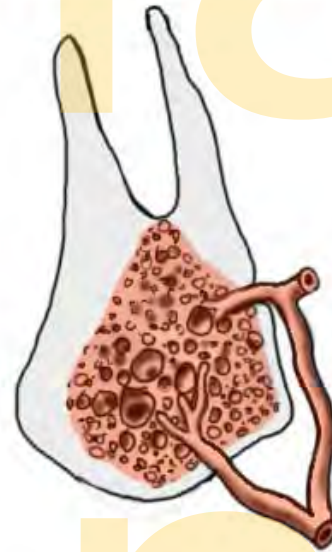
M. geniohyoideus

M. digastricus, Venter anterior

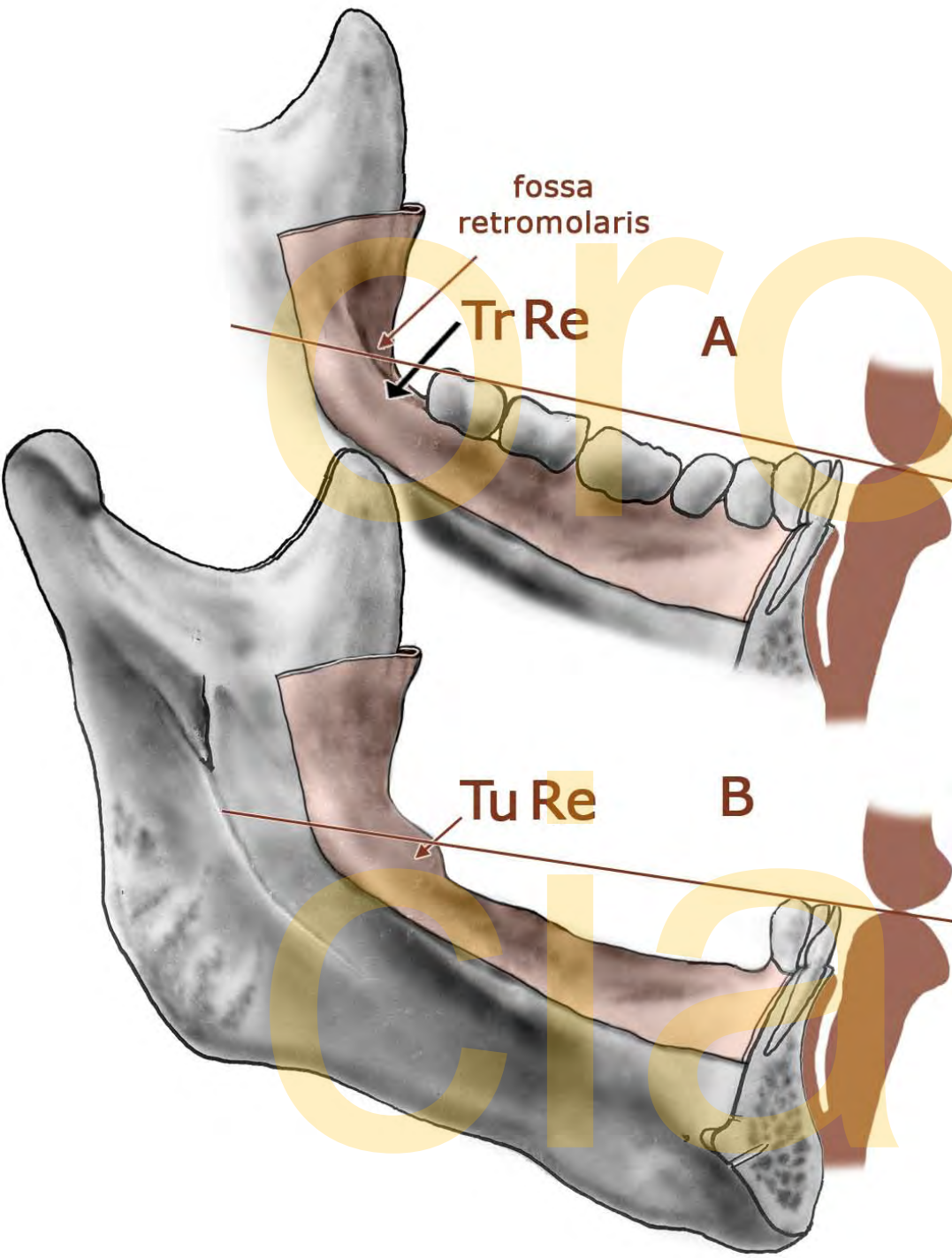
neonatus



senilis



Cévní zásoben
bradové
krajiny
a dolních
řezáků



fa

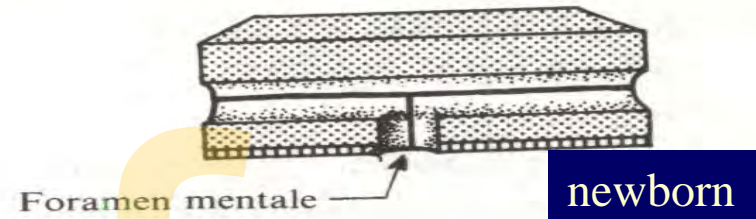
Occlusal plane as is determined (following clinical demands), like line crossing lower lip and top of lower caninus.

A – incomplete denture

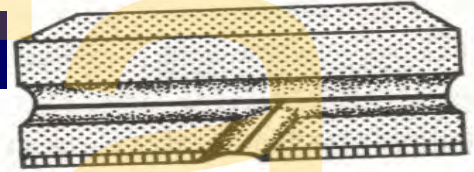
B – senile denture. Mucosa of the retromolar tubercle is not removed.

pink.

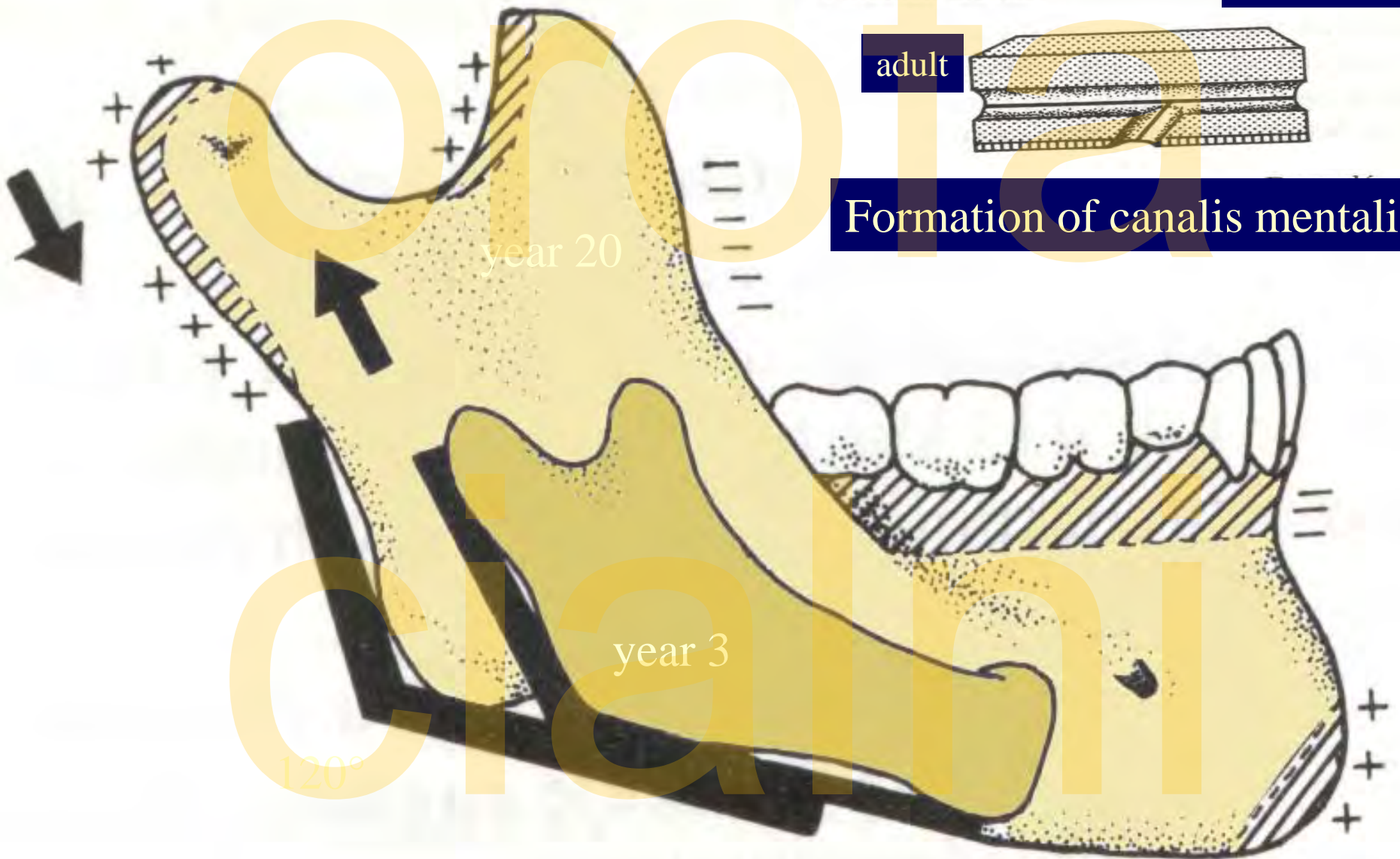
Mandible growth

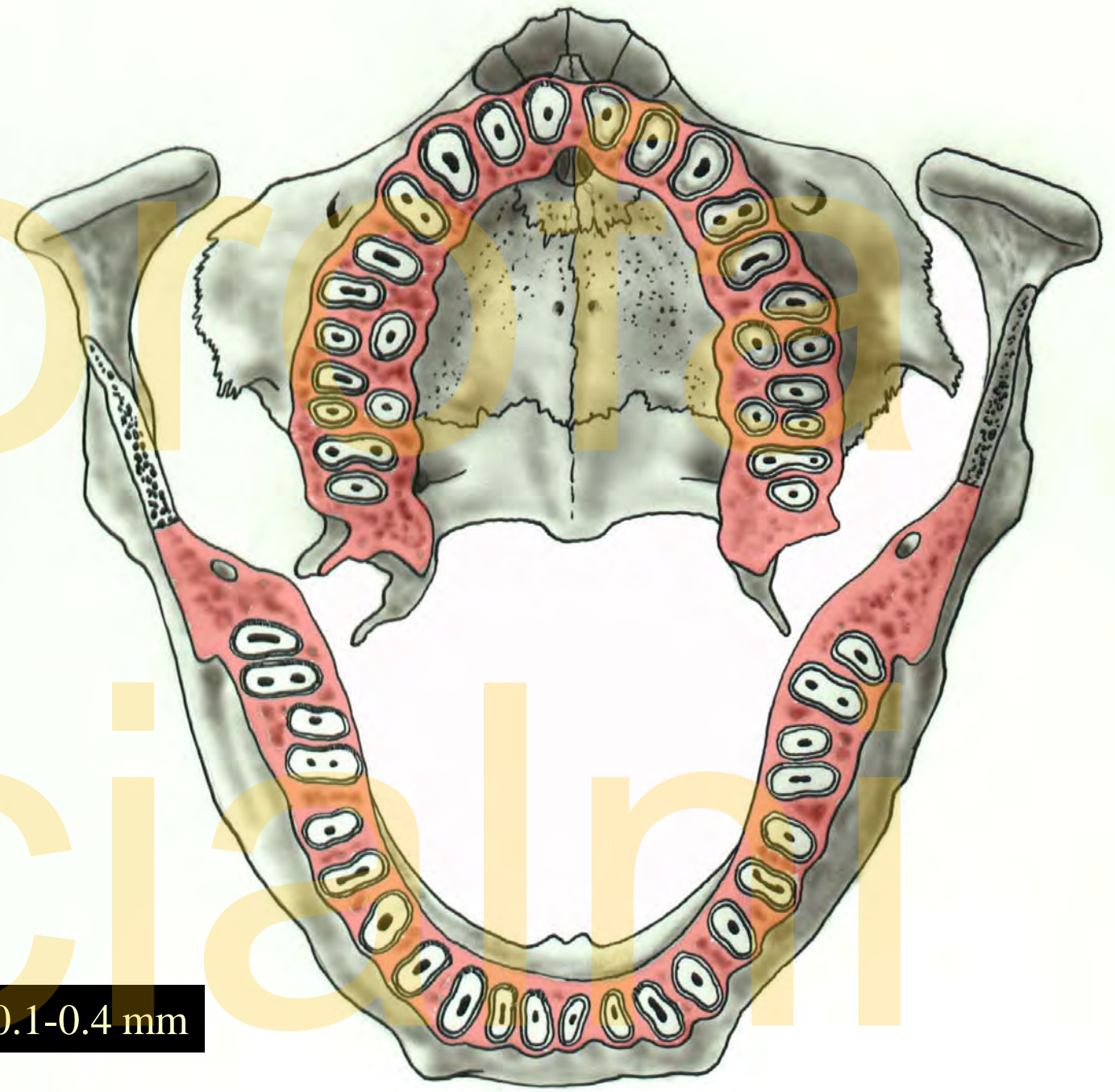


adult

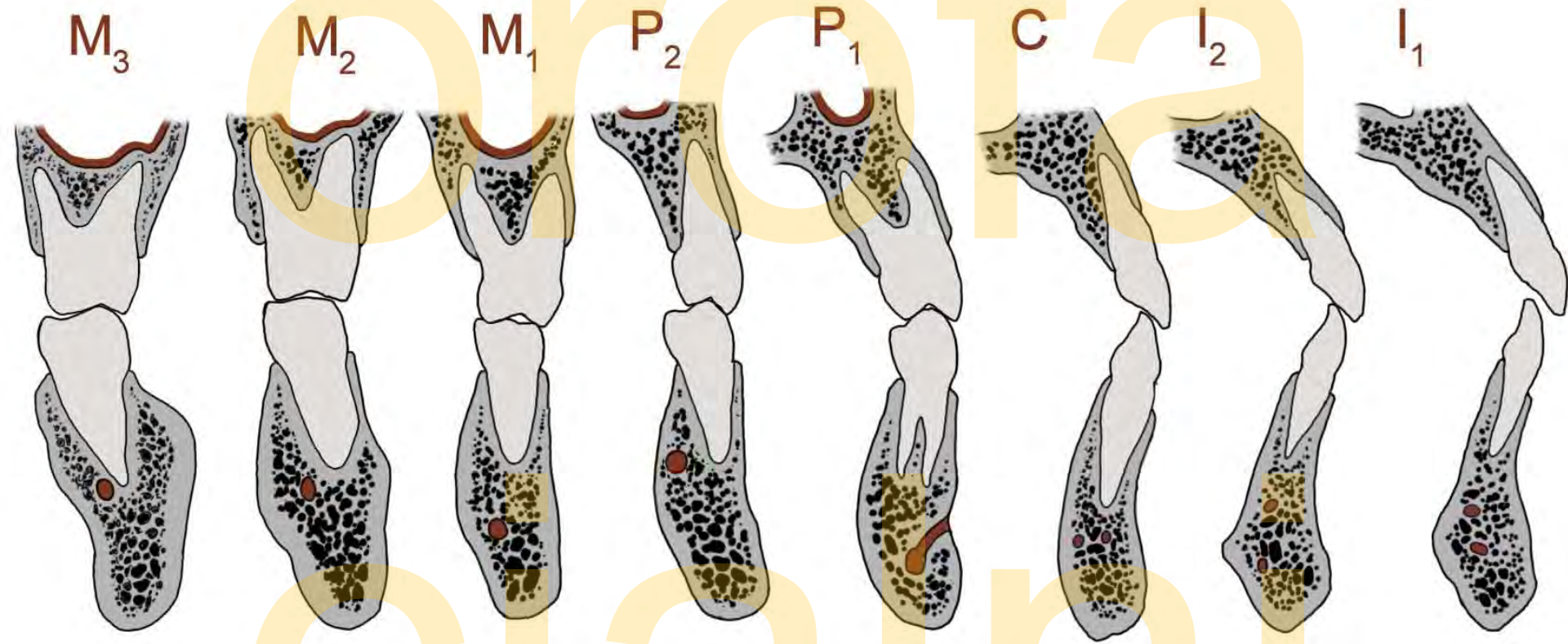


Formation of canalis mentalis





0.1-0.4 mm



Topographic relations between spongy and compact bone seen in sections. (McMillen 1924, modified)

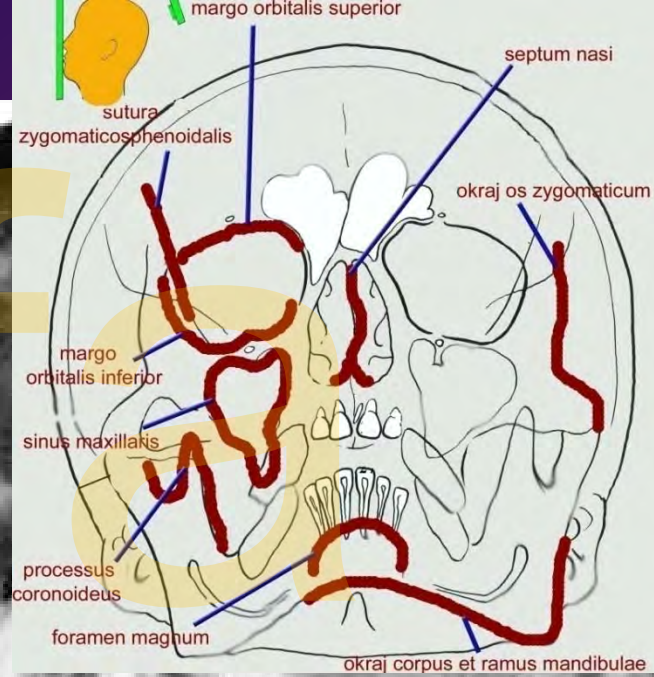
Red arrows – maxillary sinus; red areas – mandibular canal

X-ray photo
(Waters projection)

Sinus frontalis

Sinus maxillaris

Sinus sphenoidalis



Panoramaticky snimek

Recessus
alveolaris (sinus
maxillaris)

oro-fa

Fig. 24. Panoramic radiograph of upper jaw

cialini

Canalis mandibularis

Fig. 25. Panoramic radiograph of lower jaw

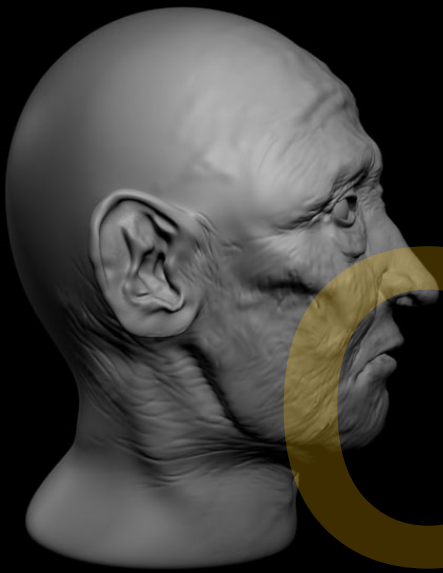
Žvýkáací svaly

Musculi masticatorii

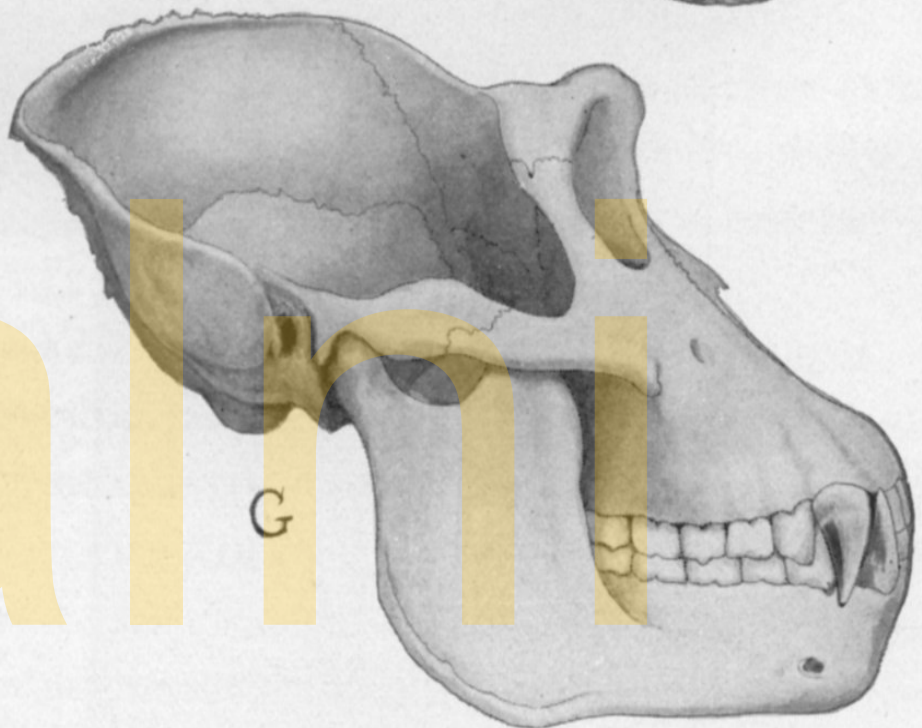
Muscles of mastication

V3 – MANDIBULARIS

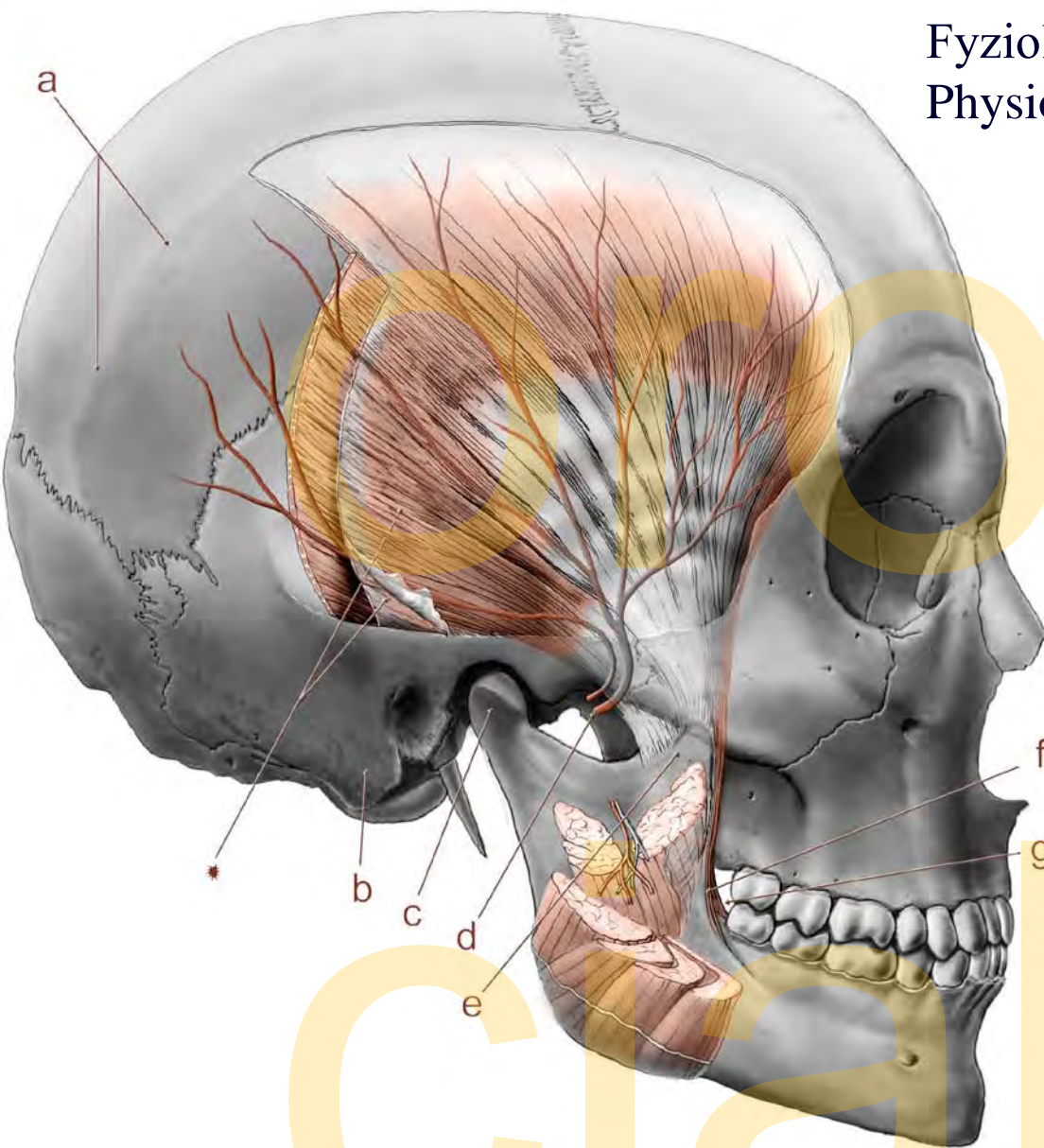
deriváty 1. žaberního oblouku



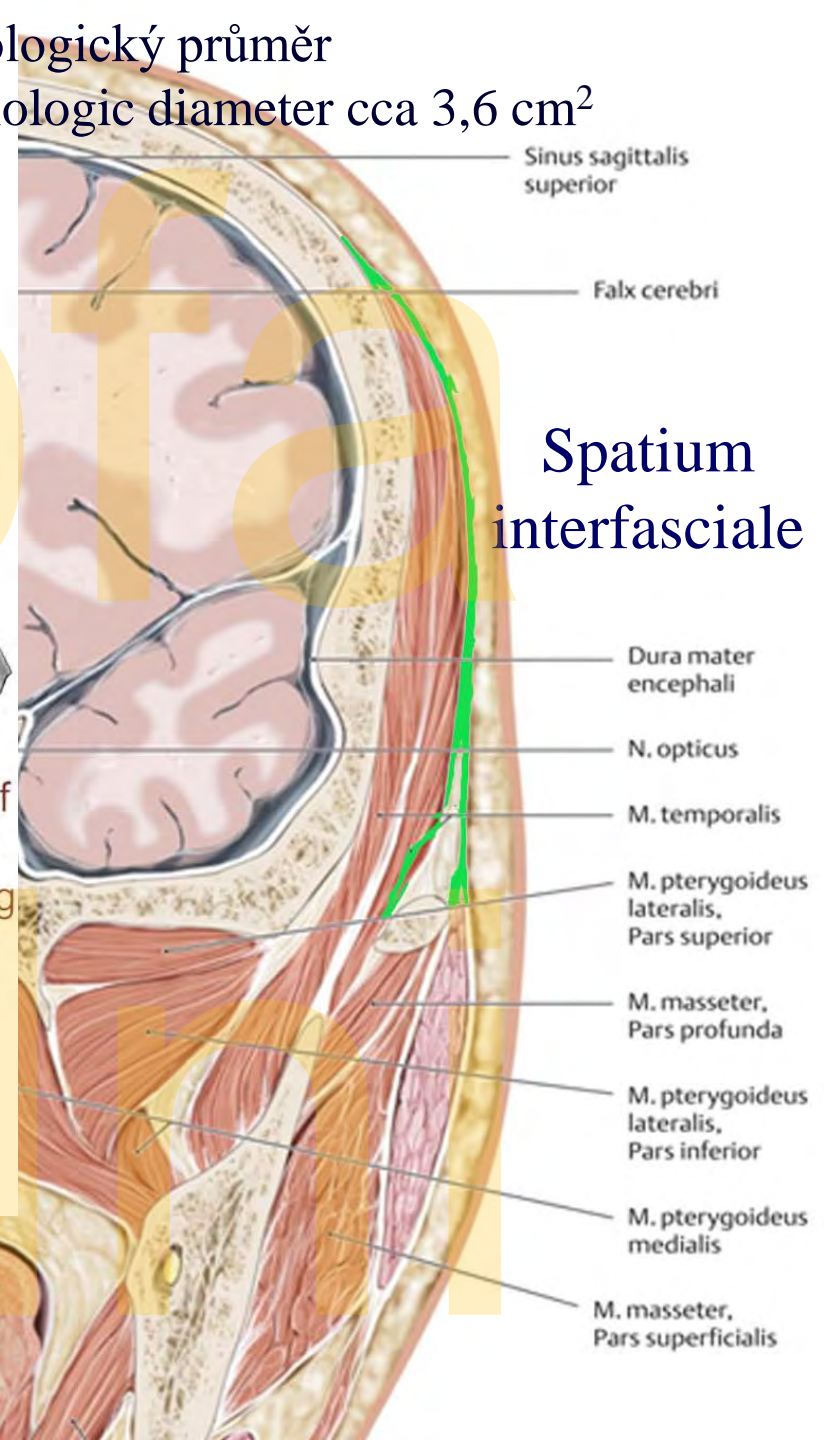
M



G

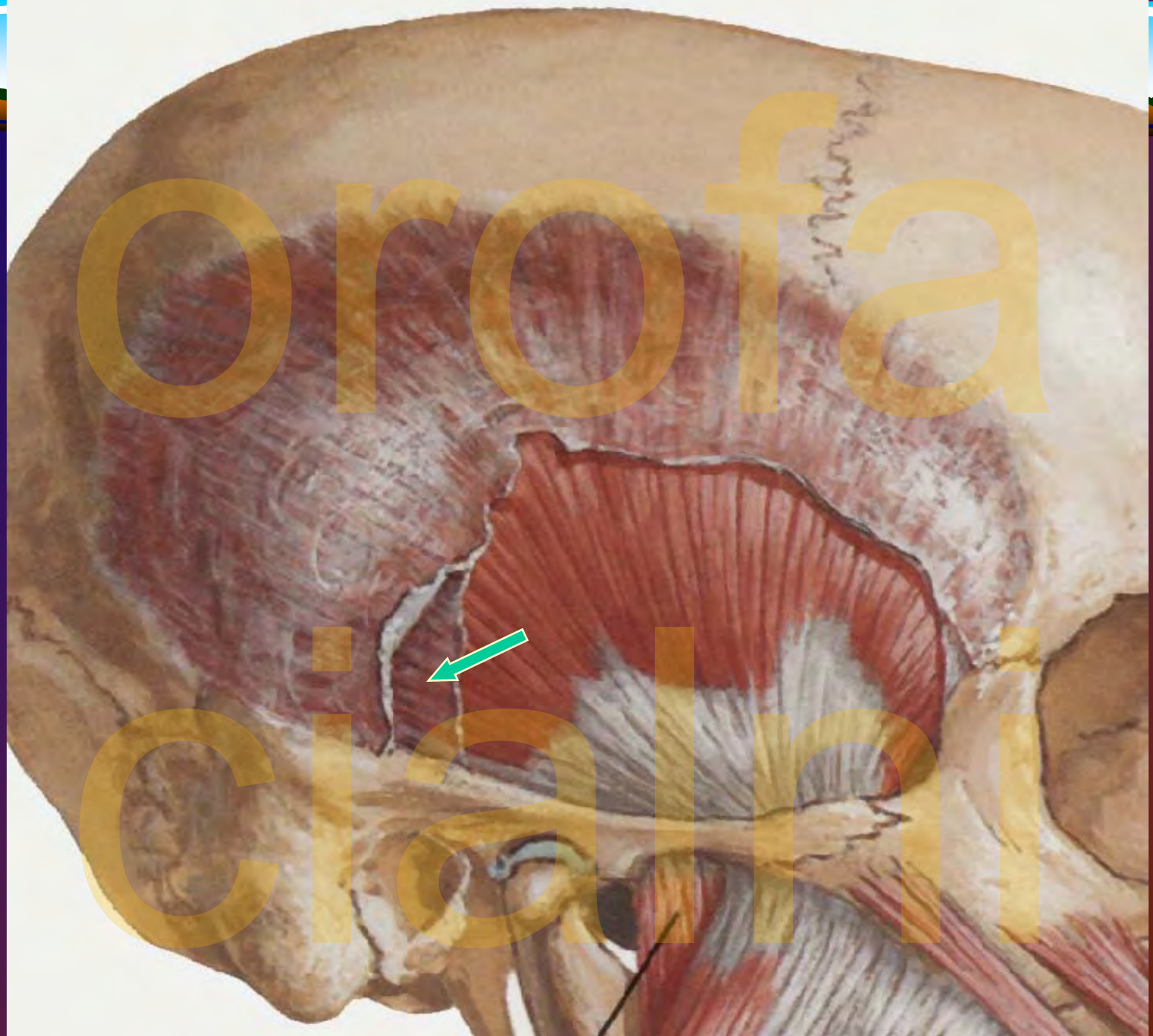
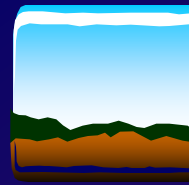


Fyziologický průměr
 Physiologic diameter cca 3,6 cm²



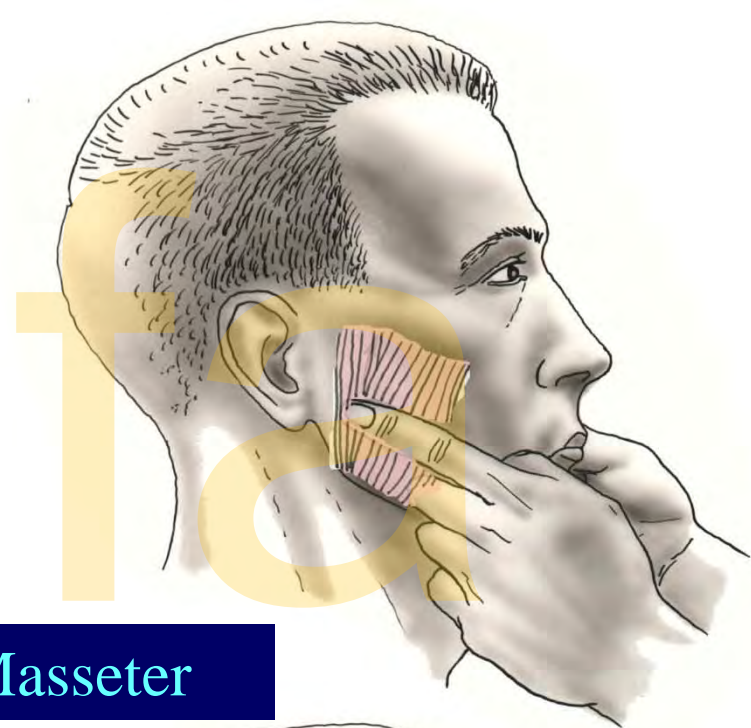
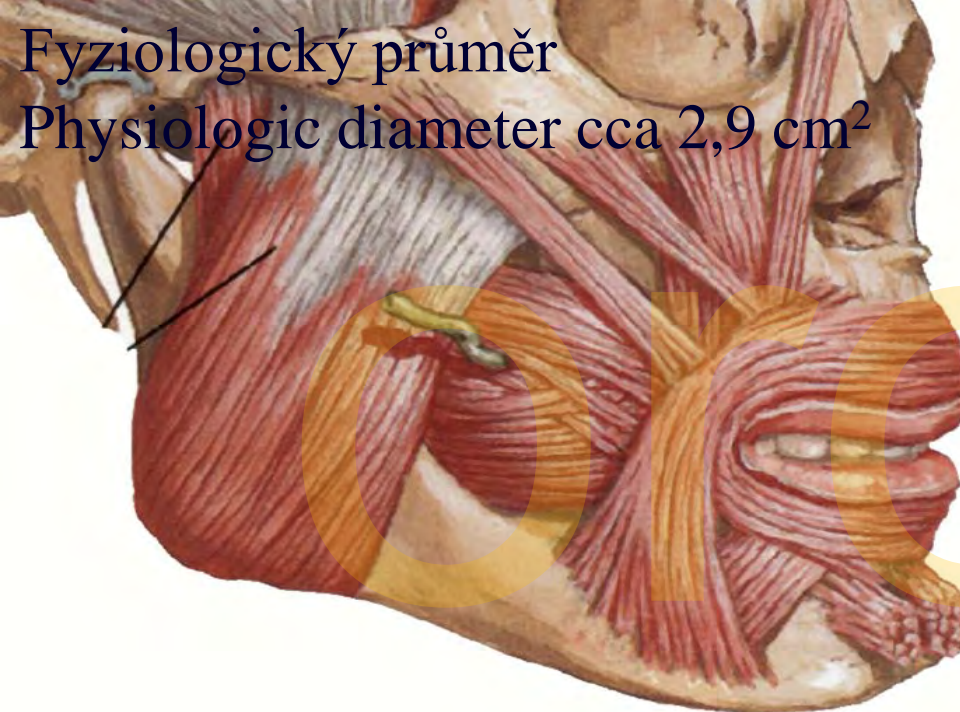
Spatium
 interfasciale

