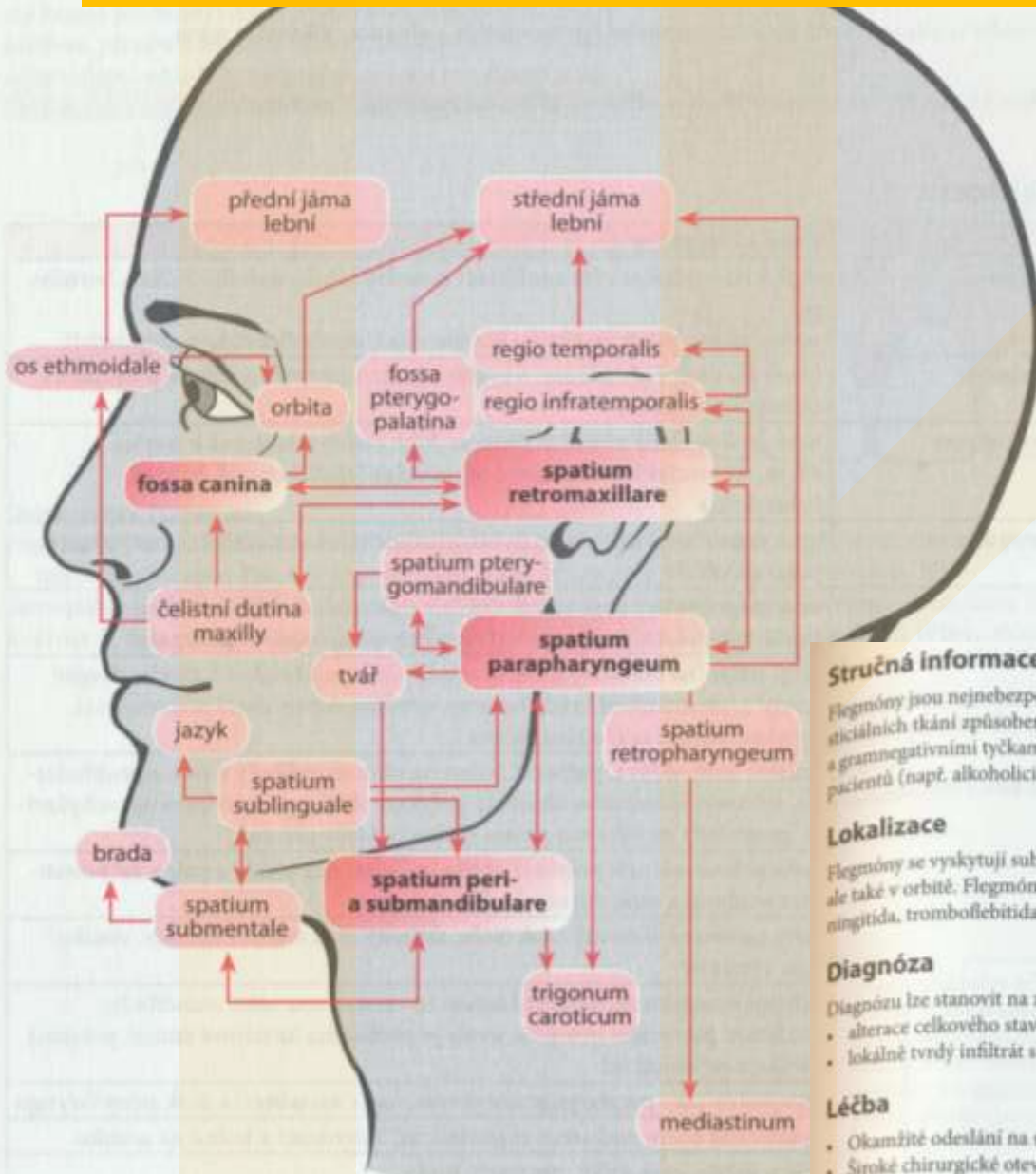


# Odontogenetic infection is spreaded



## Stručná informace

Flegmóny jsou nejnebezpečnější formou infekce měkkých tkání ve stomatologické oblasti. Jde o difuzní zánět intersticiálních tkání způsobený betahemolytickými streptokoky a anaerobními mikroorganismy, ale také stafylokoky a gramnegativními tyčkami; zpočátku je serózní, následně hnisavý a nekrotizující. Závažné je postižení u oslabených pacientů (např. alkoholici, diabetici).

## Lokalizace

Flegmóny se vyskytují submandibulárně v oblasti velkých krčních cév a na spodní dutiny ústní (angina Ludovici), ale také v orbitě. Flegmóny jsou vzácné, ale život ohrožující neohraničeným šířením do okolí (mediastinitida, meningitida, tromboflebitida, dusivý otok krku, sepse).

## Diagnóza

Diagnózu lze stanovit na základě klinického obrazu:

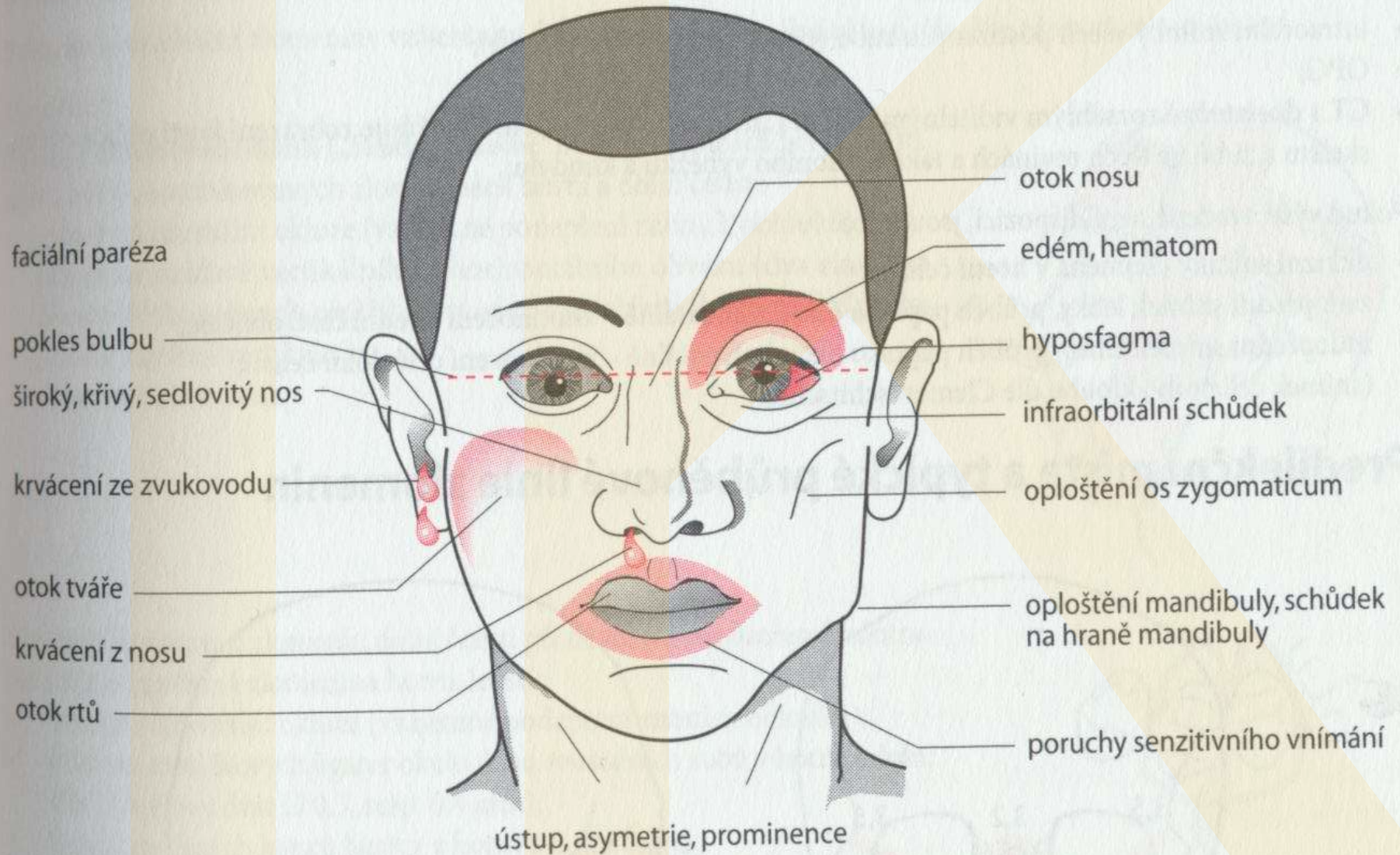
- alterace celkového stavu, vysoké teploty, tachykardie, dechové obtíže;
- lokálně tvrdý infiltrát s difuzním ohraničením do okolí, klinicky jsou vyjádřeny všechny lokální známky zánětu.

## Léčba

- Okamžité odeslání na specializované nemocniční pracoviště.
- Široké chirurgické otevření všech postižených prostor.
- Antibiotika (vysoké dávky a kombinace).

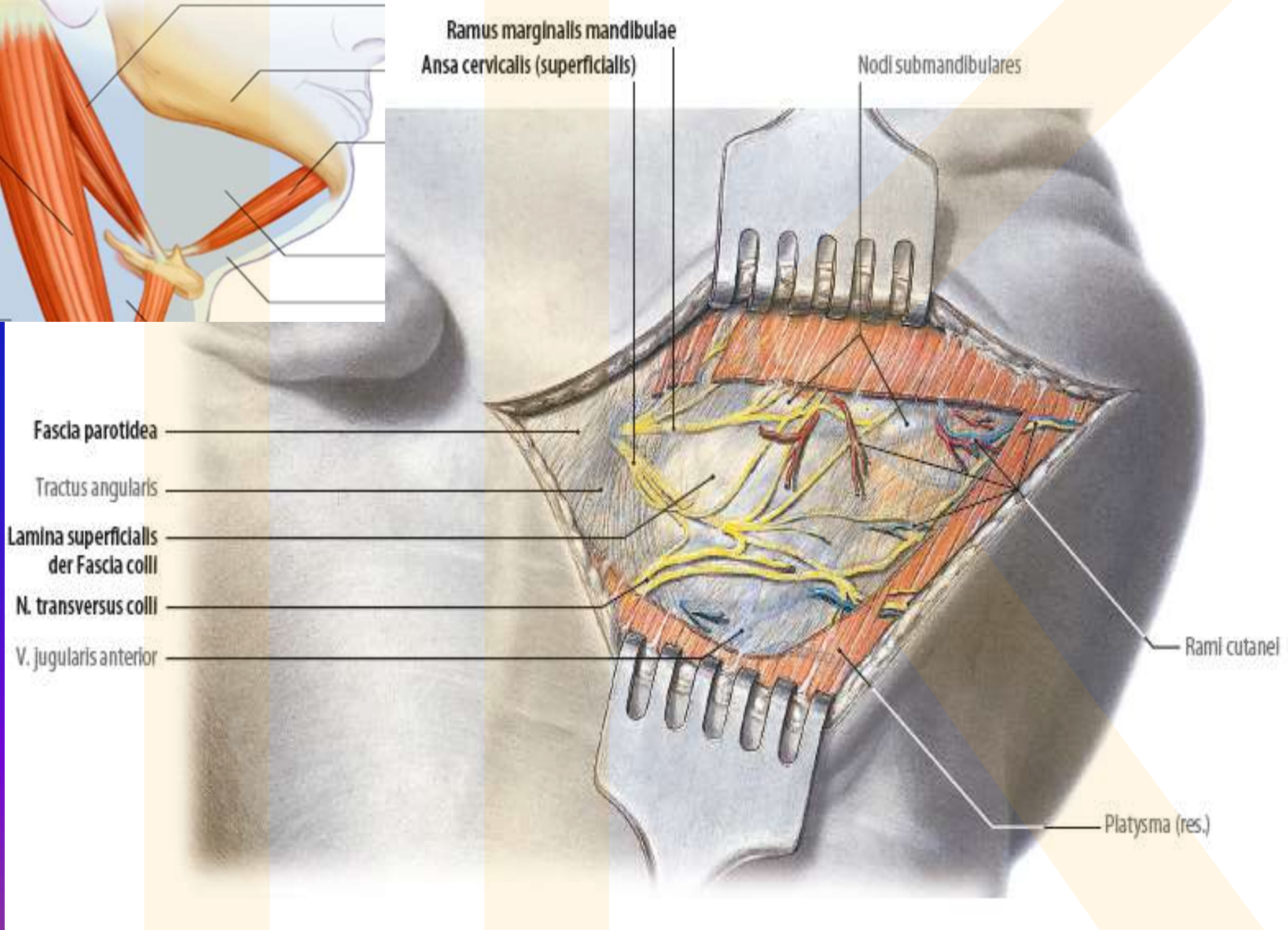
# Možné projevy zlomenin a zánětů

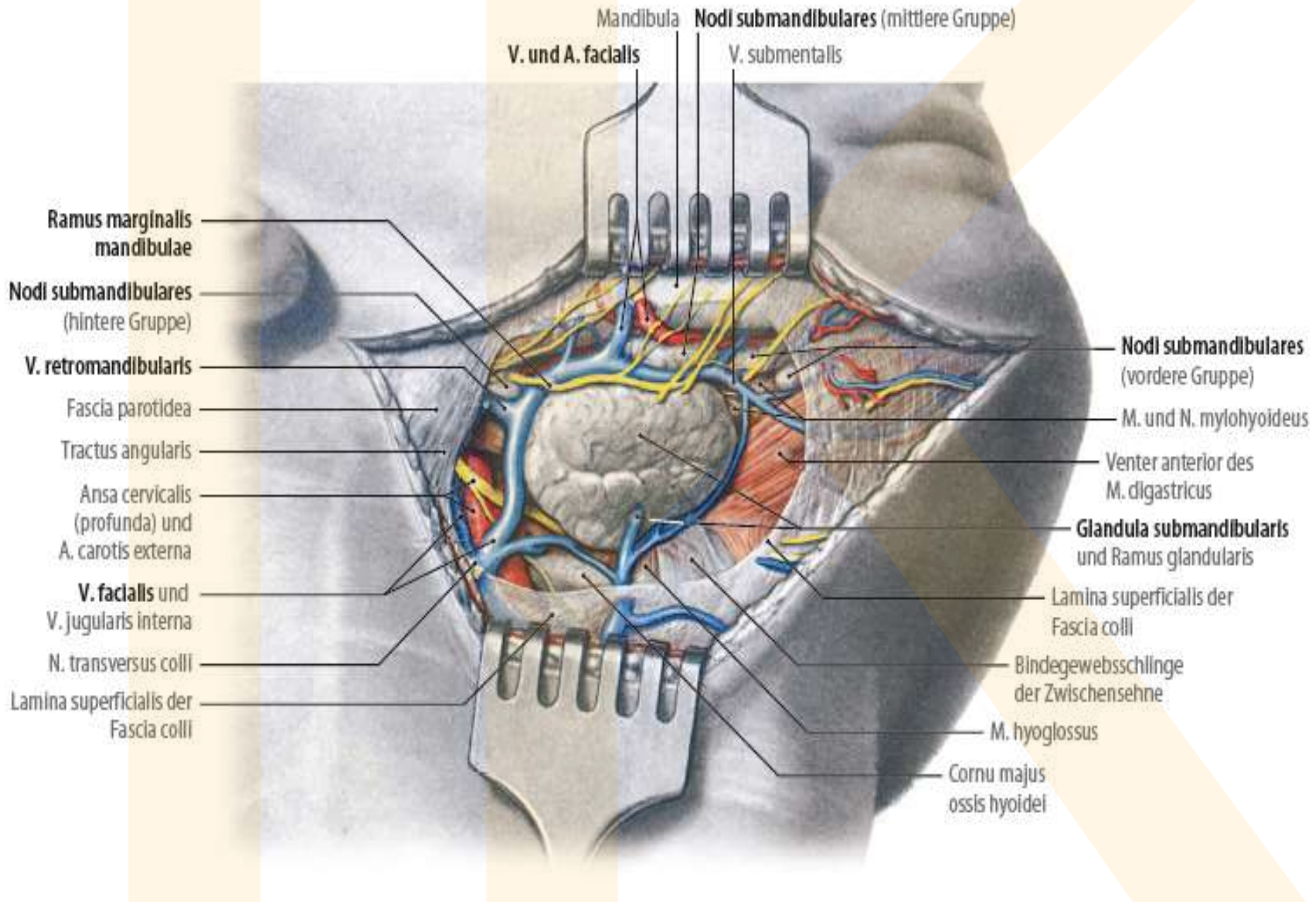
## Possible signs of fractures or inflammations



# Submandibular space

lies between the bellies of the digastric muscles, mandible, mylohyoid muscle and hyoglossus and styloglossus muscles

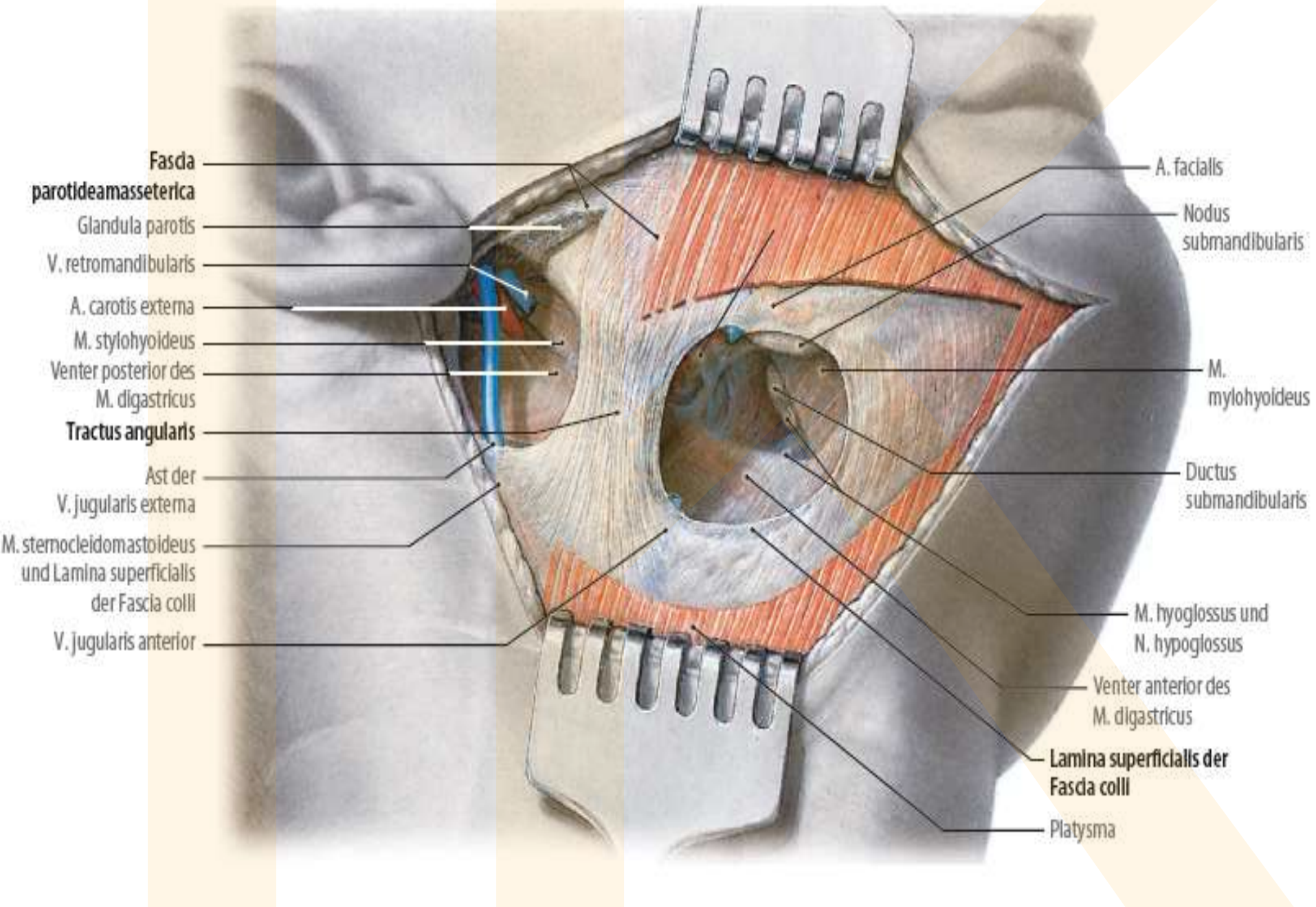


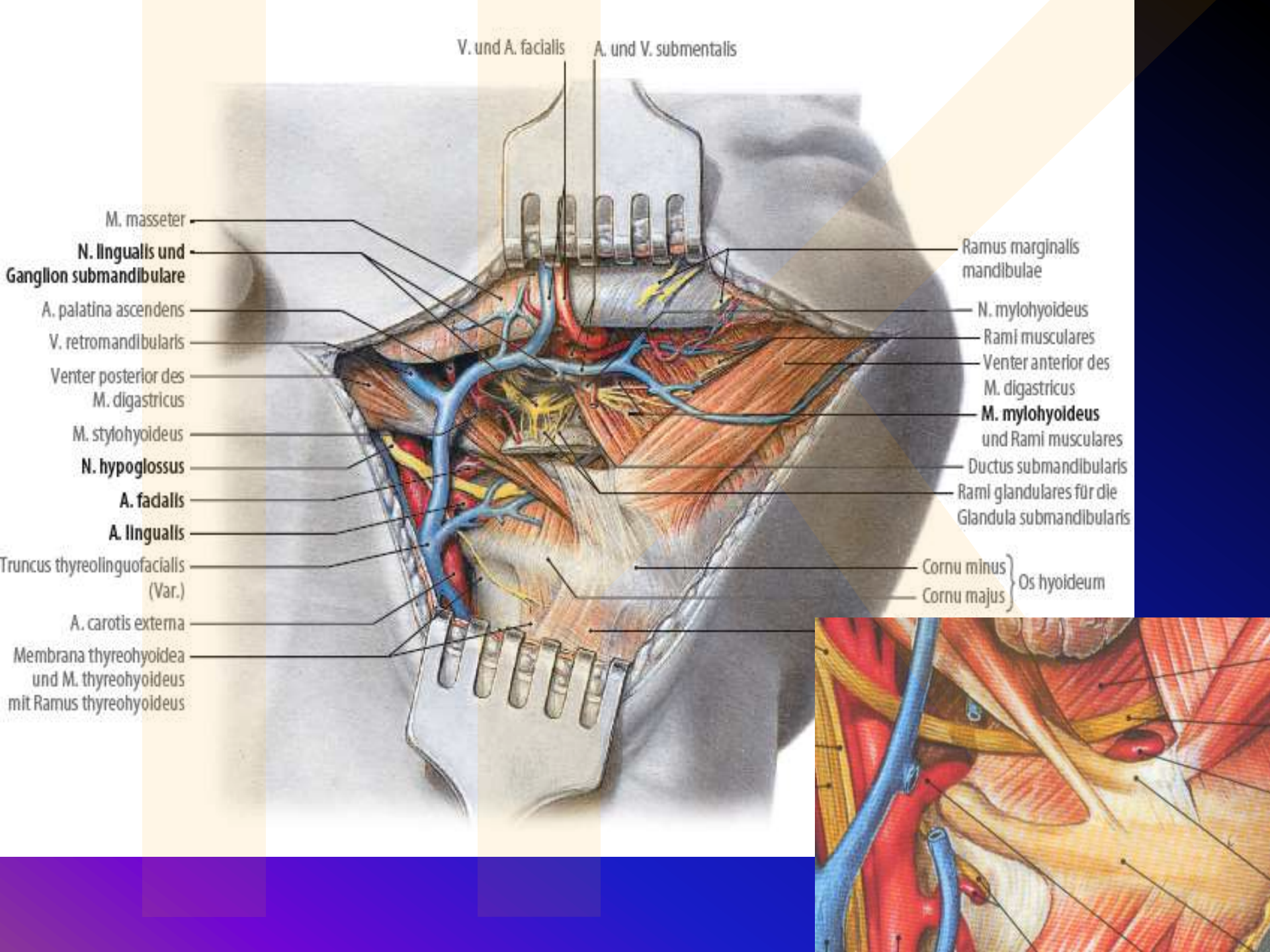


Mandibula  
 V. und A. facialis  
 Nodi submandibulares (mittlere Gruppe)  
 V. submentalis

Ramus marginalis mandibulae  
 Nodi submandibulares (hintere Gruppe)  
 V. retromandibularis  
 Fascia parotidea  
 Tractus angularis  
 Ansa cervicalis (profunda) und A. carotis externa  
 V. facialis und V. jugularis interna  
 N. transversus colli  
 Lamina superficialis der Fascia colli

Nodi submandibulares (vordere Gruppe)  
 M. und N. mylohyoideus  
 Venter anterior des M. digastricus  
 Glandula submandibularis und Ramus glandularis  
 Lamina superficialis der Fascia colli  
 Bindegewebsschlinge der Zwischensehne  
 M. hyoglossus  
 Cornu majus ossis hyoidei





V. und A. facialis      A. und V. submentalalis

M. masseter

**N. lingualis und  
Ganglion submandibulare**

A. palatina ascendens

V. retromandibularis

Venter posterior des  
M. digastricus

M. stylohyoideus

**N. hypoglossus**

**A. facialis**

**A. lingualis**

Truncus thyroloinguofacialis  
(Var.)

A. carotis externa

Membrana thyrohyoidea  
und M. thyrohyoideus  
mit Ramus thyrohyoideus

Ramus marginalis  
mandibulae

N. mylohyoideus

Rami musculares

Venter anterior des  
M. digastricus

**M. mylohyoideus**

und Rami musculares

Ductus submandibularis

Rami glandulares für die  
Glandula submandibularis

Cornu minus } Os hyoideum  
Cornu majus }





Submandibulární  
absces

Submandibular  
abscess

**Fig. 3.34** Abscess within the submandibular tissue space. Courtesy of Professor J. Langdon.



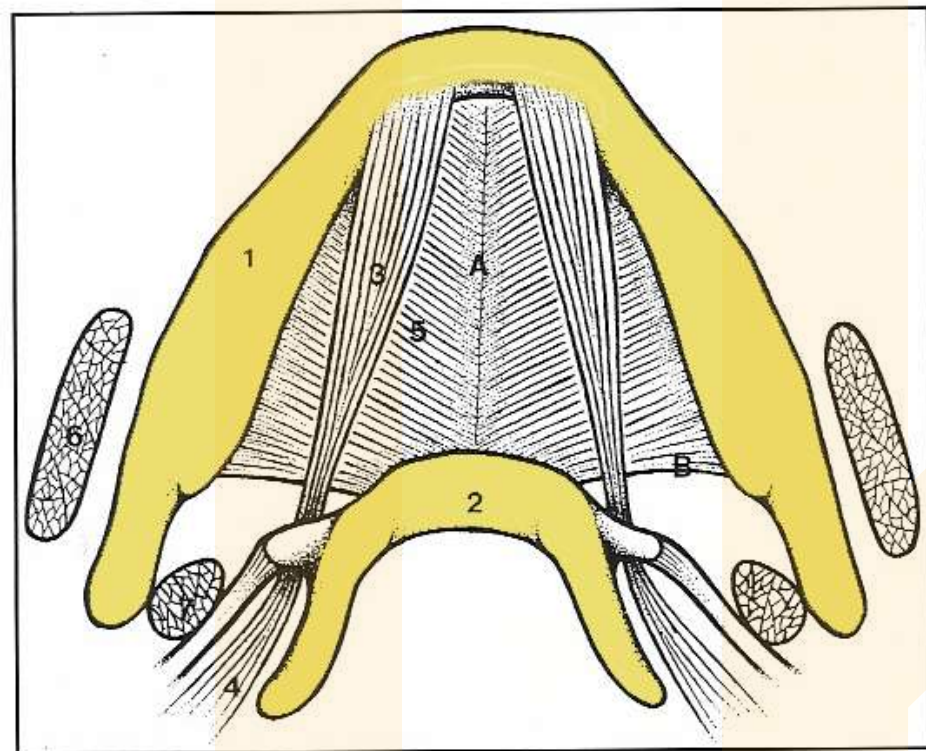


Sběhlý  
submandibulární  
absces

Submandibular  
abscess is  
getting down

# Submental space

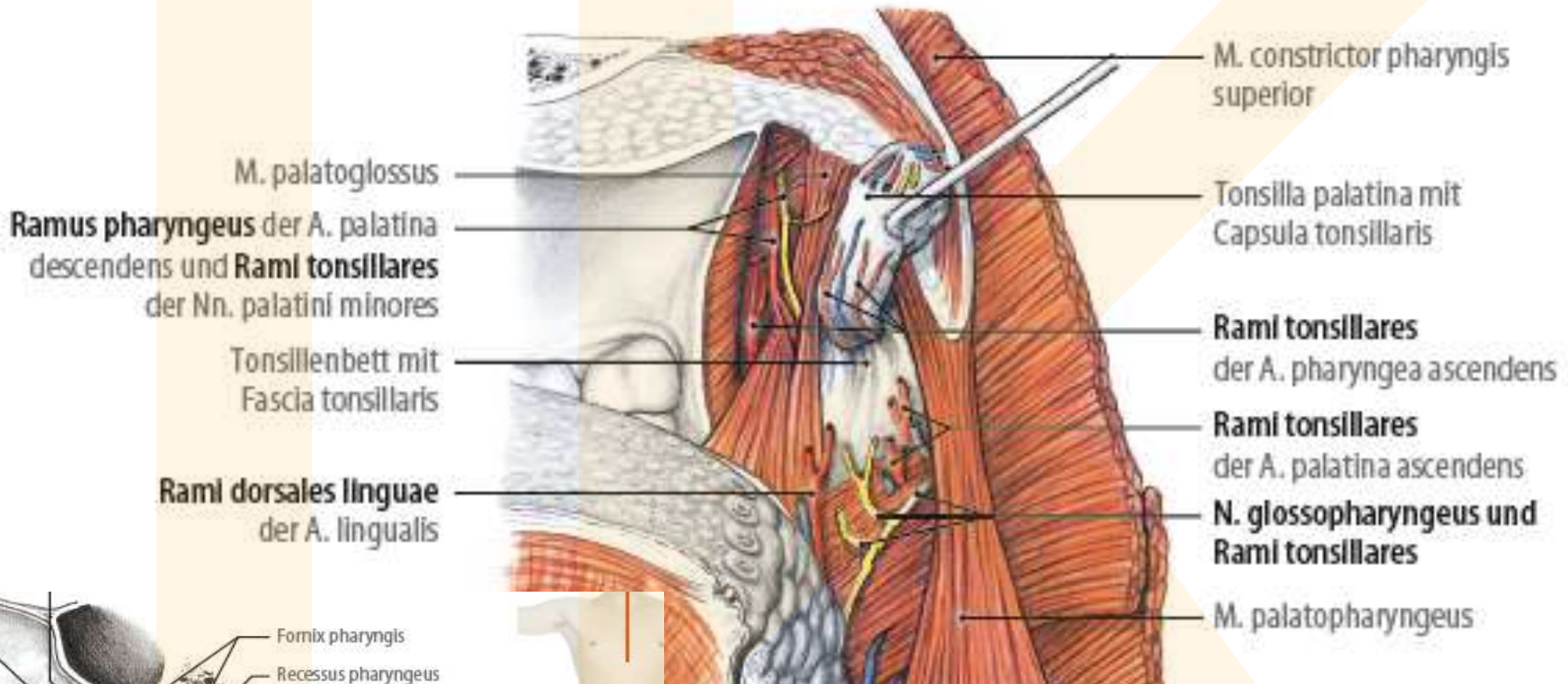
lies between **the mylohyoid muscles and the investing layer of deep cervical fascia superficially**



**Fig. 3.33** Inferior view of the submental and submandibular tissue spaces. 1 = Body of mandible; 2 = hyoid bone; 3 = anterior belly of digastric muscle; 4 = posterior belly of digastric muscle; 5 = mylohyoid muscle; 6 = masseter muscle; 7 = medial pterygoid muscle; A = the submental space lying between the mylohyoid muscle and the investing layer of deep cervical fascia. Laterally, it is bounded by the two anterior bellies of the digastric muscles. The submental space communicates posteriorly with the submandibular space (B).

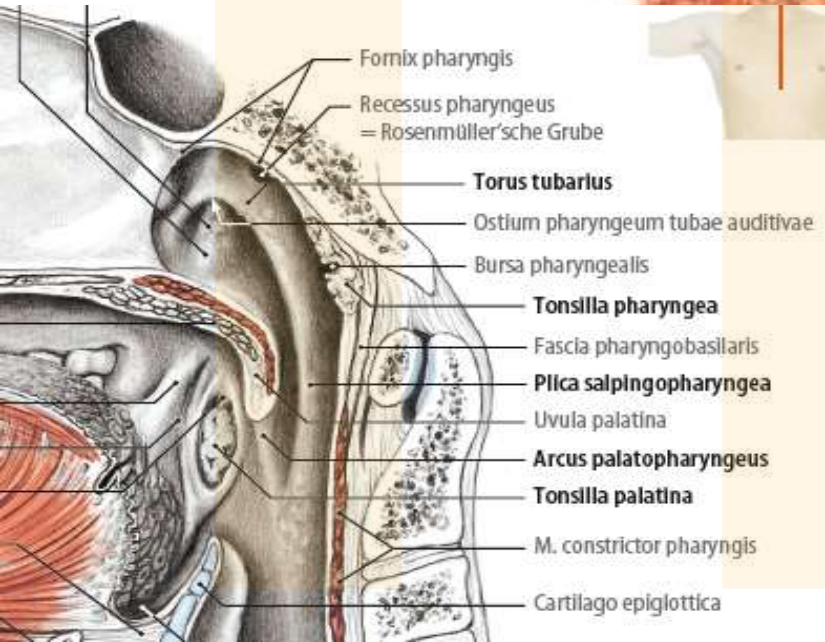


**Spatium peritonsillare**



M. palatoglossus  
**Ramus pharyngeus** der A. palatina descendens und **Rami tonsillares** der Nn. palatini minores  
 Tonsillenbett mit Fascia tonsillaris  
**Rami dorsales linguae** der A. lingualis

M. constrictor pharyngis superior  
 Tonsilla palatina mit Capsula tonsillaris  
**Rami tonsillares** der A. pharyngea ascendens  
**Rami tonsillares** der A. palatina ascendens  
**N. glossopharyngeus** und **Rami tonsillares**  
 M. palatopharyngeus



Fornix pharyngis  
 Recessus pharyngeus = Rosenmüller'sche Grube  
**Torus tubarius**  
 Ostium pharyngeum tubae auditivae  
 Bursa pharyngealis  
**Tonsilla pharyngea**  
 Fascia pharyngobasilaris  
**Plica salpingopharyngea**  
 Uvula palatina  
**Arcus palatopharyngeus**  
**Tonsilla palatina**  
 M. constrictor pharyngis  
 Cartilago epiglottica

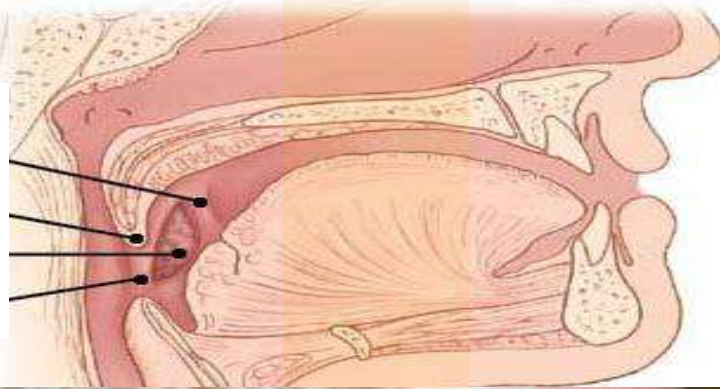


Platoglossal arch

Uvula

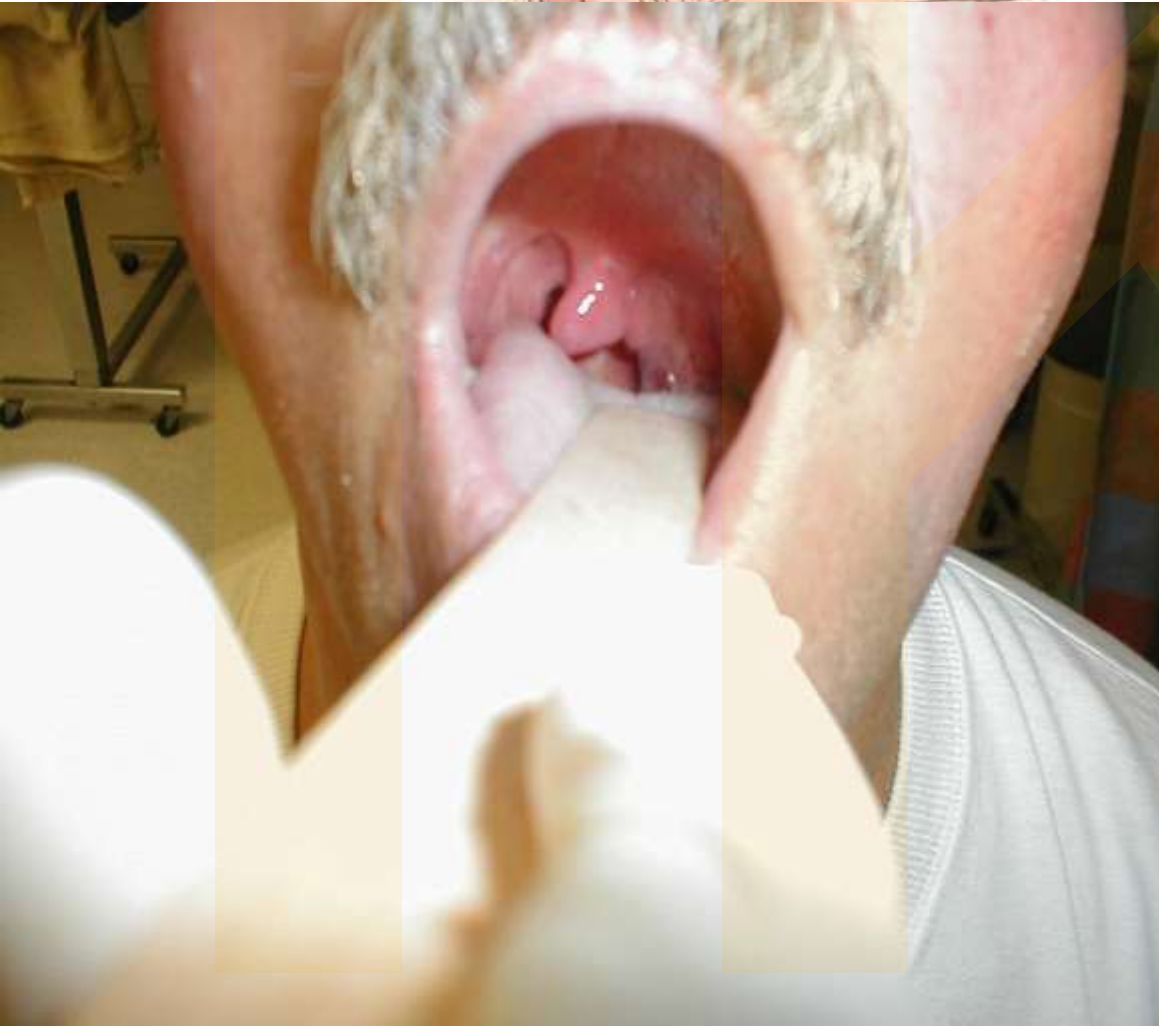
Palatine tonsil

Palatopharyngeal arch



Absces  
v peritonsilární  
krajině

Abscess  
in peritonsilar  
region



# Neck fasciae

## Fasciae cervicales

### Demarcate spaces

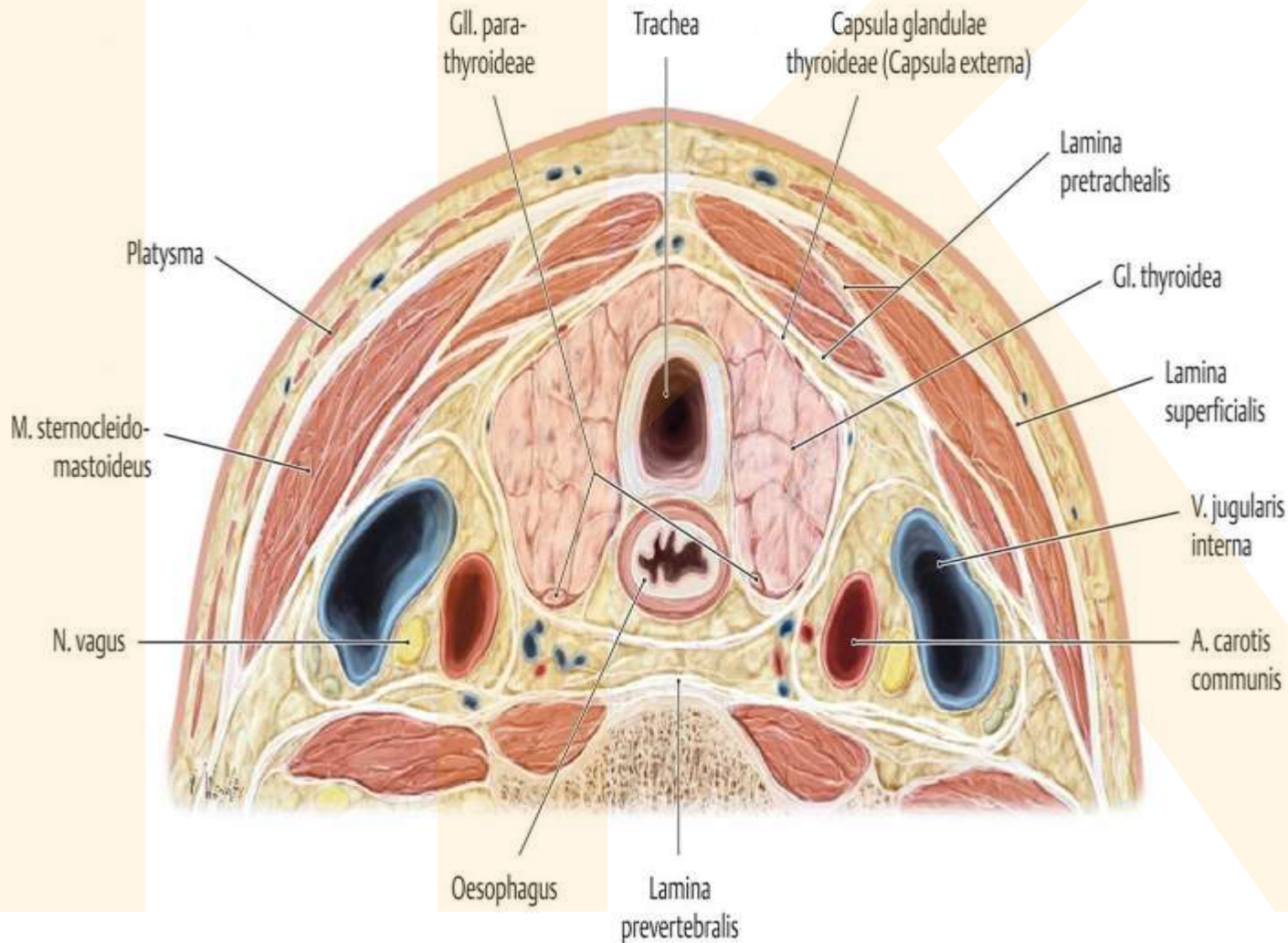
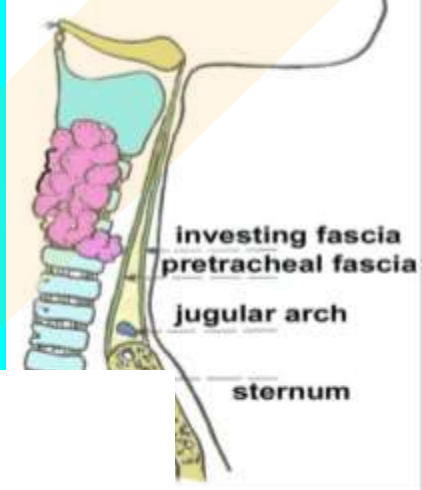
- fasciae
  - Superficial (investing):
    - → f. nuchae, f. pectoralis, f. deltoidea
    - invests m. sternocleidomastoideus + trapezius
    - f. supra/infrahyoidea
  - pretrachealis (middle neck f.)
    - form  $\Delta$ , invests infrahyoid mm.
    - vagina carotica (carotic sheet)
  - Prevertebral (deep cervical f.)
    - Covers scaleni mm.
    - Alar fascia

