

Lymph drainage of the head and neck

Lymphatics of head and neck

Lymphatic drainage divided into

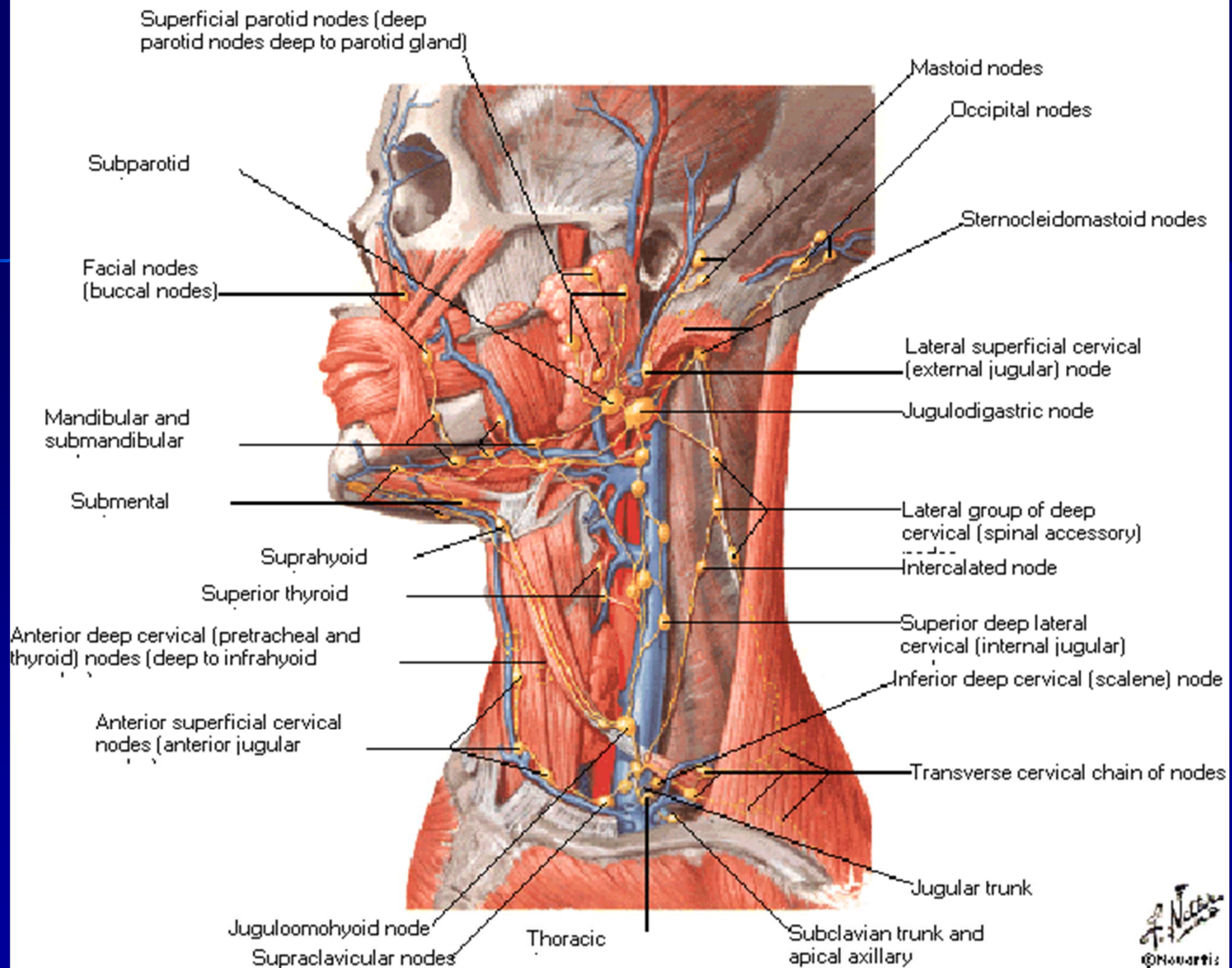
- (1) horizontal group
- (2) vertical group

Horizontal group

- **Suboccipital** (back of scalp and neck)
- **Mastoid** (post scalp, auricle, and ext aud meatus)
- **Parotid** (ant scalp, ext and middle ear, and parotid g)
- **Submandibular** (scalp, face, and tongue)
- **Submental** (tip of the tongue, floor of the mouth, lower lip, and chin)

Vertical group

- **Tracheal** (trachea, larynx, thyroid, and superficial neck, below hyoid)
- **Retropharyngeal** (nasopharynx, auditory tube, and middle ear)
- **Superficial cervical** (along the EJV, lower parotid, auricle, mastoid, and angle of mandible)
- **Deep cervical** (along the IJV, entire head and neck, either directly or through regional LN)
 - **Superior group with jugulodigastric node** (palatine tonsil and posterior 1/3 of the tongue, larynx, pharynx)
 - **Inferior group with jugulomohyoid node** (ant 2/3 of tongue, larynx, thyroid g)



The Lymph Glands of the Head

The lymph glands of the head are arranged in the following groups:

Occipital

Posterior Auricular

parotid

buccal

facial

Deep Facial

Anterior Auricular

Lingual

Retropharyngeal.

The occipital glands

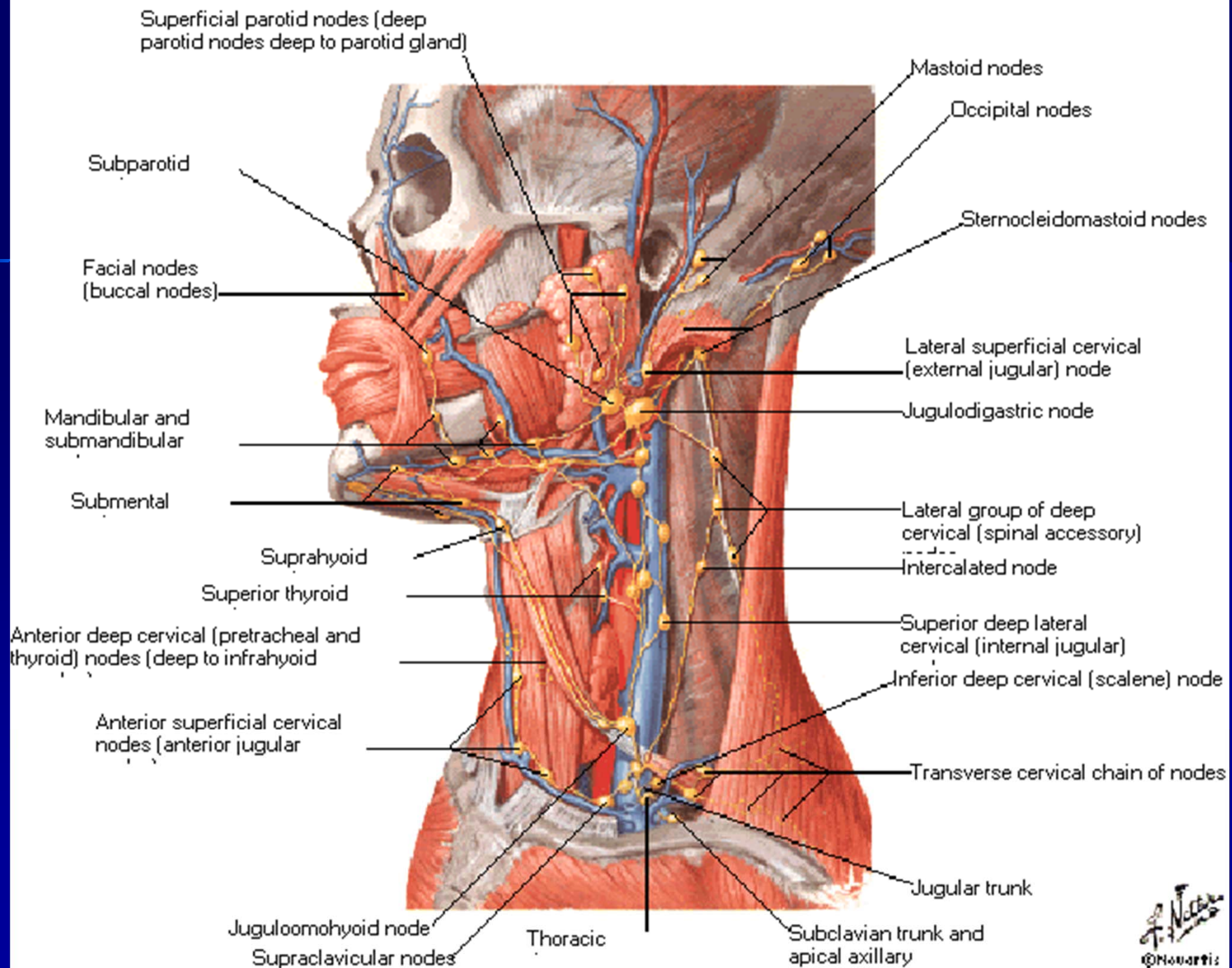
(lymphoglandulæ occipitales)

one to three in number

LOCATION: on back of the head close to the margin of the Trapezius
and resting on the insertion of the Semispinalis capitis

AFFERENT VESSELS drain the occipital region of the scalp

EFFERENT VESSELS pass to the superior deep cervical glands.



The posterior auricular glands

(lymphoglandulæ auriculares; mastoid glands),

usually two in number, are situated on the mastoid insertion of

the Sternocleidomastoideus

beneath the Auricularis posterior.

Their afferent vessels drain the posterior part of the temporoparietal region

the upper part of the cranial surface of the auricula or pinna, and the back of the external acoustic meatus; their

efferents pass to the superior deep cervical glands.

anterior auricular glands

*(lymphoglandulae auriculares anteriores;
superficial parotid or preauricular glands)*

from one to three in number, lie immediately in front of the tragus. Their afferents drain the lateral surface of the auricula and the skin of the adjacent part of the temporal region their efferents pass to the superior deep cervical glands.

parotid glands

(*lymphoglandulæ parotideæ*),

form two groups in relation with the parotid salivary gland

- (1) group imbedded in the substance of the gland,
- (2) group of subparotid glands lying on the lateral wall of the pharynx.

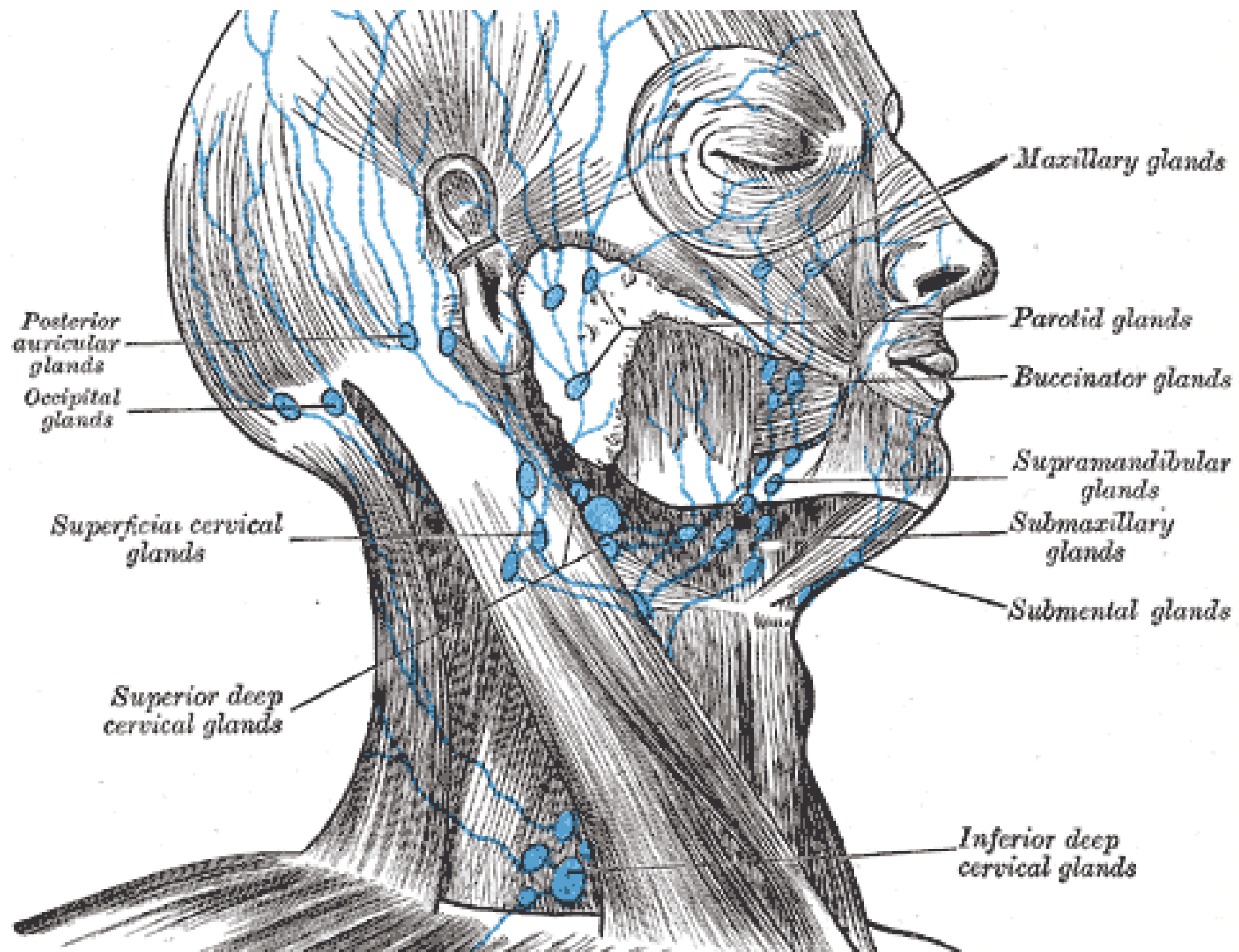
small glands are found in the subcutaneous tissue over the parotid gland.

