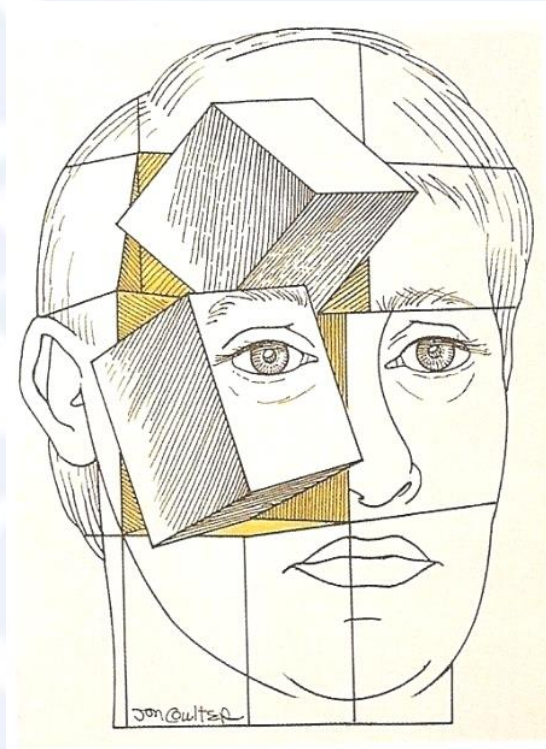


HEAD AND NECK VESSELS AND NERVES

(clinical applications)



Chovanec M^{1,2}

¹Dep. of Otorhinolaryngology, 3rd Medical Faculty, University Hospital Kralovske Vinohrady

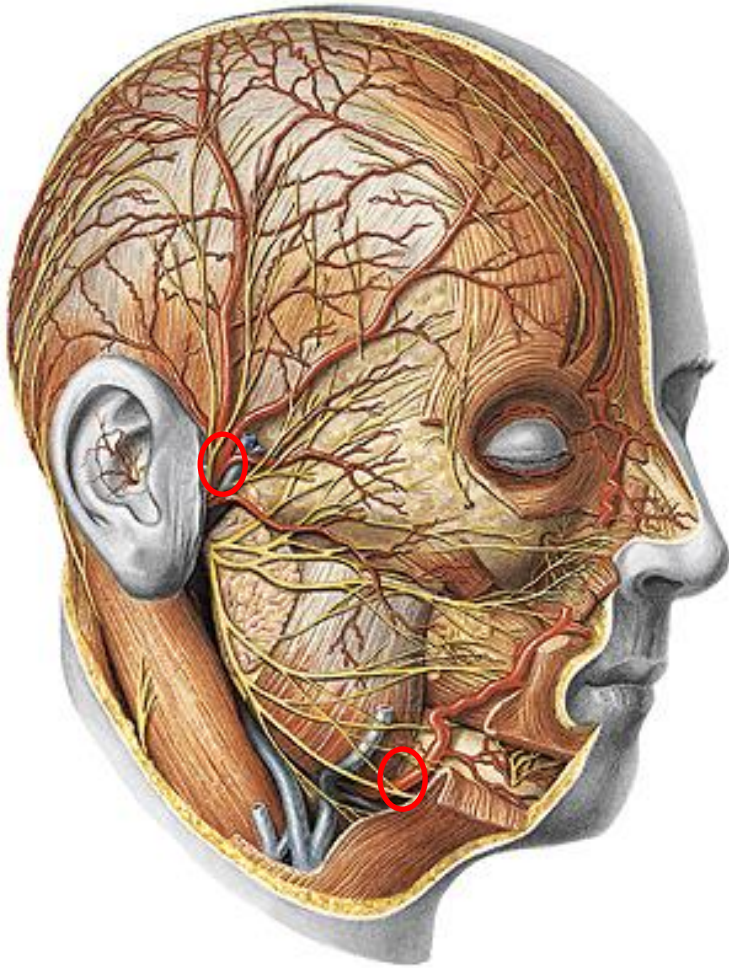
²Inst. of Anatomy, 1st Medical Faculty

Charles University Prague

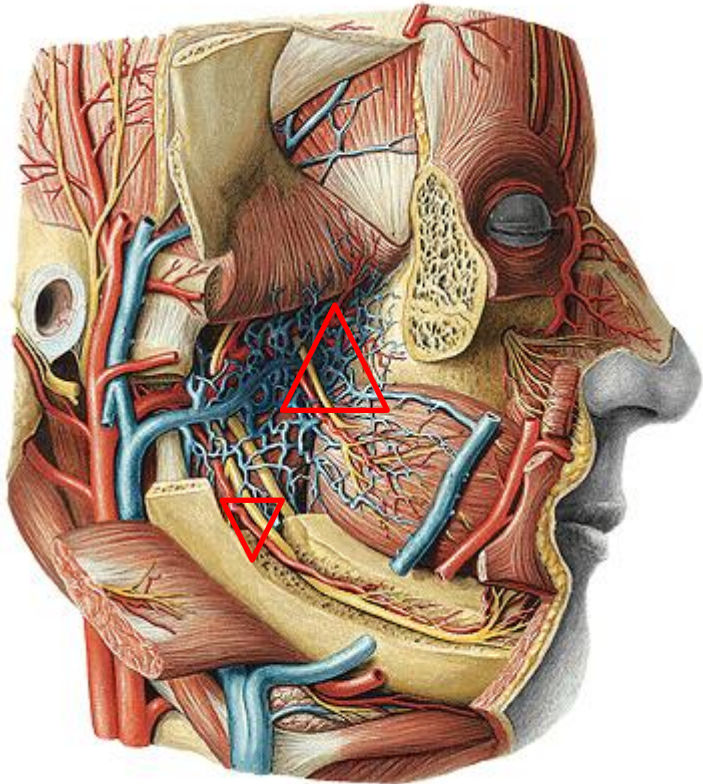


Arteries of the head

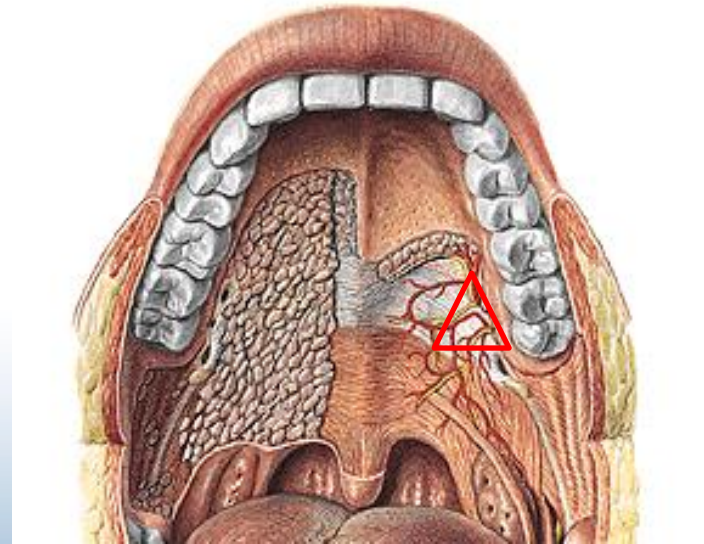
Bleeding - compression
facial a.
superf. temporal a.



Arteries of the head



bleeding - compression
gret. palatine a.
inf. alveolar a. – alveolus
pterygoid v. plexus



Arteries of the head

bleeding - ligation

lingual a.

(Pirogov's tr. Béclard's ang)

facial a.

(submandibular tr.)

maxillary a.

(infratemporal f.)

ext. carotid a.

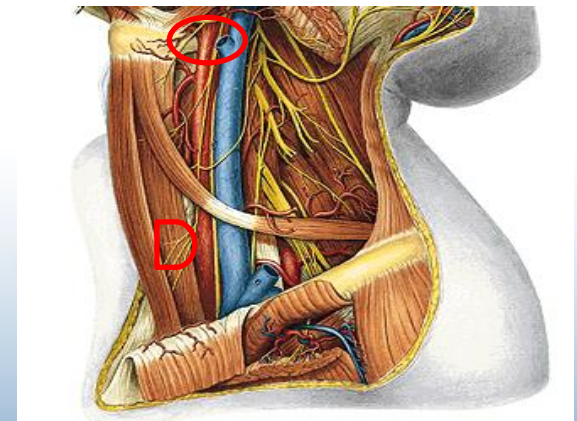
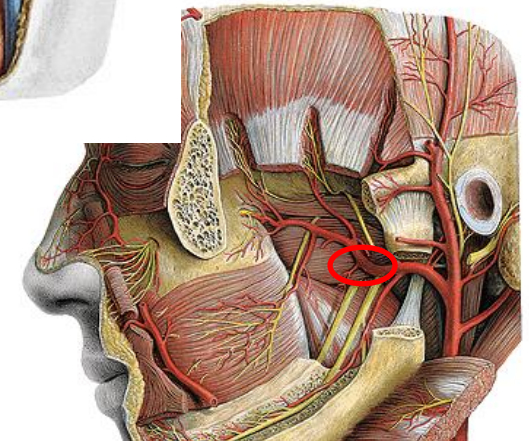
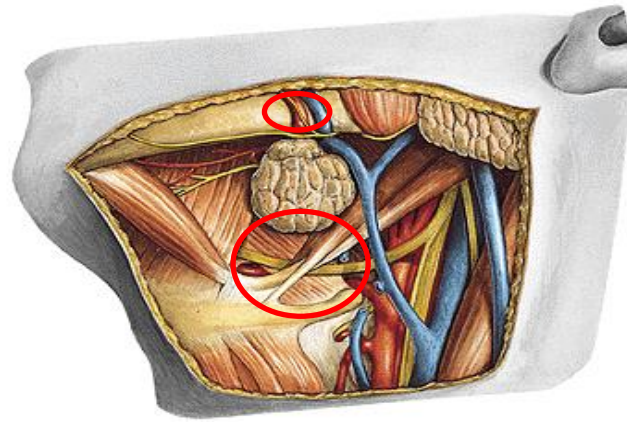
(carotic tr.)

comon carotid a.

(arterial circle of Willis!)

comon carotid a.

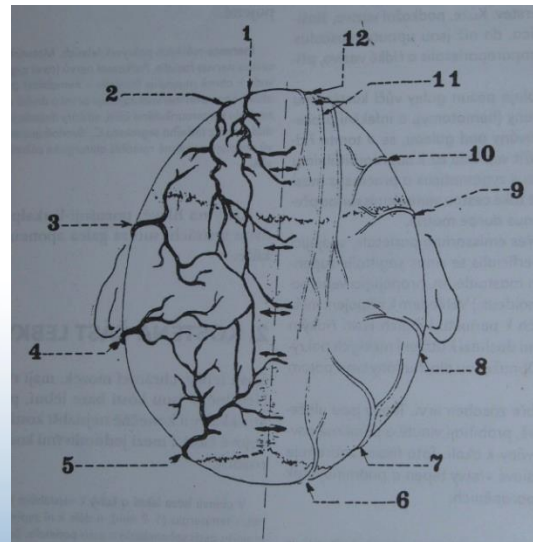
(compression – carotic tr. - transv. pr. C6)



Arteries of the head



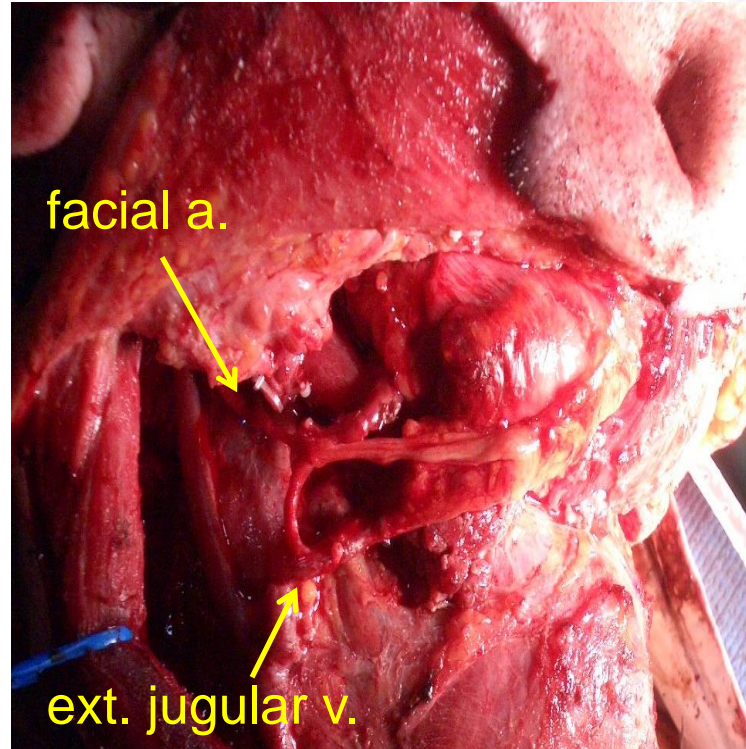
skin incisions



arteries and nerves of the scalp

- 1 - supratrochlear a.
- 2 - supraorbital a.
- 3 - superf. temporal a.
- 4 - post. auricular a.
- 5 - occipital a.
- 6 - tert. occipital n.
- 7 - great. occipitali n.
- 8 - lesser occipital n.
- 9 - auriculotemporal n.
- 10 - zygomaticotemporal n.
- 11 - supraorbital n.
- 12 - supratrochlear n.

Arteries of the head



microvascular reconstruction
(rect. abdominis free flap)

Arteries of the head

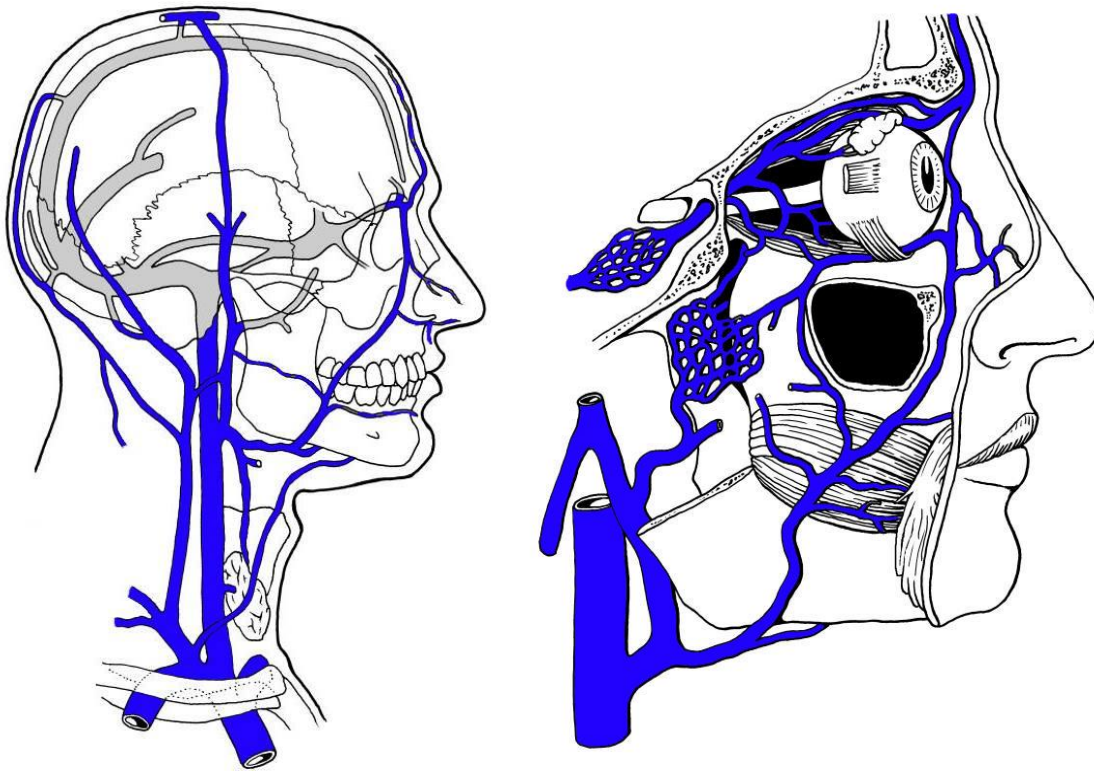


CAVE!: anastomoses
ext. and int. carotid aa.
supratrochl. a./angular a.
vidian a.



Angiofibroma of nasopharynx
(sphenopalatine f.) maxillary a. -
angiography and embolization

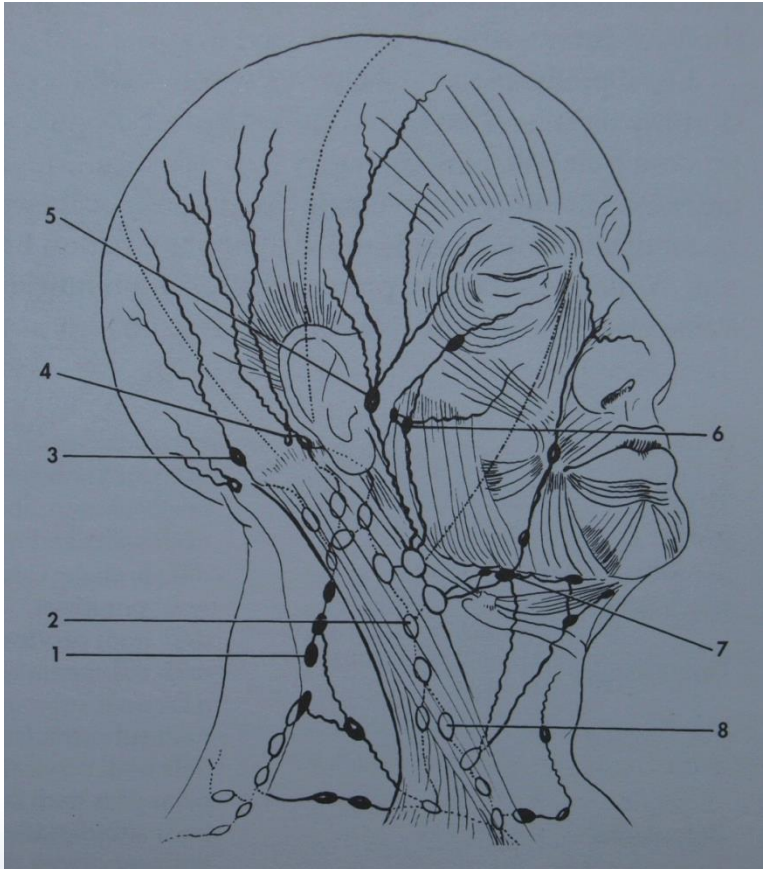
Veins of the head



venous anastomoses (spread of infection)

- facial v. • supraorbital/supratrochlear v. •
- sup. and inf. ophthalmic vv. • cavernous s. •
- pterygoid v. pl. • maxillary v. •
- retromandibular v. • ext. palatine v. • deep facial v. •
- superf. and med. temp. vv. • parotid vv. • transv. facial v.

Lymphatic drainage of the head



Lymph nodes of the head and neck

(acc. to Borovanský 1976)

- 1 - cervic. superf. LNs
- 2 – deep sup. cervical LNs
- 3 – occipital LNs
- 4 – retroauricular LNs
- 5 – preauricular LNs
- 6 – parotid LNs
- 7 – submandibular LNs
- 8 – deep inf. cervical LNs

Sensitive innervation of the head

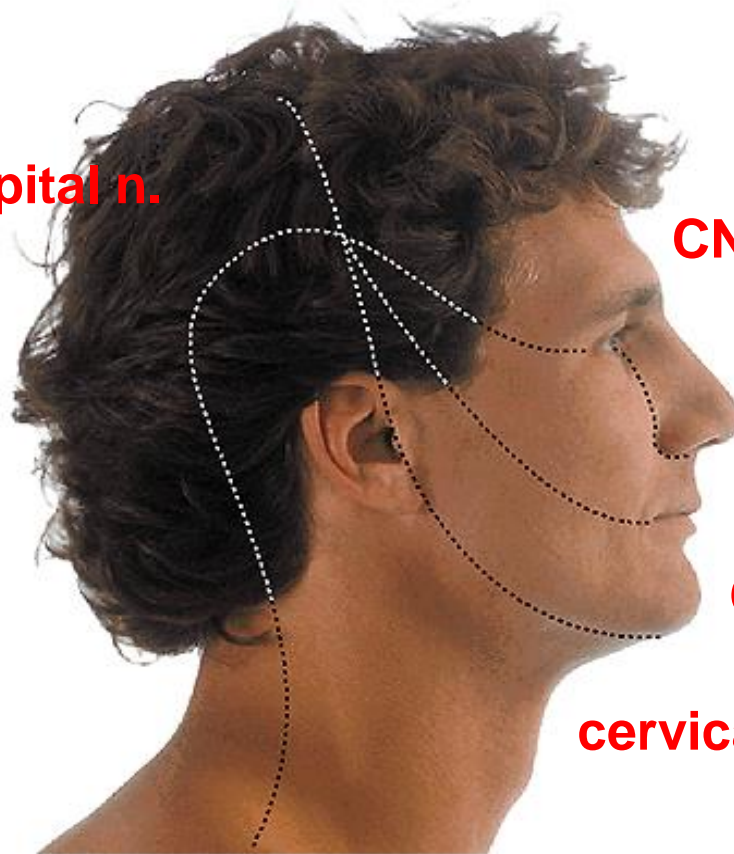
gr. occipital n.