# Fascie cervicales

Fascia cervicalis superficialis

Fascia cervicalis media

Fascia cervicalis profunda



superfic

achealis



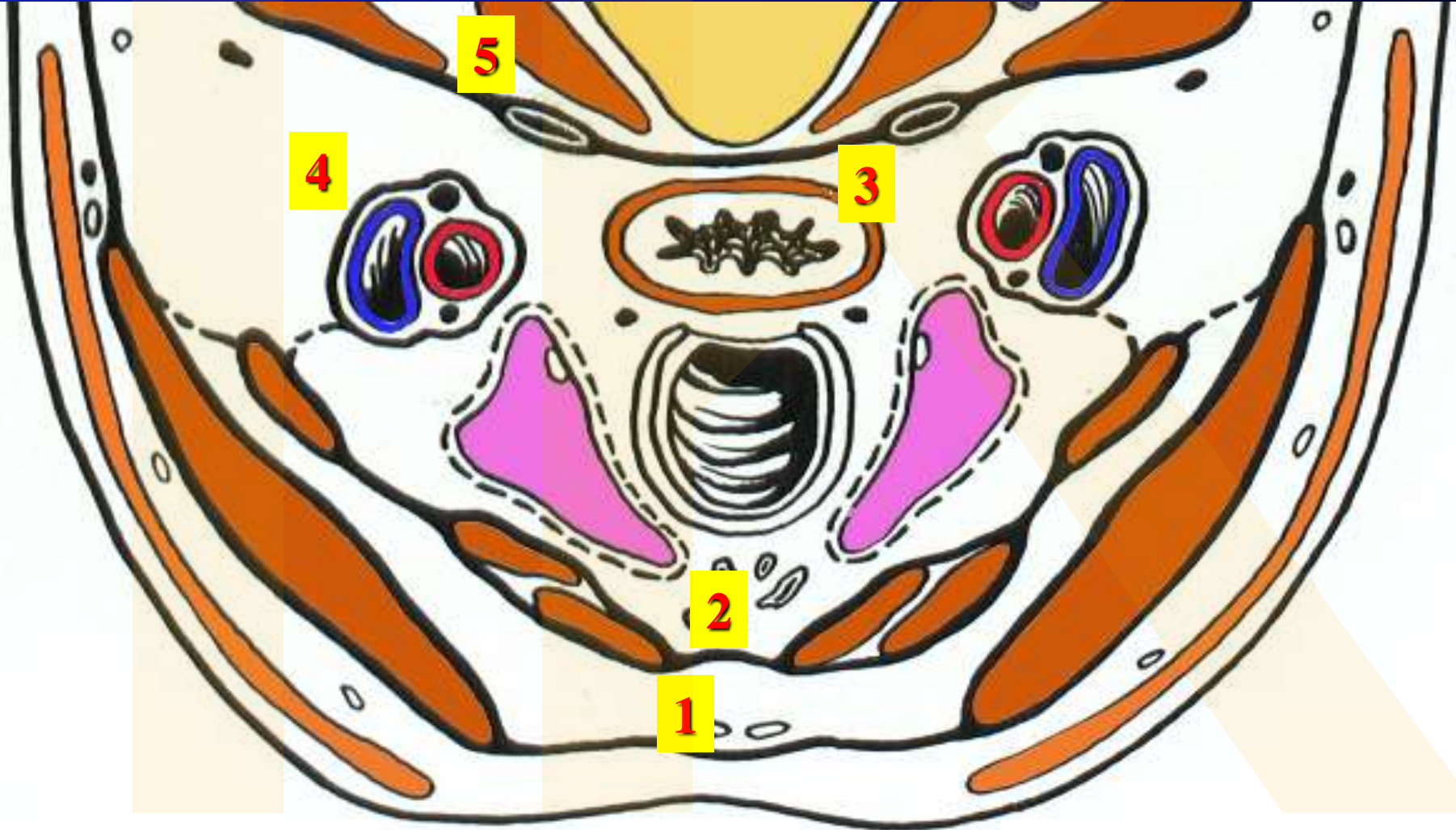
# Neck spaces - extent

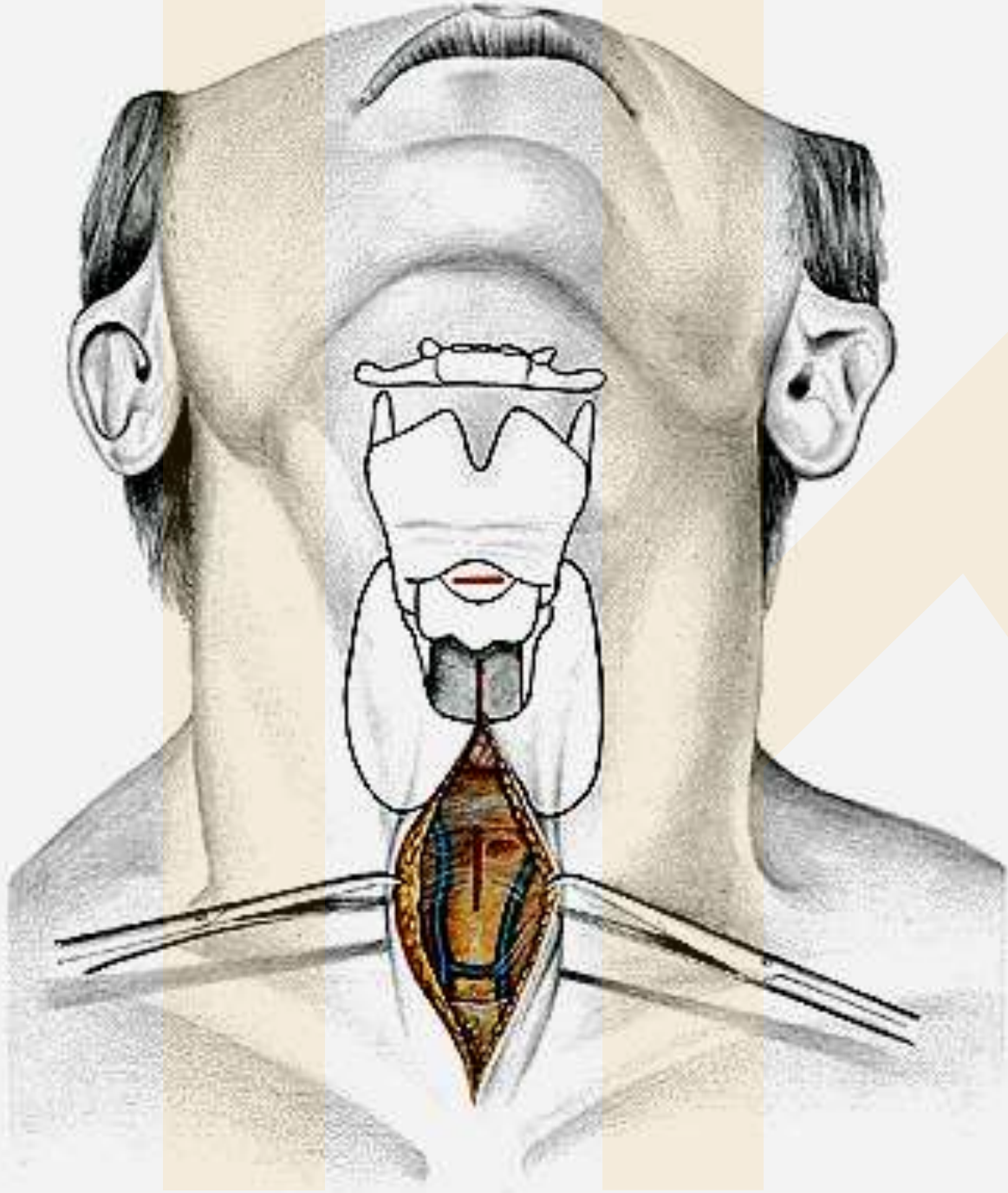
- paravisceral space
  - Continuation of parafaryngeal space
  - Nervous and vascular neck bundle
- retrovisceral space
  - Between oesophagus and prevertebral f.
  - Previsceral space
  - mezi l. pretrachealis a orgány
  - v. thyroidea inf./plx. thyroideus impar
- Suprasternal space
  - Between spf. F. and pretracheal one
  - arcus venosus juguli

# Spatia colli

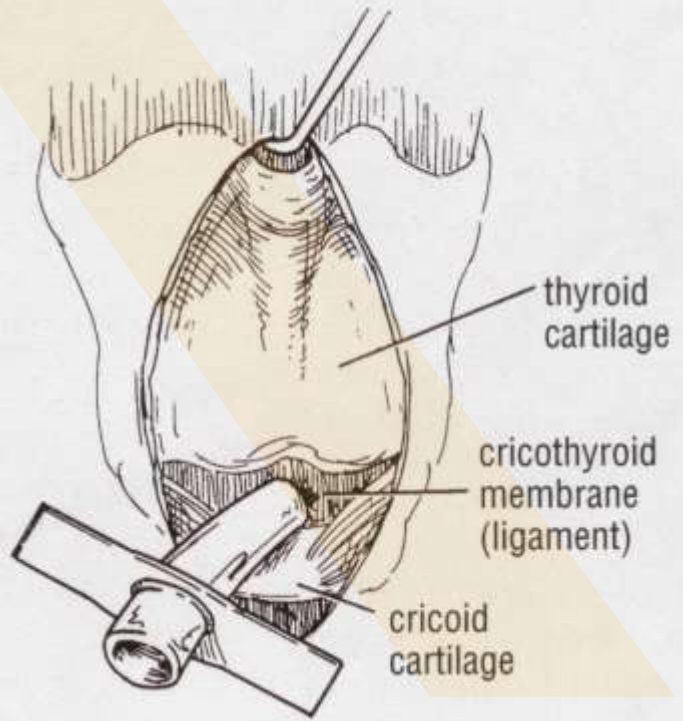
## Neck spaces

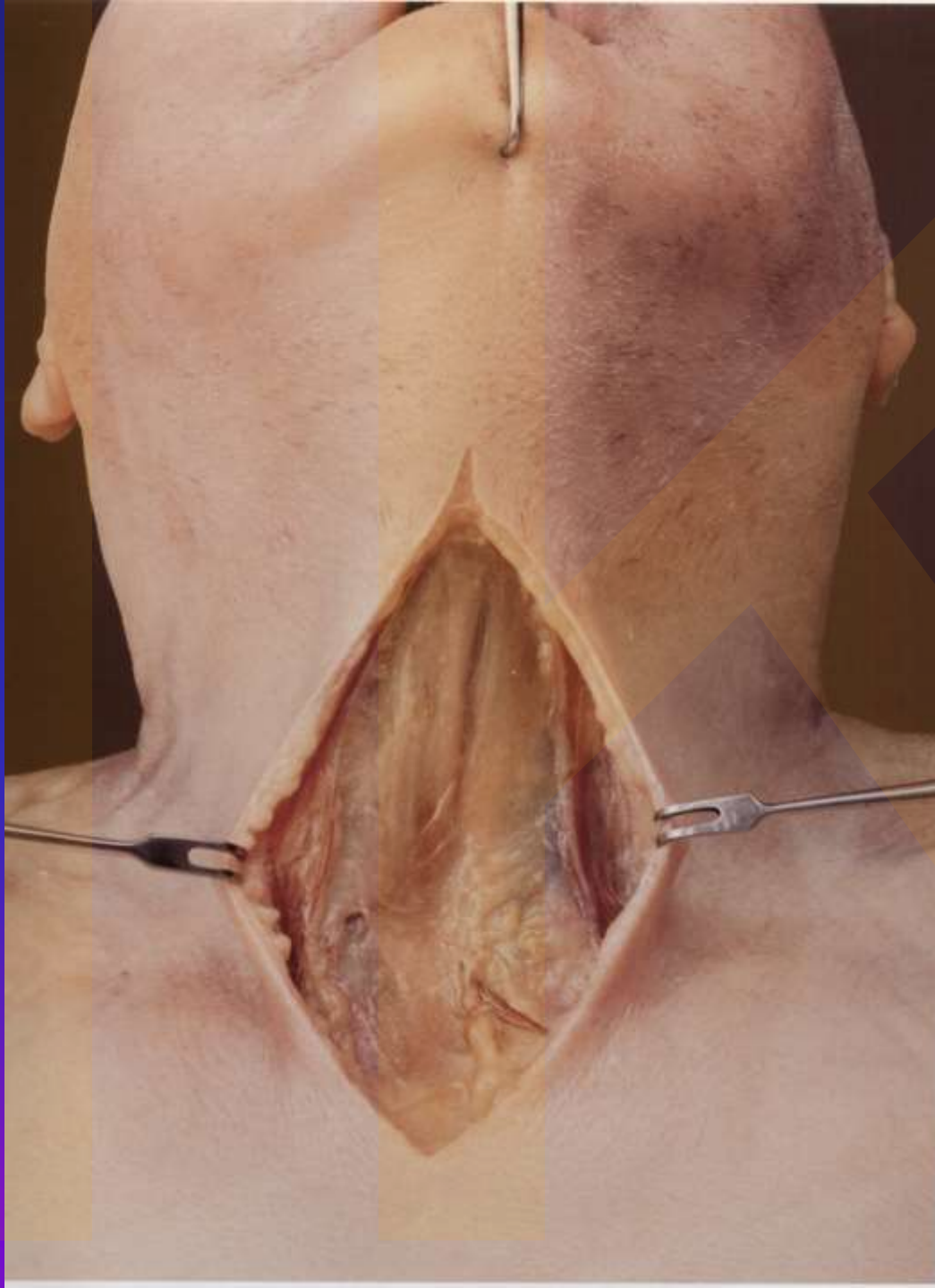
- |                         |                 |
|-------------------------|-----------------|
| 1 – sp. suprasternale   | suprasternal    |
| 2 – sp. pretracheale    | pretracheal     |
| 3 – sp. retroesophageum | retroesophageal |
| 4 – sp. paraviscerale   | paravisceral    |
| 5 – sp. prevertebrale   | prevertebral    |



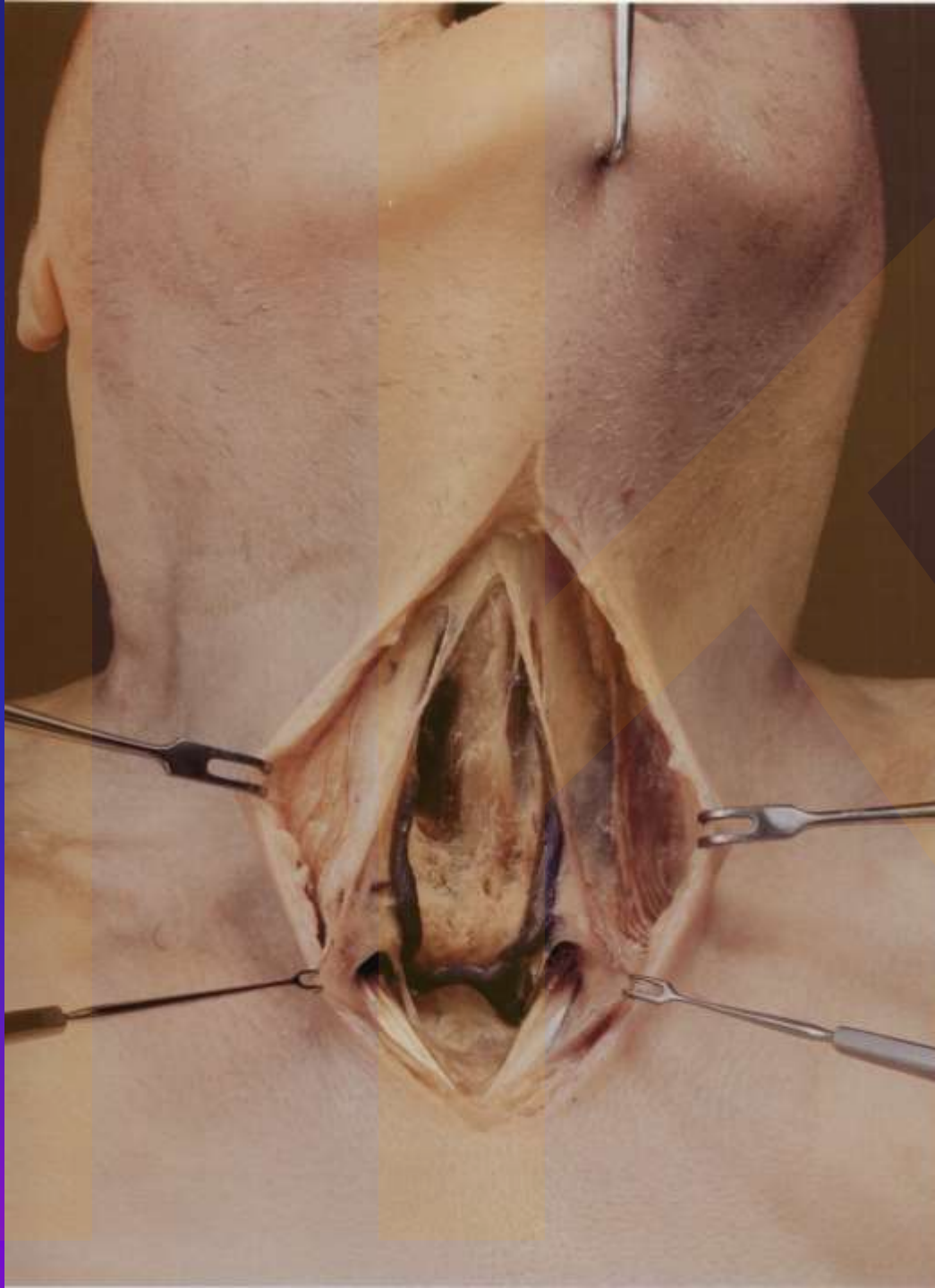


koniotomy  
tracheostomy



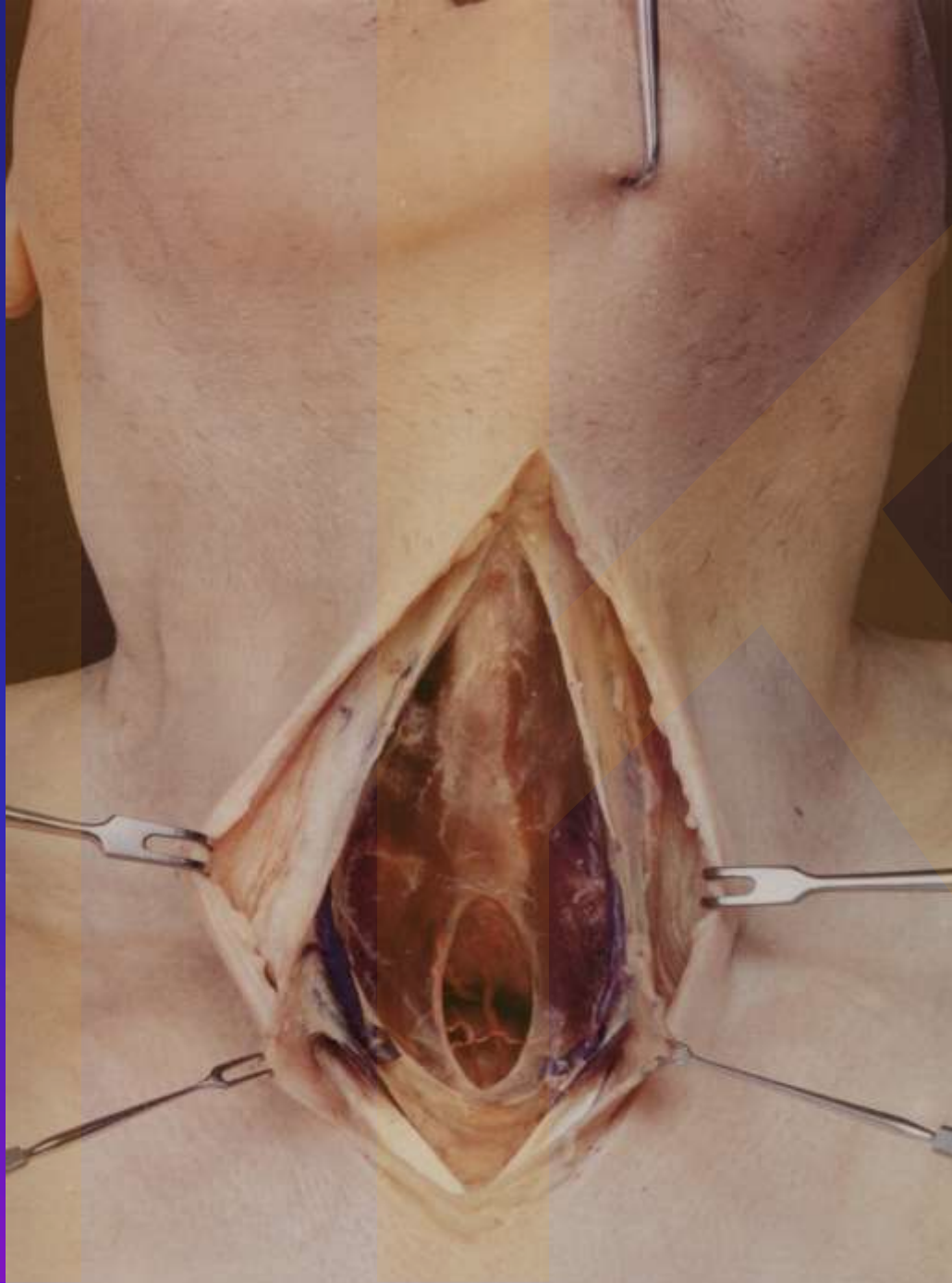


Fascia superficialis  
Investing fascia



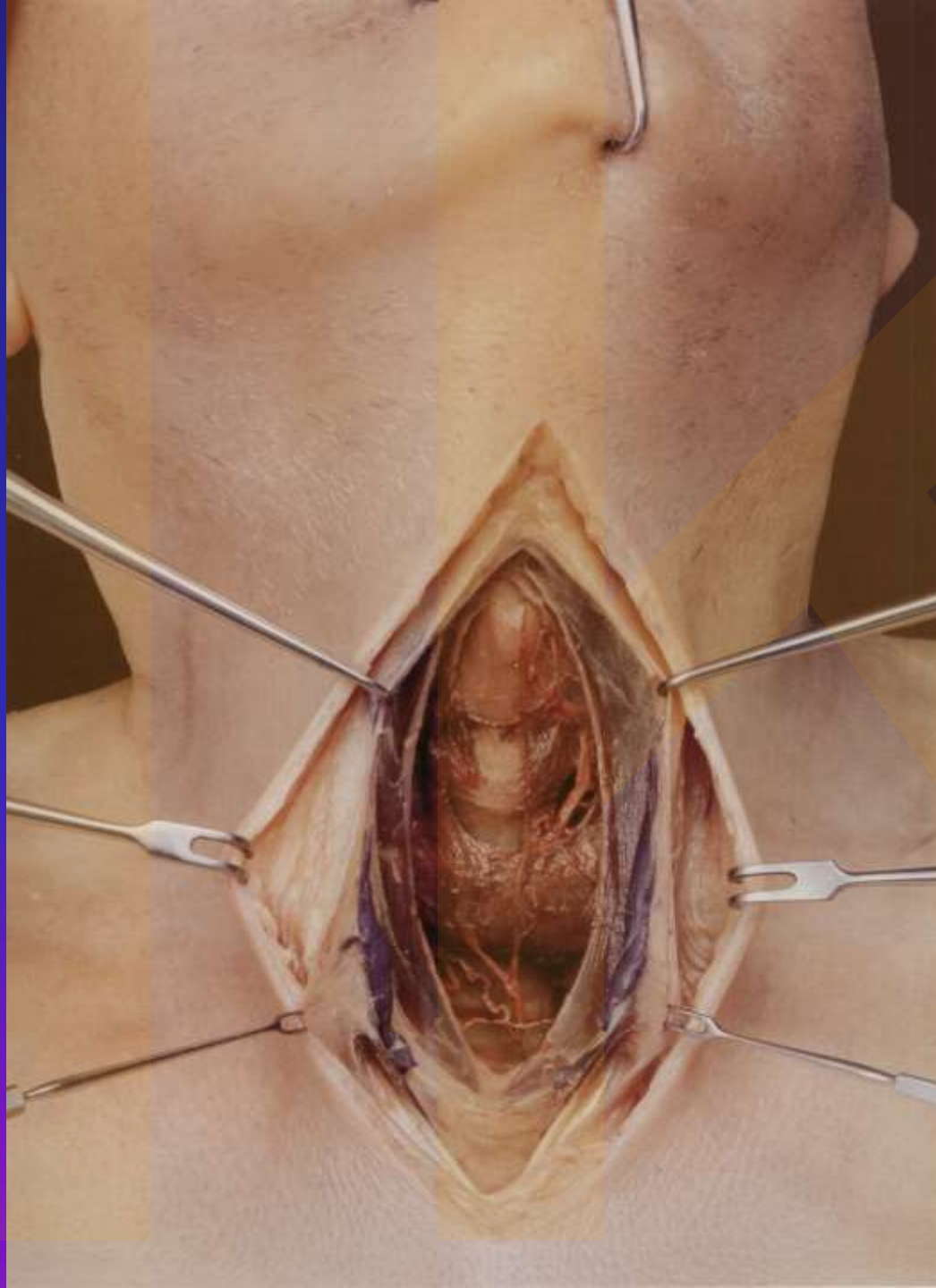
Fascia superficialis  
Investing fascia

Prot'ata  
cut



Fascia pretrachealis  
Pretracheal fascia

S otvorem  
windowed



Fascia pretrachealis  
pretracheal fascia

Široce otevřena  
Widely cut

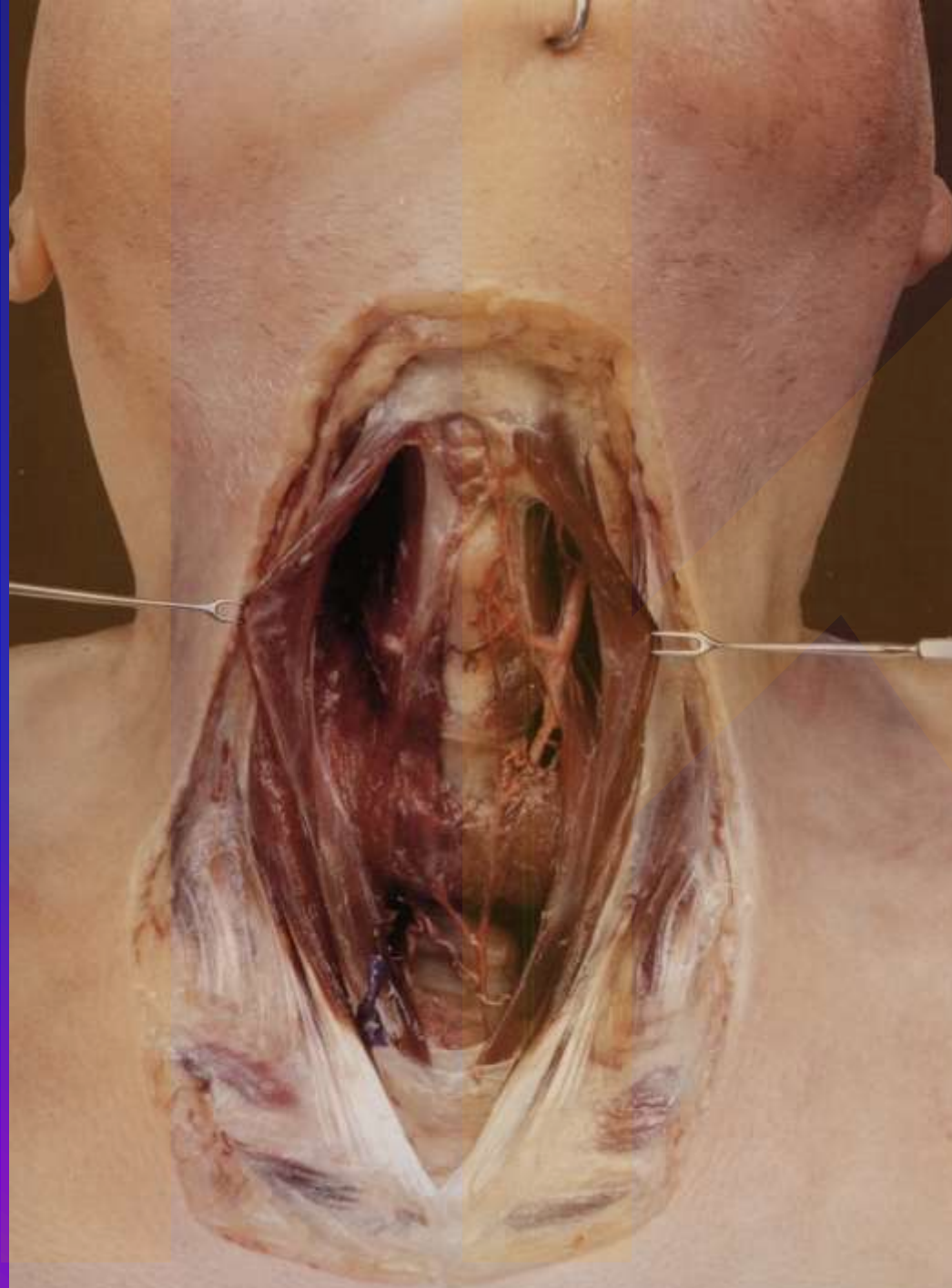


Isthmus gl.  
thyroideae

Thyroid gland  
isthmus





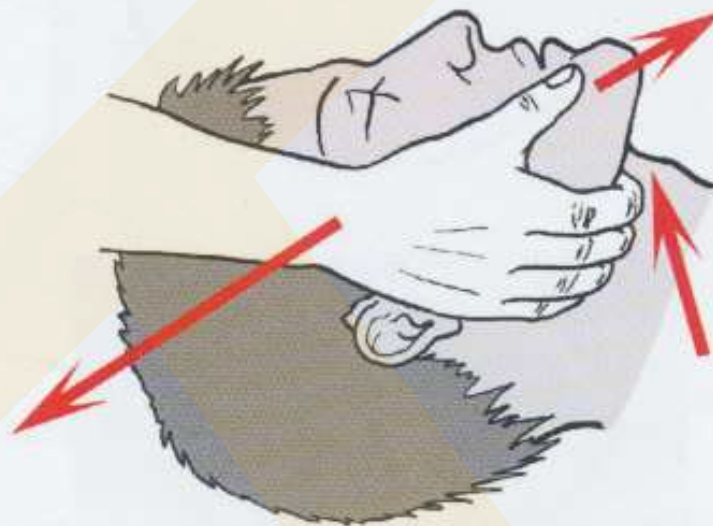
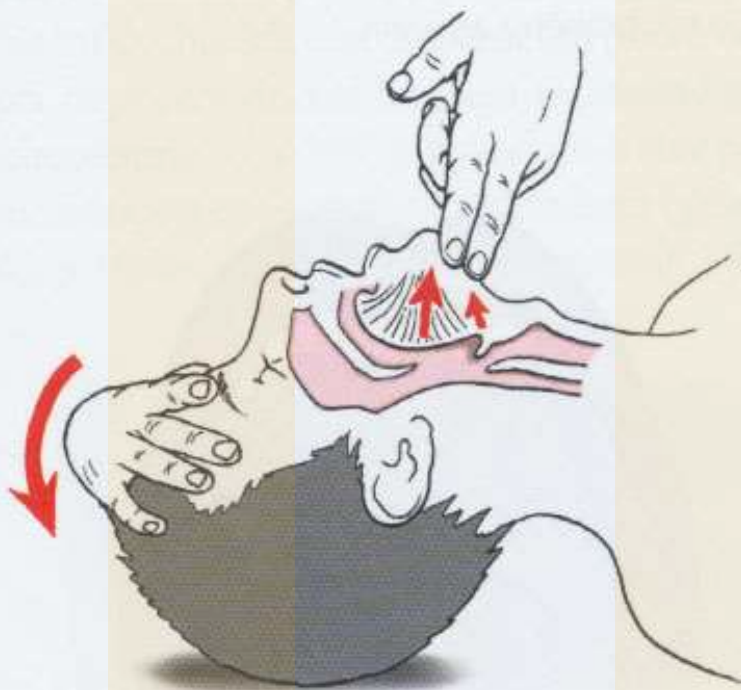
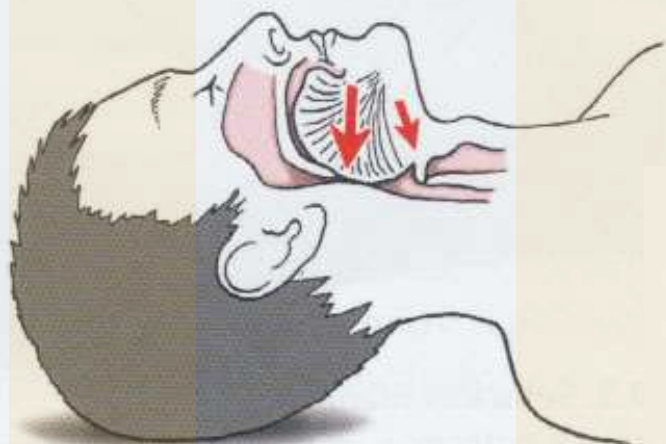


a. thyroidea superior

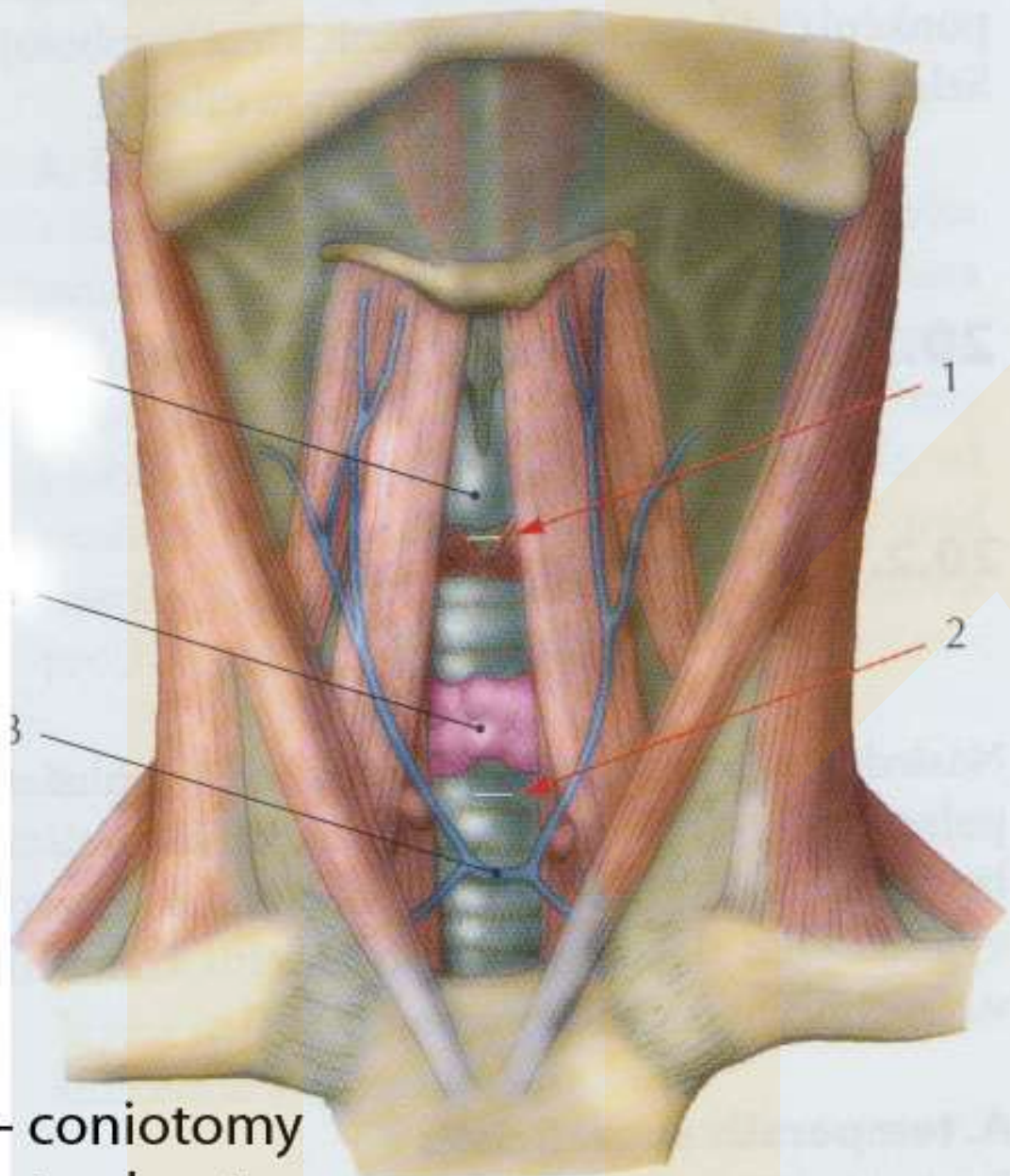
Superior thyroid a.