Their afferent vessels drain the root of the nose, the eyelids the frontotemporal region, the external acoustic meatus and the tympanic cavity, possibly also the posterior parts of the palate and the floor of the nasal cavity. The efferents of these glands pass to the superior deep cervical glands.

The afferents of the subparotid glands drain the nasal part of the pharynx and the posterior parts of the nasal cavities; their efferents pass to the superior deep cervical glands.

facial glands comprise three groups:

- **(a) infraorbital or maxillary,**
scattered over the infraorbital region from the groove between the nose and cheek to the zygomatic arch;
- **(b) buccinator,**
one or more placed on the Buccinator opposite the angle of the mouth;
- **(c) supramandibular,**
on the outer surface of the mandible, in front of the Masseter and in contact with the external maxillary artery and anterior facial vein. Their afferent vessels drain the eyelids, the conjunctiva, and the skin and mucous membrane of the nose and cheek; their efferents pass to the submandibular glands.

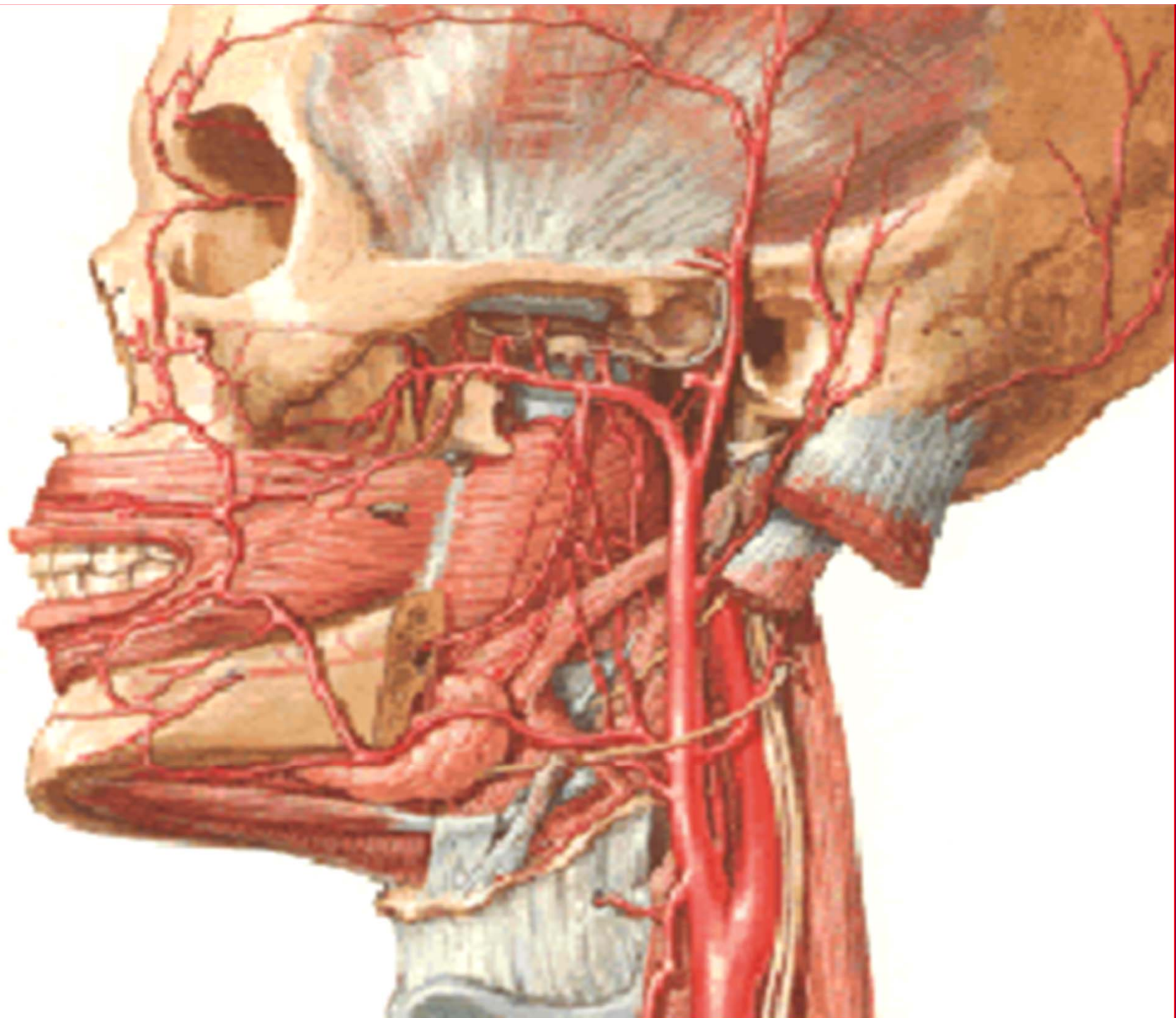


The deep facial glands

(lymphoglandulæ faciales profunda; internal maxillary glands)

are placed beneath the ramus of the mandible, on the outer surface of the Pterygoideus externus, in relation to the internal maxillary artery.

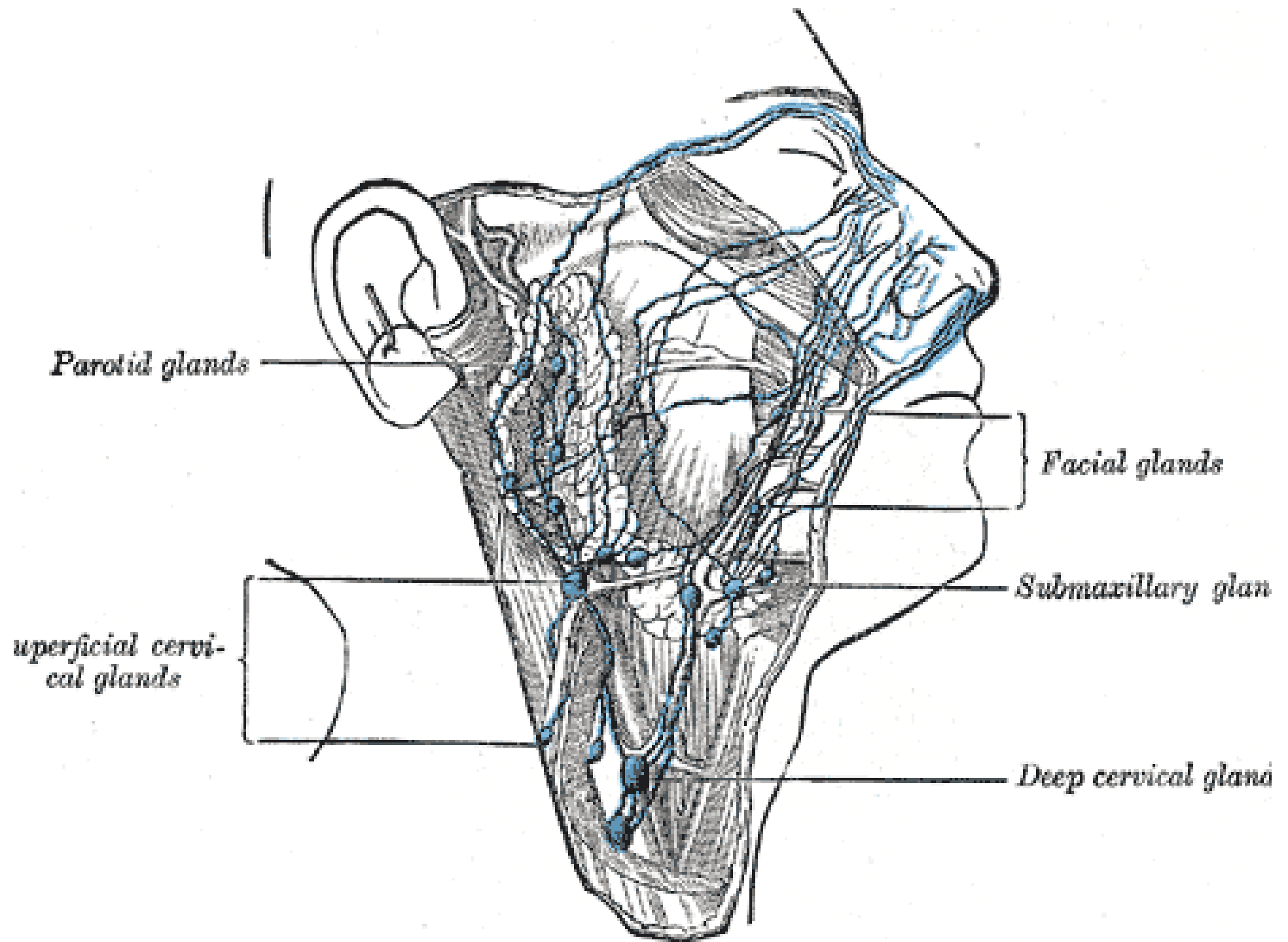
Their afferent vessels drain the temporal and infratemporal fossæ and the nasal part of the pharynx
their efferents pass to the superior deep cervical glands.



The **lingual glands** (*lymphoglandulae linguales*)

are two or three small nodules lying on the Hyoglossus and under the Genioglossus.

They form merely glandul substance in the course of the lymphatic vessels of the tongue.