M. temporalis
 et fascia temporalis

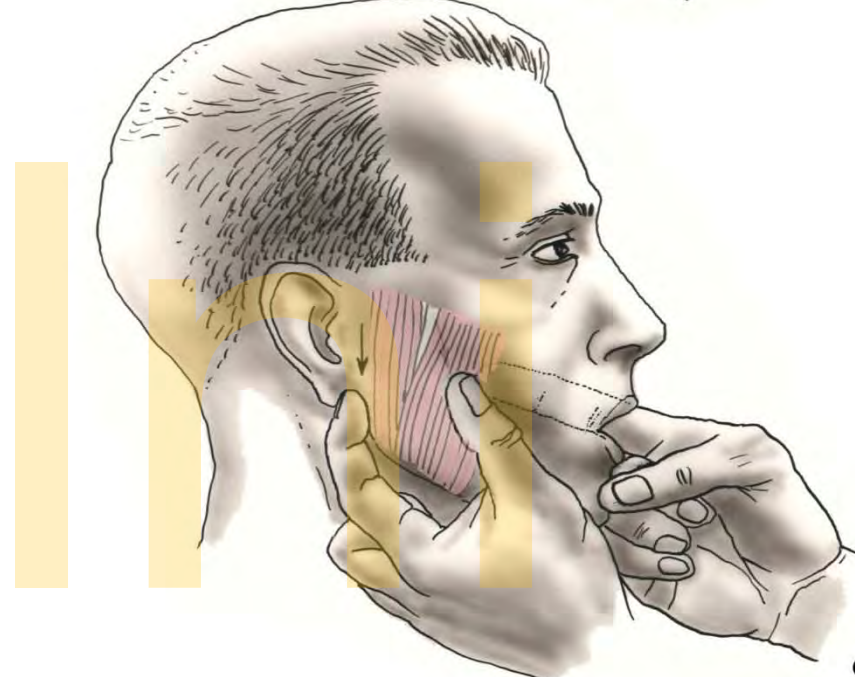


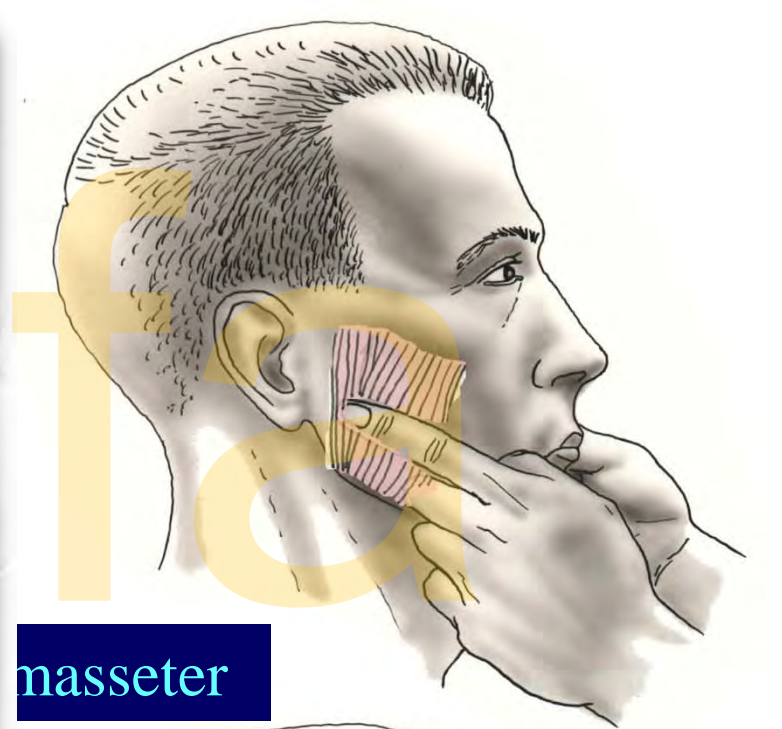
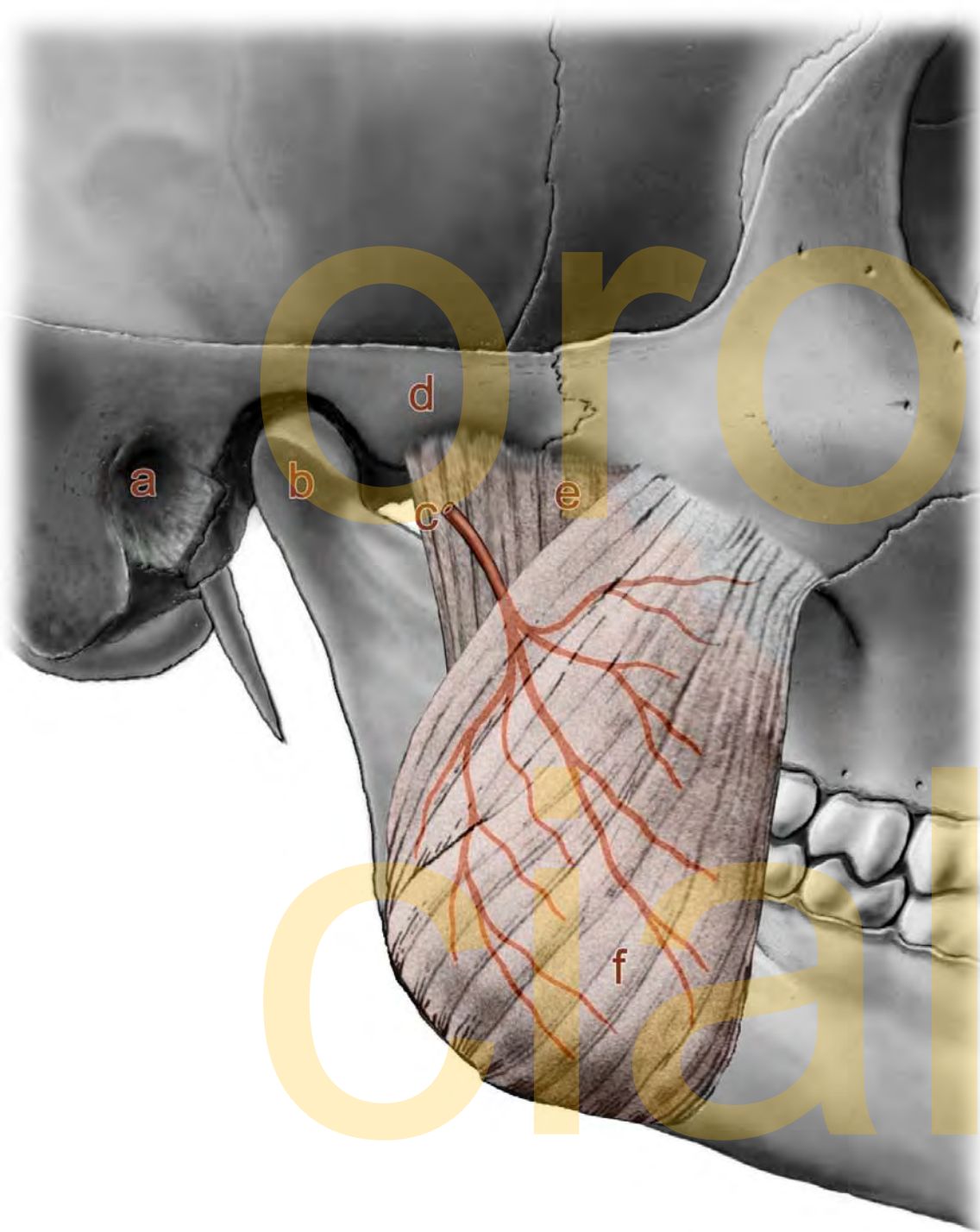
oro fa

cia la

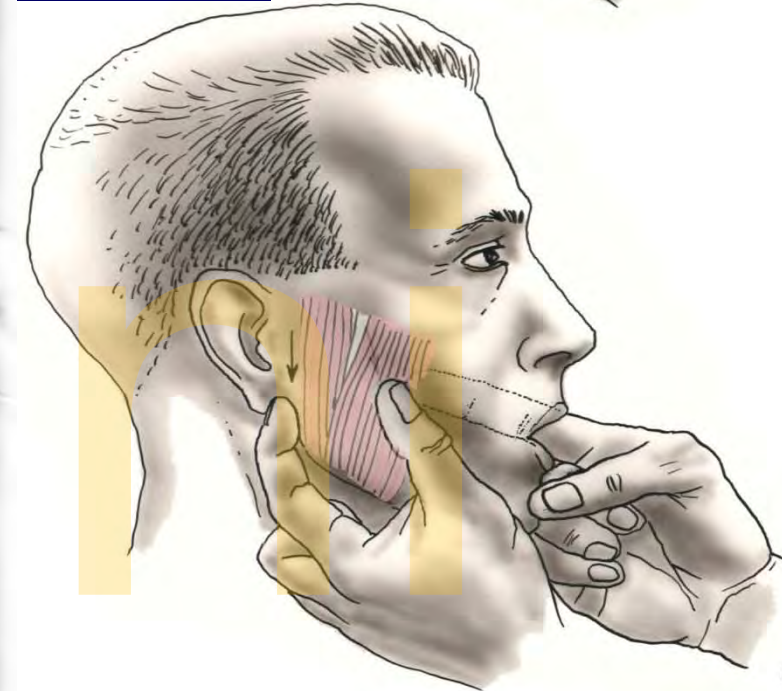


Masseter





masseter





oro fa

Cialni

Fascia

parotidomasseterica

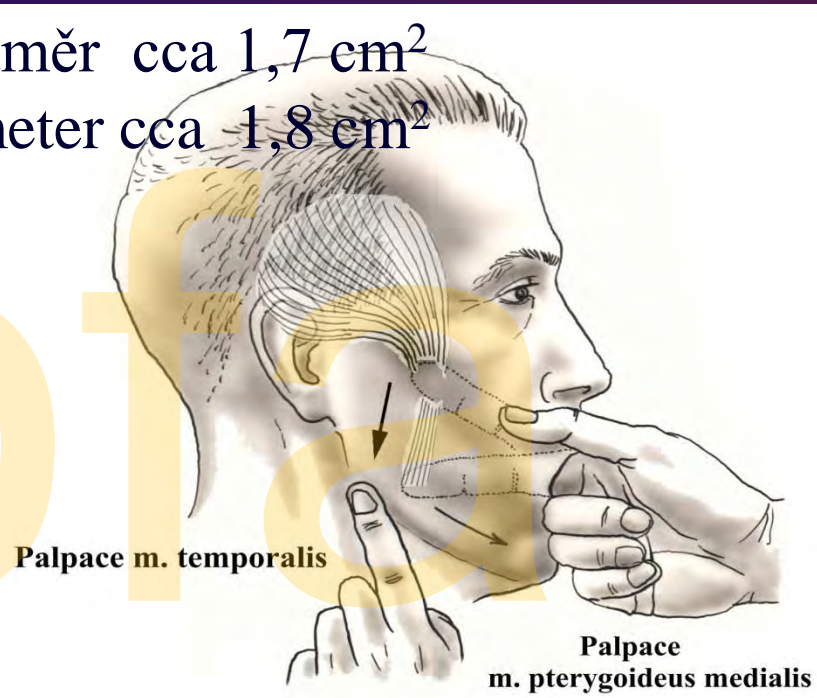
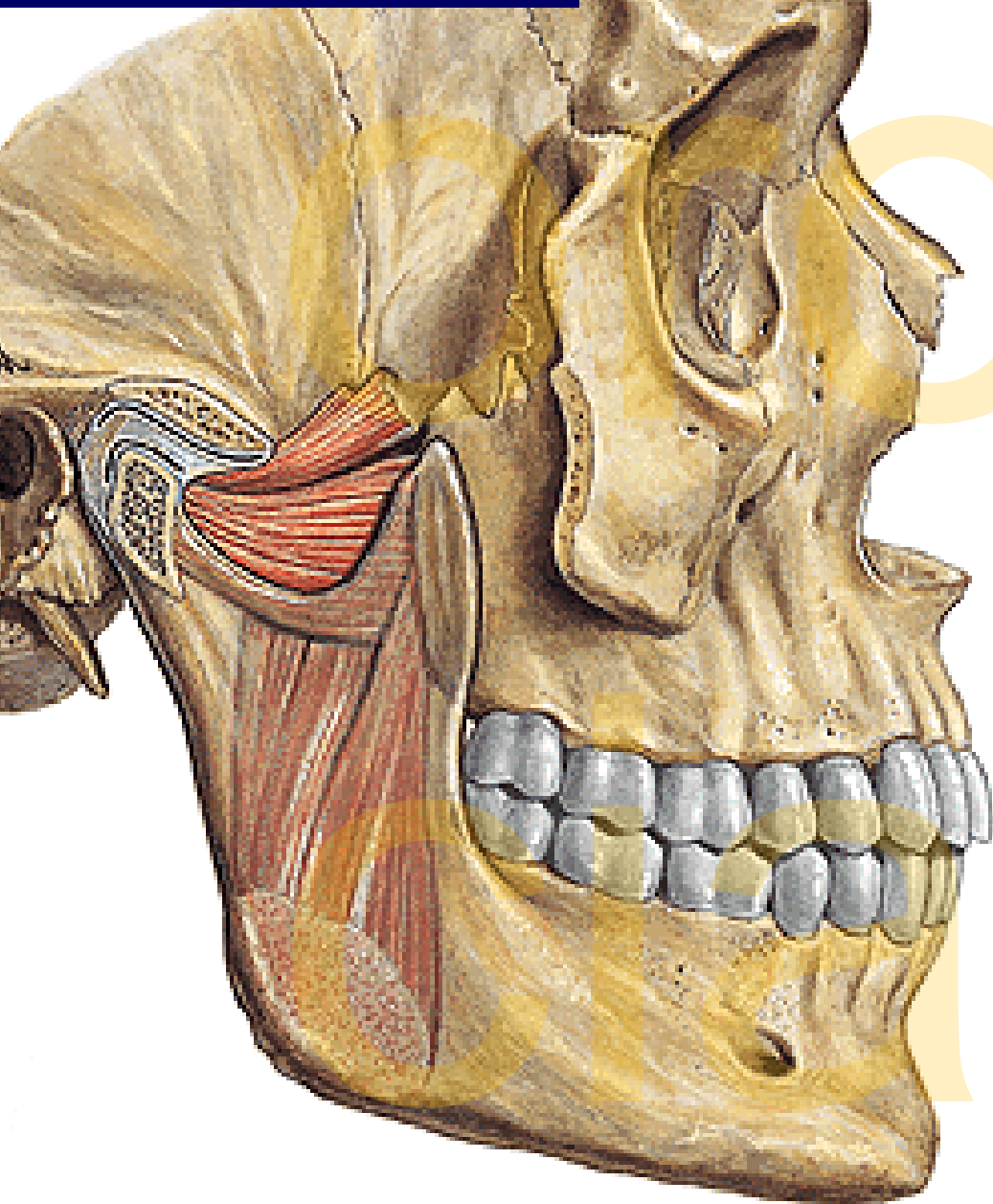
- 1 - m. temporalis
- 2 - m. masseter (pars prof.)
- 3 - m. masseter (pars superficialis)
- 4 - ductus parotideus
- 5 - n. auriculotemporalis



- 6 - a. carotis ext. et a. transversa faciei
 - 7 - n. VII. et a. retroauricularis
 - 8 - r. colli (n. VII.)
 - 9 - plexus parotideus
- ∩∩∩ - resection line

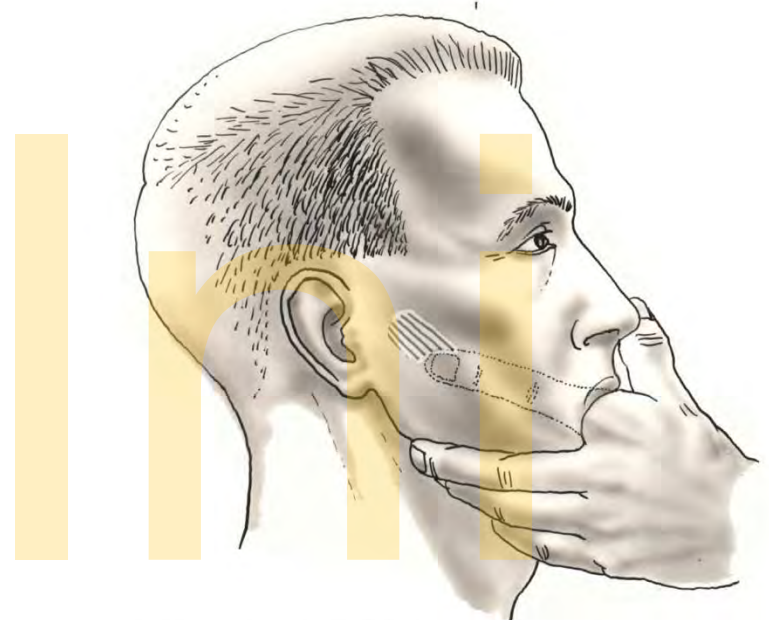
Pterygoideus lateralis
Pterygoideus medialis

Fyziologický průměr cca 1,7 cm²
Physiologic diameter cca 1,8 cm²



Palpace m. temporalis

Palpace
m. pterygoideus medialis



Palpace m. pterygoideus lateralis

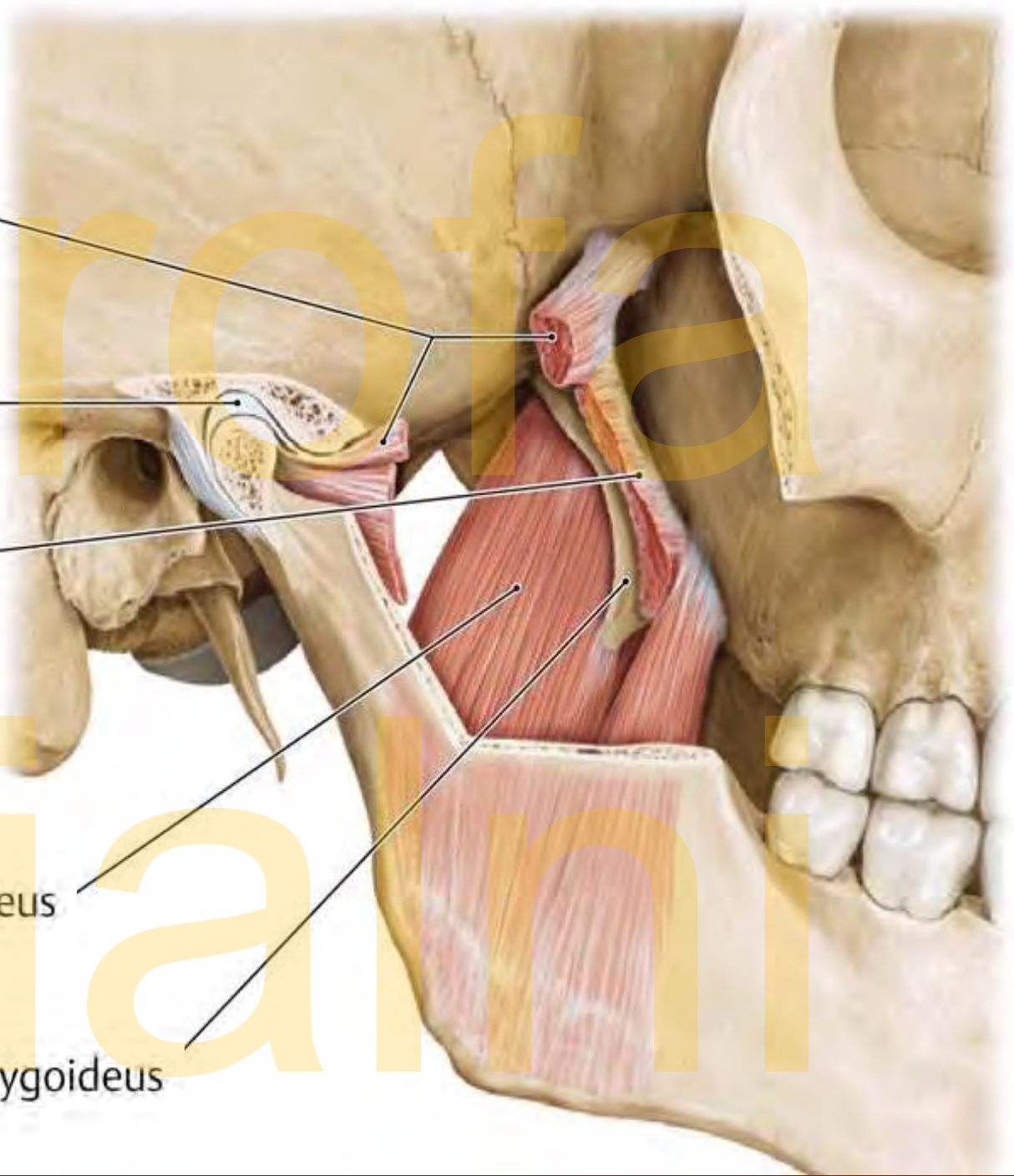
M. pterygoideus
lateralis,
Pars superior

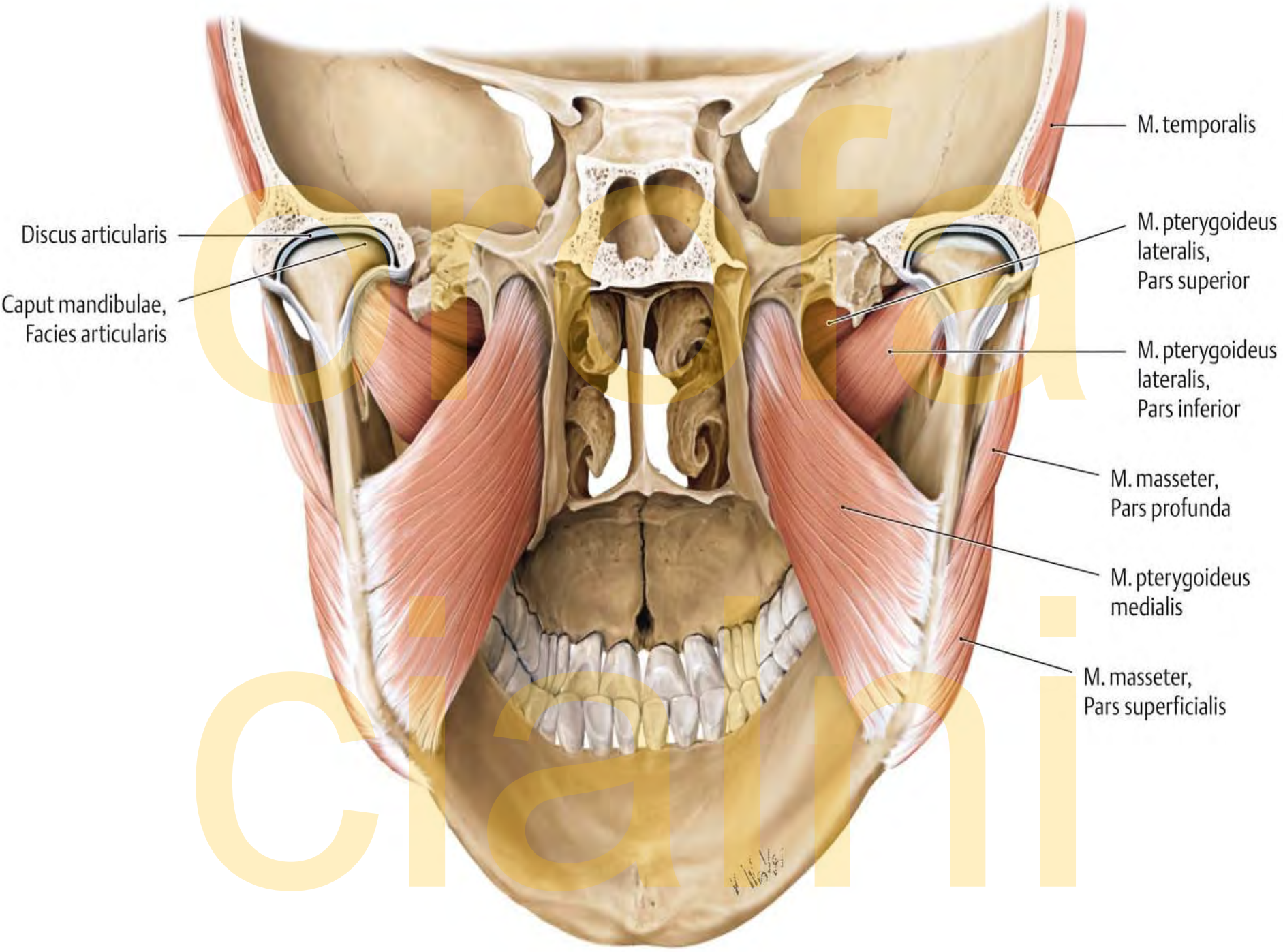
Discus
articularis

M. pterygoideus
lateralis,
Pars inferior

M. pterygoideus
medialis

Proc. pterygoideus
lateralis





Discus articularis

Caput mandibulae,
Facies articularis

M. temporalis

M. pterygoideus
lateralis,
Pars superior

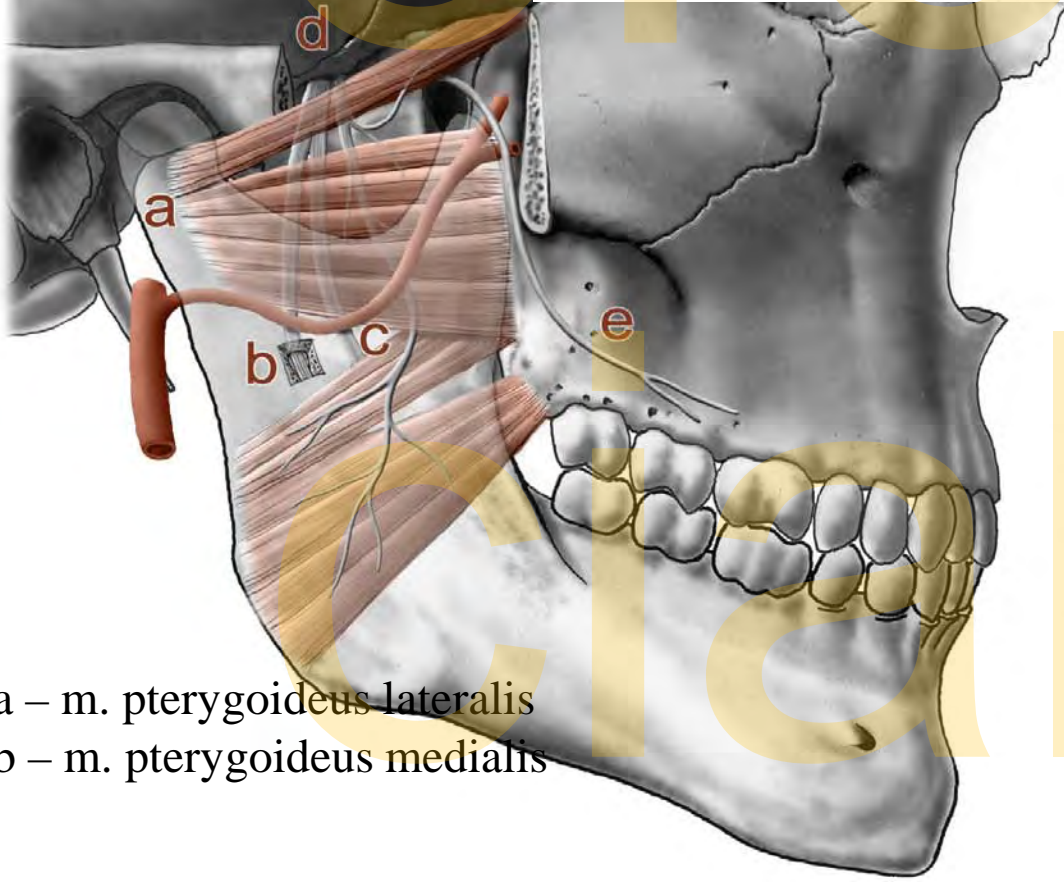
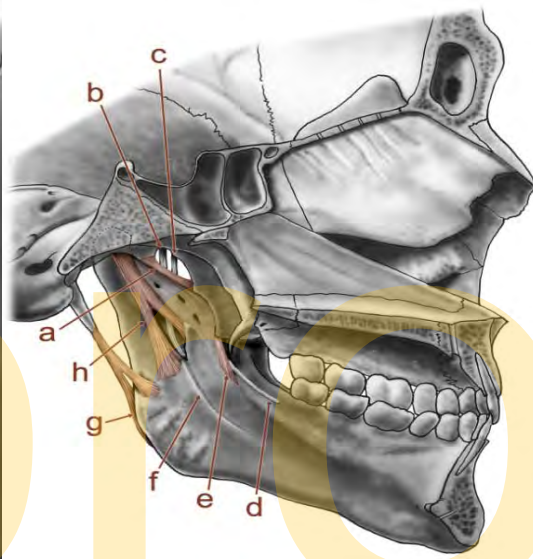
M. pterygoideus
lateralis,
Pars inferior

M. masseter,
Pars profunda

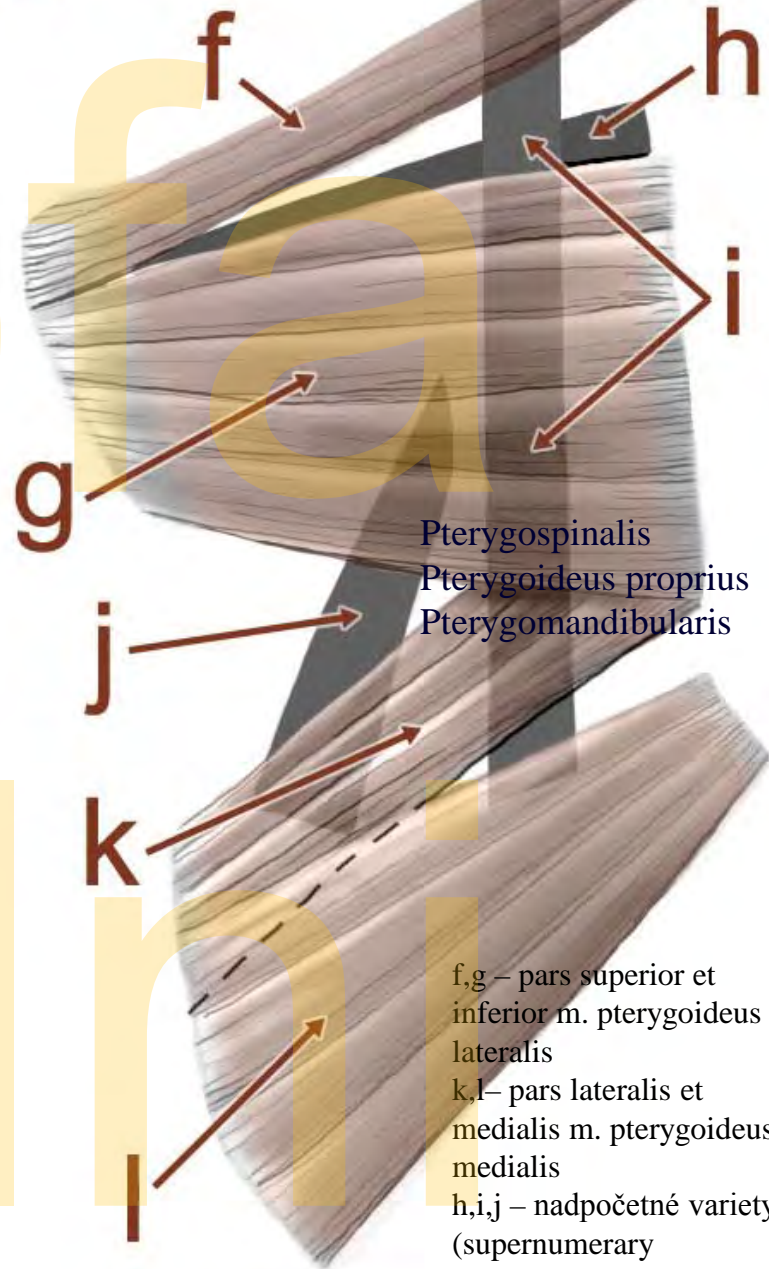
M. pterygoideus
medialis

M. masseter,
Pars superficialis

Mm.
pterygoidei
et variationes



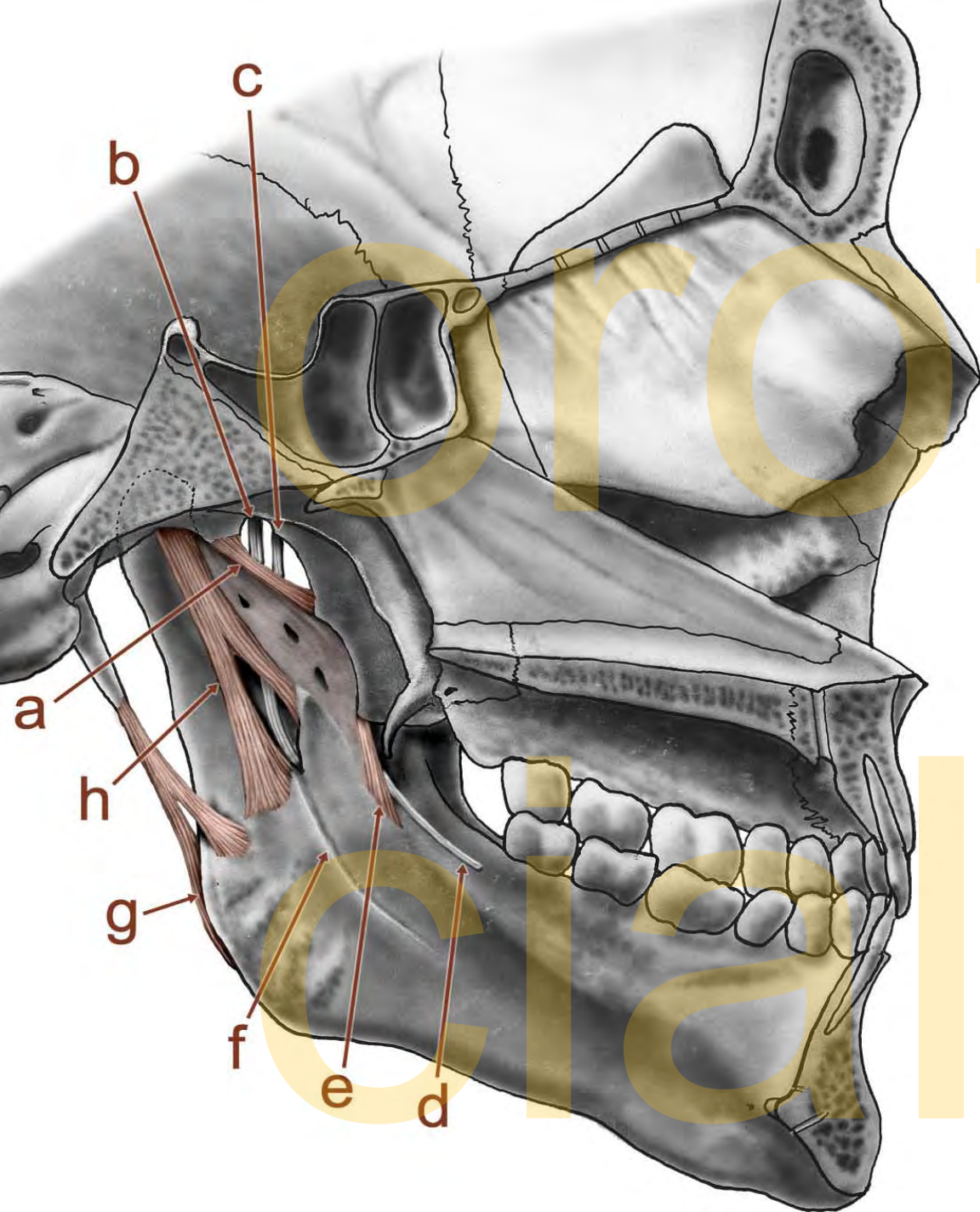
B



Pterygospinalis
Pterygoideus proprius
Pterygomandibularis

f,g – pars superior et inferior m. pterygoideus lateralis
k,l – pars lateralis et medialis m. pterygoideus medialis
h,i,j – nadpočetné variety (supernumerary varieties)

a – m. pterygoideus lateralis
b – m. pterygoideus medialis



g- lig. stylomandibulare
fascia parotidomasseterica

a- lig. pterygospinosum

h- lig. sphenomandibulare

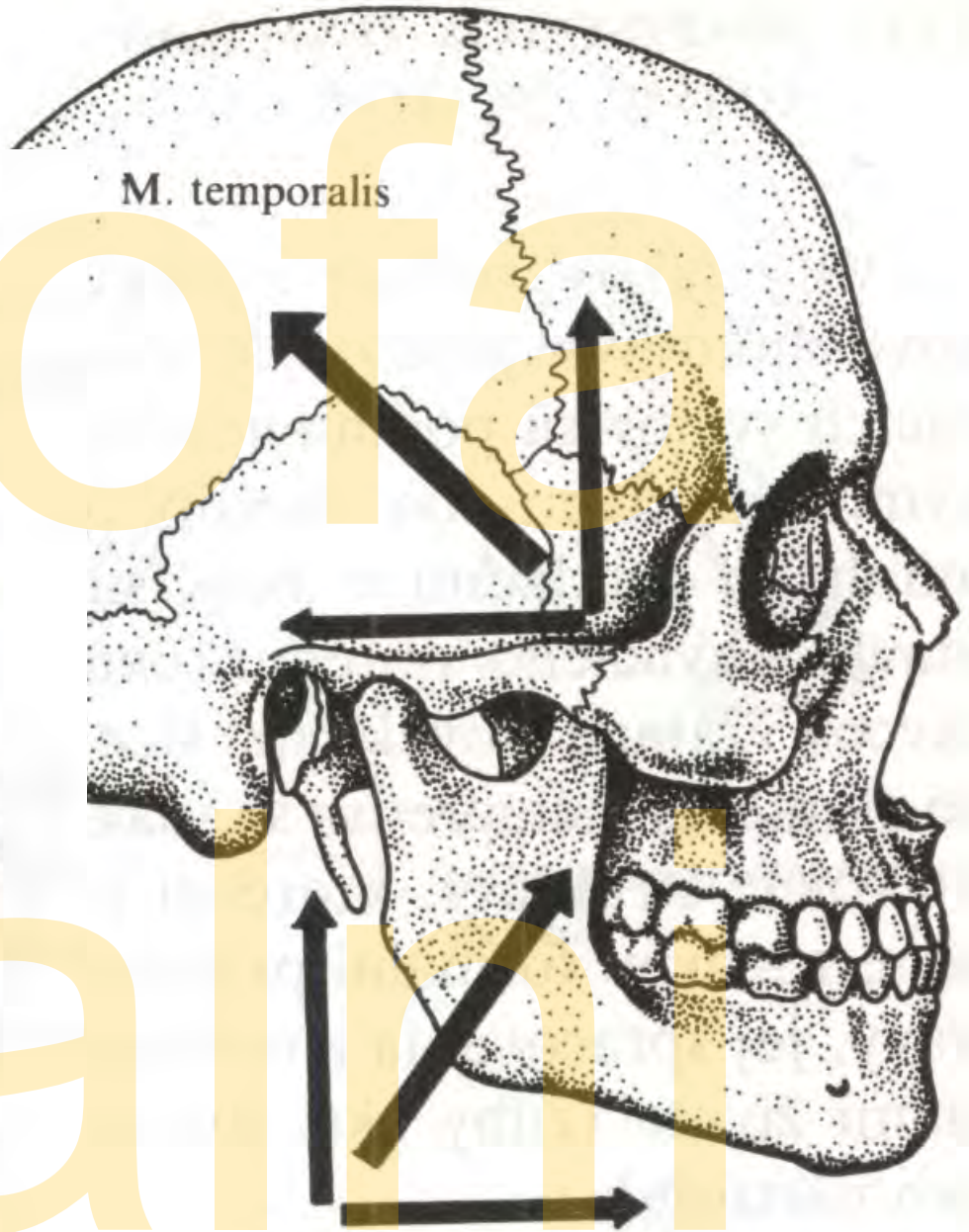
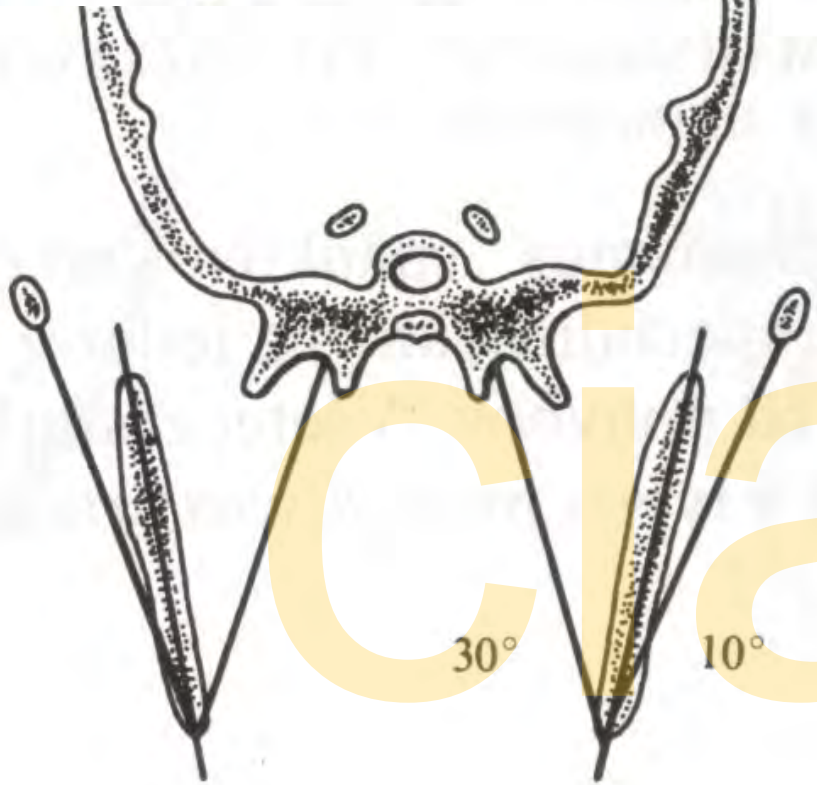
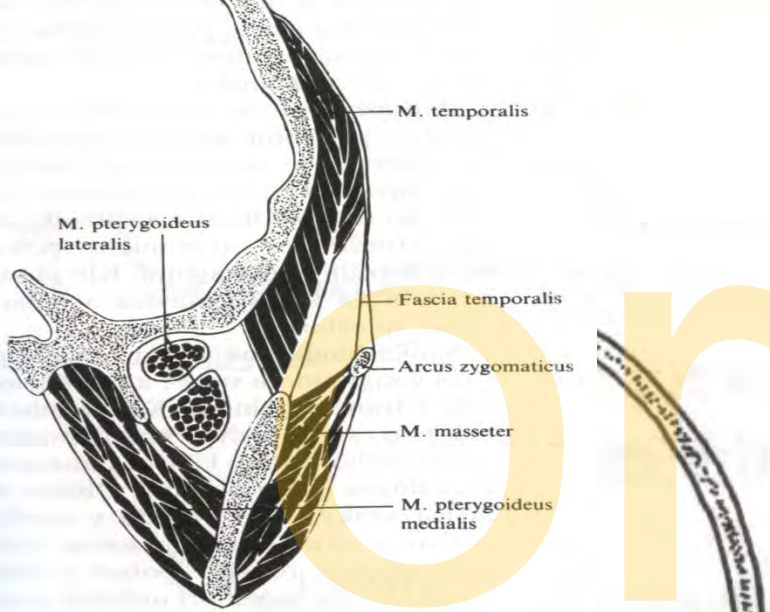
e- lig. pterygomandibulare

fascia interpterygoidea

anatomia

It is supposed that contractile power is 10 kg/1 cm²; bilateral contraction - even 200 kg (crown masticatory surface is about 1 cm²). Woman - about one quarter lesser value.