Tracheální chrupavky

Tracheal rings

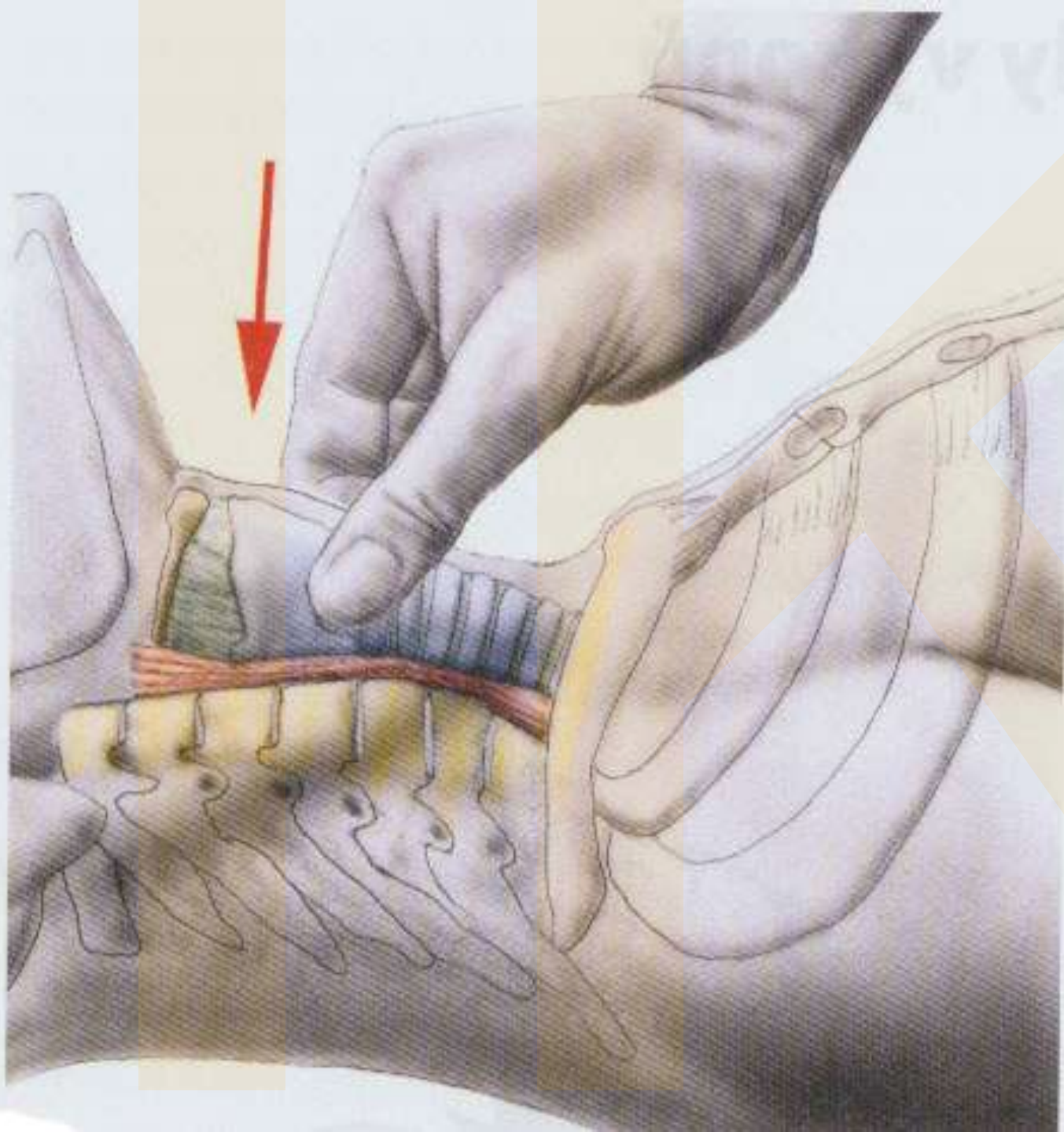


Trojitý hmat (Esmarchův manévr) kombinuje předchozí postup s předsunutím dolní čelisti a otevřením úst



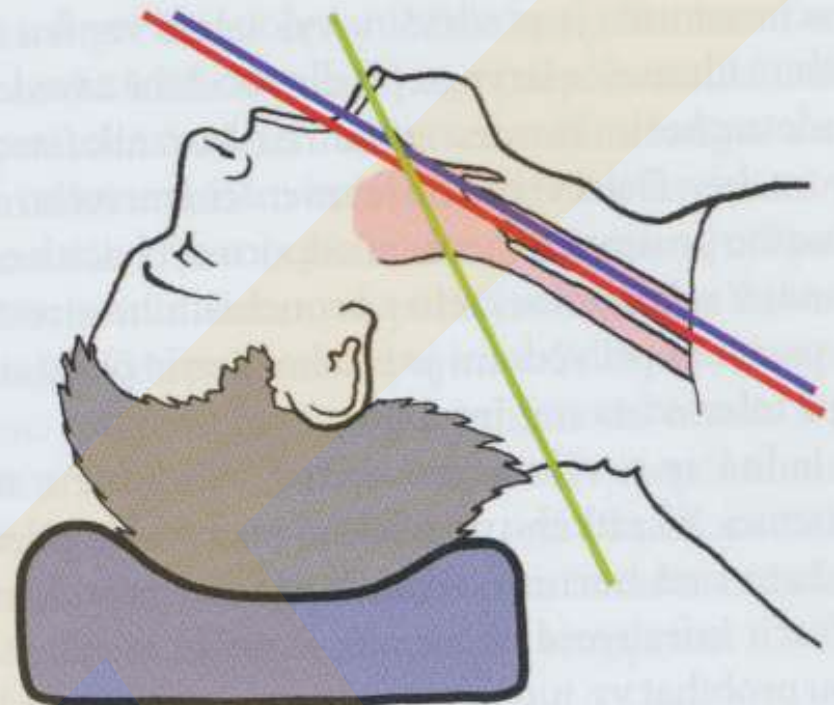
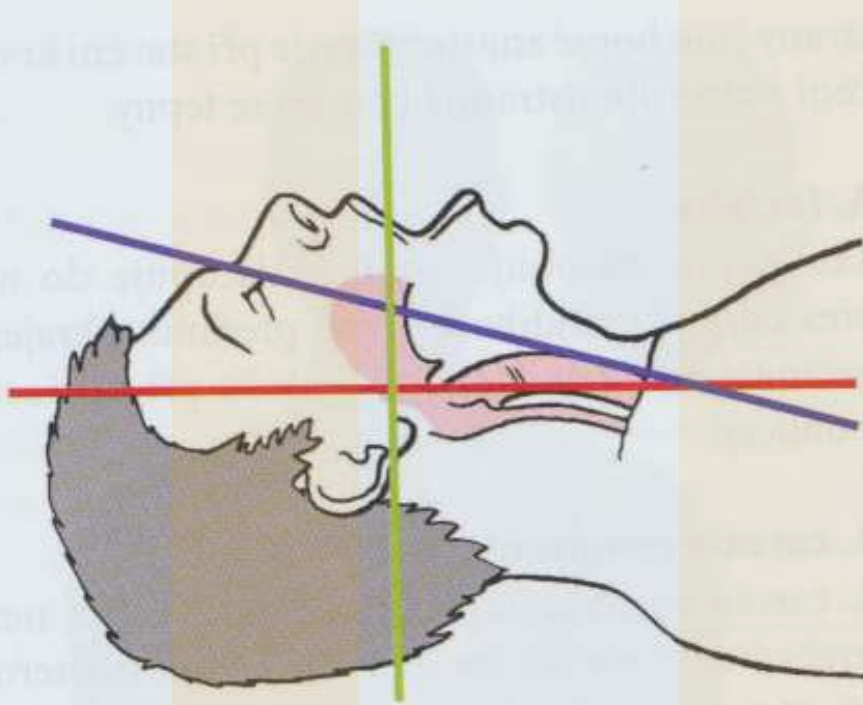
- 1 - coniotomy
- 2 - tracheotomy
- 3 - arcus venosus juguli

Oblast, kde  
se provádí  
koniotomie  
a  
tracheotomie



Sellickův  
manévr -  
je stlačen  
jícen a tím  
se brání  
aspiraci jeho  
obsahu

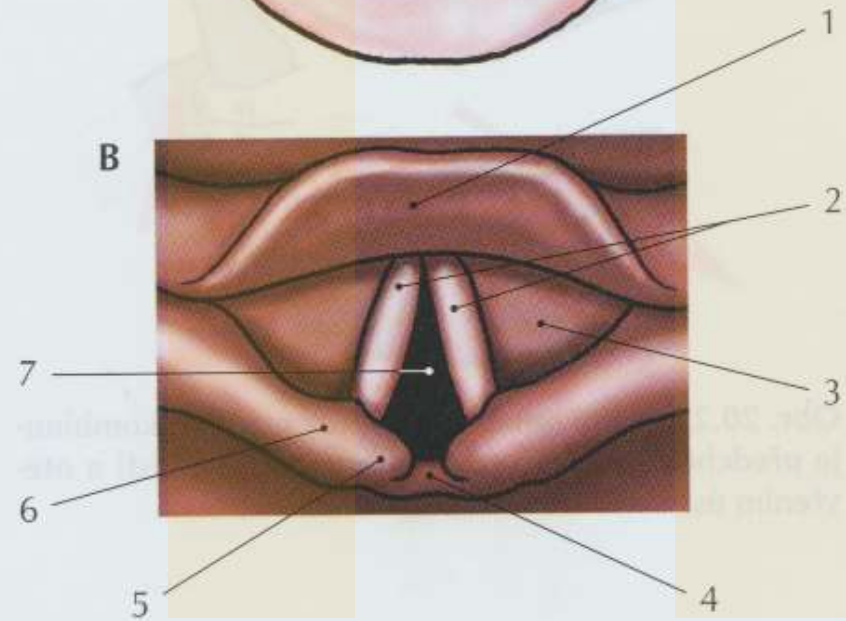
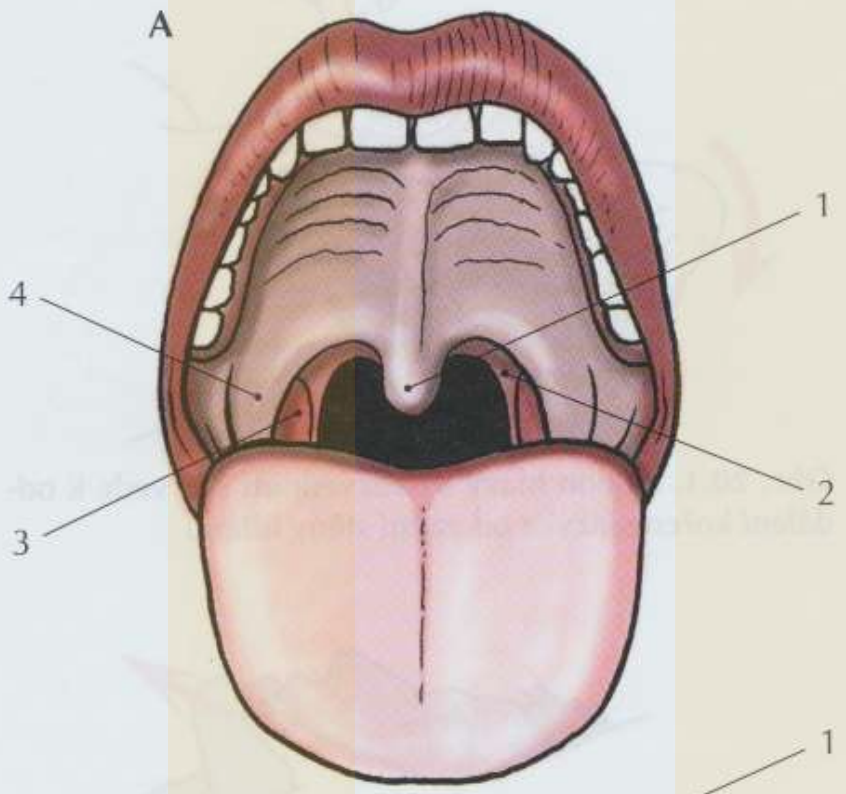
kontraindikován  
při poranění  
jícnu!



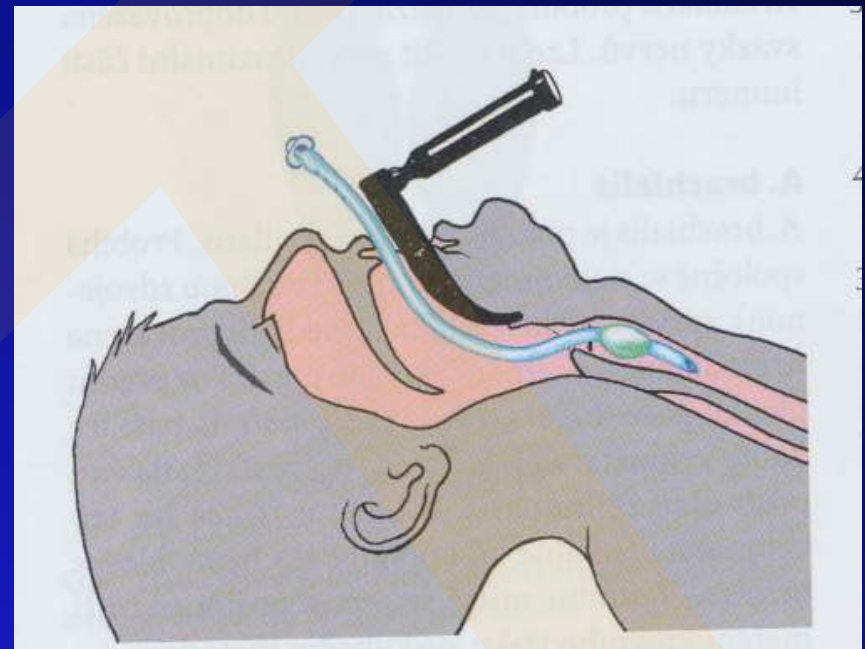
Obr. 20.5. Nejvýhodnější poloha pro orotracheální intubaci při podložení hlavy a ramen, dojde k vyrovnání osy dutiny ústní, hltanu a hrtanu lépe než při jednoduchém záklonu hlavy

Poloha pro intubaci

Intubation position



- A**
- 1 – patrový čípek
  - 2 – arcus palatopharyngeus
  - 3 – tonsilla palatina
  - 4 – arcus palatoglossus
- B**
- 1 – epiglottis
  - 2 – plicae vocales
  - 3 – plica vestibularis
  - 4 – incisura interarytenoidea
  - 5 – tuberculum corniculatum
  - 6 – tuberculum cuneiforme
  - 7 – hlasivková štěrbina (rima glottidis)



Obr. 20.6. Zavádění endotracheální kanyly pomocí laryngoskopu ústy přes hrtan do průdušnice. Lžice laryngoskopu stlačuje kořen jazyka a umožňuje tak zavedení kanyly mezi hlasovými vazy do průdušnice (sagitální řez)

\* \_

oedemapreepiglotticum

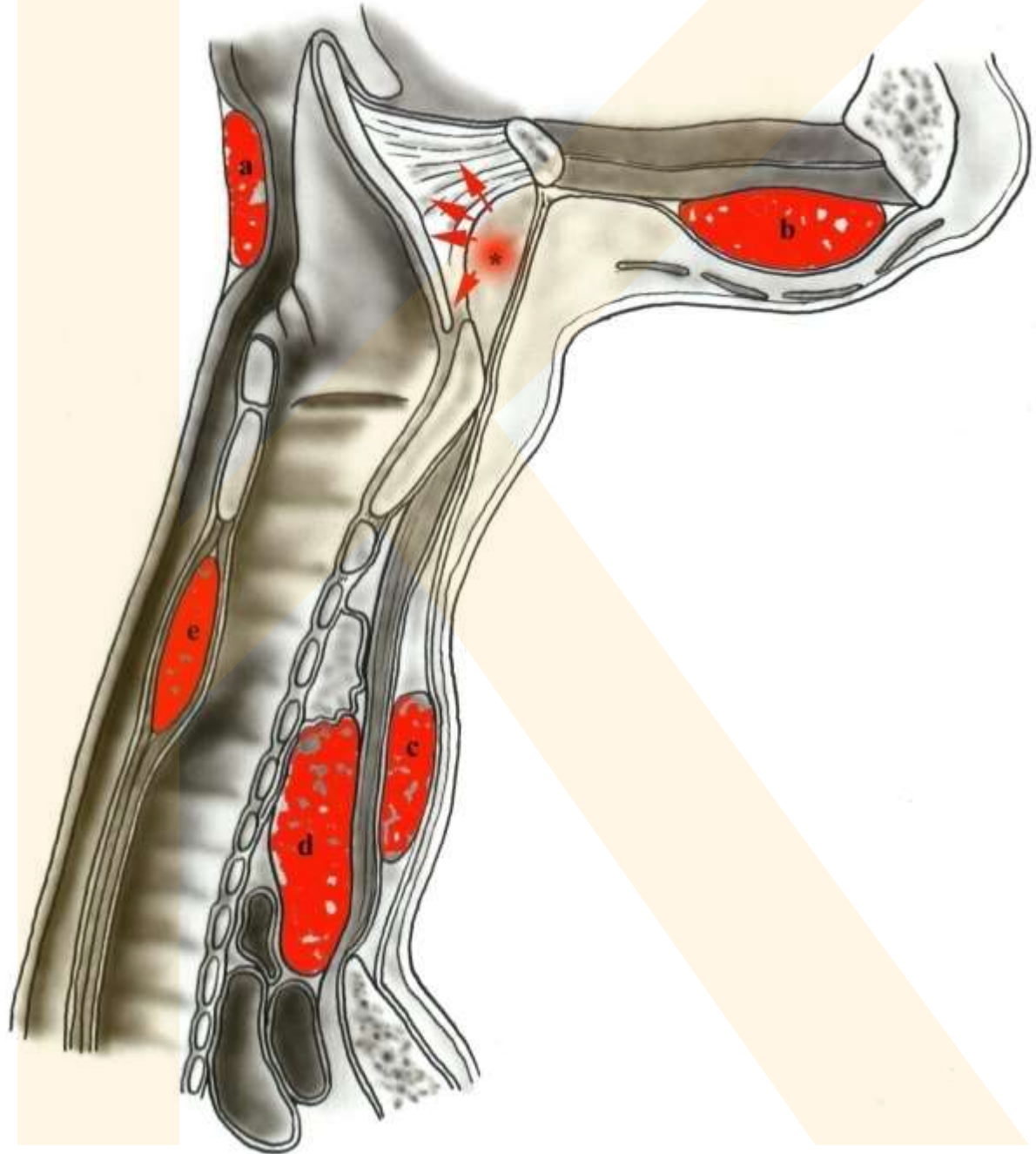
a – retropharyngealis  
abscessus

b – submandibularis  
abscessus

c – suprasternalis  
abscessus

d – pretrachealis abscessus

e – retrotrachealis  
abscessus

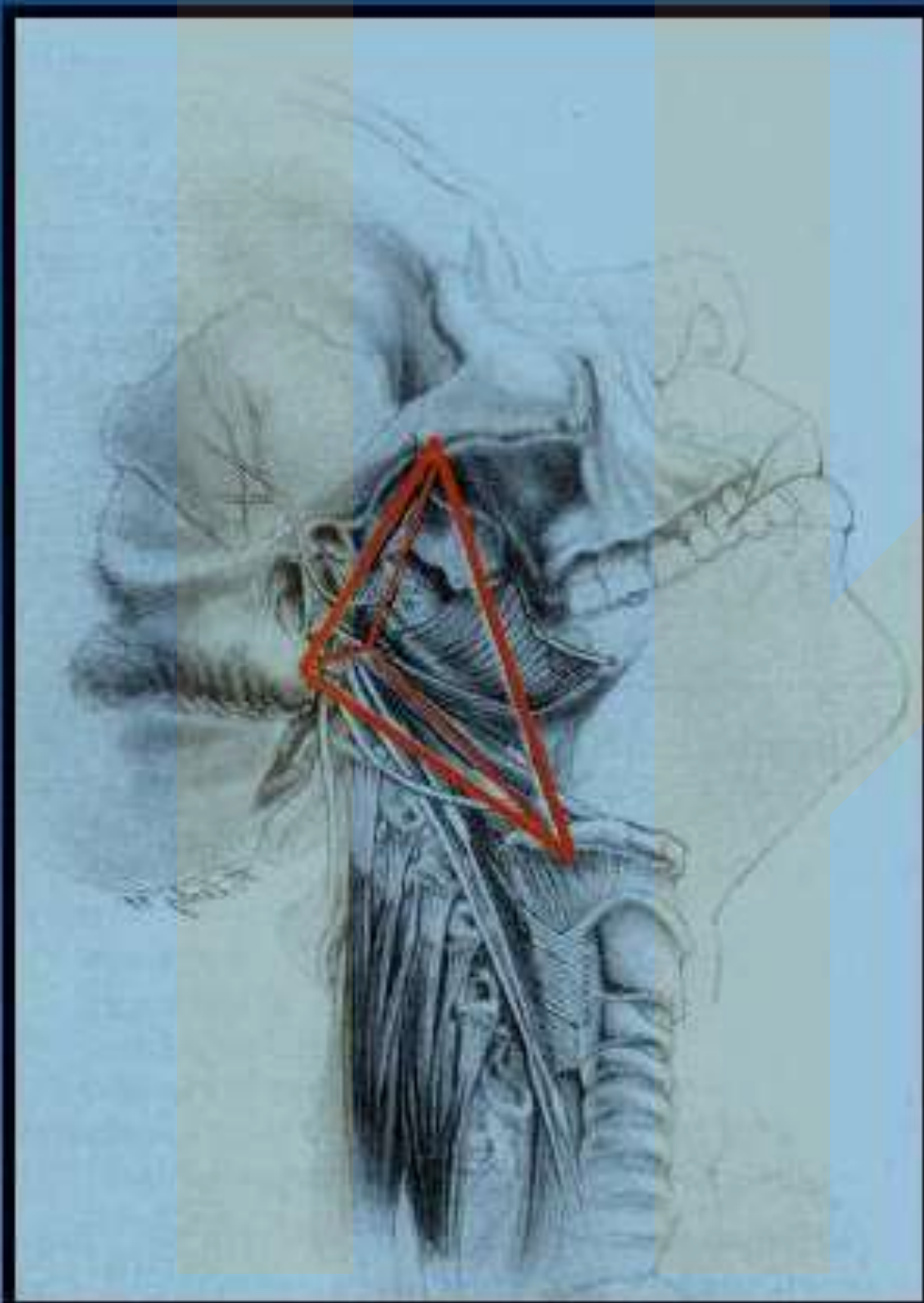


# Pharyngeal tissue spaces

Parapharyngeal space (lateral pharyngeal space) lies around the pharynx – between pharynx, parotid gland, pterygoid muscles, skull base and suprahyoid structures (it is partially divided by the styloid process and styloid septum)

Intrapharyngeal space lies between inner surface of the superior constrictor muscle and the pharyngeal mucosa  
part of this space is peritonsillar space

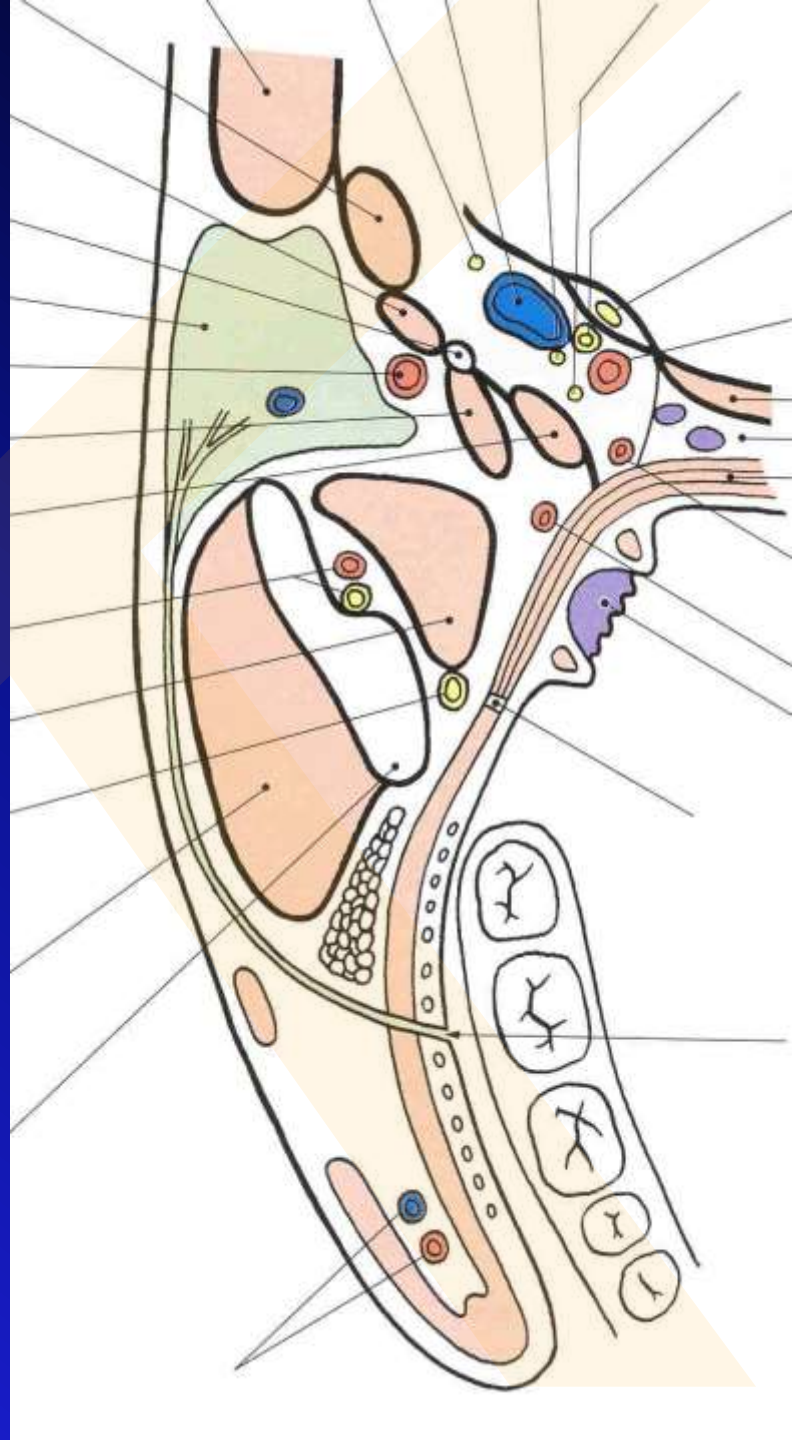
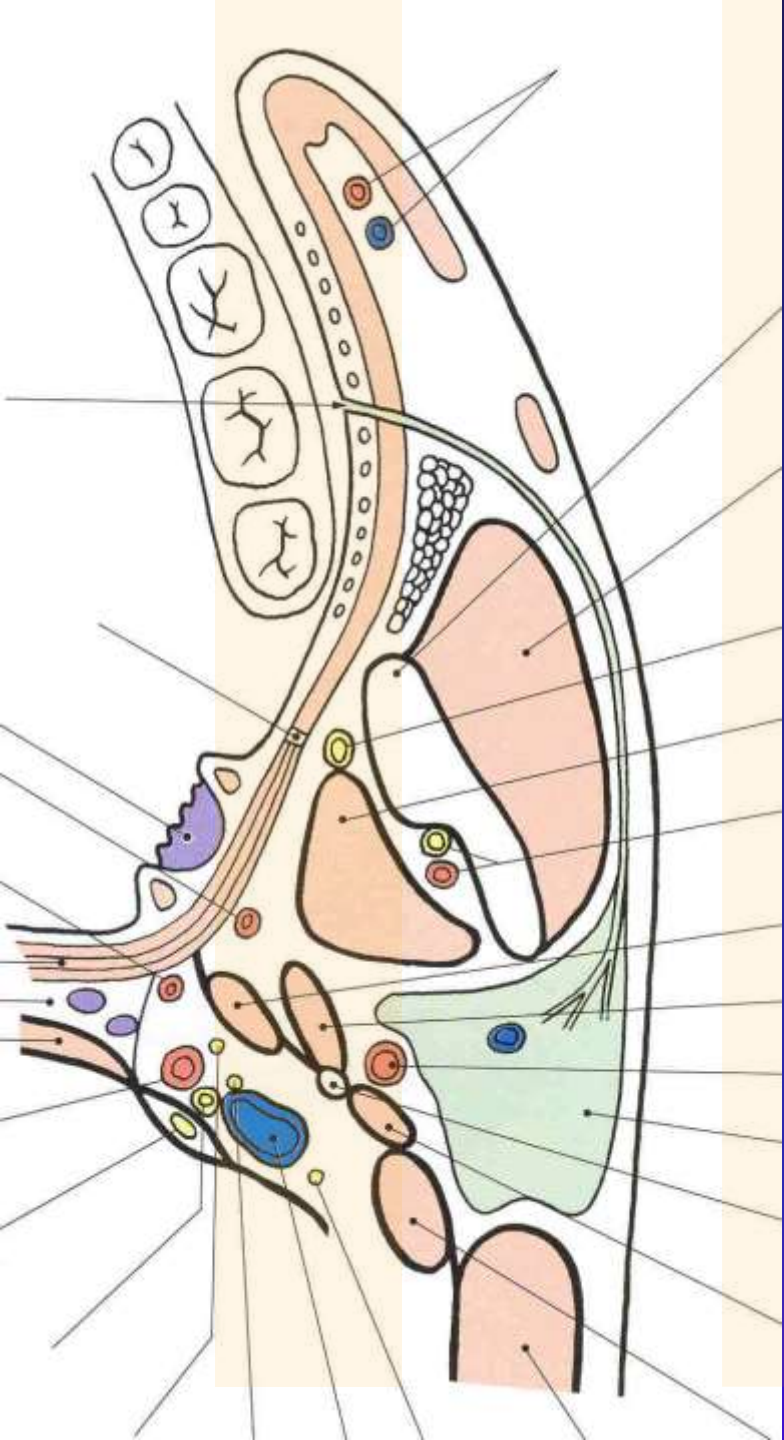


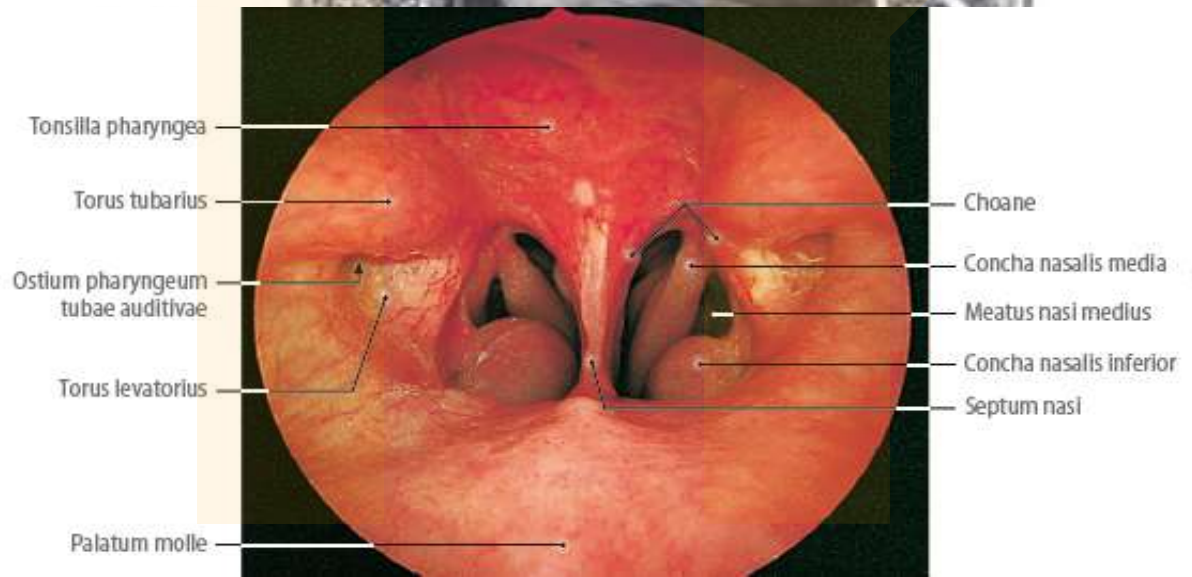
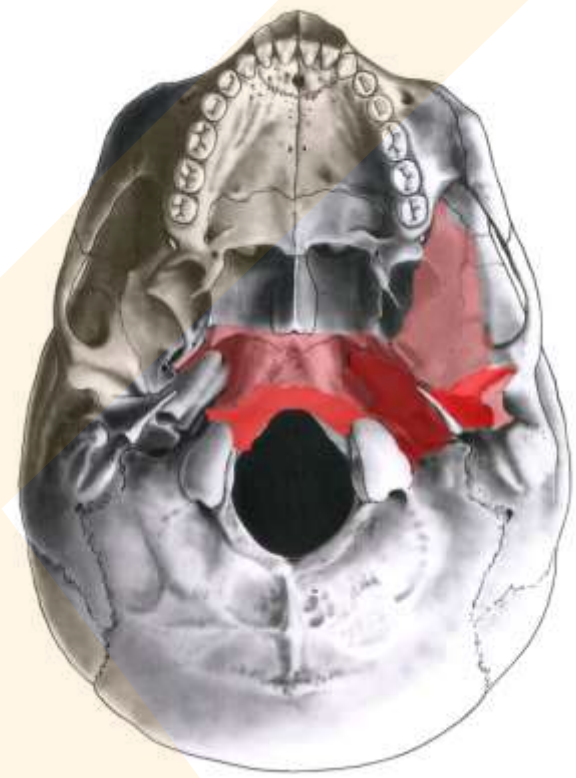
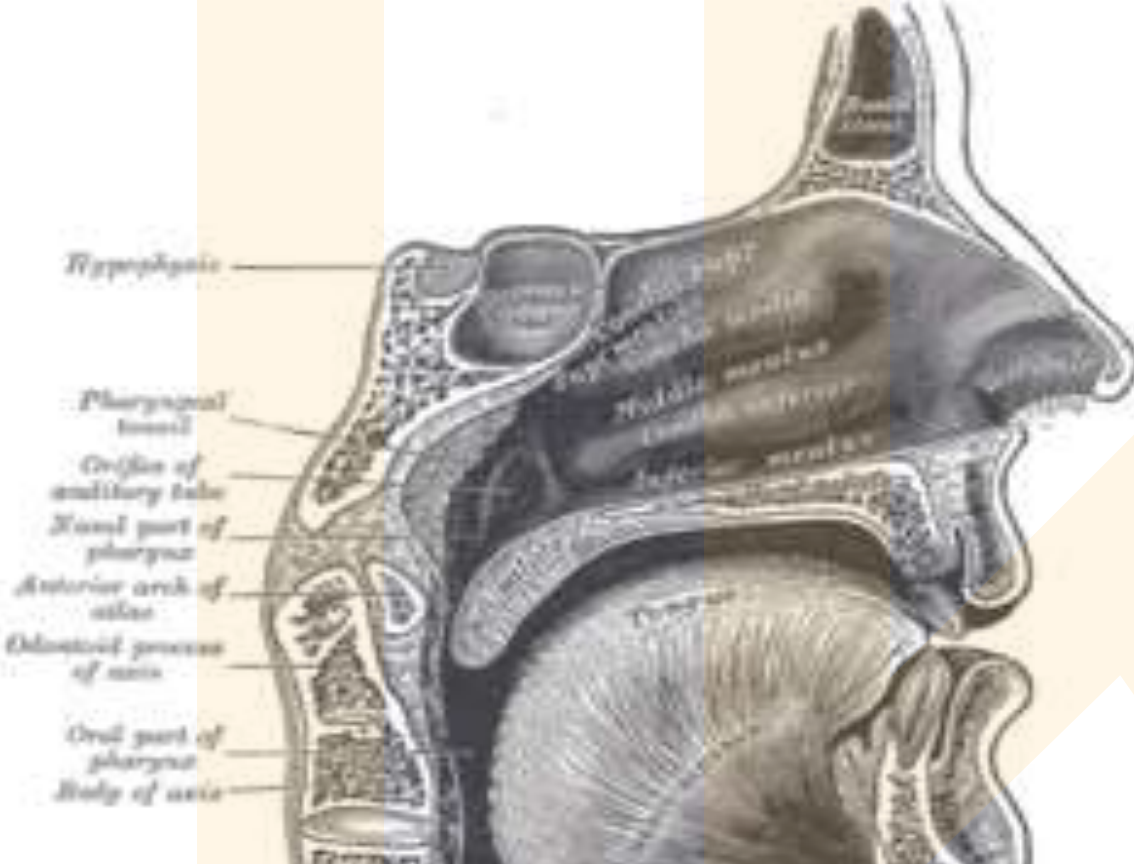


Parapharyngeální  
prostor

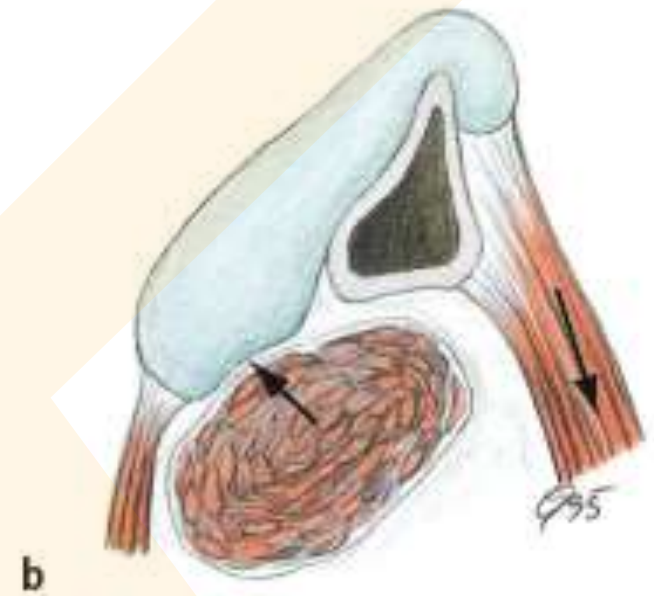
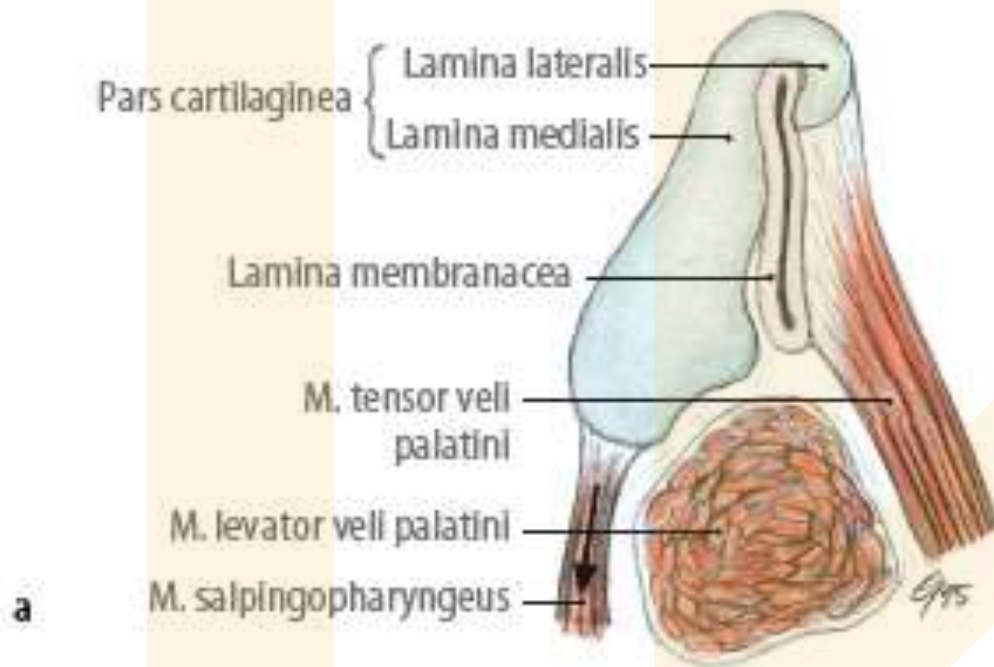
Parapharyngeal  
space

(Work and Hybels. Laryngoscope 1974;84:1748-1755.)