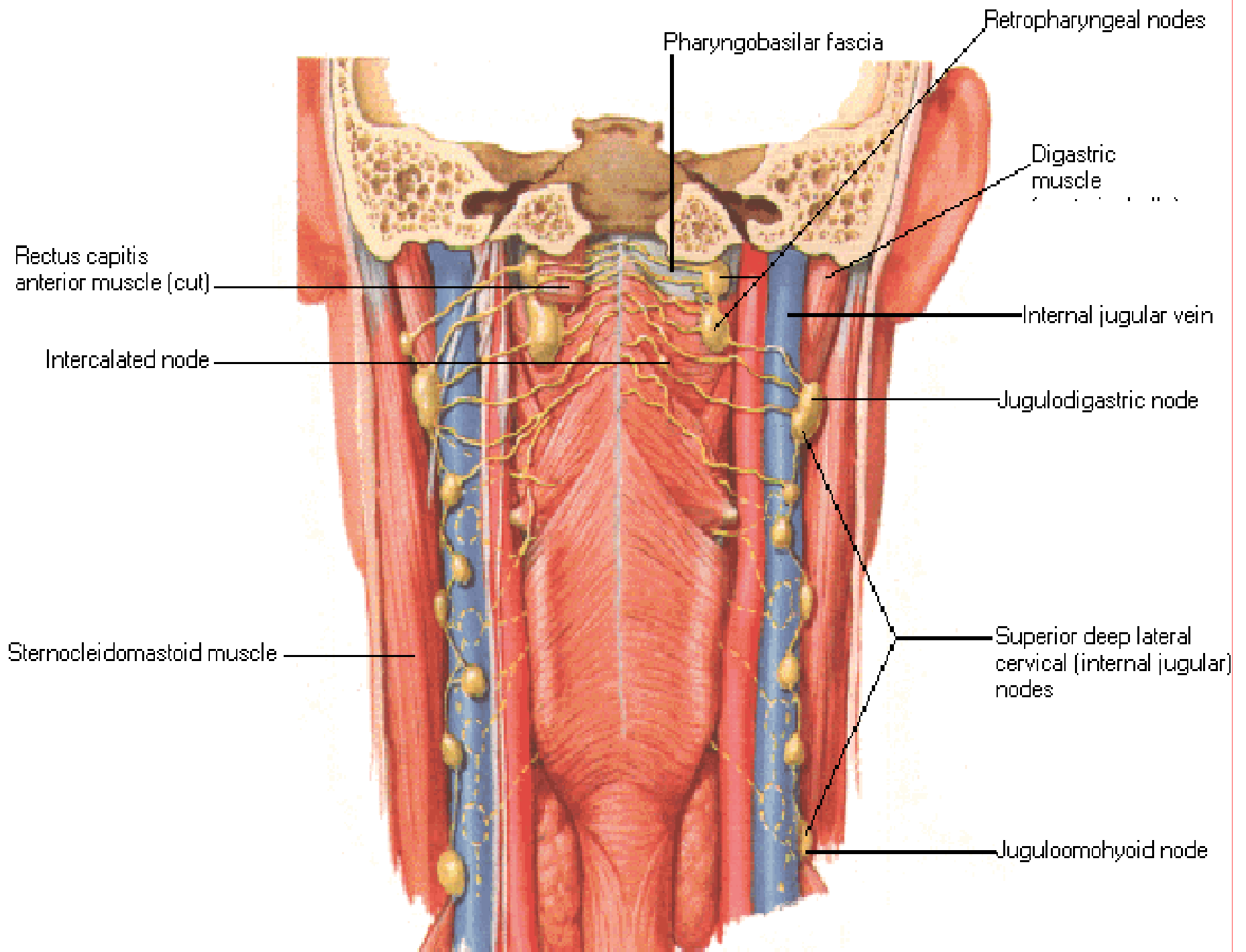
retropharyngeal glands

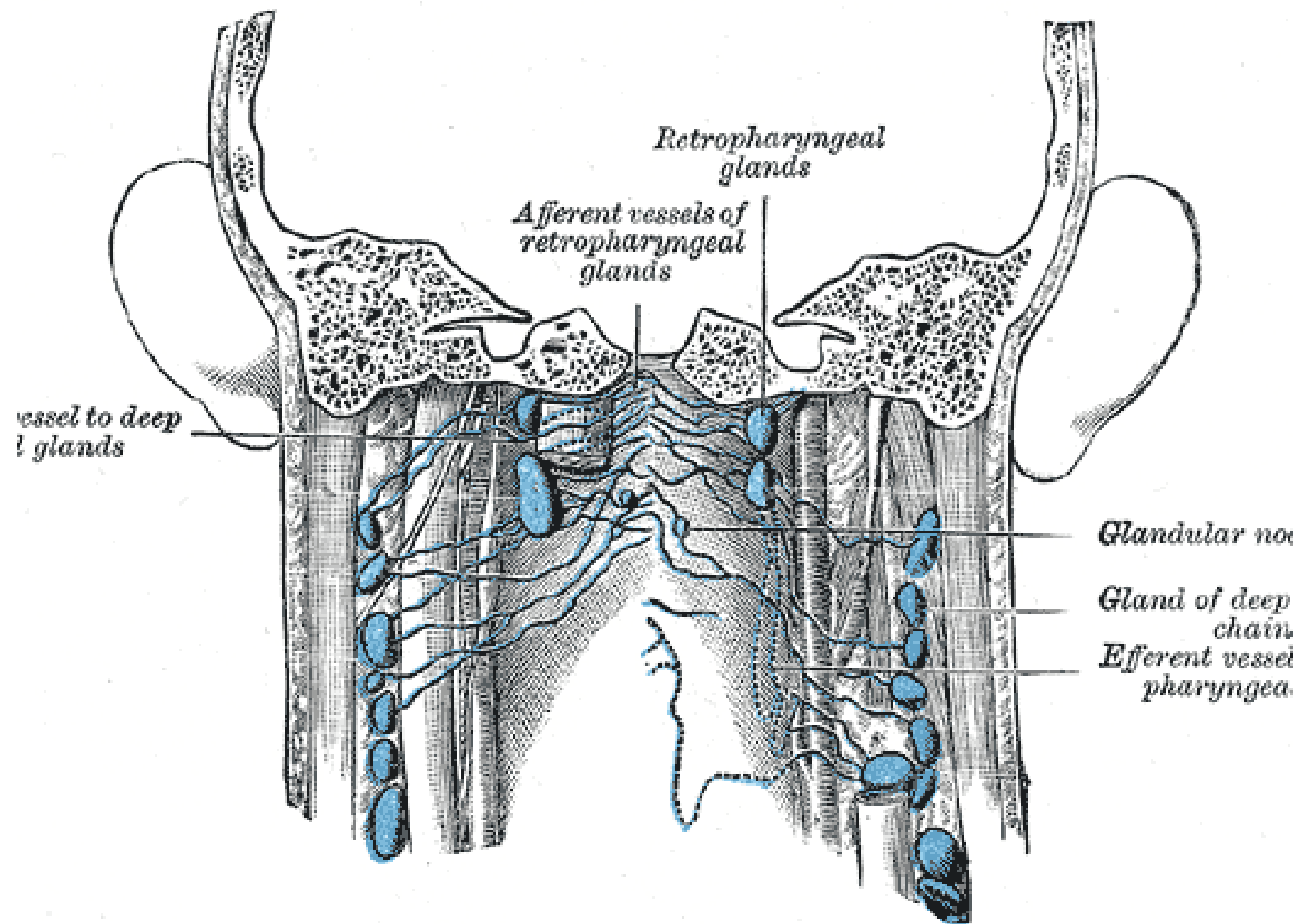
from one to three in number, lie in the buccopharyngeal fascia, behind the upper part of the pharynx and in front of the arch of the atlas, being separated, however, from the latter by the Longus capitis.

Their afferents drain

the nasal cavities, the nasal part of the pharynx, and the auditory tubes;

their efferents pass to the superior deep cervical glands.





The Lymph Glands of the Neck—

The lymph glands of the neck include the following groups:

- Submandibular
- Superficial Cervical
- Submental
- Anterior Cervical
- Deep Cervical

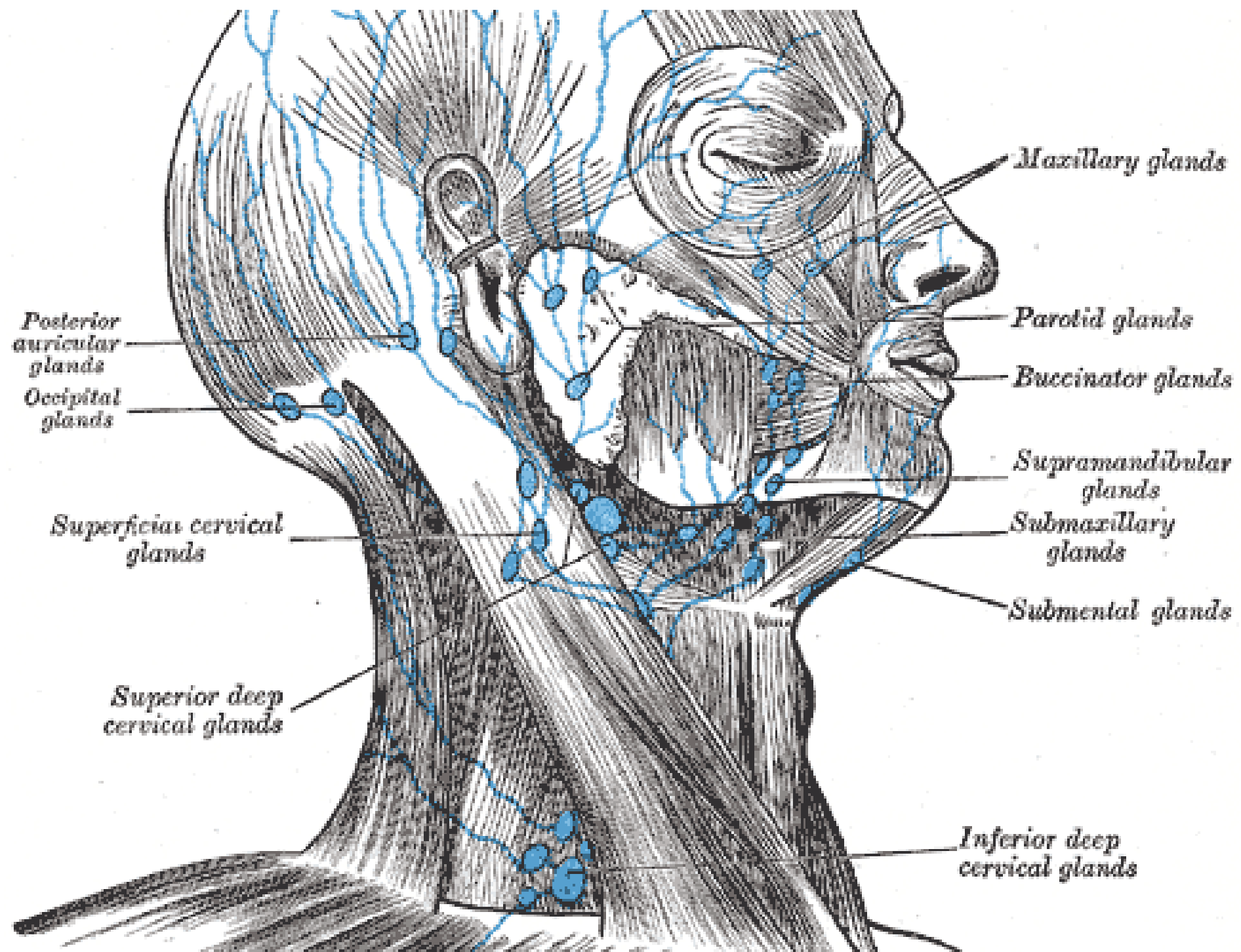
submandibular glands (*lymphoglandulæ submaxillares*)

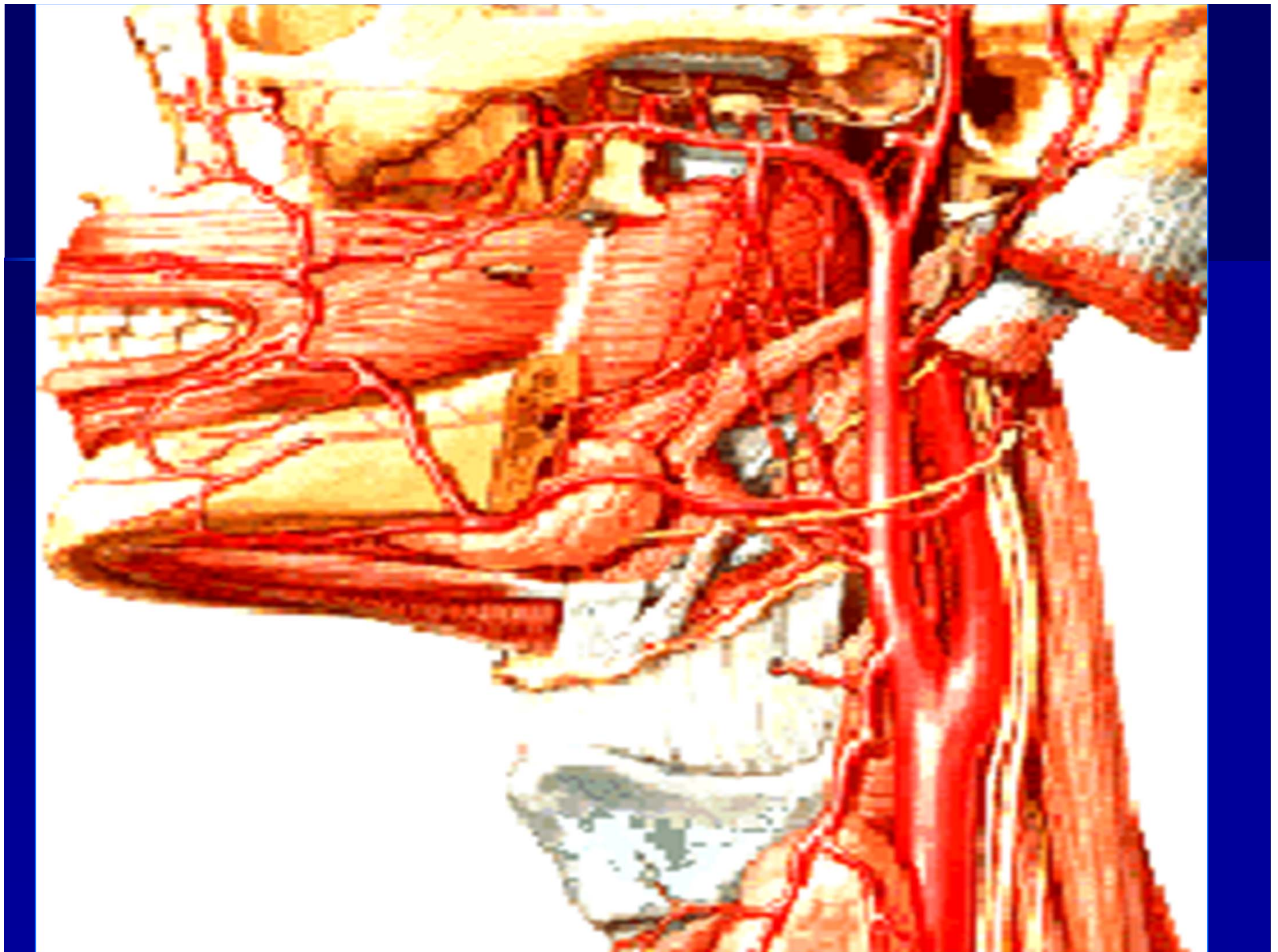
three to six in number, are placed beneath the body of the mandible in the submandibular triangle, and rest on the superficial surface of the submandibular salivary gland.