CN V/1

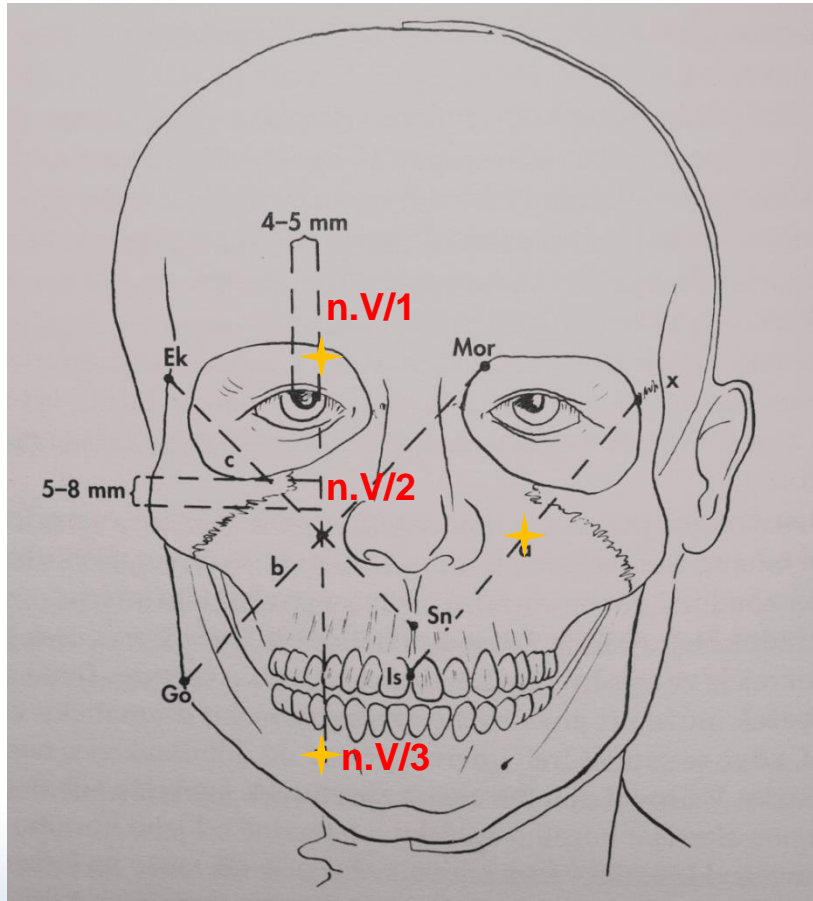
CN V/2

CN V/3

cervical pl.



Sensitive innervation of the head



Exit points of CN V

Ek - ektokonichion

Go - goniale

Is - incisale superius

Mor - medioorbitale

x – frontozygomatic s.

a – line of Černý

b – line - Mor a Go

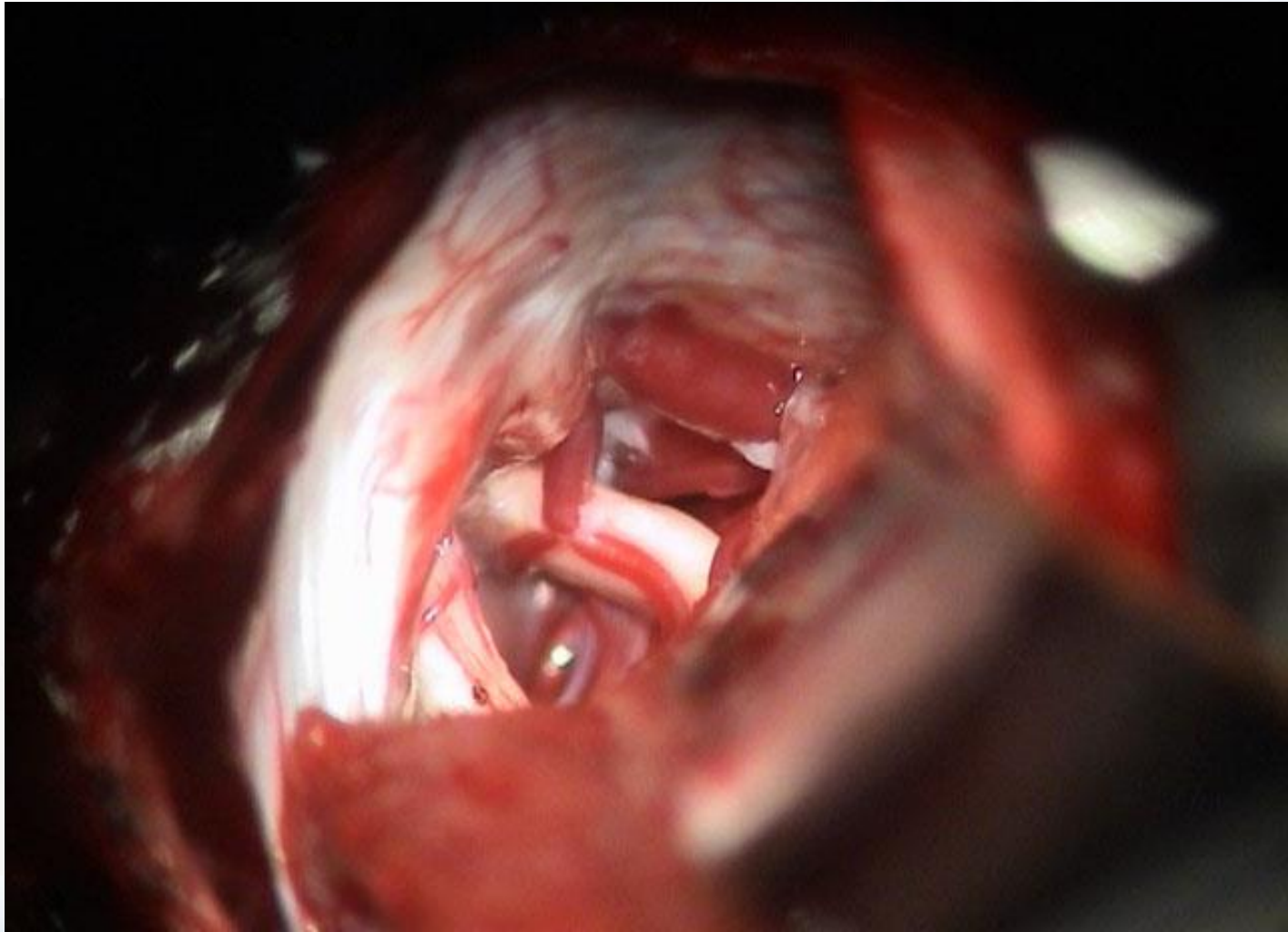
c – line - Sn a Ek

Sensitive innervation of the head



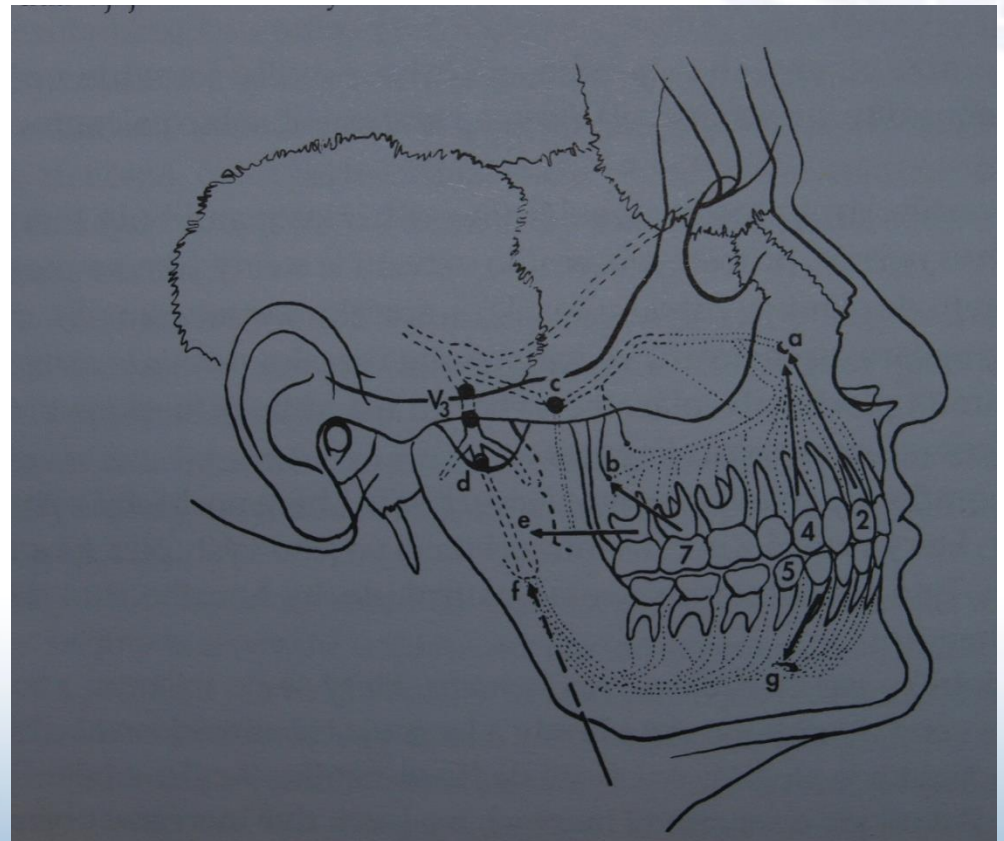
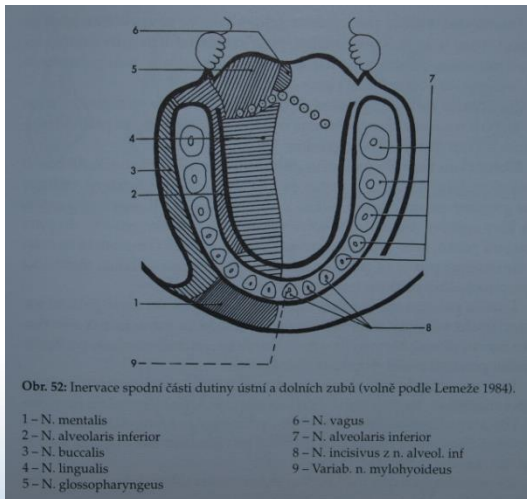
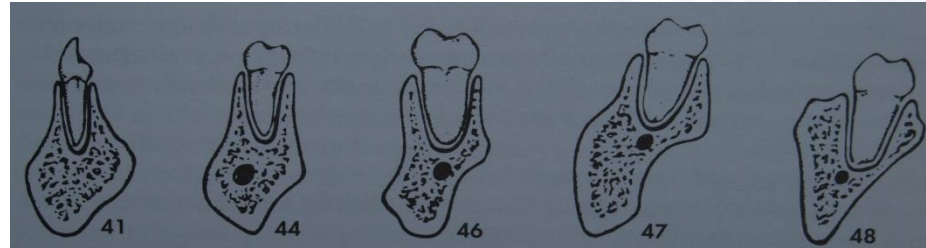
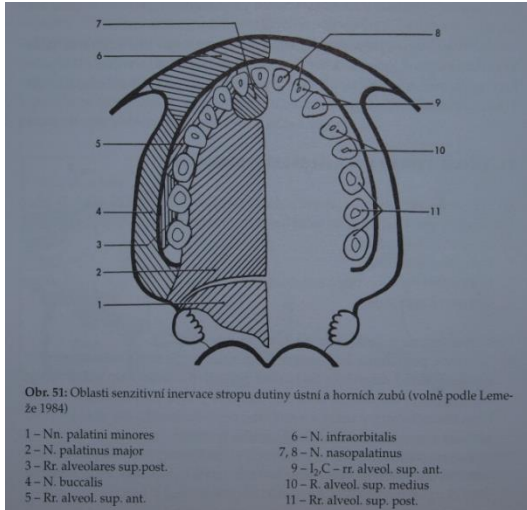
palpation

Esencial neuralgia of CN V

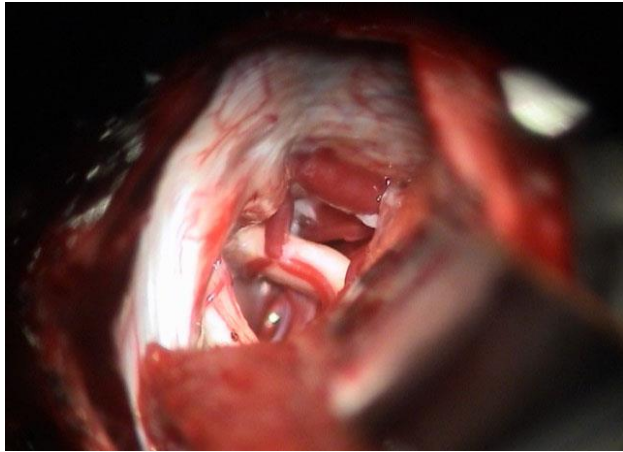


neurovascular conflict of CN V and AICA

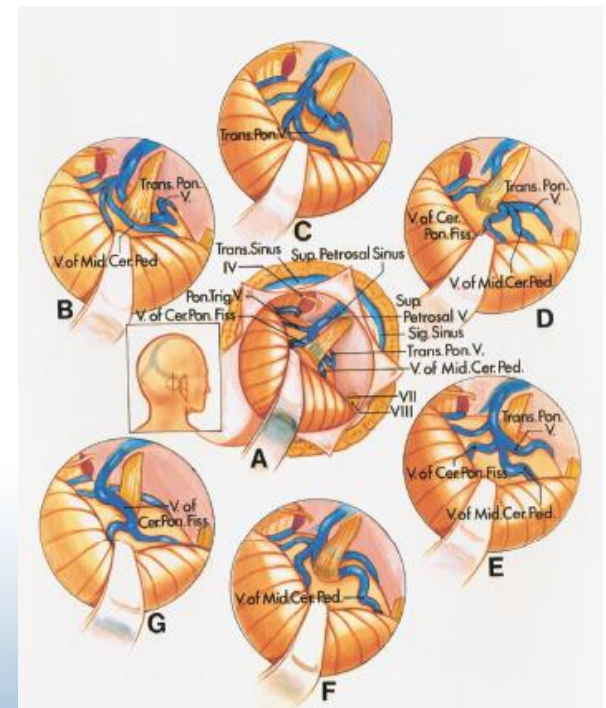
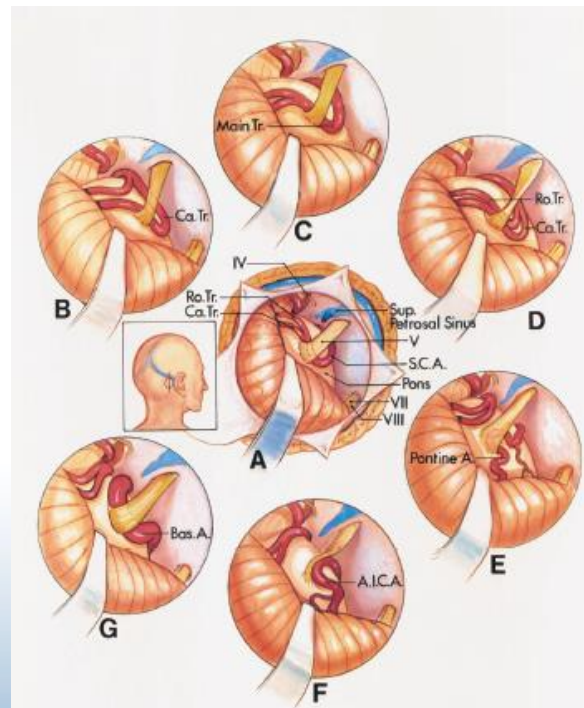
Anesthesia of the oral cavity



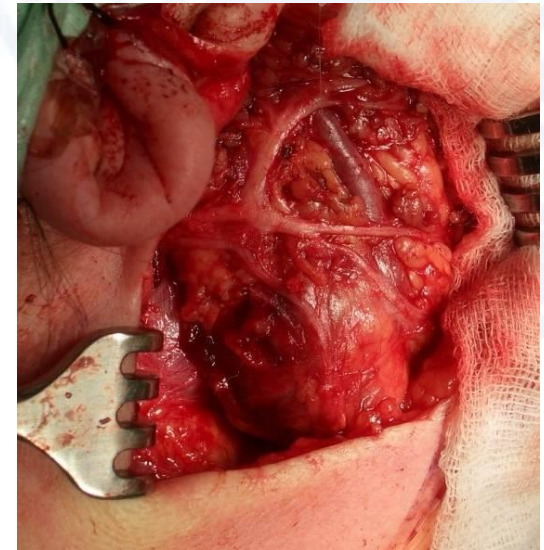
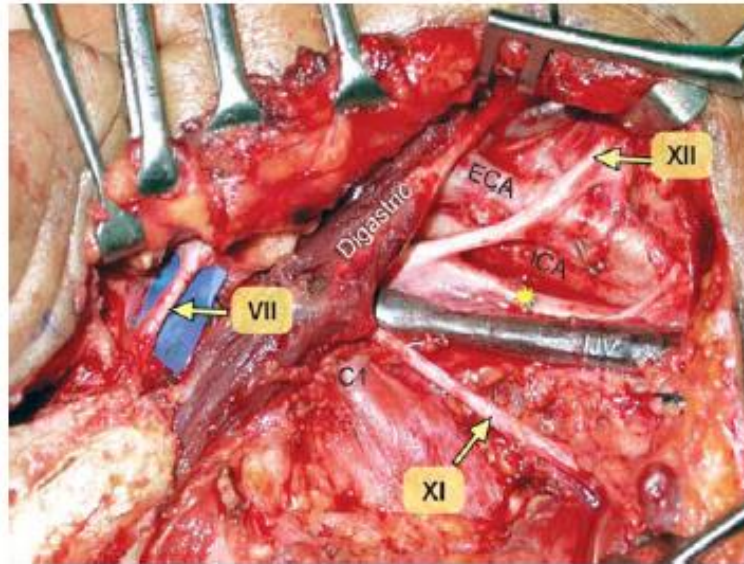
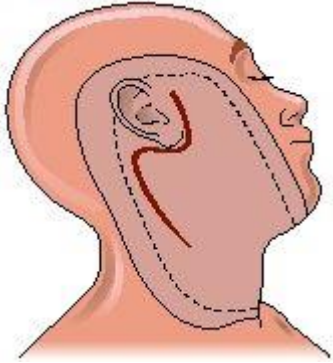
Esenciální neuralgie n. V



neurovaskulární konflikt



CN.VII and parotid gland surgery



superf. parotidectomy

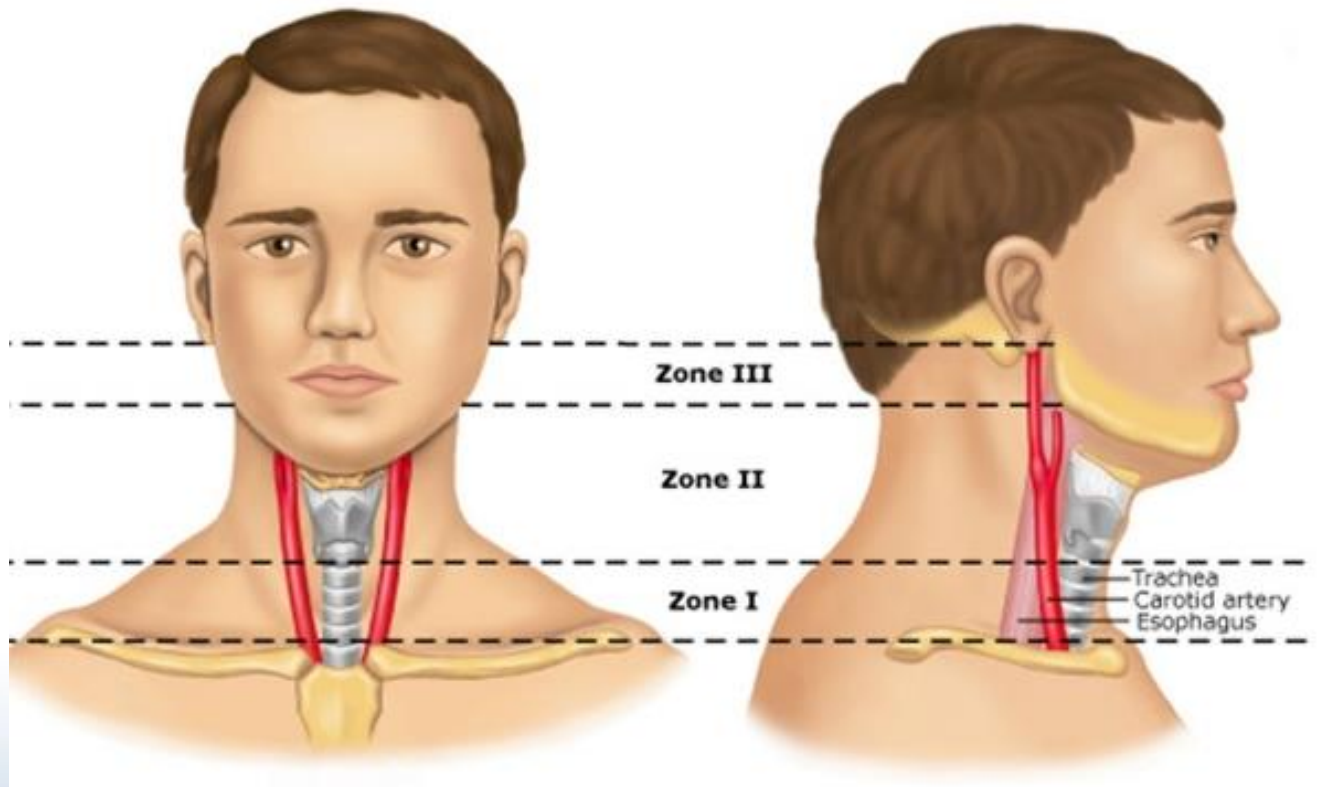
CN VII identification (landmarks)