**Torus Passavanti**  
**Passavantū val**  
**Passavant's swelling**

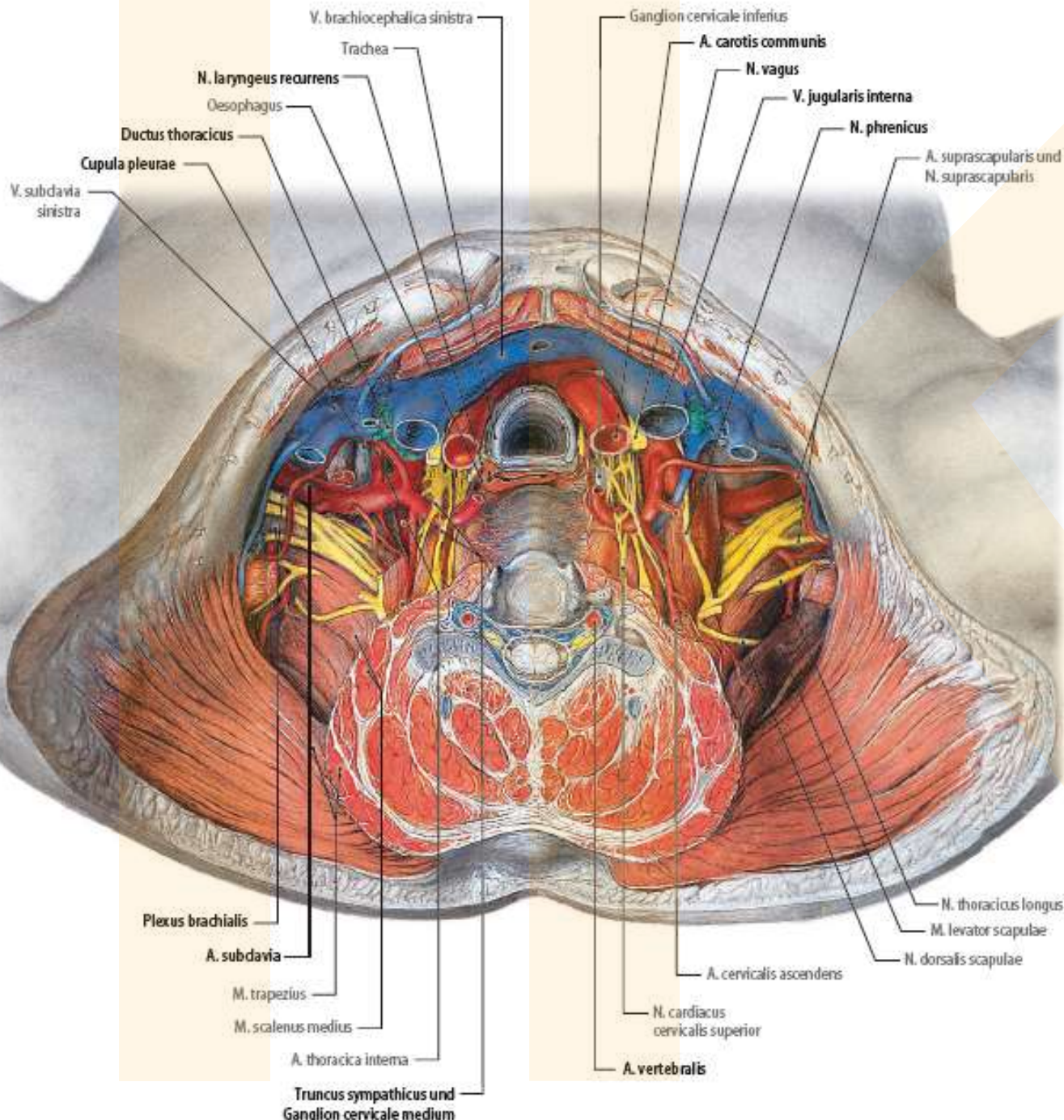


Tensor rozširuje ústí  
 levator zahajuje rozšíření  
 tensor dilates tuba  
 levator starts opening process of  
 tuba

# **Retropharyngeal space**

**lies between pharynx and the prevertebral fascia**

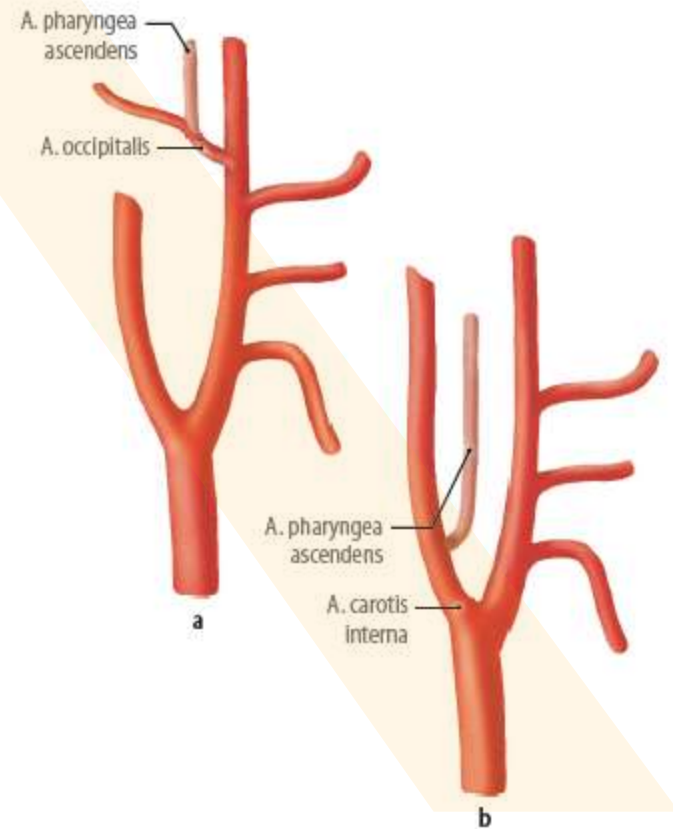
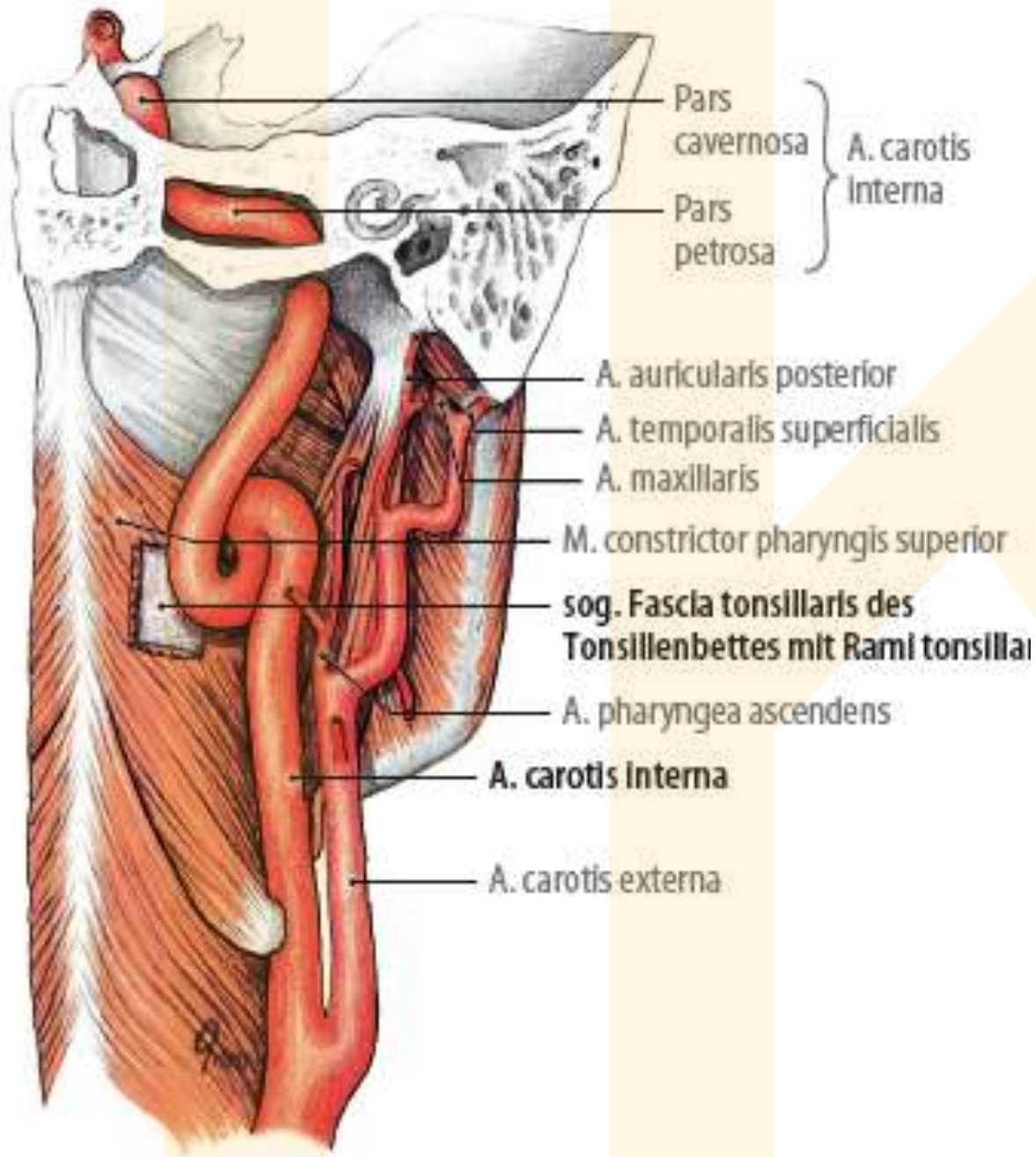
**lies between superficial temporal fascia and (*squamous part of the temporal bone*)**



Luschkov  
prostor

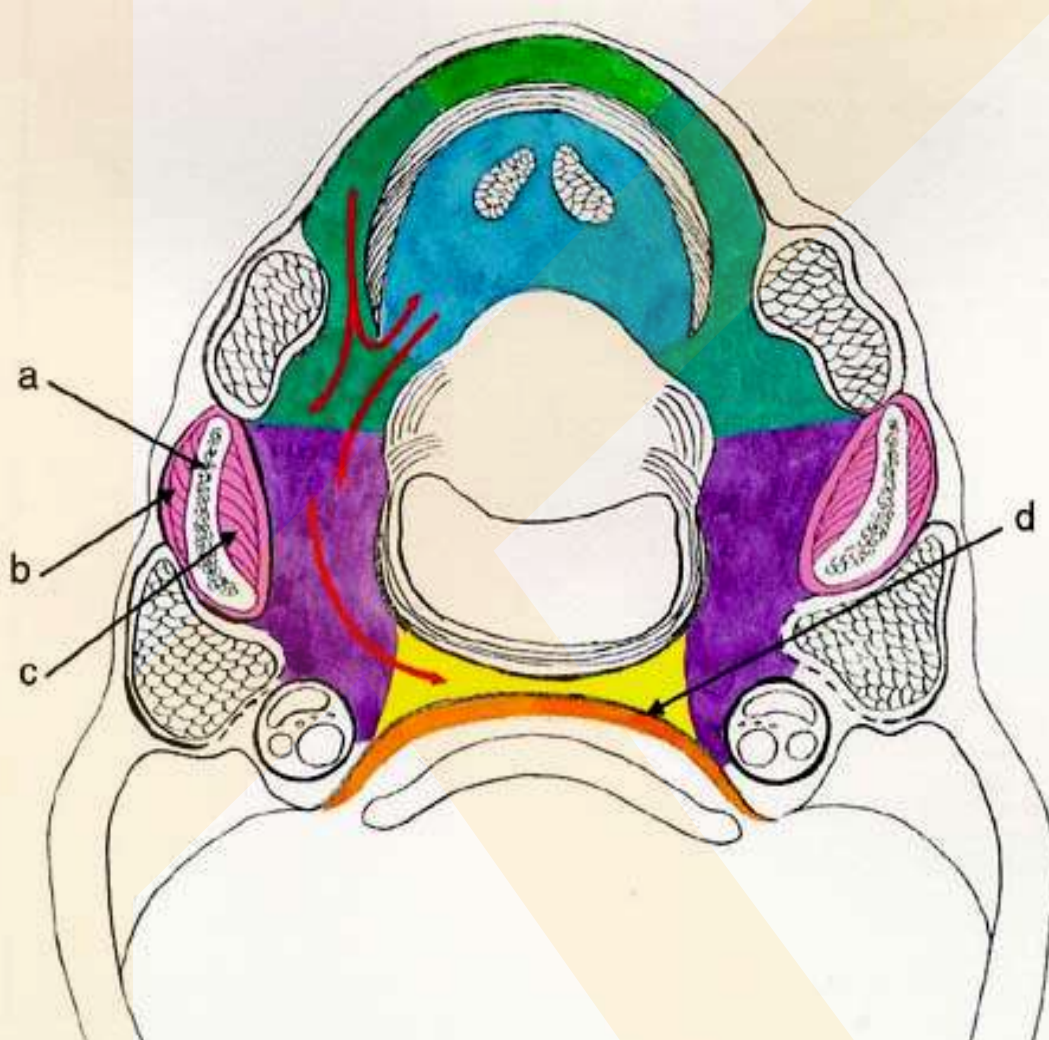
Luschka  
space

# Perifaryngové prostory Peripharyngeal spaces



- submental space
- submaxillary space
- sublingual space
- lateral pharyngeal space
- retropharyngeal space
- danger space #4

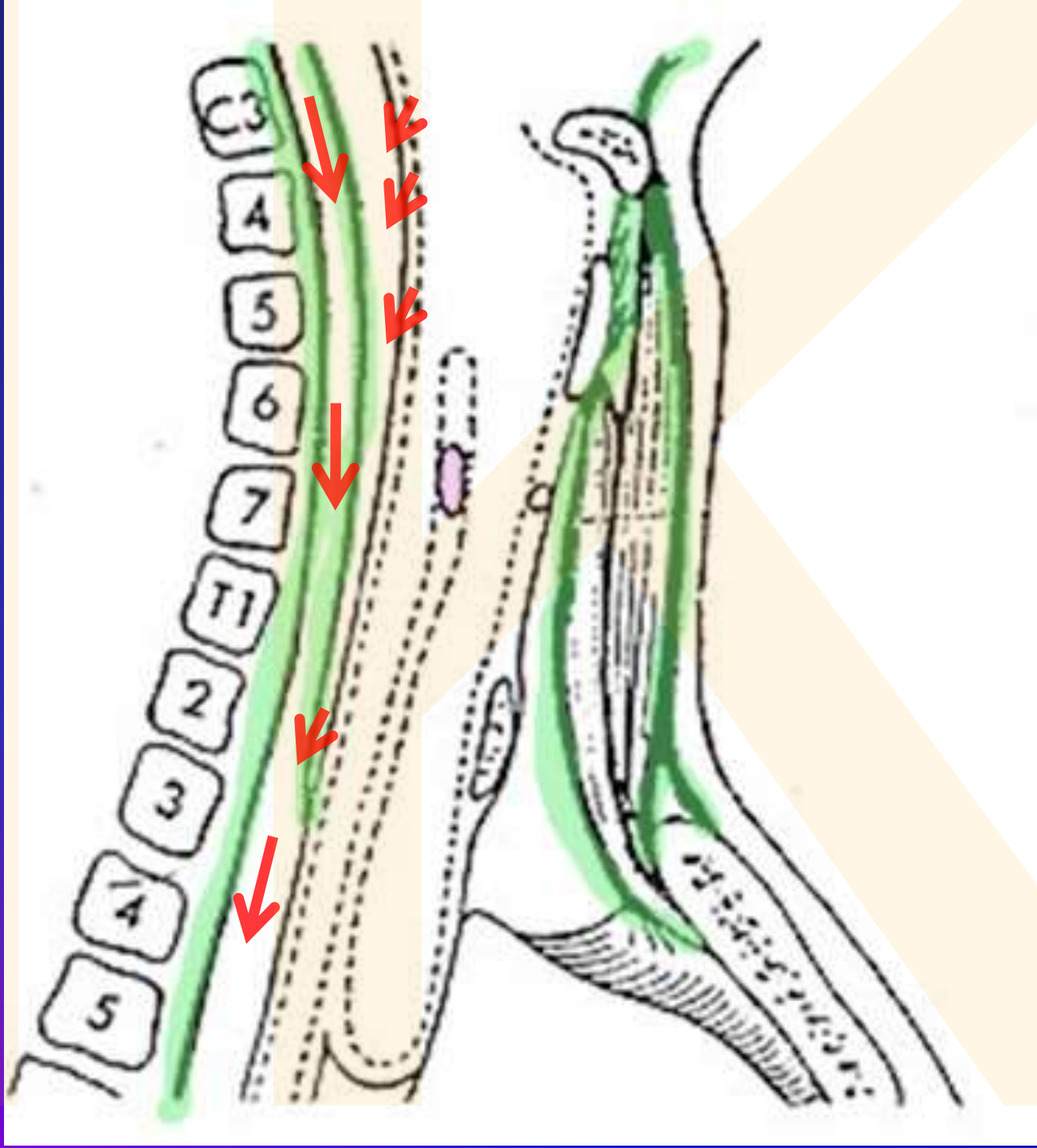
Level of lower jaw



- masticator space
- a- ramus of the mandible
- b- masseter muscle
- c- medial pterygoid muscle
- d- alar fascia
- infection pathway

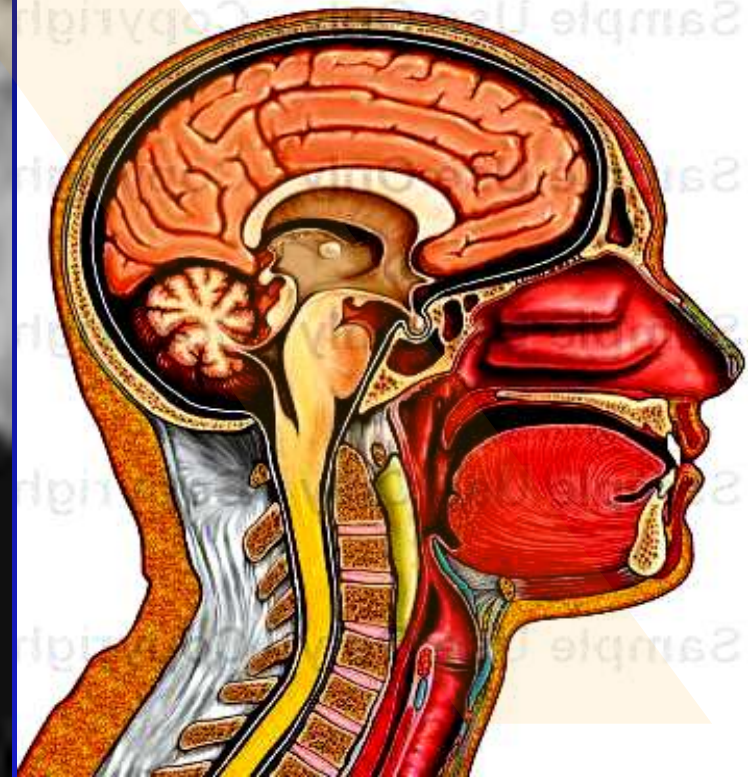
**Retrovisceral space is divided into retropharyngeal space and danger space using alar fascia (intercarotic). Clinically important – proceeding from skull basis to posterior mediastinum !!!!!**

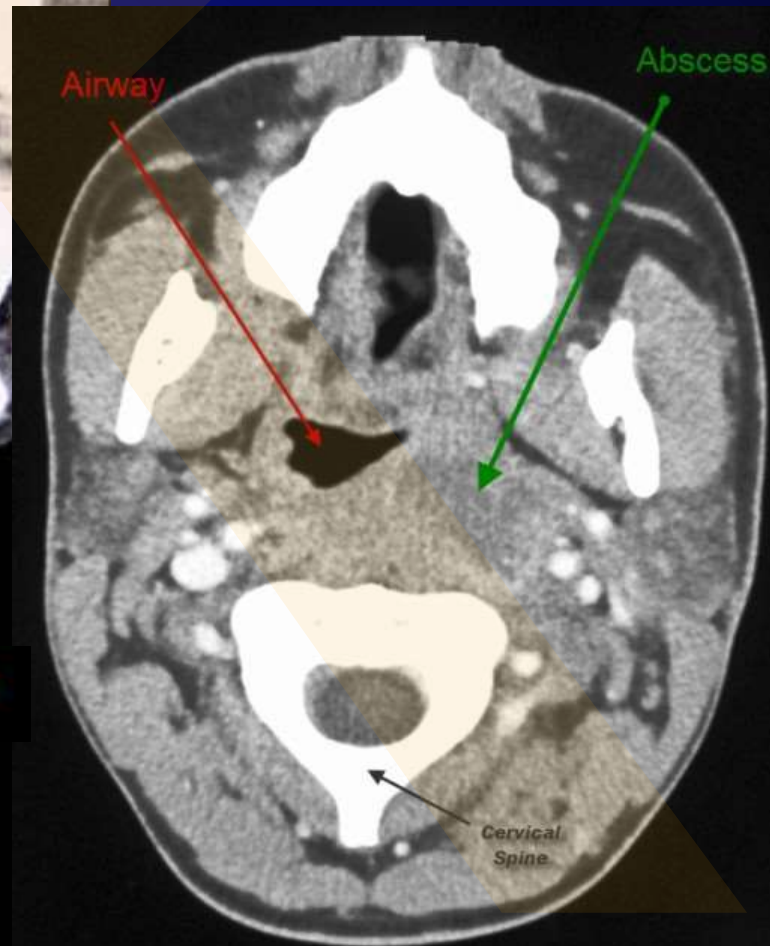
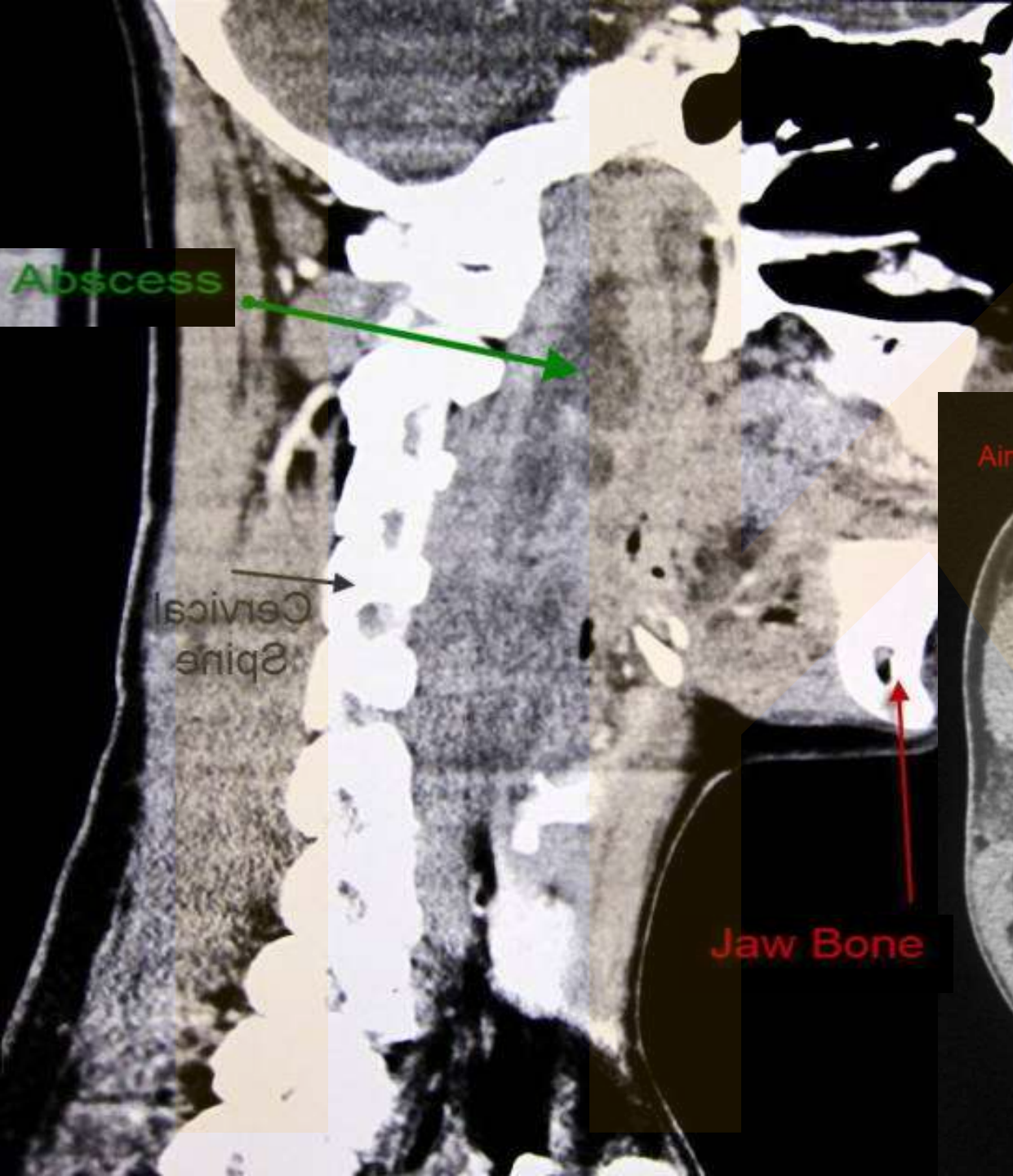


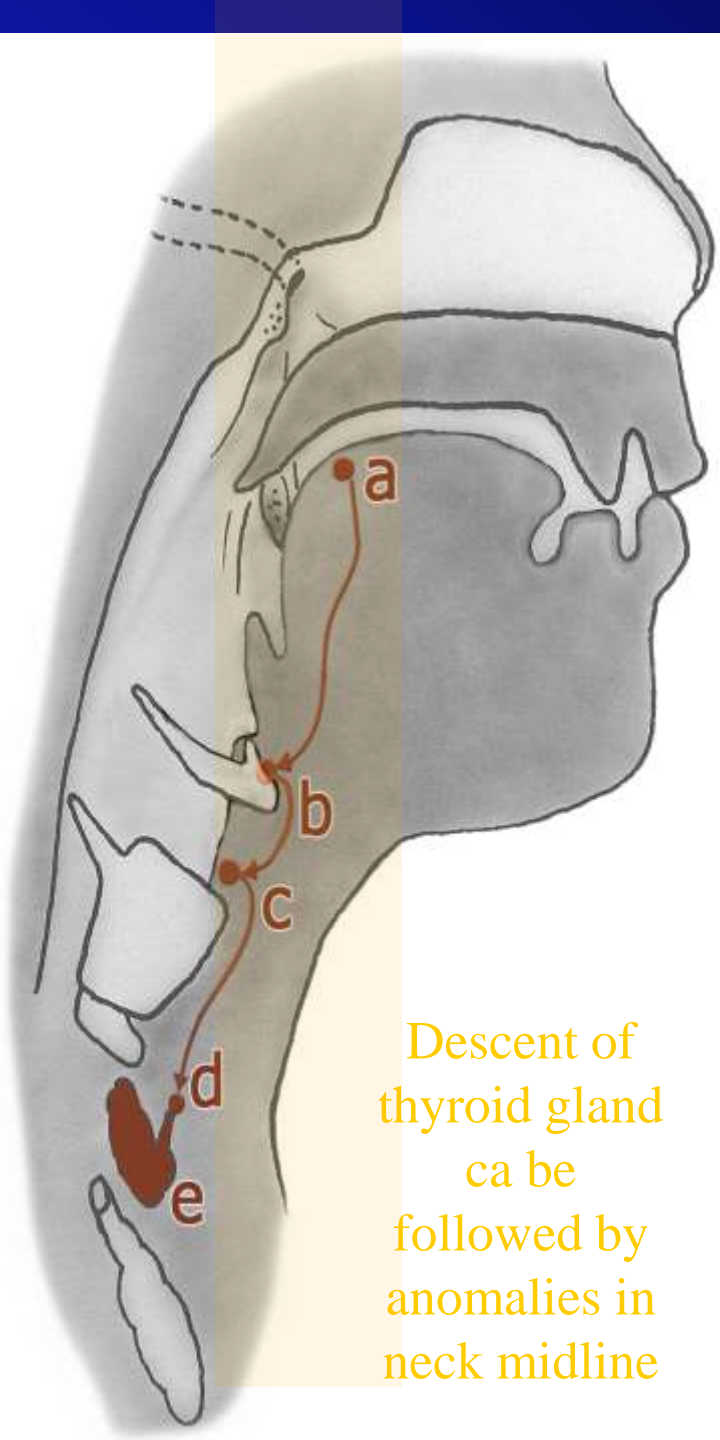


# Abscessus retropharyngealis

## Retropharyngeal abscess



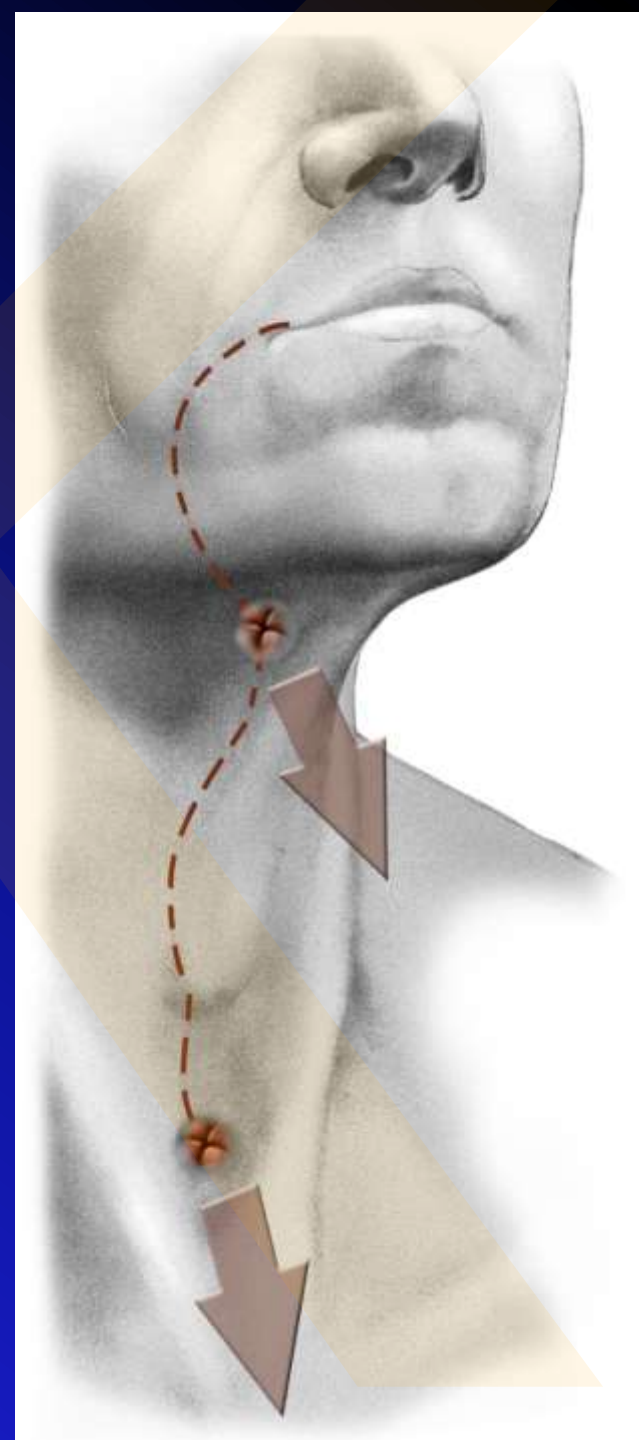




Descent of thyroid gland can be followed by anomalies in neck midline

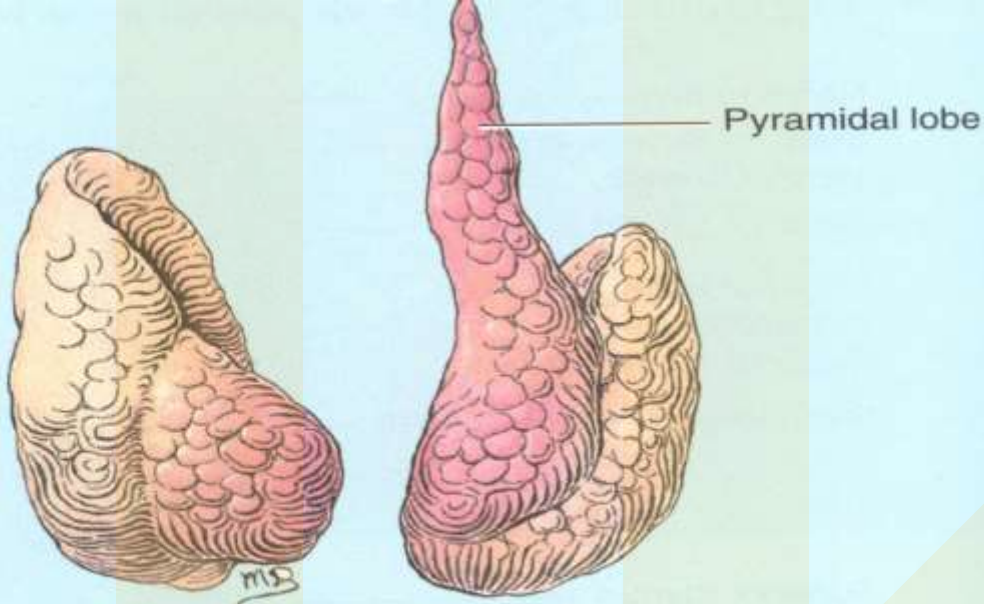
**Thyroglossal cyst develops from** epithelial material of *thyroglossal duct*. Its remaining pieces can be appeared between *foramen caecum linguae* and *isthmus glandulae thyroideae* (they are in midline only).

Sometimes are transformed to **aberrant thyroid glands**, with hormonal activities. Duct has to be separated from stripped and narrow *m. thyroglossus*. This muscle connects thyroid gland surface and tongue root; it is a part of infrahyoid muscles. Cysts lie either in tongue root or in hyoid region. They can be opened to surface in foramen caecum (canal) as a **thyroglossal fistula**.

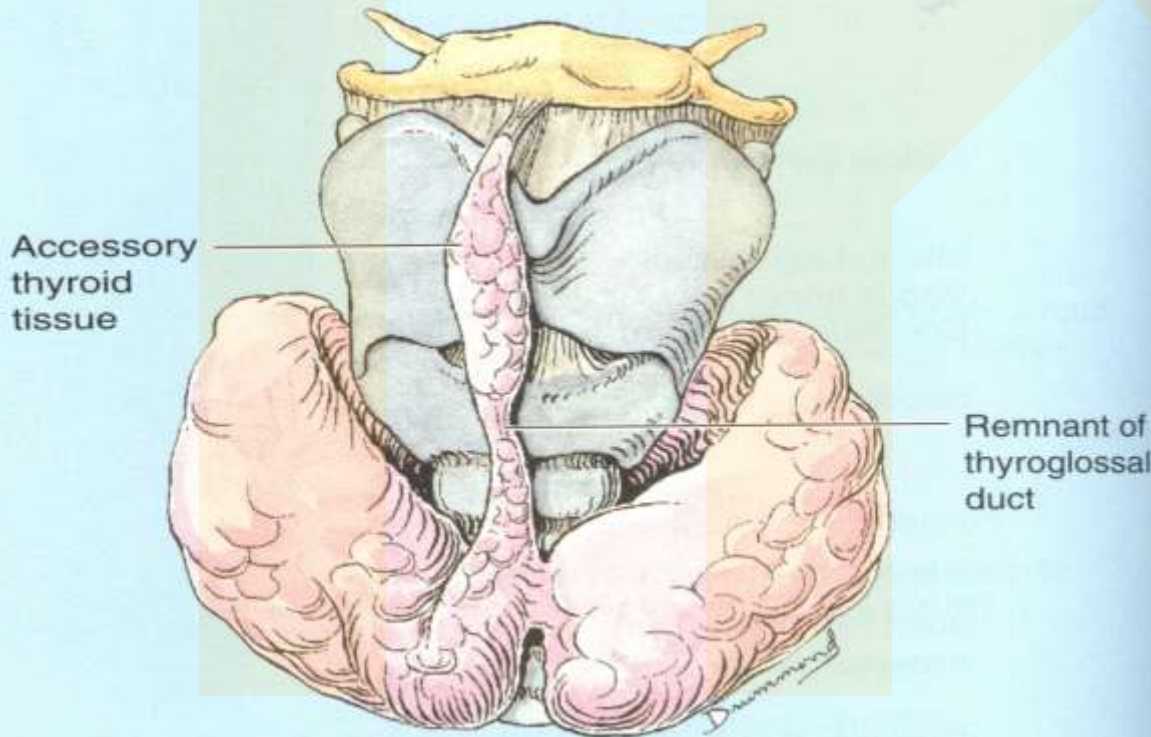




Thyroglossal cyst. These cysts, which are remnants of the thyroglossal duct, may be anywhere along the migration pathway of the thyroid gland. They are commonly found behind the arch of the hyoid bone. An important diagnostic characteristic is their midline location.

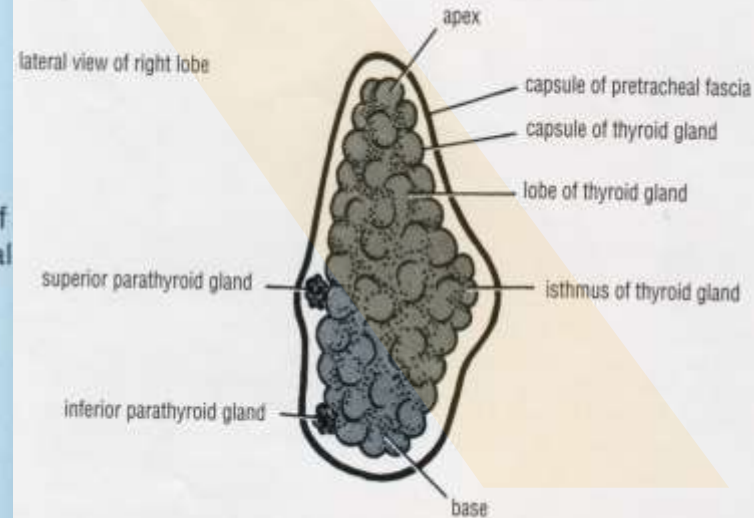


Absence of isthmus



# Glnadula thyroidea

## External form, covers, varieties



# Some developmental disturbancies

Ductus thyroglossus persistens

Cysta thyroglossalis + fistula thyroglossalis

—  
Lies in the middle neck line; follow descent of thyroid  
gland;

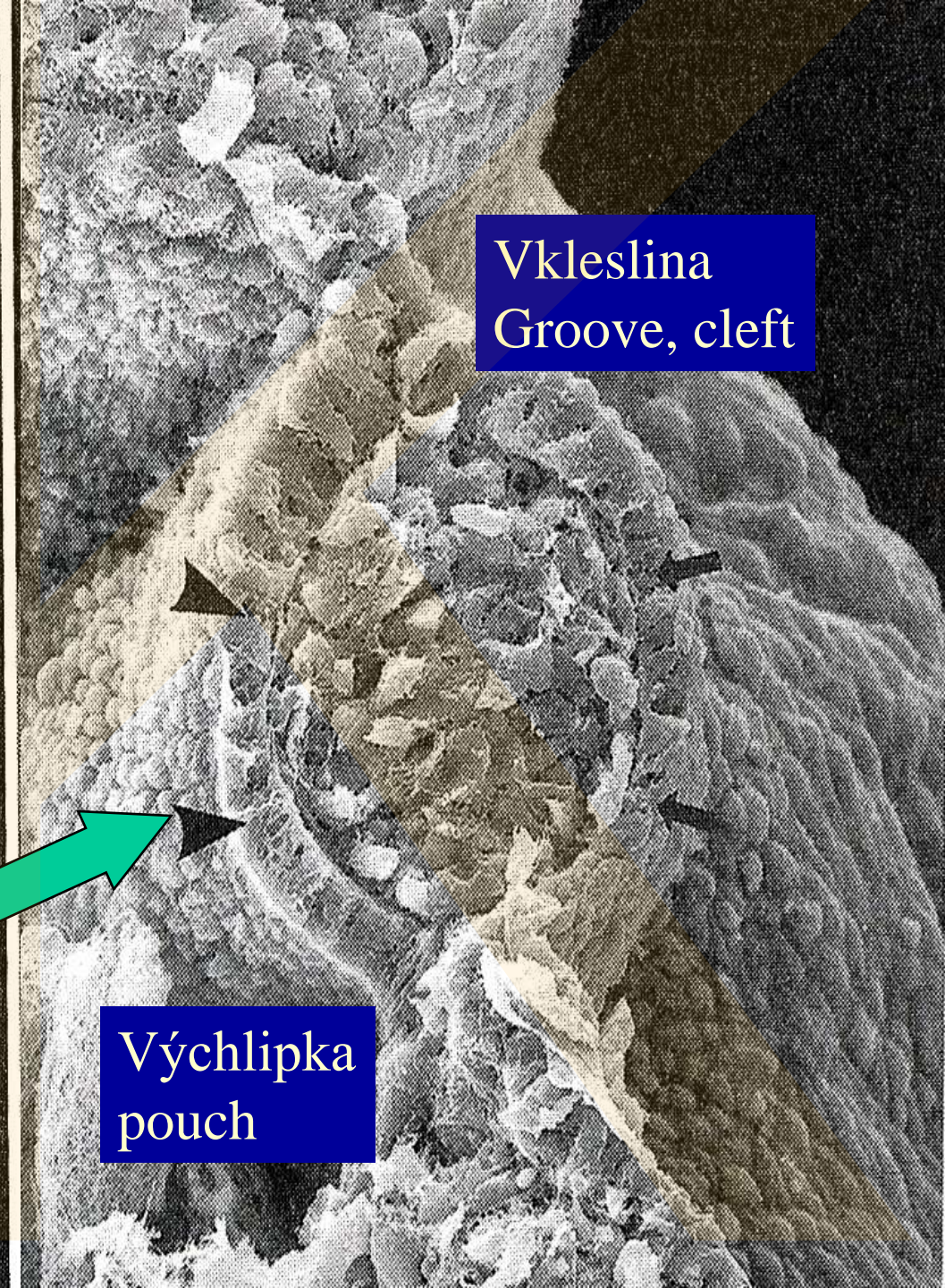
Glandulae thyroideae aberrantes

In the tongue basis

S.C.  
thyroglossal  
muscles and  
their  
connection  
with thymus







Vkleslina  
Groove, cleft

Výchlipka  
pouch

B

# 1. Pharyngeal arch

## 1. Pharyngeal pouch

Maxillary processes, mandibular processes, Meckel's cartilage

Premaxilla, maxilla, os zygomaticum, membranous part of temporal bone

mm. masticatorii, ventral belly of m. digastricus, m. mylohyoideus, m. tensor tympani, tensor veli palatini

V. nervus

recessus tubotympanicus, meatus acusticus externus, cavitas tympani, tuba Eustachii auditiva

Inner surface of eardrum

## 2. Pharyngeal arch

## 2. Pharyngeal pouch

processus styloideus cartilago Reichert's

Stapes, processus styloideus, lig. stylohyoideum, cornua minora hyoidei, upper part of hyoid bone

Mimic mm., m. stapedius, m. stylohyoideus, dorsal belly of m. digastricus, mm. auriculares

VII.nervus

Tonsilla palatina, fossa tonsillaris

Lymph tissue appear during month 3rd and 4th

# 3. Pharyngeal arch

## 3. Pharyngeal pouch

Lower part of hyoid bone and great horns

m. stylopharyngeus

IX. nervus

glandulae parathyroideae inferiores, thymus

Lymph tissue appears through week 5

# 4.-6. pharyngeal arch

## 4.-5. pharyngeal pouch

cartilago thyroidea, cricoidea, arythenoidea,  
corniculatum and cuneiforme

mm. cricothyroidei, levatores palatini, constrictores pharyngeales

N. laryngeus recurrens (X.) nervus

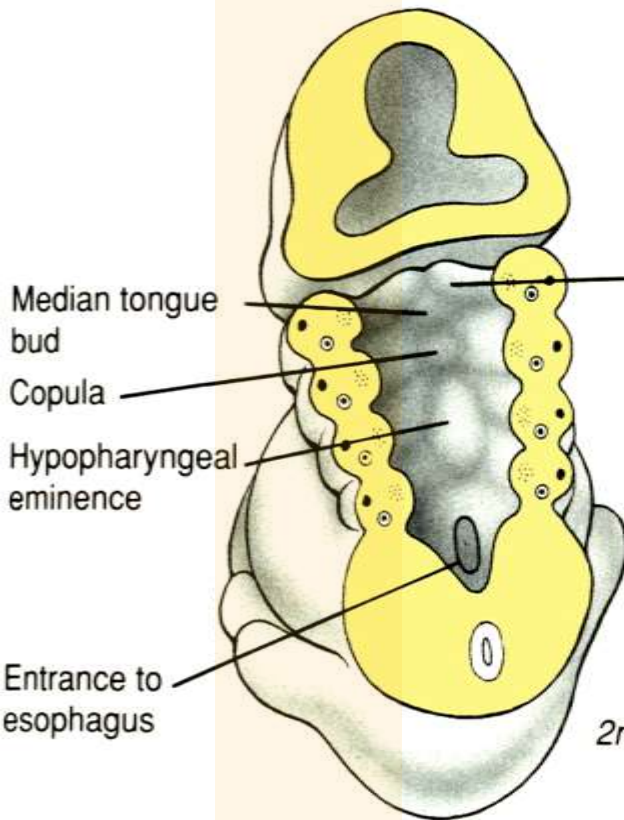
### Glandulae parathyroideae superiores

corpus ultimobranchiale (C body)