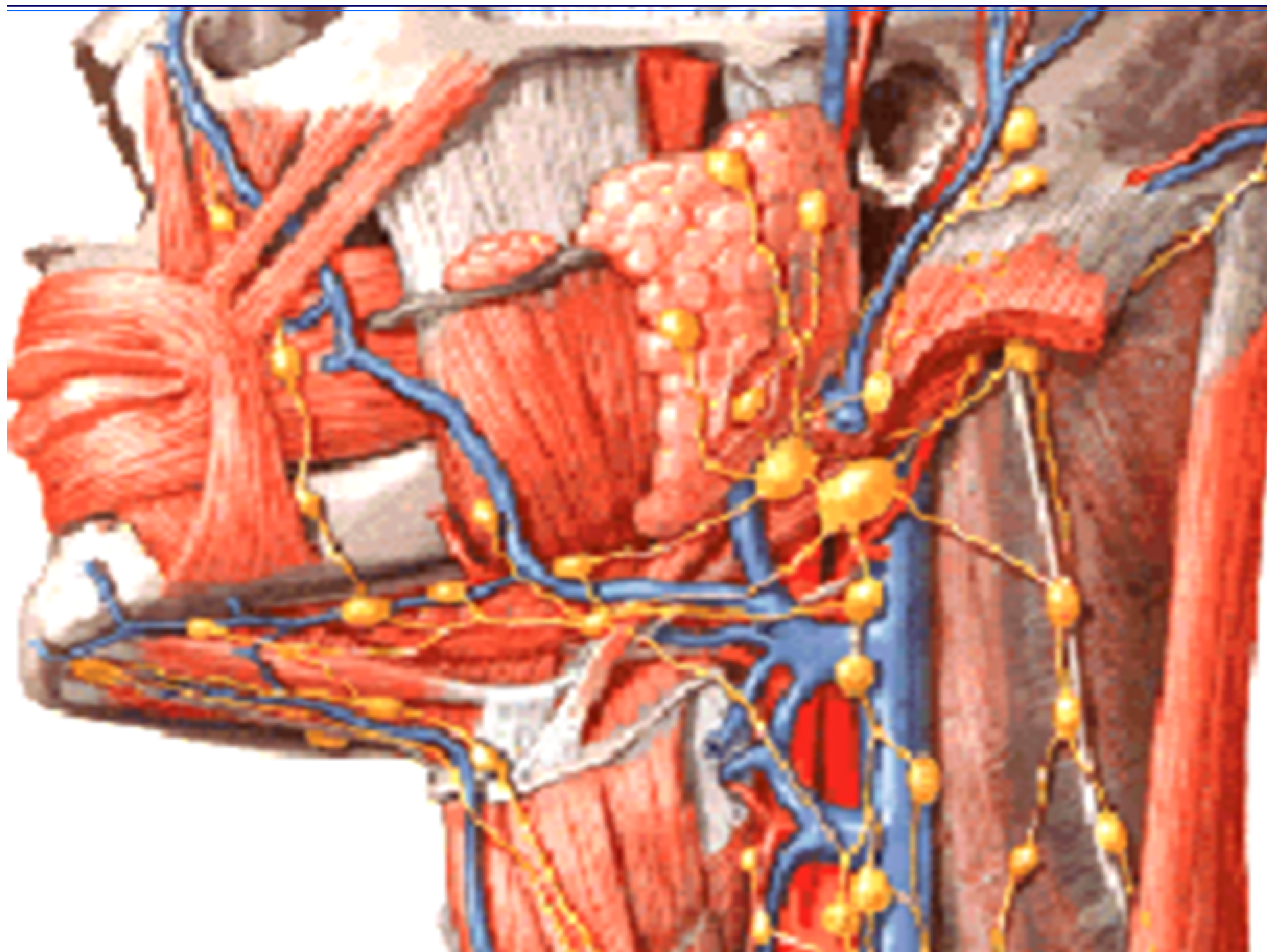
One gland, the **middle gland of Stahr**, which lies on the external maxillary artery as it turns over the mandible, is the most constant of the series;

small lymph glands are sometimes found on the deep surface of the submandibular salivary glands.

The afferents of the submandibular glands drain the medial palpebral commissure, the cheek, the side of the nose, the upper lip, the lateral part of the lower lip, the gums, and the anterior part of the margin of the tongue; efferent vessels from the facial and submental glands also enter the submandibular glands. Their efferent vessels pass to the superior deep cervical glands.







applied anatomy

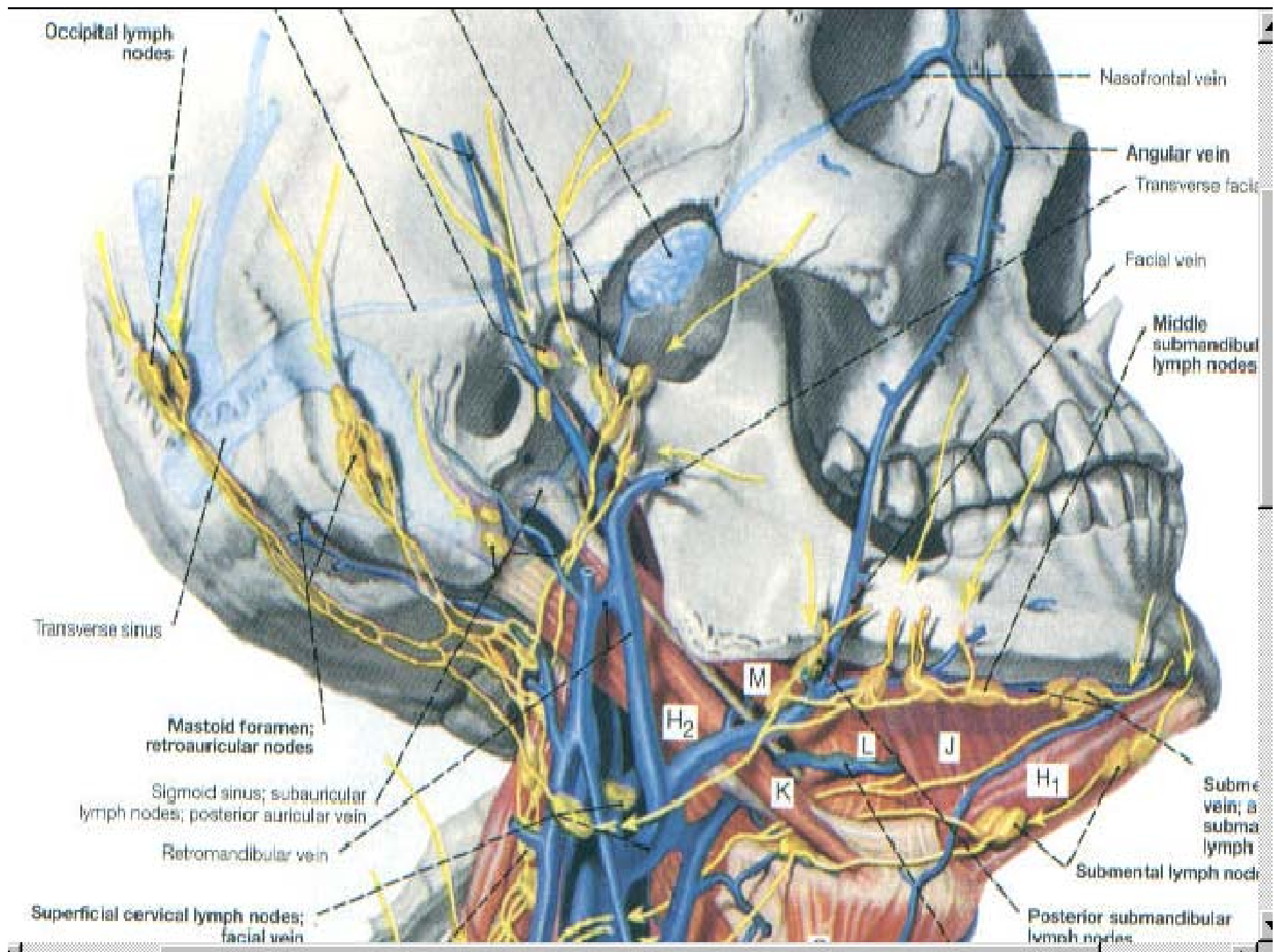
- Enlarged LN (tumor of the tongue)
- Enlarged submand.g (calculus or tumor)
- Surgery risks the following
 - Mandibular branch of the facial n
 - Cervical branch of the facial n

glands **submental or suprahyoid**

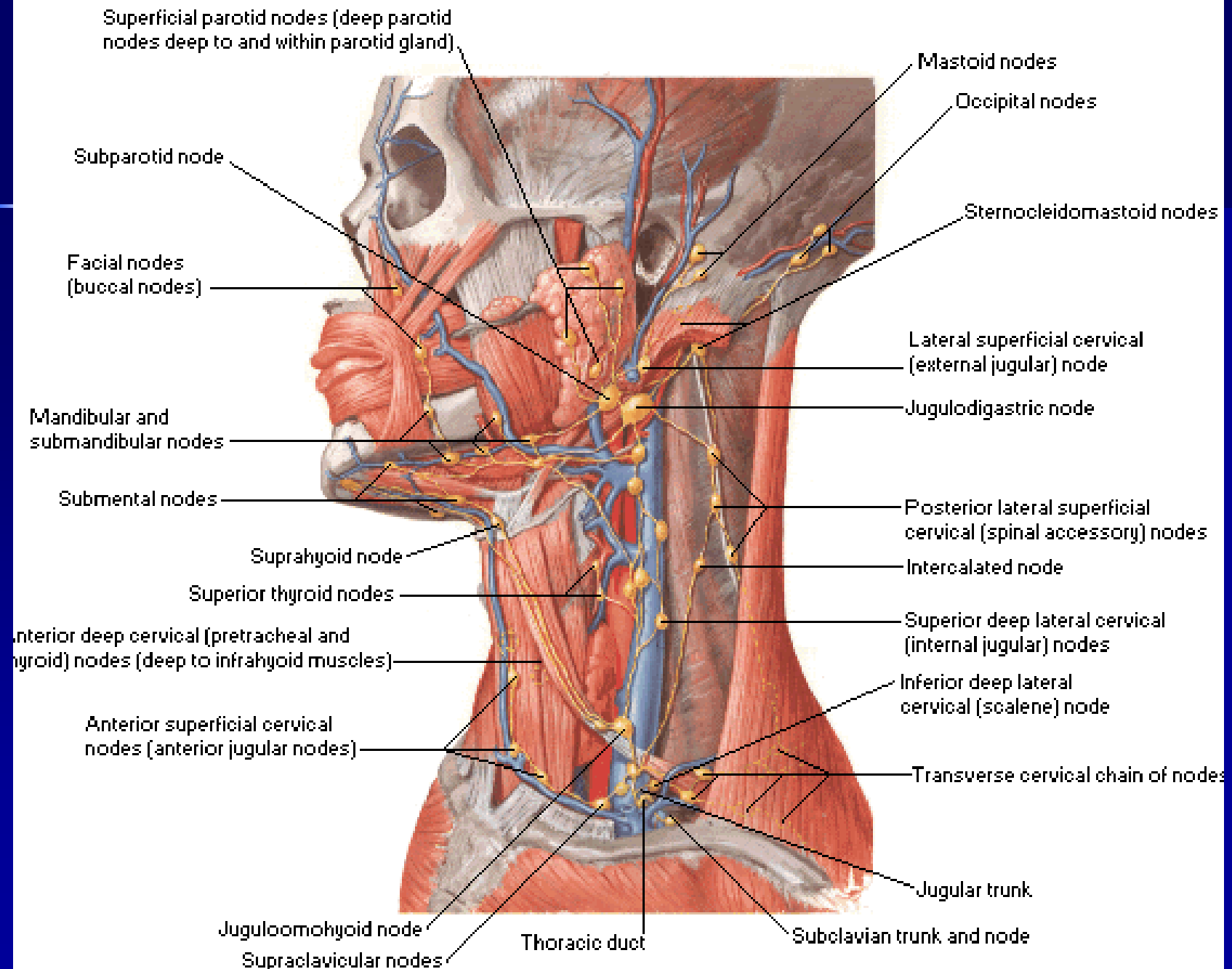
are situated between the anterior bellies of the Digastrici.

Their afferents drain the central portions of the lower lip and floor of the mouth and the apex of the tongue;

their efferents pass partly to the submandibular glands and partly to a gland of the deep cervical group situated on the internal jugular vein at the level of the cricoid cartilage.



Lymph Vessels and Nodes of Oral and Pharyngeal Regions



Internal jugular vein

- Receives blood from

- 1-brain

- 2- face

- 3-neck

- Begins at jugular foramen

As a continuation of the sigmoid venous sinus

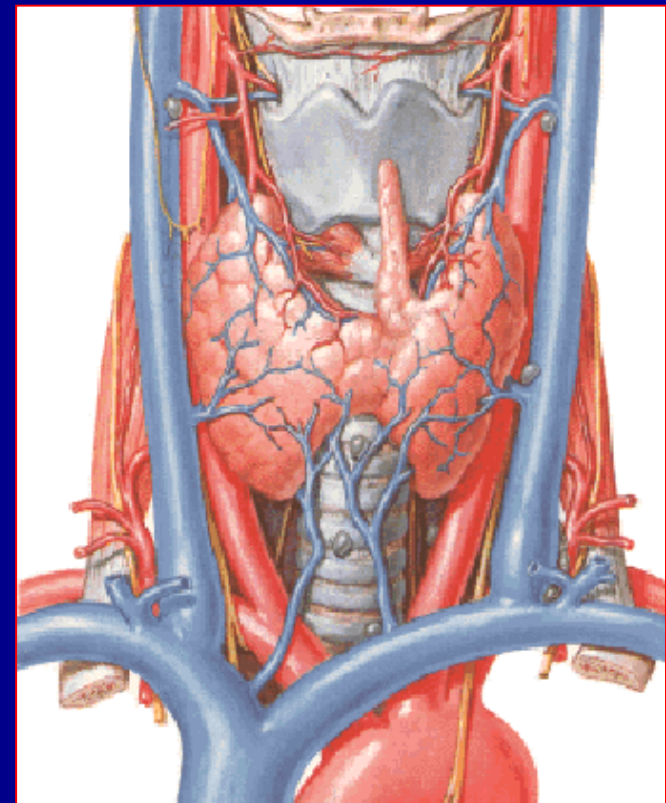
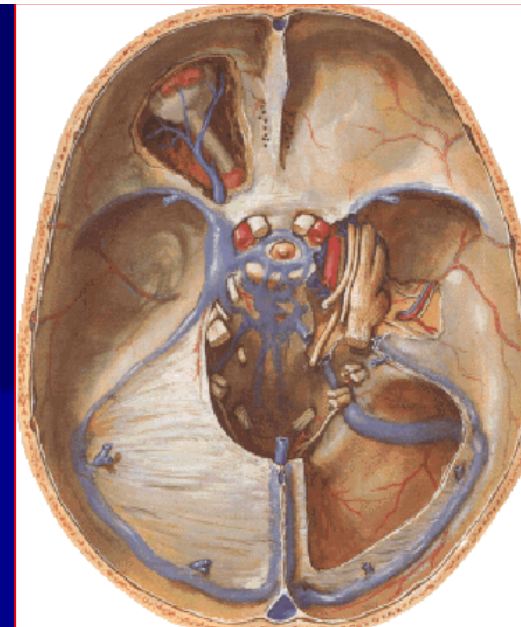
- Descends within the carotid sheath