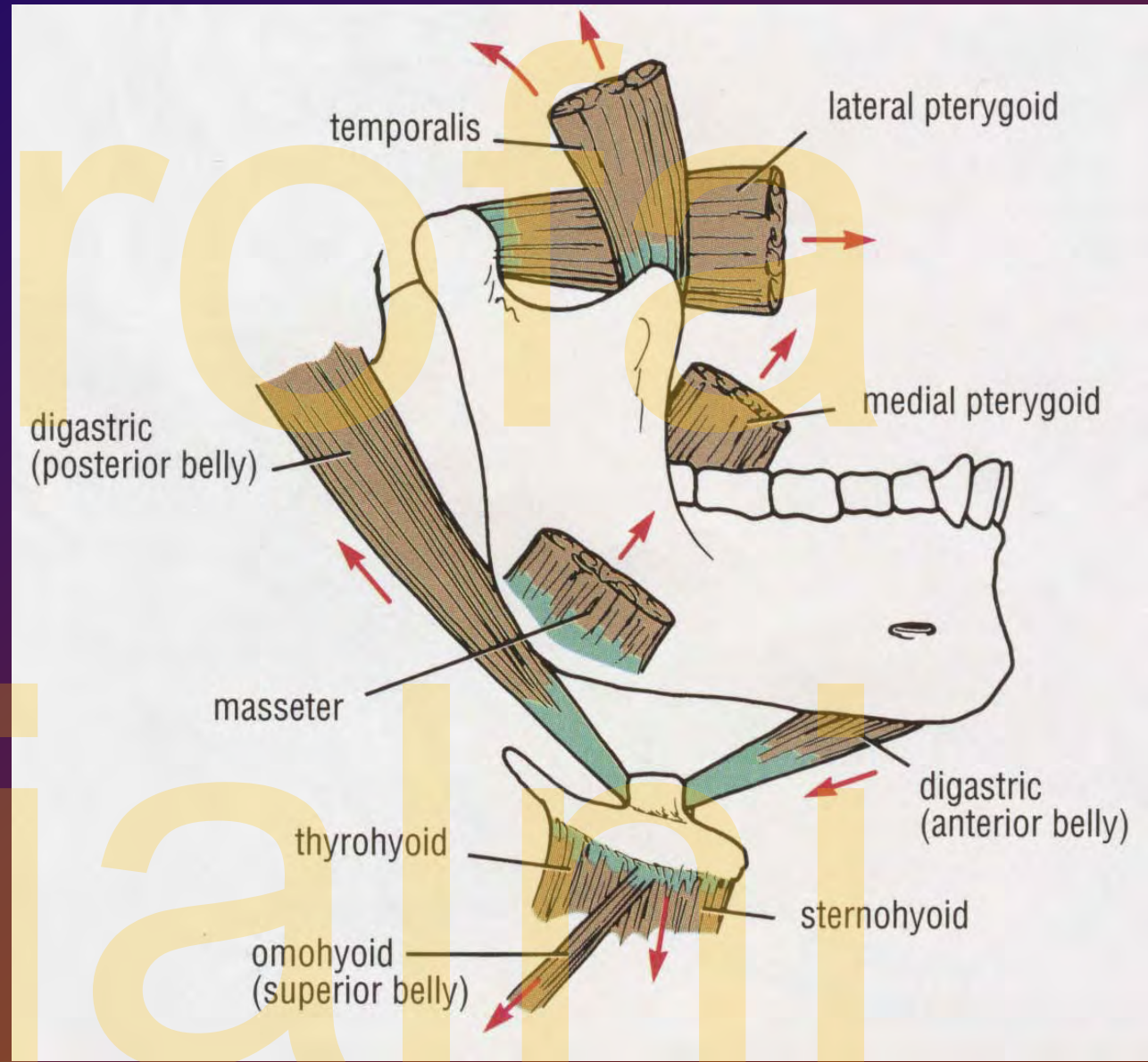
Even normal masticating exhibit pressure about 30 - 100 kg. Sensory receptors (inside suspensory systems, tendons and muscles) control hyperelongations.



M. masseter

Pomocné svaly
žvýkácí
(žvýkácí svaly
z protetického
hlediska)

venter anterior m.
digastrici
m. mylohyoideus
Inervace:
CN V₃
m. geniohyoideus



Functional arrangement of the masticatory muscles

mm. adductores (elevatores)	m. masseter m. temporalis m. pterygoideus medialis
mm. abductores (depressores)	m. digastricus (biventer) m. mylohyoideus m. geniohyoideus
mm. protractores (propulsores)	m. pterygoideus lateralis m. masseter m. pterygoideus medialis
mm. retractores (retropulsores)	m. temporalis (pars mastoidea) m. masseter (pars profunda) m. digastricus

Articulatio temporo- mandibularis

ATM lat.
TM , TMJ engl.

Morphological findings:

- The great variability of all the articular structures
- The absence of hyaline cartilage
- The two separate compartments, allowing a wider range of mandibular movements
- The marked weakness of the articular ligaments, allowing hypertranslation and dislocation without tearing the capsule

Temporomandibular (craniomandibular) joint



Compound joint
Similar to hinge joint type



Joint fossa

Relations to the
temporal squama,
tympanic bone,
petrotympanic fissure
petrosquamous fissure

Extremes:

- Broad, slightly raised surface that gives the impression of low ridge of palpation
- Deep, high mound-like form, that is convex throughout

Flat eminences (tubercles) are associated with prognathism, edge-to-edge occlusal contact of the incisors, overbite and overjet of the upper incisors

Mandibular fossa and tympanic bone. View from below.

- Condylus occipitalis
- Processus styloideus
- Foramen jugulare
- For. stylomastoideum
- Processus mastoideus
- Fissura tympanomastoidea
- Fis.tympanopetrosa
- Fis.petrosquamosa
- Fis.tympanosquamosa
- Porus acusticus ext.

- Os tympanicum zvýrazníte dalším kliknutím
- Tuberc. pharyngicum
- Foramen lacerum
- Spina sphenoidalis
- Foramen spinosum
- Foramen ovale

- Fossa mandibularis
- Tuberculum articulare
- Arcus zygomaticus



Demi-axial projection of Albers-Schönberg (Parma) exhibits different congruencies of the both articular surfaces

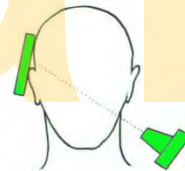
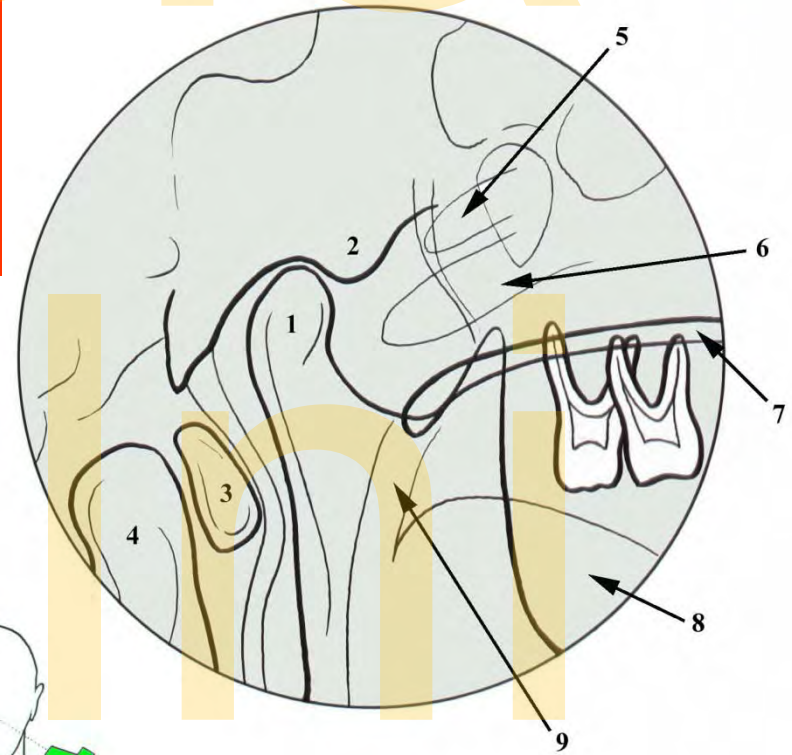
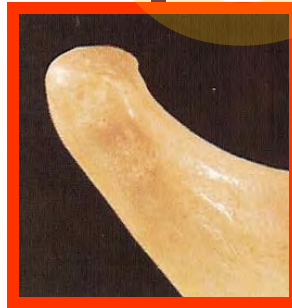
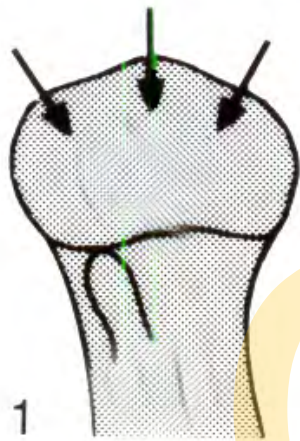
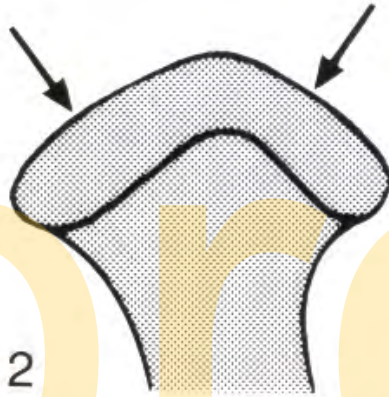


Fig. 2.122 Tomographic examination of the temporomandibular articulation. The two images (a and b) are about 0.5 cm apart.



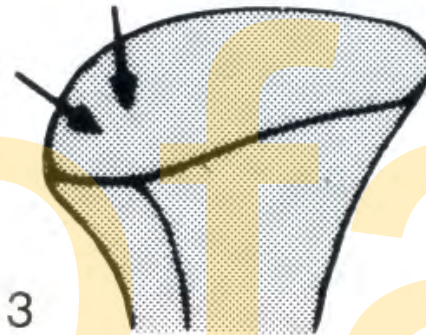
1

23%



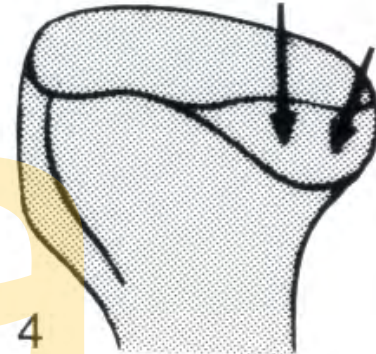
2

23%



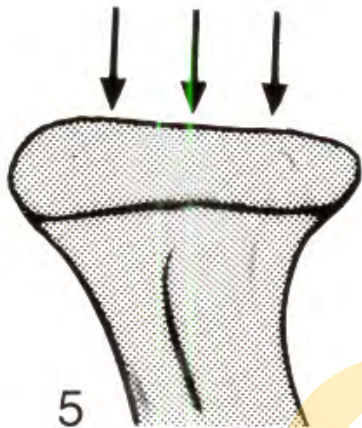
3

17%



4

21%



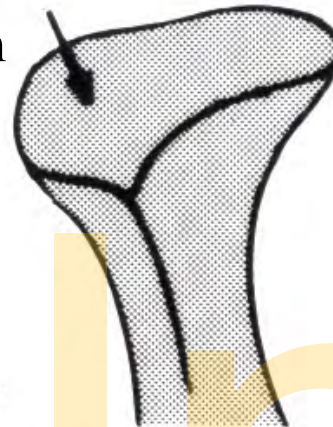
5

24%

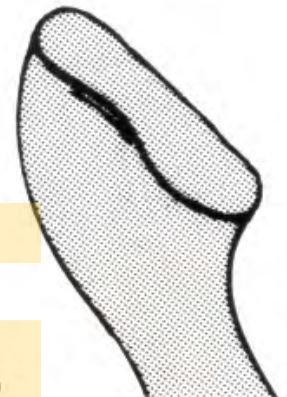
Width : 20.5 mm
Sagittal diameter : 8.7 mm



6

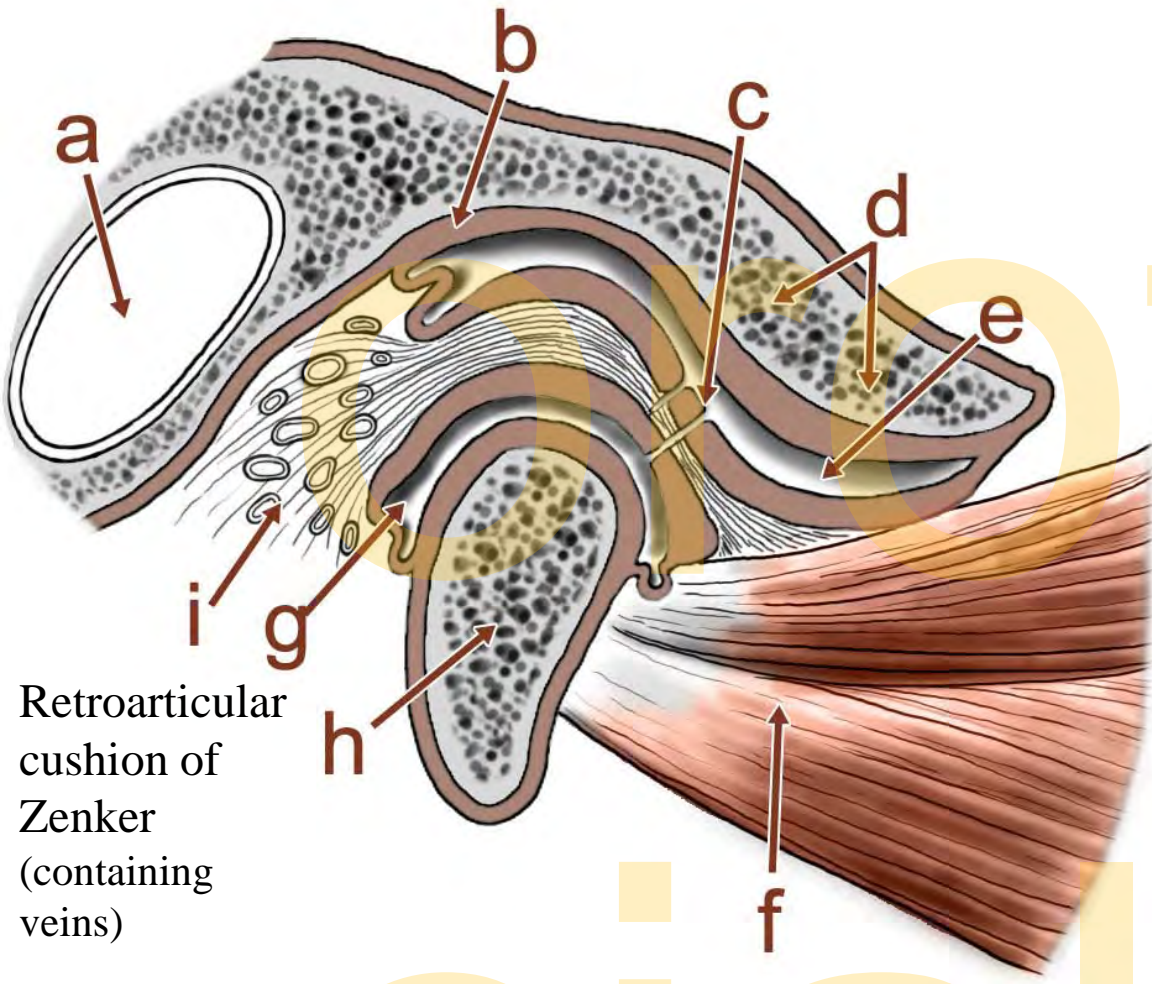


7

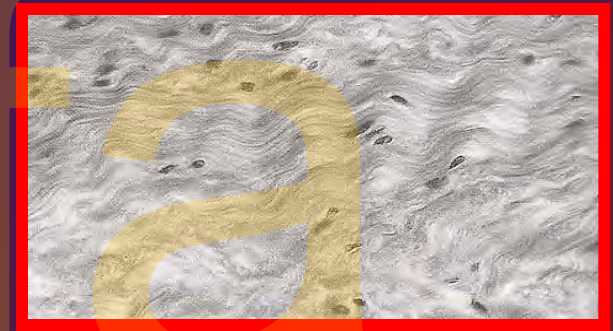


8

Various morphologic types of mandibular condyle and their prevalence, based on specimens from fully dentulous individuals 20–53 years of age (Mongini 1975)



Section through intraarticular disc



Retroarticular
cushion of
Zenker
(containing
veins)

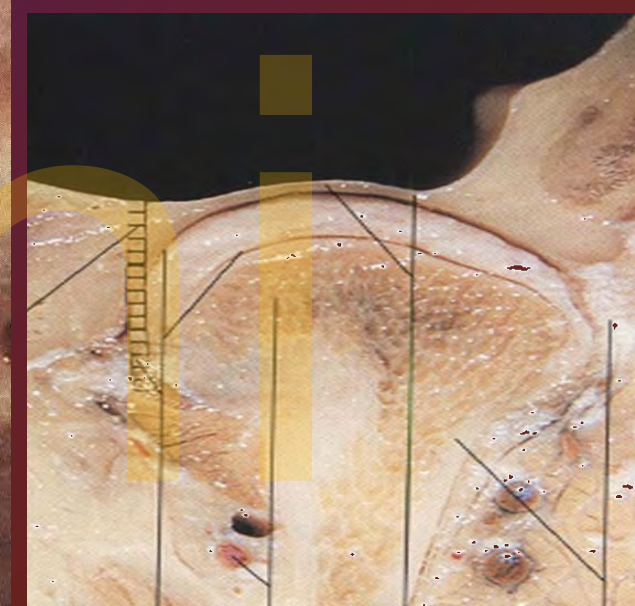
Anteroposterior section through TMJ joint.

a – meatus acusticus externus, b – cartilago on surface of the fossa mandibularis, c – perforations in the disc (variety), d – bone layer inside of tuberculum articulare, e – fissura discotemporalis (discotemporal fissure), f – insertio of m. pterygoideus lateralis, g – fissura discomandibularis (discomandibular fissure), h – caput mandibulae, i – Zenker's retroarticular cushion

Medial view of the TMJ with the joint spaces opened

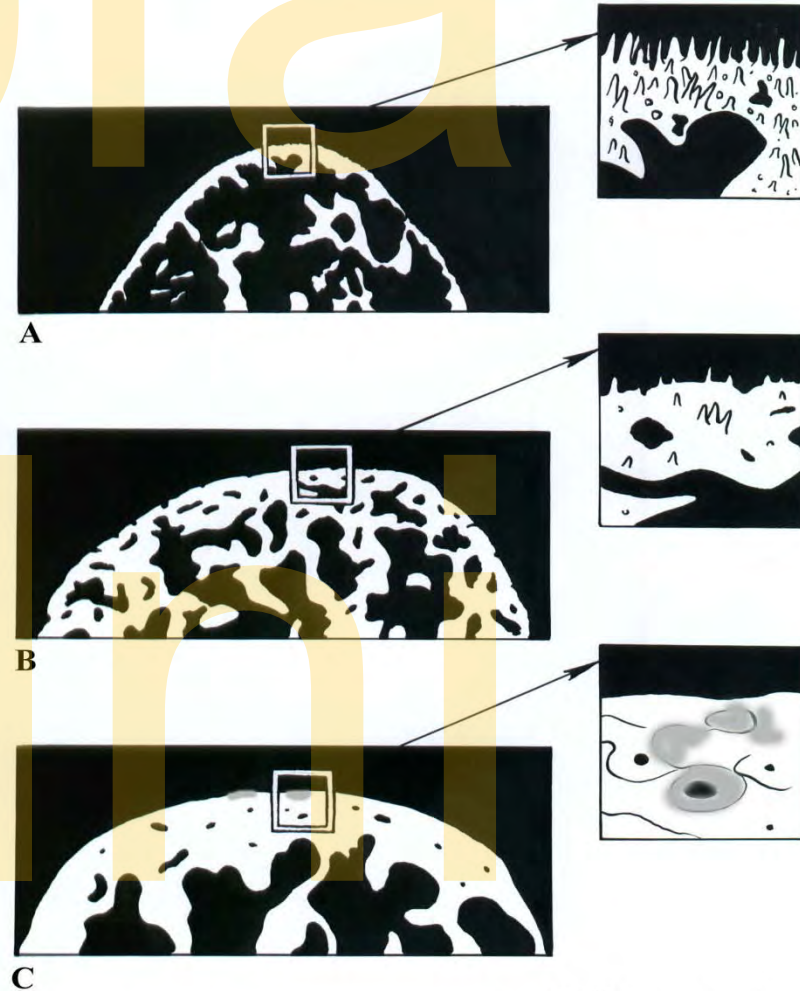
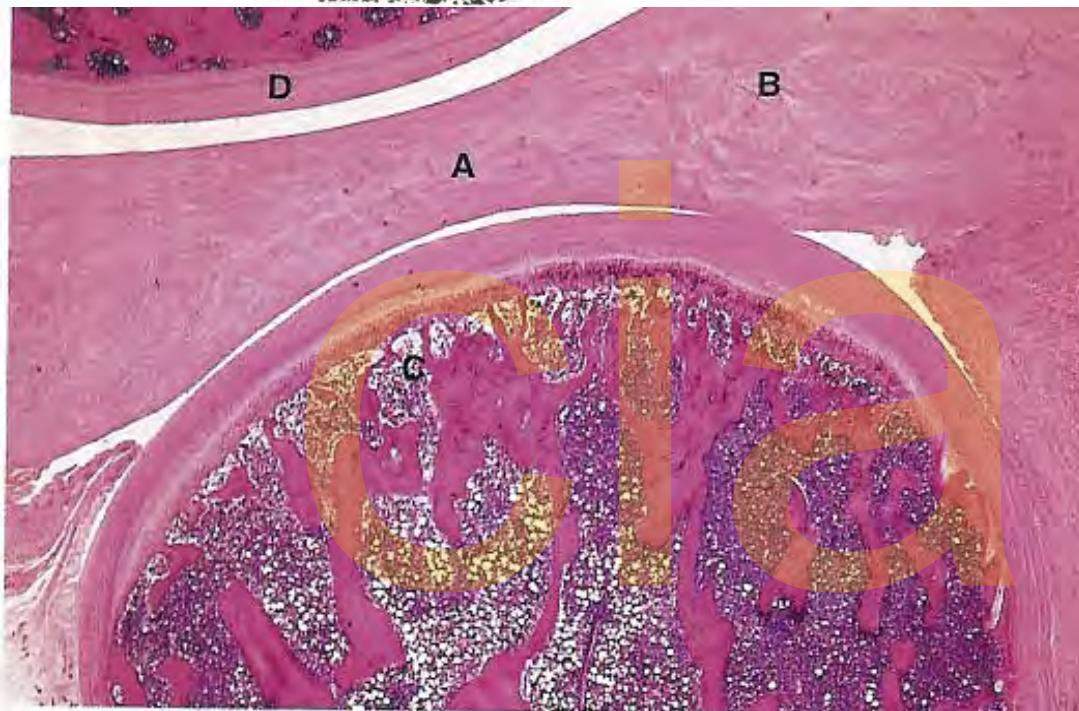
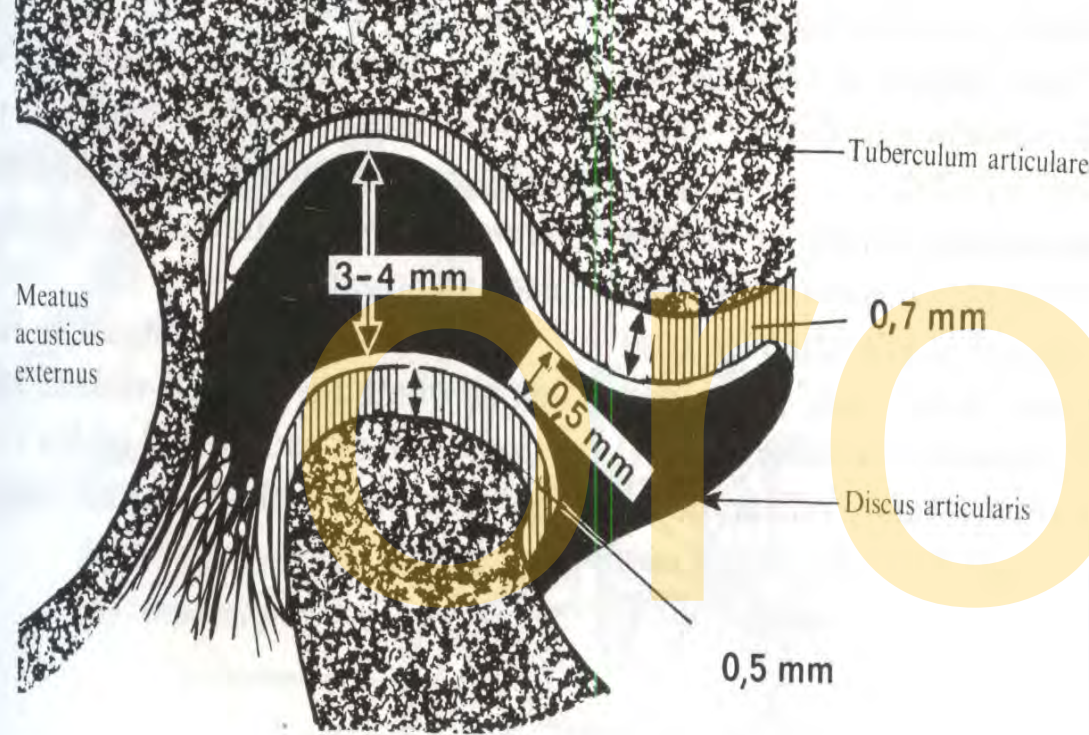
- 1 Articular eminence and upper joint space
- 2 Anterior end of lower joint space
- 3 Lateral pterygoid muscle
- 4 Articular disc
- 5 Posterior end of upper joint space
- 6 Tympanic membrane and posterior end of lower joint space

Upper joint space – 581 mm²
Lower joint space – 396 mm²



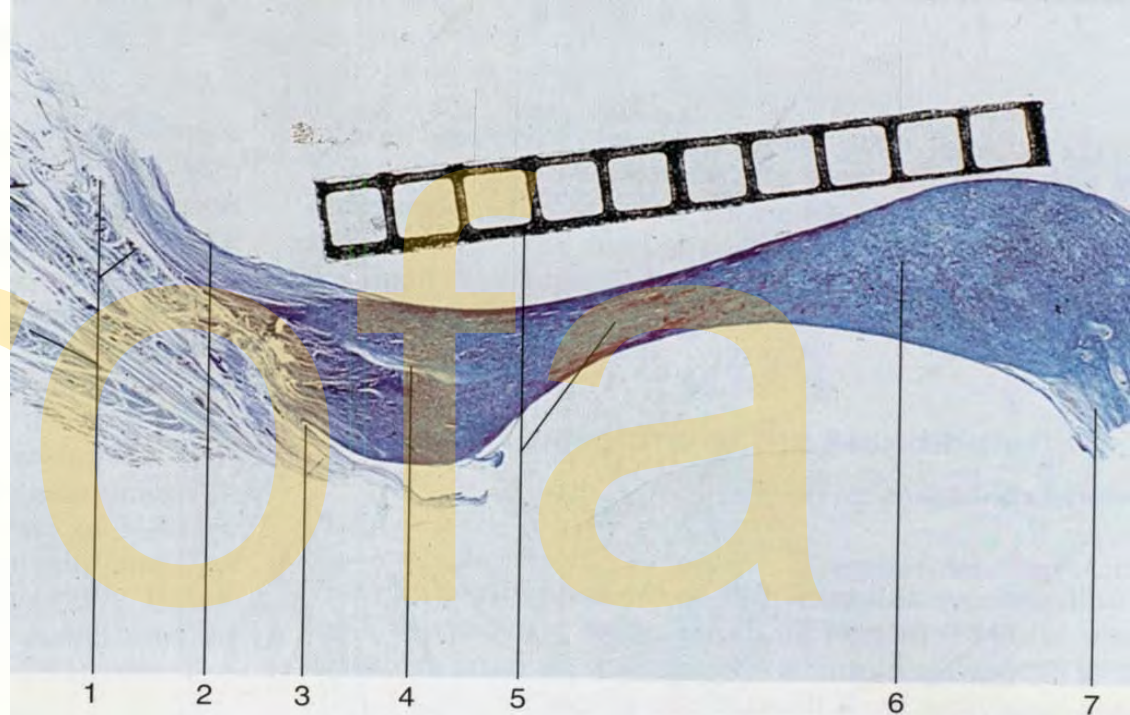
6 5 4 3 2 1

Atrophy of the mandibular condyle depending age



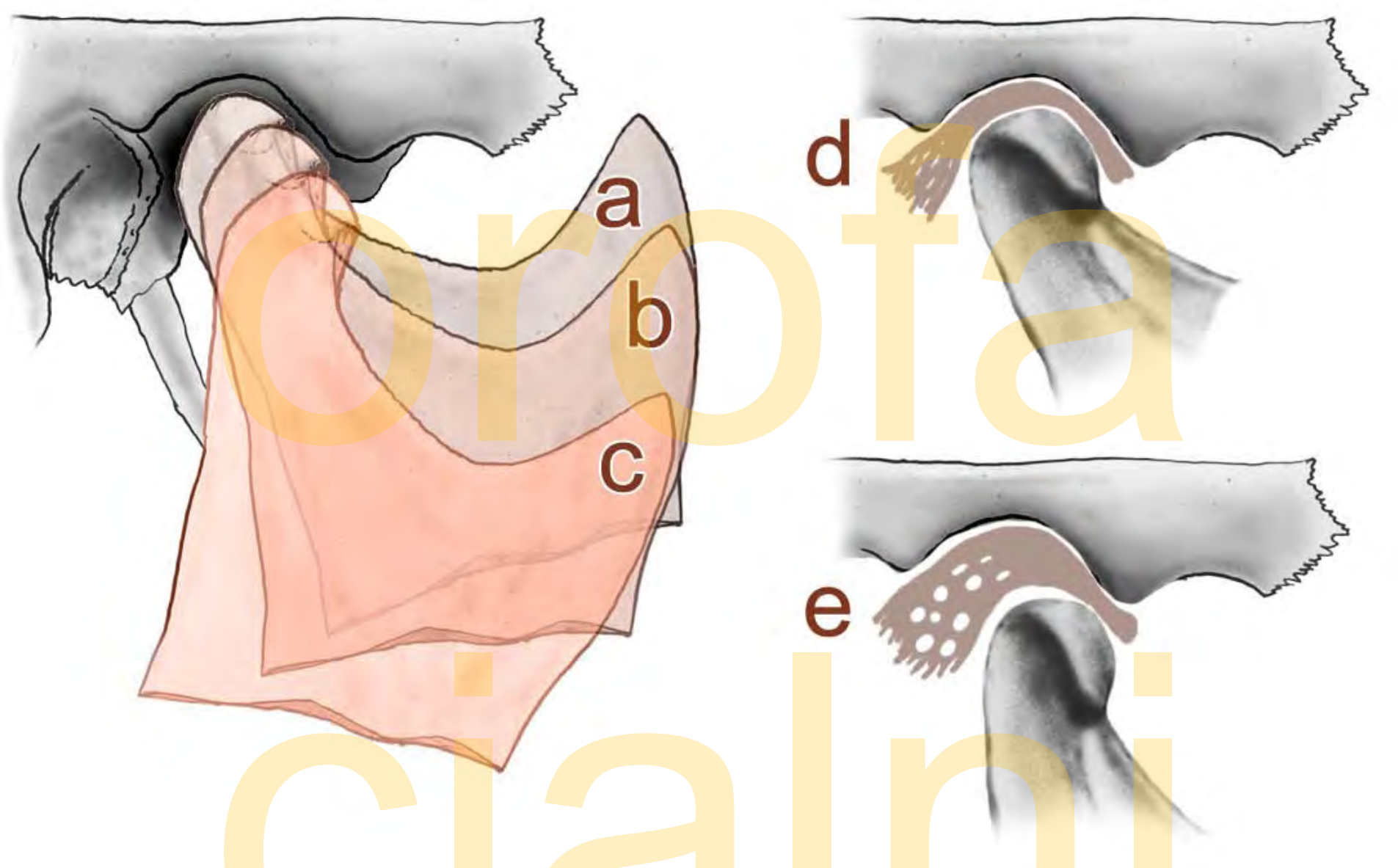
Articular disc, central zone in longitudinal section (54-year-old man)

- 1 Lateral pterygoid muscle
- 2 Capsule of upper joint space
- 3 Anterior reflection of lower joint space
- 4 Anterior end of articular disc
- 5 Millimeter scale and thin zone of disc
- 6 Posterior portion of articular disc
- 7 Loose retrodiscal tissue



Isolated chondroid cells

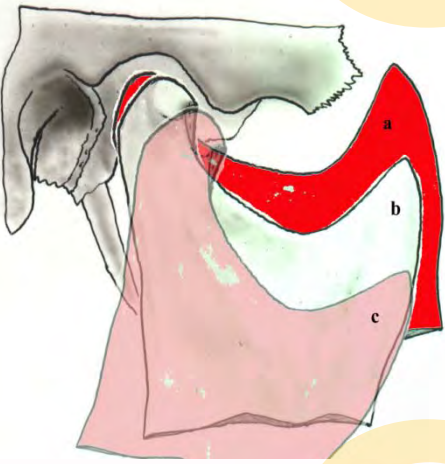
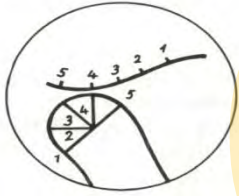
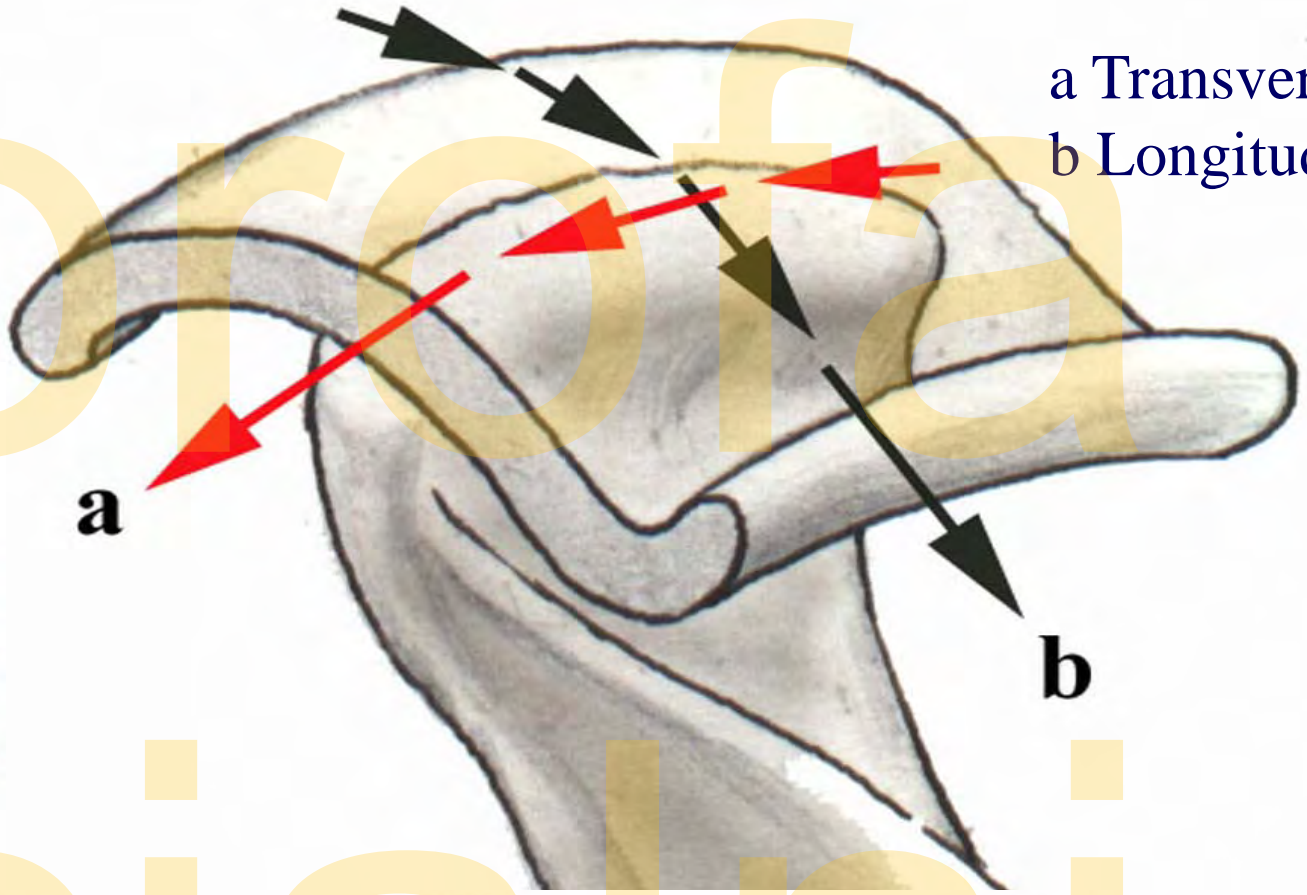
Elastic fibers (black) in the anterior segment of the articular disc



Condyle movement phases through mouth opening .
a - basic position (jaws are in central occlusal position), b – rotation, c – translational motion, d – dorsal part of the Zenker cushion is compressed), e – dorsal part of the Zenker cushion is dilated – mouth is open)