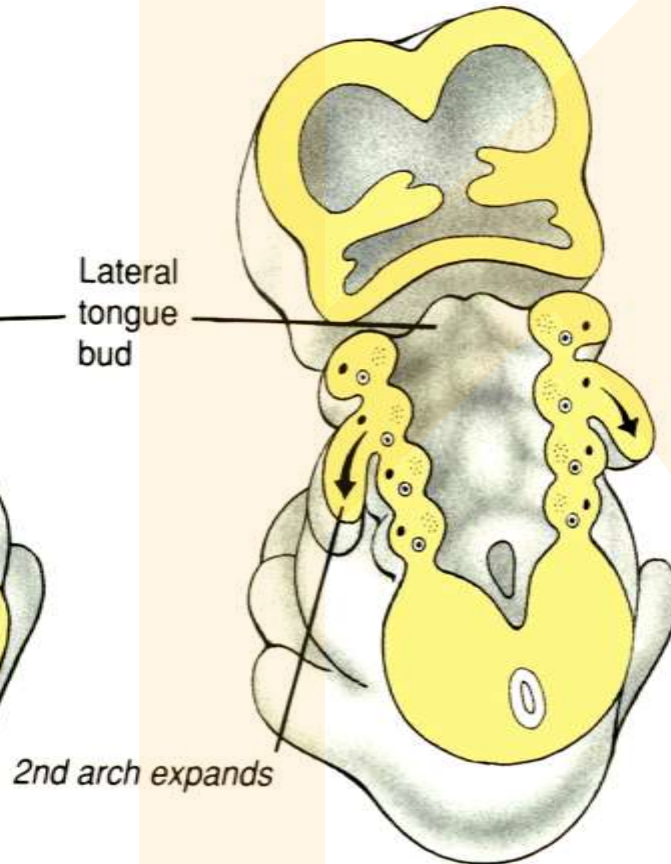
Body is involved to thyroid gland as parafollicular glands (calcitonin)

# Face of pharyngeal clefts

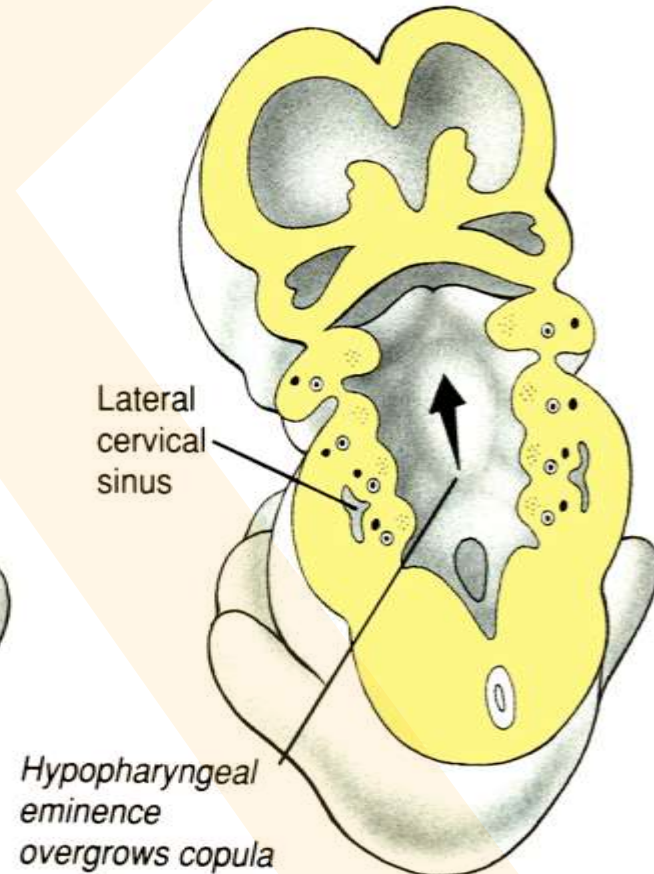
**A** 29 days



**B** 32 days

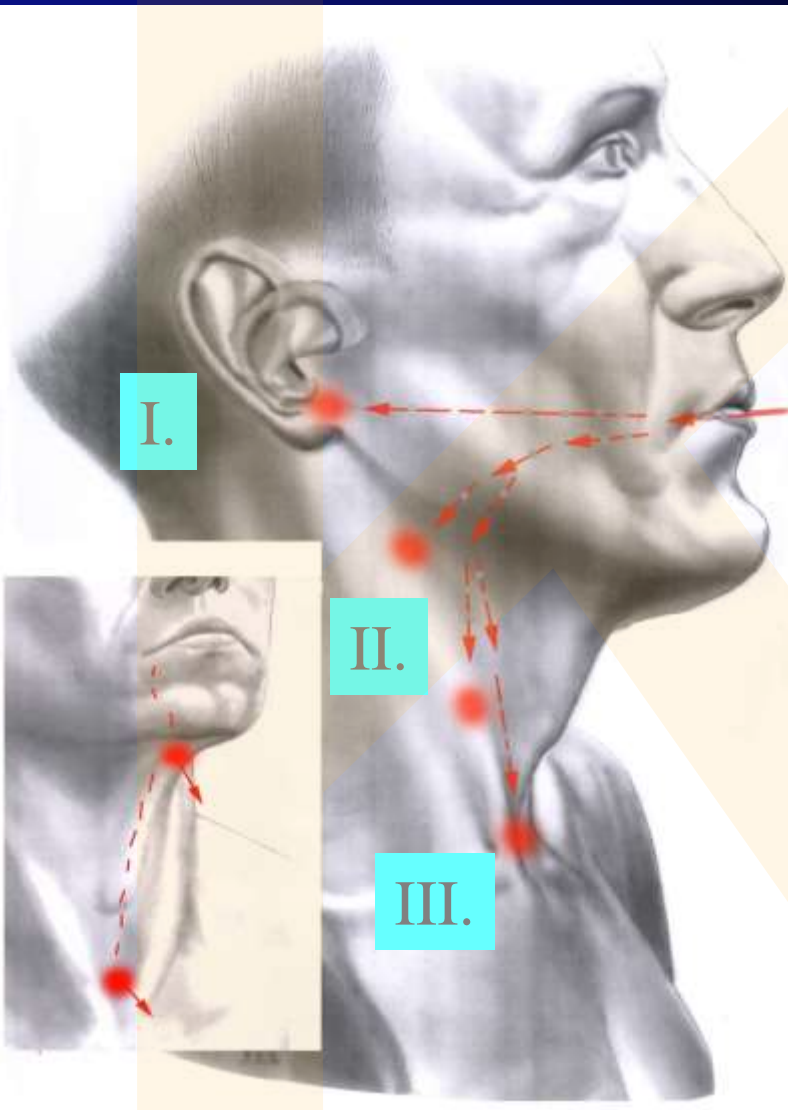
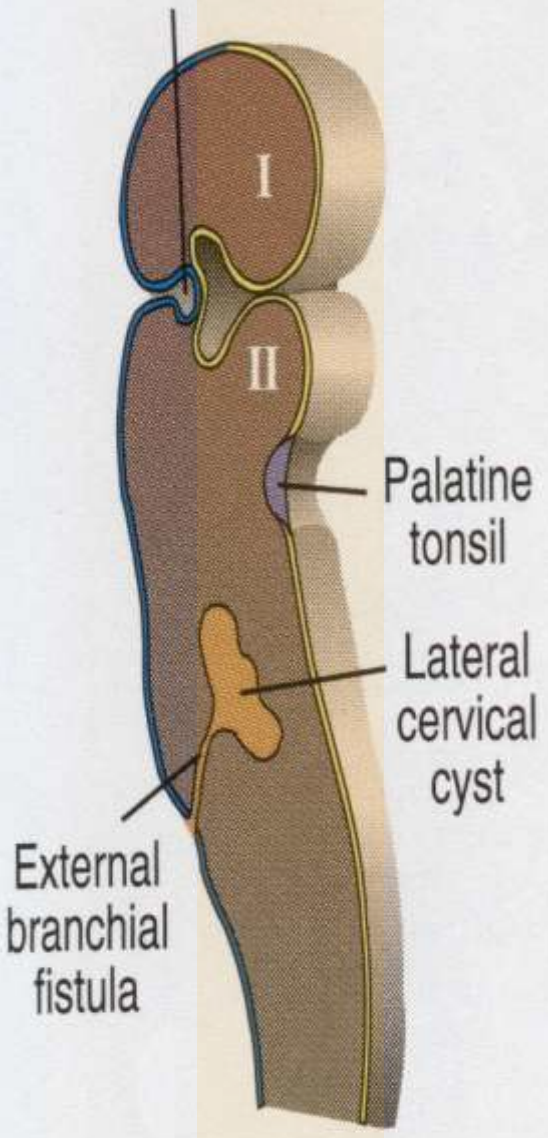


**C** 42 days

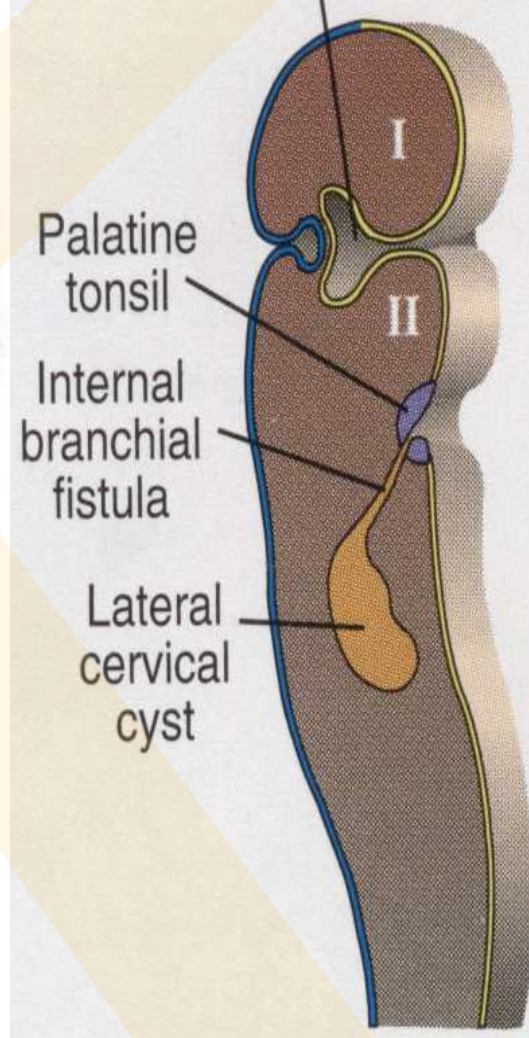


Fate of the pharyngeal clefts. The first pharyngeal cleft forms the external auditory meatus. The second pharyngeal arch expands and fuses with the cardiac eminence to cover the remaining pharyngeal clefts, which form the transient lateral cervical sinus.

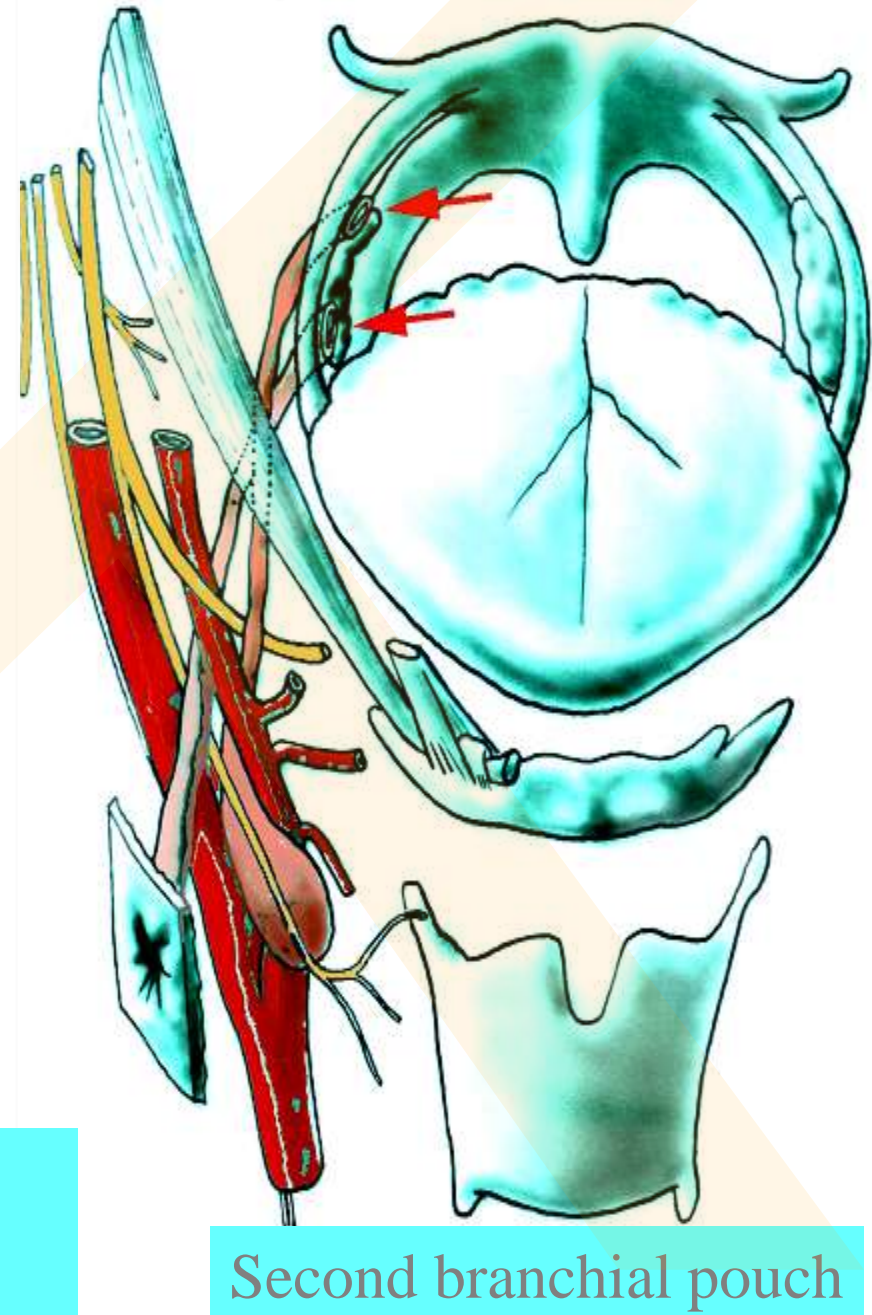
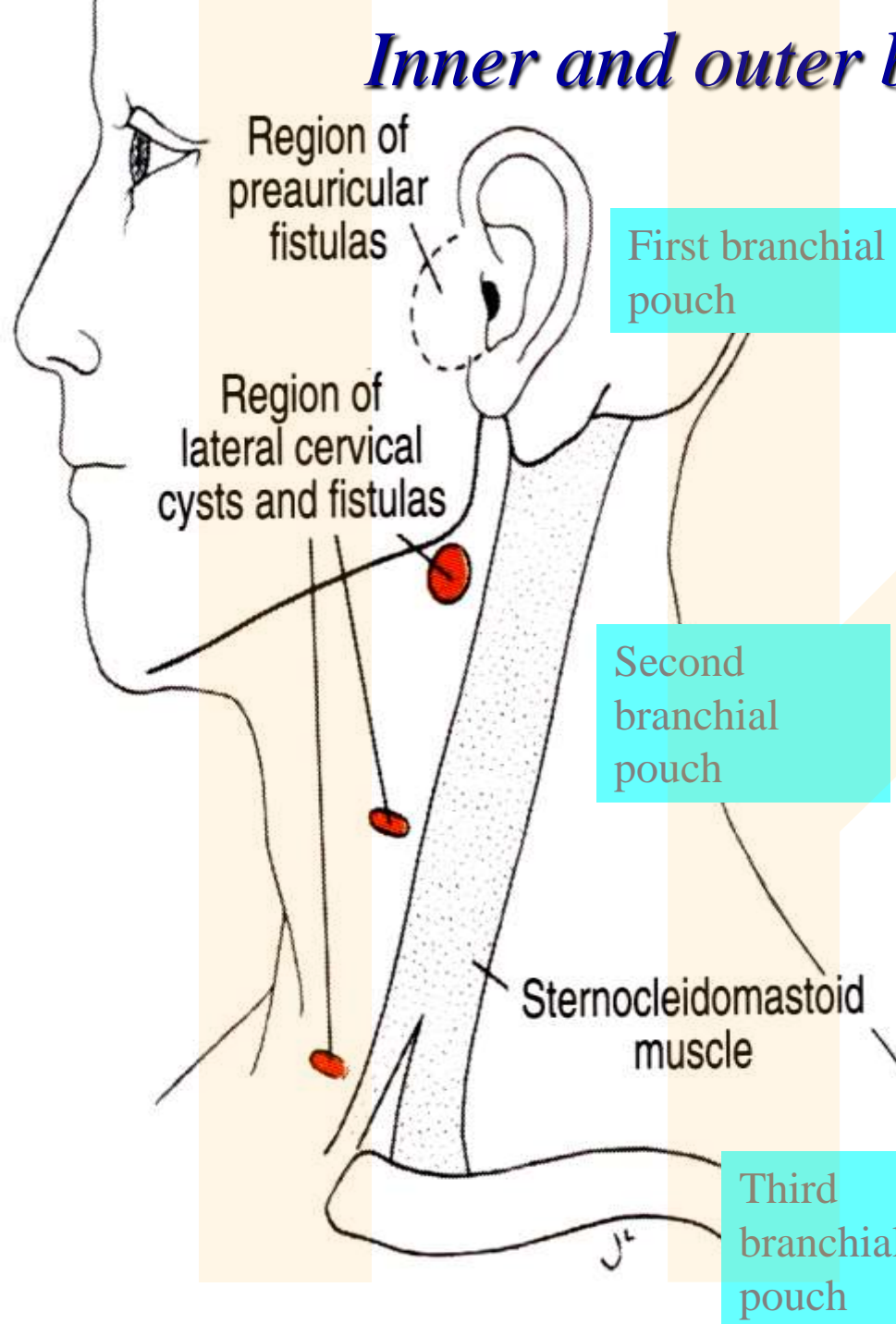
External auditory meatus



Tubotympanic recess



# *Inner and outer branchial fistulas*



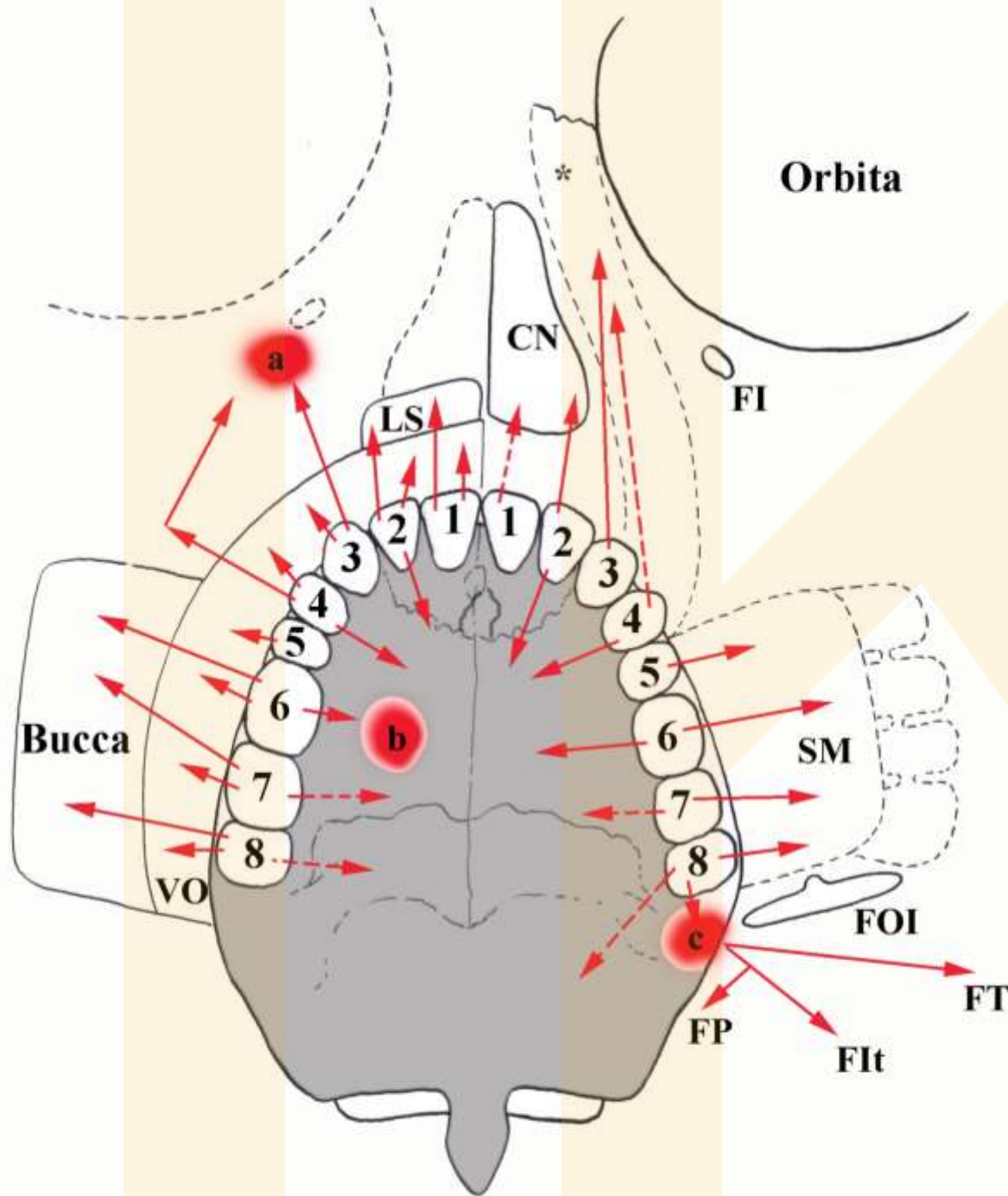


# Spreading of the pathologic processes



By

Ivo Klepáček,  
MD., PhD.

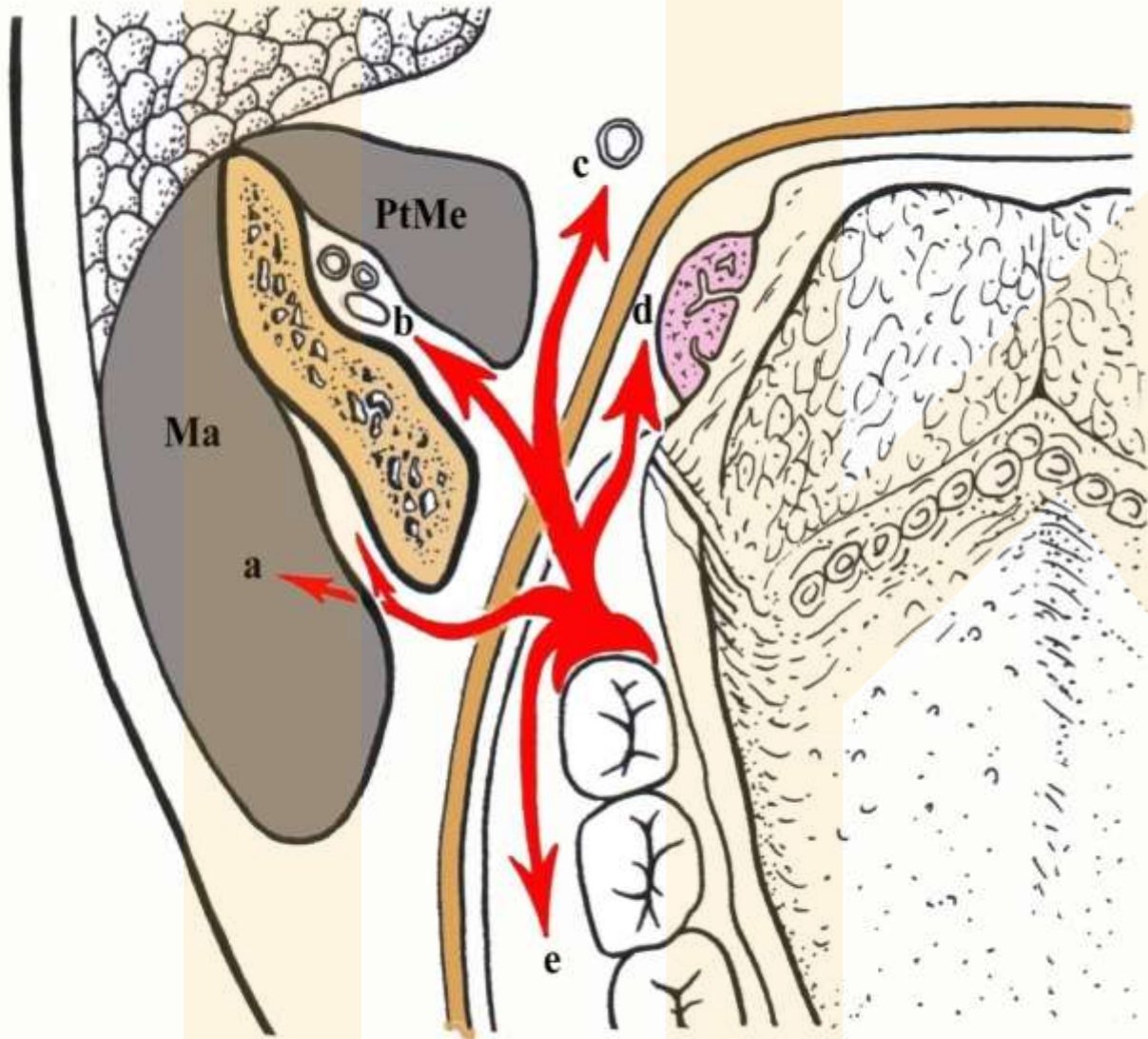


FT – fossa temporalis  
 FI – foramen infraorbitale  
 FP – fossa pterygopalatina  
 FIIt – fossa infratemporalis  
 FOI – fissura orbitalis inferior  
 SM – sinus maxillaris  
 LS – labialis superior  
 VO – vestibulum oralis

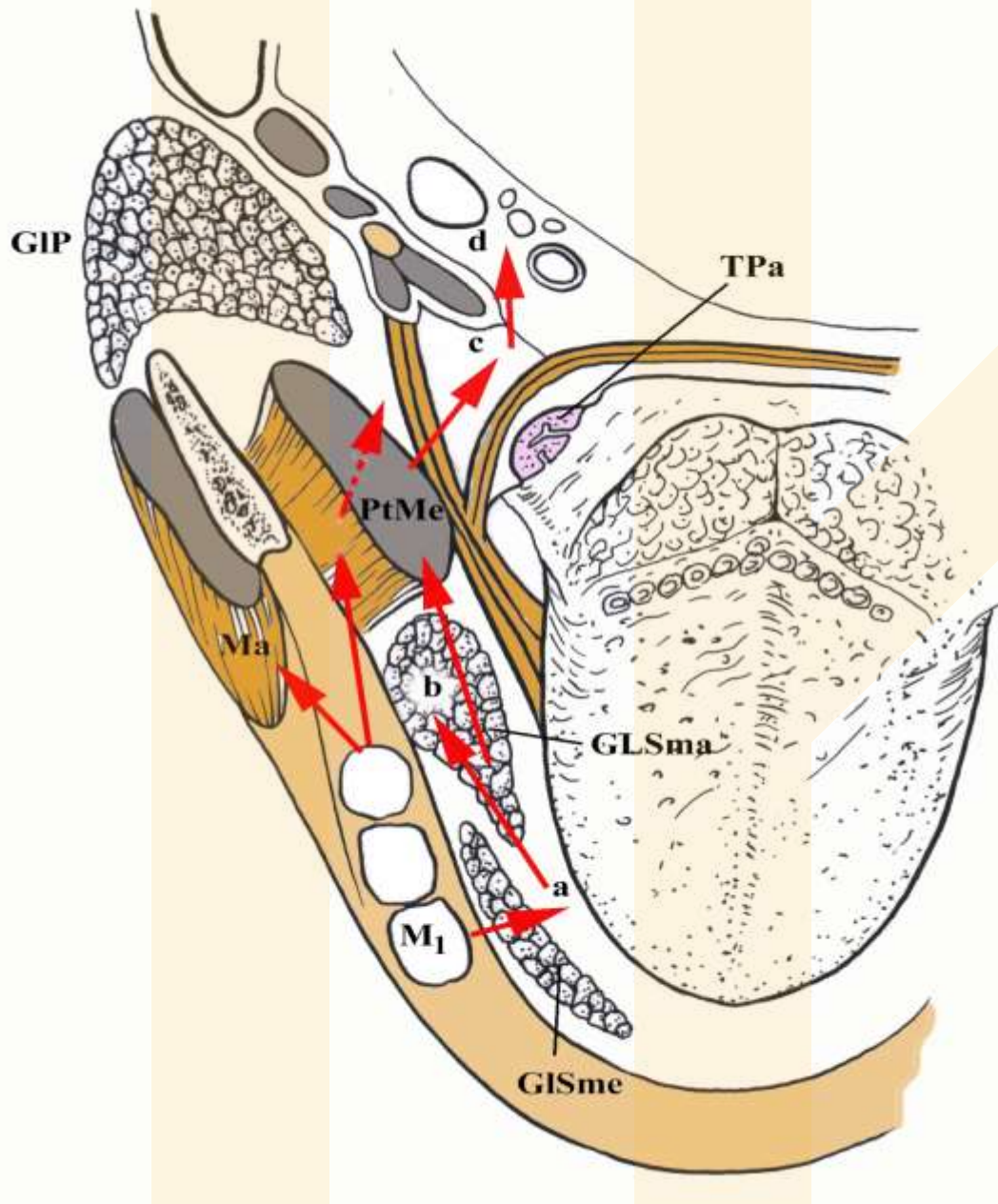
a – infraorbital foramen  
 b – hard palate  
 c – greater palatal foramen



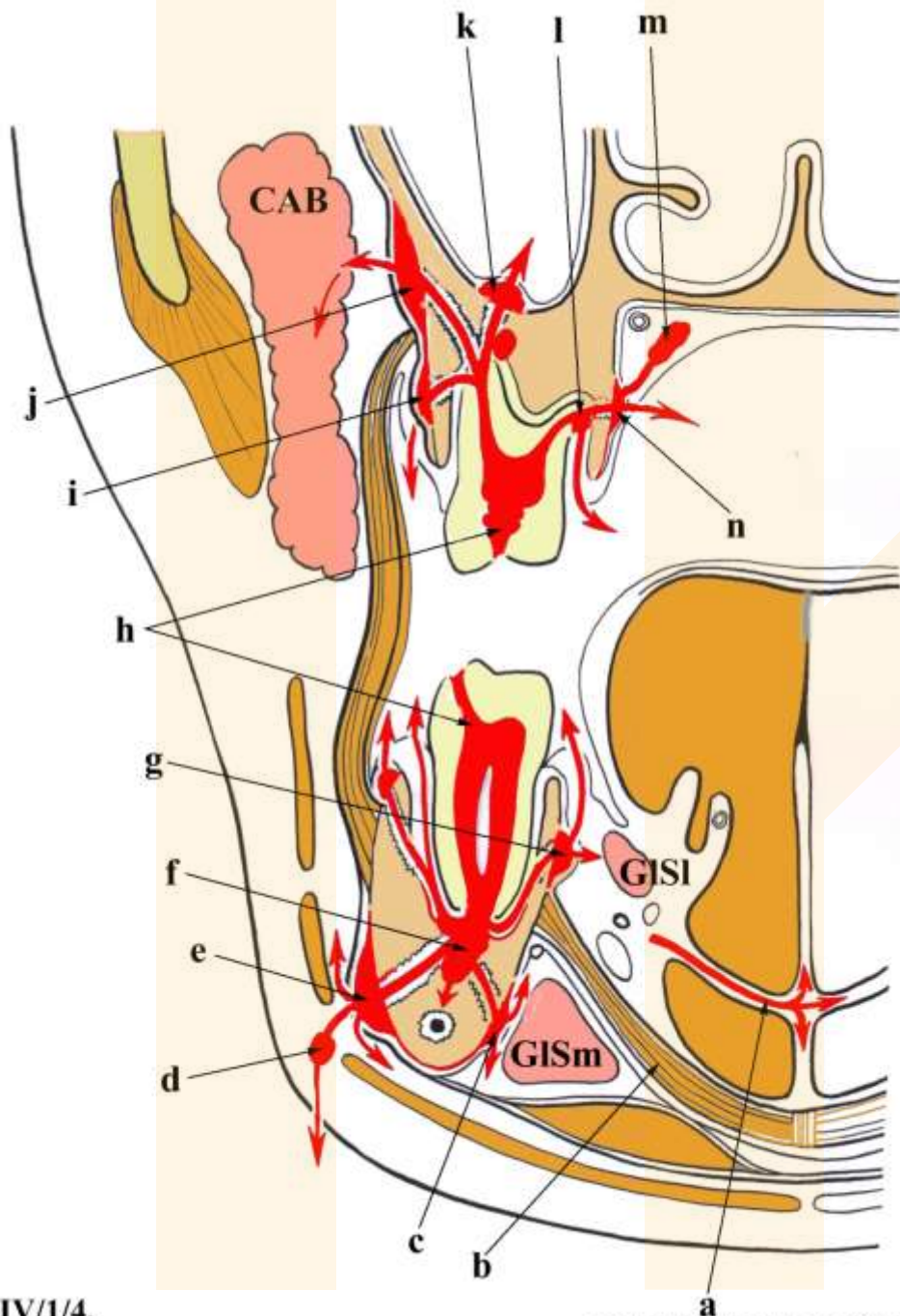
Periapikální absces  
Abscess periapicalis



- a – masseter
- b – pterygopalatine space
- c – retrostyloid space
- d – paratonsillar space
- e – vestibulum



- a – submandibular gland
- b – sublingual space
- c – paratonsillar space
- d – retrostyloid space

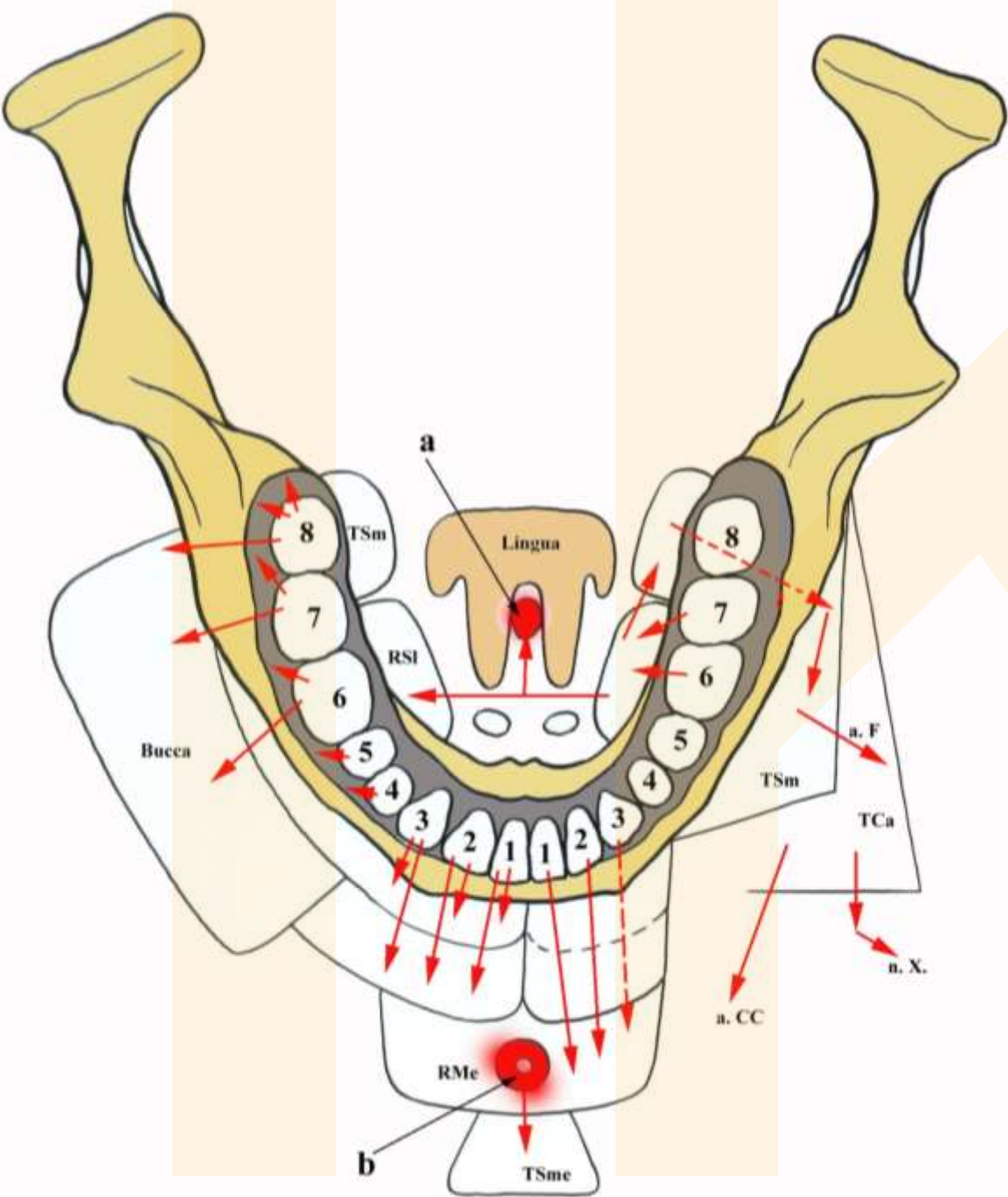


- a – lingual space and septum
- b – m.mylohyoideus
- c – submandibular absces
- d – paramandibular absces
- e – subperiostal absces
- f – periodontal absces
- g – subperiostal sublingual absces
- h – pulpal inflammation
- i – subperiostal vestibular absces
- j – subperiostal buccal absces
- k – absces inside antrum
- l – periodontal absces
- m – palatal absces
- n – subperiostal alveolar absces



Absces  
dentálního  
původu  
Abscess  
of dental origin





TSm – trigonum submandibulare  
 TCa – trigonum caroticum  
 TSme – trigonum submentale  
 RSI – regio sublingualis  
 RMe – mental regiones  
 a.F – facial artery  
 a. CC – common carotid artery

a – lingual septum  
 b – canalis mentalis





Absces

v

submandibulární

krajině

Abscess in

submandibular

region



Per continuitatem  
to spatium submentale  
submental space

From lower incisors and canini

- There is usually no contracture
- There are usually no breathing and swallowing troubles

# Per continuitatem to spatium submandibulare submandibular space

## From lower molars and premolars

- Infection follows mylohyoideus muscle and spreads to trigonum submandibulare, pterygomandibulare and to parapharyngeum space
- There is contracture muscles of mastication
- There are usually no breathing and swallowing troubles

Per continuitatem  
to glandula sublingualis  
sublingual gland

From lower first molar and its  
alveolus

- Infection follows upper surface of mylohyoideus
- There is contracture of musculus mylohyoideus
- Pain during depression of mandible
- There is no contracture of muscles of mastication

Per continuitatem  
to spatium pterygomandibulare  
pterygomandibular space

From lower third molar

- Infection spreads between mandible and muscles to infratemporal fossa
- Suspicious contracture of the muscles of mastication

Cut penetrates through medial pterygoid muscle

Per continuitatem  
to spatium parapharyngeum  
parapharyngeal space

From lower third molar,  
submandibular and  
pterygomandibular space

- Infection spreads even to the posterior mediastinum between mandible and muscles to infratemporal fossa
- Pain and swallowing pain

Cut penetrates through dorsal part of the  
submandibular space

Per continuitatem  
to spatium  
massetericomandibulare  
submandibular space

From lower teeth erygomandibular  
space

- Infection spreads even to the posterior mediastinum between mandible and muscles to infratemporal fossa
- Pain and masseteric contracture

Per continuitatem  
to retromaxillar space and after  
to the pterygopalatine fossa,  
infratemporal fossa and  
temporal fossa



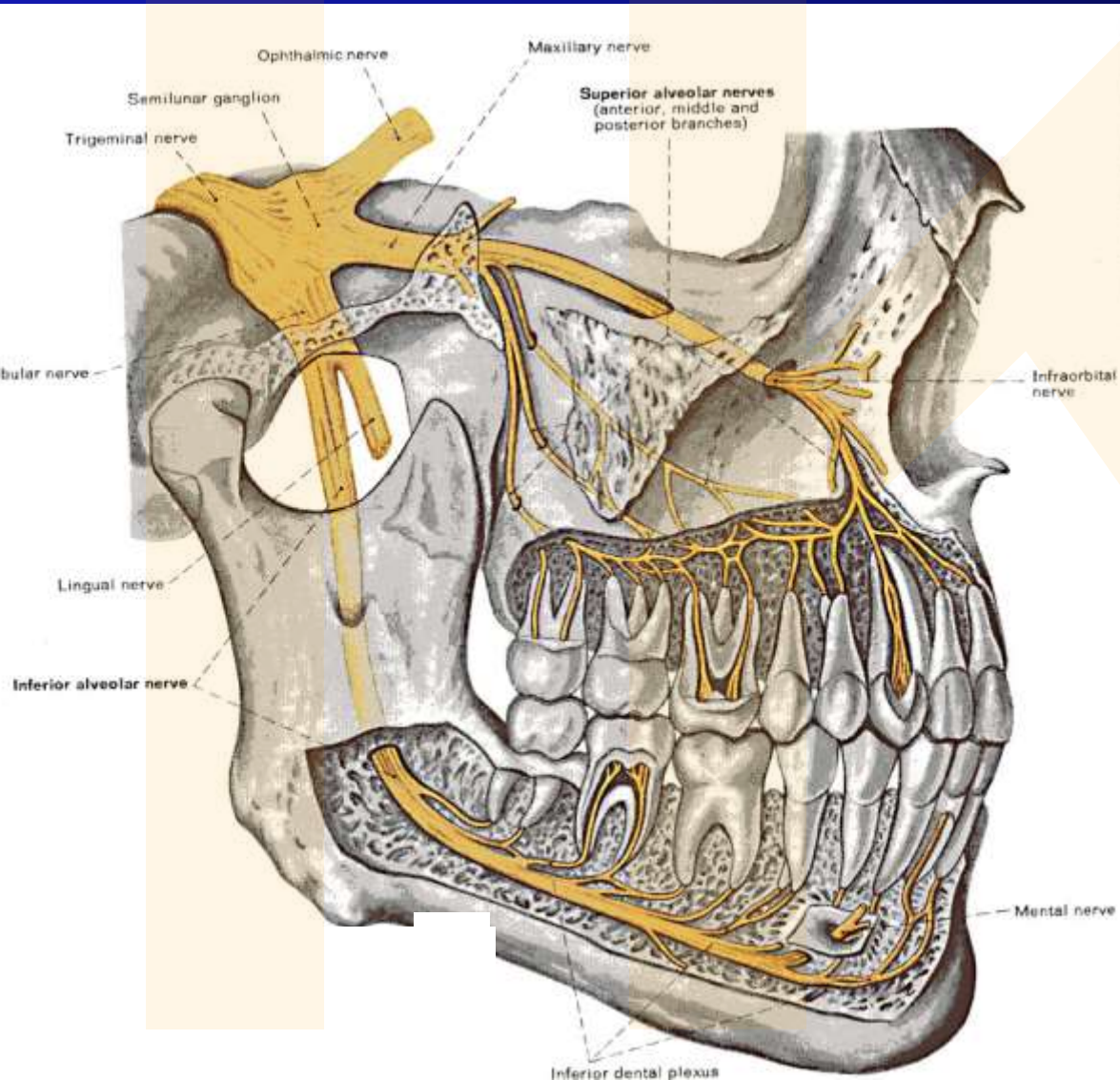
# Anatomical base for anaesthesia on the face and of the jaw apparatus



By

Ivo Klepáček,  
MD., PhD.