Lateral to the ICA and CCA

- Ends behind the medial end of the clavicle
by joining the subclavian vein

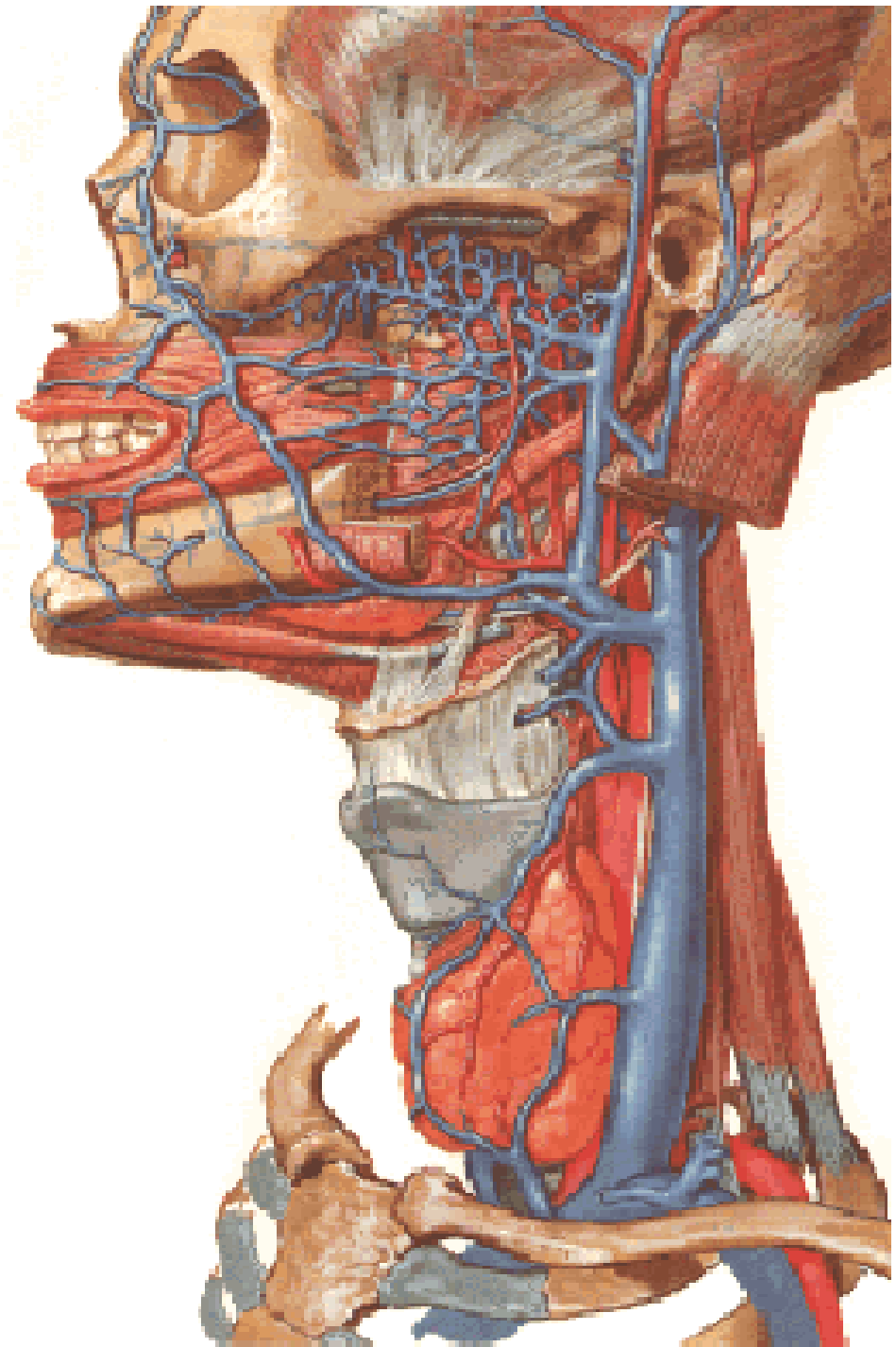
to form the brachiocephalic vein

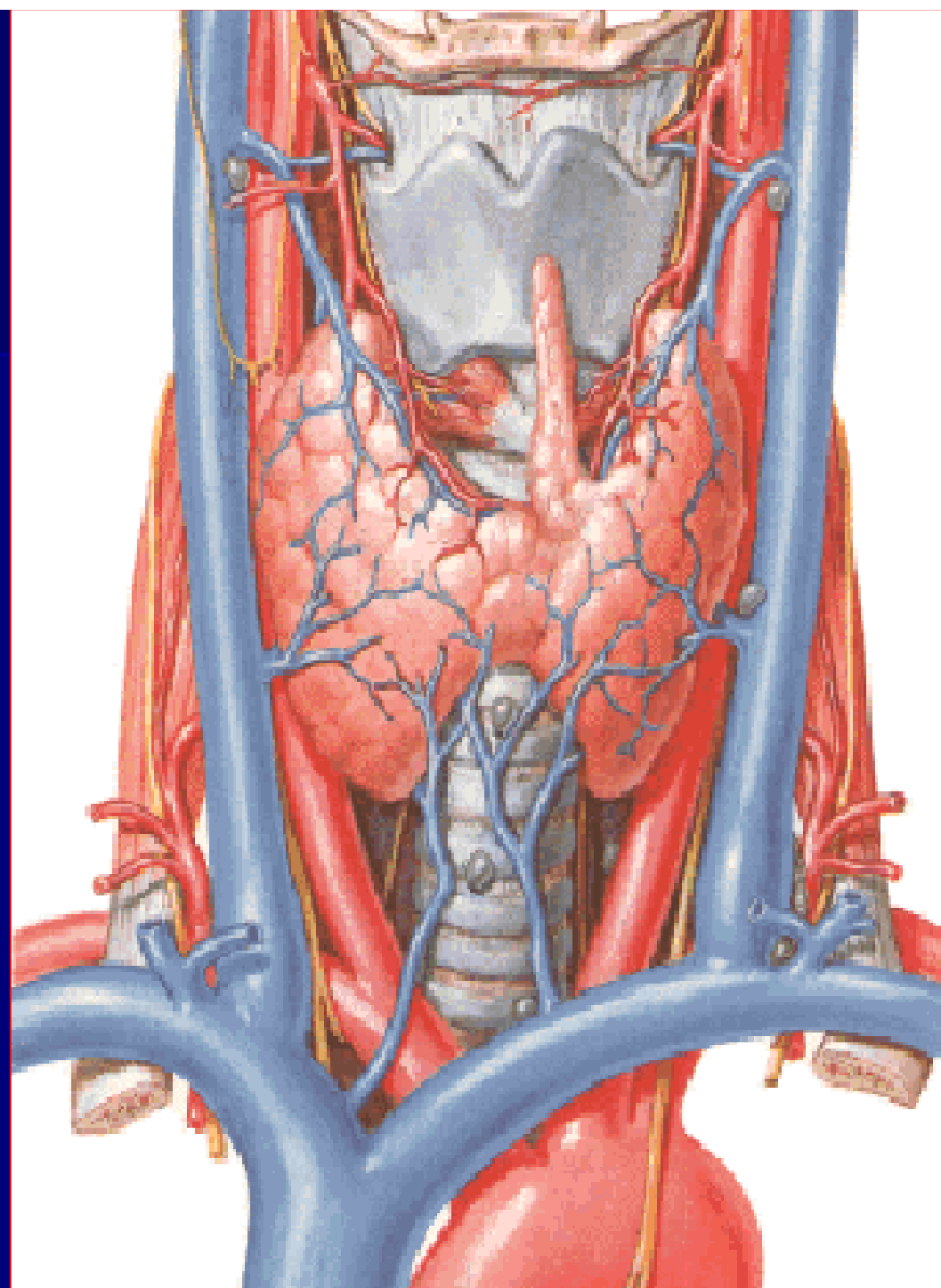
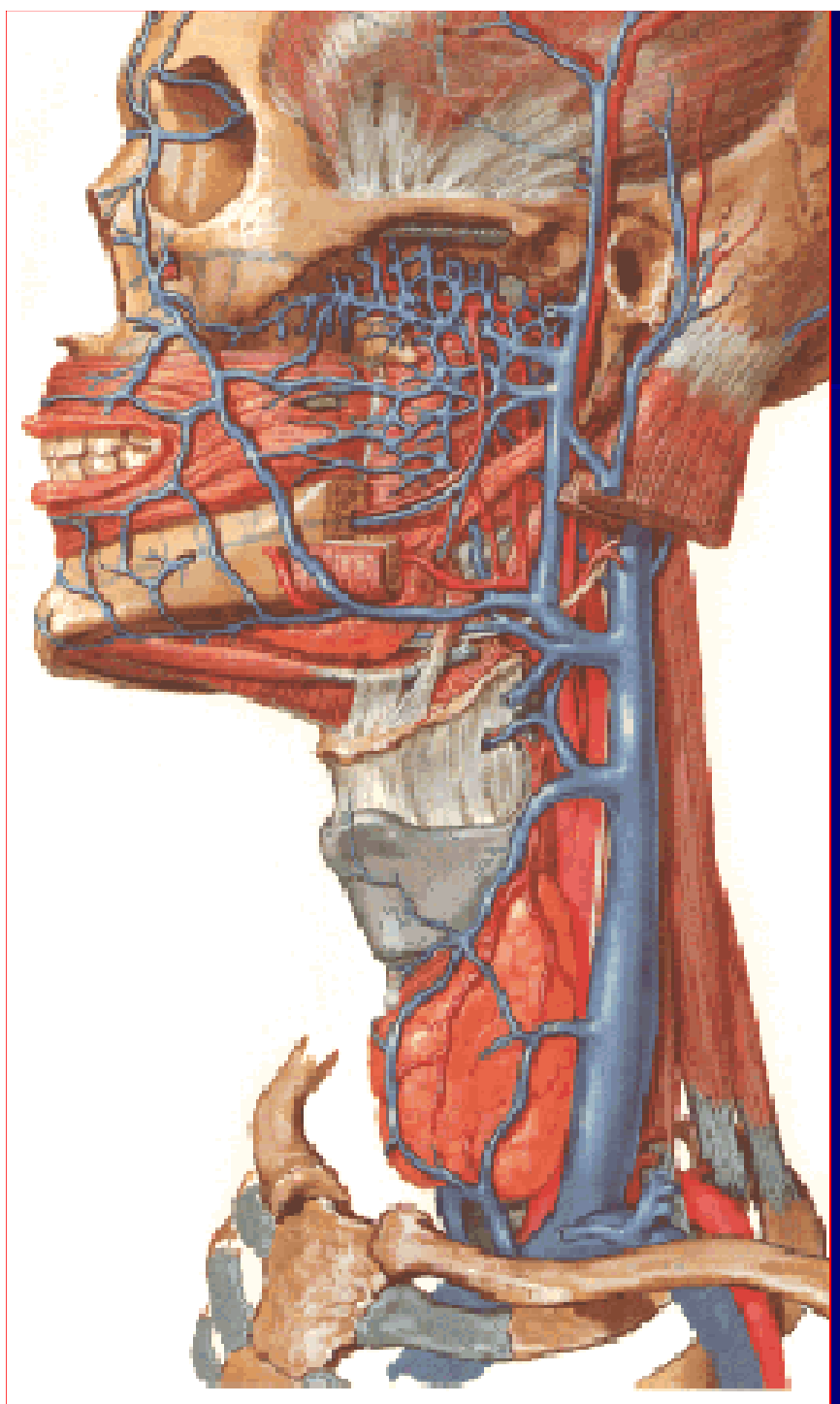
- Usually has a single valve
located just above the inferior bulb