pointer

tympanomastoid suture

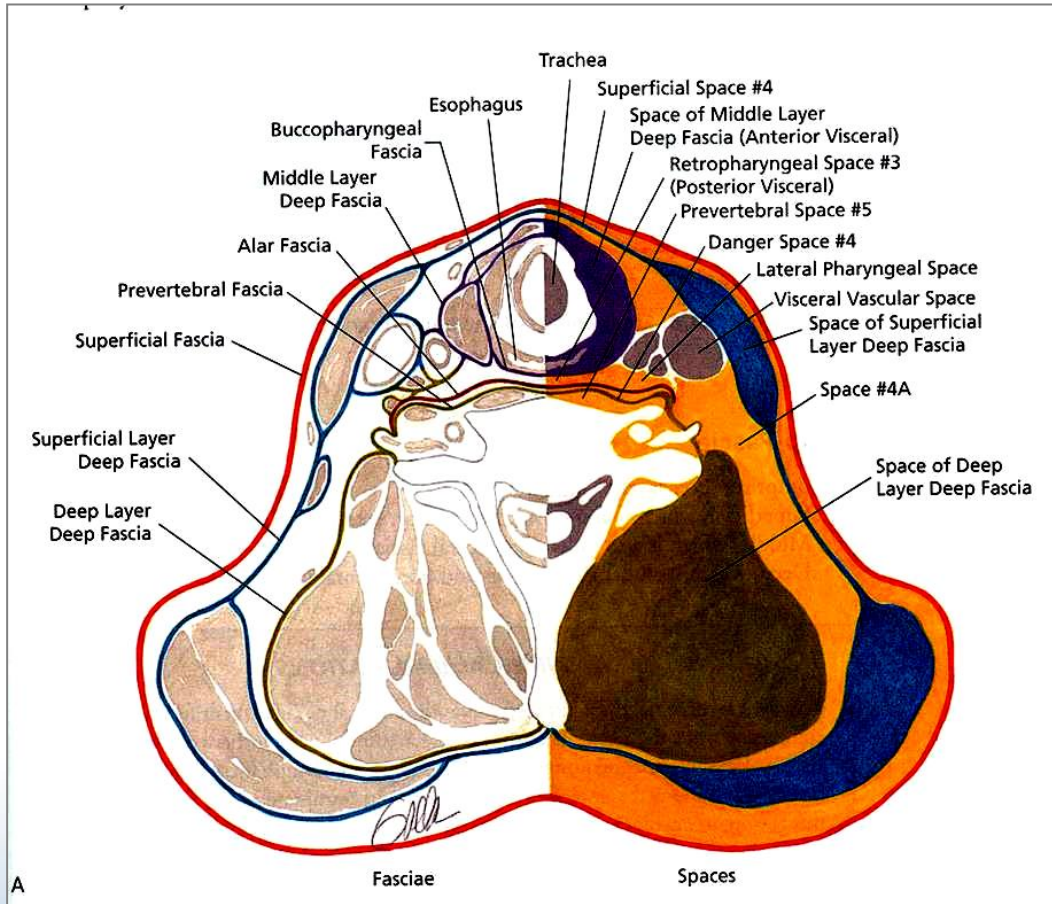
digastric/m, sternocleidmastoid muscle

Penetrating neck injury - Neck zones



Neck dissection

(surgical treatment of neck metastases)



**fascial
compartmentalisation**

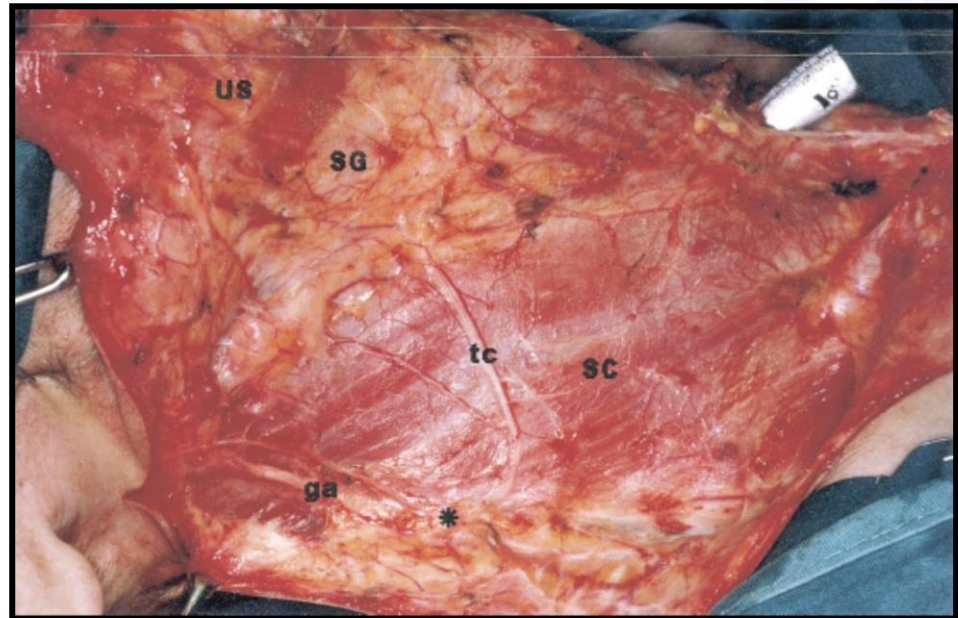
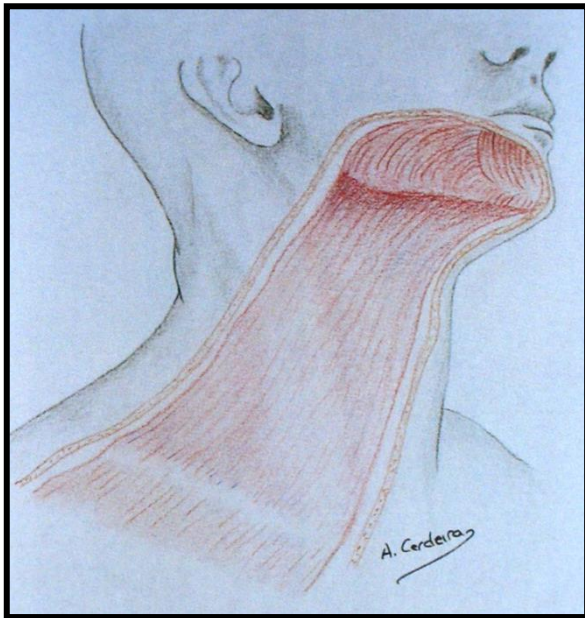


neck dissection



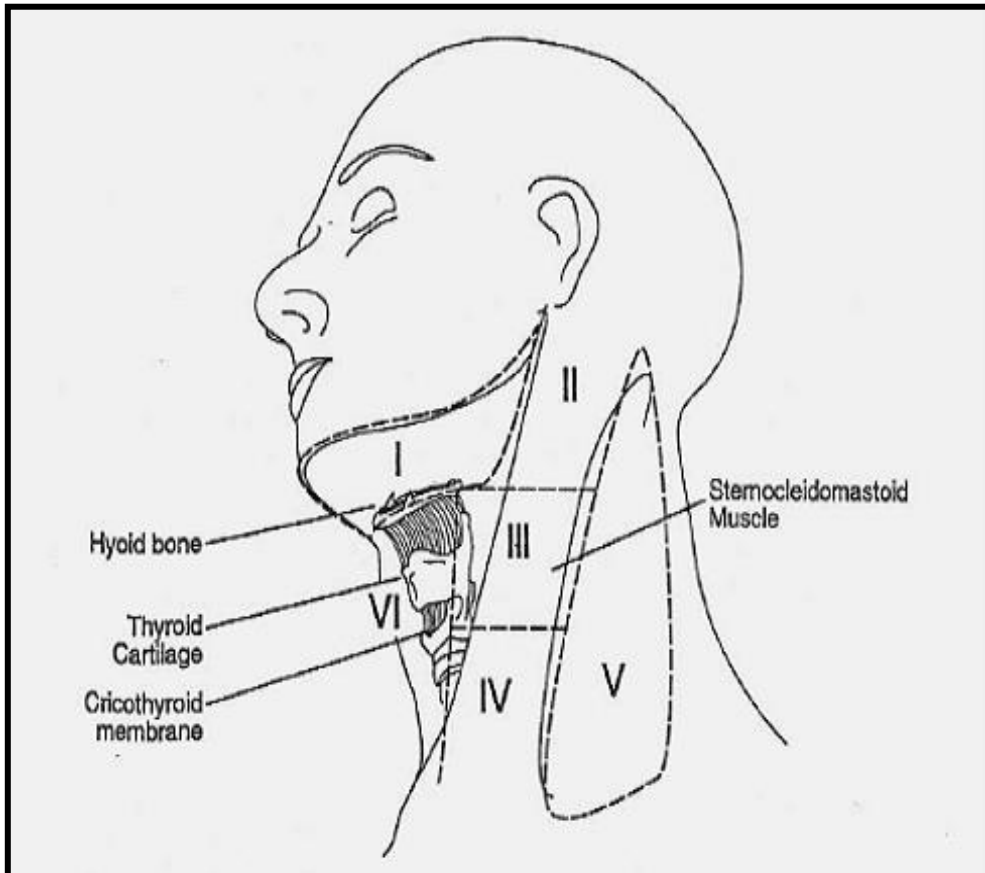
**lymph node metastases
exstirpation does not
have impact on the
prognosis of HNSCC**

Platysma muscle



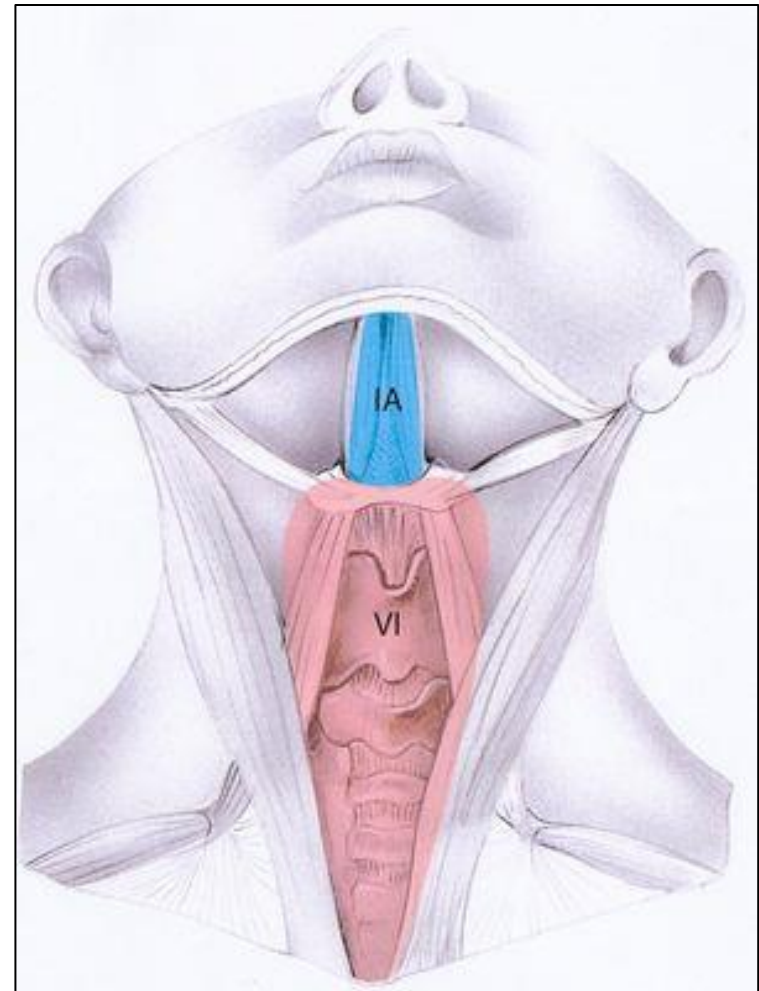
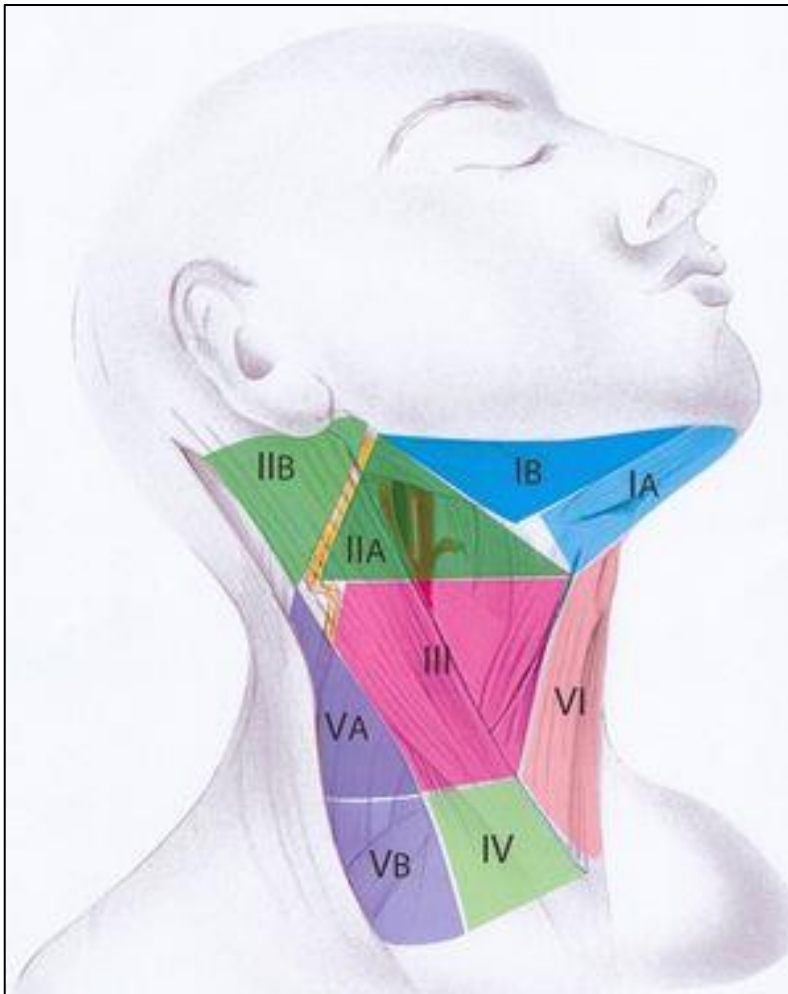
Neck lymph node levels

Classification of the system of deep neck lymph nodes (Memorial Sloan-Kettering Cancer Center)



Neck lymph node levels

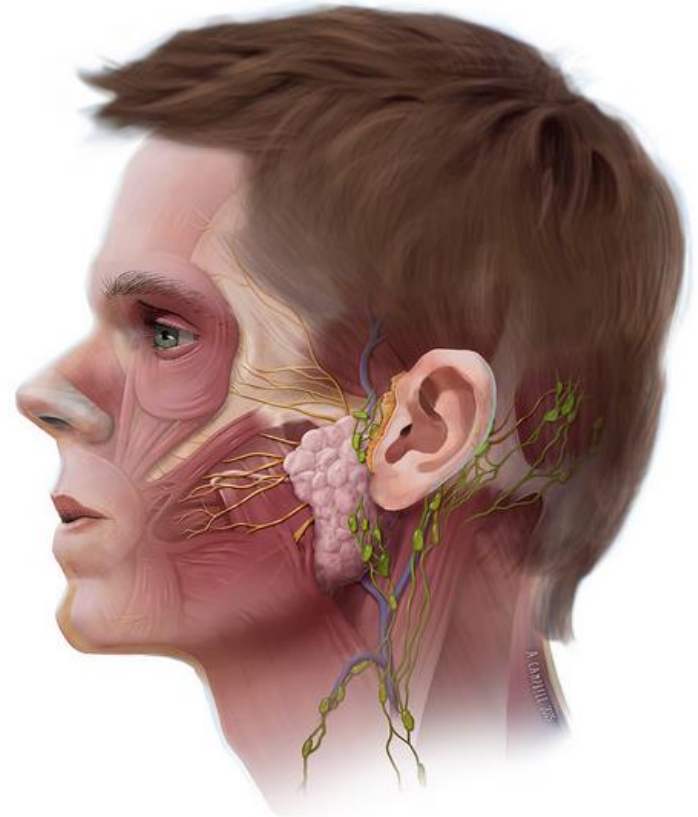
Subclassification of the level I, II, and V



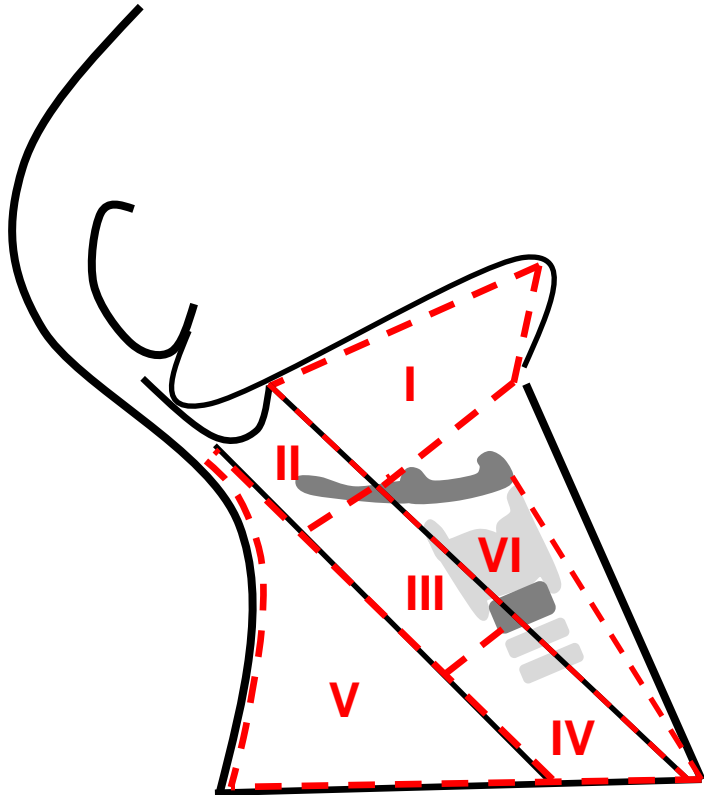
Neck lymph node levels

Lymph nodes outside of level I-VI (VII)

- **perifacial**
- **periparotid**
- **retroauricular**
- **suboccipital**
- **parapharyngeal**
- **retropharyngeal**



Drainage pattern to lymph nodes levels



I: lip, oral cavity, nasal vestibule, external nose, submandibular gland

II: nasopharynx, posterior parts of oral cavity, oropharynx, supraglottis, hypopharynx, thyroid gland, parotid gland

III: hypopharynx, larynx, tongue, thyroid gland

IV: hypopharynx, subglottis, cervical oesophagus, thyroid gland, organs below the clavicle

