

Topographic formations of the neck

From an anatomical point of view, the neck can be divided into the anterior region of the neck (*regio cervicalis anterior*), the lateral region of the neck (*regio cervicalis lateralis*) and the sternocleidomastoid region. There are several triangular topographical areas in these regions.

Anterior cervical region

- *Submental triangle*
- *Submandibular triangle*
- *Carotid triangle*
- *Muscular triangle* (median region of the neck, omotracheal triangle)

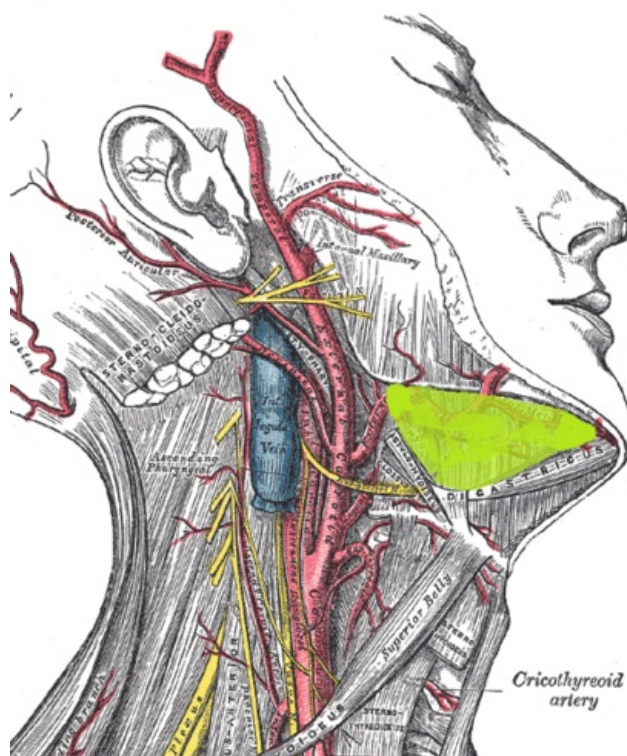
Sternocleidomastoid region

- *lesser supraclavicular fossa*
- *Scalenovertebral triangle*

Lateral cervical region

- *Omoclavicular triangle*
- *Omotrapezoid triangle*

Submandibular triangle



Boundary

The submandibular triangle belongs to the anterior cervical region. It is bordered caudally by the **body of the mandible** and both bellies of the **digastric muscle** (*anterior and posterior bellies*). In the subcutaneous layer lies the **platysma muscle**, under which there is a thin fibrous subcutaneous layer. Below it is the cervical fascia (its *lamina superficialis*), which is fixed to the edge of the mandible. At the angle of the mandible, the fascia is strengthened into a fibrous band (angular tract/*tractus angularis*), which separates the parotid and submandibular spaces. The base of the triangle is formed by the **mylohyoid muscle**, with the **hyoglossus** and **styloid muscles** located dorsal to them. This group of muscles separates the triangle from the sublingual region.

Submandibular space

The main content of the space is the submandibular gland, ***glandula submandibularis***. Externally, it touches both bellies of the digastric muscle, medially it extends over the posterior edge of the mylohyoid muscle into the sublingual space. Here, **the submandibular duct, *ductus submandibularis***, emerges forward from the gland, which is interposed between the mylohyoid muscle and the hyoglossus muscle.

Vascular structures

The **facial vein** runs along the outer surface of this gland. From the carotid triangle inwards from the digastric muscle and the stylohyoid muscle, the submandibular **facial artery** enters the triangle, which usually runs medially from the submandibular gland through this space. Above the upper edge of the gland, the artery turns over the mandible and joins the vein.

Nervous structures

Several major nerves run through the space. **Lingual nerve** runs through the upper part of the triangle, inside from the edge of the mandible, bends forward in an arc, and after crossing with the submandibular duct, enters the submandibular region and the tongue. The **parasympathetic submandibular ganglion** is suspended at the lowest point of the arch.