Tributaries

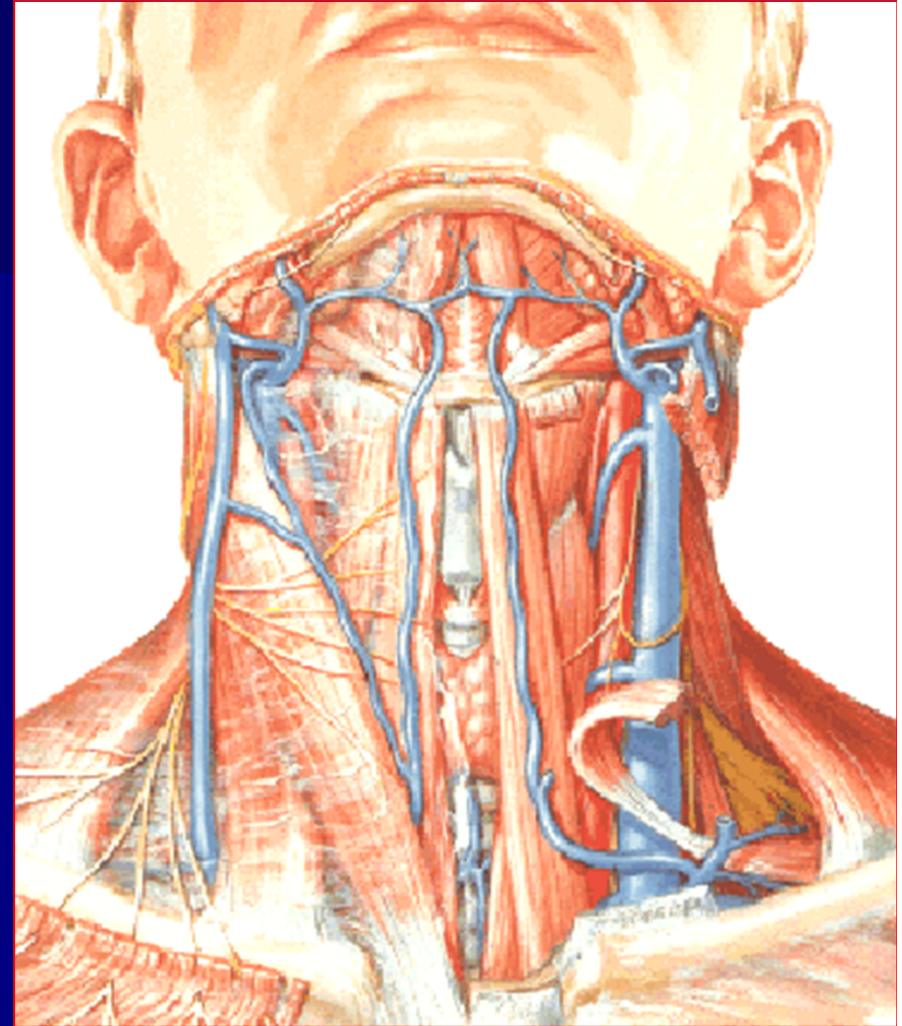
- 1) **Inferior petrosal sinus**
drains the cavernous sinus
- 2) **Facial vein**
- 3) **pharyngeal vein**
drain the pharyngeal
plexus
- 4) **Lingual vein**
- 5) **Superior thyroid vein**
- 6) **Middle thyroid vein**
- 7) **Occipital vein**





Anterior jugular vein

- Begins in the submandibular region
- Ends in the EJV
- Just above the jugular notch of the sternum may be connected to the opposite vein by a jugular venous arch



superficial cervical glands

(lymphoglandulæ cervicales superficiales)

lie in close relationship with the external jugular vein as it emerges from the parotid gland, and, therefore, superficial to the Sternocleidomastoideus.

Their afferent drain the lower parts of the auricular and parotid region,

while their efferents pass around the anterior margin of the Sternocleidomastoideus to join the superior deep cervical glands.

■ The **anterior cervical glands**

form an irregular and inconstant group on the front of the larynx and

trachea. They may be divided into

(*a*) a **superficial set**, placed on the anterior jugular vein;

(*b*) a **deeper set**, which is further subdivided into prelaryngeal, on the middle cricothyroid ligament, and pretracheal, on the front of the trachea. This deeper set drains the lower part of the larynx, the thyroid gland, and the upper part of the trachea;

its efferents pass to the lowest of the superior deep cervical glands.

The deep cervical glands

(lymphoglandulae cervicales profundae)

are numerous and of large size: they form a chain along the carotid sheath, lying by the side of the pharynx, esophagus, and trachea, and extending from the base of the skull to the root of the neck.

They are usually described in two groups:

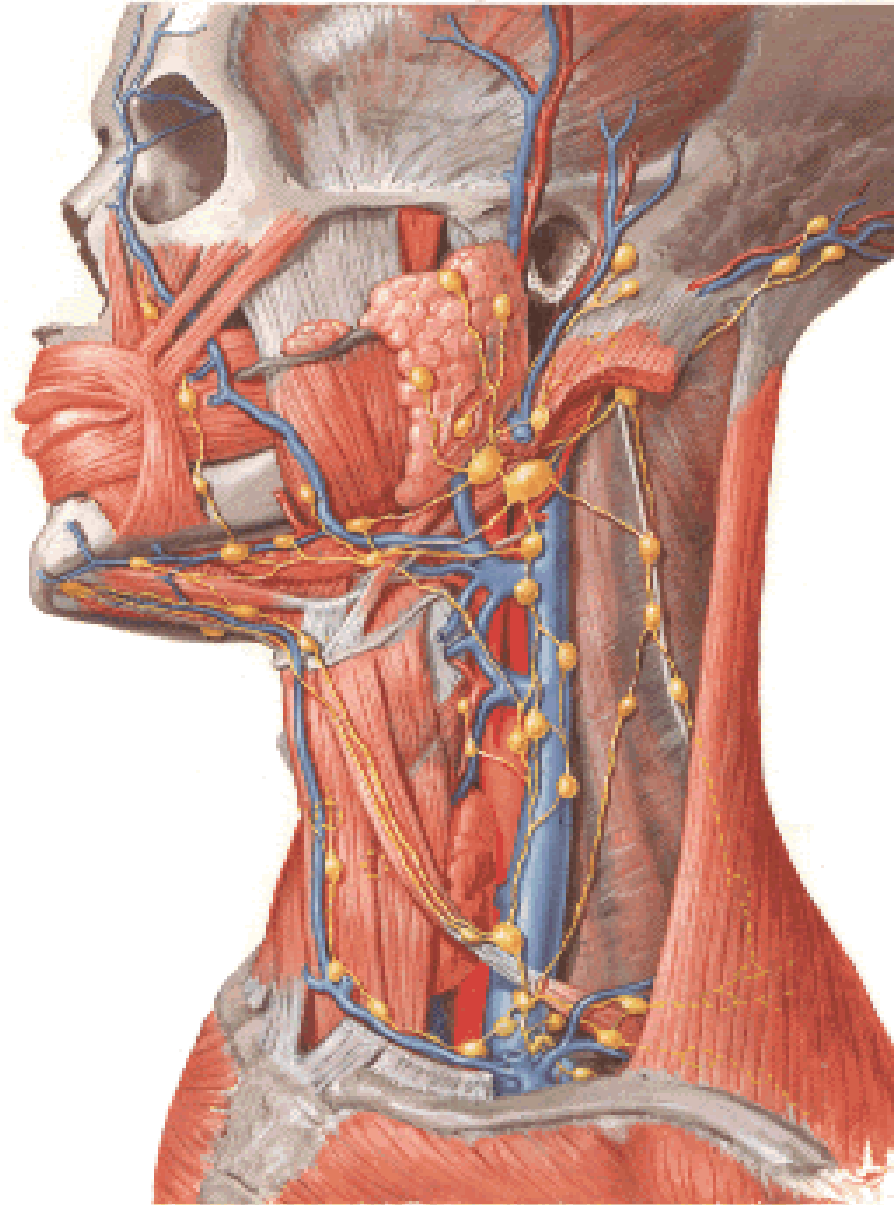
- (1) the **superior deep cervical glands** lying under the Sternocleidomastoideus in close relation with the accessory nerve and the internal jugular vein, some of the glands lying in front of and others behind the vessel;
- (2) the **inferior deep cervical glands** extending beyond the posterior margin of the Sternocleidomastoideus into the supraclavicular triangle, where they are closely related to the brachial plexus and subclavian vein.
- A few minute **paratracheal glands** are situated alongside the recurrent nerves on the lateral aspects of the trachea and esophagus.

- All lymph nodes drain directly or indirectly to the deep cervical group of nodes
- Some of deep cervical nodes form a circular collar at the junction of the head and neck
- Is collected by the jugular lymph trunk

a- on the left side usually joins the thoracic duct

b- on the right side either joins the right lymphatic duct or empties independently at the junction of the IJV and subclavian vein

Lymph Vessels and Nodes of Oral and Pharyngeal Regions



Lymphatic vessels of the scalp

are divisible into

(a) those of the frontal region, which terminate in the anterior auricular

and parotid glands;

(b) those of the temporoparietal region, which end in the parotid and

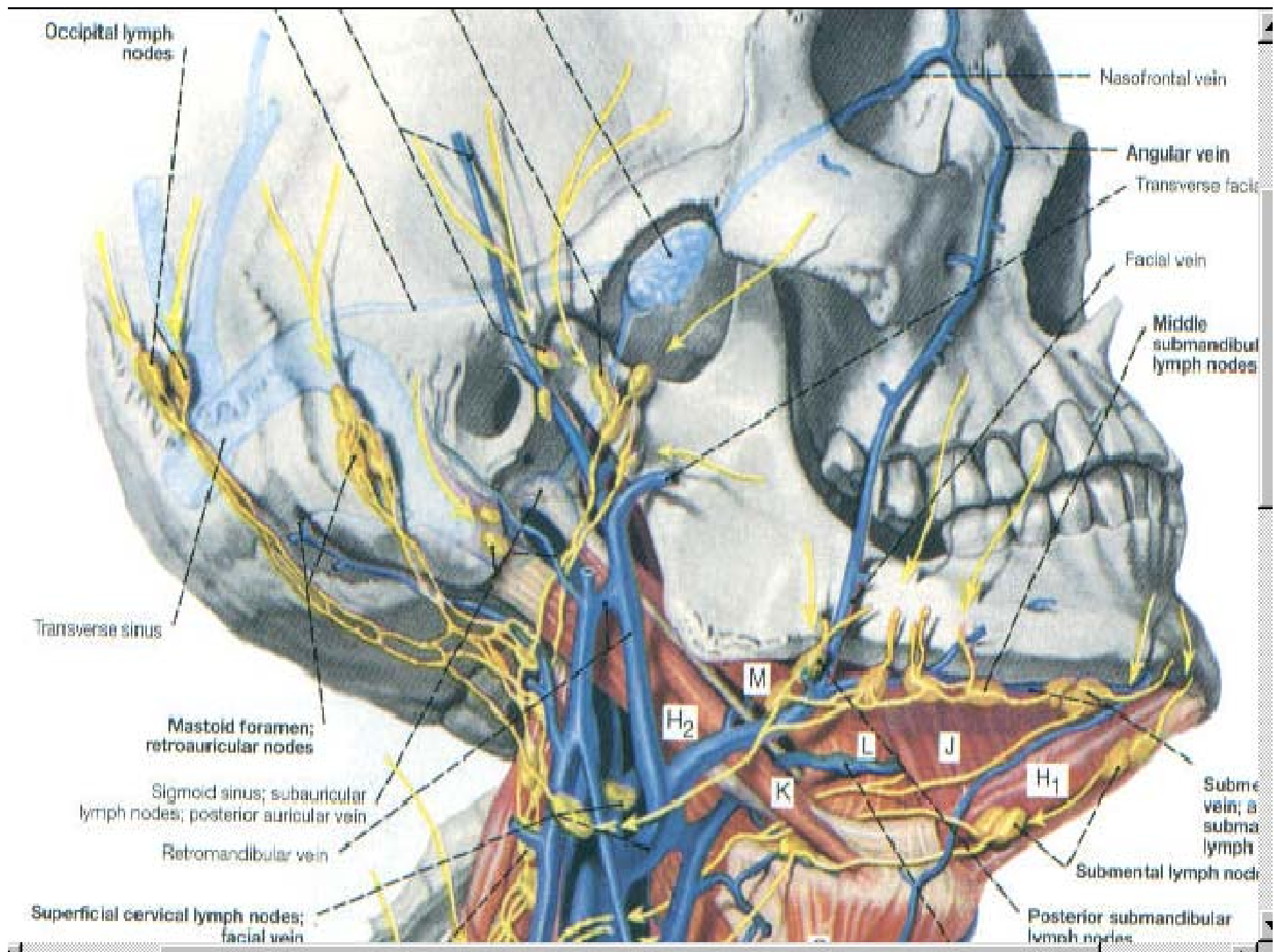
posterior auricular glands; and

(c) those of the occipital region, which terminate partly in the occipital

glands and partly in a trunk which runs down along the posterior

border of the Sternocleidomastoideus to end in the inferior deep

cervical glands.



lymphatic vessels of the auricula and external acoustic meatus

are also divisible into three groups:

(*a*) an anterior, from the lateral surface of the auricula and anterior wall of the meatus to the anterior auricular glands;

(*b*) a posterior, from the margin of the auricula, the upper part of its cranial surface, the internal surface and posterior wall of the meatus to the posterior auricular and superior deep cervical glands;

(*c*) an inferior, from the floor of the meatus and from the lobule of the auricula to the superficial and superior deep cervical glands.

Lymphatics of face

lymphatic vessels of the face

are more numerous than those of the scalp.

Those from eyelids and conjunctiva terminate partly in the submandibular but mainly in parotid glands.

The vessels from posterior part of the cheek also pass to the parotid glands, while

those from anterior portion of the cheek, side of the nose, upper lip, and lateral portions of lower lip end in the submandibular glands.

The deeper vessels from the temporal and infratemporal fossæ pass to deep facial and superior deep cervical glands. Both superficial and deep vessels of the central part of the lower lip run to submental glands.

Lymphatic Vessels of the Nasal Cavities.—

Those from the anterior parts of the nasal cavities communicate with the vessels of the integument of the nose and end in the submandibular glands;

those from the posterior two-thirds of the nasal cavities and from the accessory air sinuses pass partly to the retropharyngeal and partly to the superior deep cervical glands.