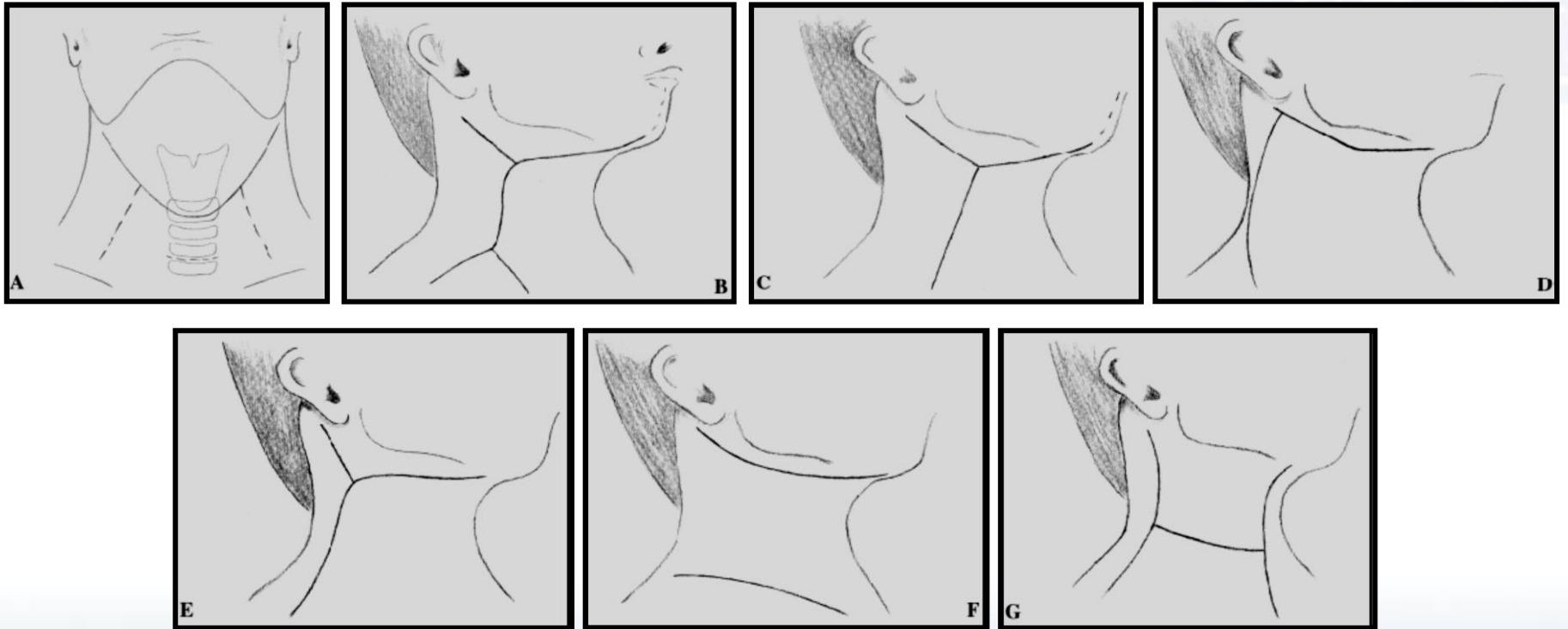
V: nasopharynx, posterior scalp

VI: thyroid gland, hypopharynx, cervical oesophagus, organs below the clavicle

Preauriculars: scalp, face, thyroid gland, external ear, oral cavity

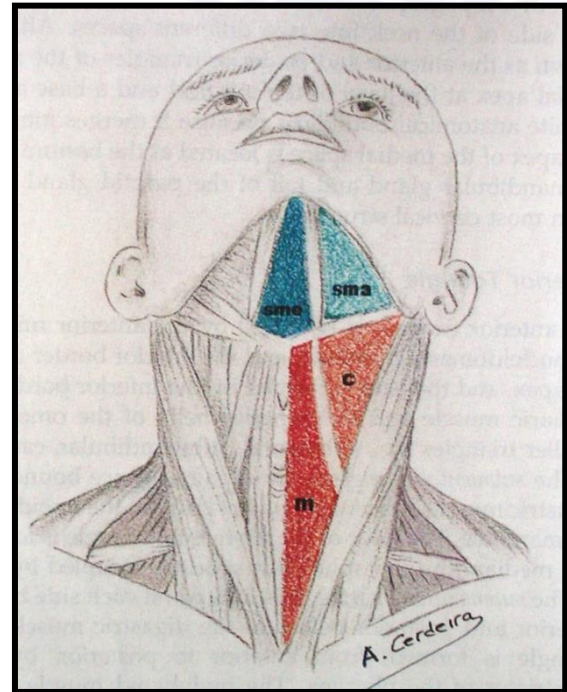
Retroauricular and nuchal: scalp, external ear

Neck dissection – incision lines



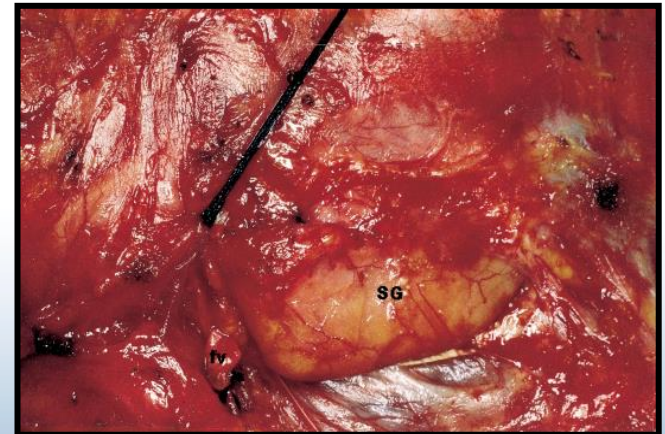
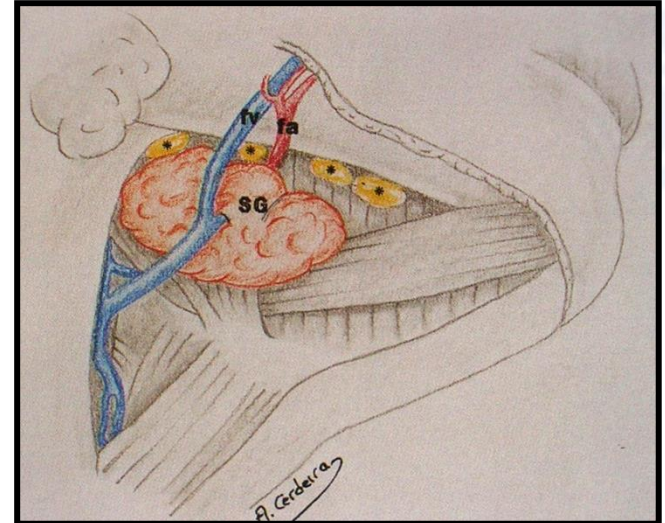
Level I

- **Submental triangle (Ia):**
 - anterior belly of digastric m.
 - hyoid
 - mylohyoid m.
- **Submandibular triangle (Ib):**
 - anterior belly of digastric m.
 - posterior belly of digastric m.
 - mandible

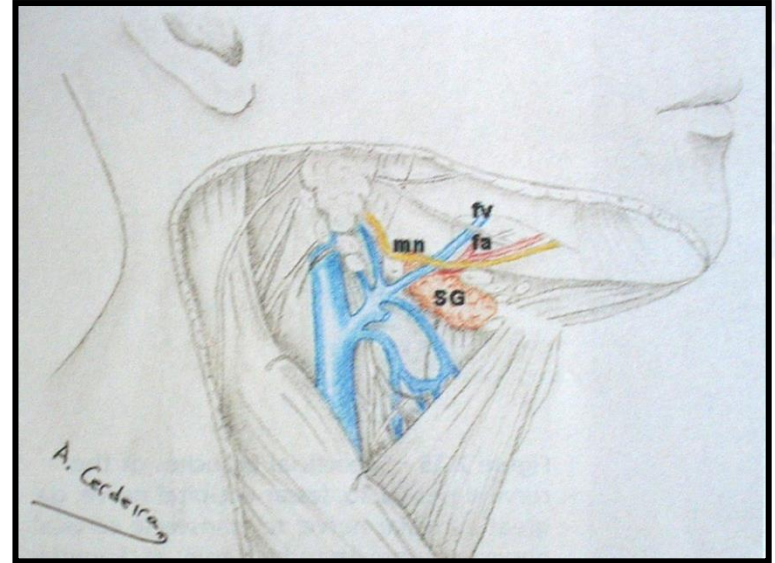
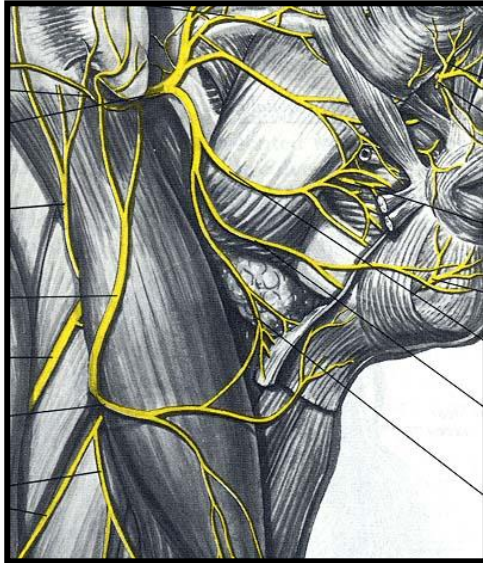


Level I

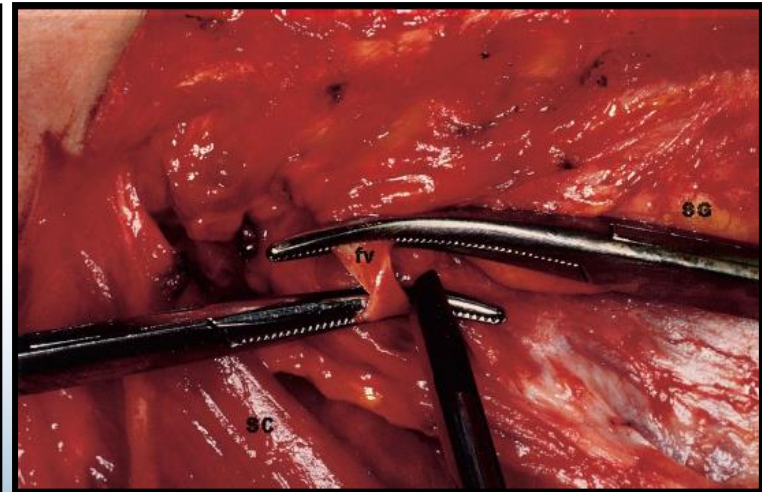
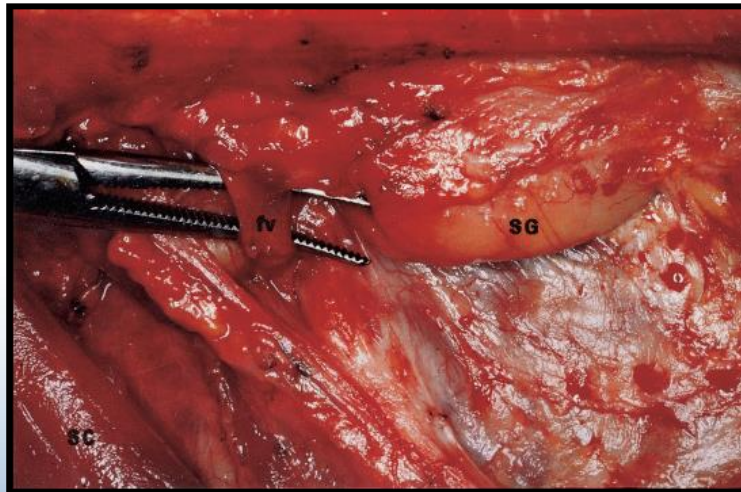
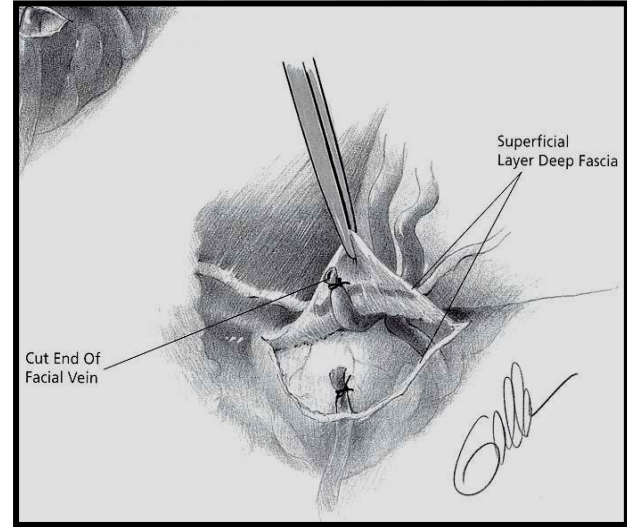
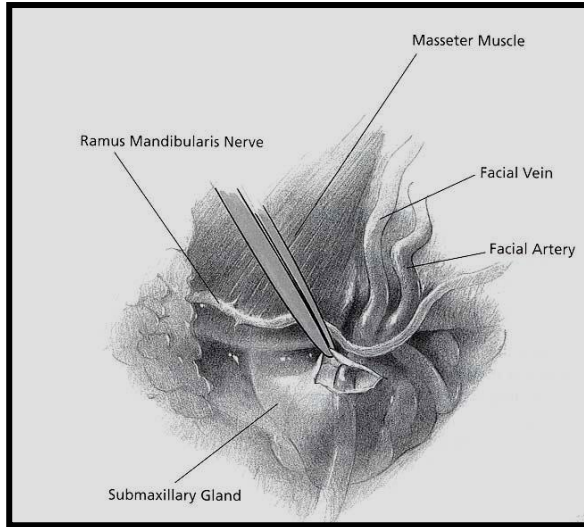
- **Ia: chin, lower lip, anterior floor of mouth, gingiva of incisors, apex of tongue**
- **Ib: oral cavity, oral part of tongue, anterior part of nasal cavity**



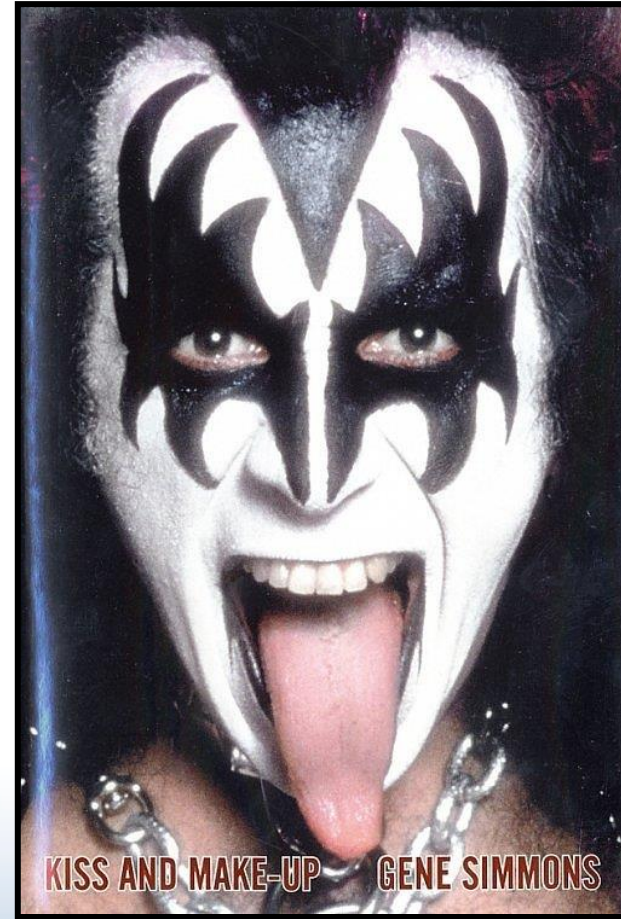
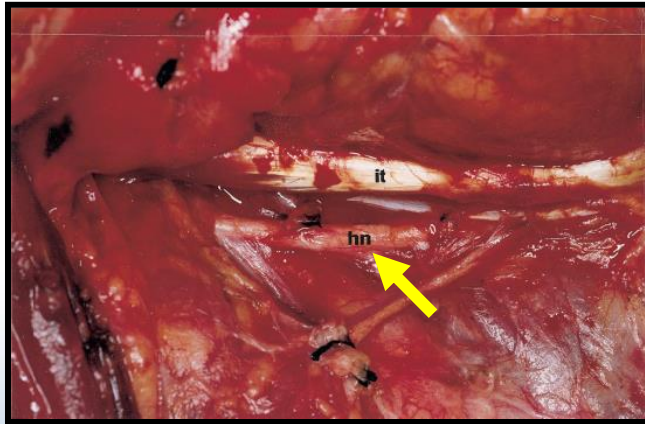
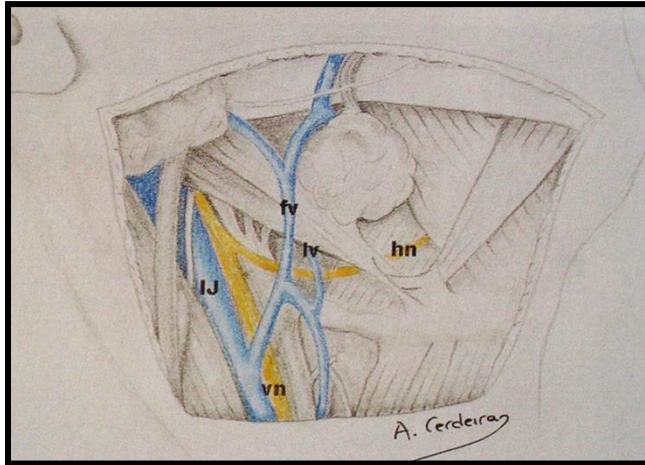
Marginal nerve (CN VII)



Marginal nerve (CN VII)



CN XII

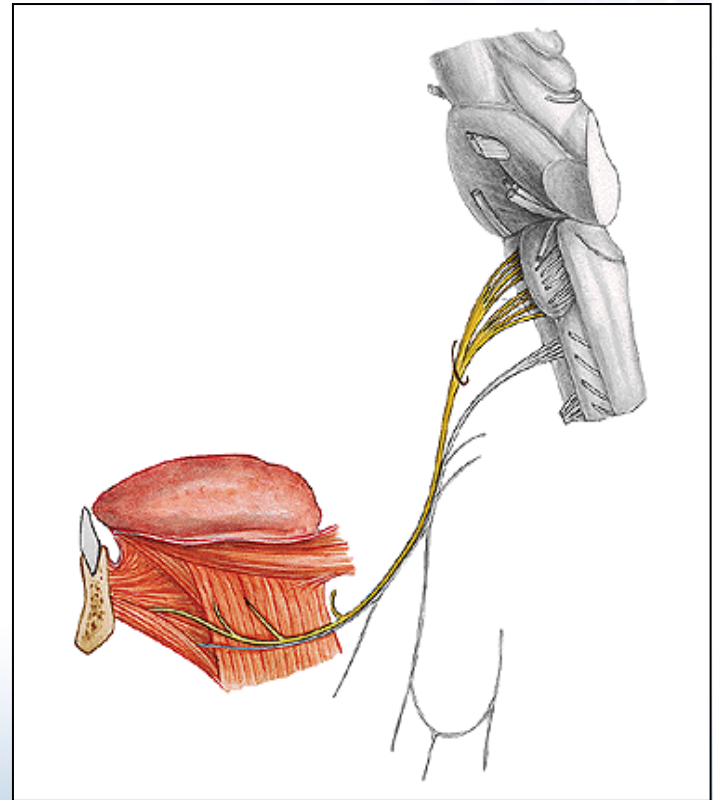


CN XII

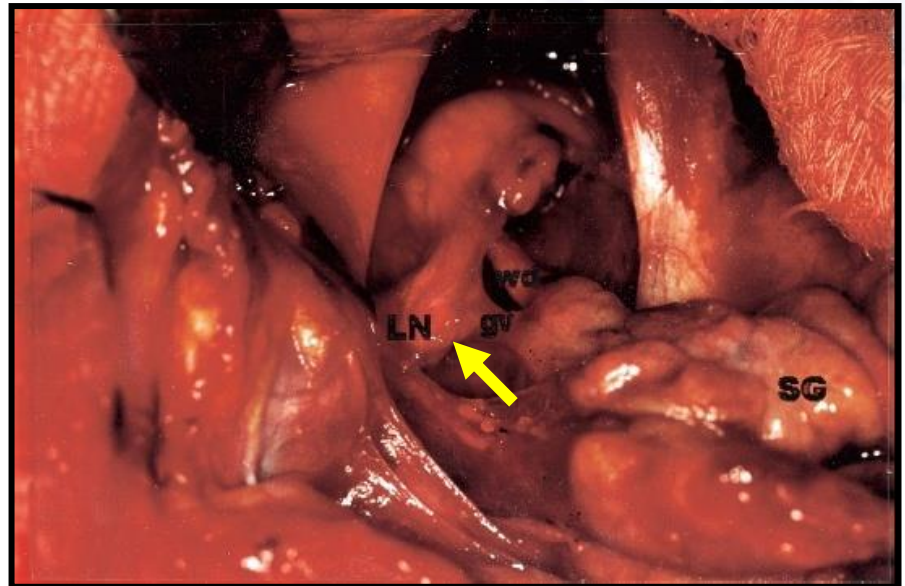
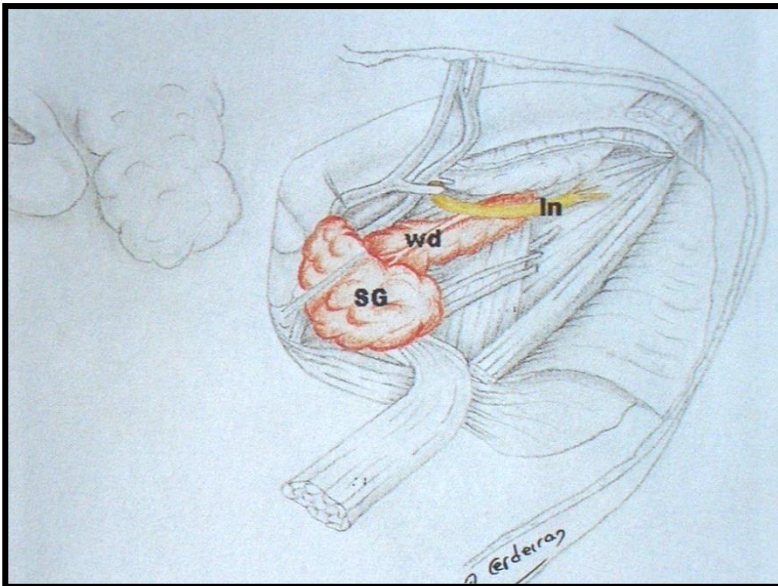
palsy