Condyle path

a Transverse
b Longitudinal

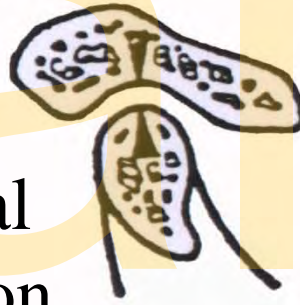


Rest position



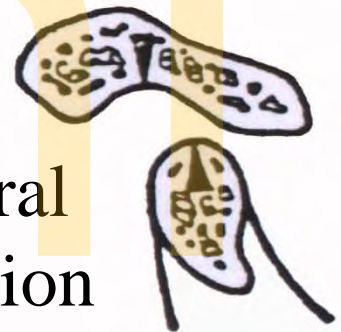
A

Central position

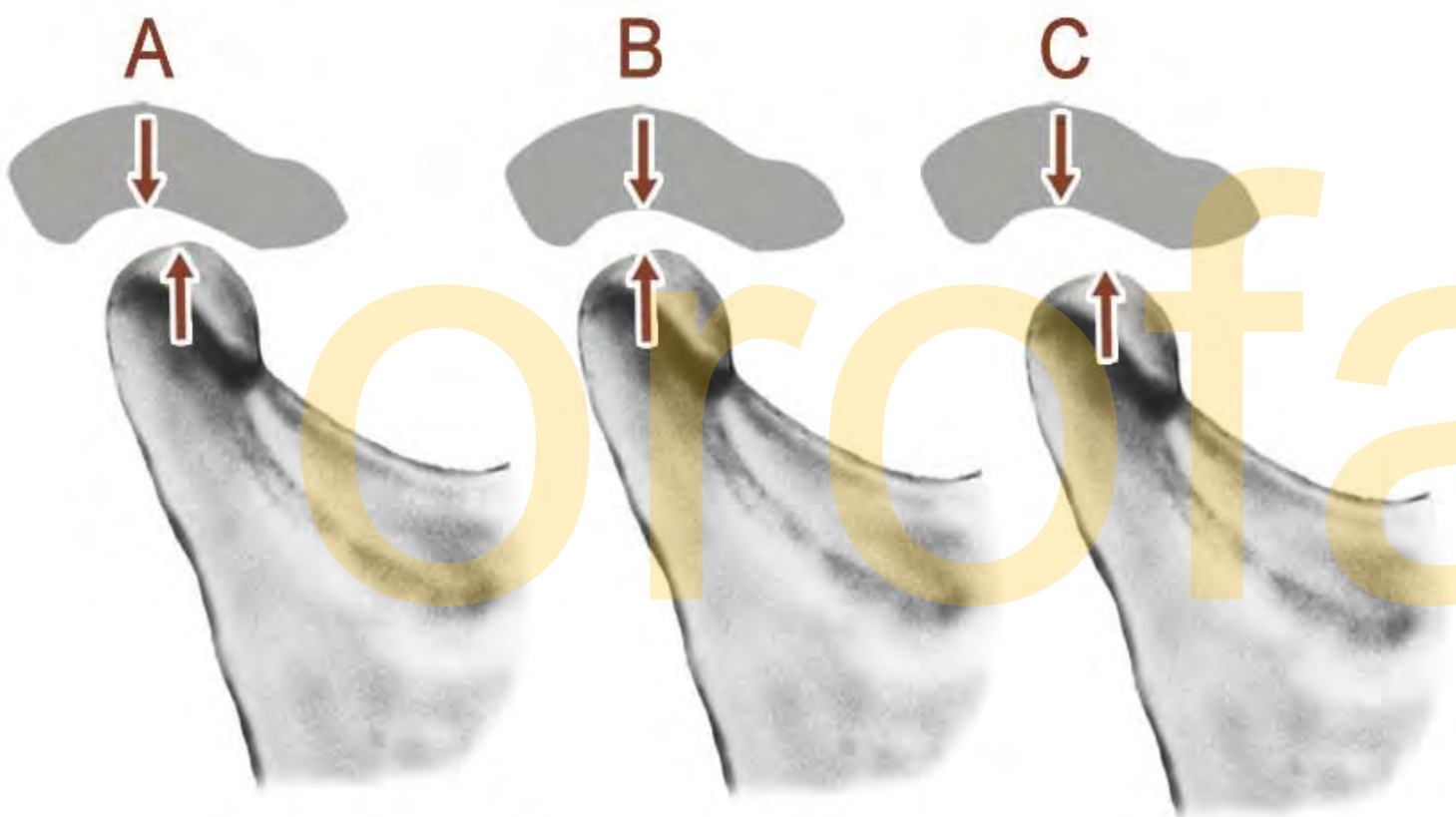


B

Ventral position

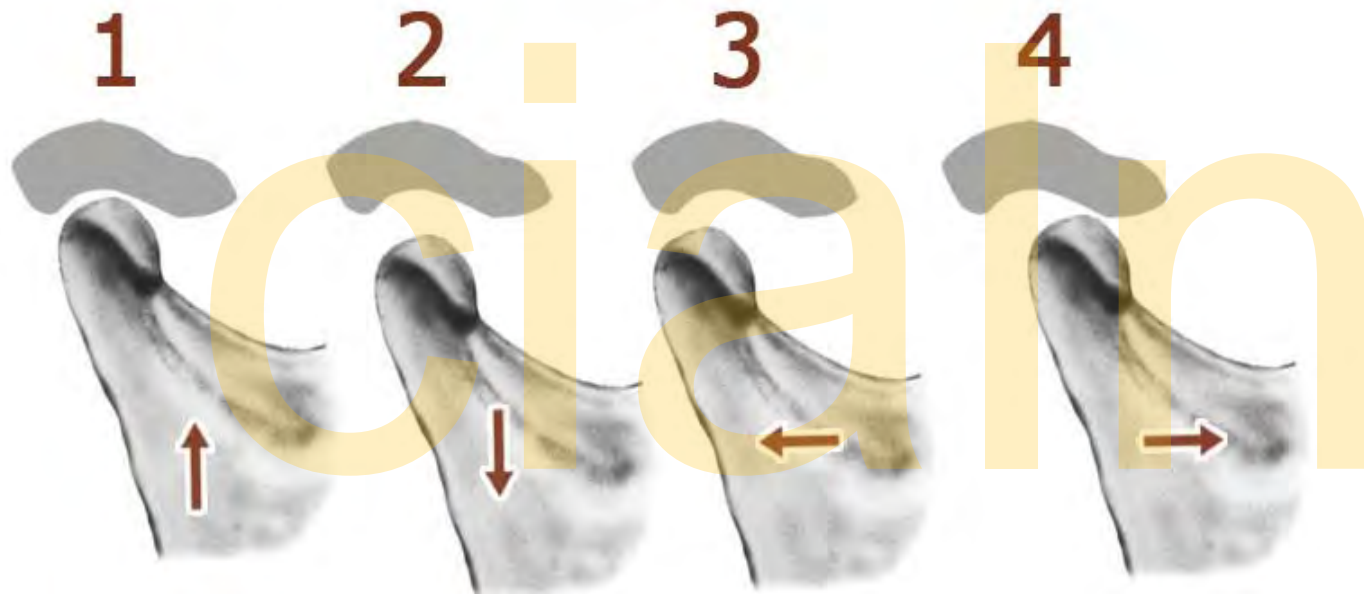


C



Basic condyle positions :

A – habitual (high central) position, B – central (zenith) position, C low ventral (relax) position;

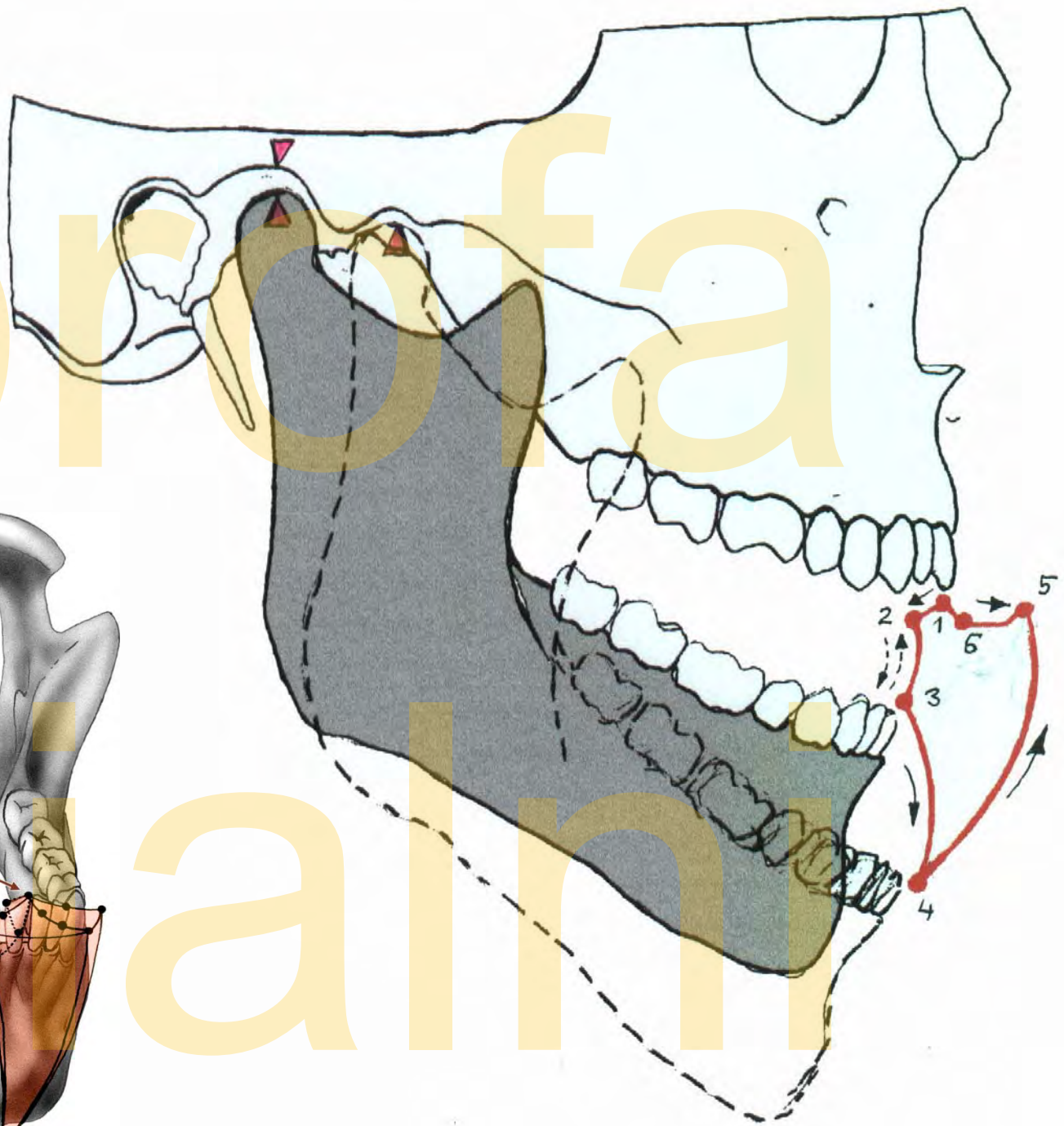
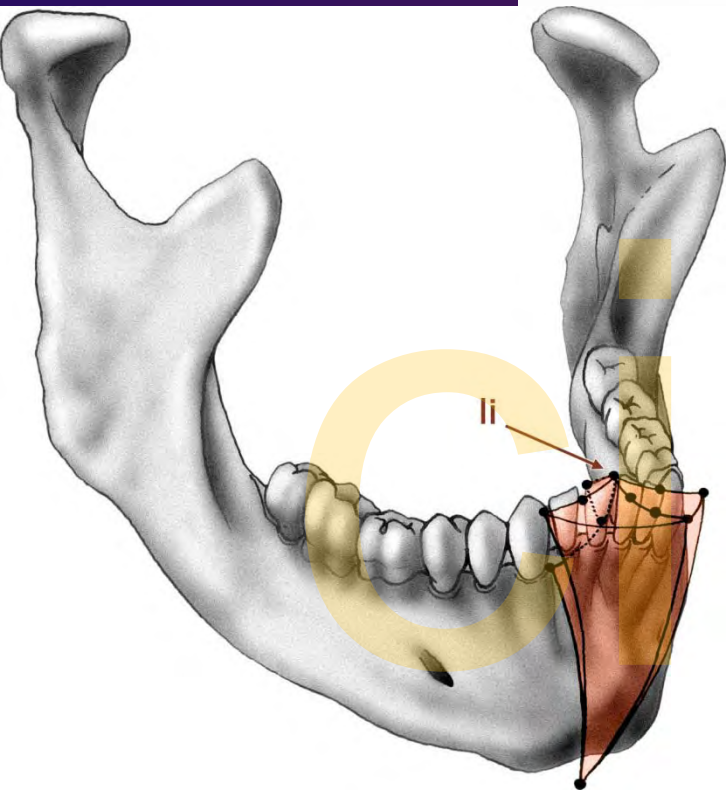


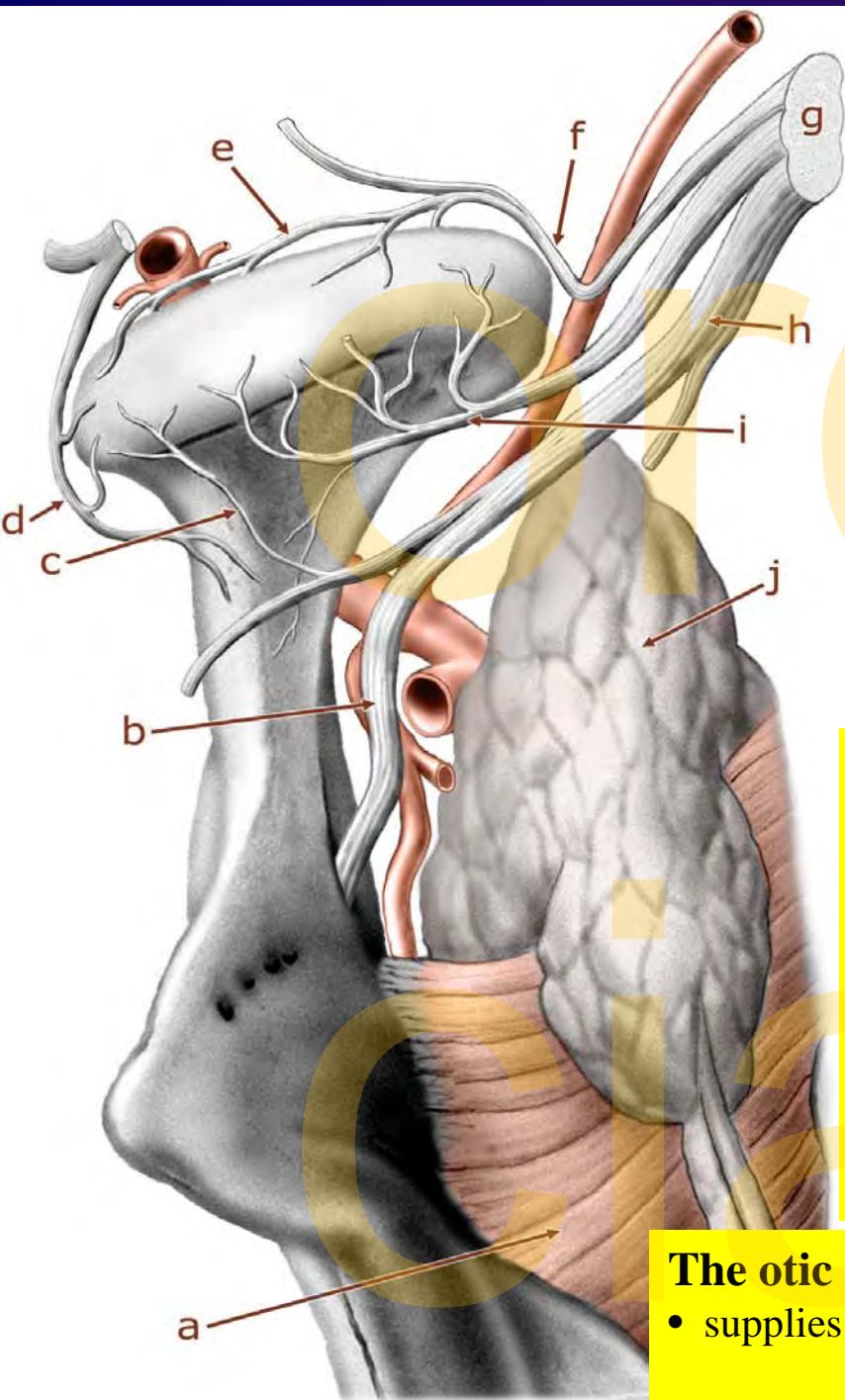
1 – inside position,
 2 - extrusal position,
 3 – retrusal position,
 4 - protrusal position

Mandible movement through chewing

Posselt cone-like space – (after Posselt 1961; modified).

Ii – incisale inferius





Vessels and nerves supplying joint capsule and condyle. Anterior view. Diagram. a – m. mylohyoideus, b – nervus alveolaris inferior, c – ramus articularis anterior (for masseter m.), d – ramus articularis anterior (from facial nerve), e – rami articulares posteriores (from auriculotemporal n.), g - ramus articularis anterior, h – n. alveolaris inferior, i – branches of ramus articularis anterior, j – gl. submandibularis

The posterior deep temporal nerve:

- supplies the rostromedial zone of the disc and capsule

Masseteric nerve gives off four branches:

- From the nerve part below foramen ovale
- From the first extracranial segment of this nerve
- The last two arise from the part below the zygomatic process

The otic ganglion:

- supplies the discosquamal part of the capsule

Auriculotemporalis nerve gives off four branches:

- From lateral limb of the nerve loop
- From the medial limb of the nerve loop
- From the midsegment
- From the area where nerve converges with the superficial temporal artery

The facial nerve:

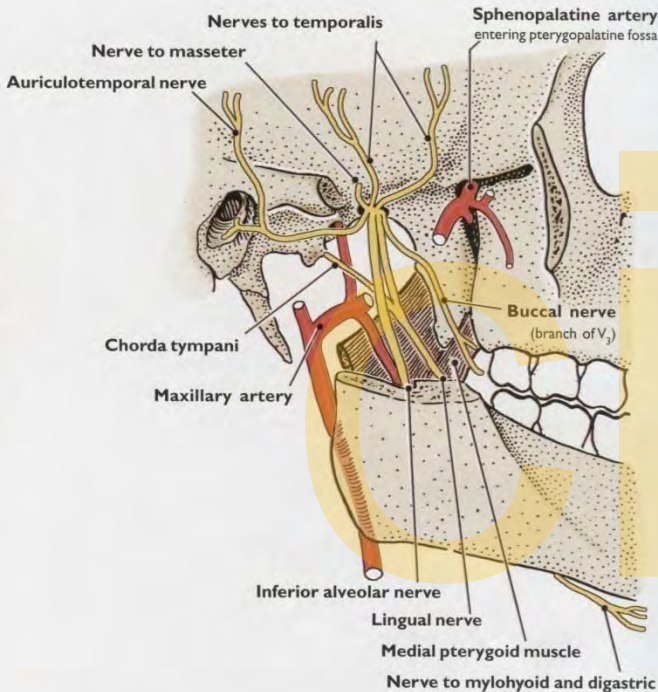
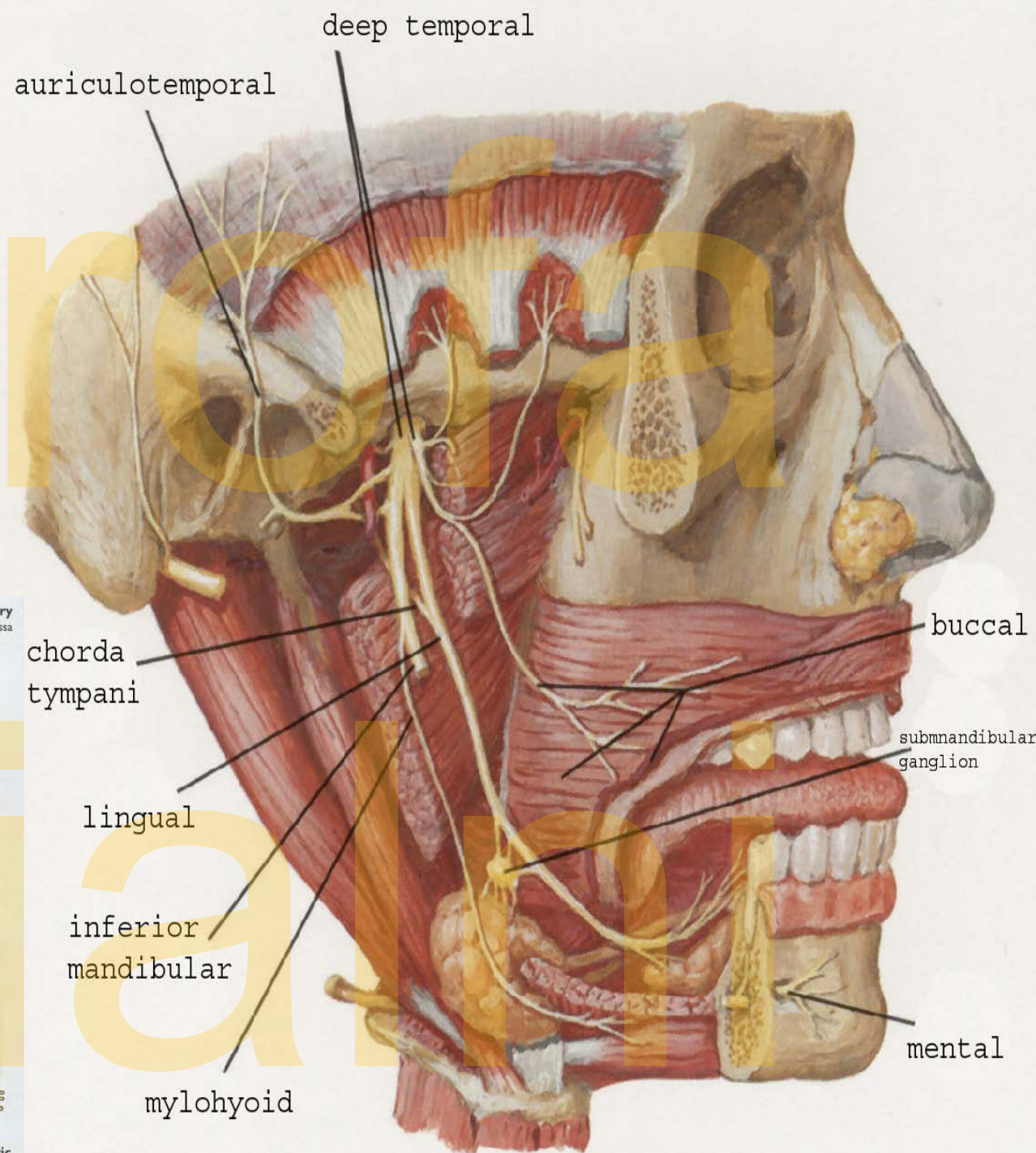
- supplies the lateral surface of the capsule

Nerves closely to TMJ:

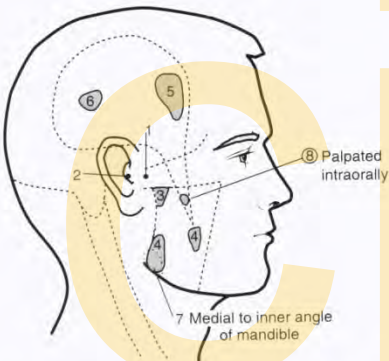
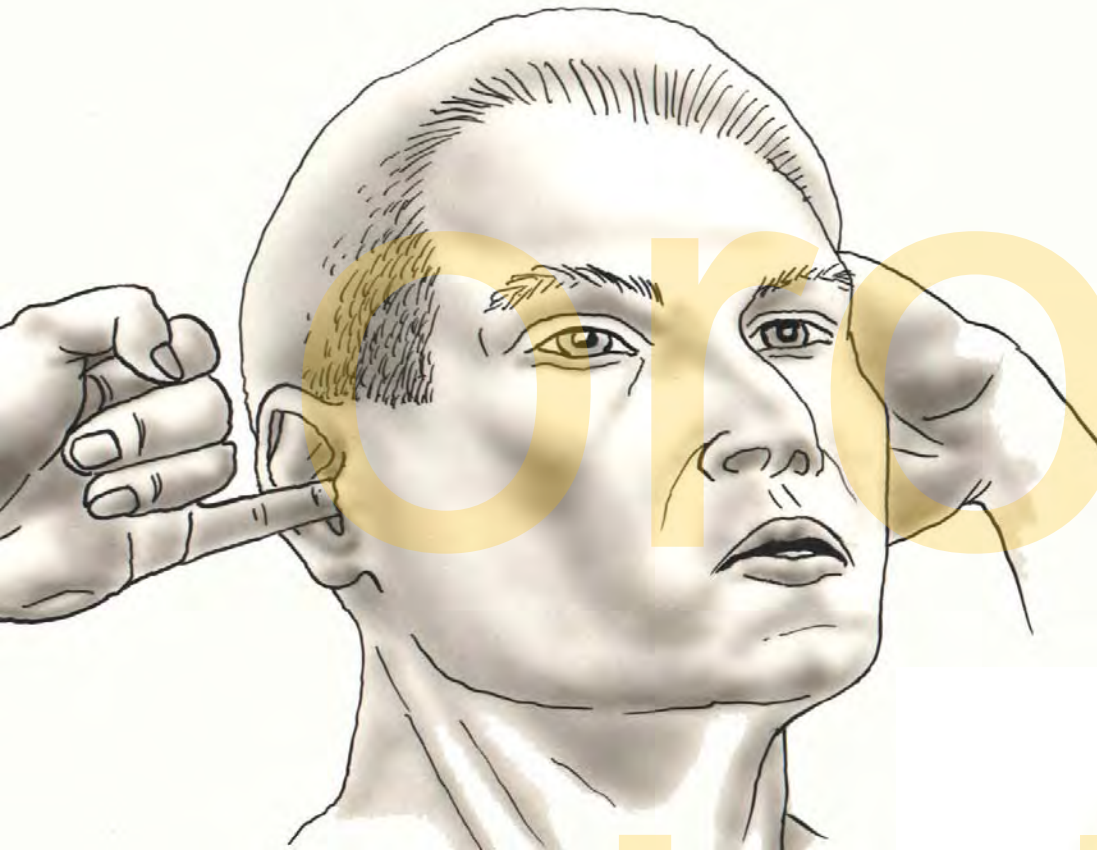
to TMJ:

n. auriculotemporalis

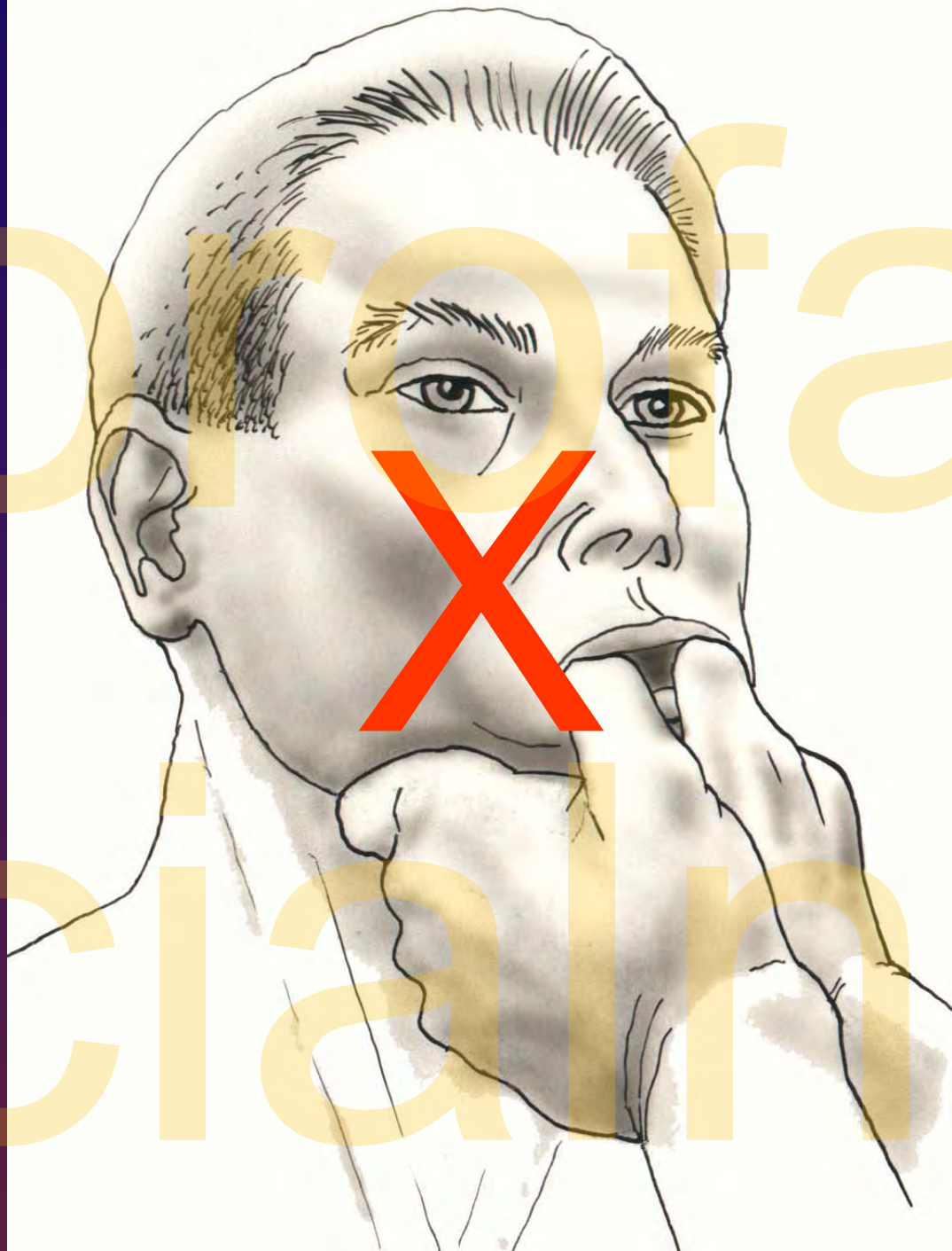
Chorda tympani

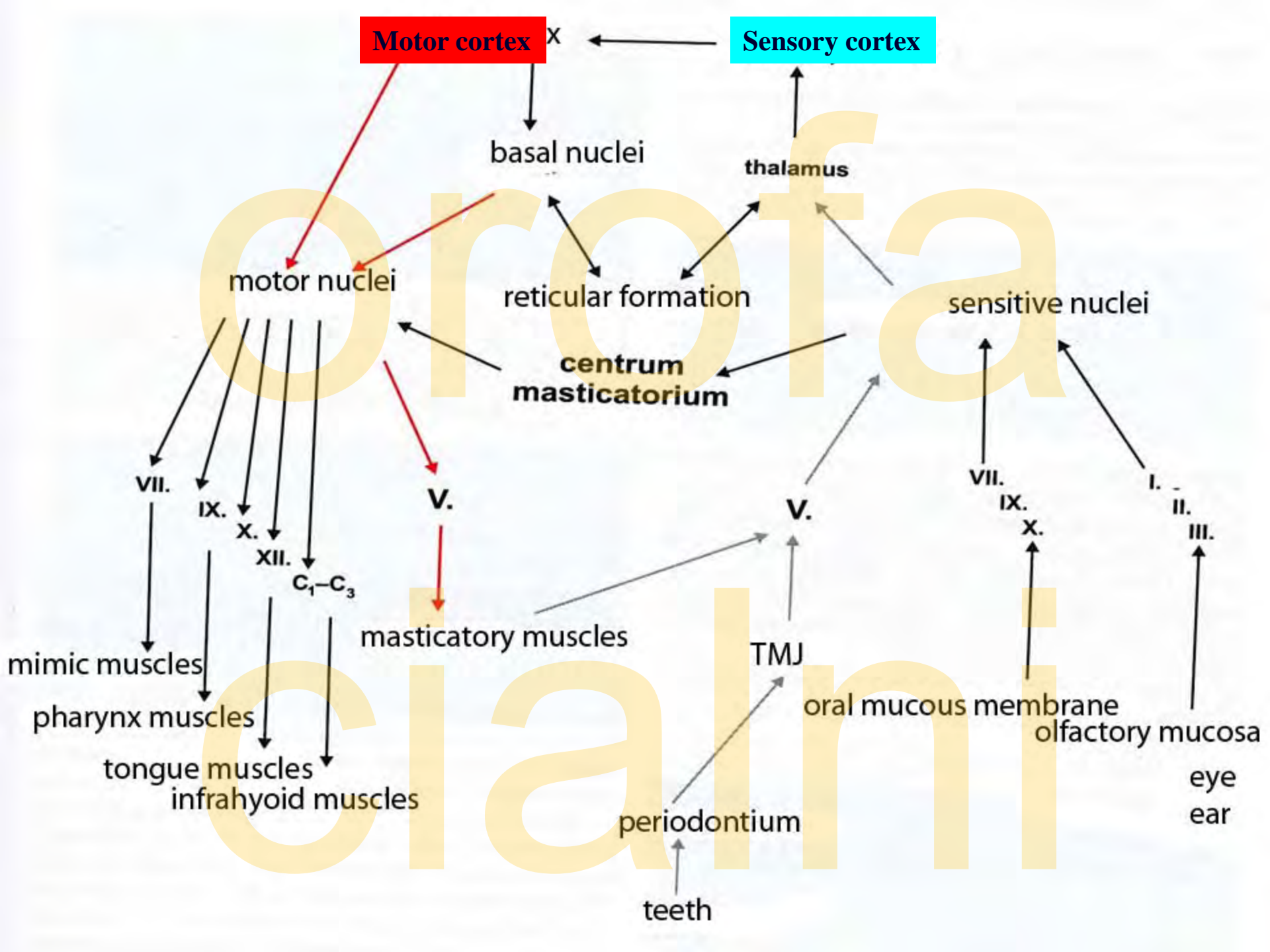


TMJ examination



Sites for palpation of temporomandibular joint and muscles of mastication (origin and insertion locations): 1. Lateral surface of mandibular condyle; 2. Posterior surface of mandibular condyle; 3. Masseter (origin); 4. Masseter (insertion); 5. Temporalis (anterior fibers that close mandible); 6. Temporalis (posterior fibers that retract mandible); 7. Medial pterygoid; 8. Lateral pterygoid (palpated intraorally)





Parodontium

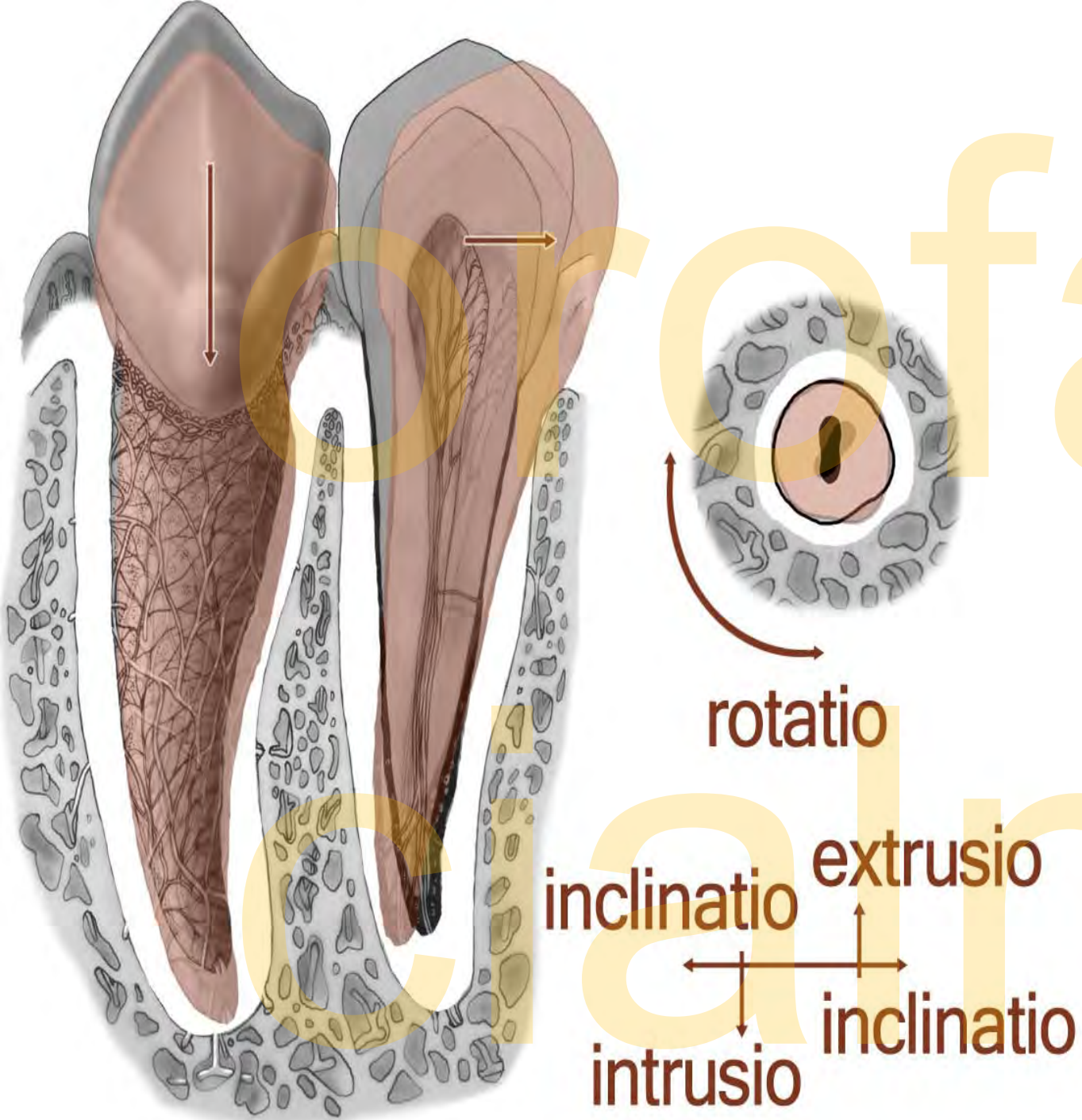
Clinical unit (cementum, corticalis,
periodontal ligg., gum)

Structure

and

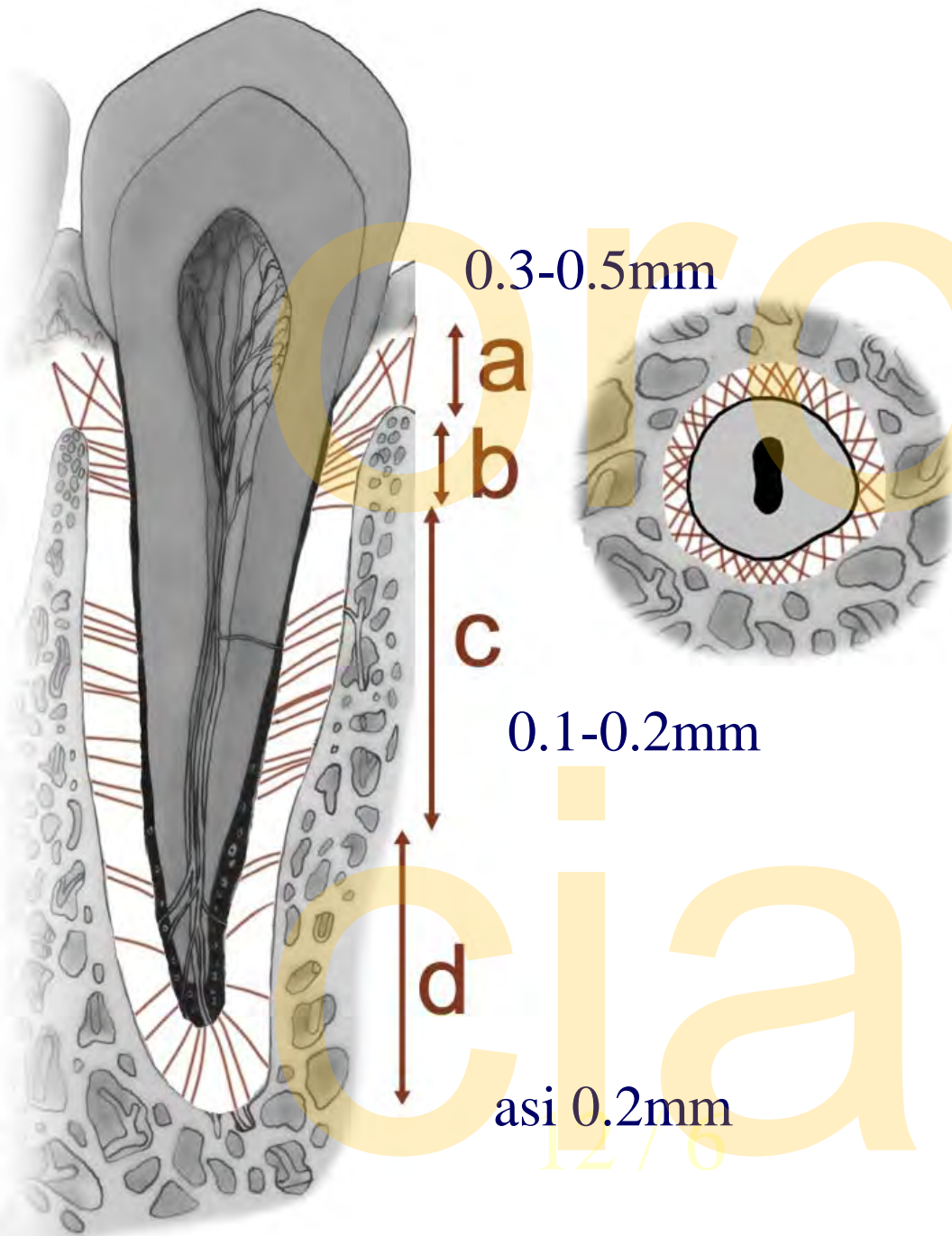
development

Its changes through eruption



Function of periodontium

Tooth fixation, elasticity, (hydroelastic cushion) nutrition, assistance during eruption



Interdental circumdental, dentoalveolar, intraalveolar ligaments

Arrangement of the intraalveolar ligaments

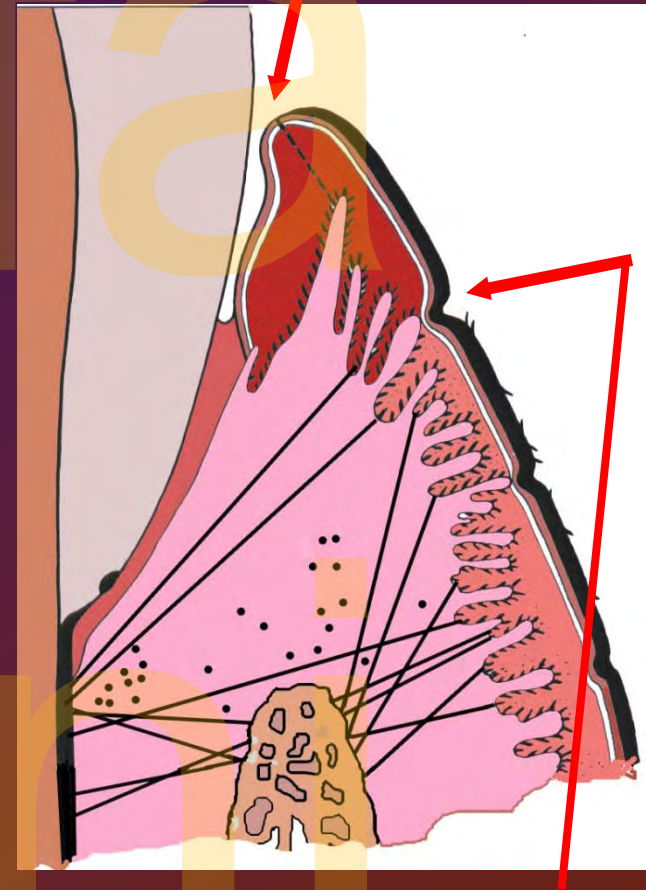
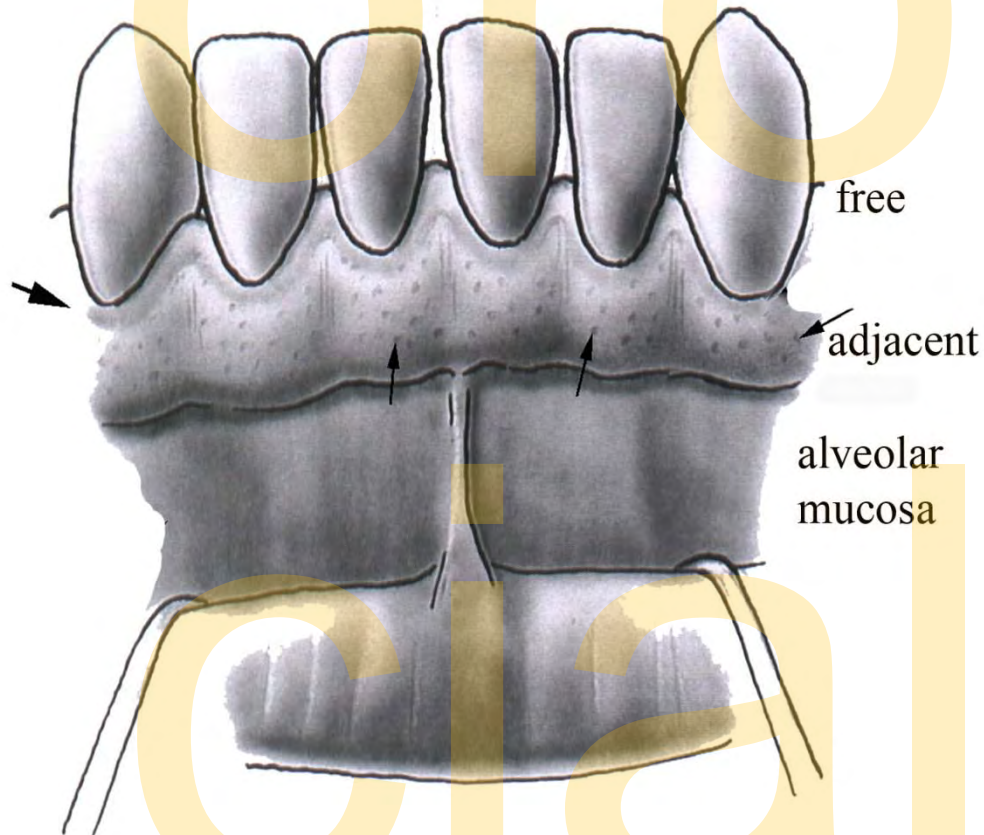
a - ligamenta marginalia, b - ligamenta dentalia superiora, c - ligamenta dentalia media, d - ligamenta dentalia inferiora (apicalia)



Gingiva = relation to the teeth

– “cuff (collar) attachment“

Gingival sulcus (pocket) Sulcus gingivae



Free: Interdental; embrasured; circumdental
Attached: Adjacent, fixed

Free gingival groove
Paramarginal sulcus

Interdental papillae



Fig. 14.50 Demineralised section showing the interdental gingiva (A) between two cheek teeth in the anteroposterior plane. B = Alveolar crest; C = transeptal group of gingival fibres; (H & E; $\times 20$).