# Nerves of teeth and interdental spaces



- Inferior alveolar n.
  - V3
- Posterior superior alveolar n.
  - V2
- Infraorbital nerve
  - Middle superior alveolar n. (40%)
  - Anterior superior alveolar n.

# Solution properties of clinical importance

## Onset time

After infiltration of the solution, diffusion from the depot at the buccal fold to the apex of the tooth is rapid, especially in the frontal, and upper premolar areas (Fig. 38). Modern solutions work within two minutes, and the amide local anaesthetics are virtually identical in their effects, though differences can be demonstrated by refined methods. One preparation may work perhaps 15 seconds quicker than another, but this is of no clinical importance.

The onset of mandibular block takes longer, irrespective of the solution - about 3 to 5 minutes.

## Spread

Good spreading capacity can be an advantage, especially in the frontal area. One injection may cover several adjacent teeth. An injection at the apex of the upper lateral incisor induces pulp analgesia in the two adjacent teeth in about 80 % of subjects (Fig. 39). Good spread also helps when needle placement cannot be, or is not, ideal, and it has been proposed that a spreading agent, e.g. hyaluronidase, be added to some dental local anaesthetic solutions. In some instances this might be of use, but the logical corollary of better spread is reduced concentration of the agent overall - also in the area where optimal effect is desirable.

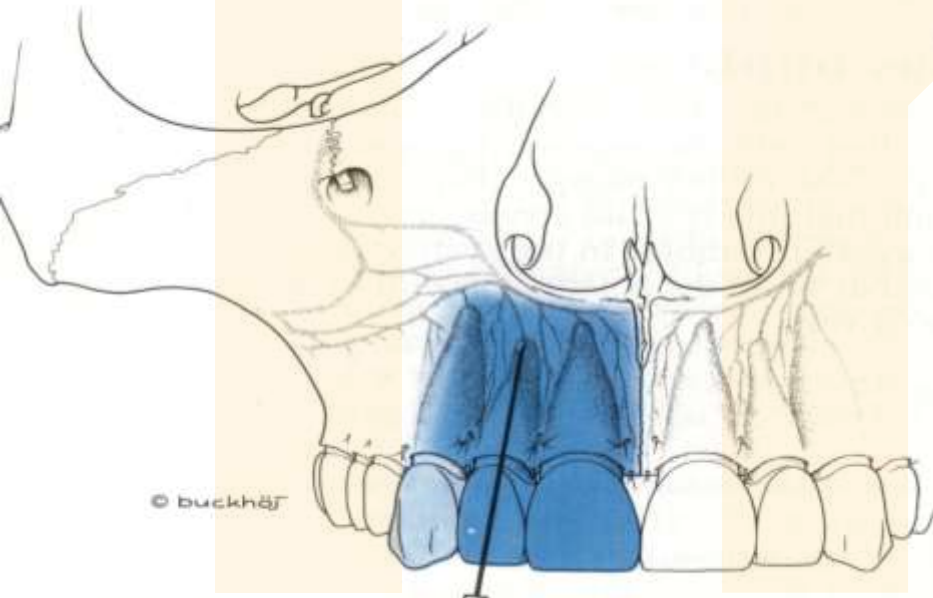
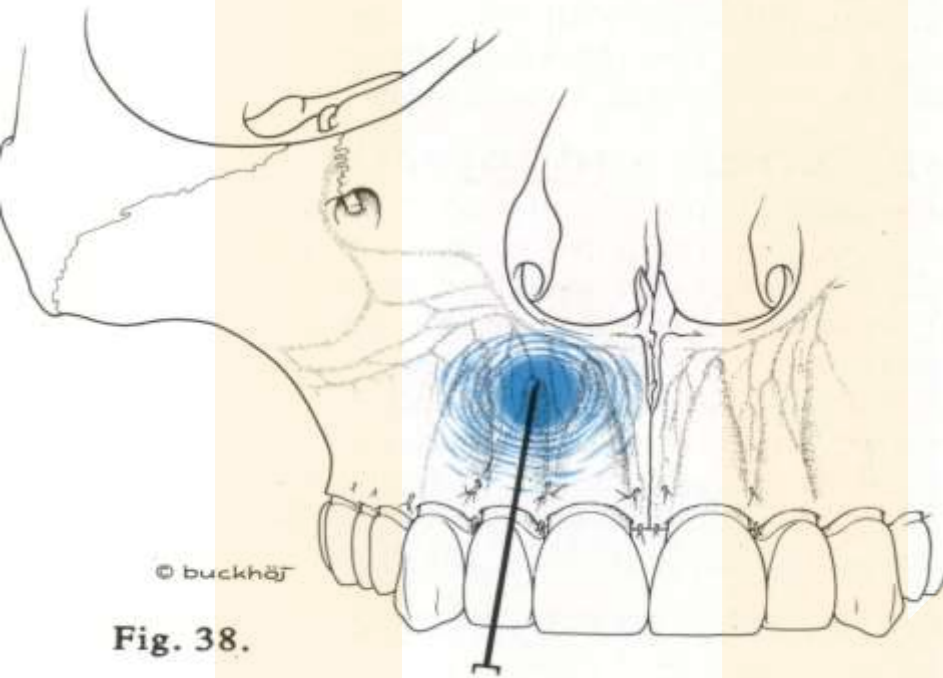
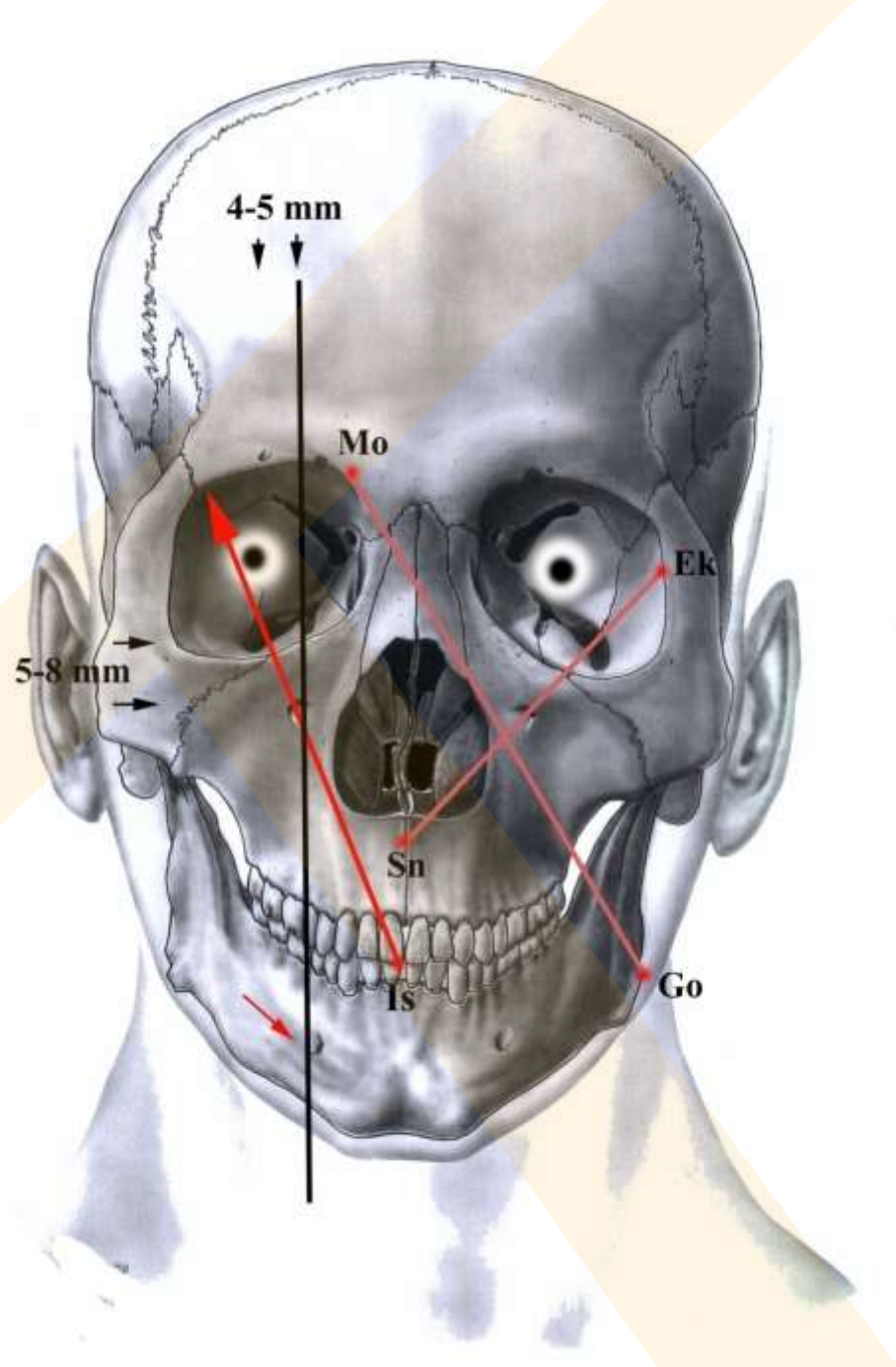
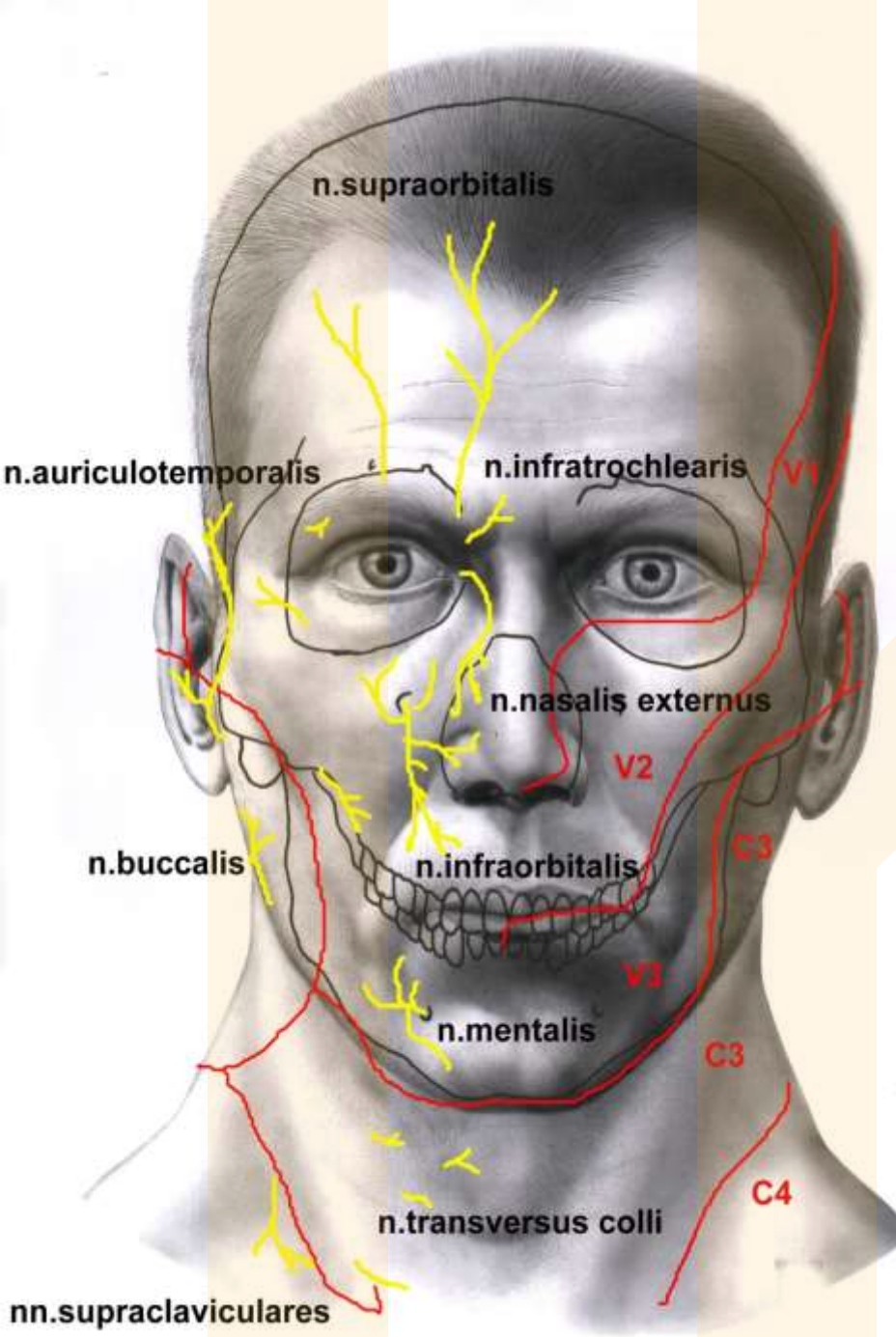


Fig. 39.

Extraorální aplikace

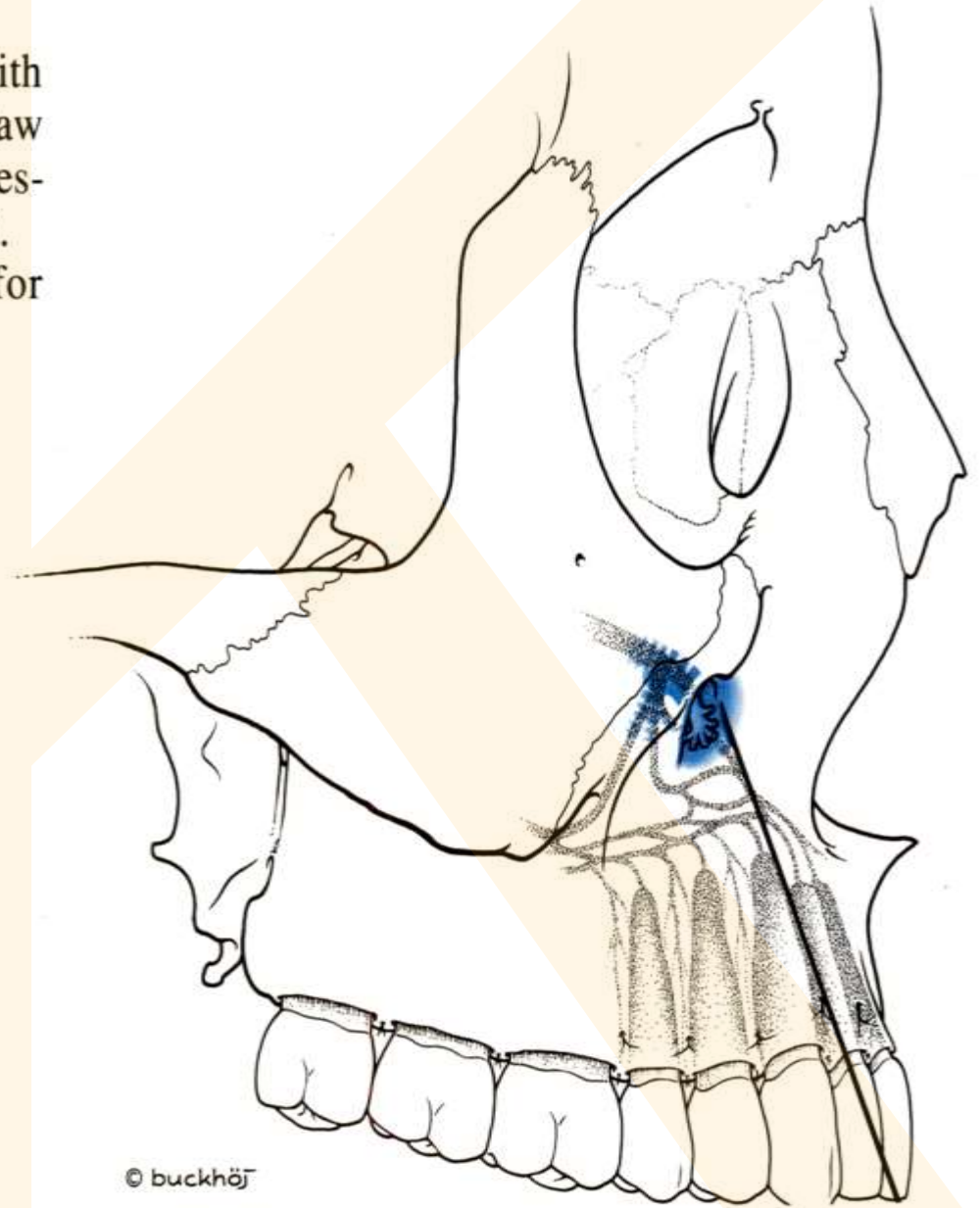
Extraoral application



## The infraorbital block

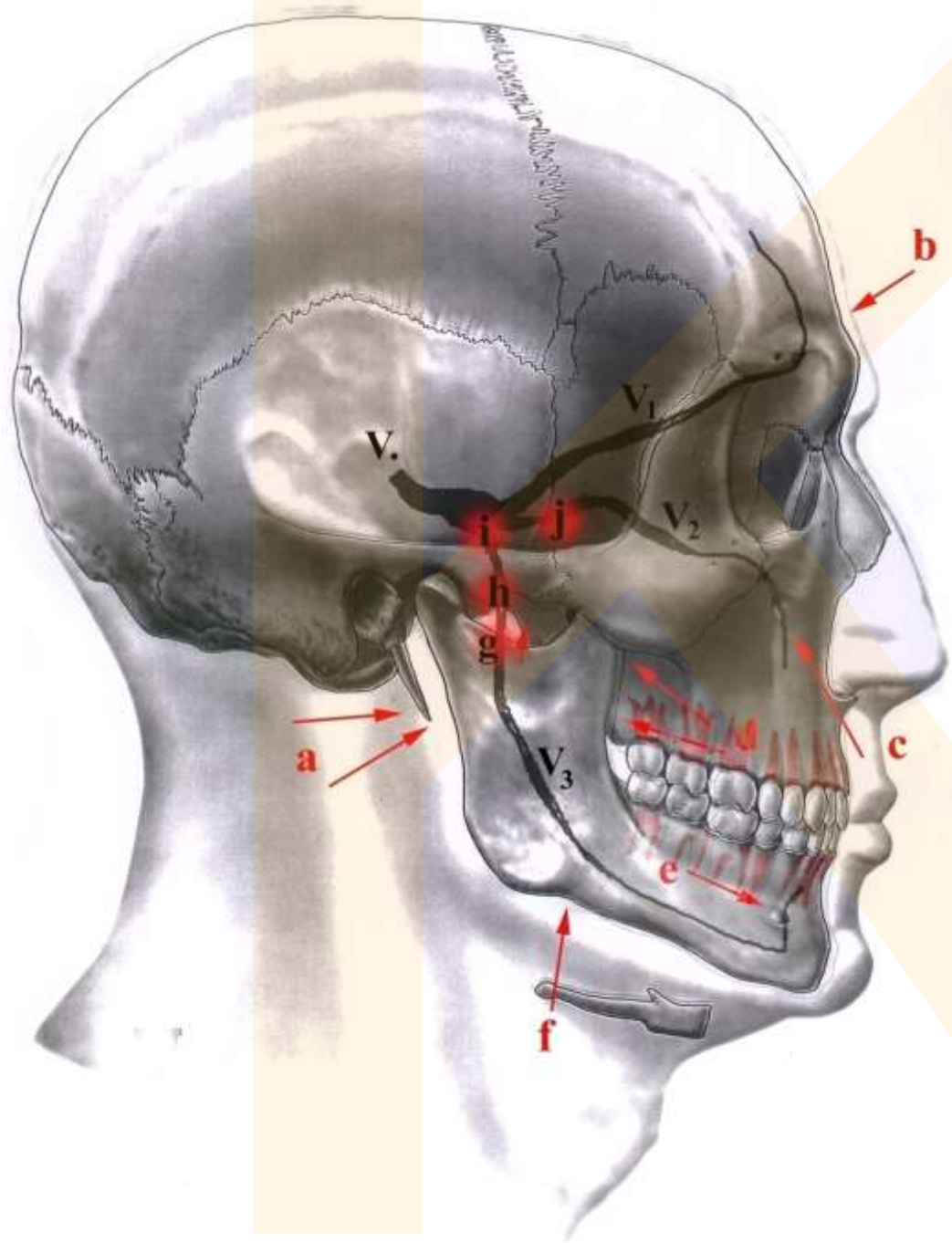
In certain cases, especially in connection with oral surgery, the anterior teeth of the upper jaw can also be anaesthetized by conduction anaesthesia, i.e. infraorbital block (Figs. 57 and 58).

The intraoral technique is the simplest for dental purposes and is applied as follows.



© buckhøj

Fig. 58.



**Table 33.1** Nerve supply to the teeth and gingivae

<b>Maxilla</b>	Nasopalatine nerve	Greater palatine nerve						Palatal gingivae
	Anterior superior alveolar nerve	Middle superior alveolar nerve	Posterior superior alveolar nerve				Teeth	
	Infraorbital nerve	Posterior superior alveolar nerve and buccal nerve						Buccal gingivae
	1	2	3	4	5	6	7	8
<b>Mandible</b>	Mental nerve	Buccal nerve and perforating branches of inferior alveolar nerve						Buccal gingivae
	Incisive nerve	Inferior alveolar nerve						Teeth
	Lingual nerve and perforating branches of inferior alveolar nerve							



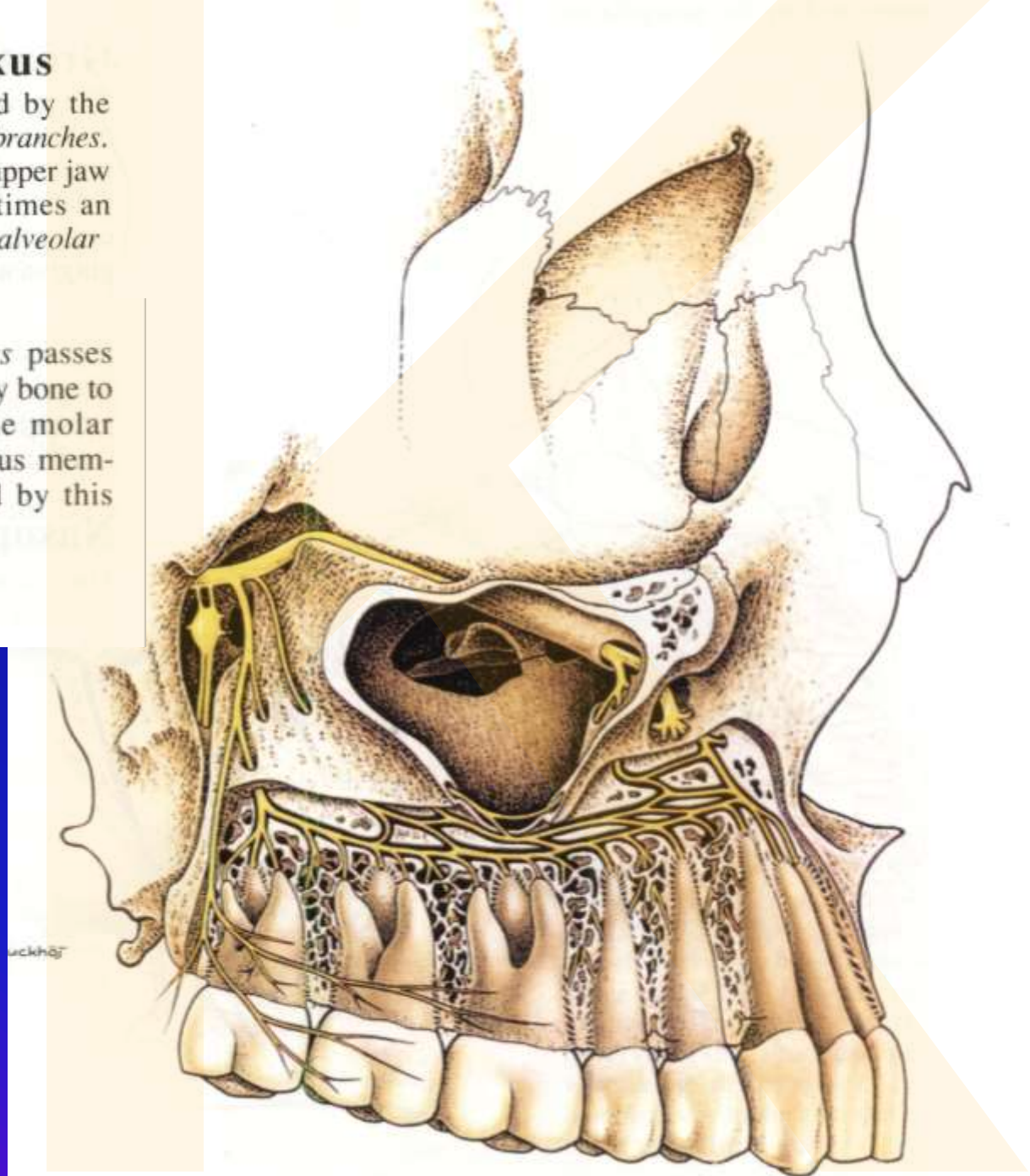
Intraorální aplikace

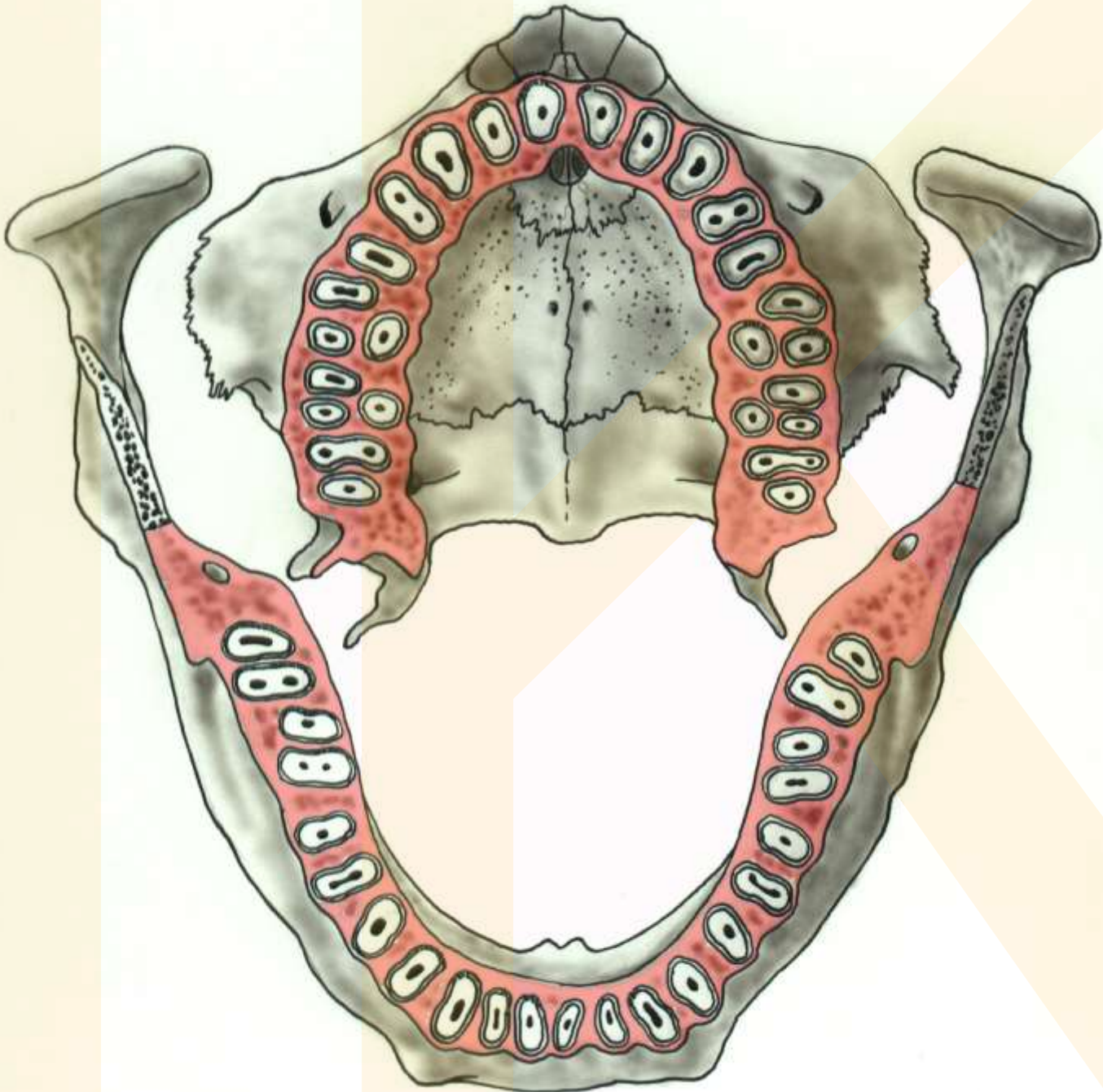
Intraoral application

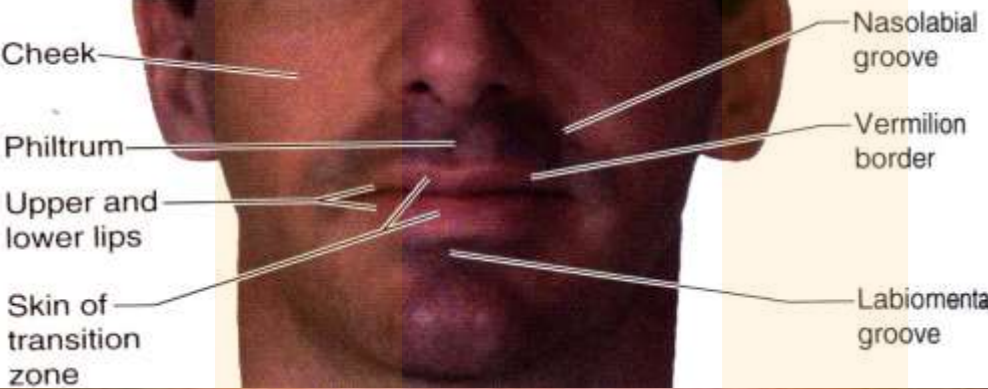
## The superior dental plexus

The *superior dental plexus* is formed by the *superior posterior and anterior alveolar branches*. The teeth and the buccal gingiva of the upper jaw are innervated by this plexus. Sometimes an irregular branch - the *middle superior alveolar branch* - is also present (Fig. 2).

One of the *posterior alveolar branches* passes downward on the surface of the maxillary bone to the gingiva of the buccal side of the molar region. The posterior part of the mucous membrane of the cheek is also innervated by this branch (Fig. 3).







# Structures for examination

- Arches
- Uvula
- Tonsils
- Papillae
- Recesses
- Folds
- Frenulum



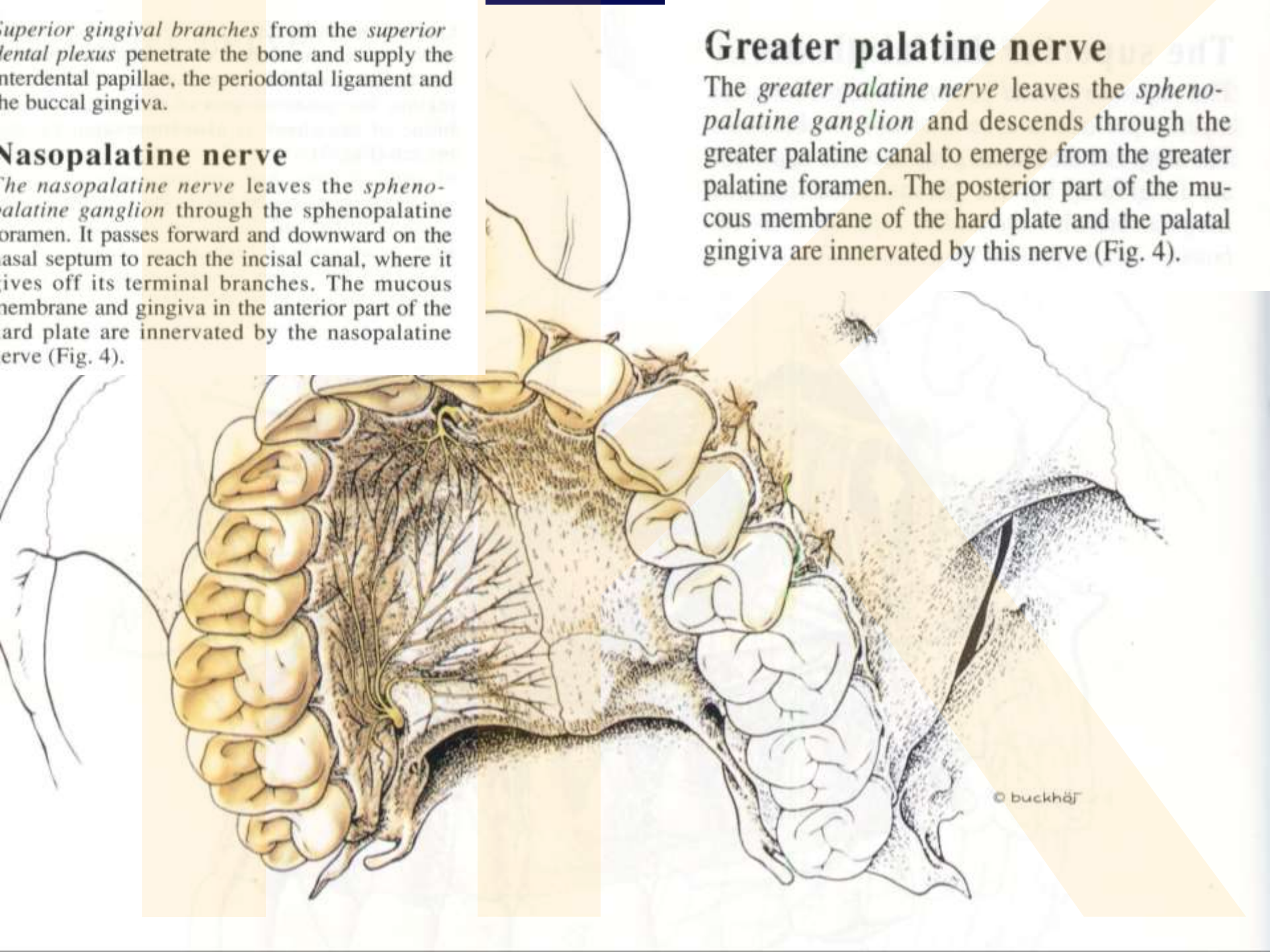
Superior gingival branches from the superior dental plexus penetrate the bone and supply the interdental papillae, the periodontal ligament and the buccal gingiva.

### Nasopalatine nerve

The nasopalatine nerve leaves the sphenopalatine ganglion through the sphenopalatine foramen. It passes forward and downward on the nasal septum to reach the incisal canal, where it gives off its terminal branches. The mucous membrane and gingiva in the anterior part of the hard plate are innervated by the nasopalatine nerve (Fig. 4).

### Greater palatine nerve

The greater palatine nerve leaves the sphenopalatine ganglion and descends through the greater palatine canal to emerge from the greater palatine foramen. The posterior part of the mucous membrane of the hard plate and the palatal gingiva are innervated by this nerve (Fig. 4).



# Maxillary arch

Gingiva

Teeth

Ant. Sup. alveolar n/a

Ant. Sup. alveolar n/a

Middle sup. alveolar n/a

Middle Sup. alveolar n/a

Post. Sup. alveolar n/a

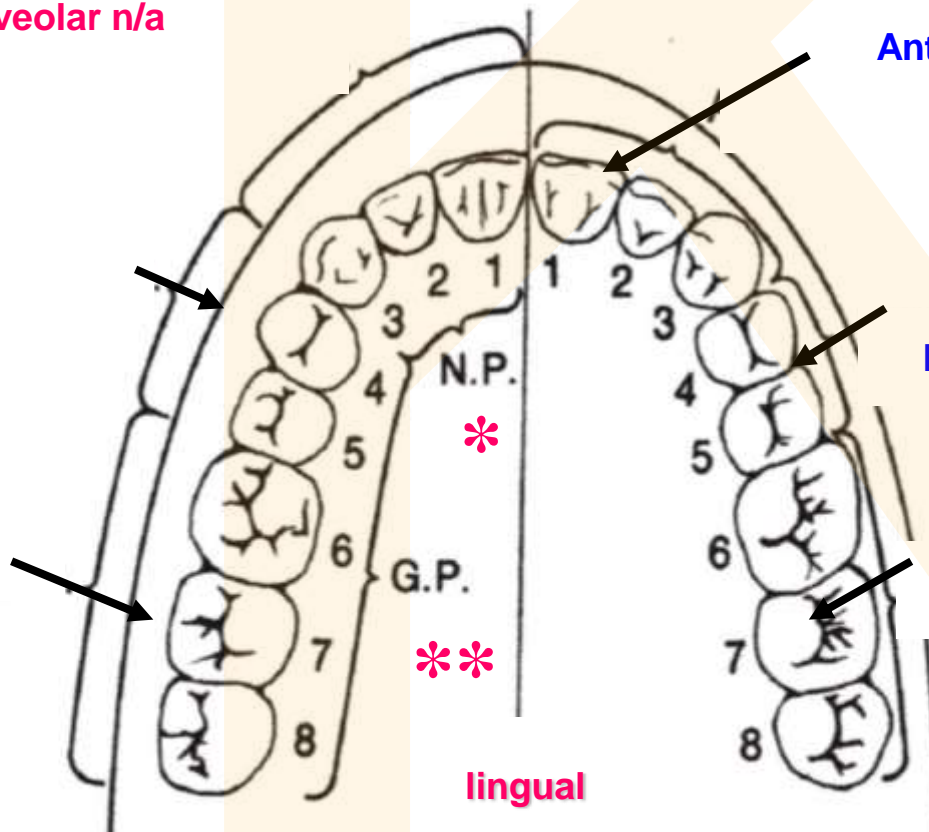
Post. Sup. alveolar n/a

vestibular

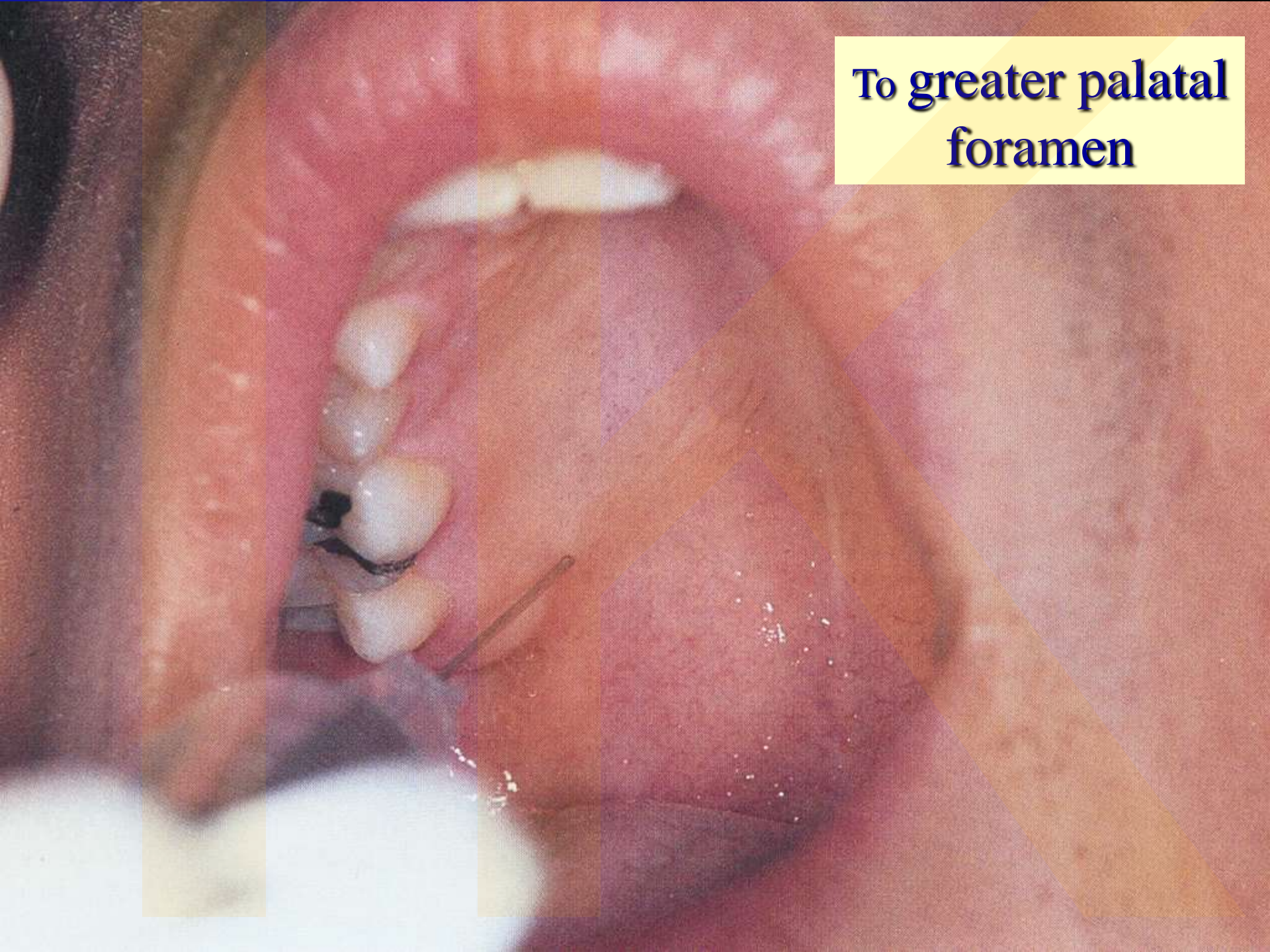
lingual

\*nasopalatine n. & art.