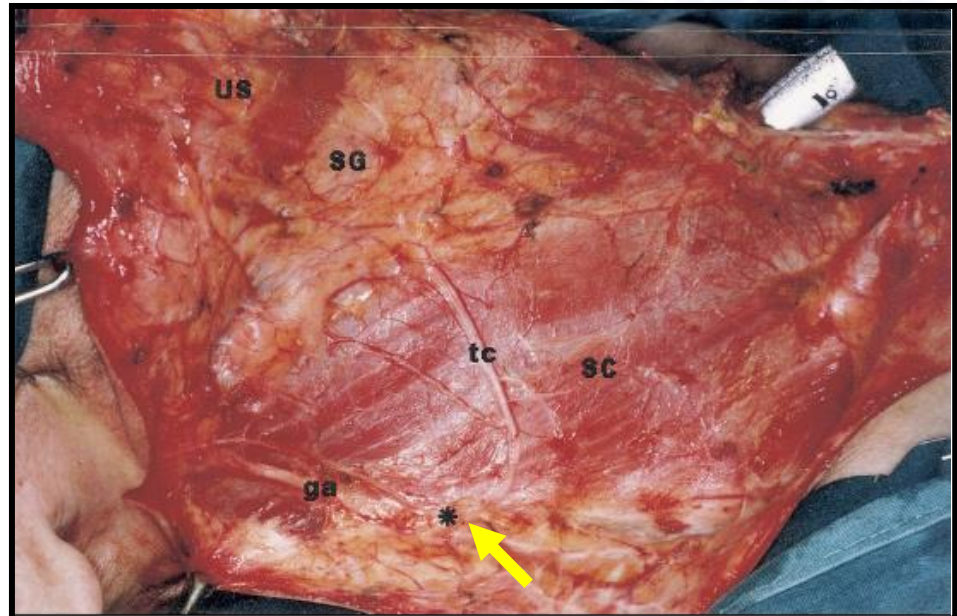
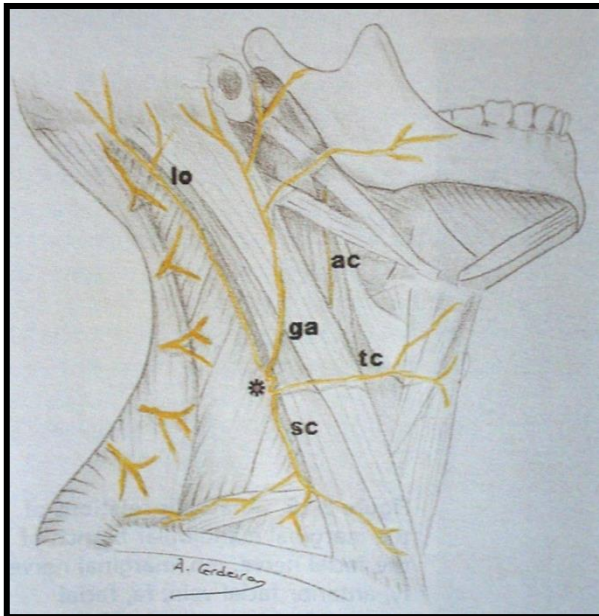
left CN XII schwannoma



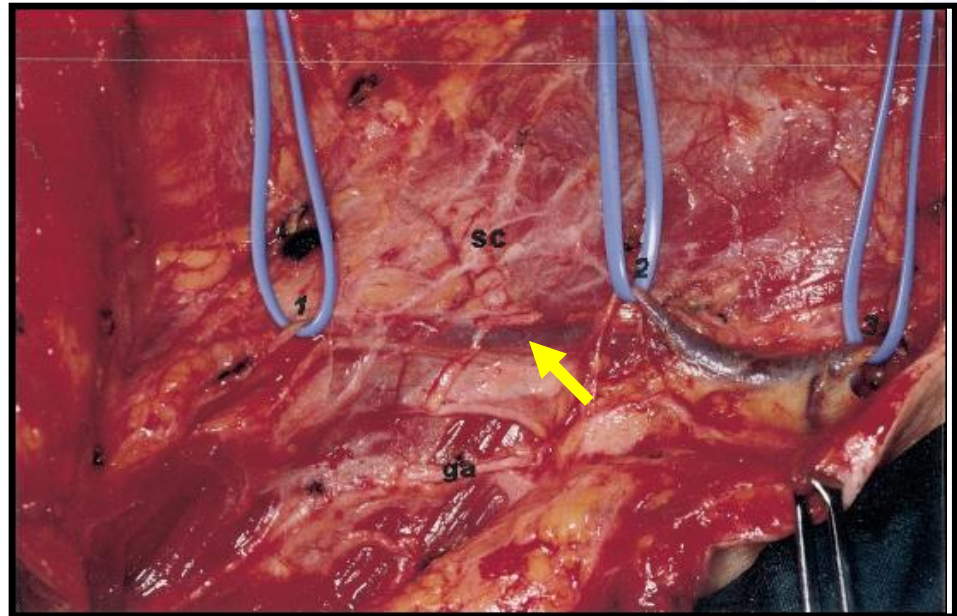
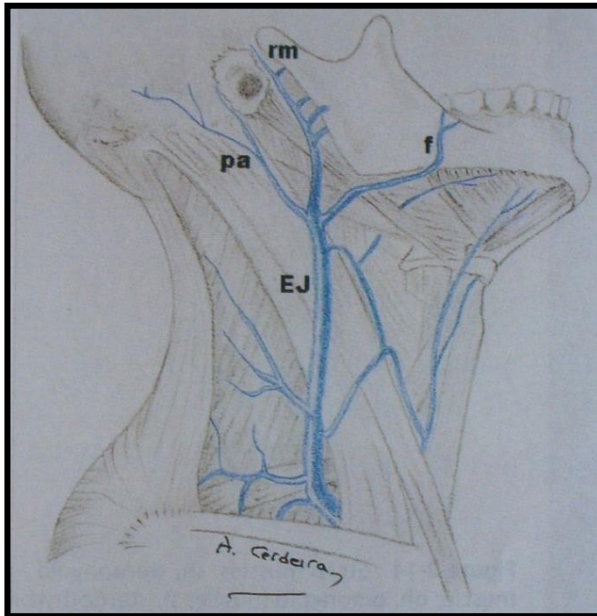
Lingual nerve (CN V/3)



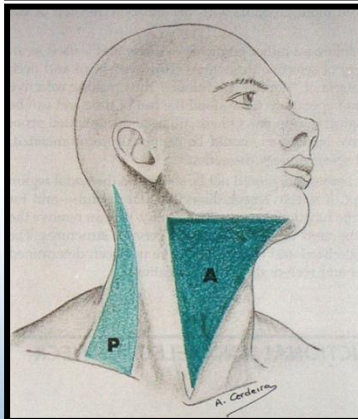
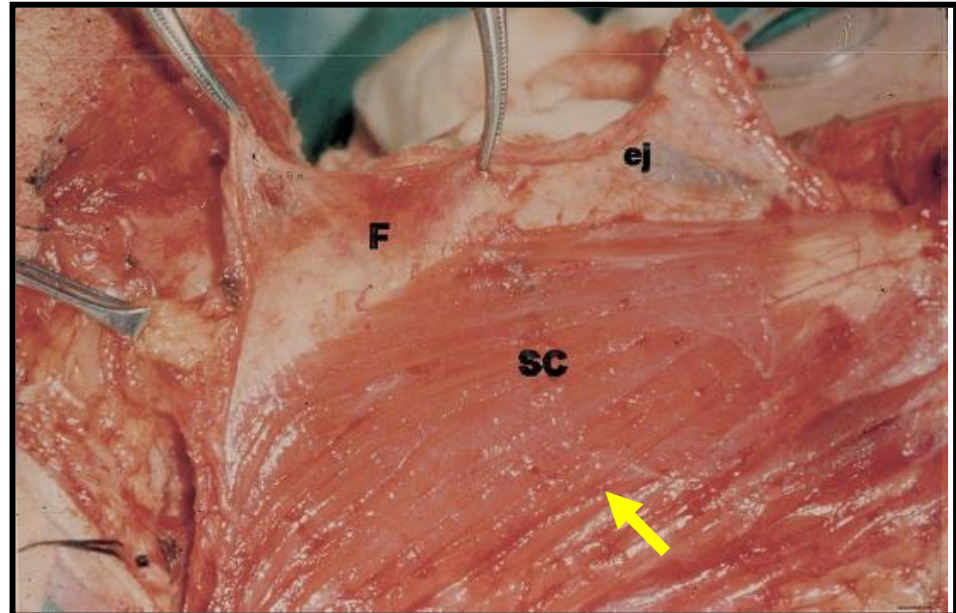
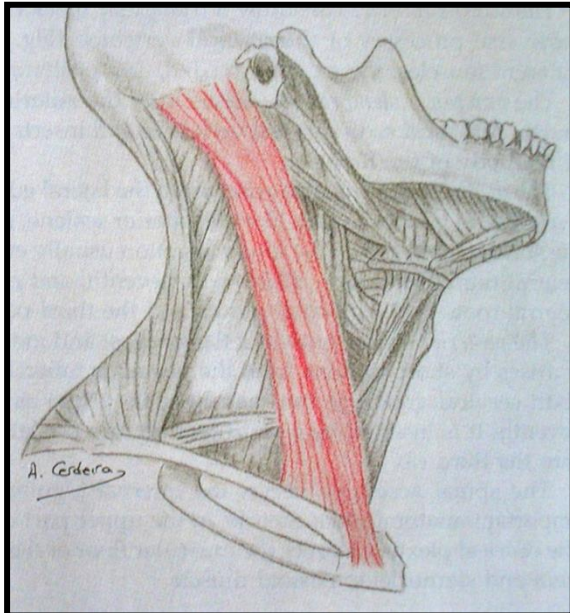
Cervical plexus



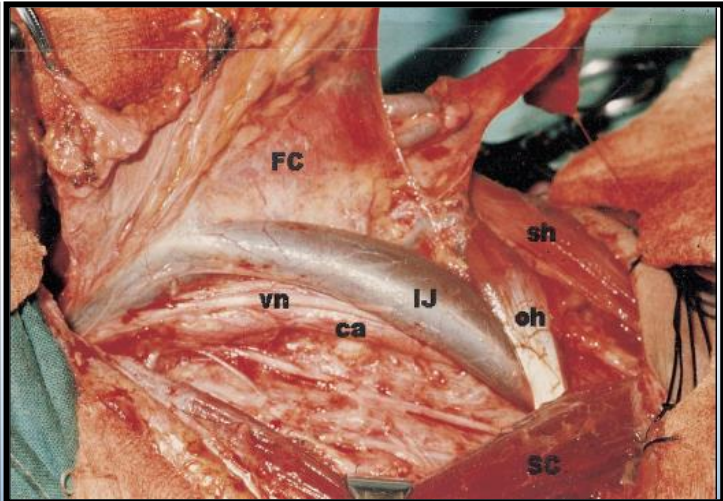
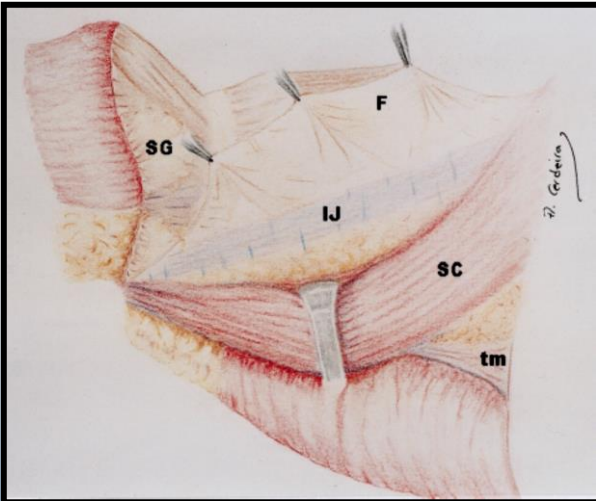
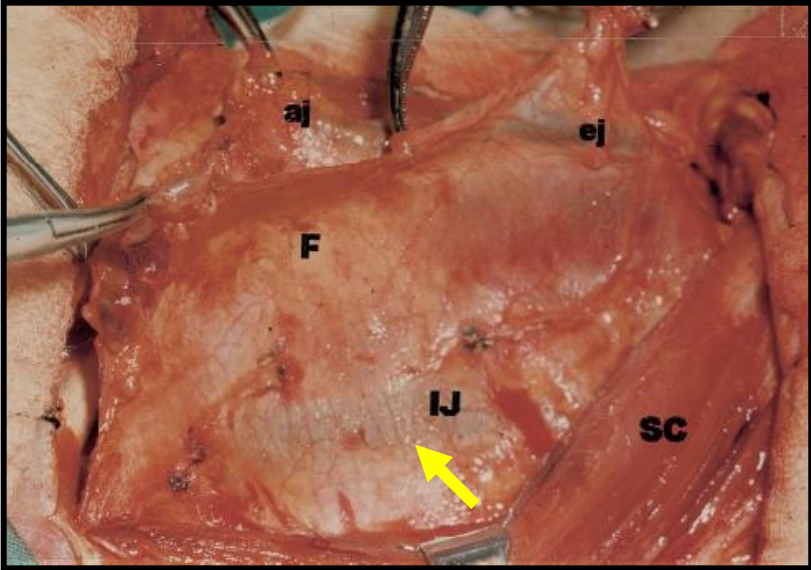
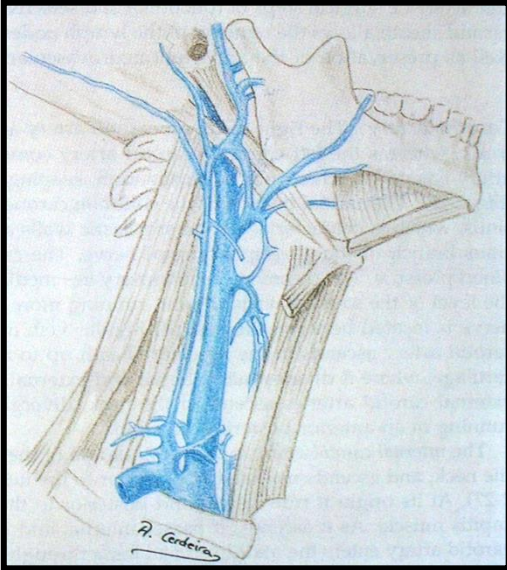
External jugular vein



Sternocleidomastoid muscle

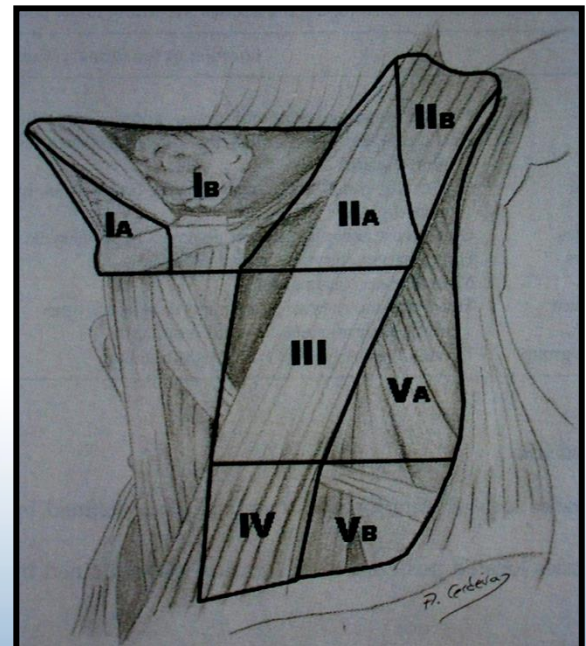
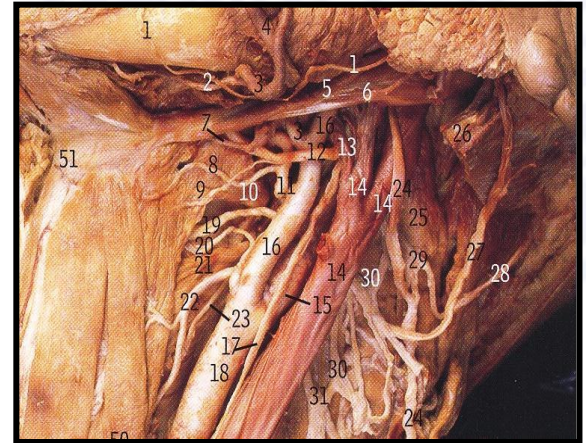


Internal jugular vein



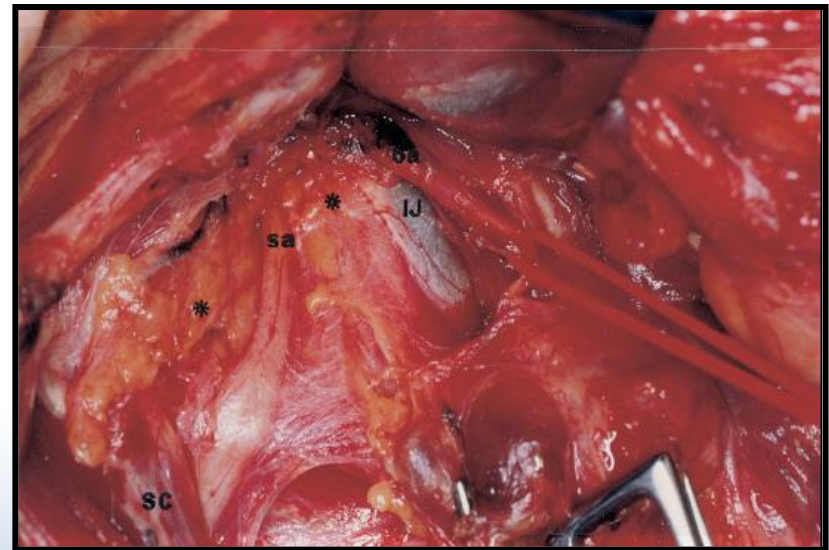
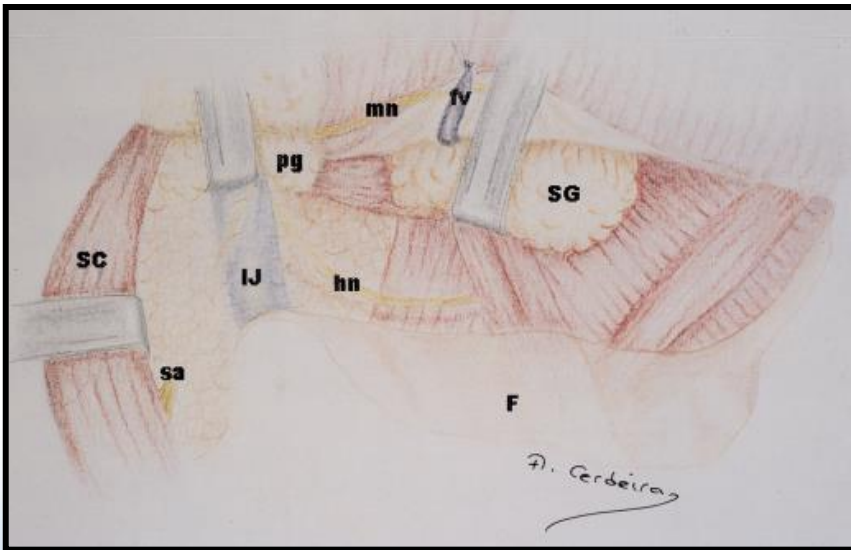
Level II

- **Upper jugular LNs (II):**
 - posterior belly of digastric m.
 - sternocleidomastoid m.
 - skull base
 - hyoid (bifurcation)
- **Ila: below CN XI**
- **Ilb: above CN XI**

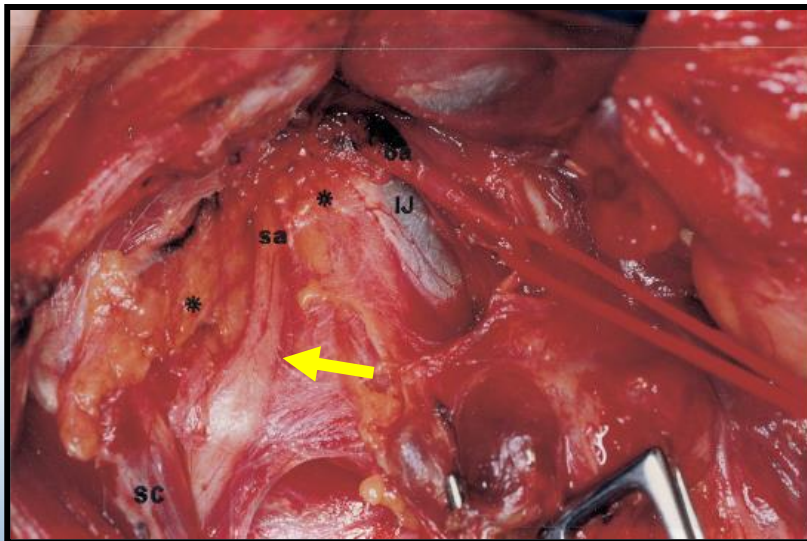
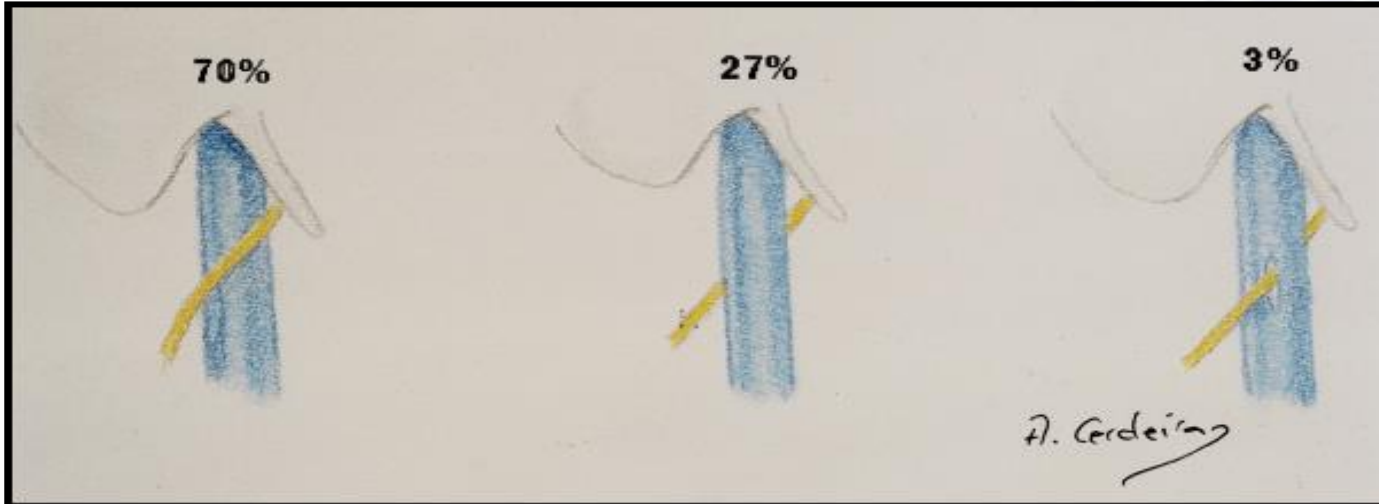