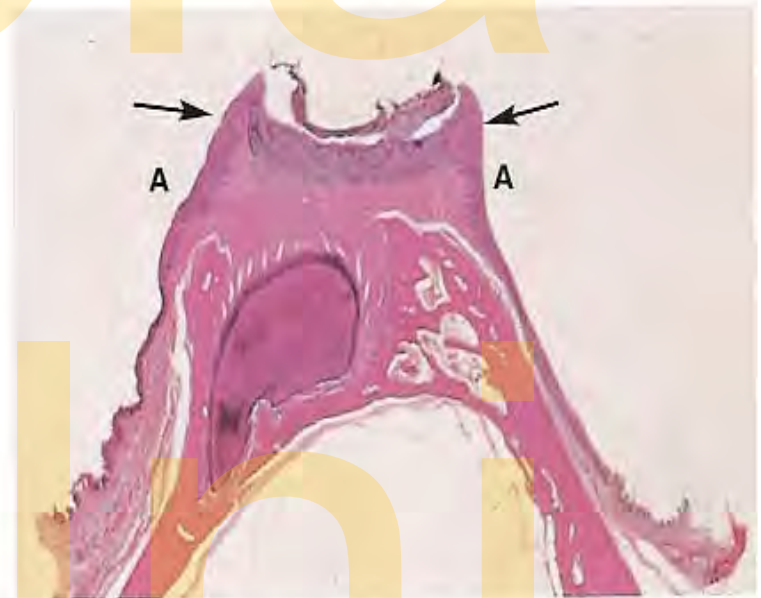
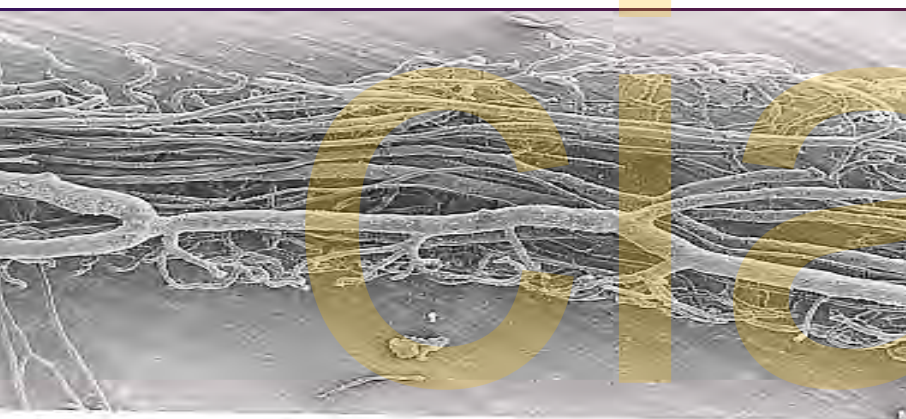


Fig. 14.51 Demineralised section of the interdental papilla cut in the buccolingual plane between two cheek teeth showing the 'interdental col'. The buccal and lingual margins (arrows) of the attached gingiva externally (A) are raised above the central concavity of the col, whose margin passes below the contact points of the teeth (H & E; $\times 4$).



SEM of a vascular cast showing a venous-venous anastomosis ($\times 160$). Courtesy of Doctors Y. Kishi and K. Takai



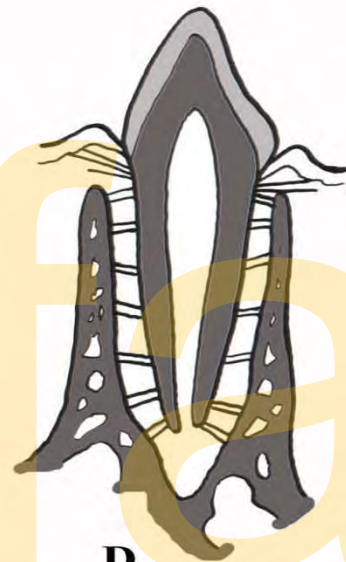
A



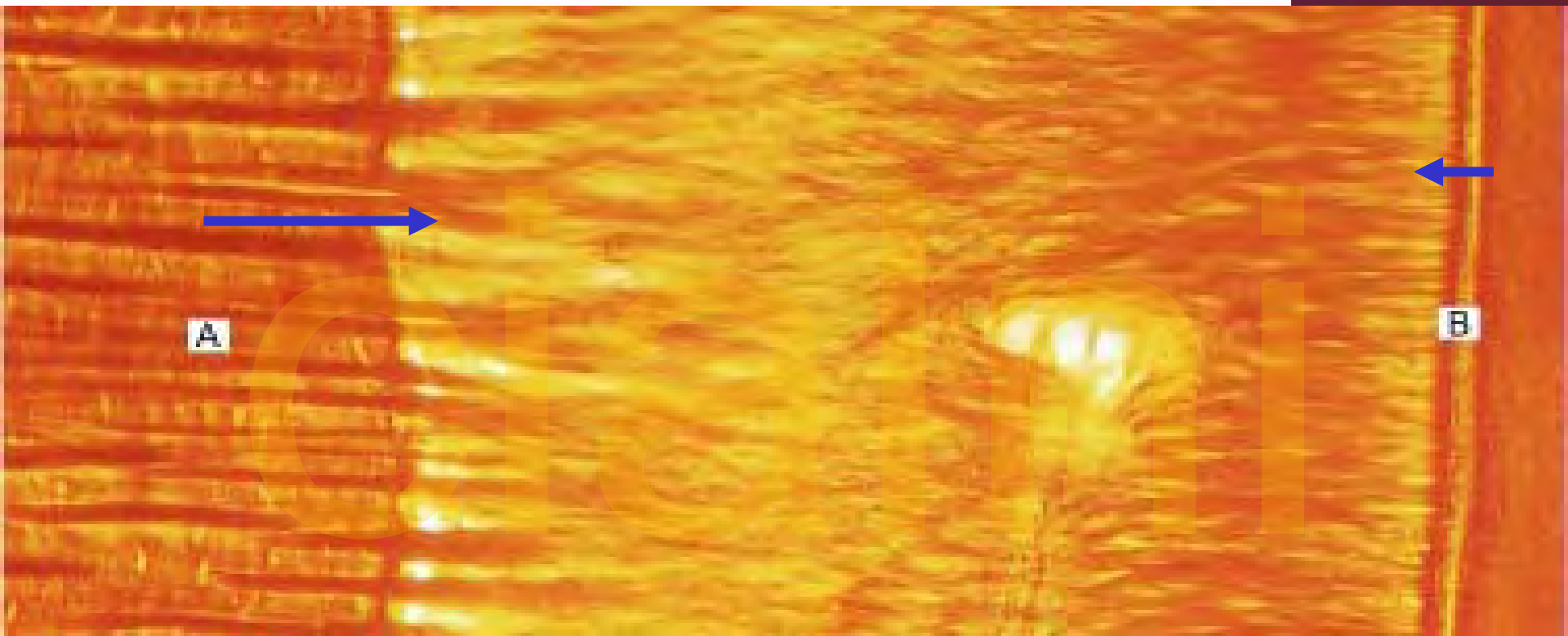
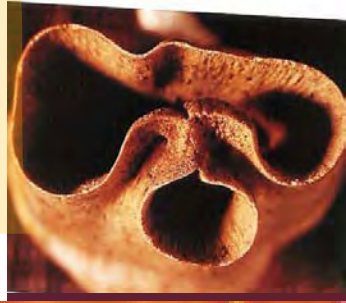
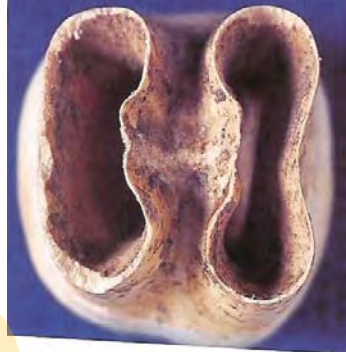
B



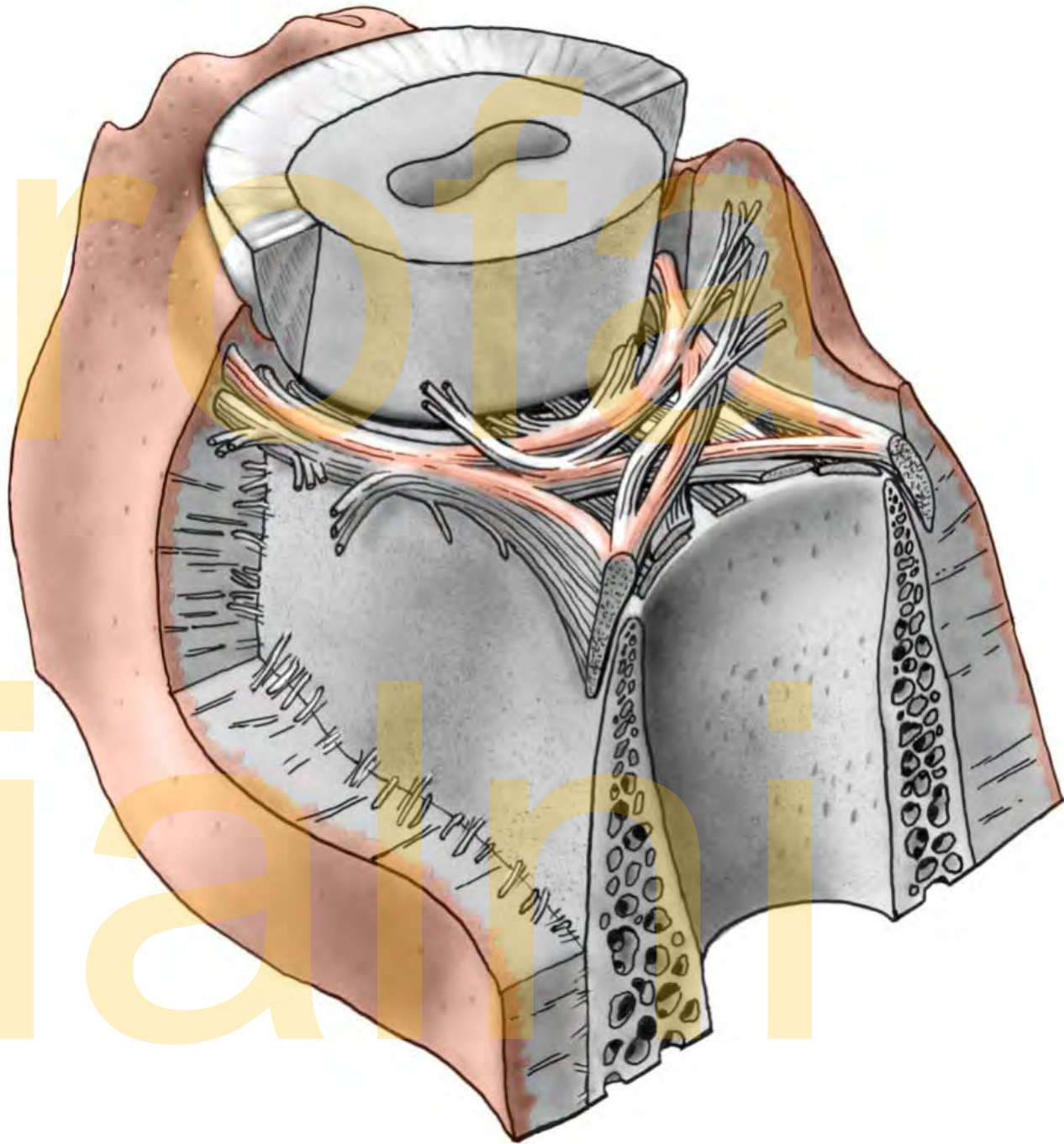
C



D



Ligamentous slings and circles help to tight attachment between gingiva and tooth



Epithelial Malassez' islets (remnants of Hertwig's sheet)

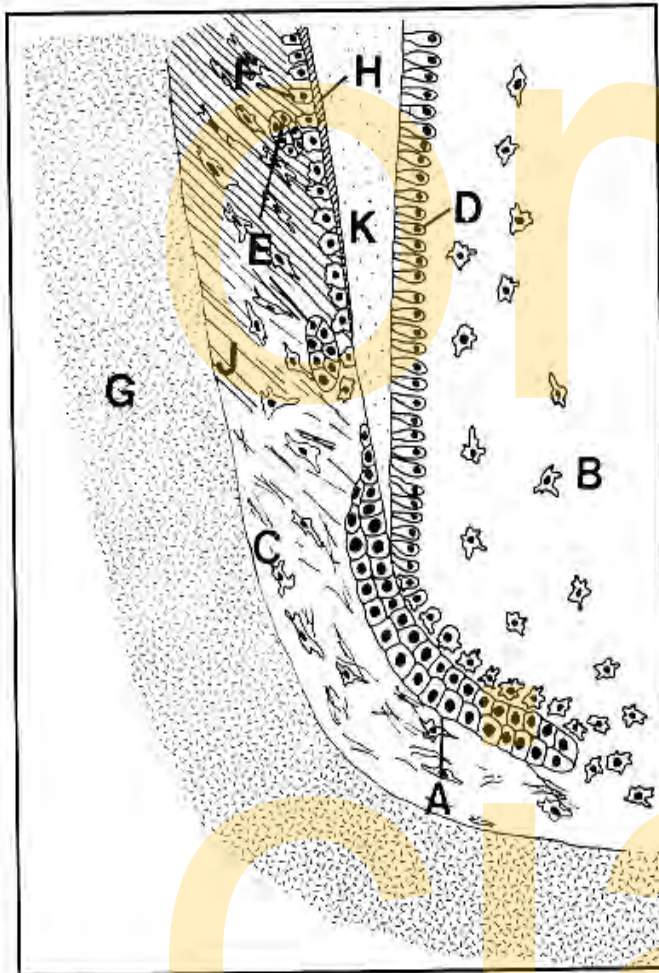
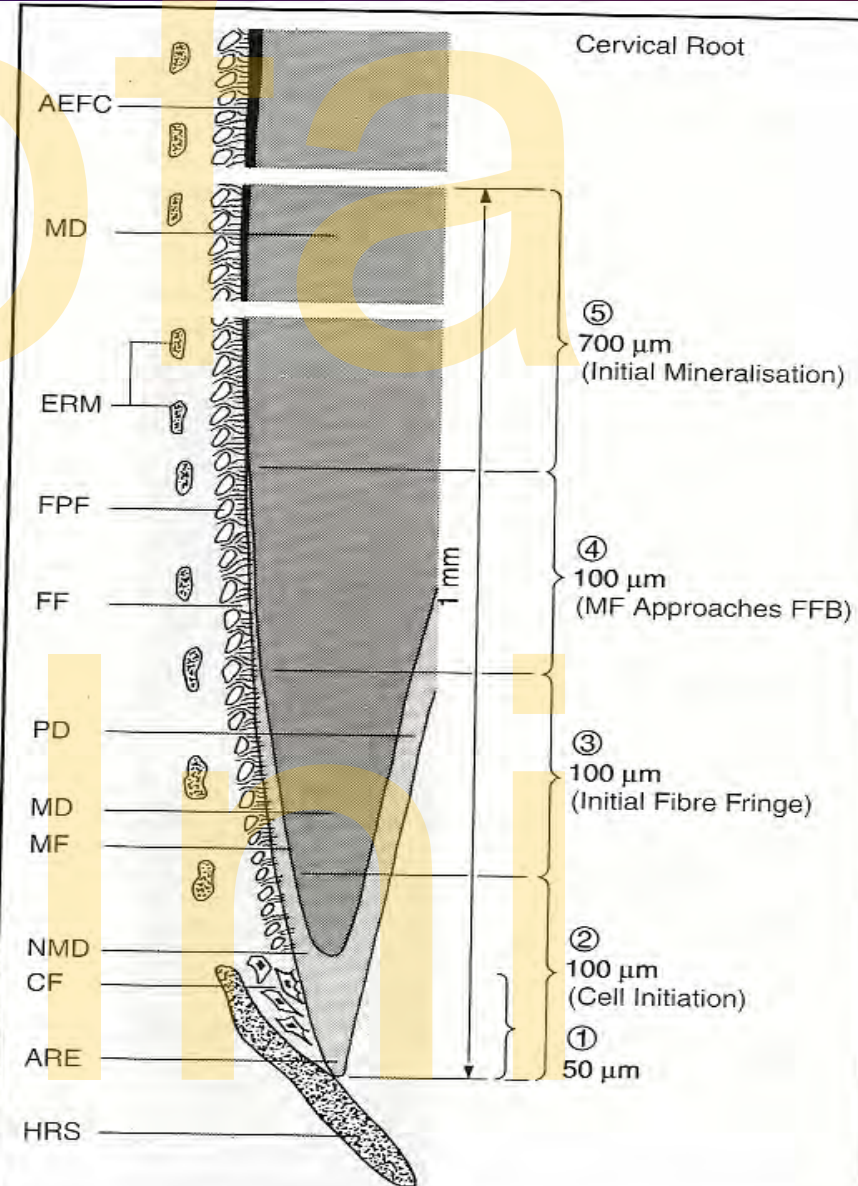
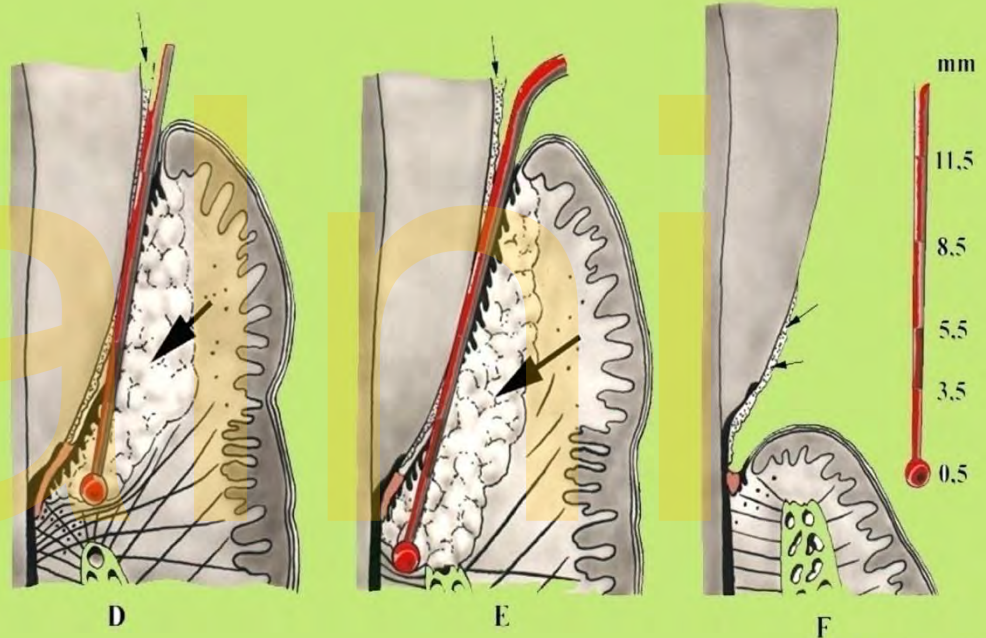
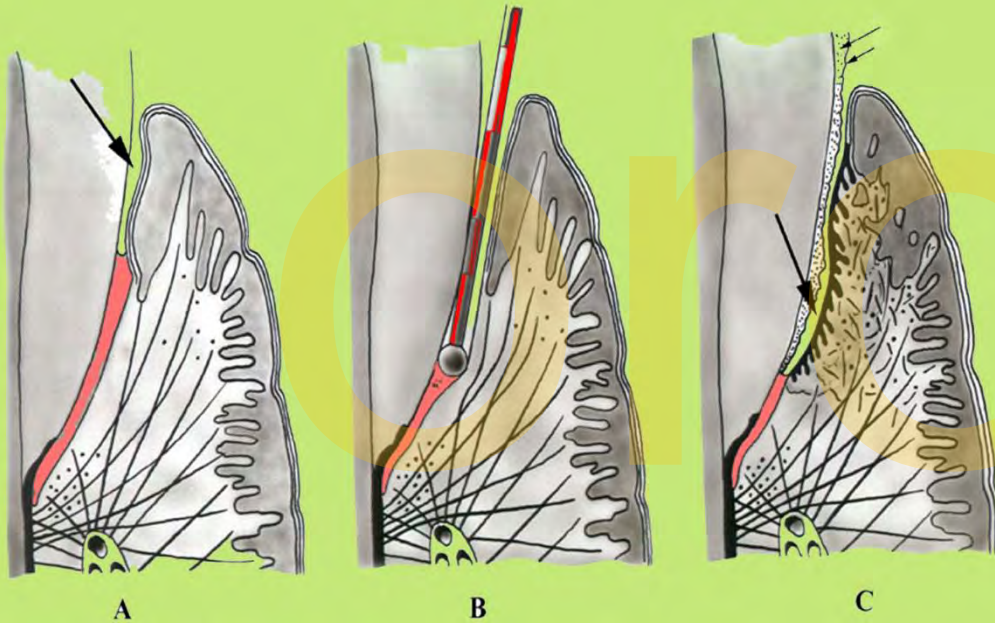


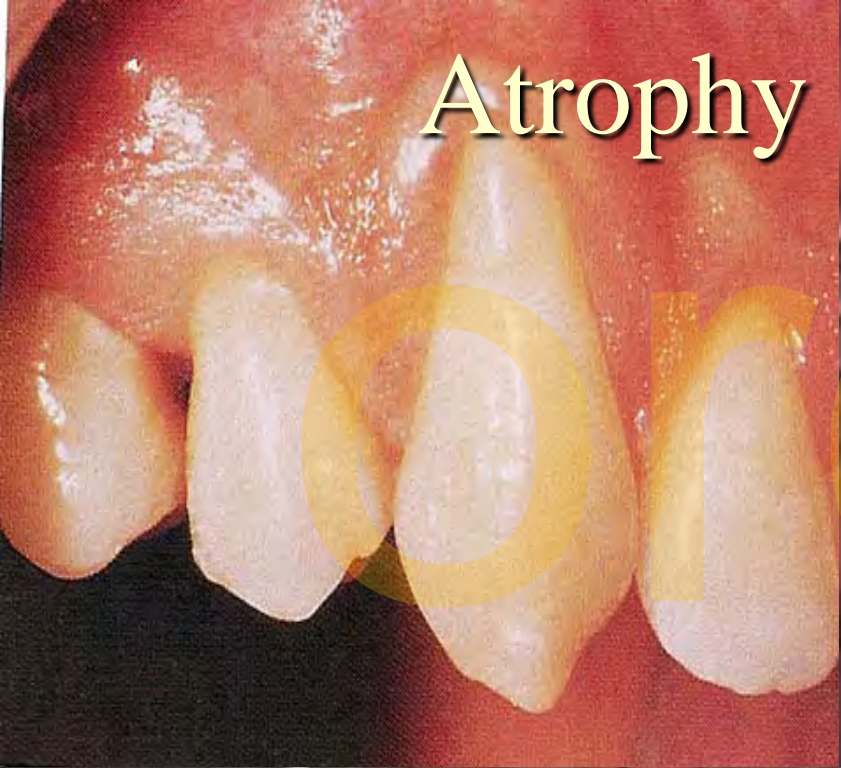
Fig. 25.4 Schematic drawing of the developing root. A = Epithelial root sheath; B = dental papilla; C = dental follicle; D = odontoblasts; E = epithelial rests; F = cementoblasts; G = developing alveolar bone; H = developing cementum; J = developing periodontal ligament; K = root dentine.



Free gingival groove changes into periodontal pocket



Atrophy of the gingiva

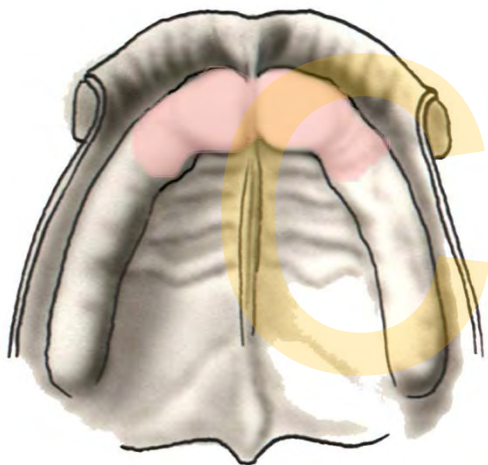


Supragingival and infragingival calculi



Juvenile
gingiva

“Sucking
pillow”



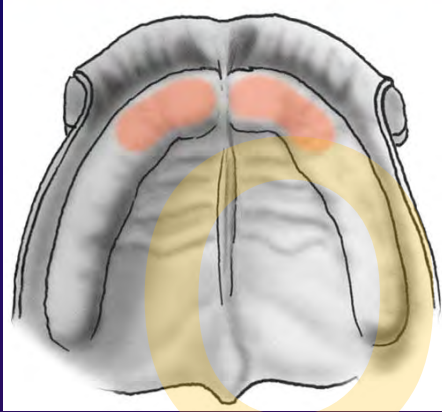
Orofa

Hard palate

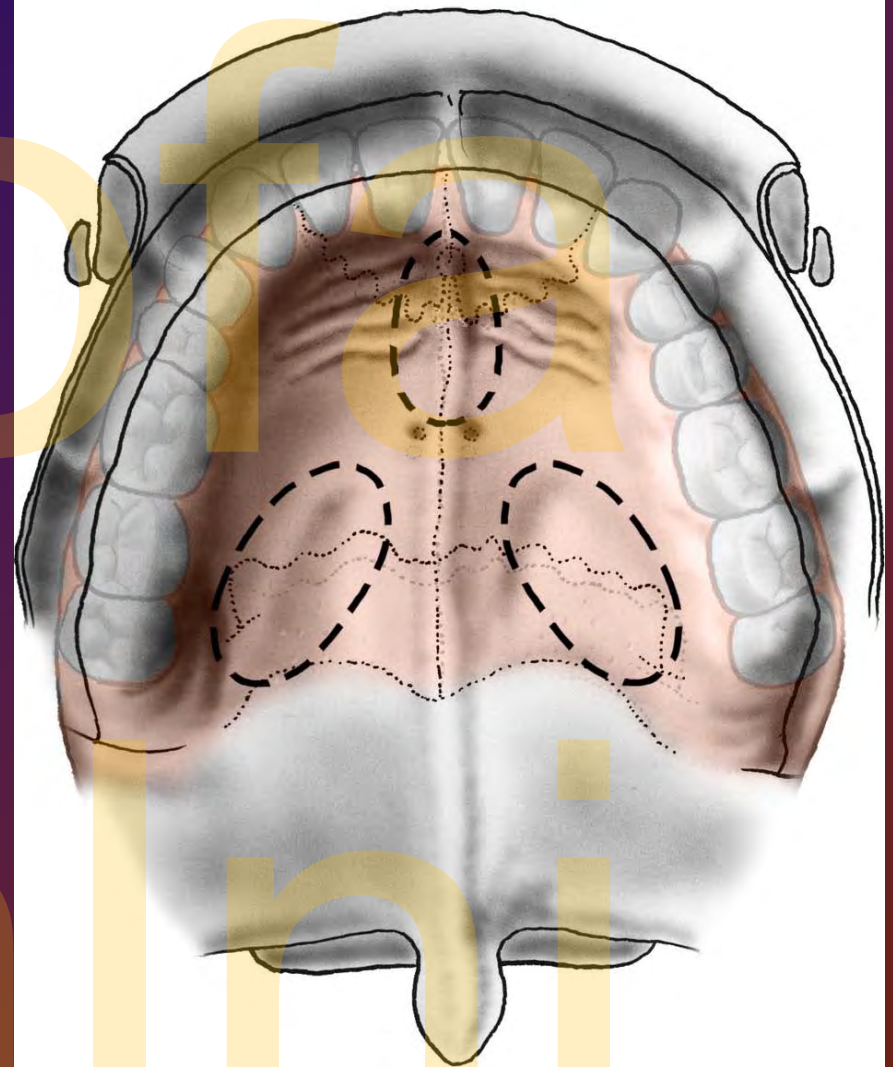
Soft palate

cialini

Newborn palate



Senile palate



Palate – surface features



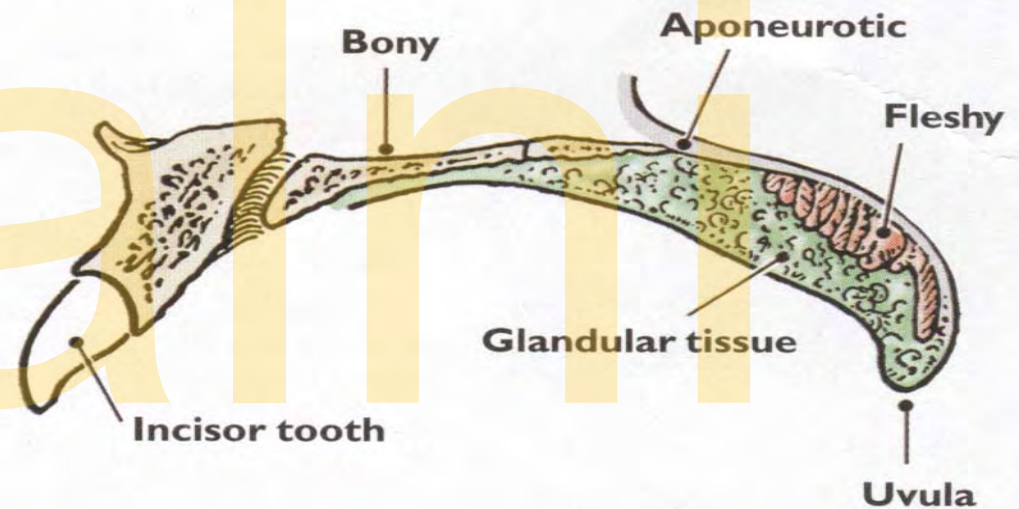
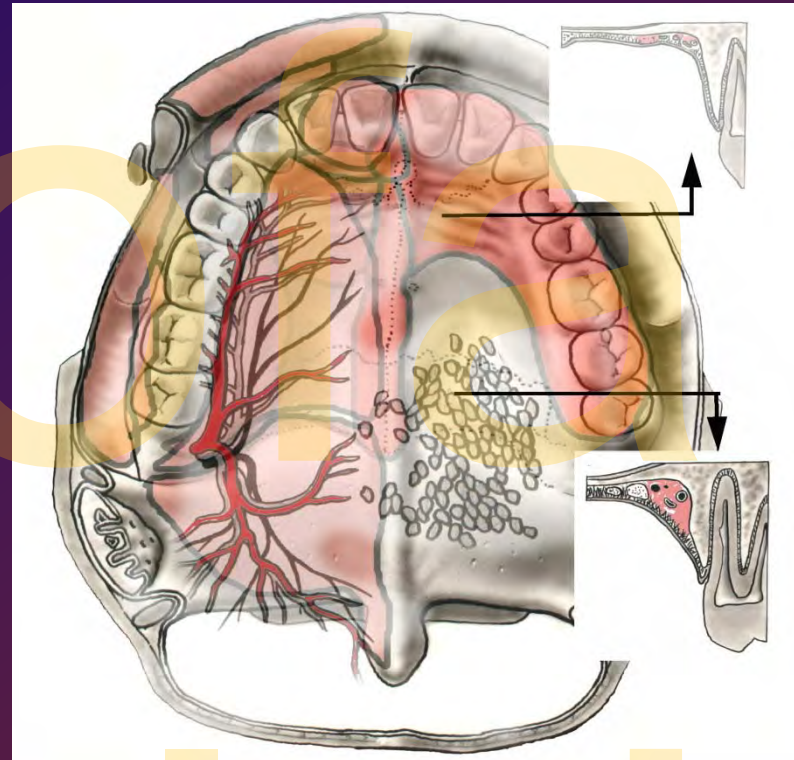
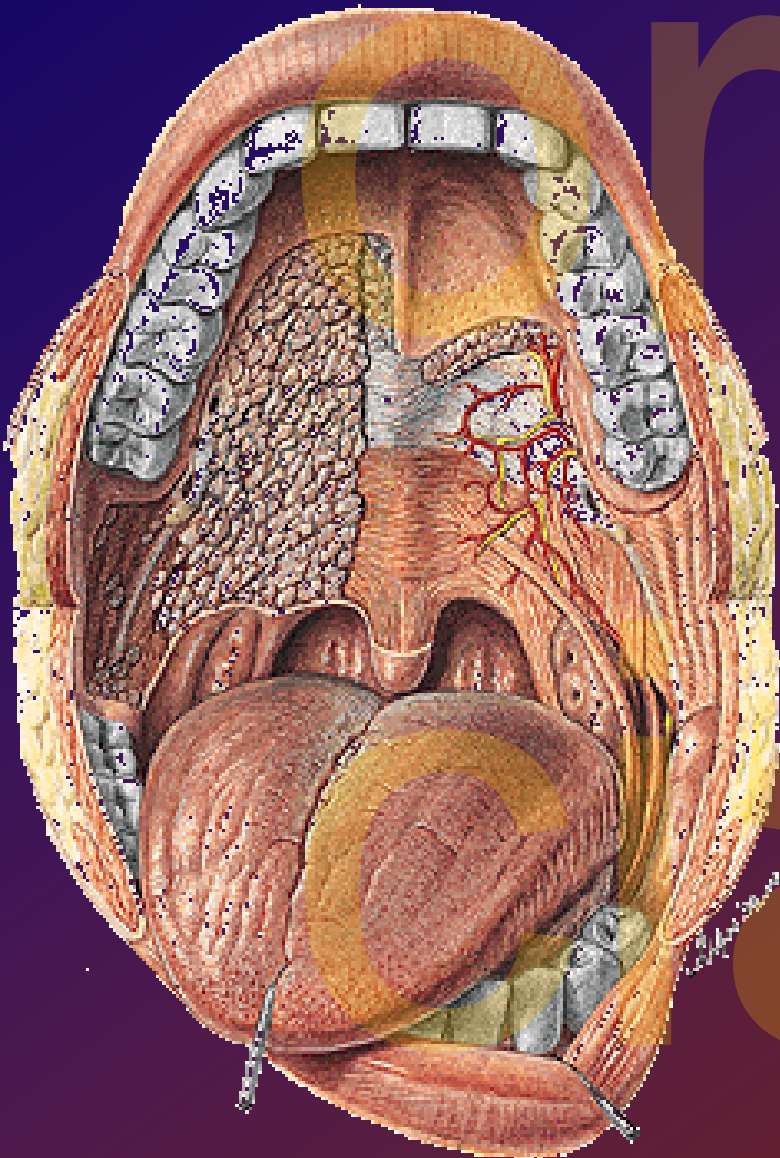
Incisive papilla

Palatine rugae

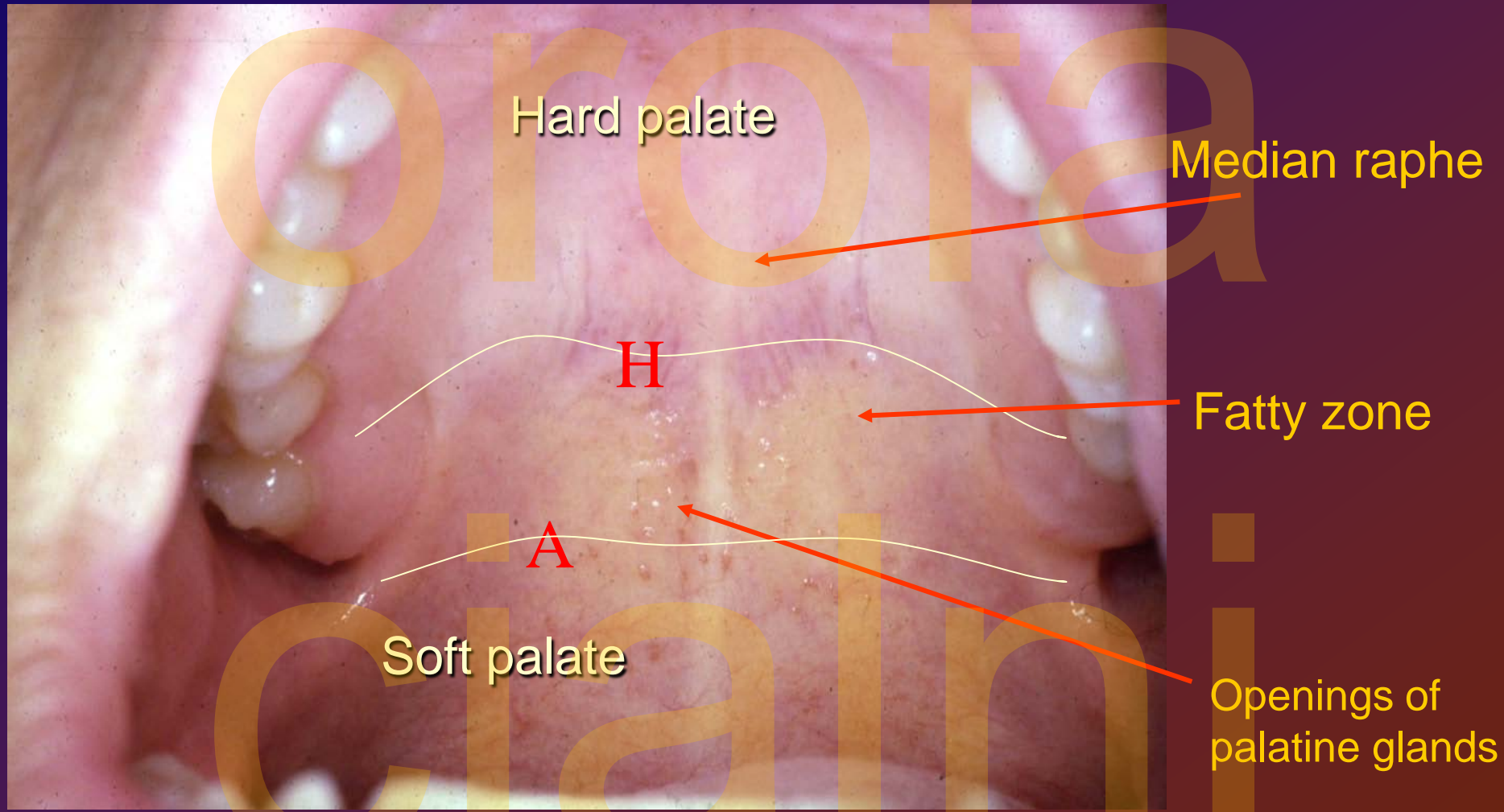
Median raphe

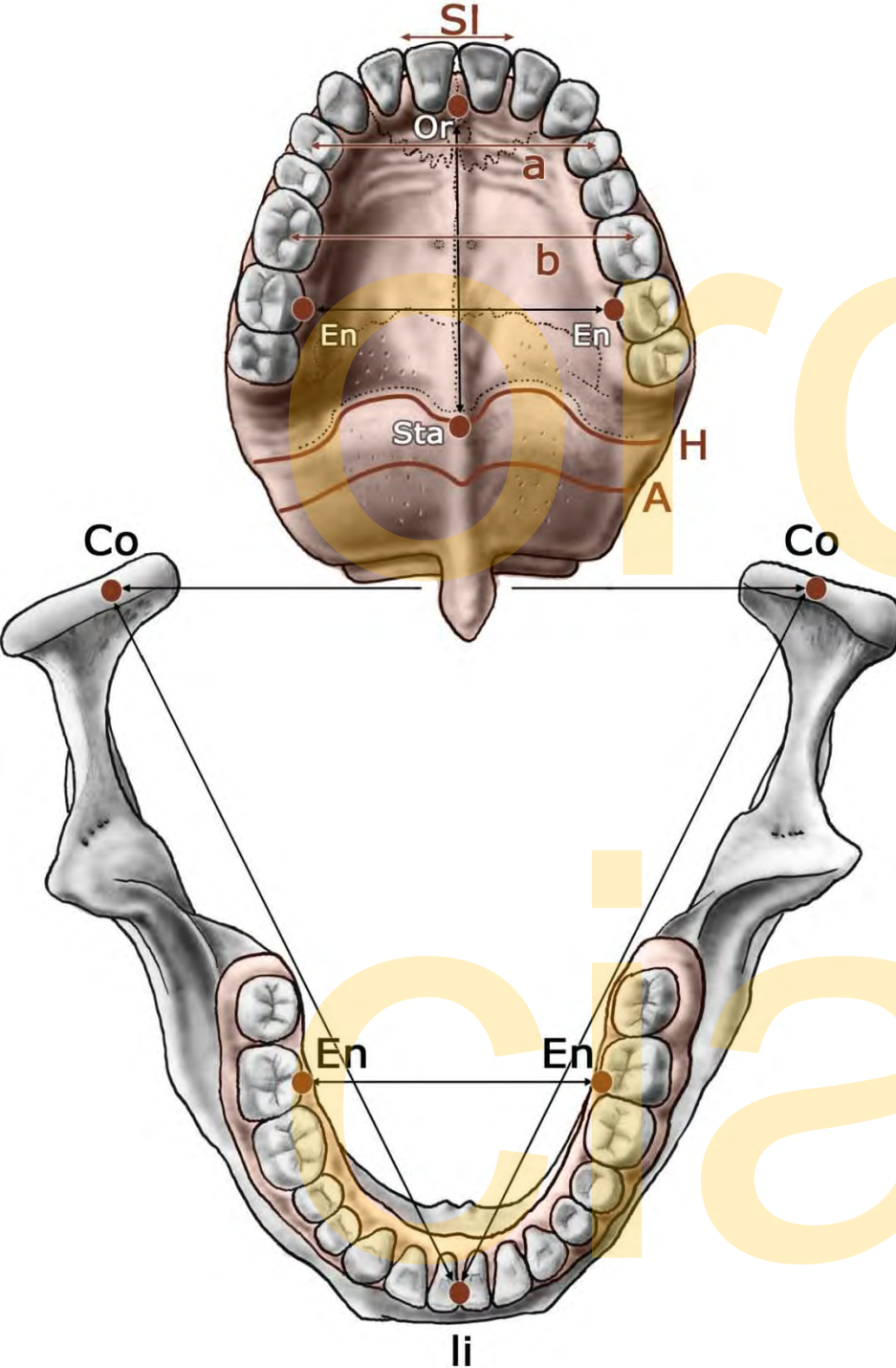


Palatal relief with rugae, foveolae and incisal papila



Palate – surface features





Distances and lines in palate and lower jaw.