\*\* greater palatine n. & art.



**To greater palatal  
foramen**



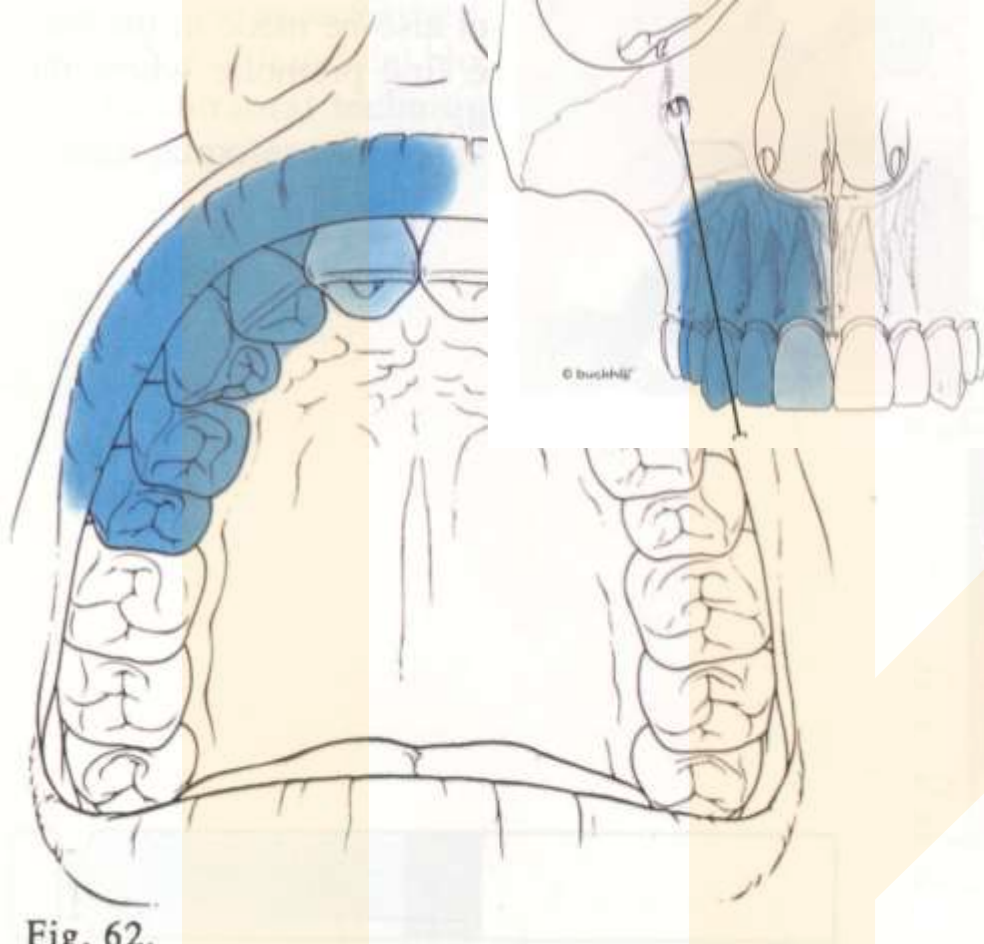
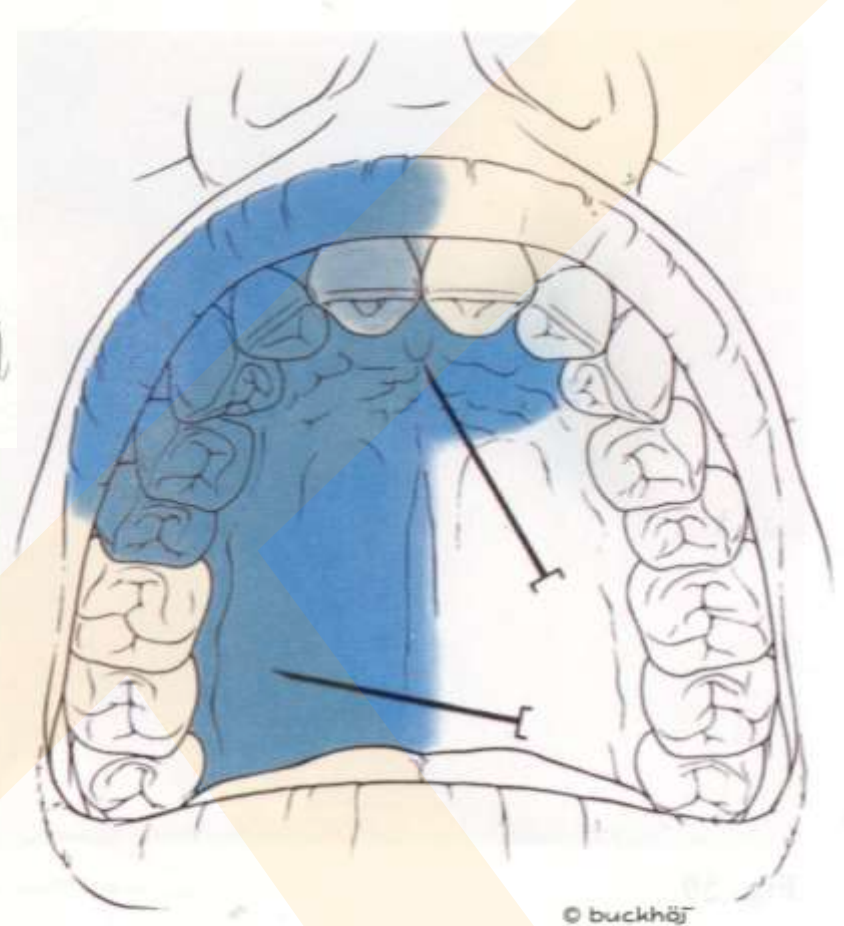


Fig. 62.

© buckhöj

The injection of 1.0 ml at the infraorbital foramen will anaesthetize the teeth and bone within the coloured area (Fig.61).

Gingival and soft tissue anaesthesia after infra-orbital block (Fig. 62).



The area of anaesthesia resulting when supplementary block is made of the palatine nerves at the incisive papilla, and at the major palatine foramen (Fig. 63).

To ensure complete anaesthesia of the medial incisor in the same quadrant it may be necessary to block anastomosing fibres from the dental nerve plexus from the opposite side of the midline. In such cases the infraorbital block is supplemented with about 0.5 ml of the solution injected in the contralateral buccal fold.



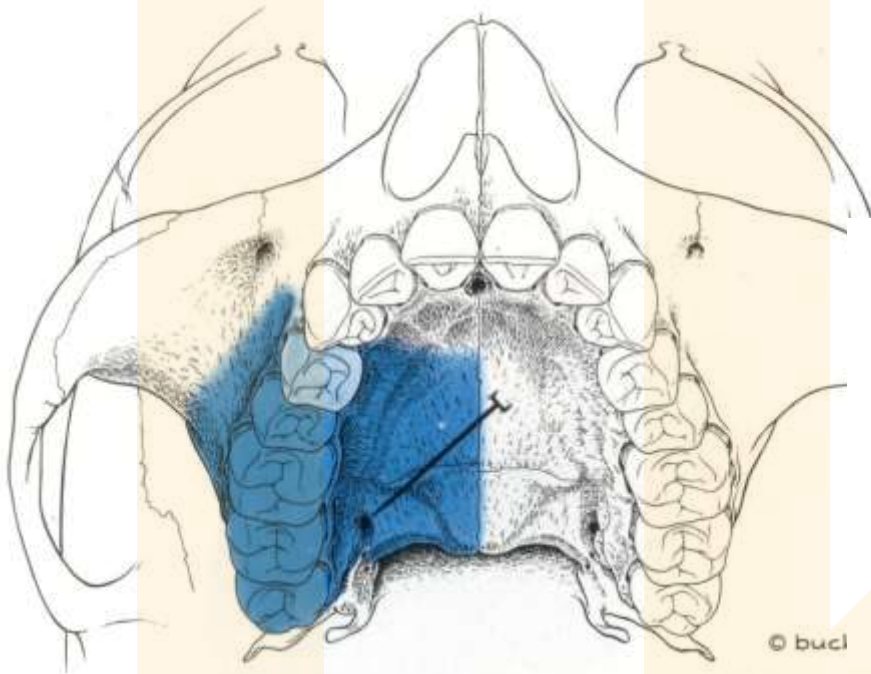


Fig. 89.

Teeth and bone anaesthesia after supplementary block at the greater palatine nerve (Fig. 89).

Gingival and soft tissue anaesthesia after supplementary blocking of the greater palatine nerve (Fig. 90).

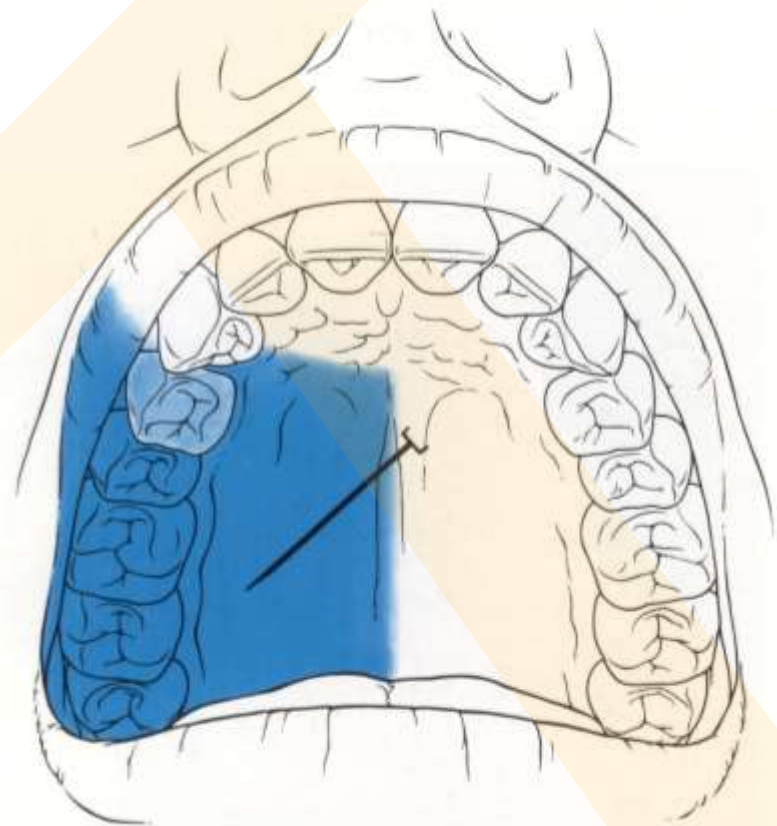
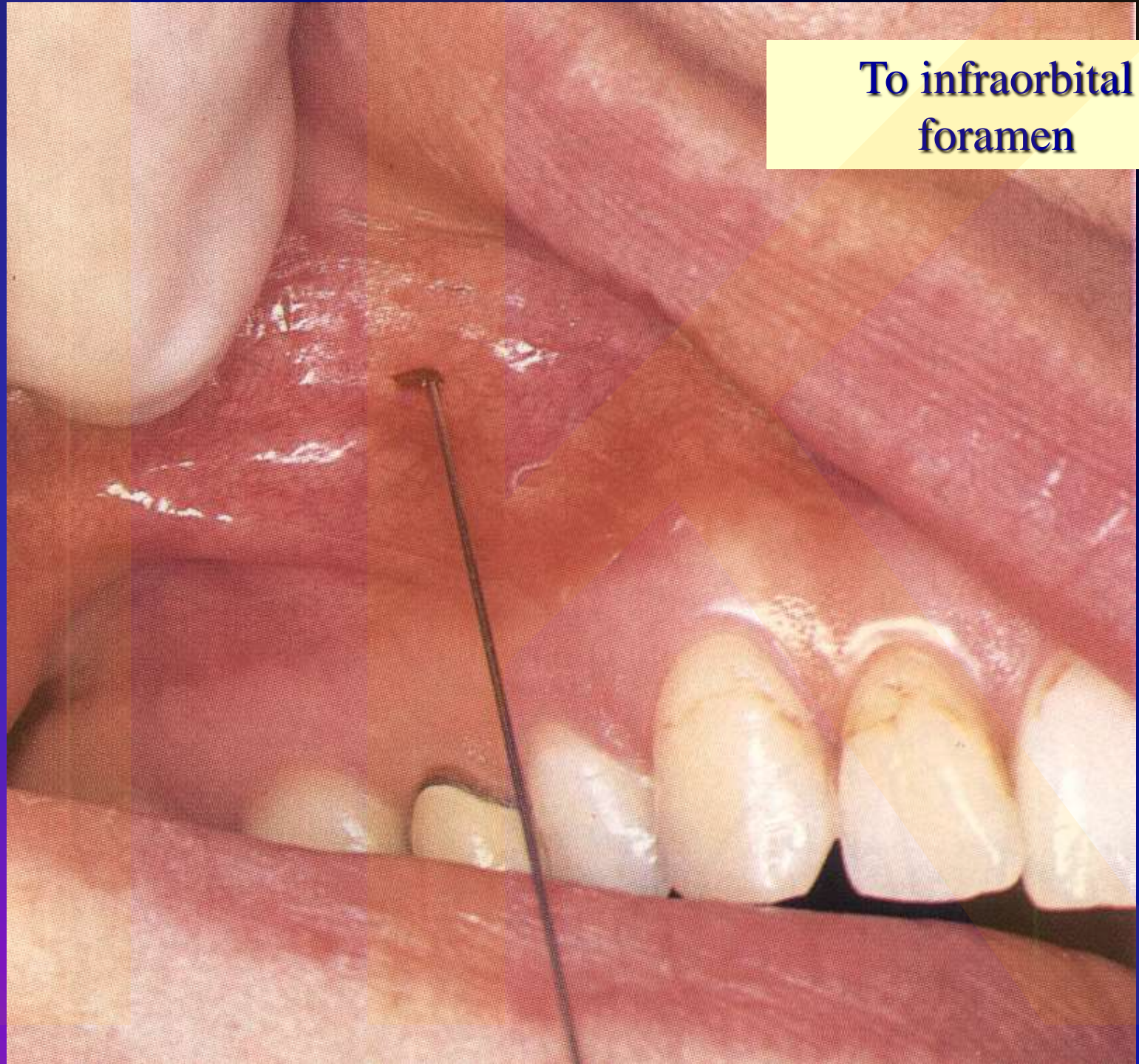


Fig. 90.

© buckhöt



**To infraorbital  
foramen**





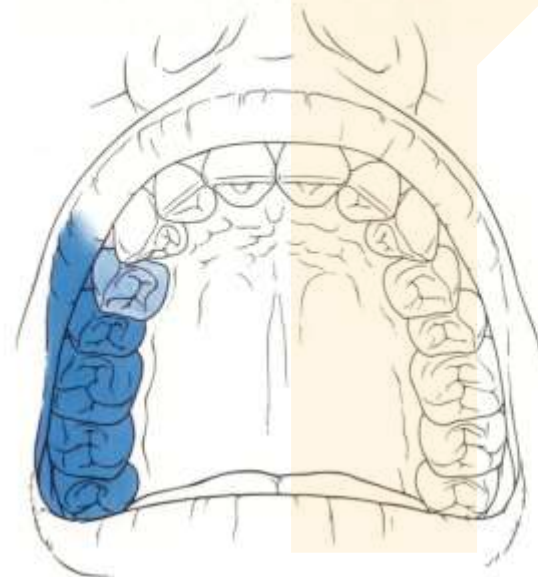
© buckhög

Fig. 85.

### Spread of analgesia

Teeth and bone anaesthesia after buccal injection at the first molar (Fig. 85).

Gingival and soft tissue anaesthesia. Observe relative absence of lip anaesthesia (Fig. 86).



© buckhög

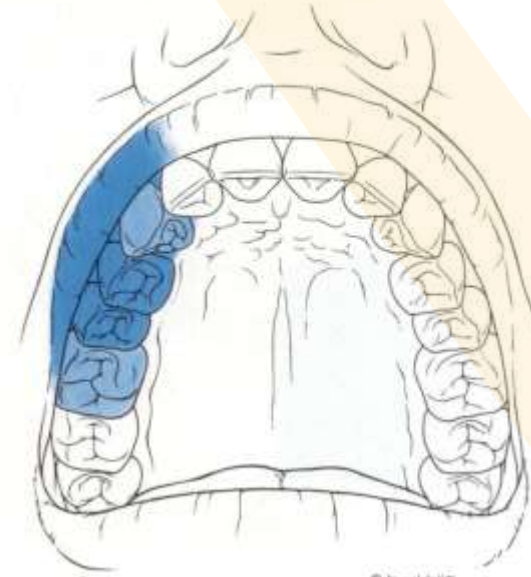


© buckhög

Fig. 87.

Teeth and bone anaesthesia after tuberosity injection of 1.5 ml of solution (Fig. 87).

Gingival and soft tissue anaesthesia after tuberosity injection of 1.5 ml. Lip anaesthesia is in many cases minimal (Fig. 88).



© buckhög

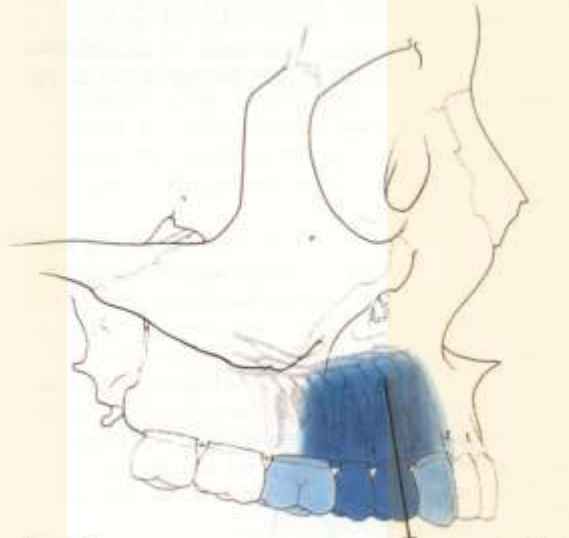


Fig. 71.

© buckhöt

### Spread of analgesia

Teeth and bone anaesthesia after buccal fold injection of 1.0 ml solution (Figs. 71 and 72).

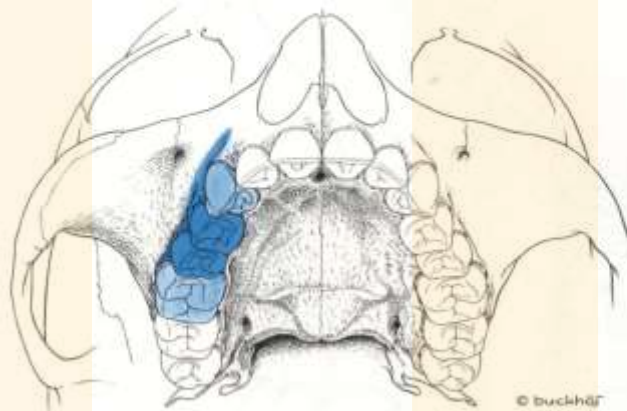


Fig. 72.

© buckhöt

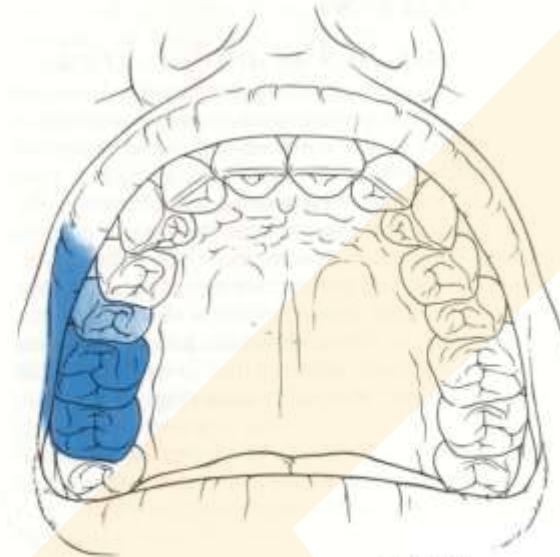


Fig. 73.

© buckhöt

Soft tissue anaesthesia (Fig. 73).

After additional blocking of the palatine by injection at the lingual side of the premolars (Fig. 74).

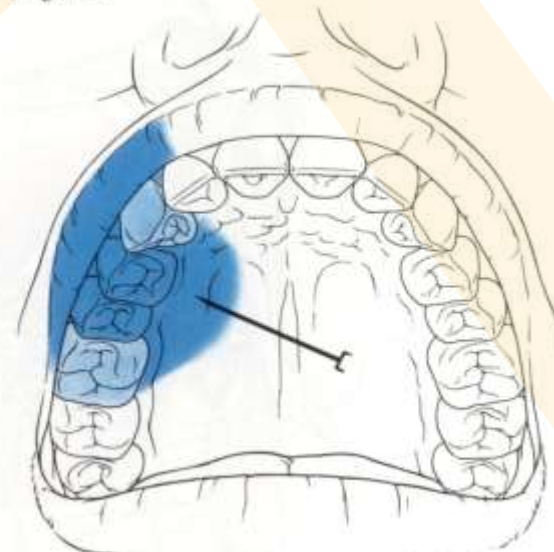


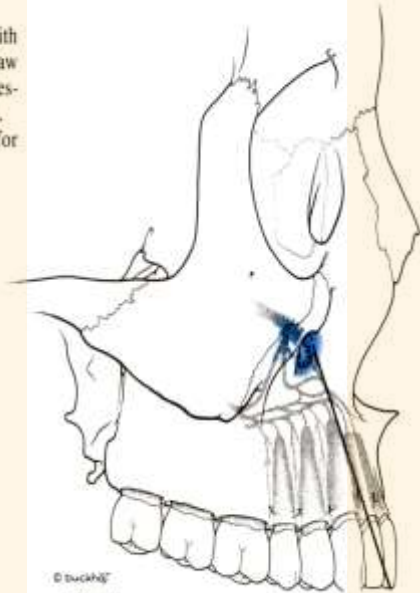
Fig. 74.

© buckhöt

## The infraorbital block

In certain cases, especially in connection with oral surgery, the anterior teeth of the upper jaw can also be anaesthetized by conduction anaesthesia, i.e. infraorbital block (Figs. 57 and 58).

The intraoral technique is the simplest for dental purposes and is applied as follows.

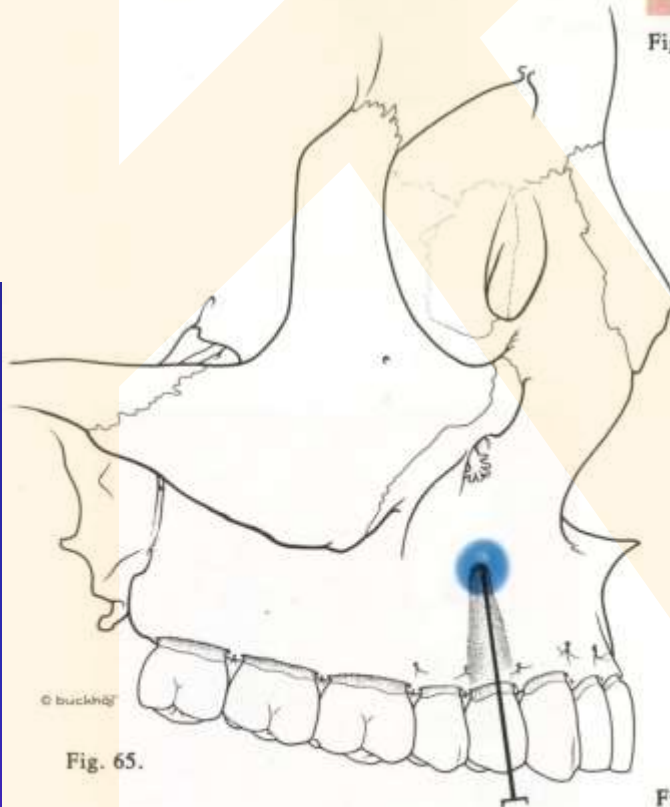


© buckholz  
Fig. 58.

## Injection

The premolars of the upper jaw are anaesthetized by infiltration in the buccal fold next to the teeth. After puncture, the needle is advanced axially (Figs. 65 and 66).

1.0-1.5 ml of solution is deposited in the apical region of the premolars (Fig. 67).



© buckholz

Fig. 65.



Fig. 66.

Fig. 67.



## Buccal infiltration

Infiltration anaesthesia of the upper molars is carried out by injecting close to the tooth. The buccal fold is punctured somewhat mesially to the tooth.

The tip of the needle is then advanced upwards and backwards towards the apex until bone contact is felt. 1-2 ml of solution is then injected (Figs. 76-78).

Fig. 76.

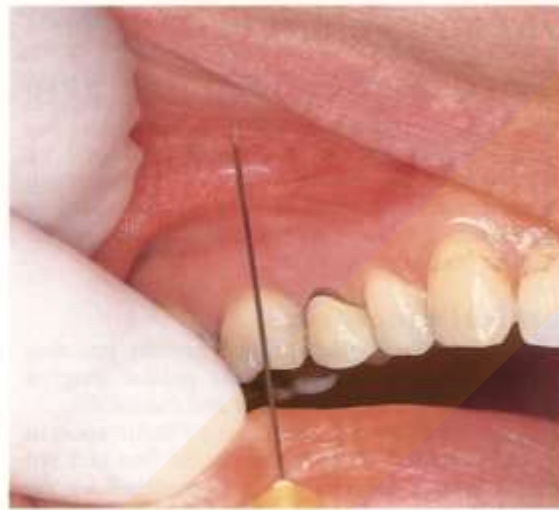
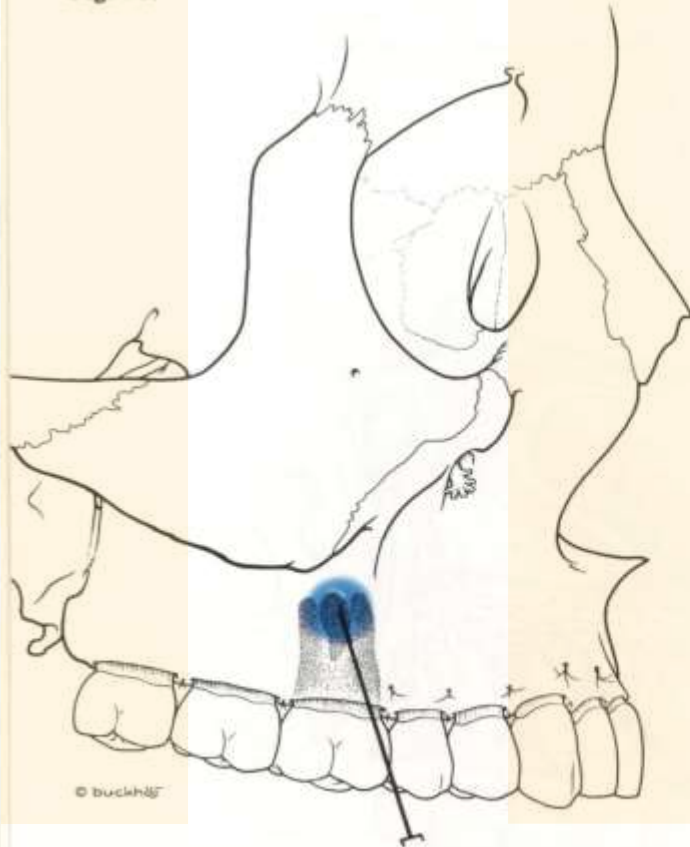


Fig. 77.

If an injection is to be made in the distal aspect of the upper jaw, it is advisable not to open the patient's mouth too widely. If the mouth is too widely opened the coronoid process of the mandible is moved ventrally, and may cover the injection site.

Fig. 78.





Fig. 79.

### Tuberosity injection

If this injection cannot be avoided, the following procedure should be used: palpate the infrazygomatic crest, as shown, and make the puncture dorsal to the retracting finger at, or slightly distal to, the second molar. Then advance the needle keeping close to the maxillary tuberosity, inwards, backwards, and upwards, about 2 cm. Inject 1-2 ml of the solution (Figs. 79-81). Avoid the pterygoid plexus, and confirm this by aspiration, which is an obligatory safeguard before injection.

Numbness of the soft tissues (lip), often a subjective confirmation for the patient that he is anaesthetized, is often only slight or absent when injections are made into the buccal molar area. Inform the patient of this before starting the procedure to allay false fears that the anaesthetic hasn't worked.

Fig. 81.

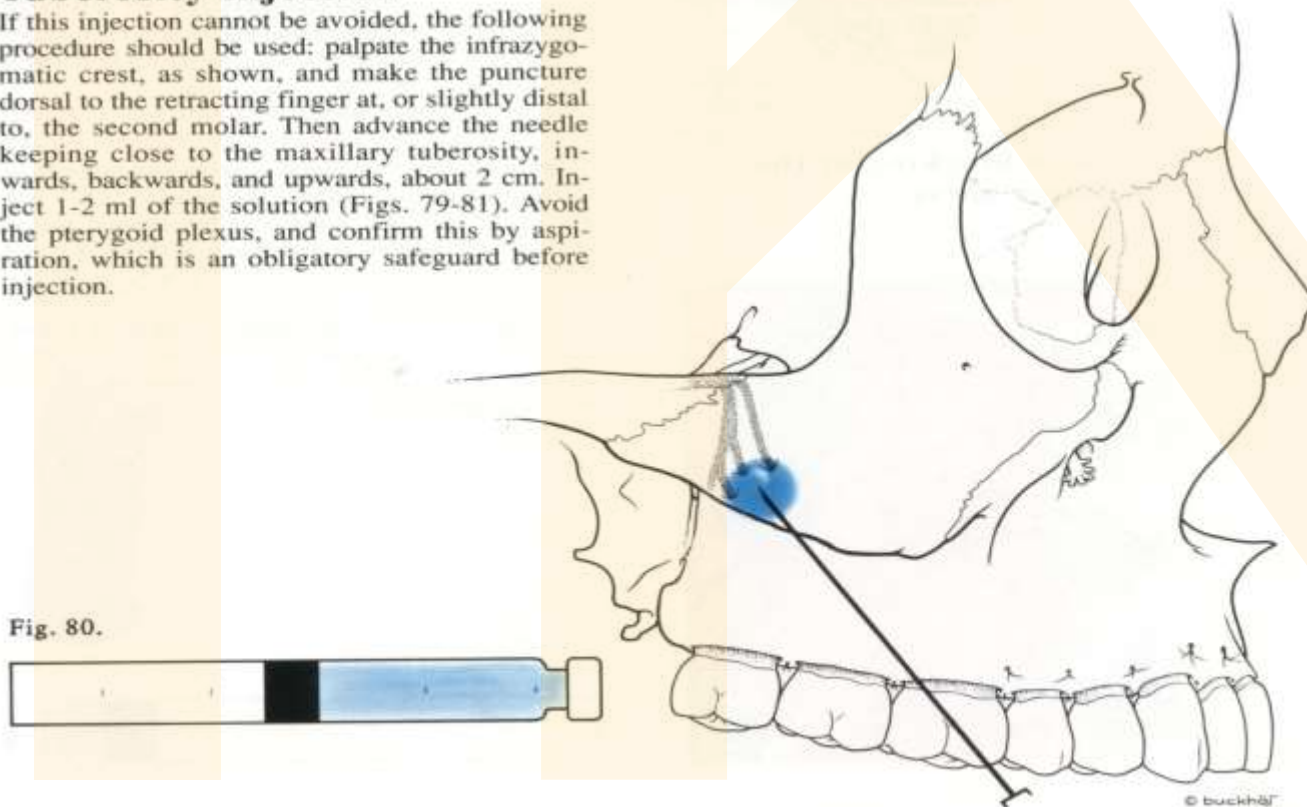
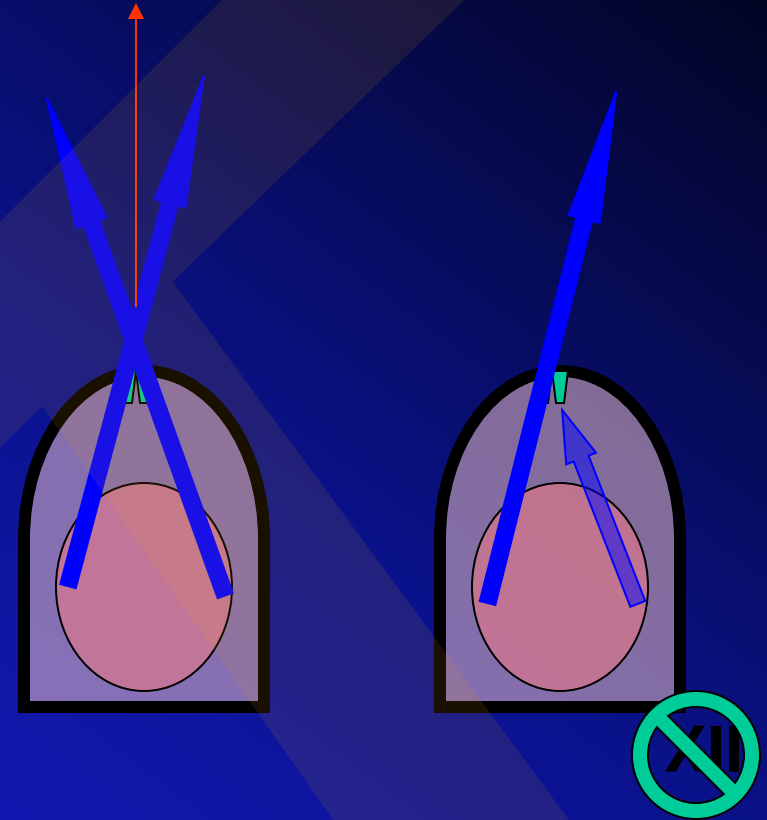
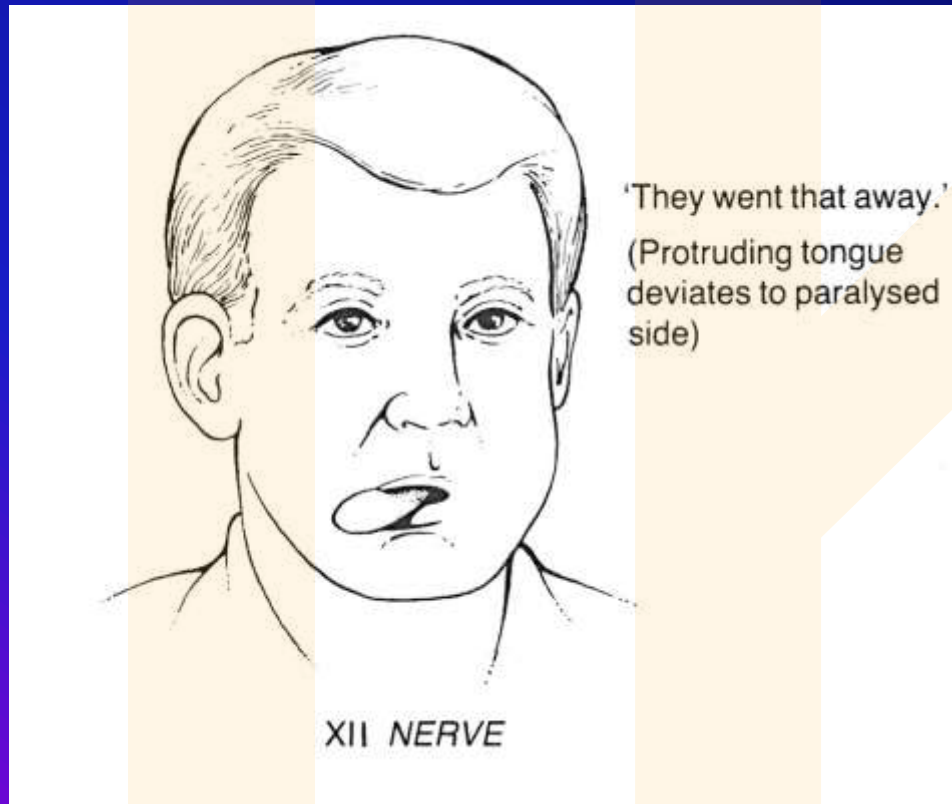


Fig. 80.



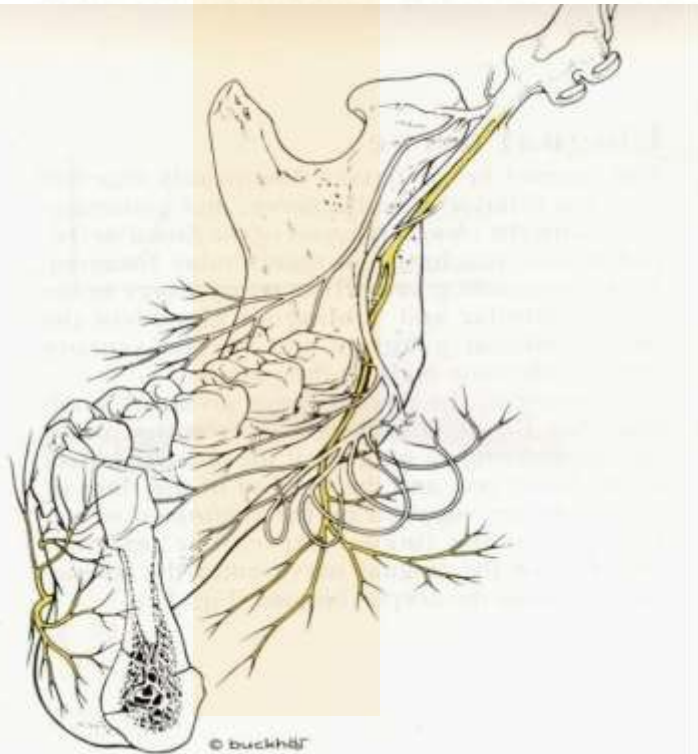
# Hypoglossal nerve test



## Inferior alveolar nerve

The *inferior alveolar nerve* passes downward along the medial side of the mandibular ramus to the mandibular foramen. In the mandibular canal the nerve gives off branches which form the inferior dental plexus from which branches innervate the teeth and gingiva of the lower jaw.

Before the nerve enters the mandibular foramen it gives off the *mylohyoid branch*, which continues along the mandibular ramus. The mylohyoid muscle and the anterior belly of the digastric muscle receive motor fibres from this mixed nerve branch (Fig. 12).



## Mental nerve

The *inferior alveolar nerve* gives off a branch in the mandibular canal - the *mental nerve* - which passes through the mental foramen to innervate the buccal gingiva between the midline and the second premolar, and the skin of the lower lip and chin (Fig. 11).