Level II

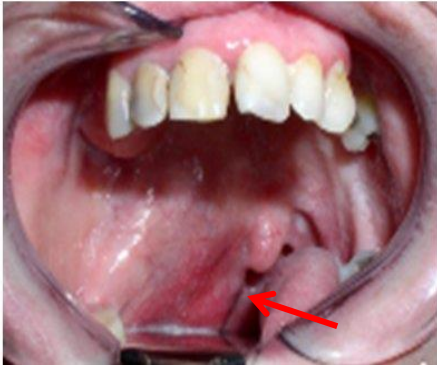
- II: oral cavity, nasal cavity, nasopharynx, oropharynx, larynx, hypopharynx, parotid gland



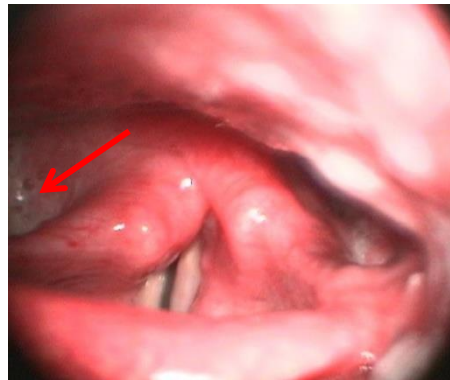
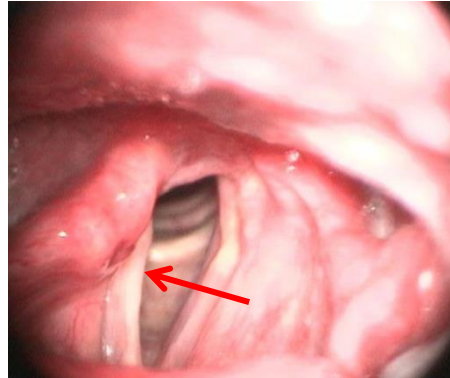
CN XI



IX, X, XI CNs



CN IX palsy



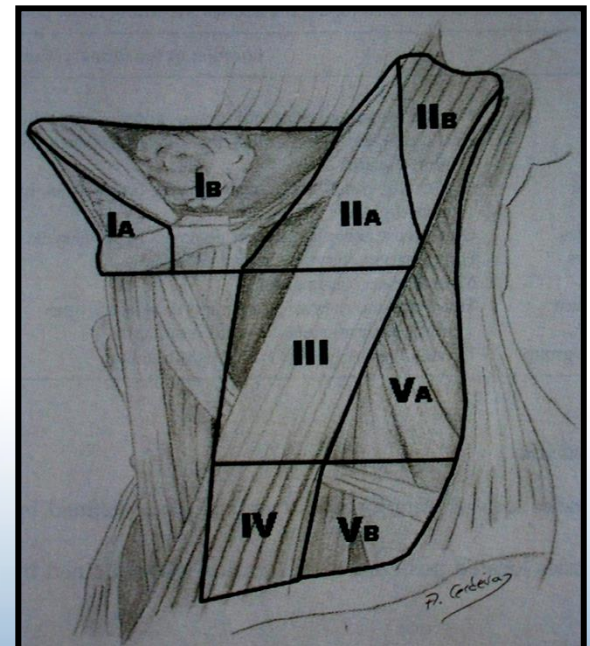
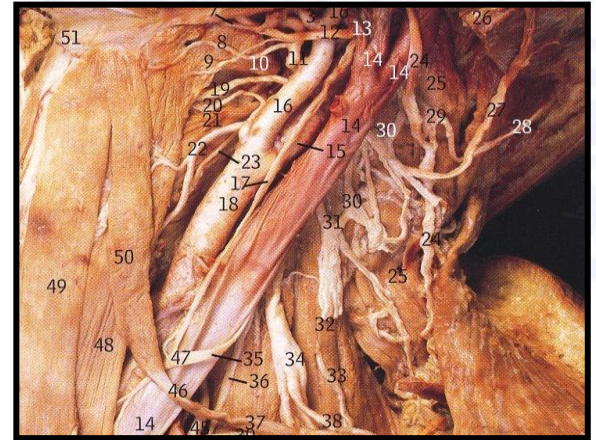
CN X palsy



CN XI palsy

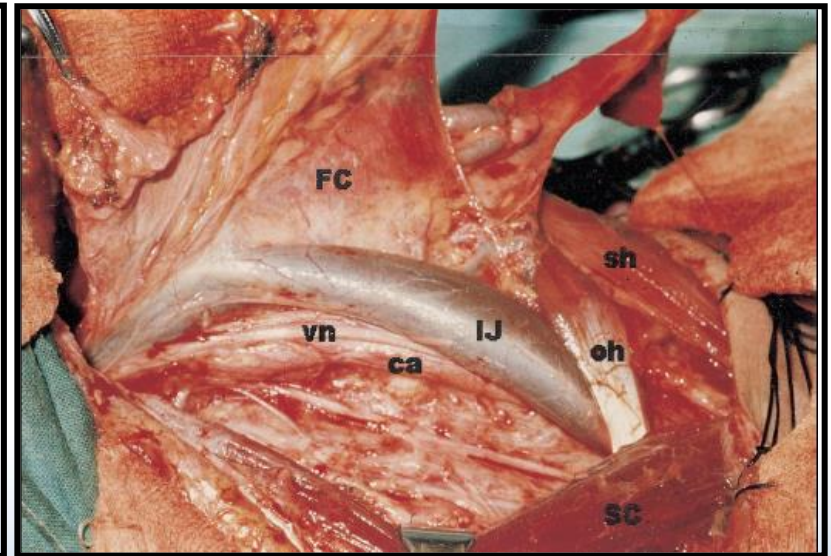
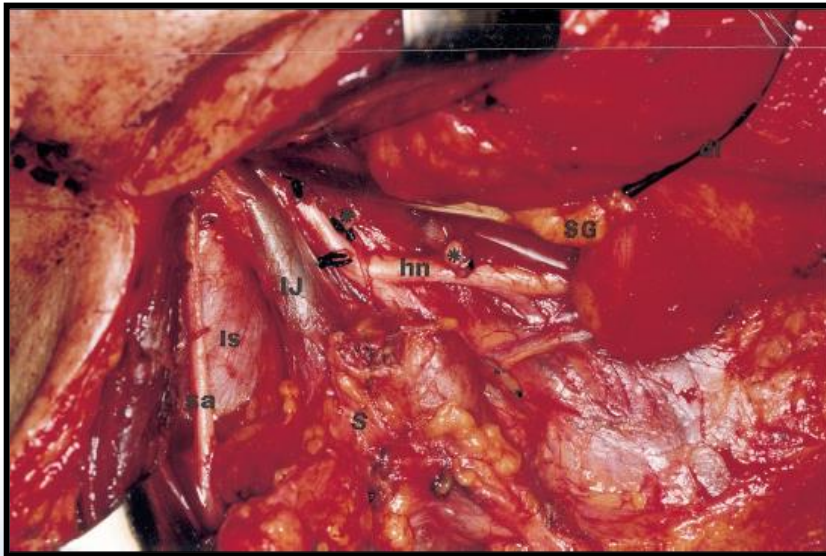
Level III

- **Midjugular LNs (III):**
 - hyoid (bifurcation)
 - sternohyoid m.
 - sternocleidomastoid m.
 - cricoid cartilage (omohyoid m.)

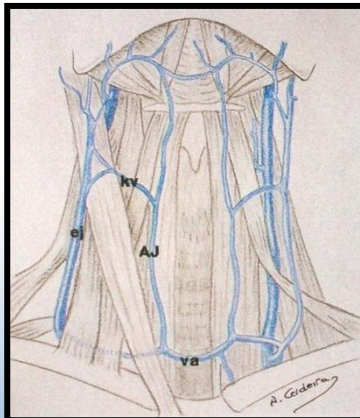
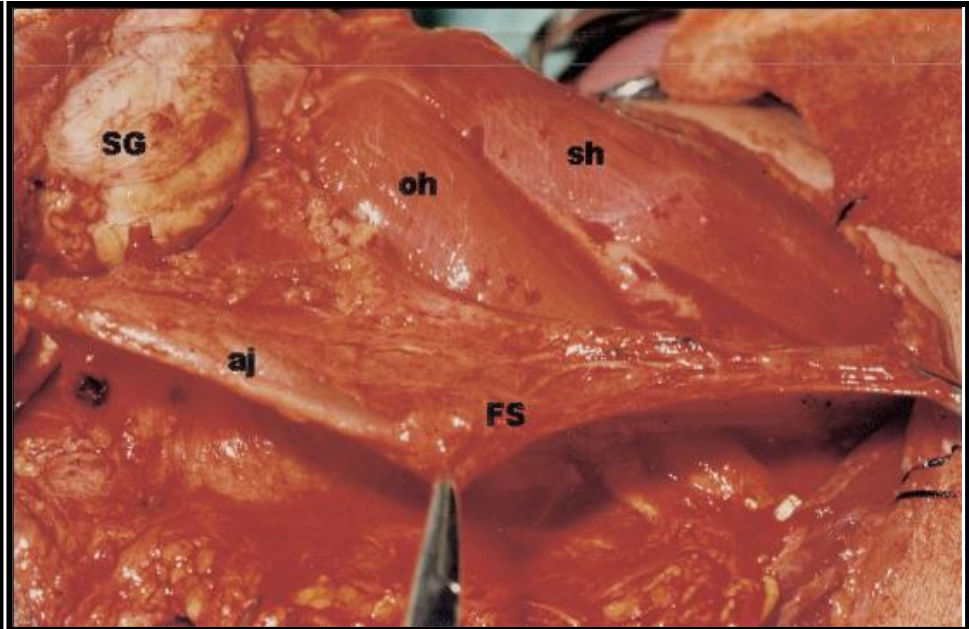
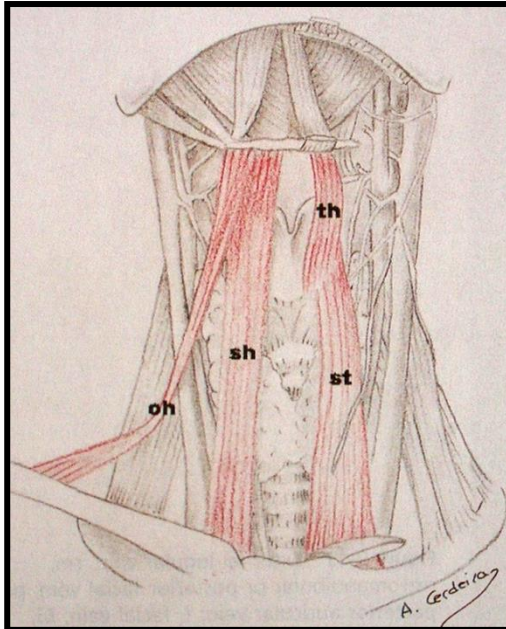


Level III

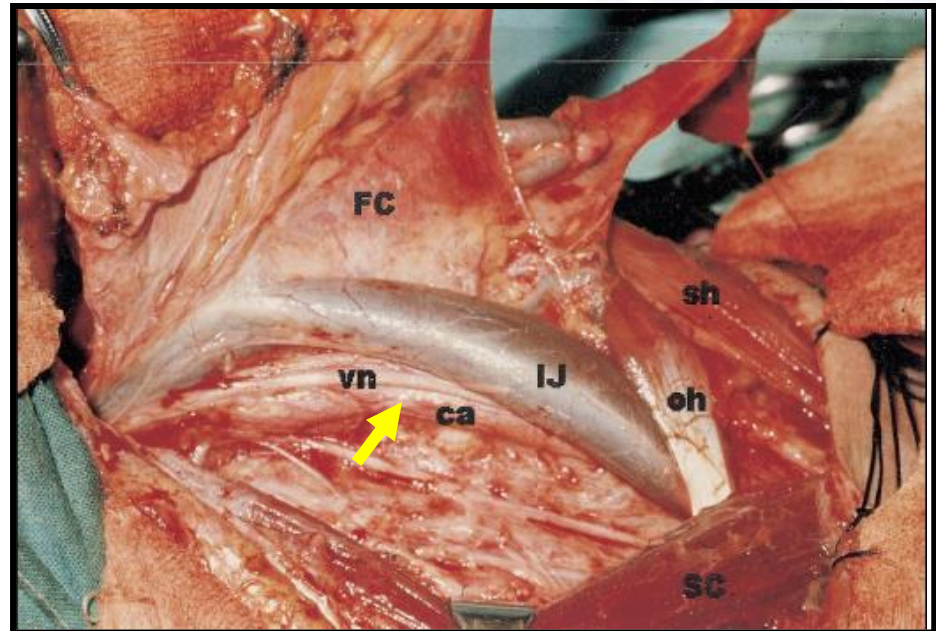
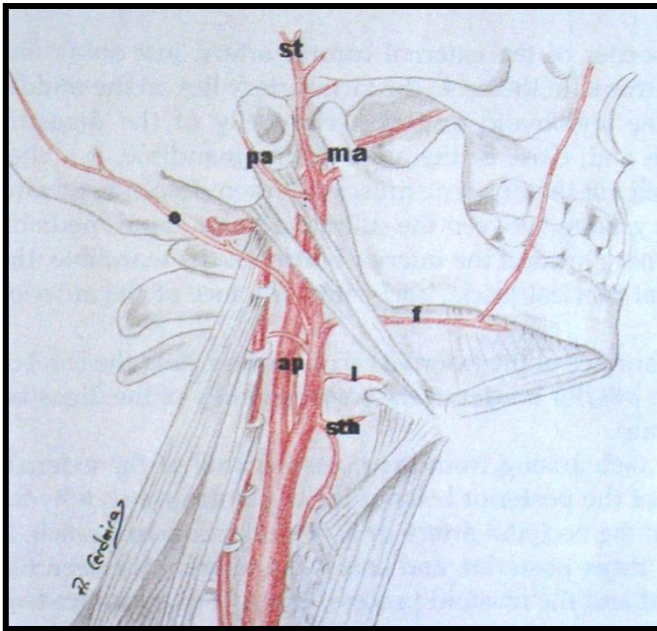
- **III: nasal cavity, nasopharynx, oropharynx, larynx, hypopharynx,**



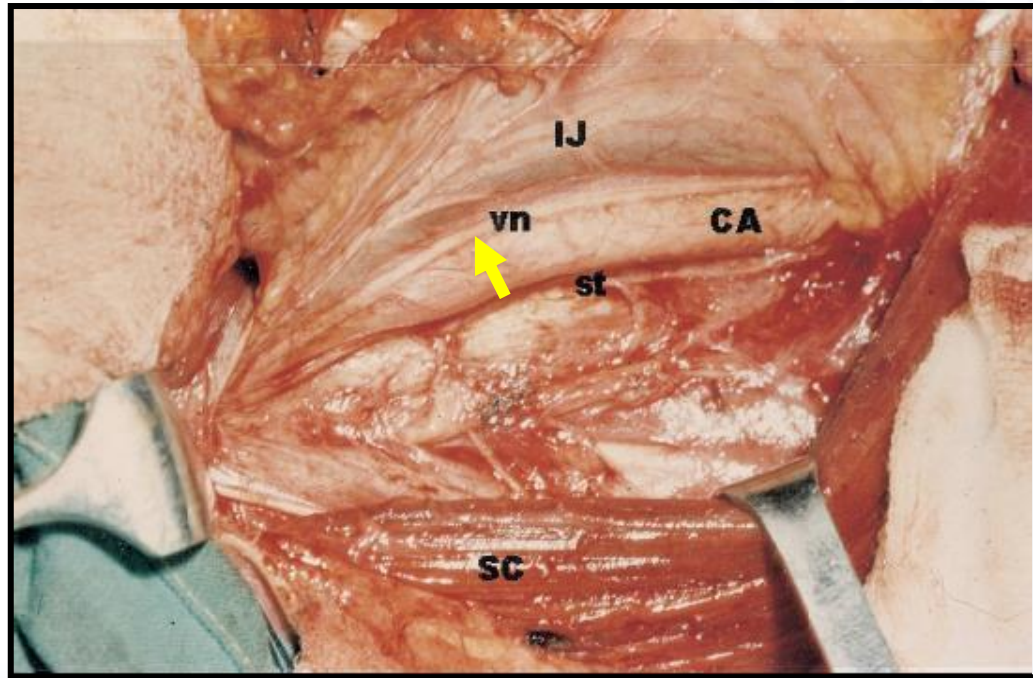
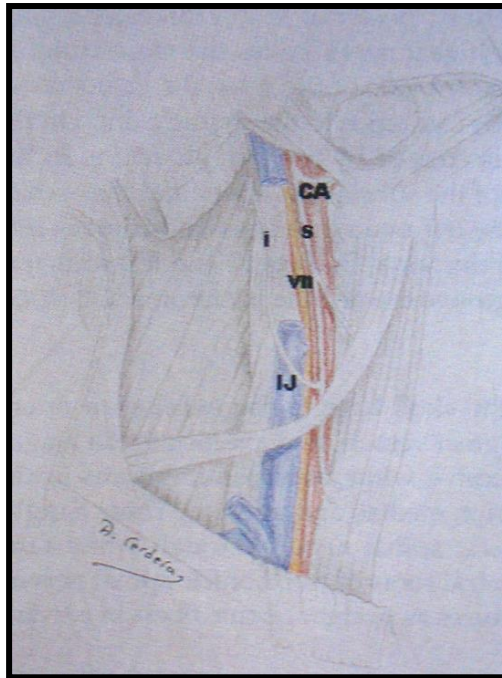
Infrahyoid muscles



Carotid artery

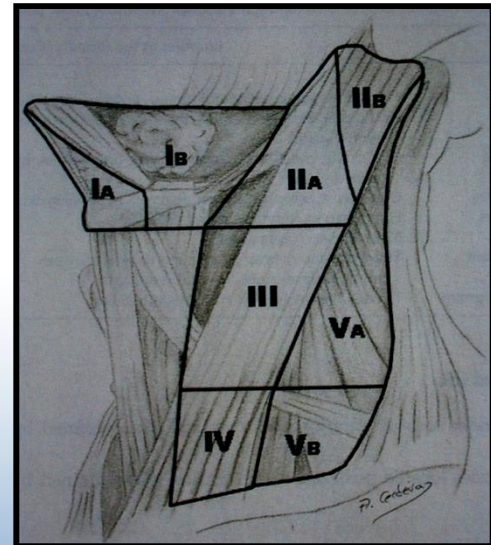
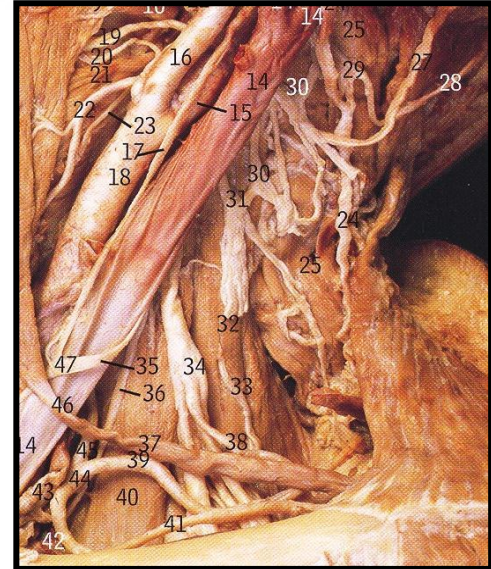