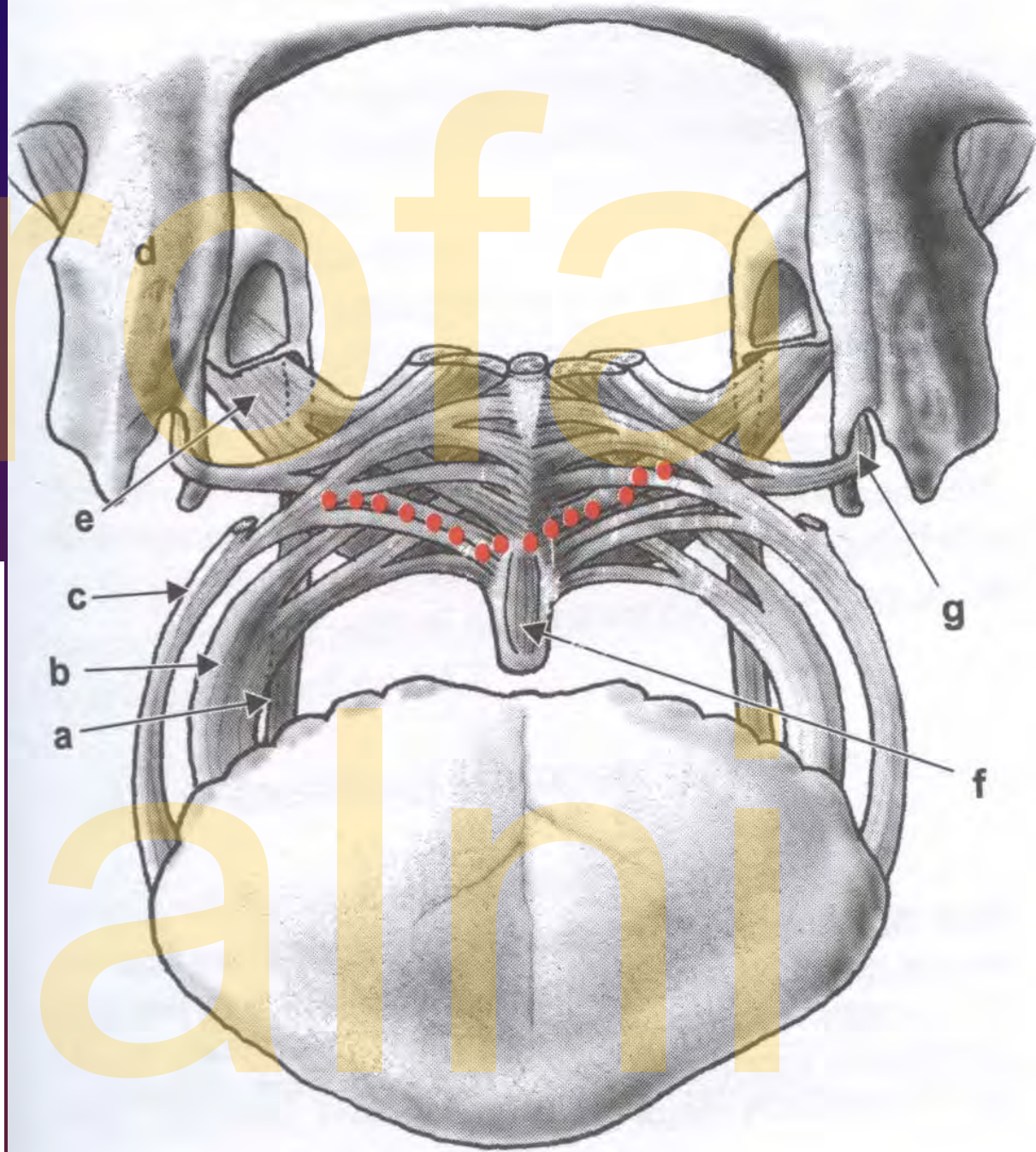
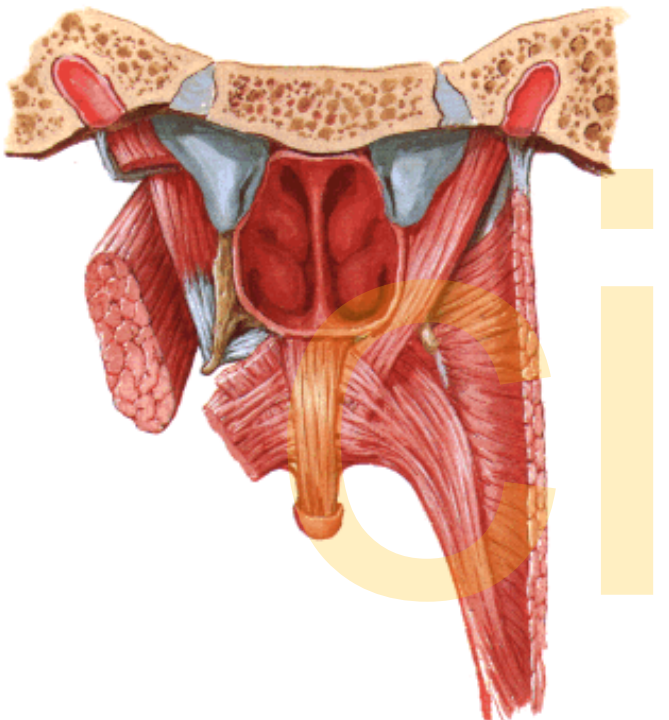
SI – summa incisivorum.

H – linie H (line between bone and palate, A – linie A (line between movable and relative stable part of soft palate), a – distance between premolars, b – distance between fissures of permanent molars, En-En – palate width, Or-Sta – palate length, Co-Ii-Co-Co – Bonwill's triangle, Co – condylion, En – endomolare, Ii – incisale inferius, Or – orale, Sta – staphylion.

Soft palate

– ventral view

– dorsal view

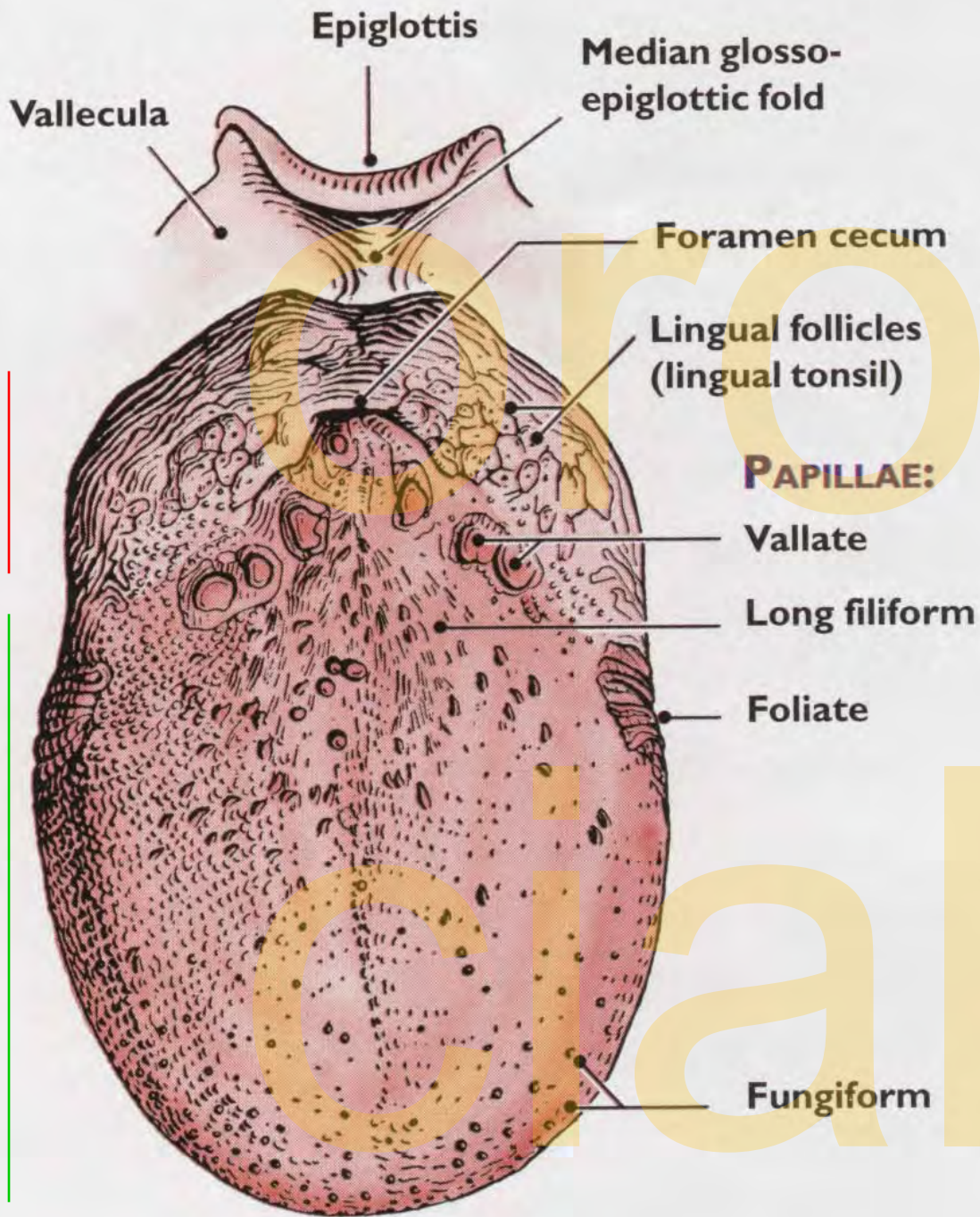


Orofa

Tongue

(Lingua
Glossa)

cialni



Lingua, tongue, glossa

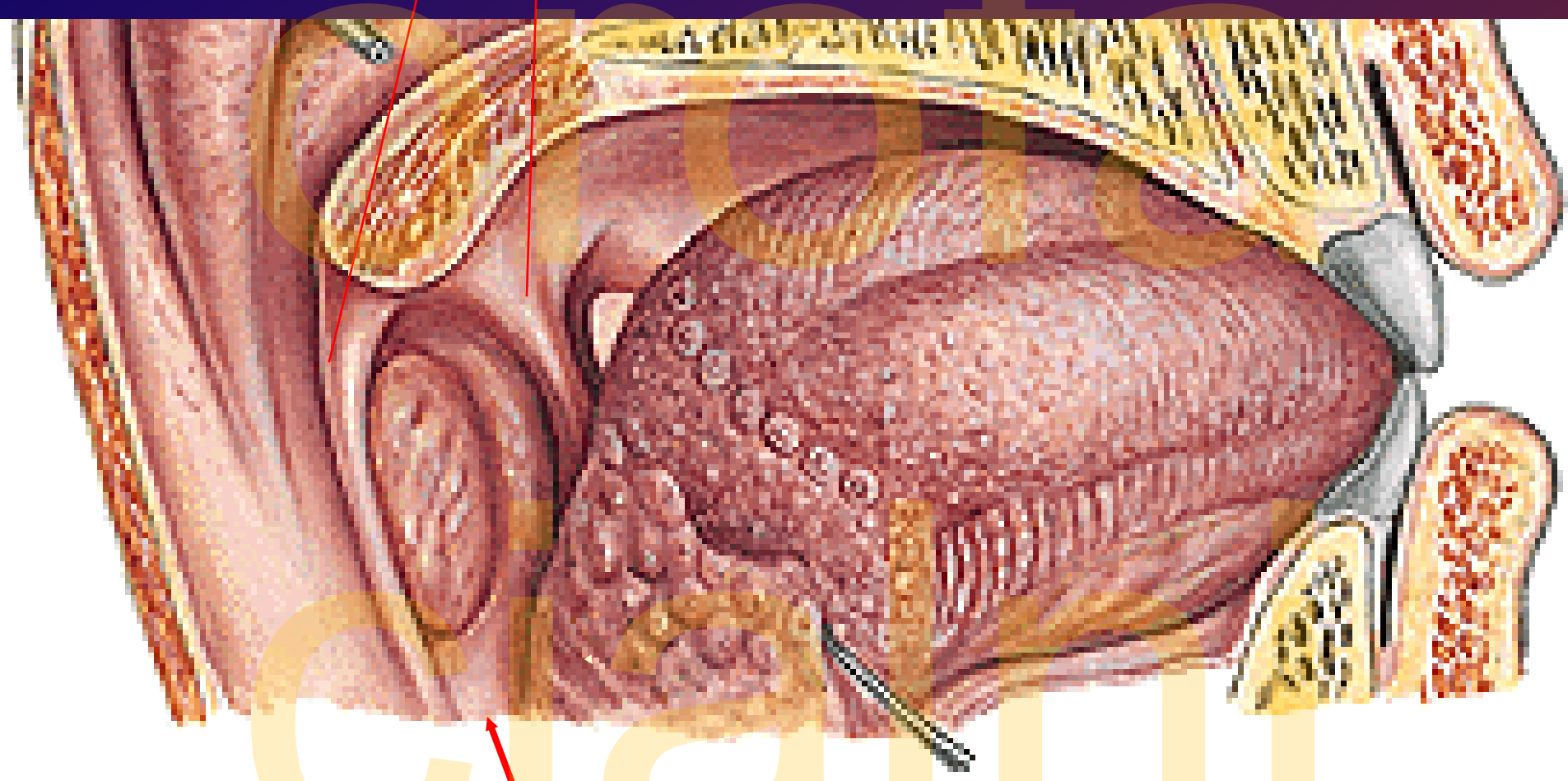
Mobile musculoepithelial organ;
Located in the oral cavity and pharynx

Mastication,
Deglutition,
Speech

Squeezing food into pharynx during swallowing;
Forming words during speaking

Palatoglossal arch

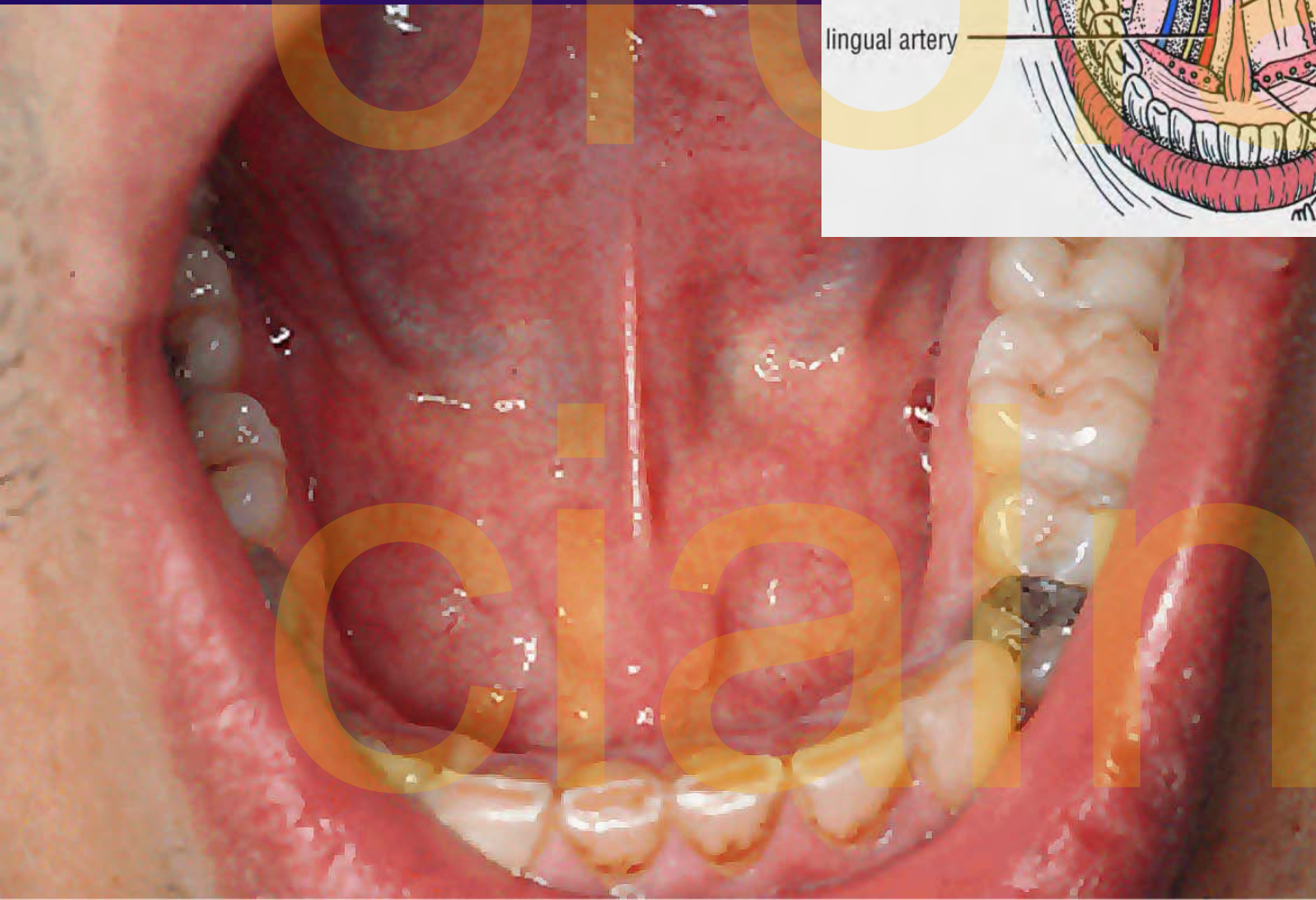
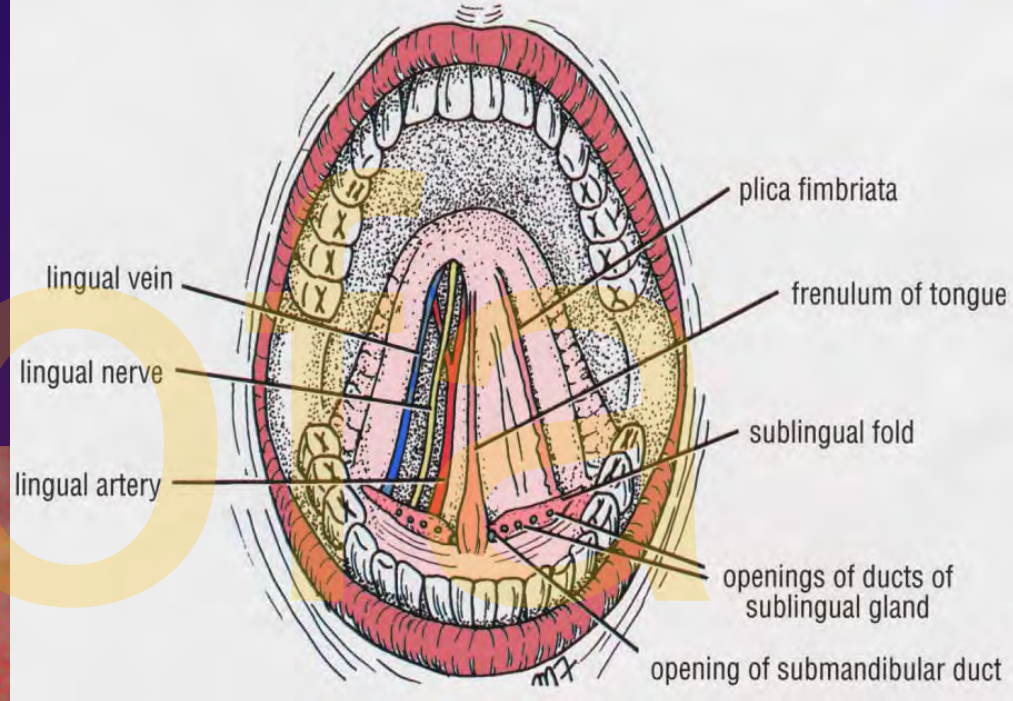
Palatopharyngeal arch



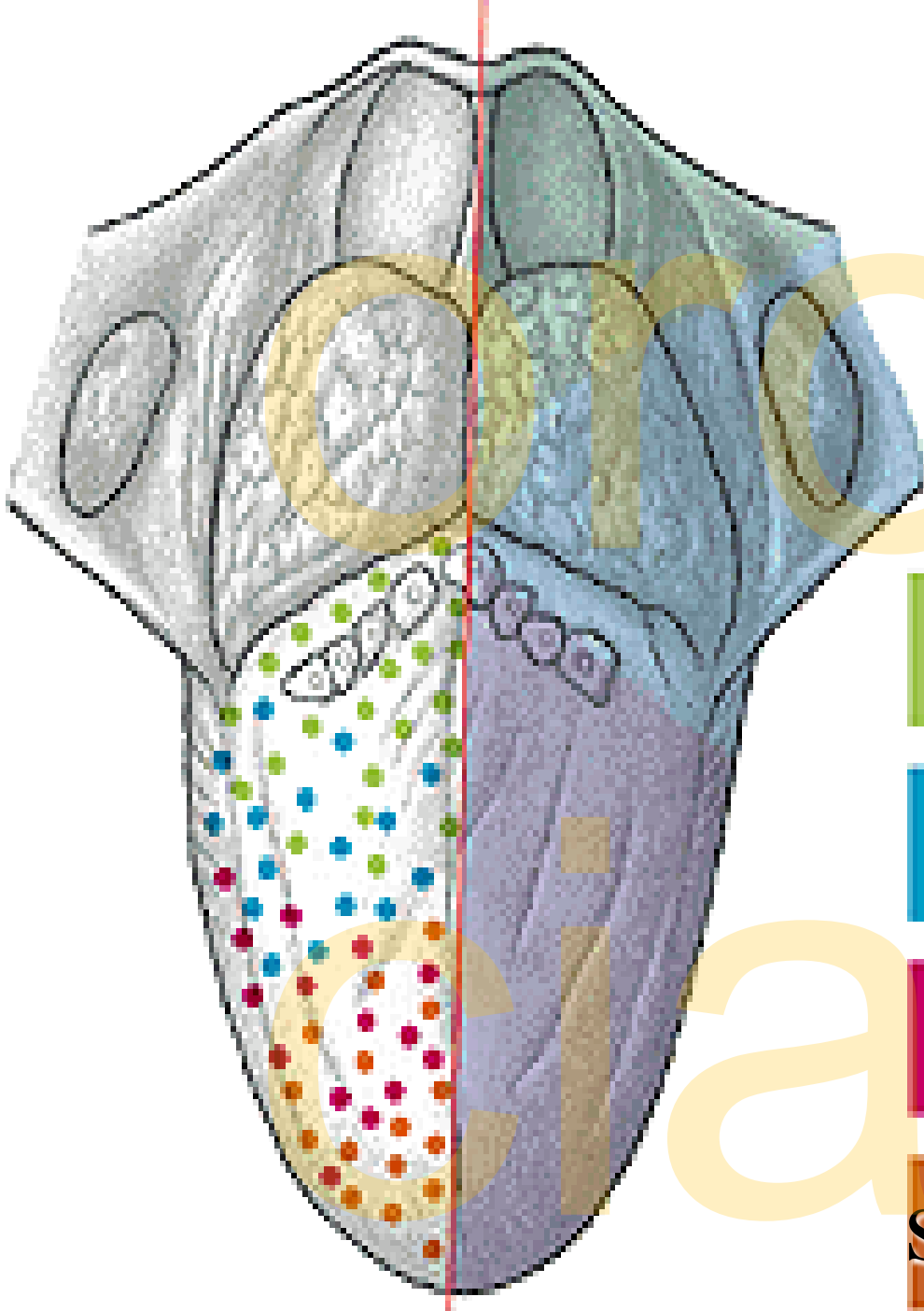
Triangular fold (plica) (there is r. tonsillaris)

Floor of the oral cavity

lingual frenulum,
sublingual folds,
carunculae



Paralingual
canal =
between
hyoglossus
and
genioglossus

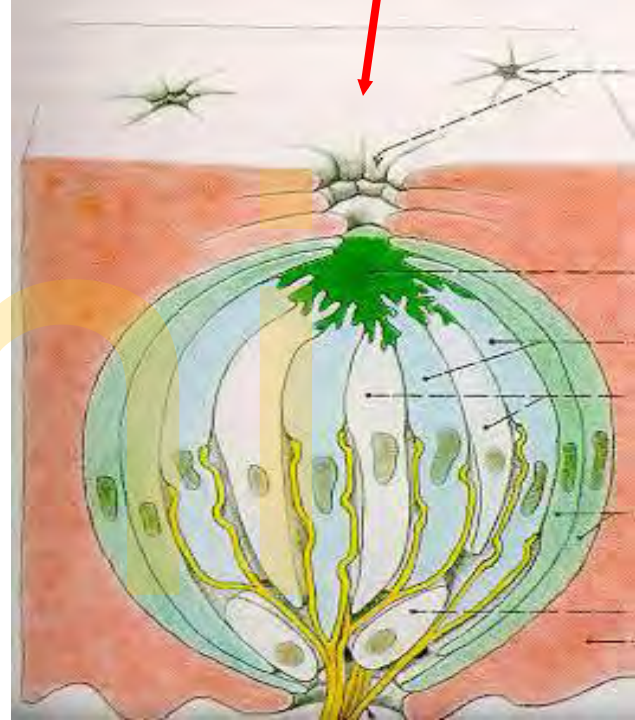
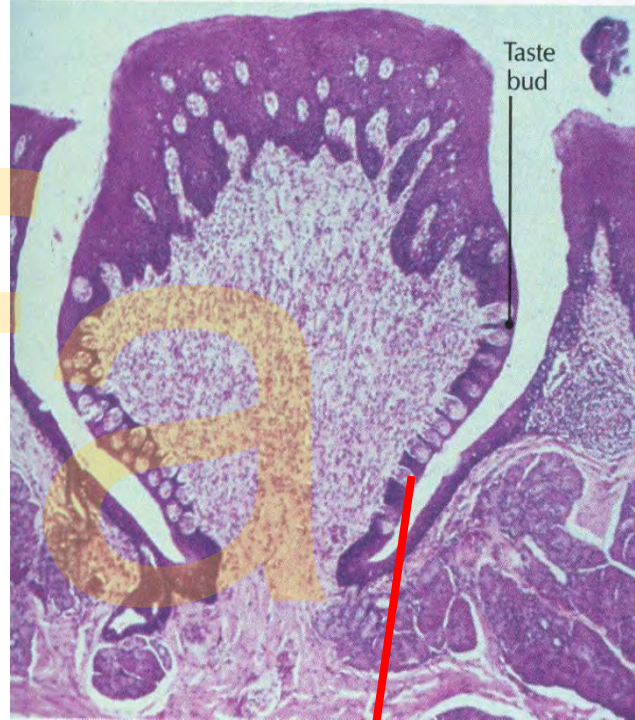


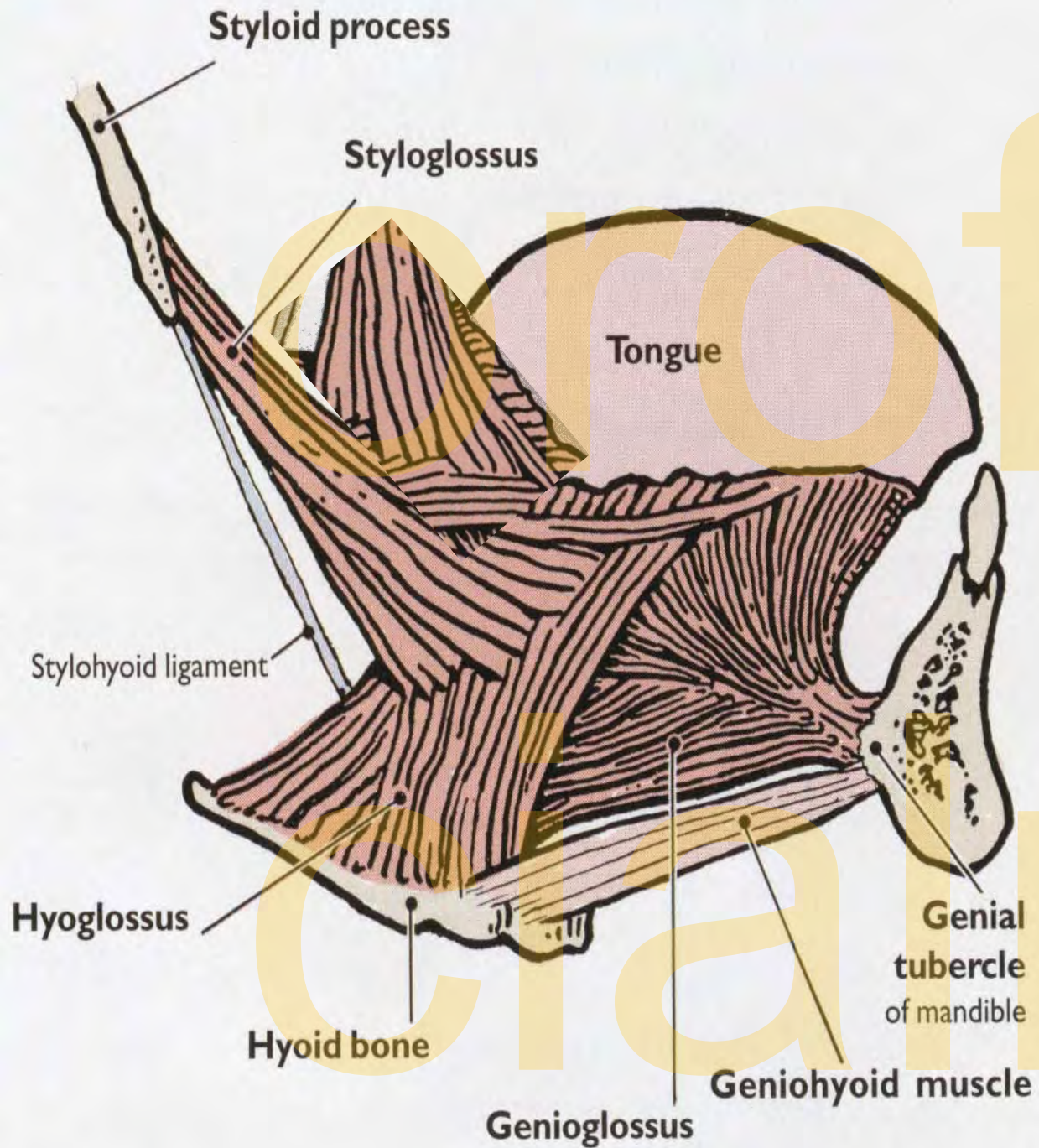
bitter

sour

salty

sweet





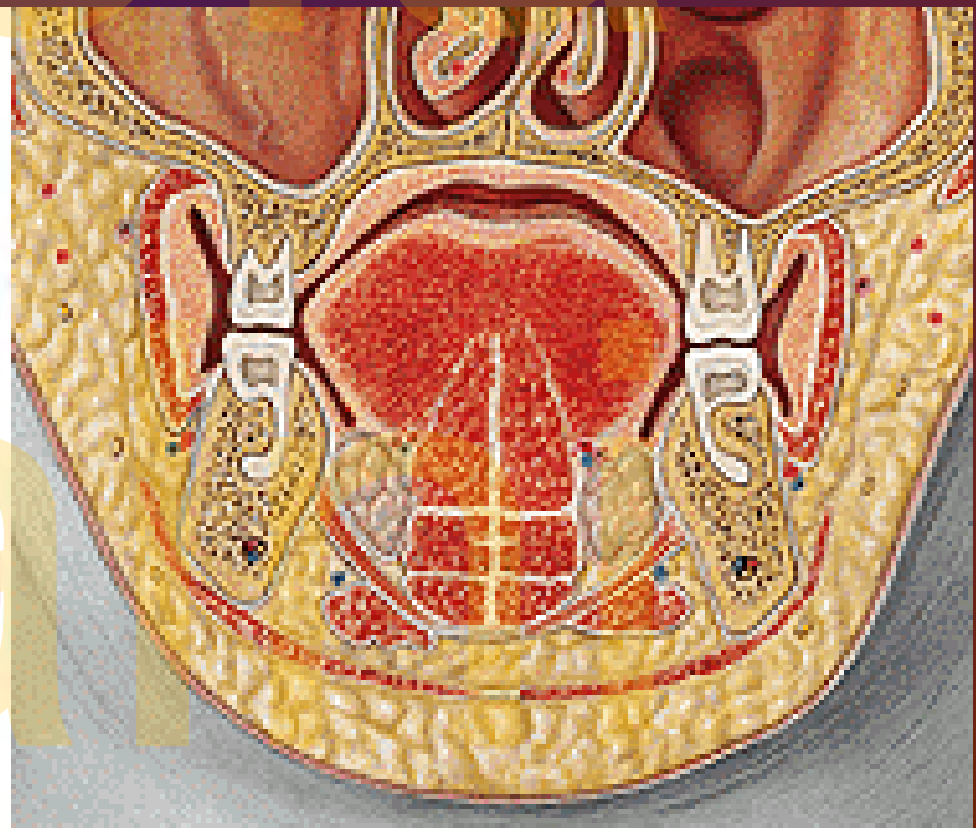
Extrinsic
lingual
muscles
 alter the
 position of
 the tongue

- Styloglossus
- Palatoglossus
- Hyoglossus
- Genioglossus

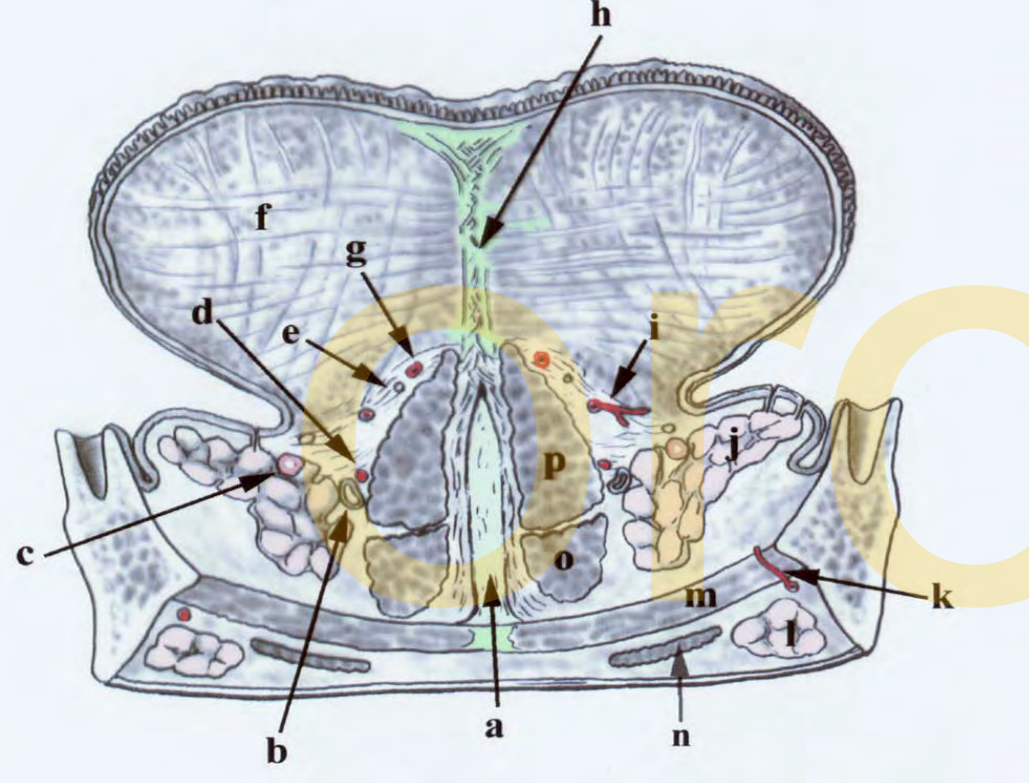
Intrinsic lingual muscles

alter lingual shape

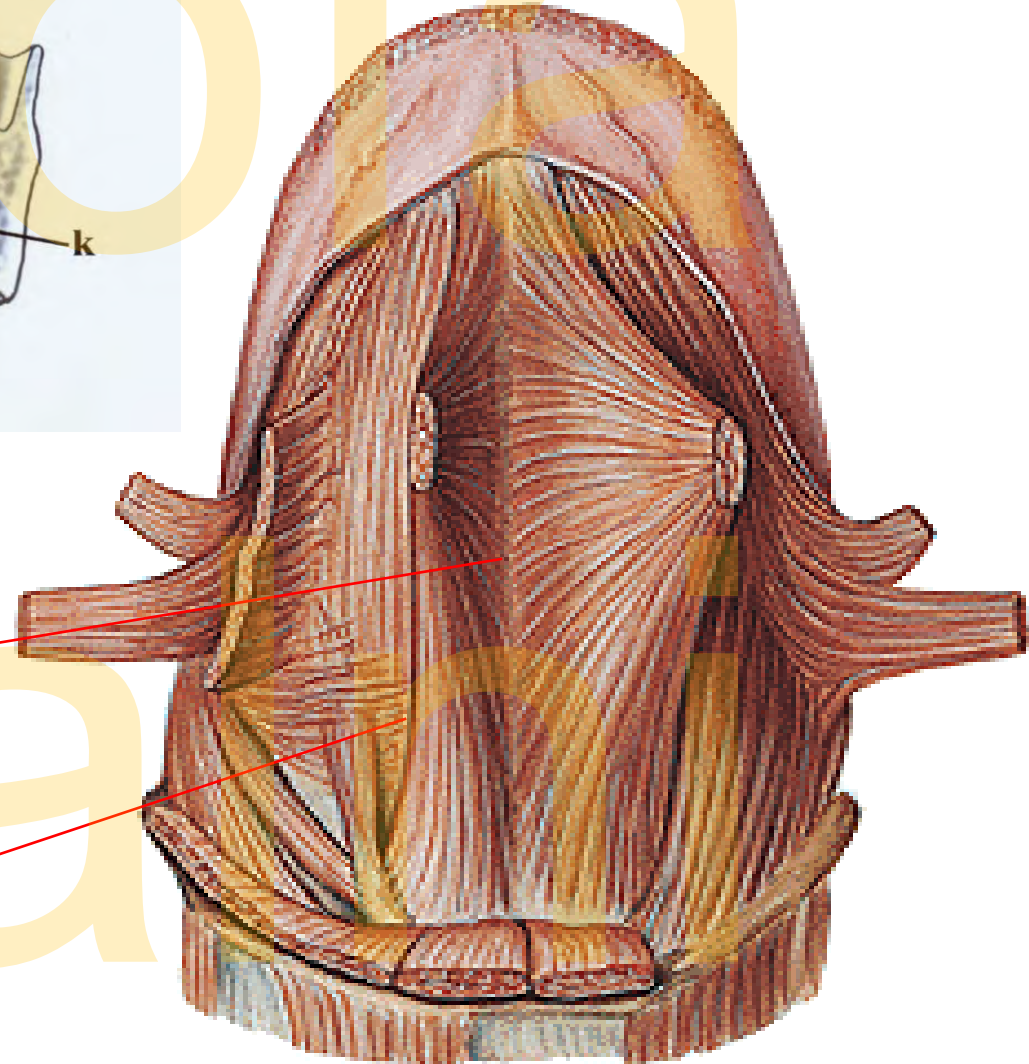
Superior and inferior longitudinal,
transverse, vertical muscles



Lingual septum can be defibered; after this abscess cavity appears

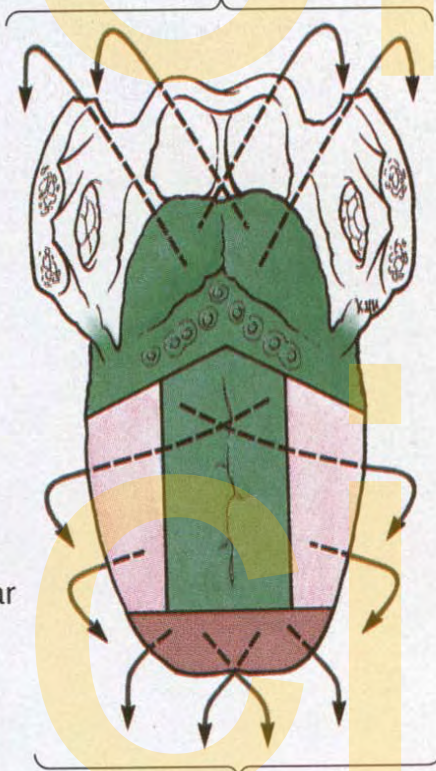


Musculi genioglossi are separated by the **lingual septum**. Between hyoglossus and genioglossus muscles there is **lingual canal**.