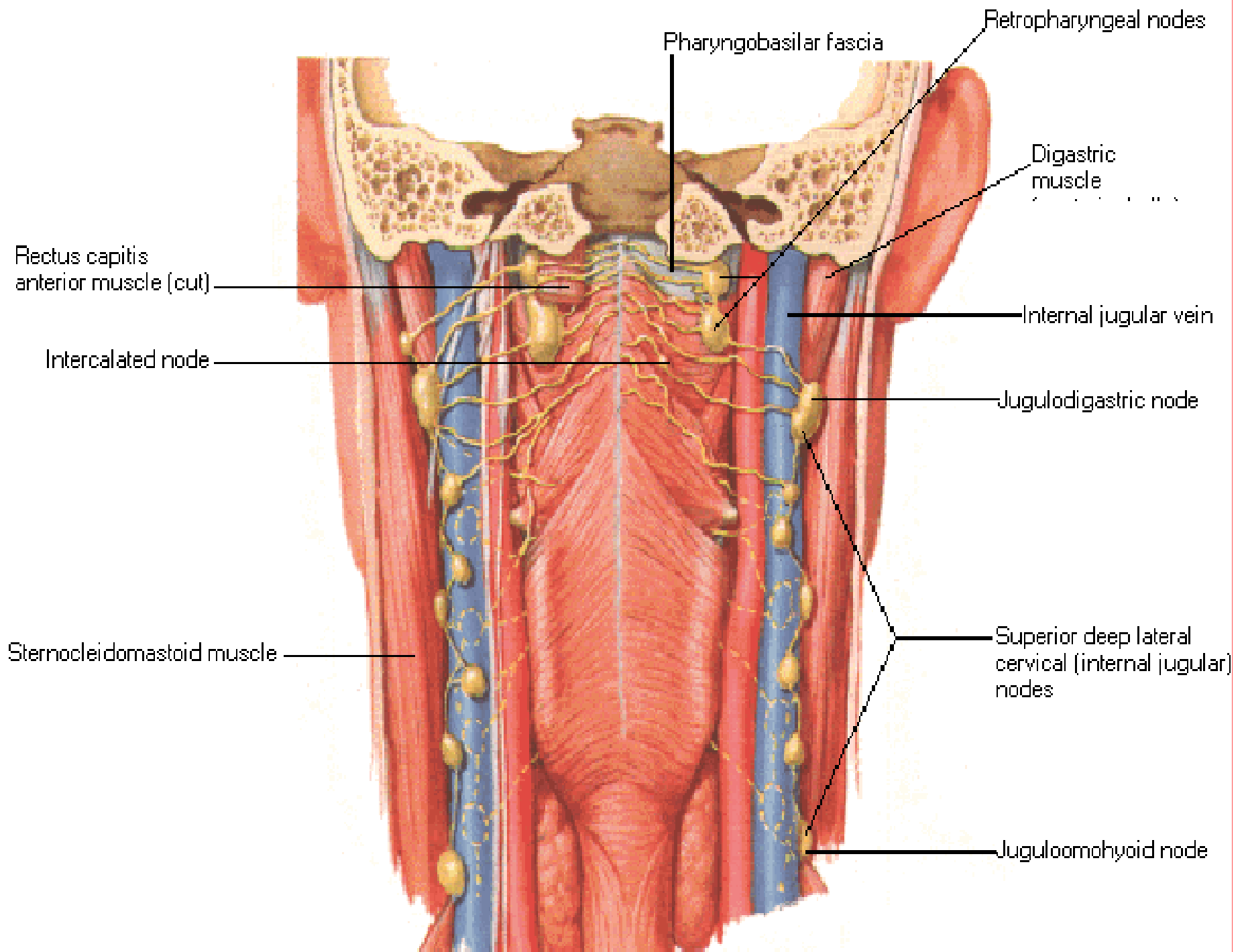
Lymphatic vessels of mouth

The vessels of the gums pass to the submandibular glands; those of the hard palate are continuous in front with those of the upper gum, but pass backward to pierce the Constrictor pharyngis superior and end in the superior deep cervical and subparotid glands;

those of the soft palate pass backward and lateralward and end partly in the retropharyngeal and subparotid, and partly in the superior deep cervical glands.

The vessels of the anterior part of the floor of the mouth pass either directly to the inferior glands of the superior deep cervical group, or indirectly through the submental glands;

from the rest of the floor of the mouth the vessels pass to the submandibular and superior deep cervical glands.



lymphatic vessels of the palatine tonsil

usually three to five in number,
pierce the buccopharyngeal fascia and
superior constrictor muscle and pass between the
Stylohyoideus and internal jugular vein to the
uppermost of the superior deep cervical glands.

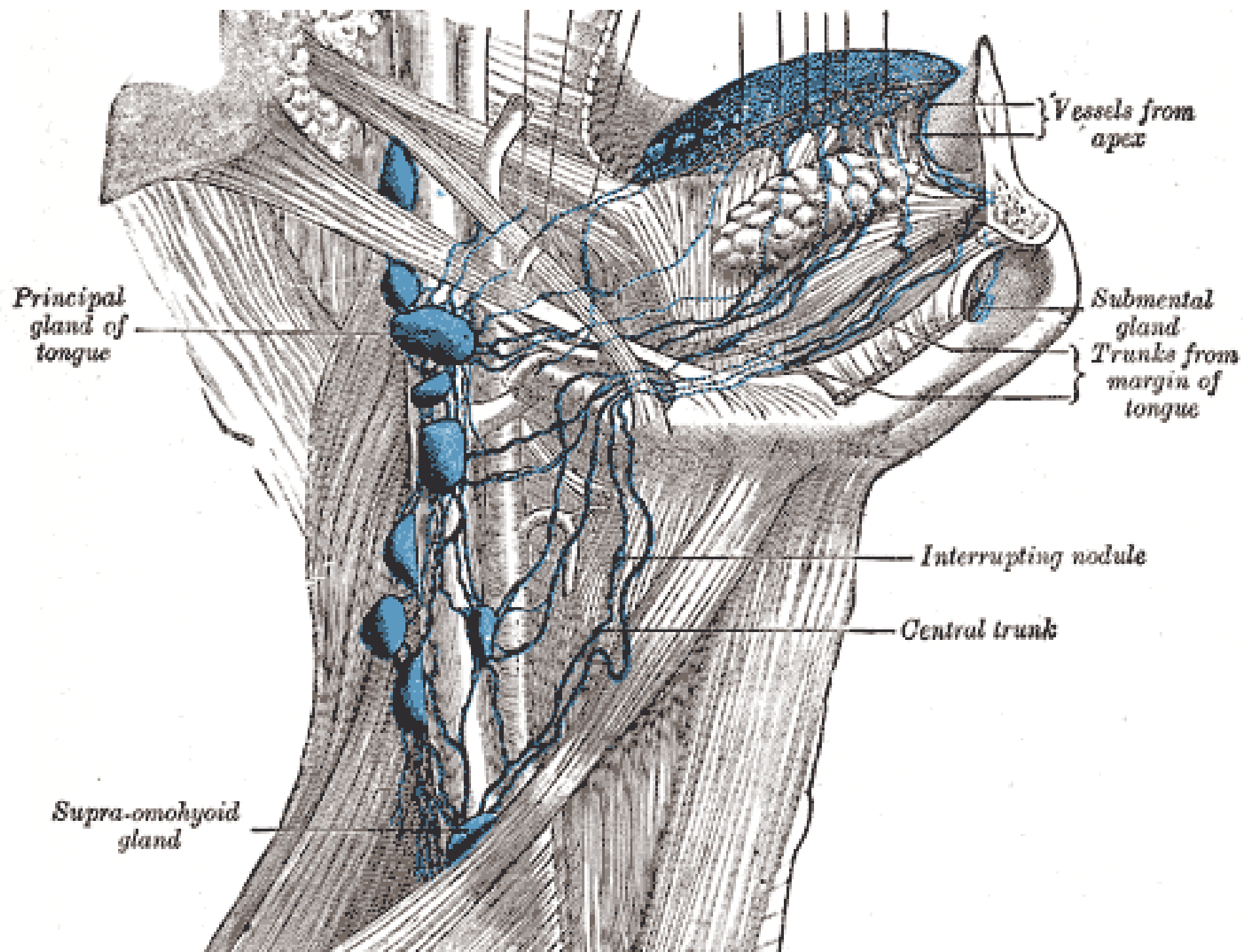
They end in a gland which lies at the side of the
posterior belly of the Digastricus, on the internal
jugular vein;

occasionally one or two additional vessels run to
small glands on the lateral side of the vein under cover
of the Sternocleidomastoideus.

lymphatics of tongue

are drained chiefly into the deep cervical glands lying between the posterior belly of the Digastricus and the superior belly of the Omohyoideus; one gland situated at the bifurcation of the common carotid artery is so intimately associated with these vessels that it is known as the **principal gland of the tongue**. The lymphatic vessels of the tongue may be divided into four groups:

- (1) apical, from the tip of the tongue to the suprahyoid glands and principal gland of the tongue;
- (2) lateral, from the margin of the tongue—some of these pierce the Mylohyoideus to end in the submandibular glands, others pass down on the Hyoglossus to the superior deep cervical glands;
- (3) basal, from the region of the vallate papillæ to the superior deep cervical gland
- (4) median, a few of which perforate the Mylohyoideus to reach the submandibular glands, while the majority turn around the posterior border of the muscle to enter the superior deep cervical glands.



Jugulodigastric node

Is a large and constant member of the sup.group
of the deep cervical nodes

Lies at the point where the posterior belly
of the digastric m crosses the IJV

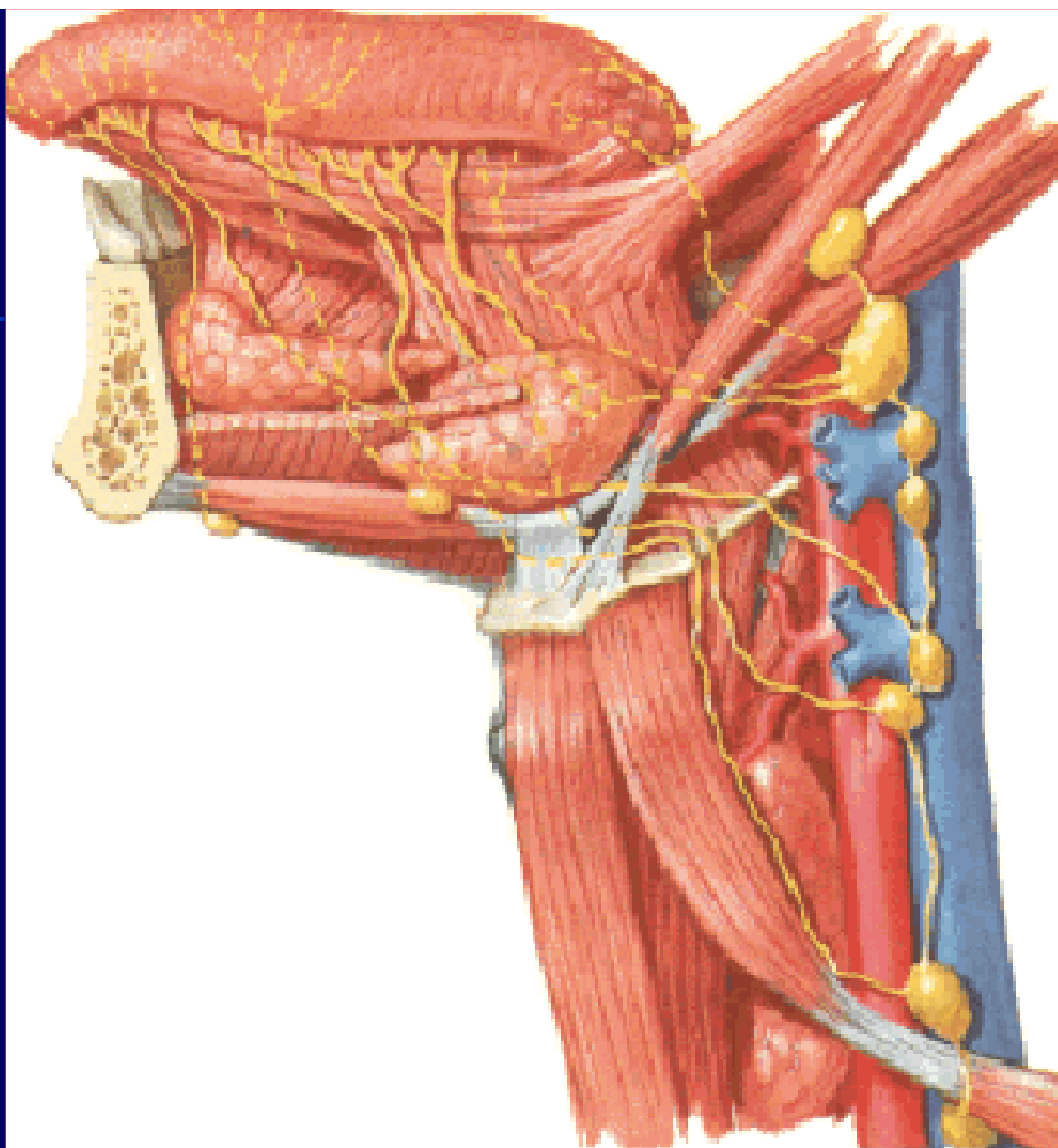
Drains the posterior third of the
tongue and the palatine tonsil