CN X



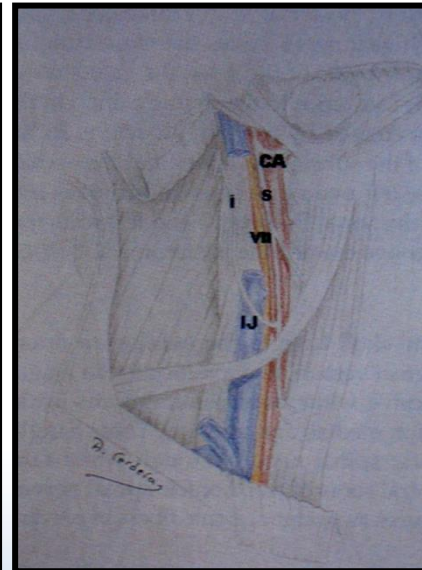
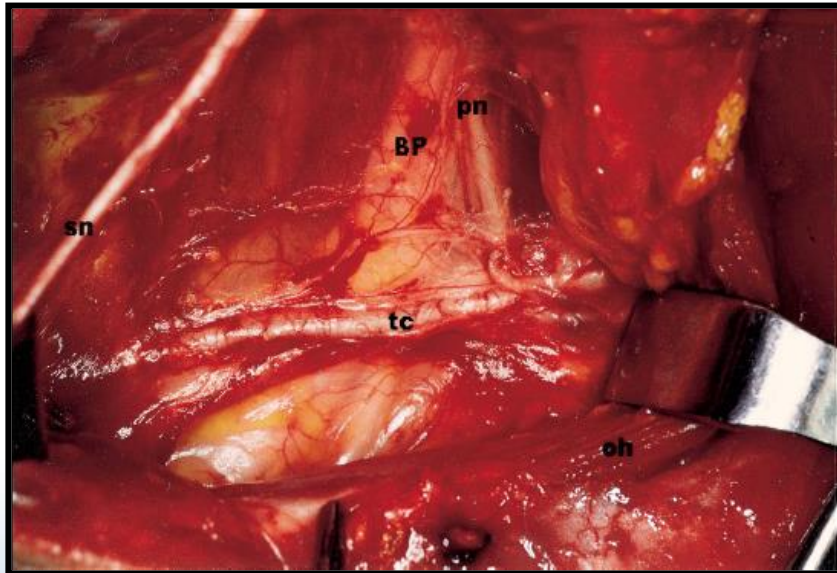
Level IV

- **Lower jugular LNs (IV):**
 - cricoid
(omohyoid m.)
 - sternohyoid m.
 - sternocleidomastoid m.
 - clavicle

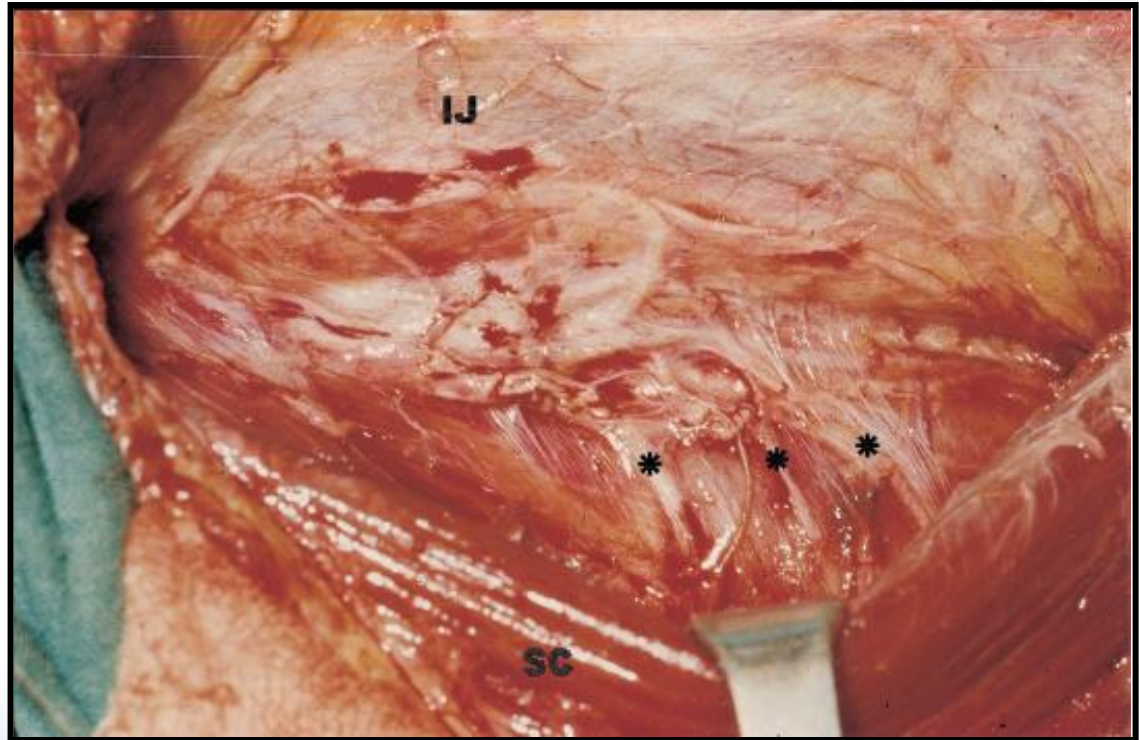
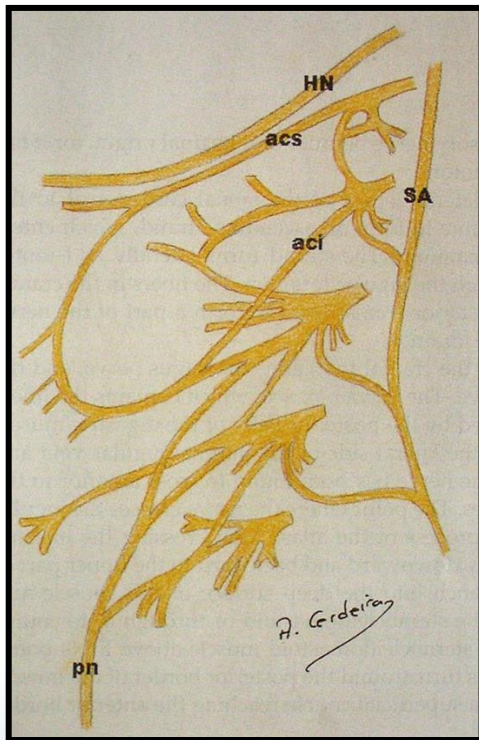


Level IV

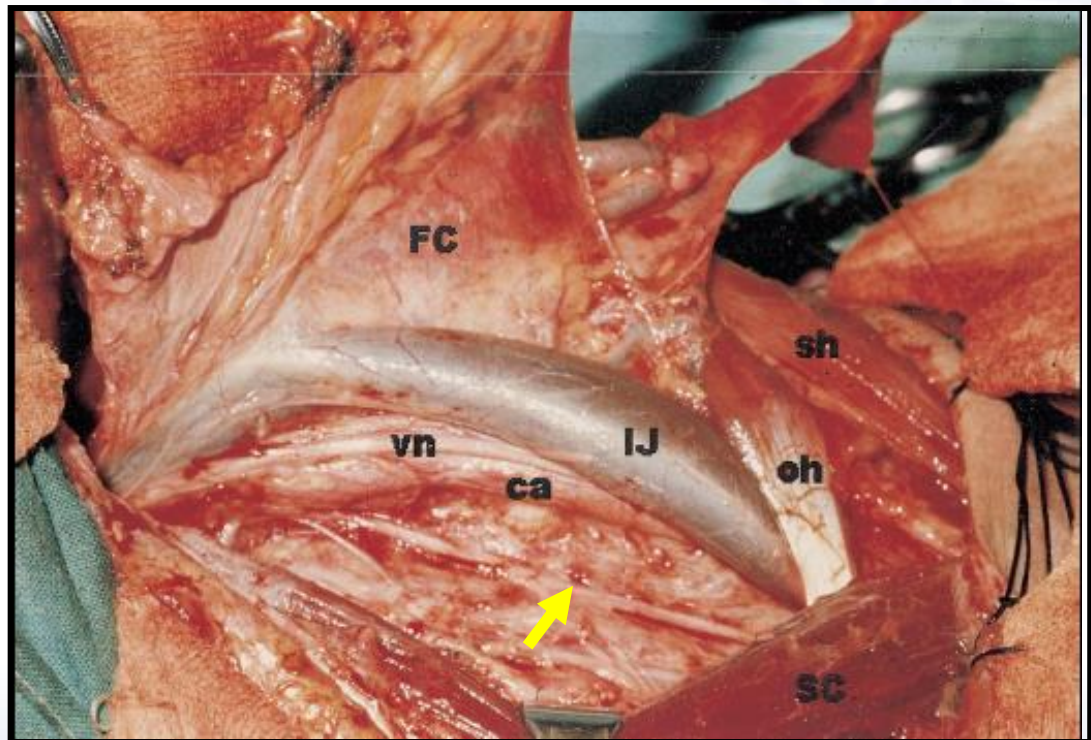
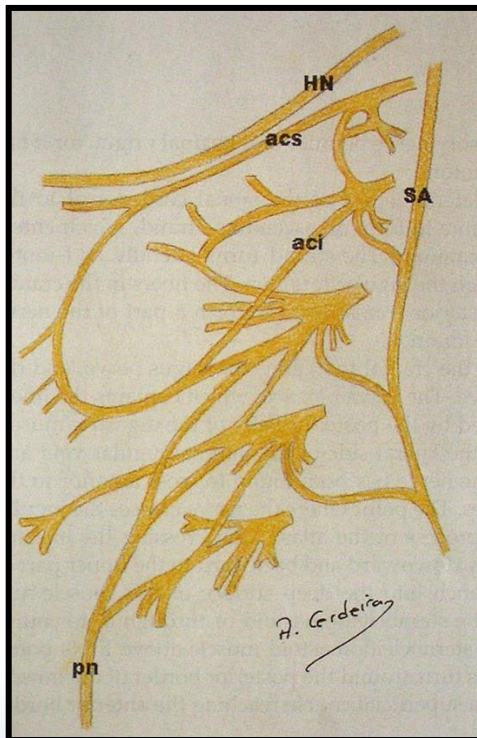
- IV: larynx, hypopharynx, thyroid gland, cervical oesophagus



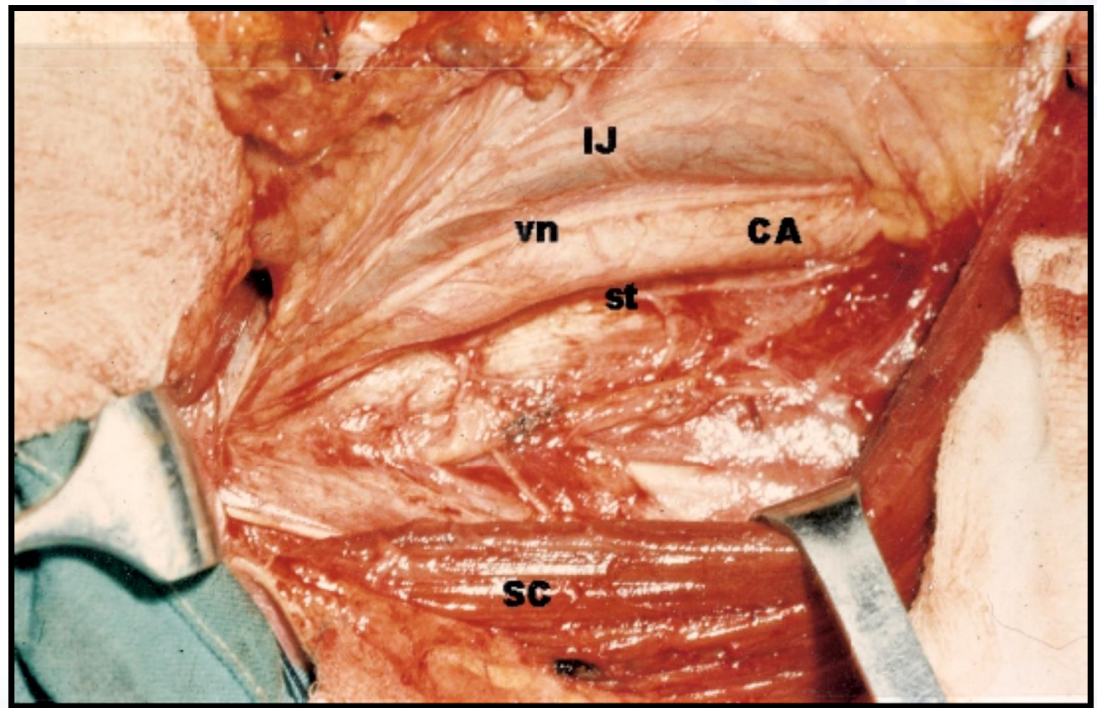
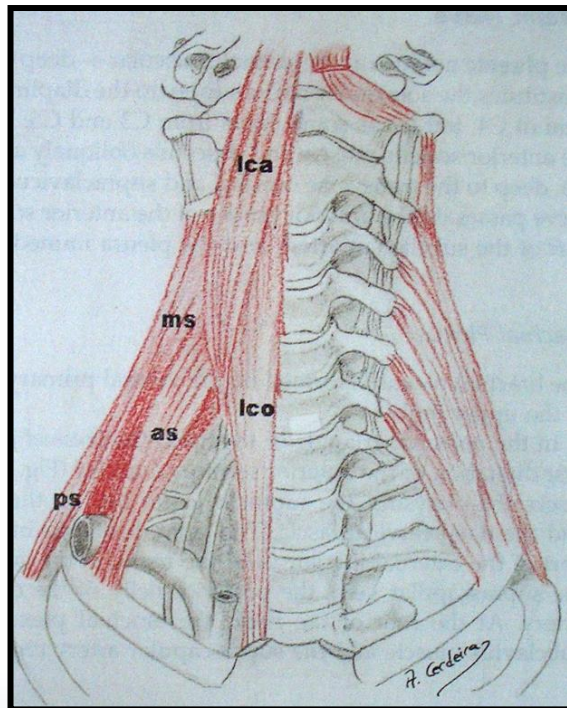
Cervical plexus



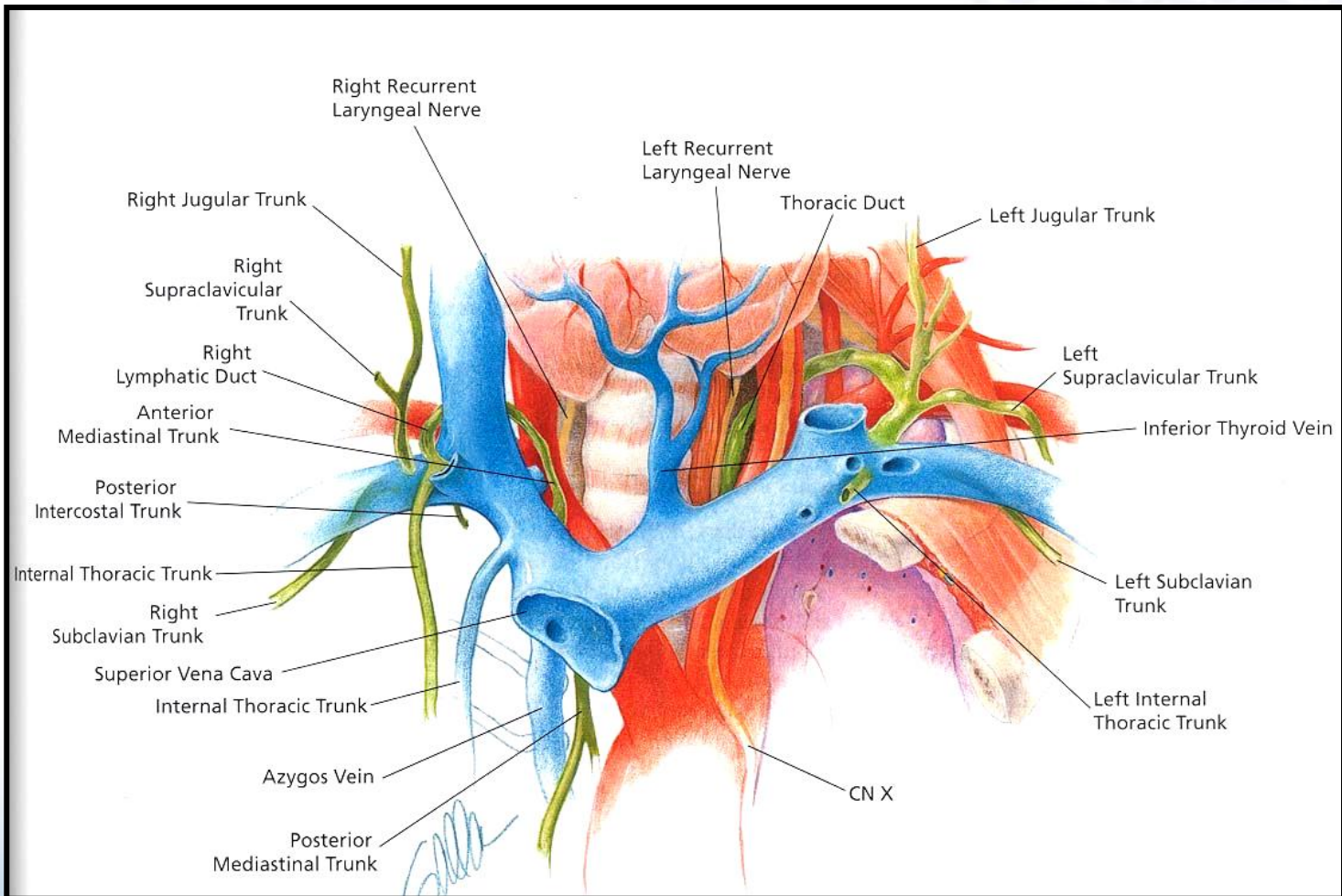
Phrenic nerve



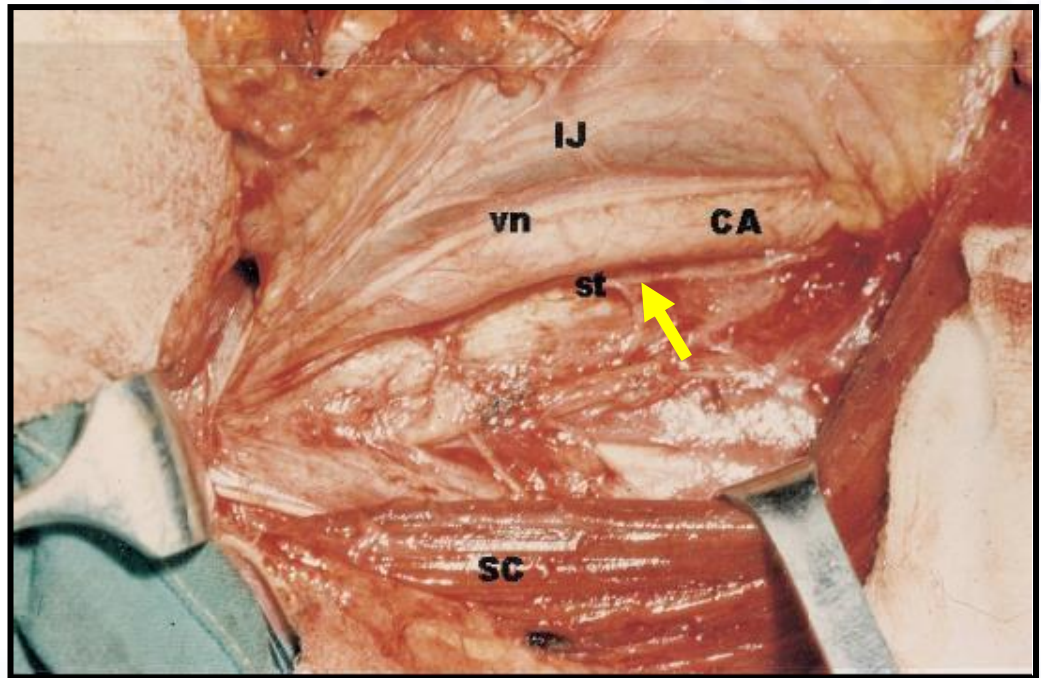
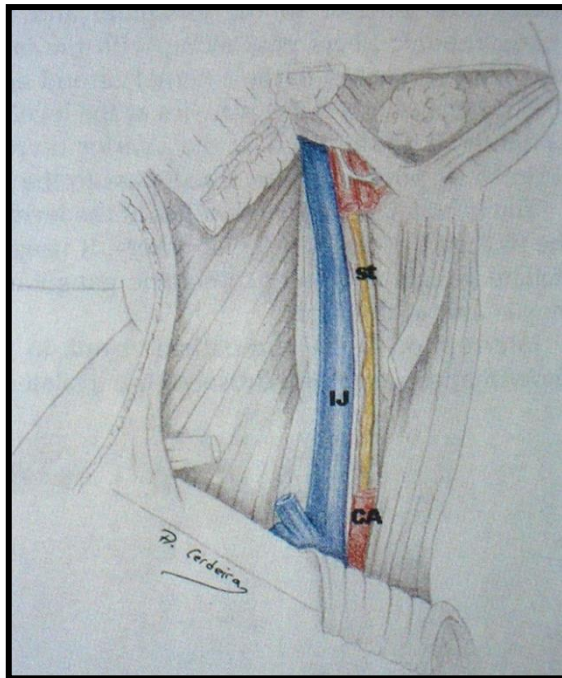
Deep neck muscles