Tongue lymph outflow

To superior deep cervical lymph nodes



To inferior deep cervical lymph nodes

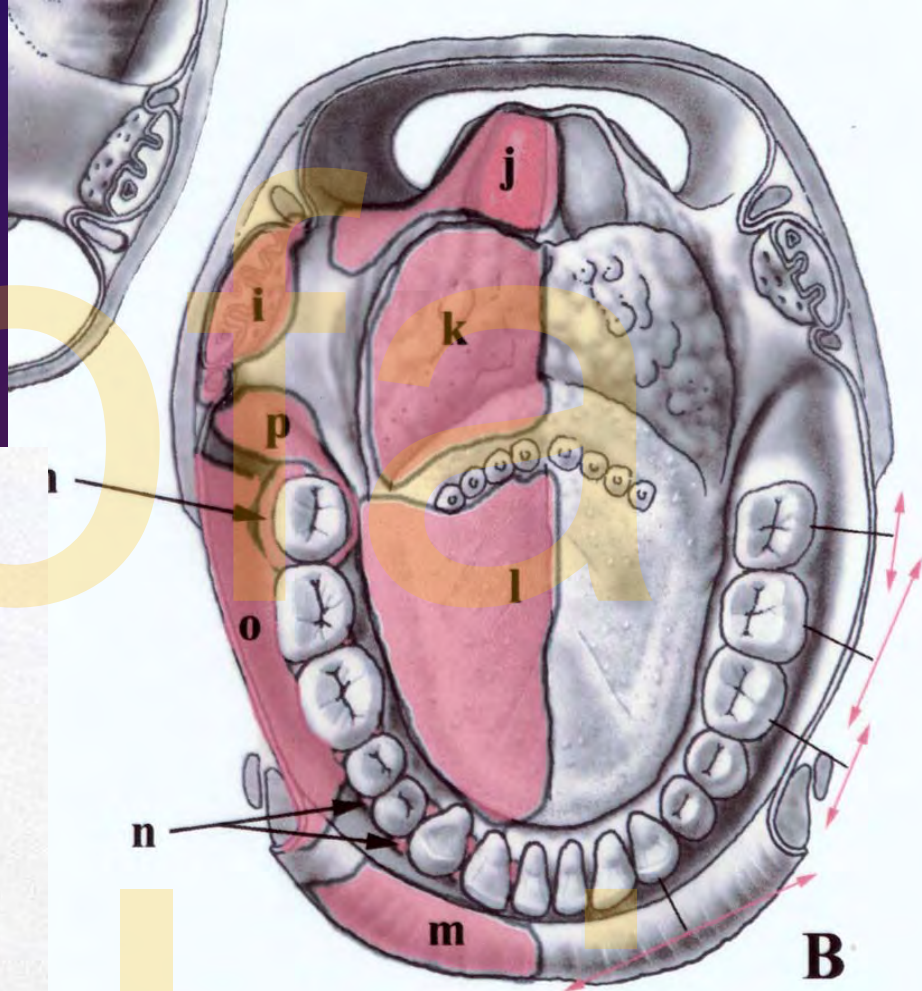
To submandibular lymph nodes

To inferior deep cervical lymph nodes

To submandibular lymph nodes

To submental lymph nodes

Superior view



Tongue innervation

j - CN X.

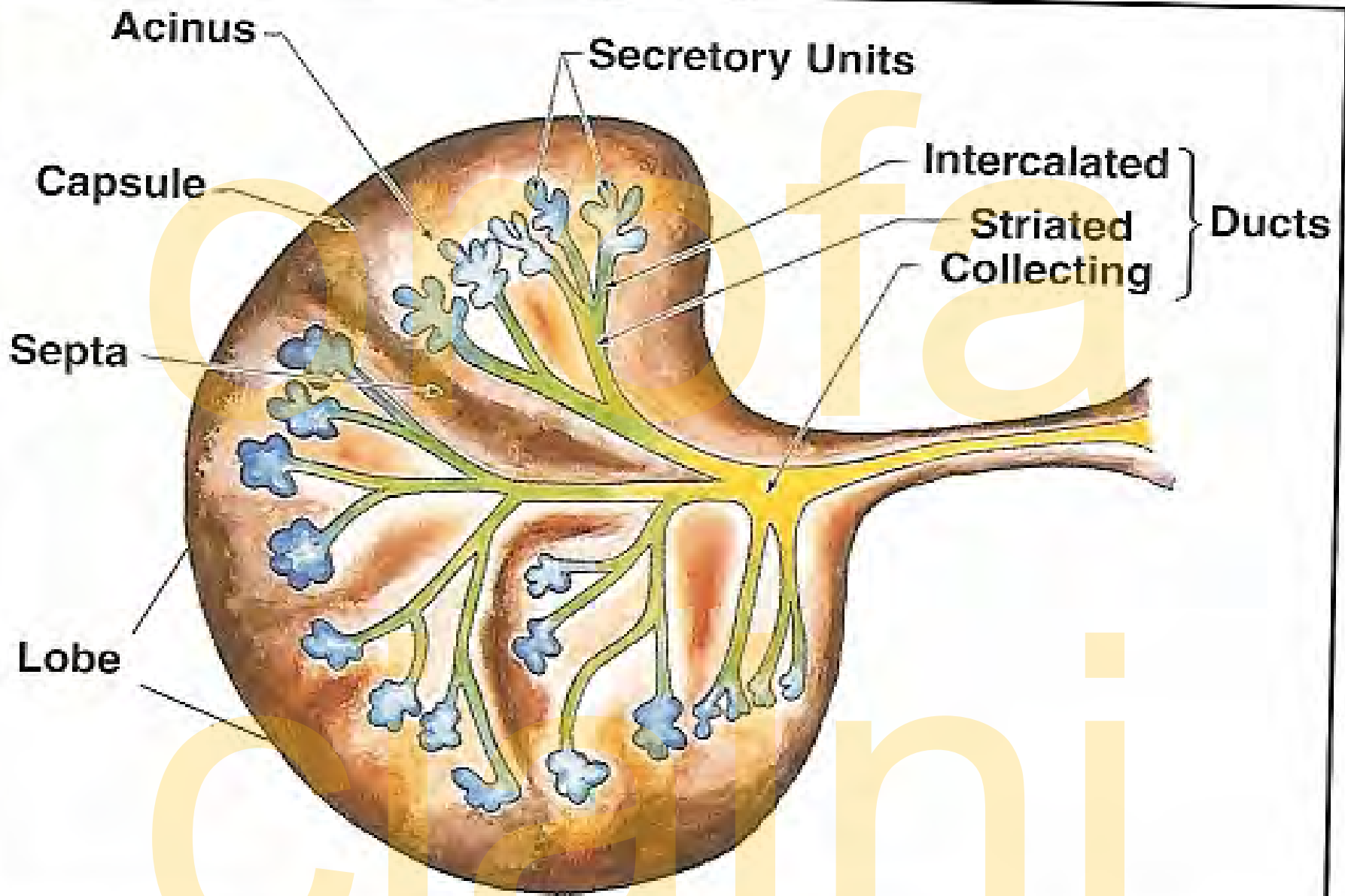
k - CN IX.

l - CN V (n. lingualis)

Salivary glands

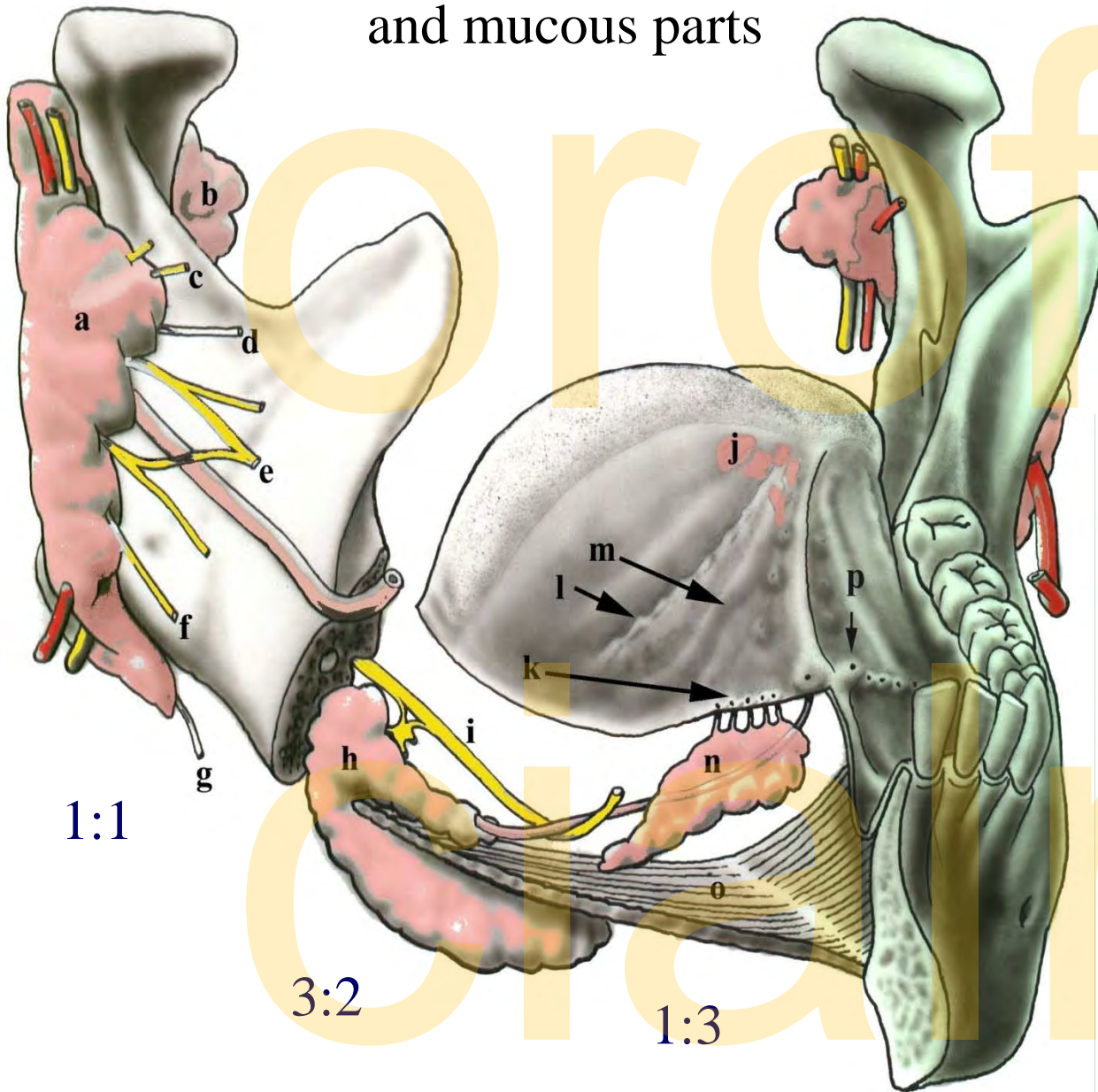
Oral glands

- ▼ glandulae salivariae majores (great glands)
 - gl. parotis
 - gl. sublingualis
 - gl. submandibularis
- ▼ glandulae salivariae minores (small glands) - labiales, buccales, molares, palatinae, linguales */Nuhn/*
 - Surrounded by capsule (dense fibrous tissue) → septae
 - Secretory part - serous and mucinous clls., myoepithelial (basket) cells
 - System of the ducts
 - Interstitial → stripped → interlobular → lobar → one main → oral cavity



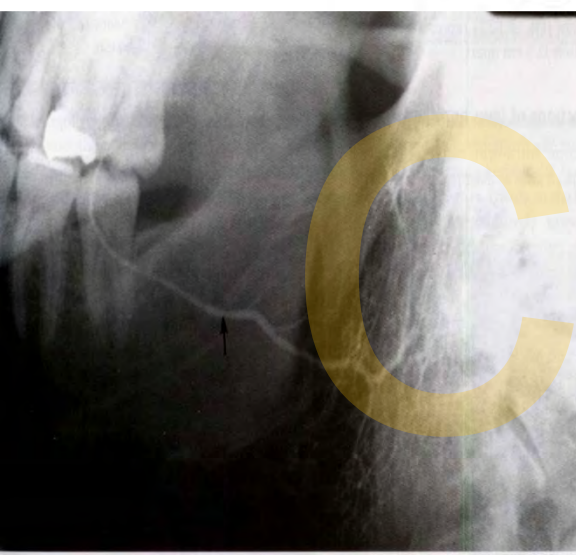
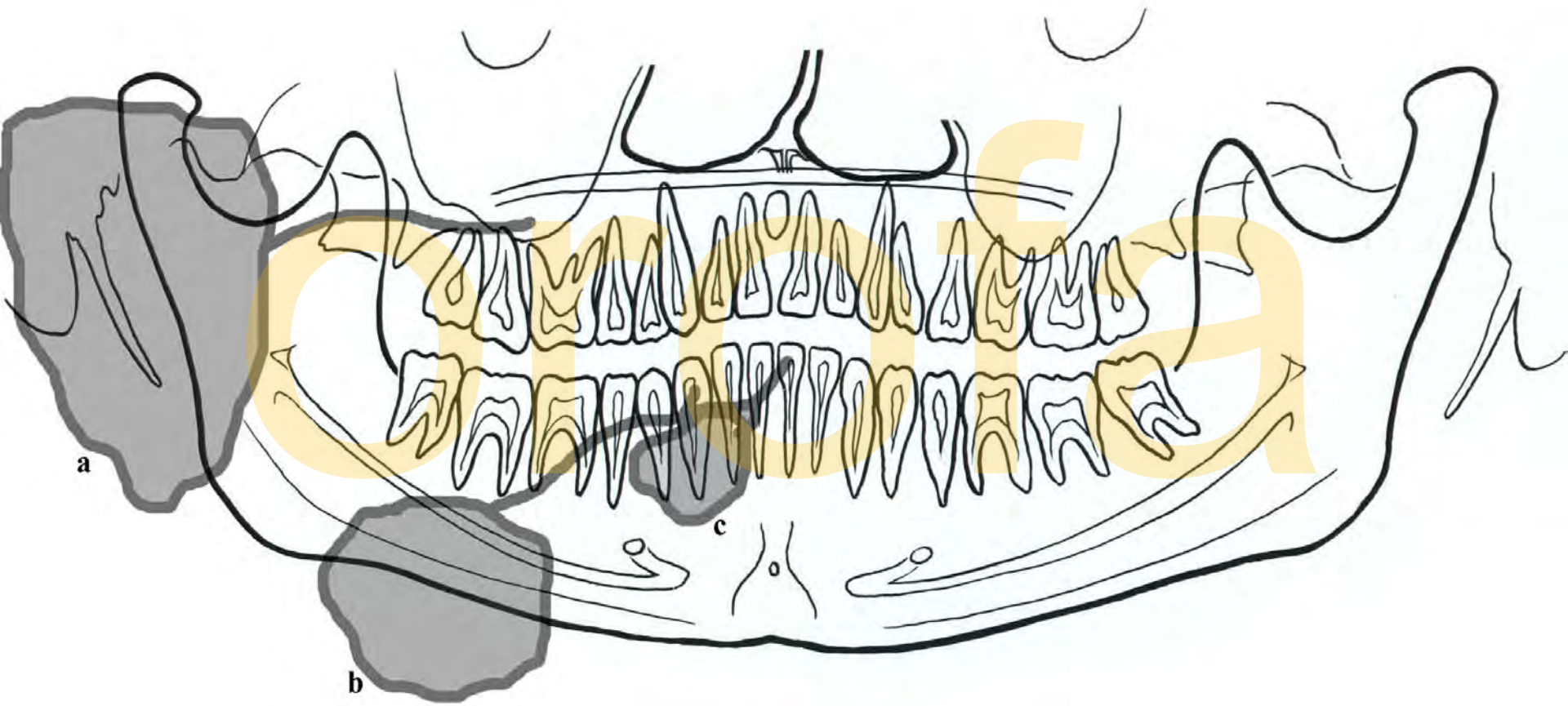
Parts of gland: Acini, lobes, septae, and capsule

Relation between serous and mucous parts



Glandula parotidea
Sublingualis
Sublingualis anterior
Submandibularis

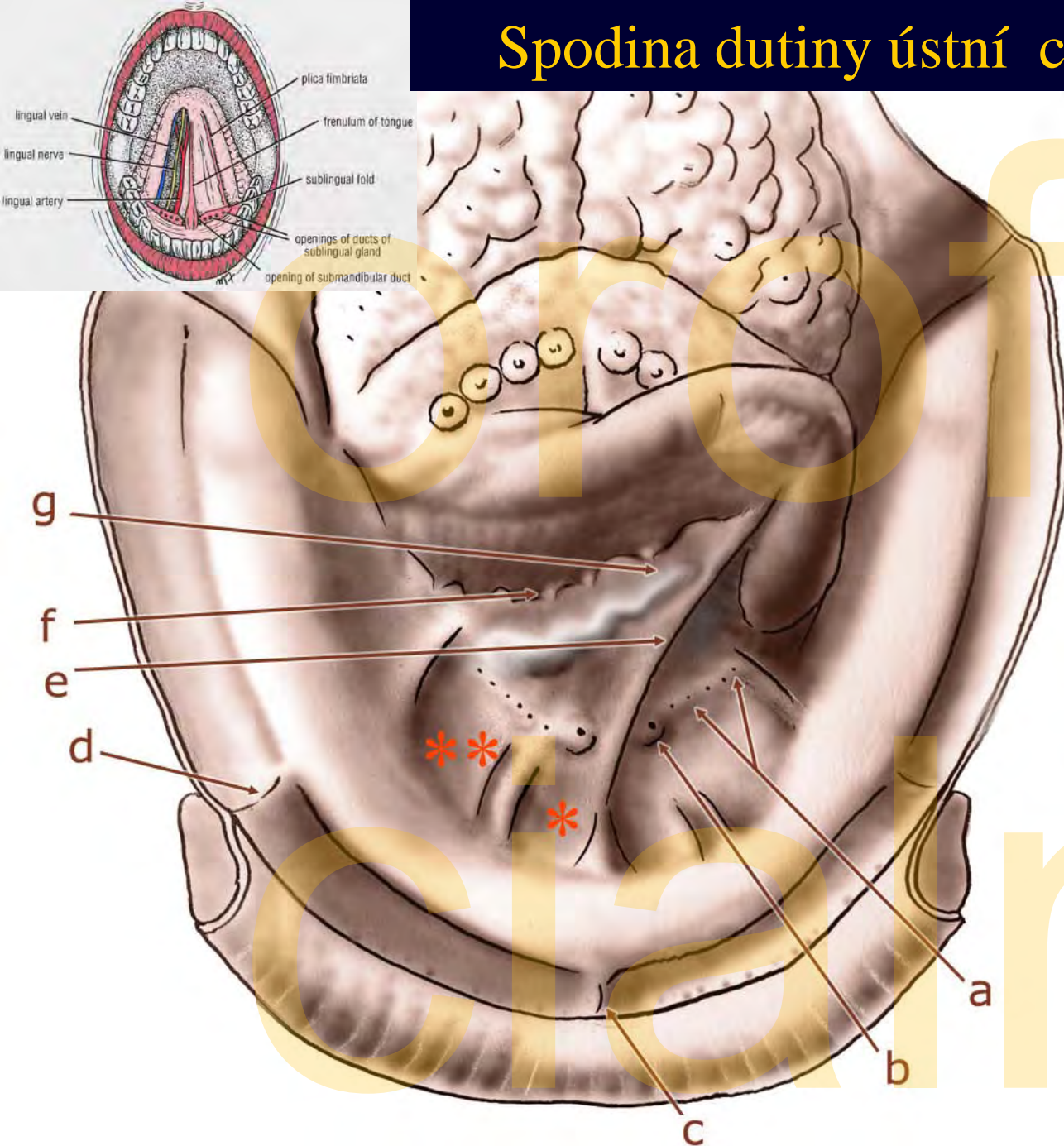




Panoramatický
snímek
panoramic X – ray
photo



Spodina dutiny ústní cavum oris bottom



- a Plica sublingualis
- b Caruncula sublingualis
- c Frenulum labii inferius
- d Plica buccogingivalis
- e Frenulum linguae
- f Plica fimbriata

Plicae gingivolabiales

* Area sublingualis

** Area submandibularis

Canalis paralingualis

Paralingual canal =
between hyoglossus and
genioglossus

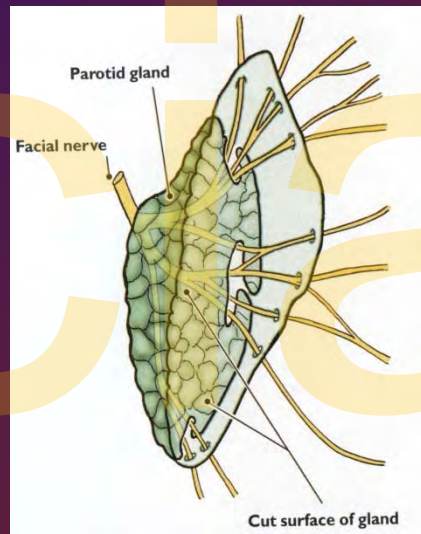
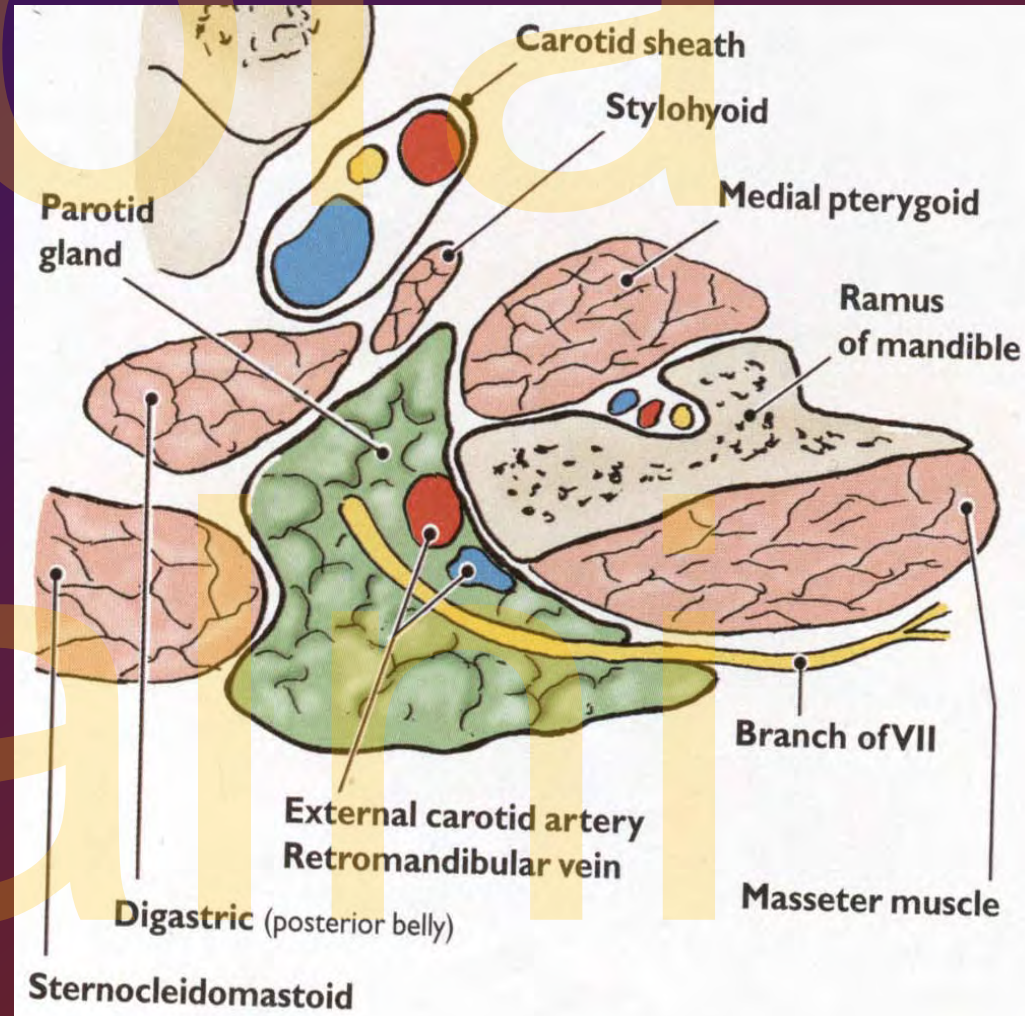
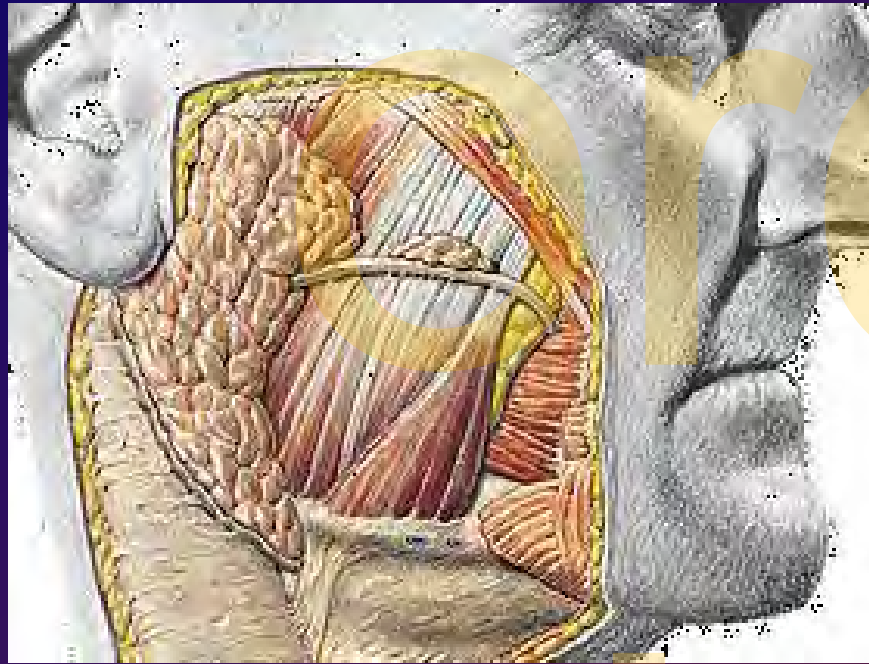
Glandula parotis

Superficial part

Deep part (processus pharyngeus

Serous tissue

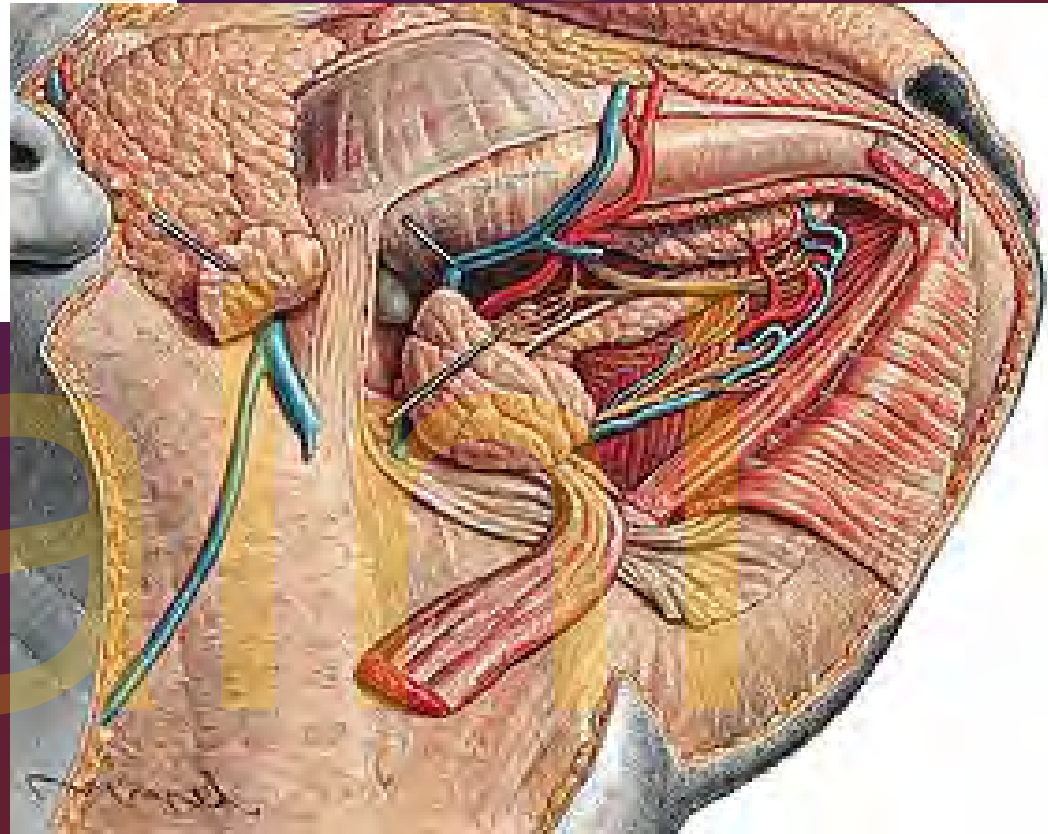
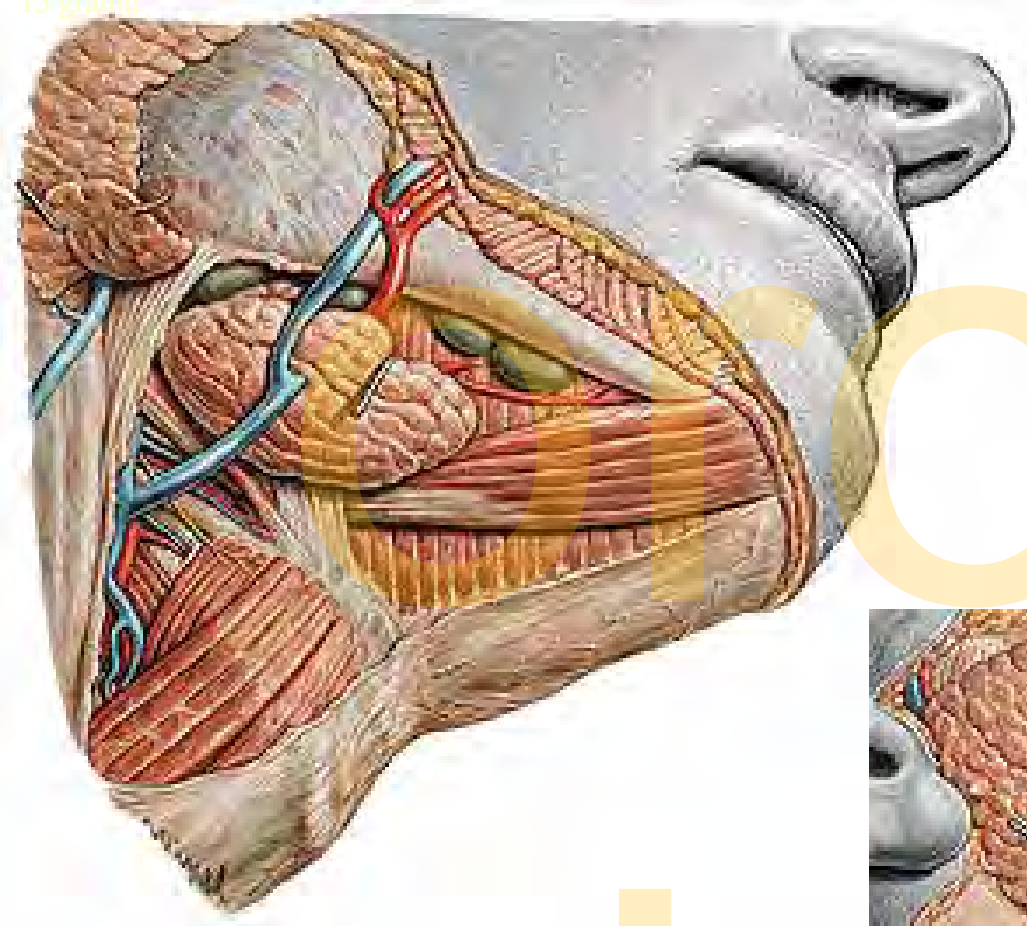
Ductus parotideus (of Stensen)



A parotid tumour compresses the facial nerve weakening the facial muscles ipsilaterally (Bell's palsy).