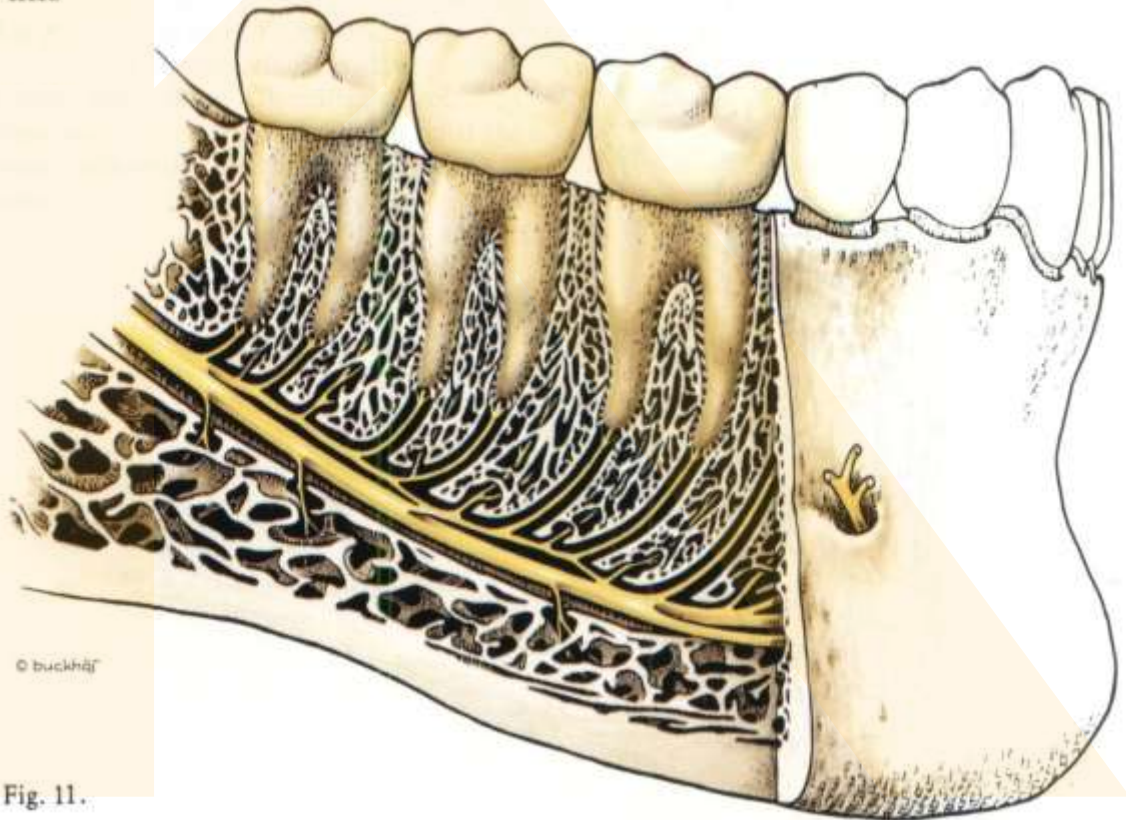
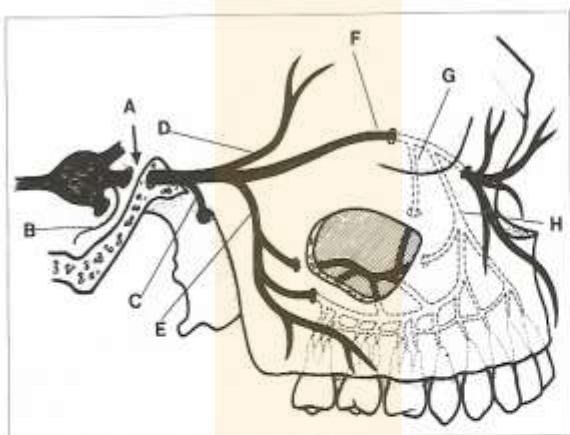
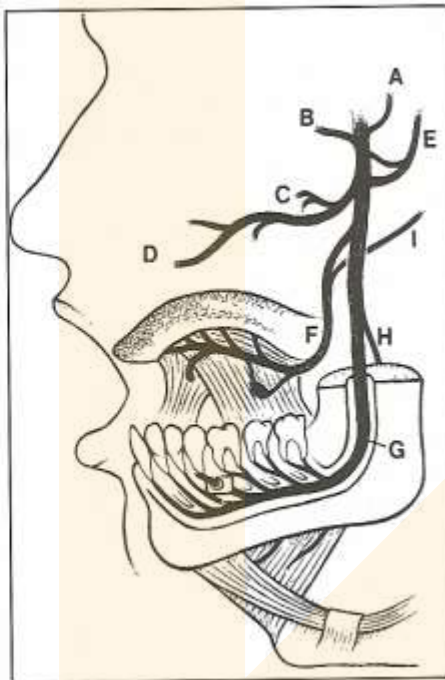


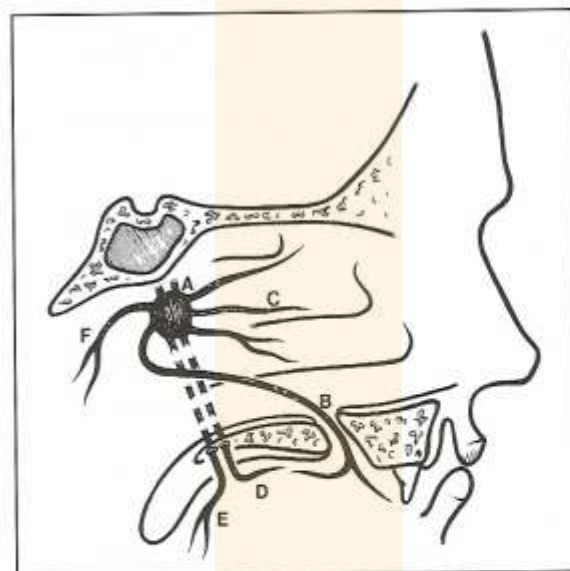
Fig. 11.



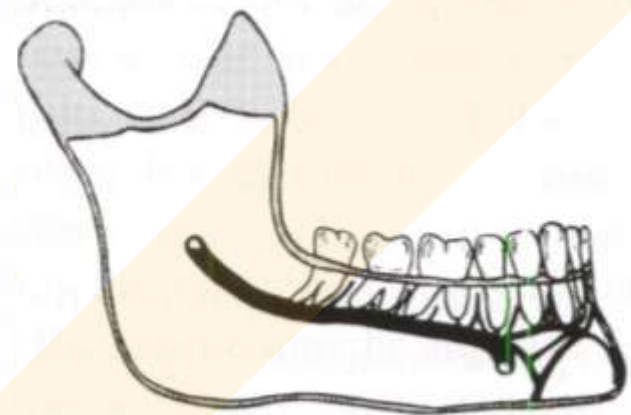
**Fig. 4.15** Diagrammatic representation of the maxillary division of the trigeminal nerve and the branches that are derived directly from the nerve trunk. A = Maxillary nerve trunk passing through the foramen rotundum into the pterygopalatine fossa; B = meningeal branch; C = ganglionic branch; D = main zygomatic nerve; E = posterior superior alveolar nerve; F = infraorbital nerve; G = middle superior alveolar nerve; H = anterior superior alveolar nerve.



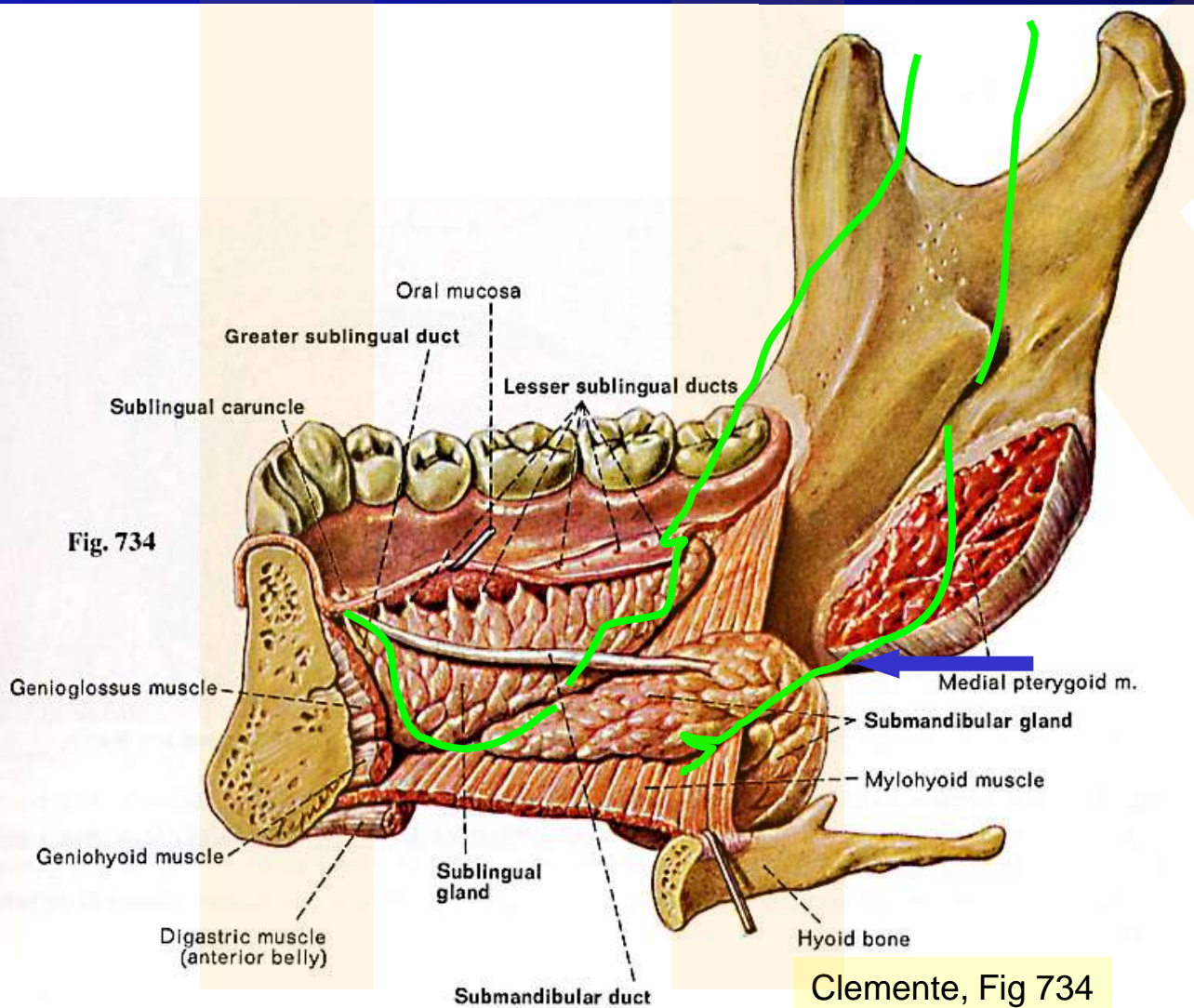
**Fig. 4.17** Schematic diagram of the mandibular division of the trigeminal nerve. A = Meningeal branch; B = nerve to medial pterygoid; C = anterior trunk giving motor branches to masseter, temporalis and lateral pterygoid muscles; D = buccal nerve; E = auriculotemporal nerve; F = lingual nerve; G = inferior alveolar nerve; H = mylohyoid nerve; I = chorda tympani branch of facial nerve joining the lingual nerve.



**Fig. 4.16** Diagrammatic representation of the maxillary division of the trigeminal nerve and the branches that are derived via the pterygopalatine ganglion. A = Pterygopalatine ganglion; B = nasopalatine nerve; C = posterior superior nasal nerve; D = greater palatine nerve; E = lesser palatine nerve; F = pharyngeal nerve.

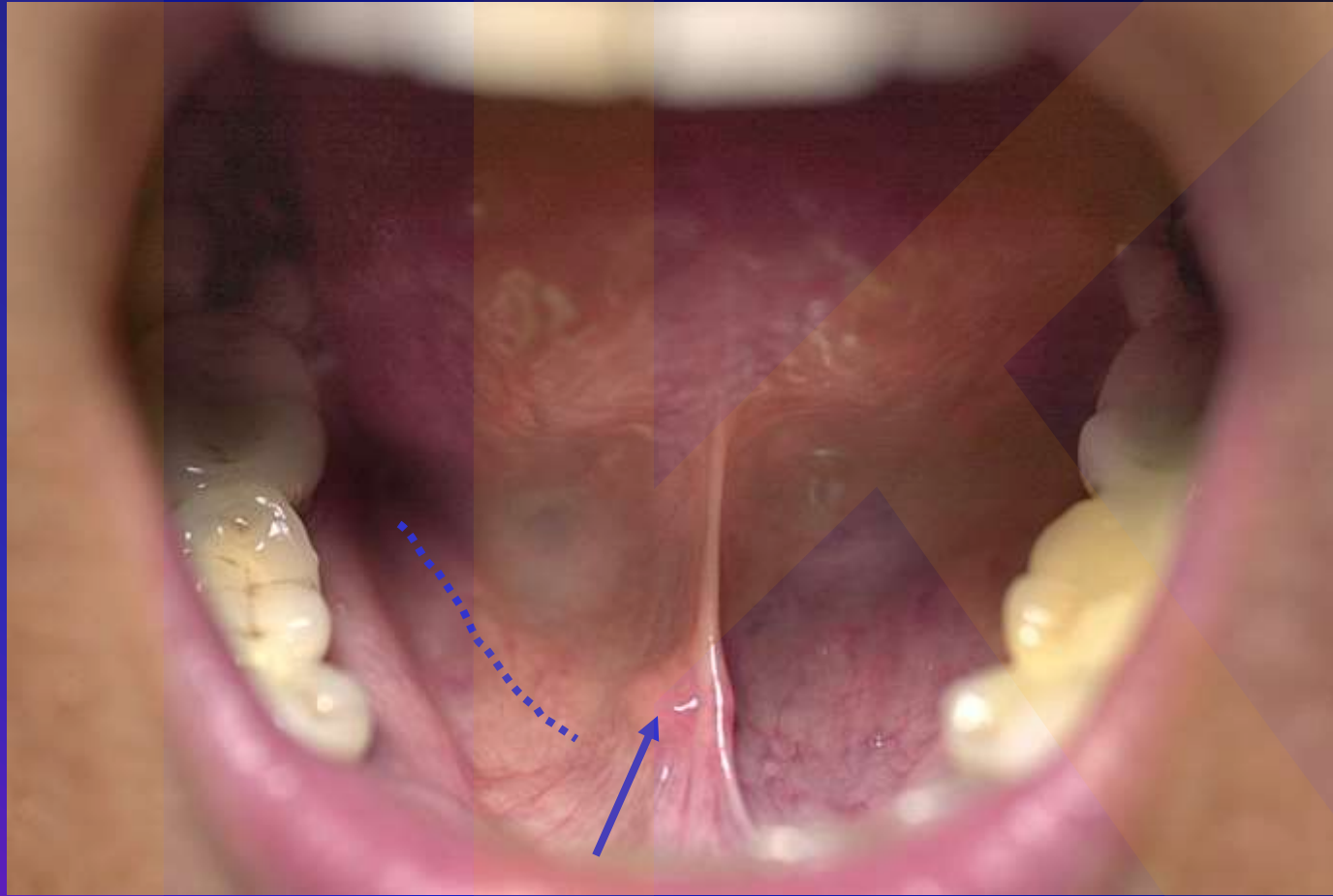


# Relationships –from medial view



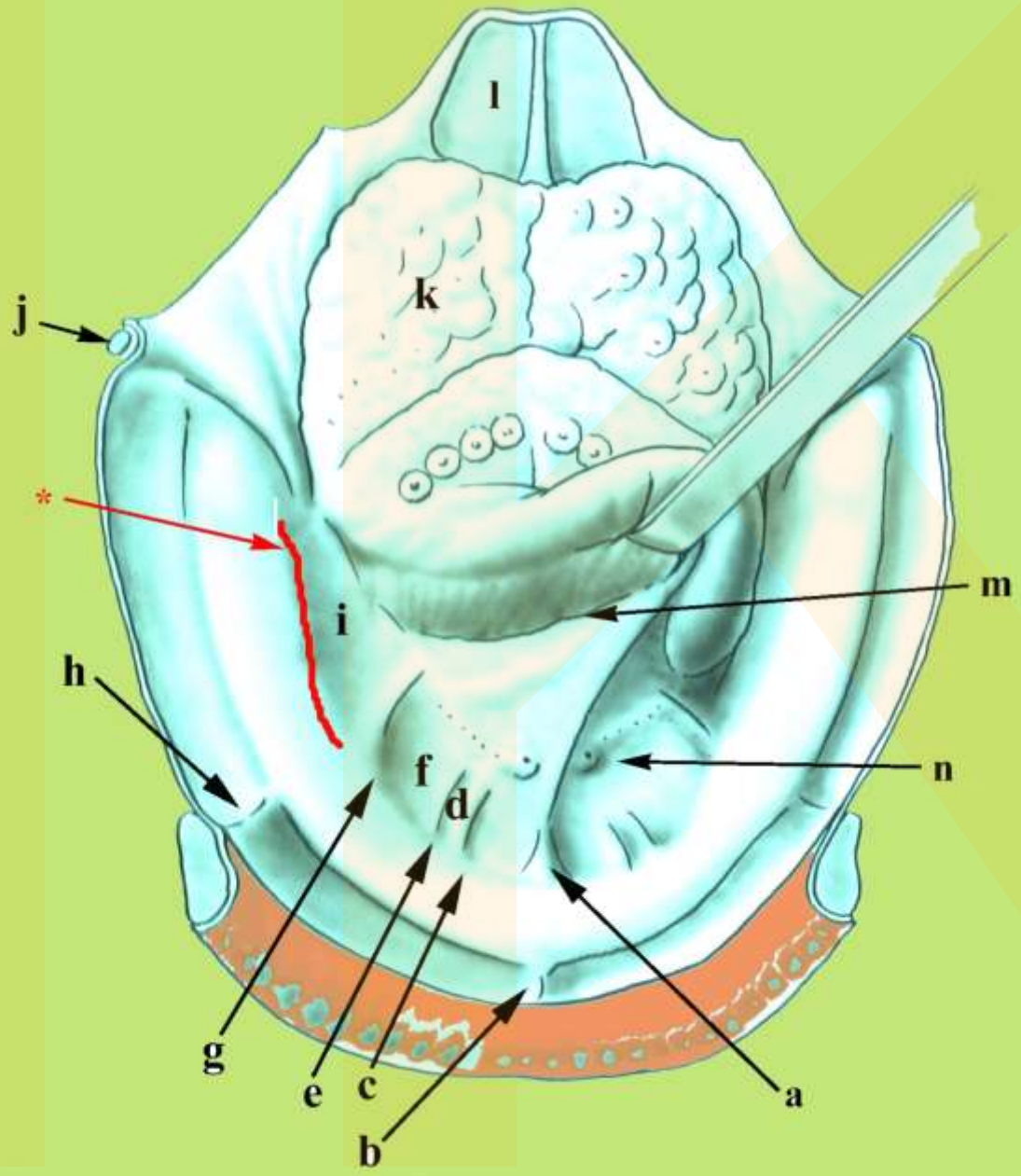
- inferior alveolar nerve
- nerve to mylohyoid
- lingual nerve

# Sublingual structures



DH-M

- Lingual frenulum
- Sublingual papilla and submandibular duct
- Sublingual fold and sublingual ducts



Gingiva

Teeth

Buccal n/a

Inferior alveolar n/a

Mental n/a (Labial art.)

Inferior alveolar n/a

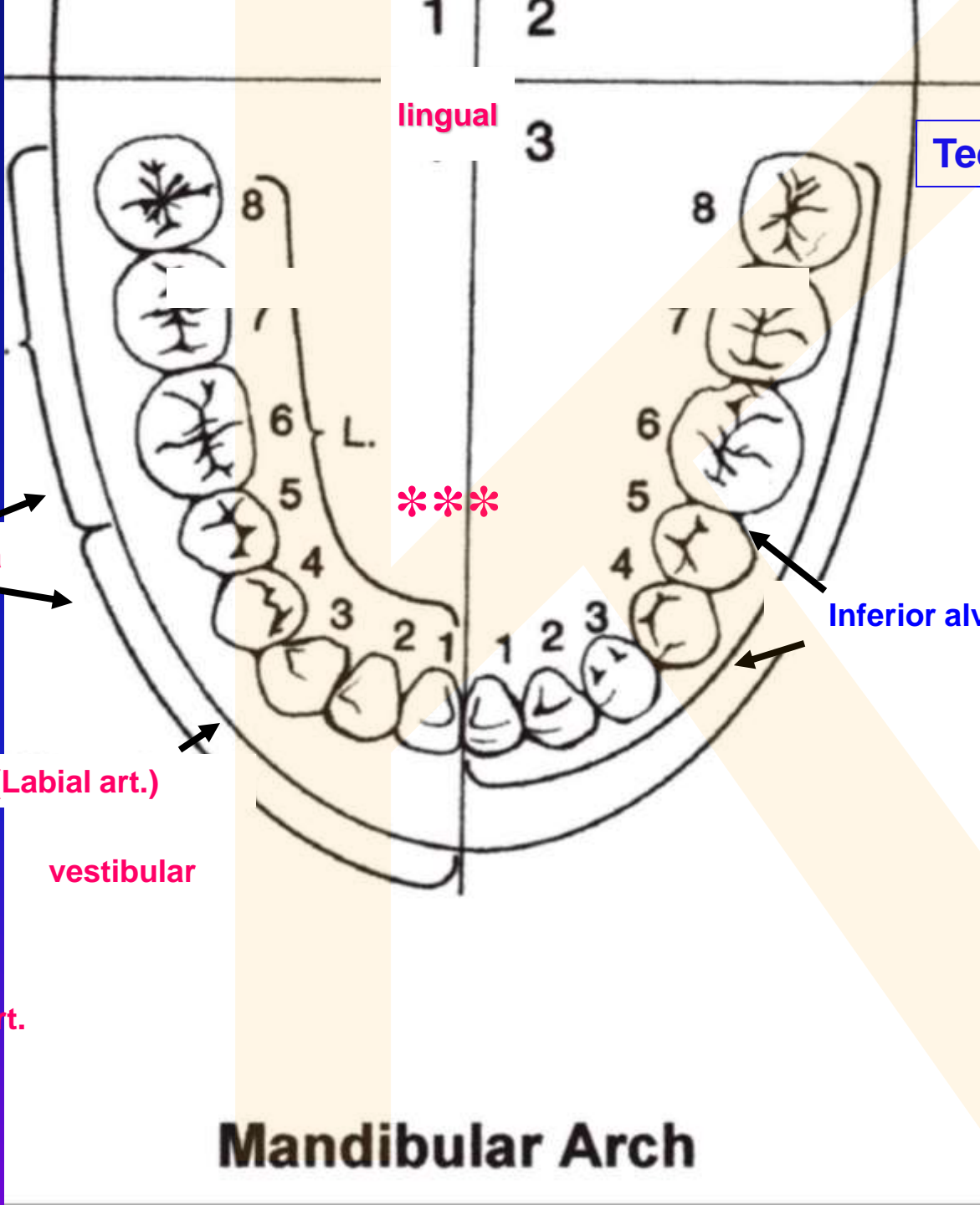
lingual

vestibular

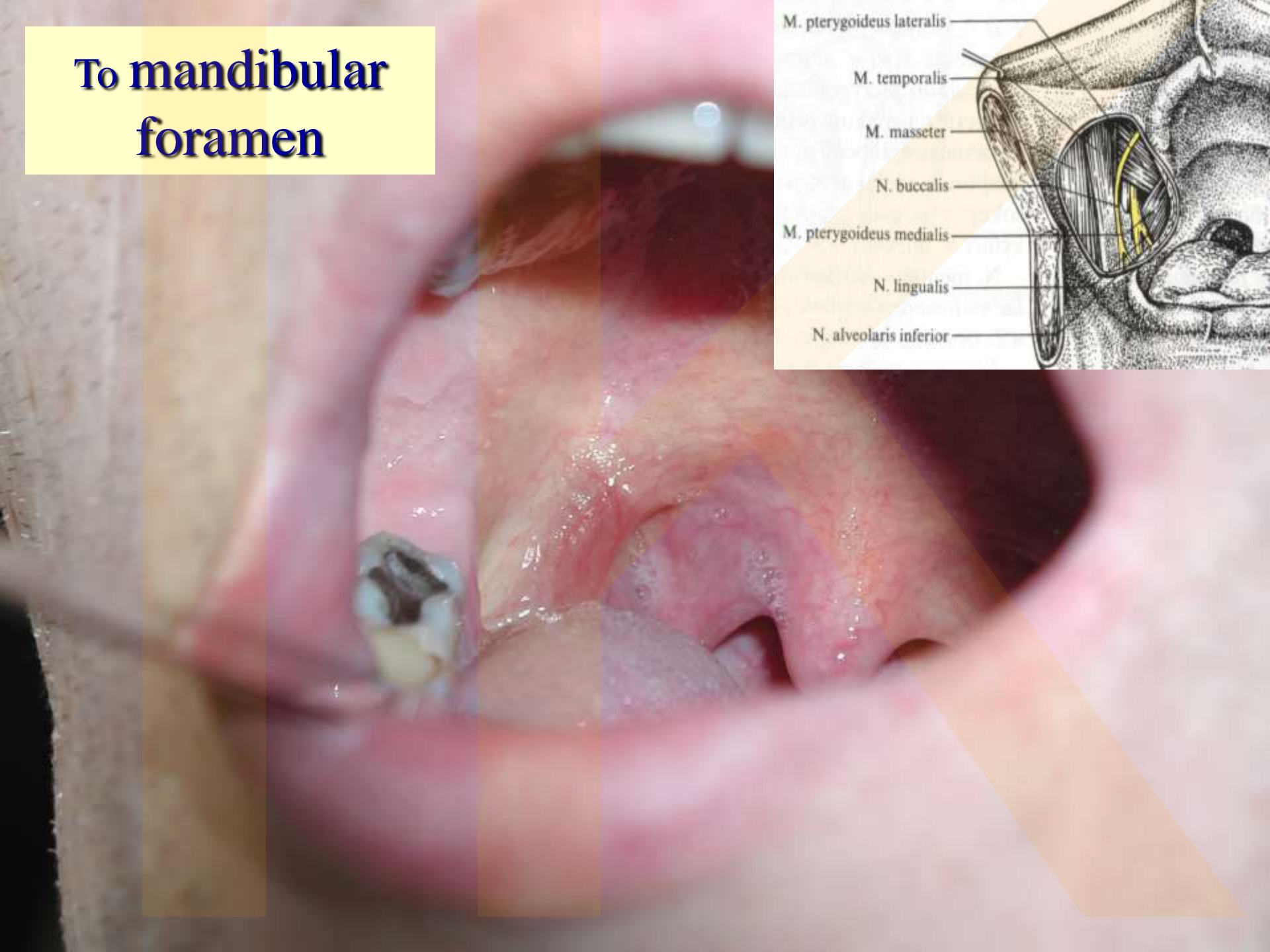
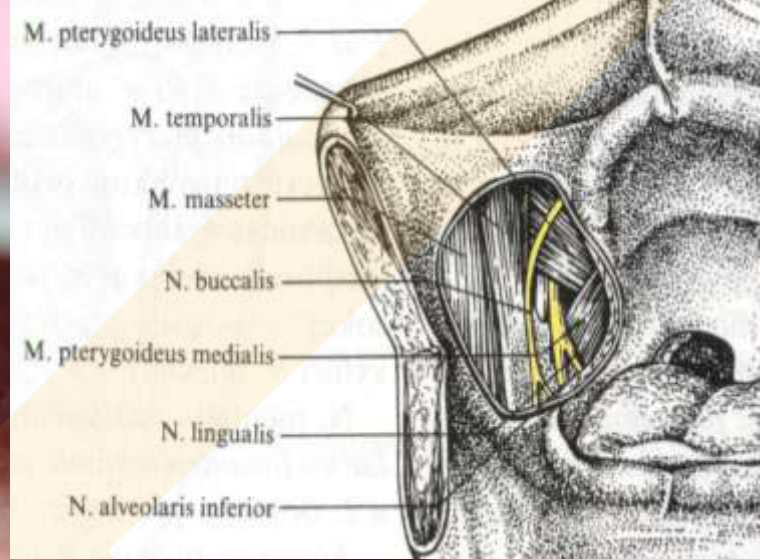
\*\*\* lingual n. & art.

\*\*\*

Mandibular Arch

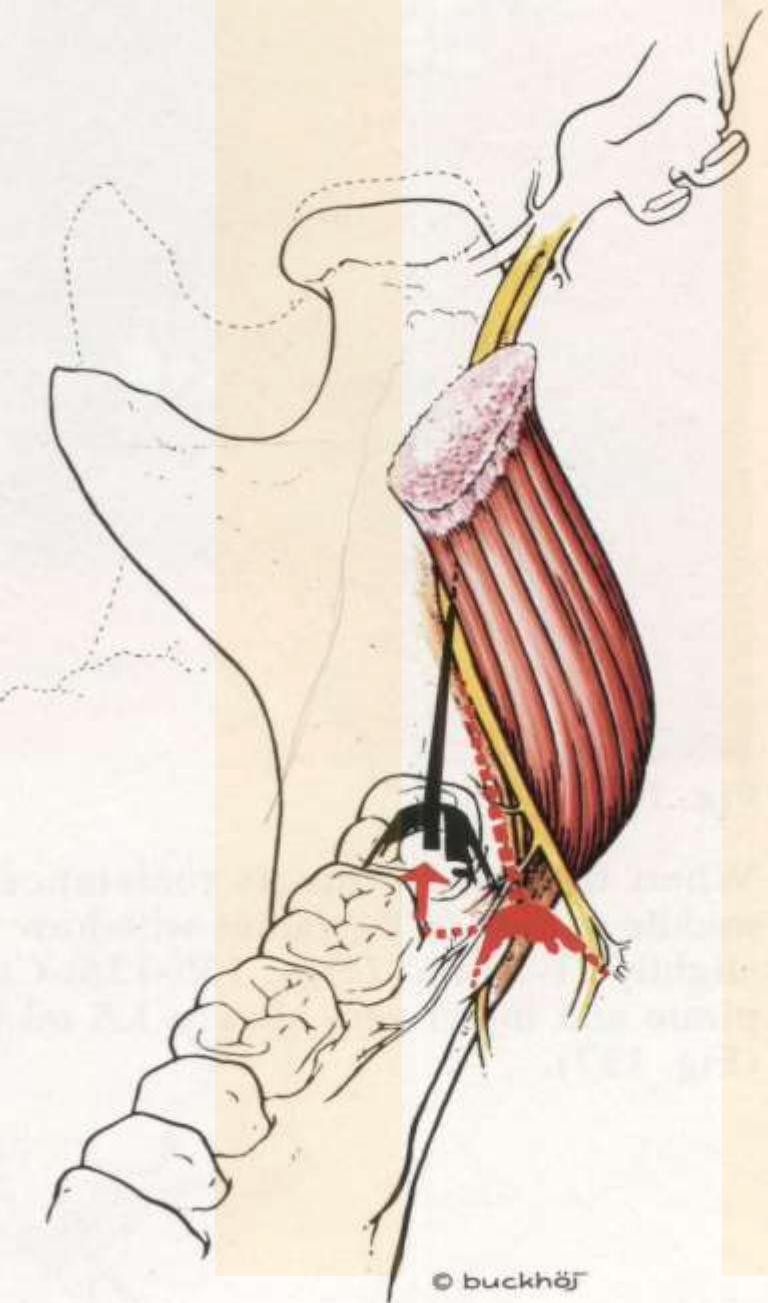


# To mandibular foramen









**Fig. 134.**

The needle is now advanced dorsally 1.5-2 cm along the medial side of the ramus. During this procedure the needle should always be in contact with the bone of the ramus and the syringe held in the original horizontal position relative to the occlusal plane (Figs. 133-134).

## Pre-injection topical anaesthesia

Using modern disposable needles, the actual pain of penetration is minimal if the dentist's technique is in order. Distraction analgesia also helps. If the tissue are gently pressed at some distance from the intended puncture site, or if the patient's lip is lightly compressed, the perception of puncture pain will be further diminished (Fig. 34).

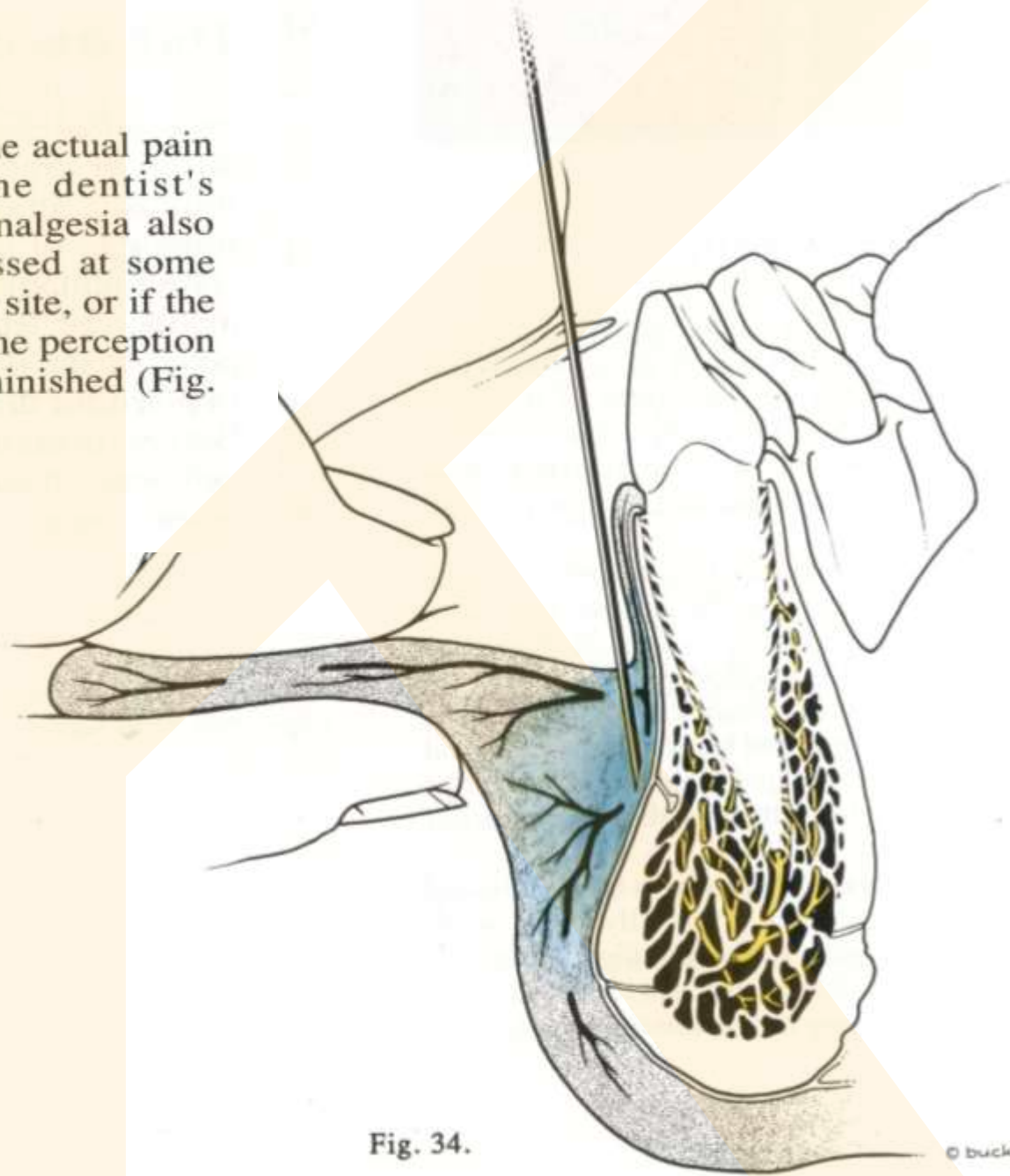


Fig. 34.

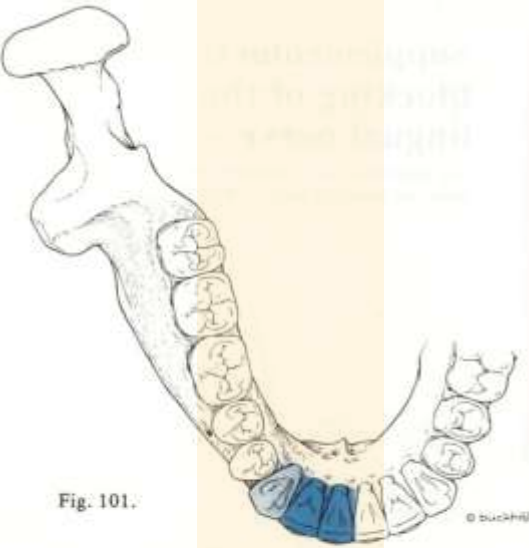


Fig. 101.

**Spread of analgesia**

The injection of a standard volume of 1 ml of the solution will ensure adequate analgesia of the tooth pulp and the bone in this area (Figs. 101 and 102).

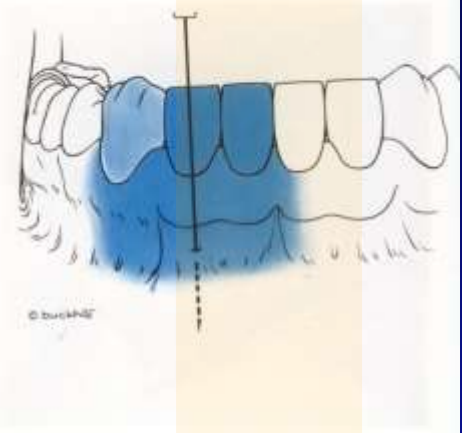


Fig. 103.

Gingival and soft tissue anaesthesia after buccal infiltration (Fig. 103 and 104).

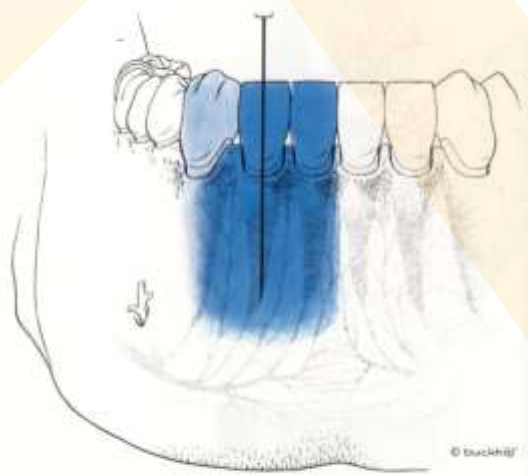


Fig. 102.

**Spread of analgesia**

The injection of a standard volume of 1 ml of the solution will ensure adequate analgesia of the tooth pulp and the bone in this area (Figs. 101 and 102).



Fig. 104.

Gingival and soft tissue anaesthesia after buccal infiltration (Fig. 103 and 104).

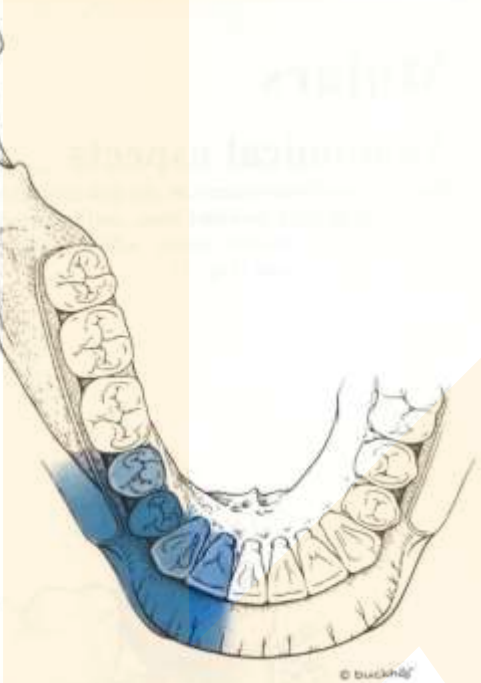
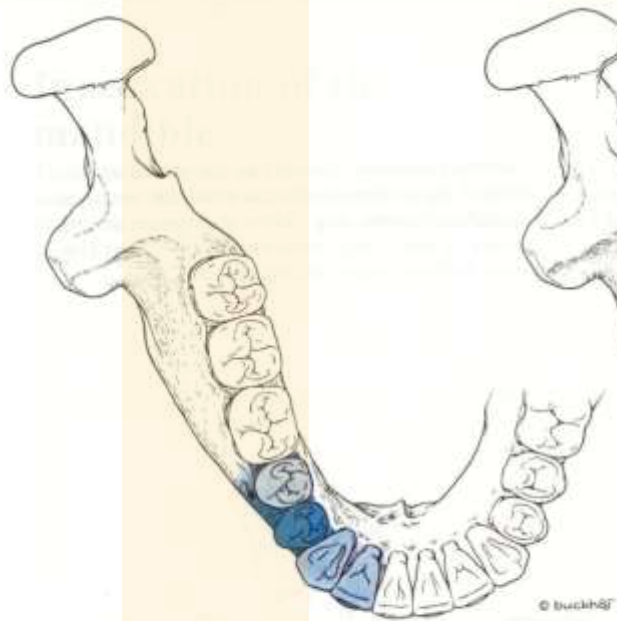


Fig. 145.

**Spread of analgesia**

A successful injection at the mandibular foramen will anaesthetize the molars, premolars, canine and incisors on the same side of the mandible (Fig. 145).

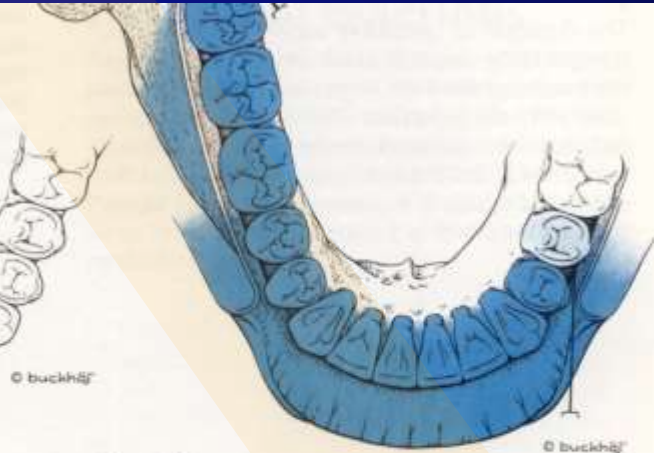


Fig. 146.

The coloured area shows the spread of anaesthesia in the teeth, buccal gingiva, and the soft tissues after supplementary block of the contralateral mental nerve (Fig. 146).



END