Thoracic duct

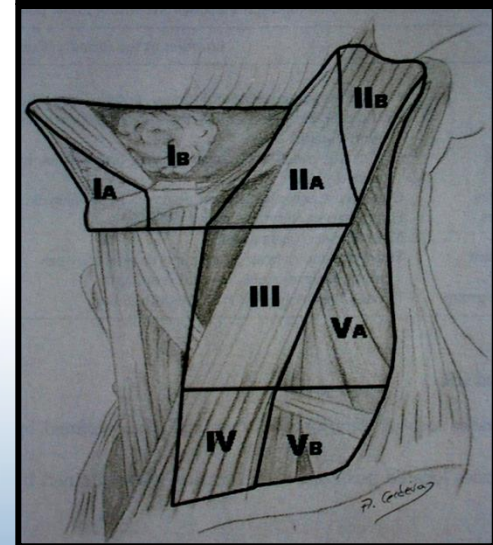
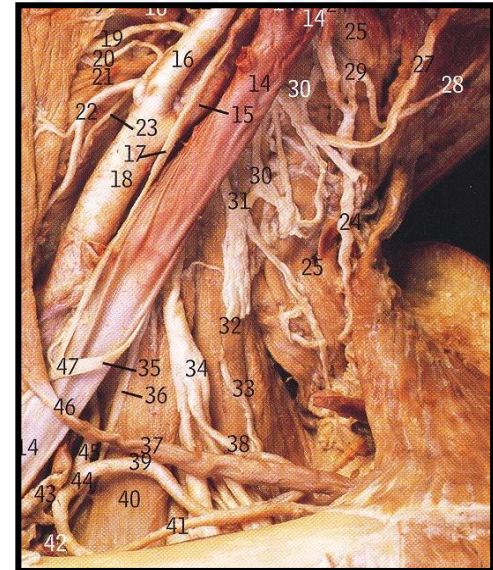


Sympathetic trunk



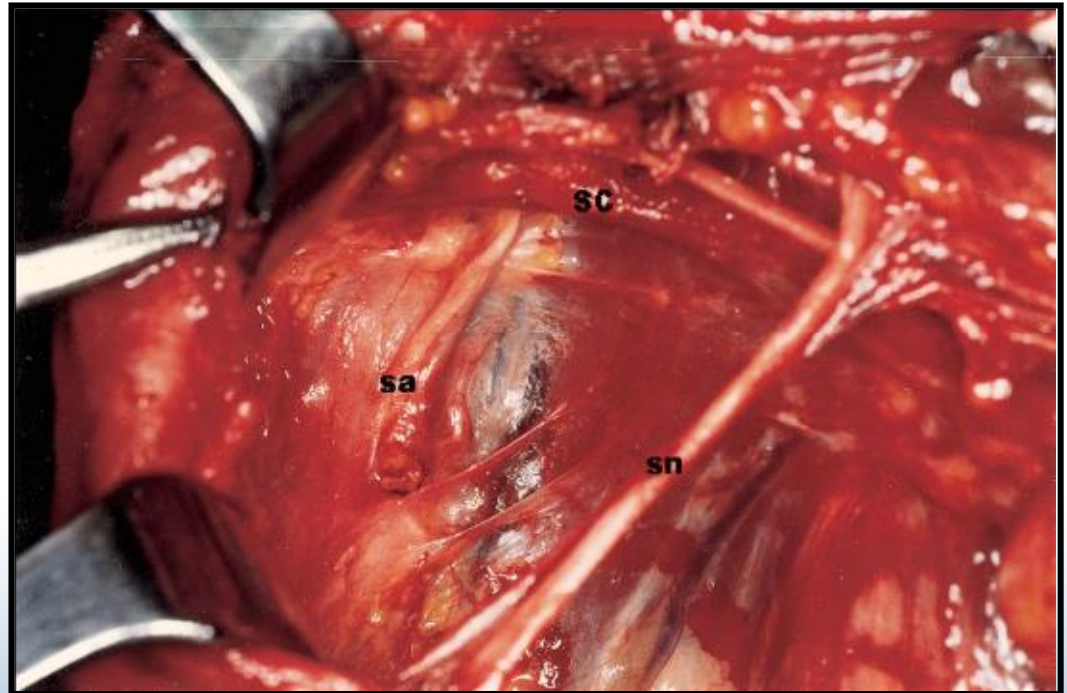
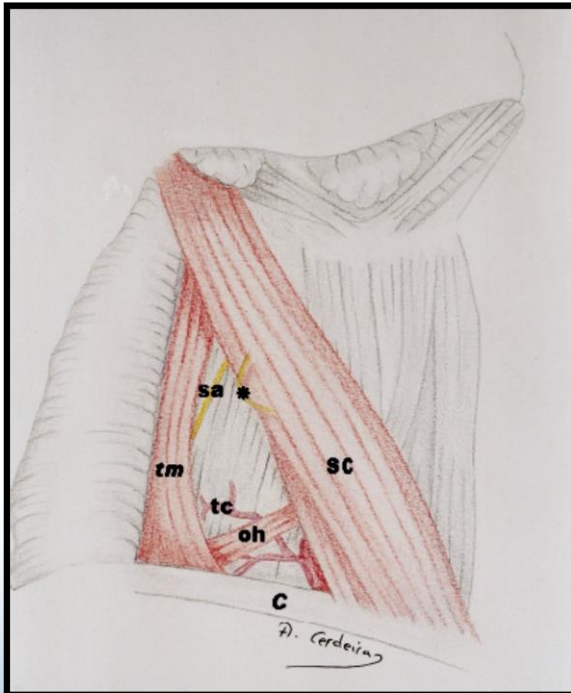
Level V

- **Posterior neck triangle (V):**
 - sternocleidomastoid m.
 - trapezius m.
 - clavicle
- **Va:**
 - along CN XI
- **Vb:**
 - along transvers neck a.
 - supraclavicular LNs

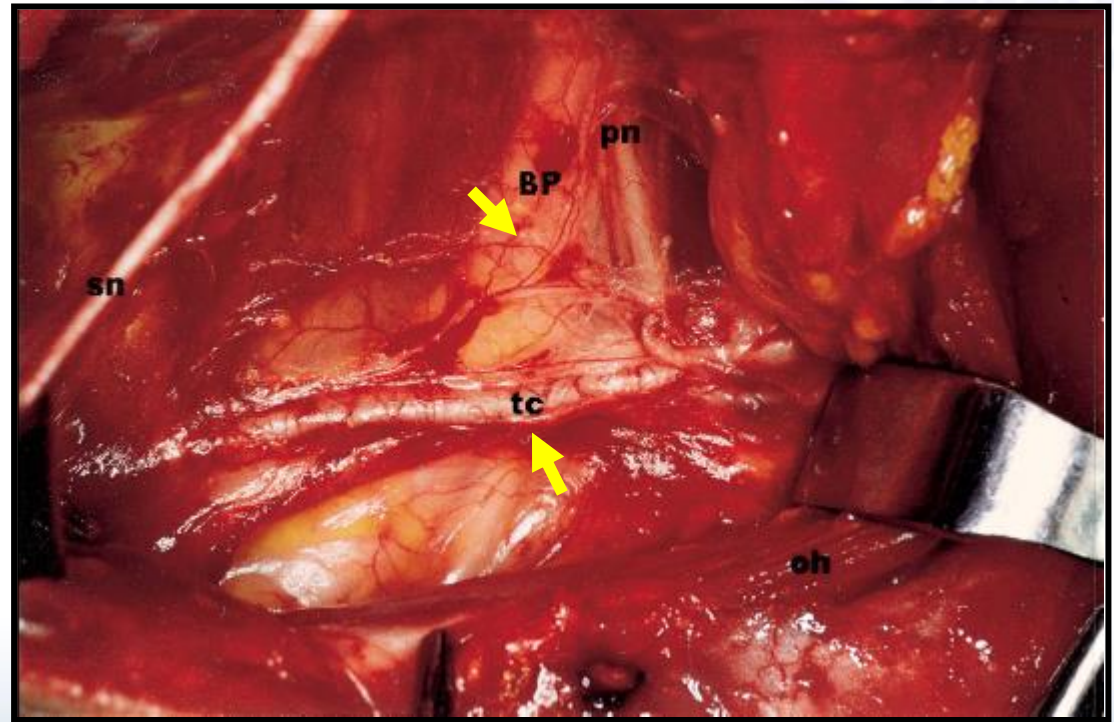
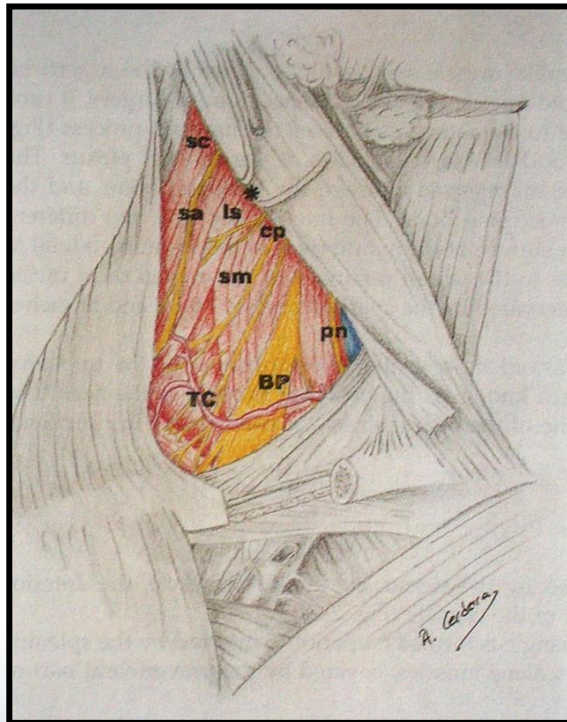


Level V

- **V: nasopharynx, oropharynx, skin of the posterior neck and scalp**

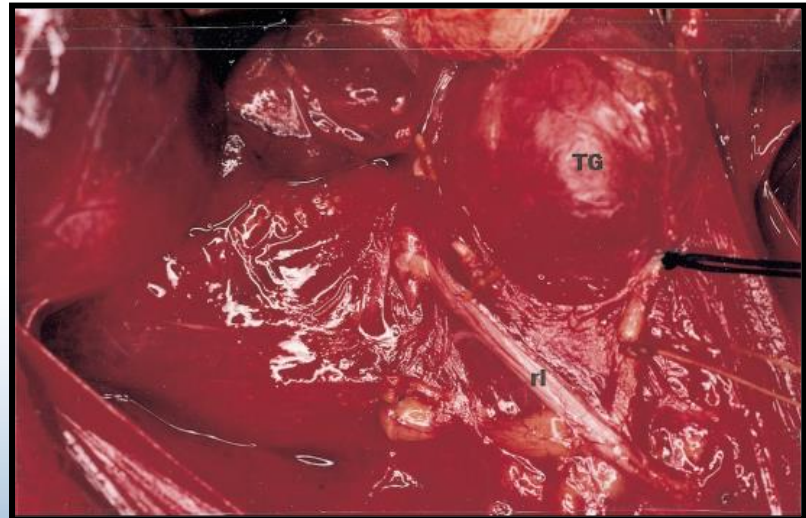
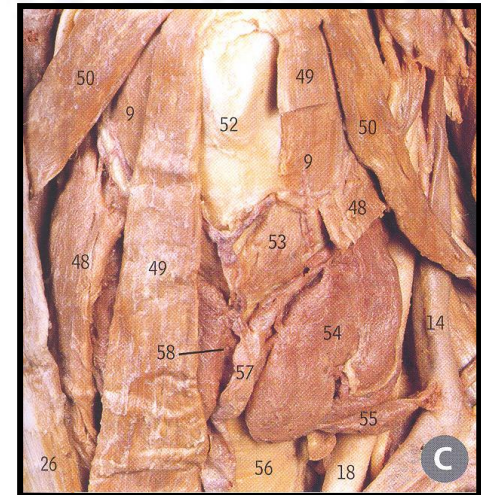


Brachial plexus, transverse neck vessels



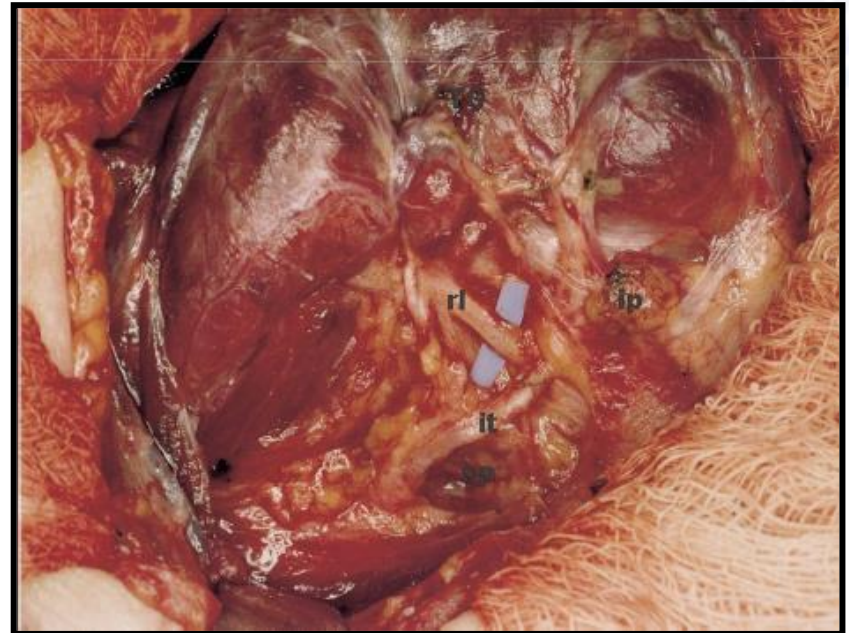
Level VI

- **anterior neck triangle (VI):**
 - **common carotid a.**
 - **hyoid**
 - **jugular notch**
- **perithyroid LNs**
- **paratracheal LNs**
- **precricoid LNs**
(delphian LN)



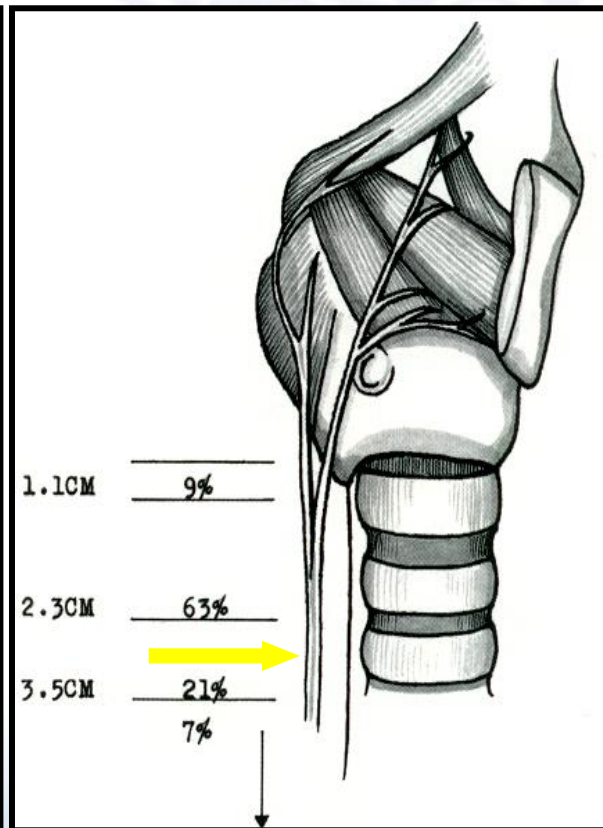
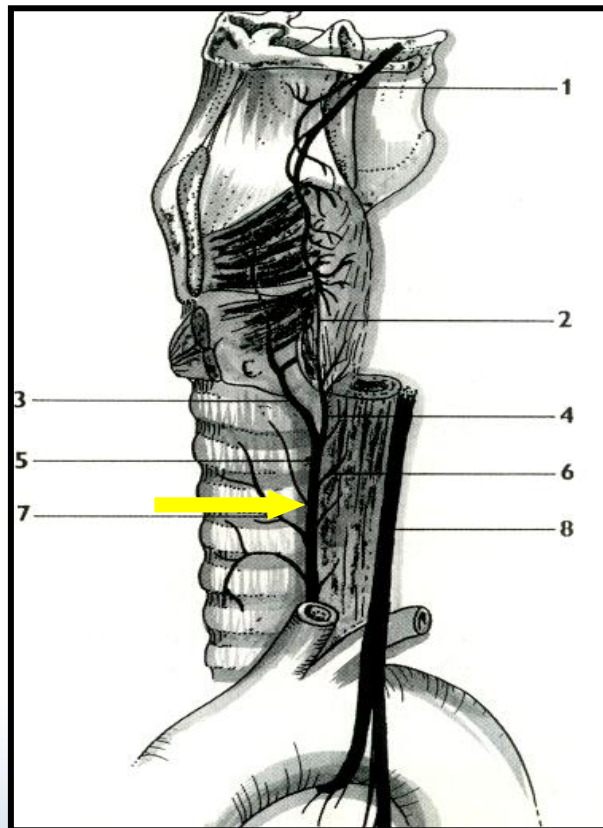
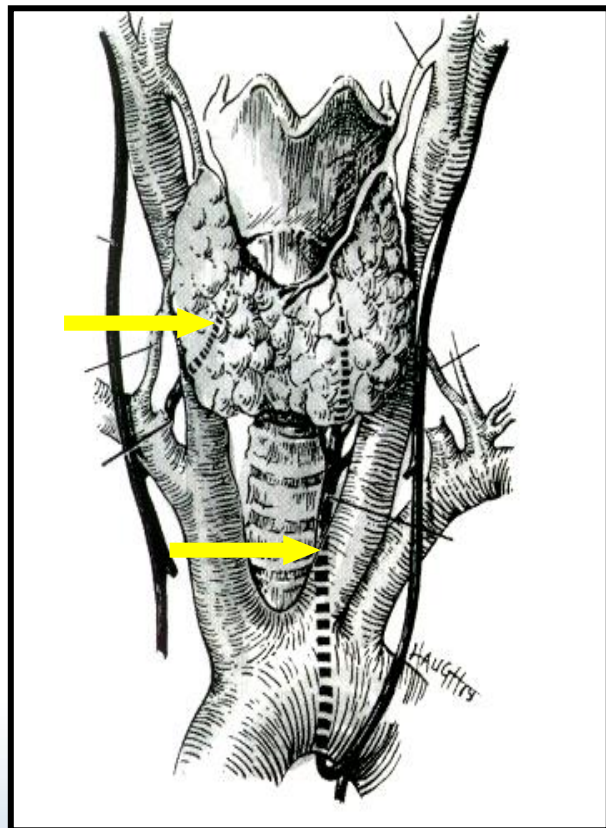
Oblast VI

- thyroid gland, parathyroid glands, larynx (glottis, subglottis), pyriform sinus apex, cervical oesophagus

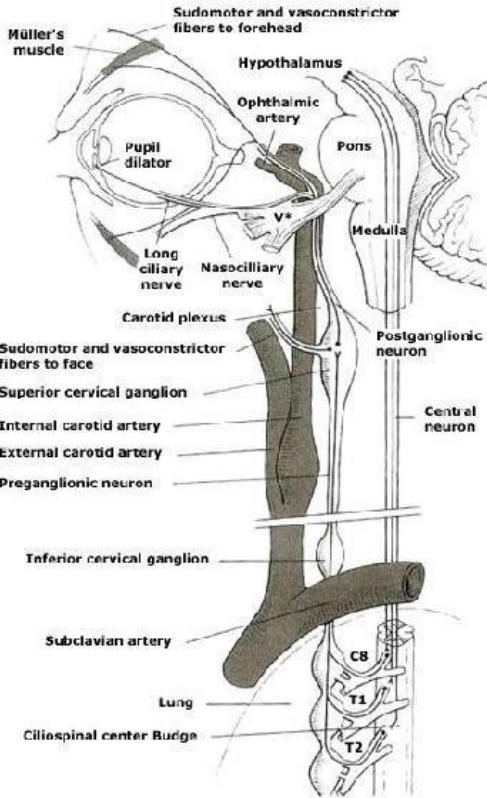


- thyroid gland
- parathyroids
- recurrent laryngeal nerve

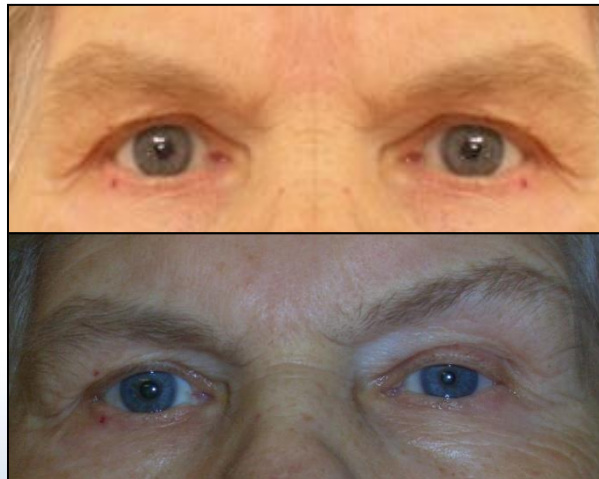
Recurrent laryngeal nerve



Horner's syndrome



Sympathetic trunk lesion
miosis
ptosis
enophthalmos
hemifacial anhidrosis



cong. Horner's syn.

schwannoma of sympathetic tr. – postop

THANK YOU FOR YOUR ATTENTION