juguloomohyoid nodes

Is a large and constant member of the inferior group
of the deep cervical nodes

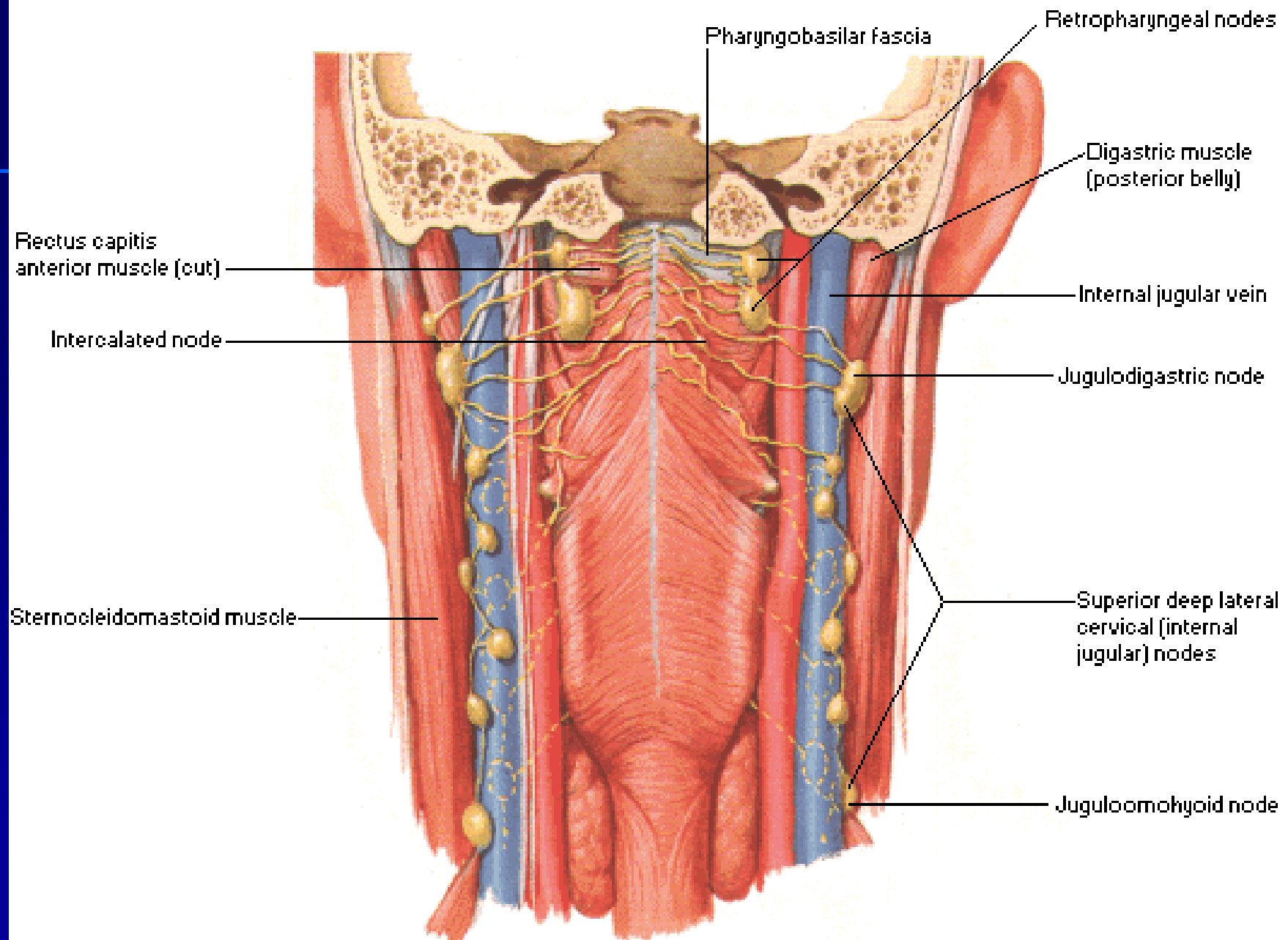
Lies above the intermediate tendon of the omohyoid m.
as it crosses the IJV

Drains the anterior 2/3 of the tongue



Lymphatic Drainage of Pharynx

Posterior View

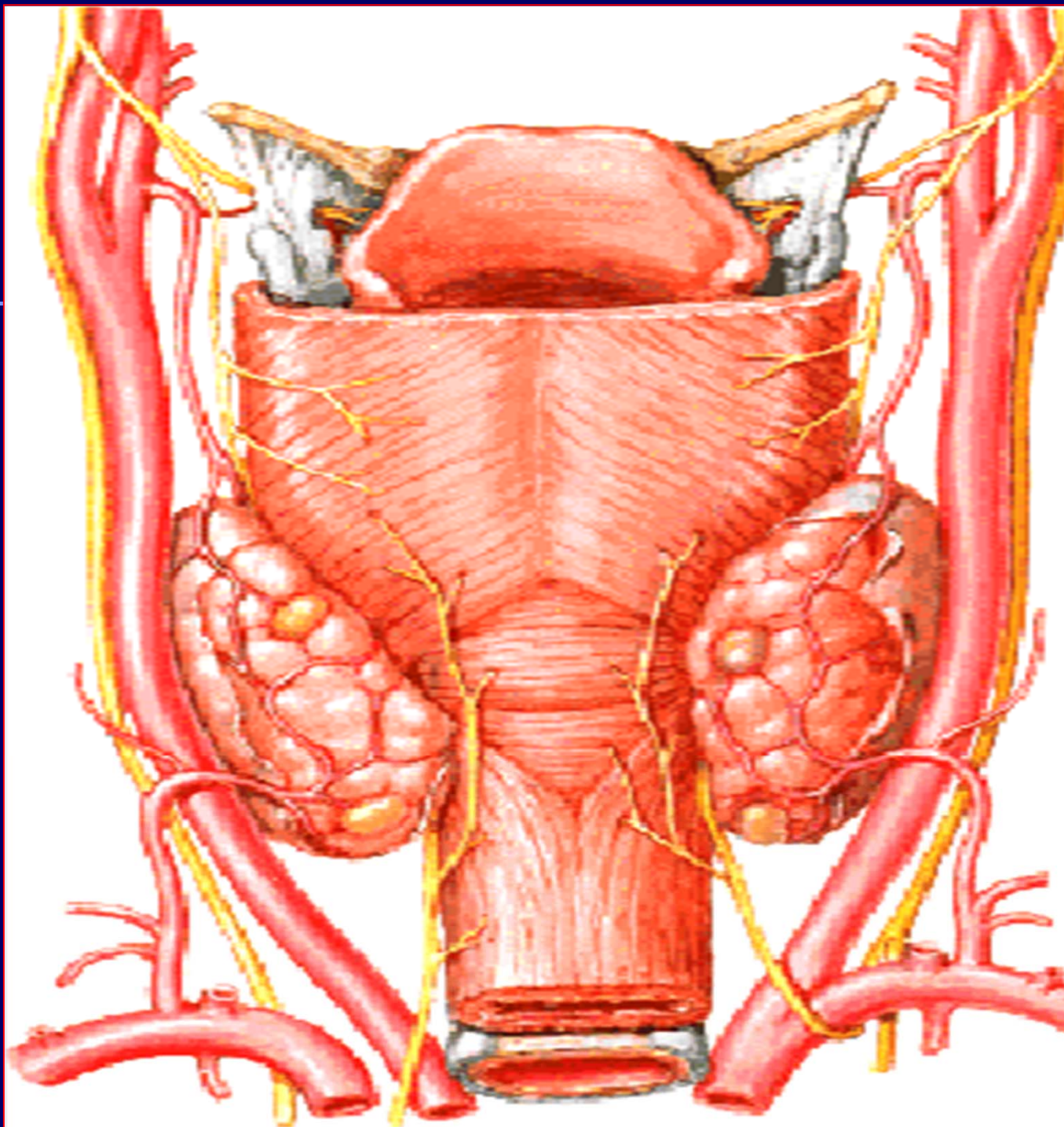


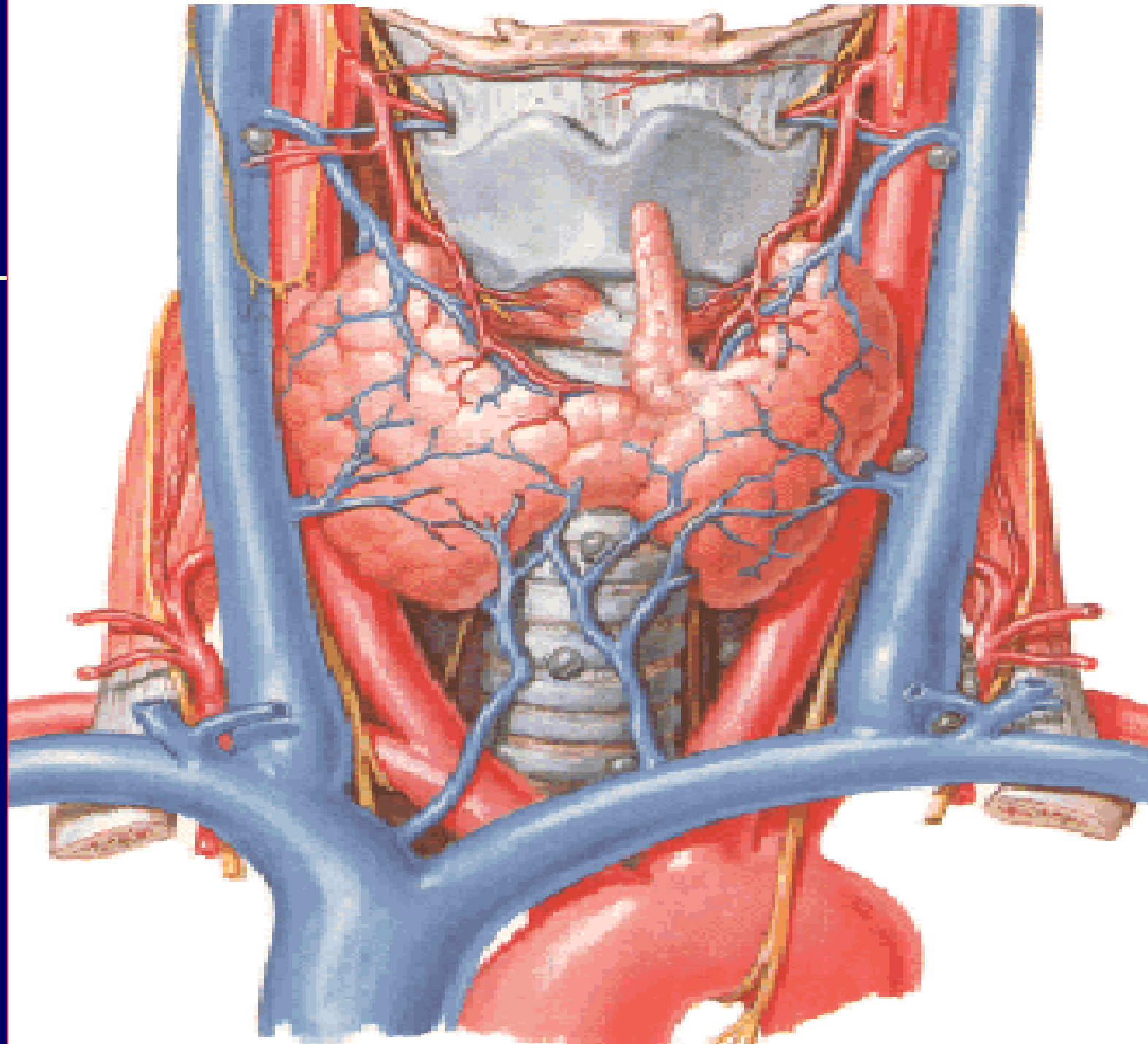
The lymphatic vessels of *thyroid gland*

consist of two sets,

an upper, which accompanies the superior thyroid artery and enters the superior deep cervical glands, and

a lower, which runs partly to the pretracheal glands and partly to the small paratracheal glands which accompany the recurrent nerves. These latter glands receive also the lymphatic vessels from the cervical portion of the trachea.





■ The lymphatic vessels of the skin and muscles of the neck

From the upper part of the *pharynx* the lymphatic vessels pass to the retropharyngeal, from the lower part to the deep cervical glands.

From the *larynx* two sets of vessels arise, an upper and a lower.

The vessels of the upper set pierce the hyothyroid membrane and join the superior deep cervical glands. Of the lower set, some pierce the conus elasticus and join the pretracheal and prelaryngeal glands;

others run between the cricoid and first tracheal ring and enter the inferior deep cervical glands.

applied anatomy

- Block dissection of neck is sometimes envisaged for removal of all cervical lymph nodes to arrest metastasis from carcinoma in region of mouth and lips.
- When the radical block dissection is combined with resection of area of lesion(oral cavity or mandible) it is called commendo operation
- The presence of rich network of lymphatics and of loose areolar tissue is responsible for enormous swelling of tongue in acute glossitis
- Carcinoma of tongue is quite common.Affected side of tongue is removed surgically.All the deep cervical lymph nodes are removed surgically;block dissection of neck because recurrence of malignancy occurs in lymph nodes
- Carcinoma of posterior one third of tongue is more common due to bilateral lymphatic spread.
- Deepcervical lymph nodes lie along internal jugular vein.these become adherent in malignancy to the vein.so,during operation along with lymph nodes vein is also removed

#neck infections in front of prevertebral fascia in retropharyngeal space usually arise from suppuration i.e formation of pus in retropharyngeal lymph nodes.pus forms an acute retropharyngeal abscess.

#parotid abscess may be formed by suppuration of parotid lymph nodes draining in infected area.

#in malignancy of parotid glands cervical lymph nodes are enlarged.