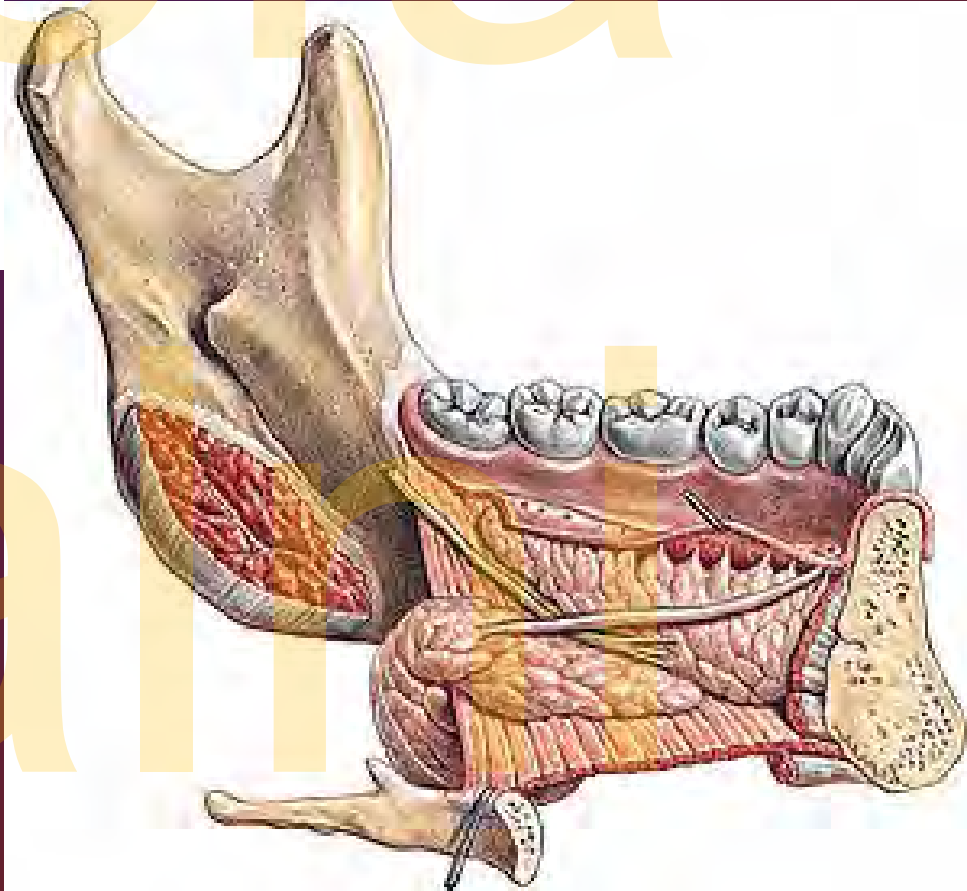
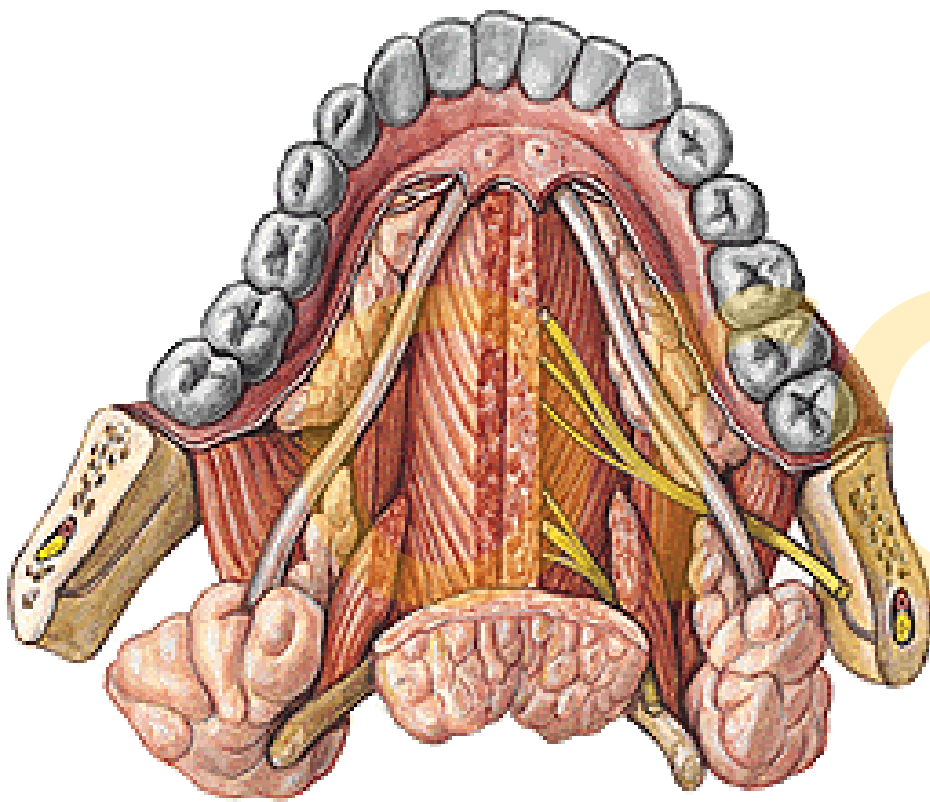
The corner of the mouth and eye may drop.

Glandula submandibularis



mukoserous
Ductus submandibularis
(Wharton)
15 gr

Glandula sublingualis



seromucinous

Ductus sublingualis major et
minores (Santorini)

5 gr

nucl. salivatorius sup.

n. facialis

n. petrosus major

gl. lacrimalis

n. zygomatico
facialis

ggl. pterygo
palatinum

n. petrosus minor

ggl. oticum

chorda
tympani

plexus
tympanicus

n. auriculotemporalis

ggl. submandibulare

gl. parotis

n. lingualis (n.V₃)

n. tympanicus

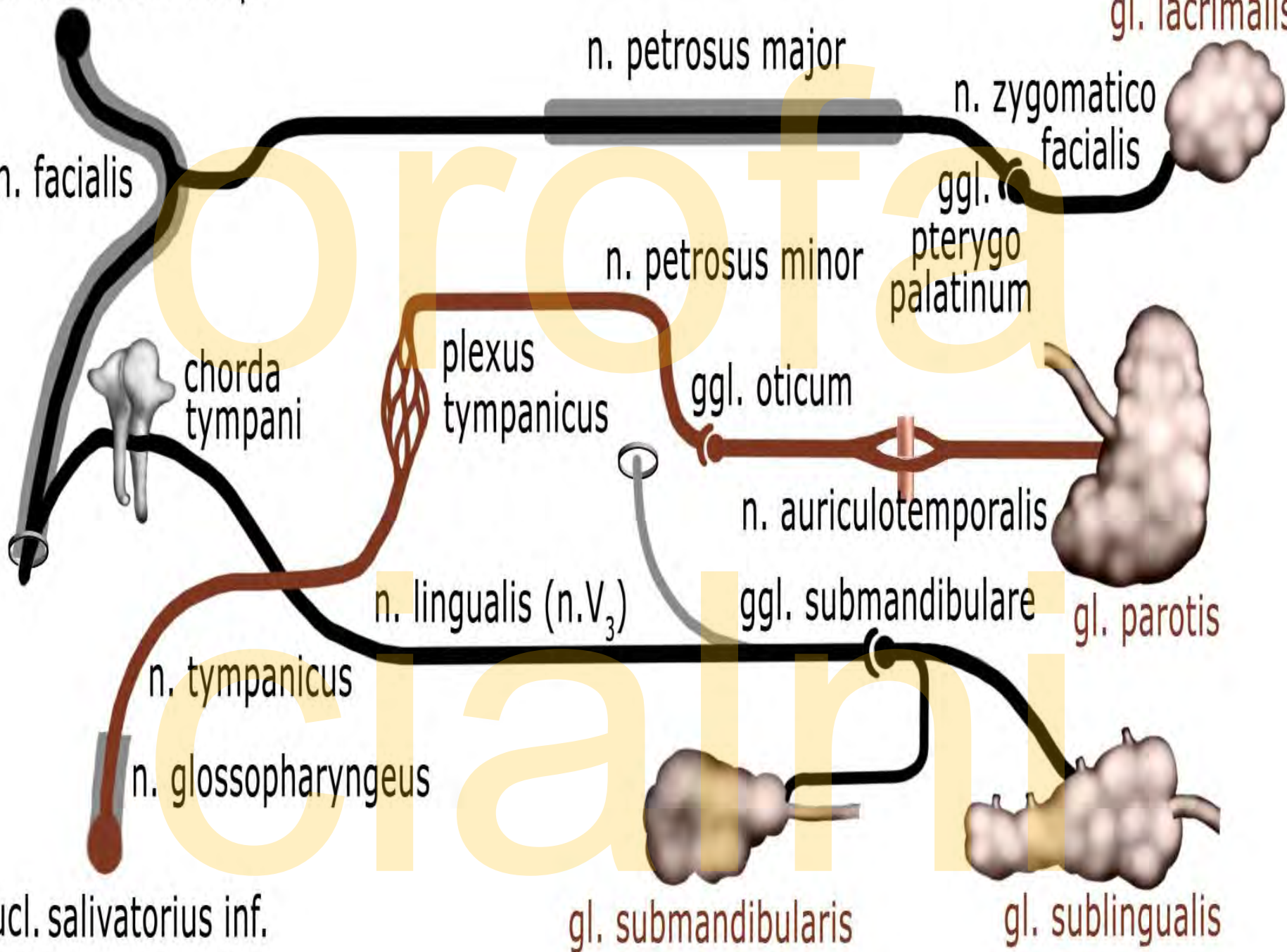
n. glossopharyngeus

ggl. submandibulare

nucl. salivatorius inf.

gl. submandibularis

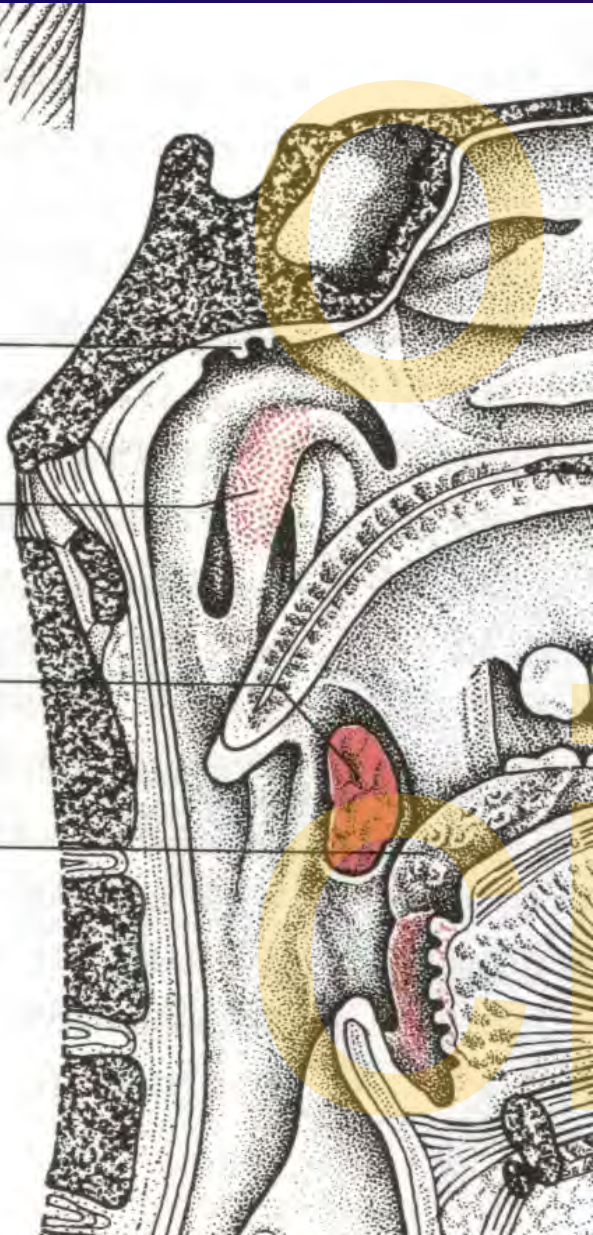
gl. sublingualis



Tonsilary system

Tonsils + lymph nodes

Tonsillar lymph circle of Waldeyer

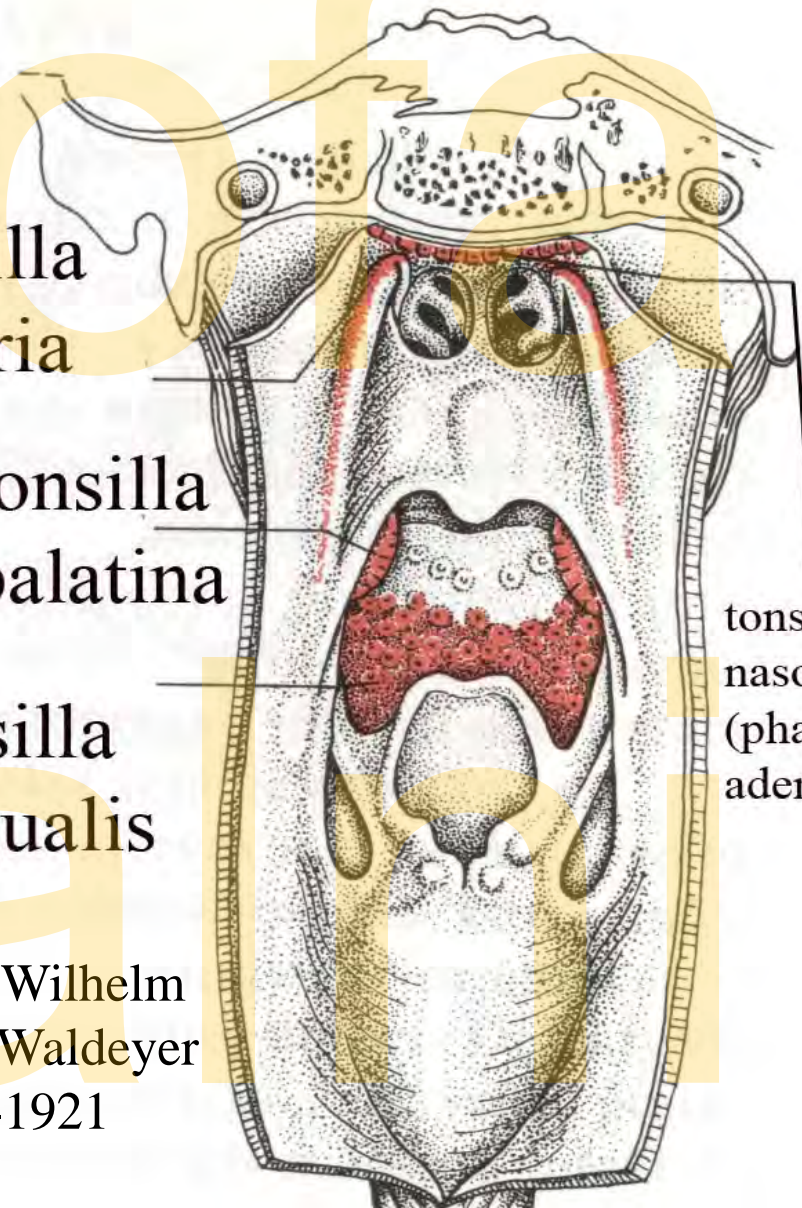


tonsilla
tubaria

tonsilla
palatina

tonsilla
lingualis

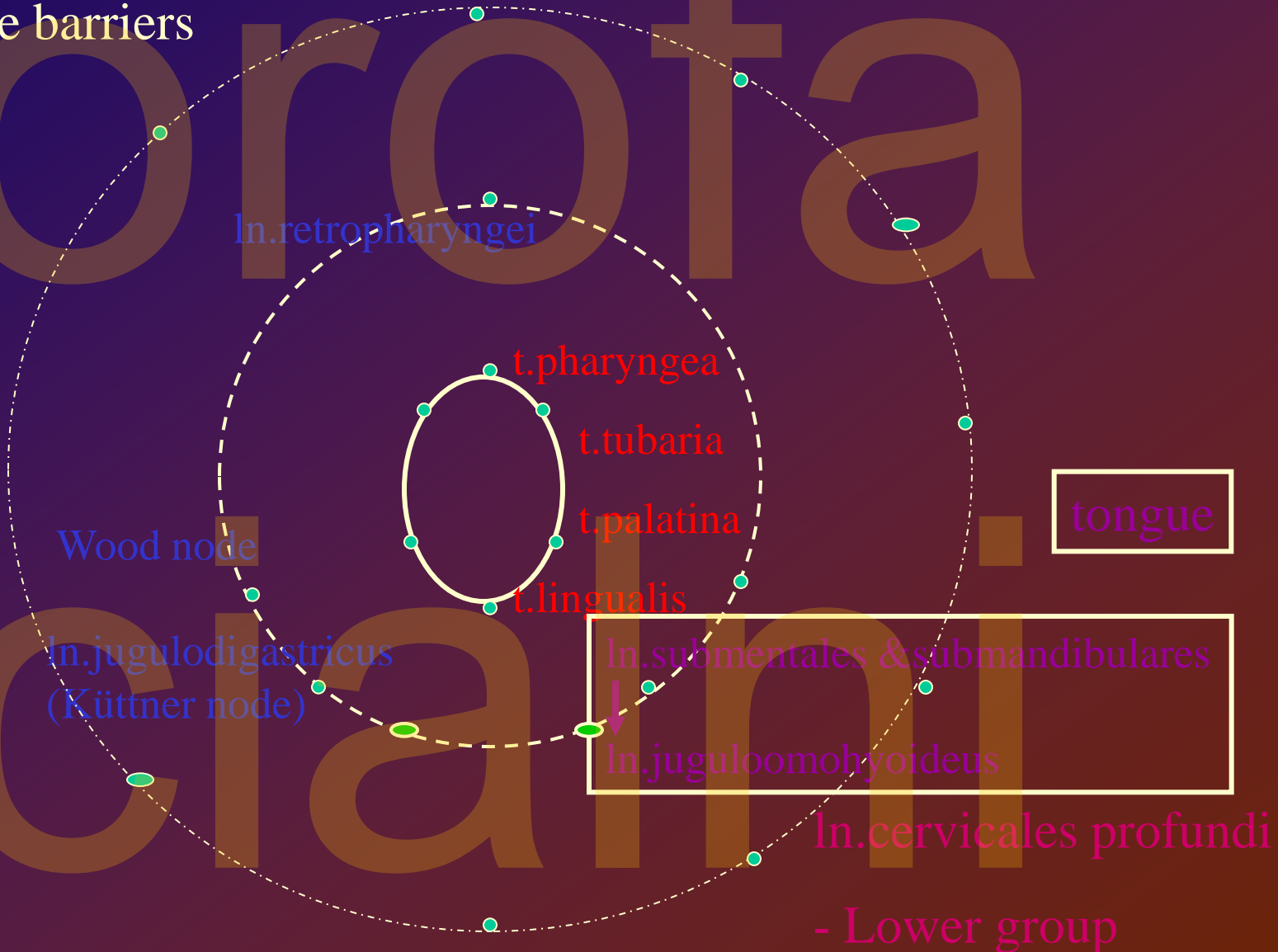
Heinrich Wilhelm
Gottfried Waldeyer
1836-1921

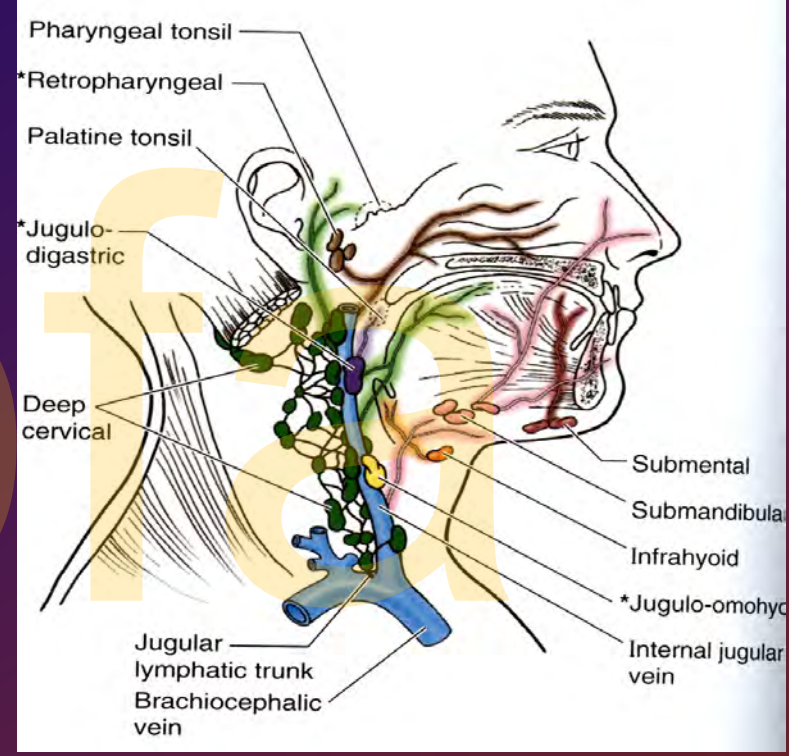
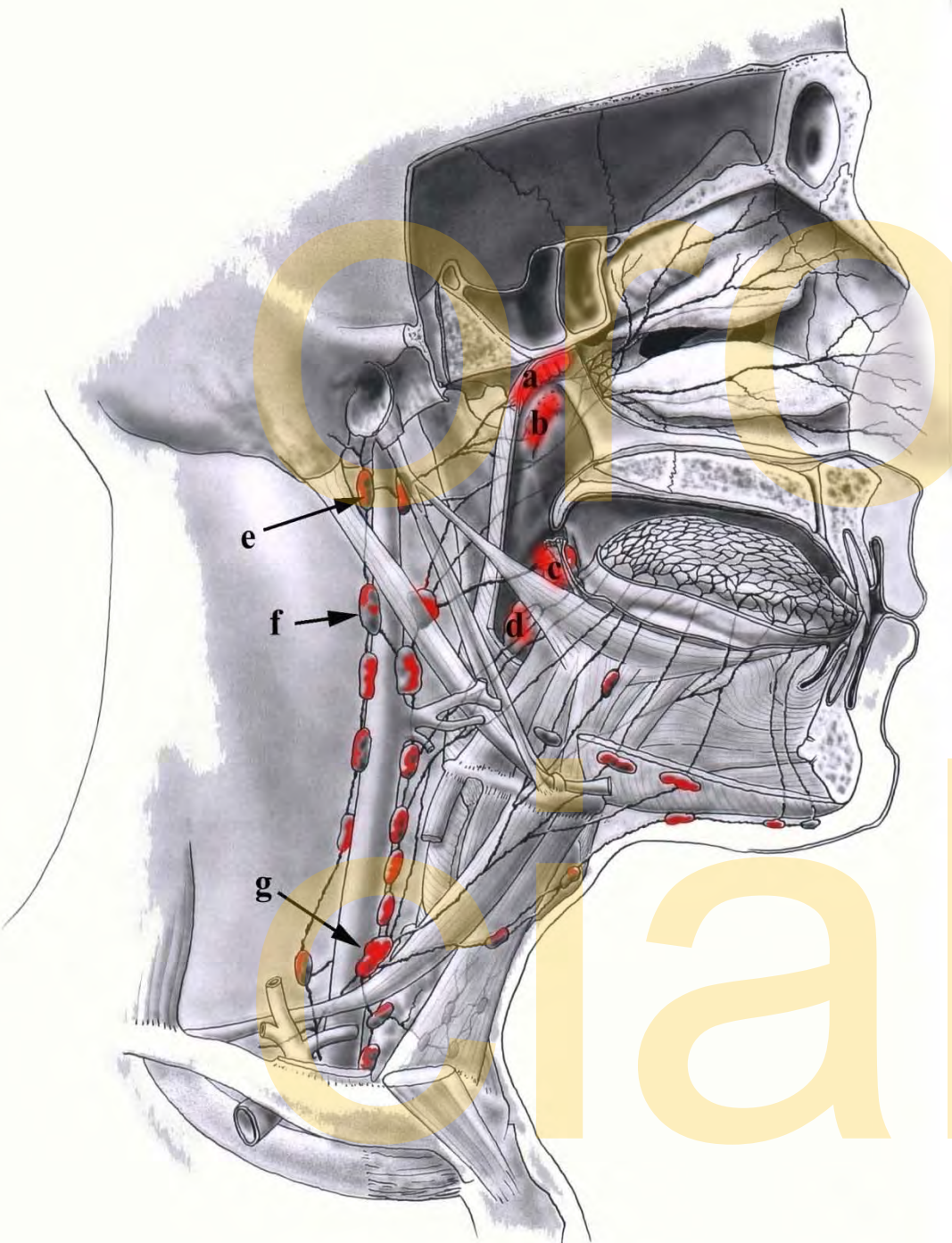


tonsilla
nasopharyngea
(pharyngea,
adenoid tissue)

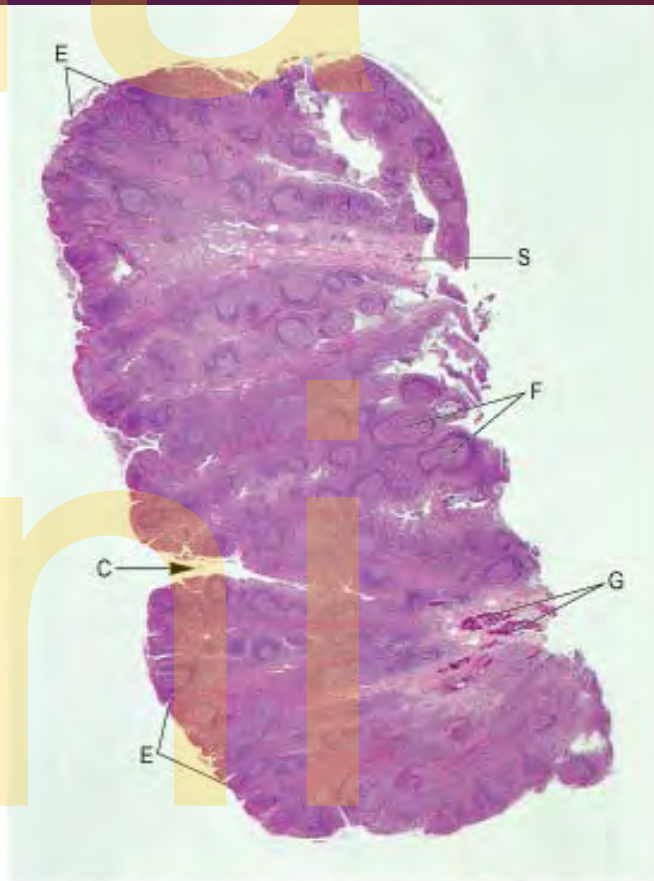
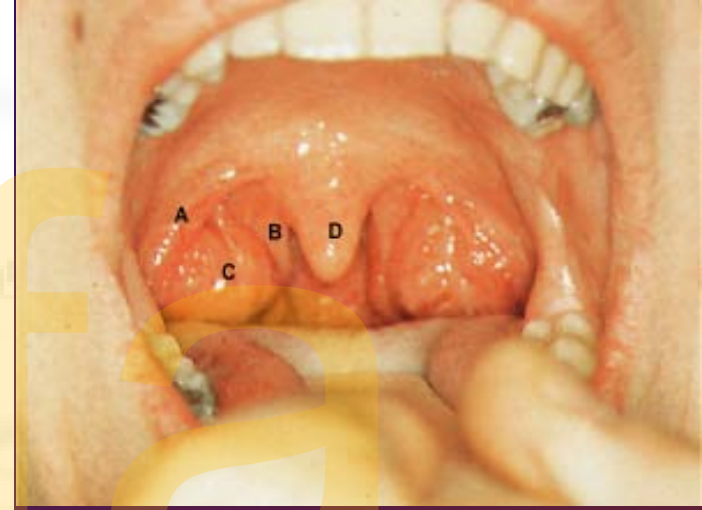
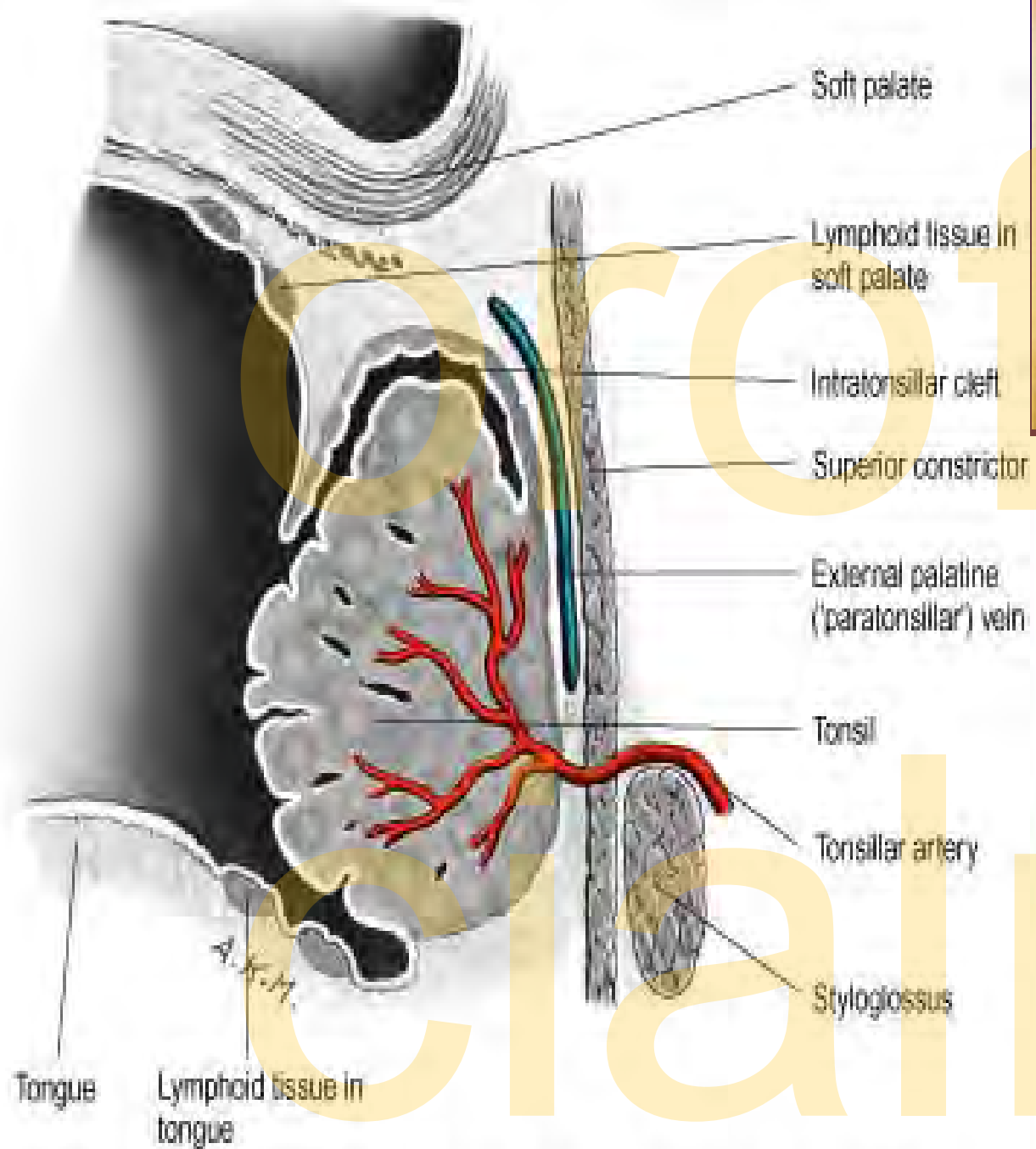
Waldeyer lymph circle

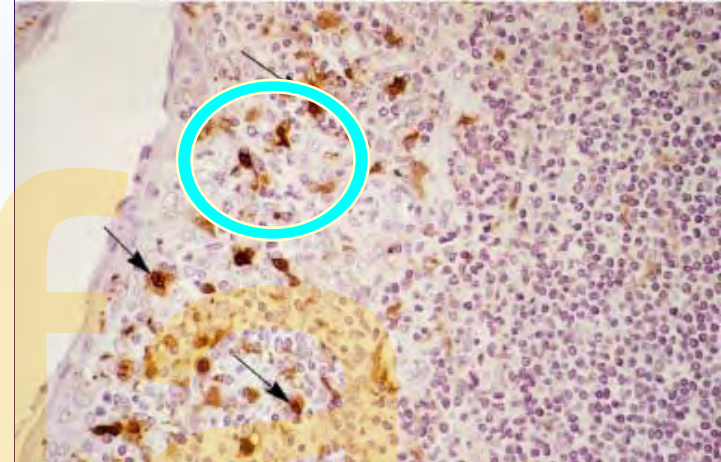
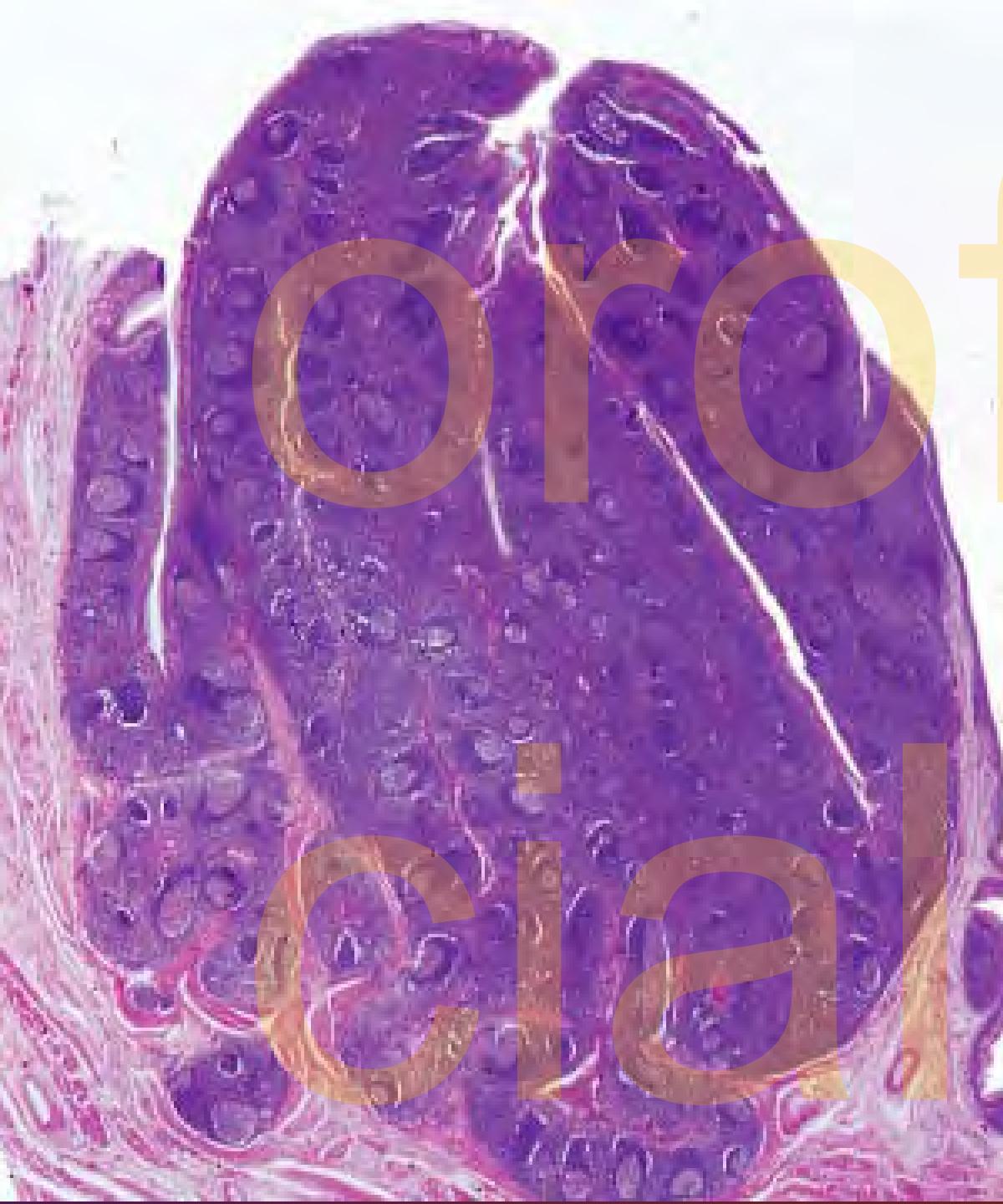
3 protective barriers





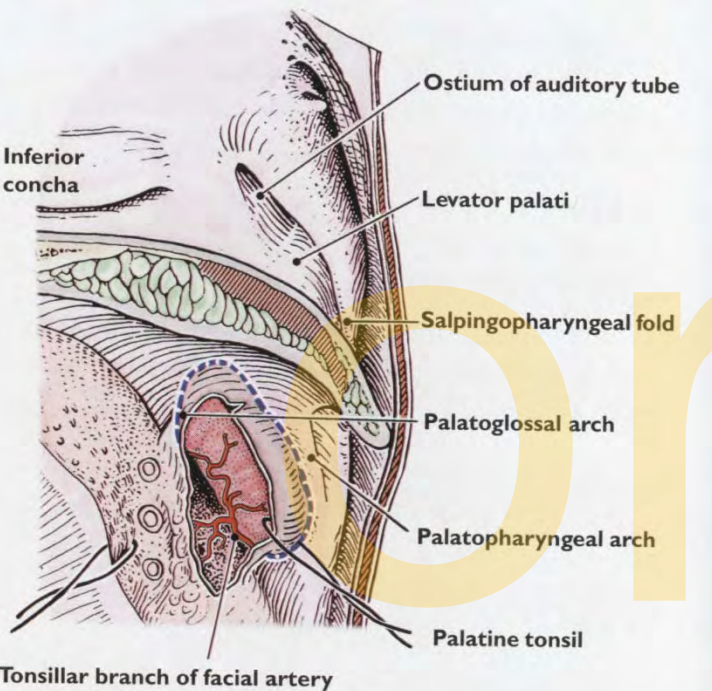
Jugulodigastric
 juguloomohyoid
 deep cervical
 lymph nodes



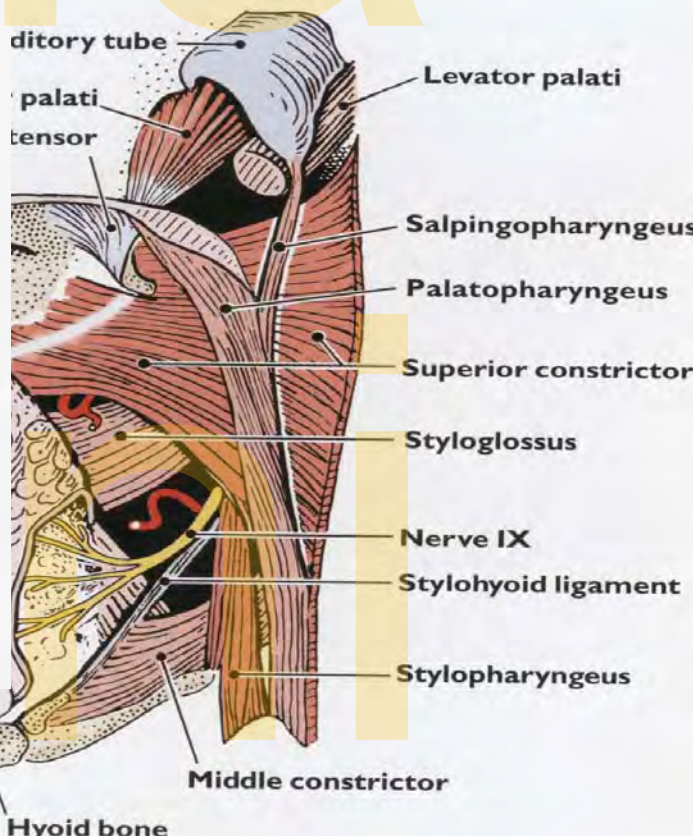
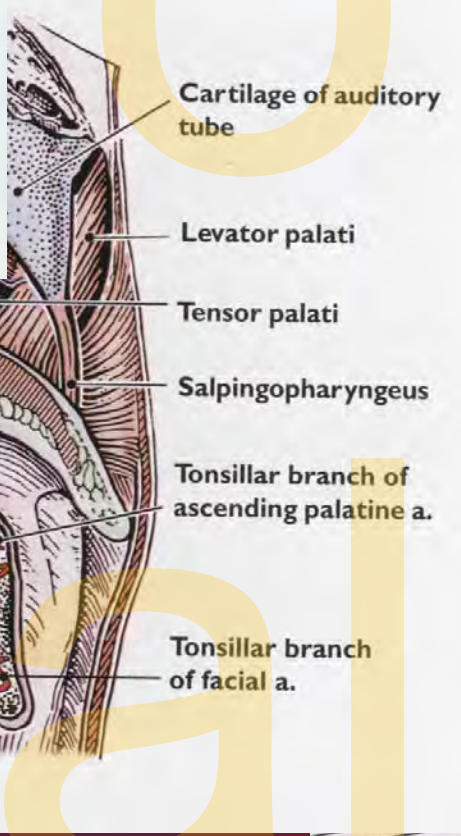
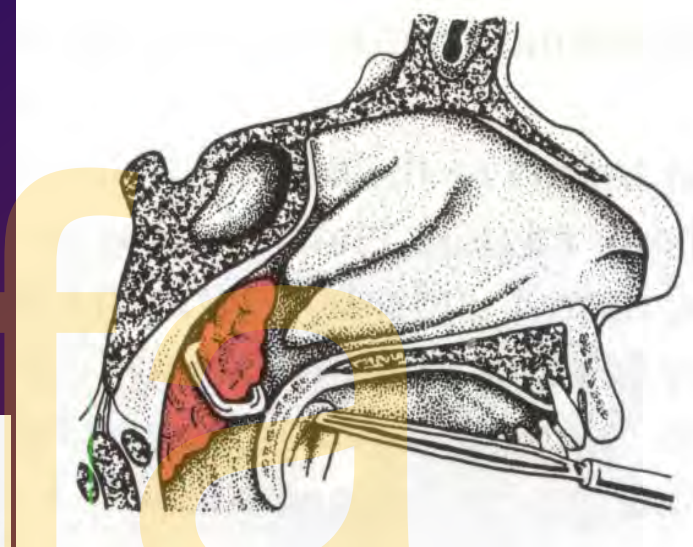


Incomplete capsule
Only efferent lymph vessels
Modified epithelium in
crypts (lymphoepithel or
FAE follicle-associated
epithelium)
Intraepithelial vascularization

Free, T, B lymphocytes,
active immunocompetitive
cells, macrophages,
Langerhans cells, fibrous
stroma



Tonsillar branch of facial artery



tonsillectomy

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