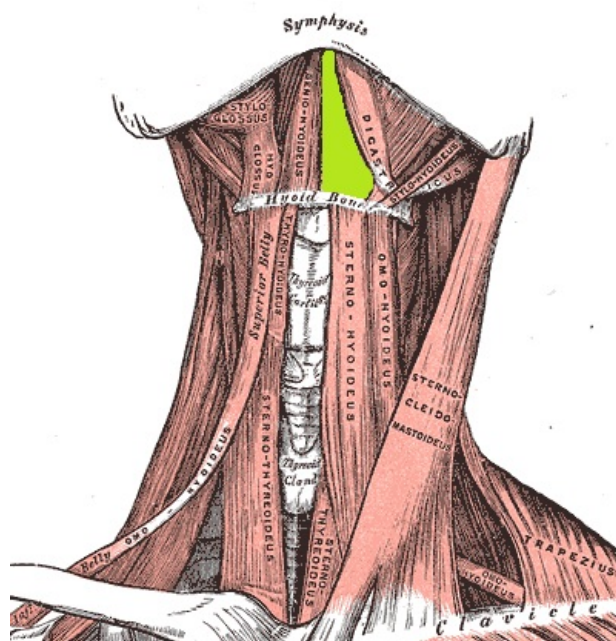
Another nerve that is the content of the submandibular triangle is **hypoglossal nerve**. The twelfth cranial nerve enters the inferior space from the carotid triangle, inward from the posterior belly of the digastric muscle. It is arched in the **nervous arc of the hypoglossal** and goes forward into the sublingual region through the cleft between the mylohyoid muscle and the hyoglossus muscle. This arch, together with the bellies of the digastric muscle and the posterior border of the mylohyoid muscle, delimits the **triangle of Pirogov**, which is one of the sites of the ligature of the **lingual artery**. The artery is located at the base of the formation, inward from hyoglossus muscle.

The last nerve to pass is the **mylohyoid nerve**. It separates from the **inferior alveolar nerve** before entering the mandibular foramen and converges along the inner surface of the ramus of the mandible to the upper part of the submandibular triangle. Here it is stored inside from the gland. It runs forward through this topographic region and enters the anterior belly of the digastric.

Lymph nodes

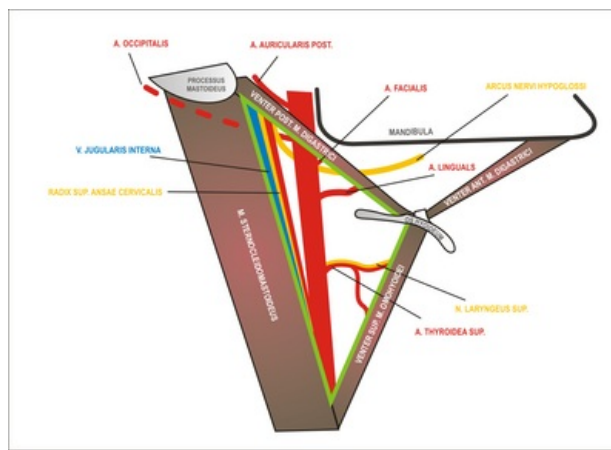
The contents of the submandibular triangle are also lymph nodes - **nodi lymphoidei submandibulares**. They are located superficially, forming the main group of lymphoid structures under the edge of the lower jaw (around the submandibular gland). They receive lymphatic vessels from the surface and deep layers of practically all regions of the face.

Submental triangle



It is an odd triangle-shaped area. It is defined by both **anterior bellies of the digastric muscles** laterally, and the **body of the hyoid bone** caudally. Medially located bundles of the platysma muscle can extend into the outer part of the space in the subcutaneous tissue. Under this muscle is the *lamina superficialis fasciae cervicalis*, which is fixed to the tongue and the edge of the lower jaw. The bottom of the topographic structure is formed by the **mylohyoid muscle**, between which and the more superficial fascia are located several lymph nodes (**nodi lymphoidei submentales**), which collect lymph from the tip of the tongue and the lower lip. It is clinically significant that this region can be surgically penetrated deep into the tongue without the risk of severing larger vascular or nervous structures.

Carotid triangle



Boundary

The triangular landscape is defined dorsolaterally by the **sternocleidomastoid muscle**, above by the **posterior belly of the digastric muscle** and below by the **superior belly of the omohyoid muscle**.

Relationship to other spaces of the neck

In the deeper layers, this region smoothly transitions upwards into the parapharyngeal space (*spatium parapharyngeum*), continuing in the caudal direction into the scalenovertebral triangle.

Cranially located structures

There is a palpable pulsation of the **common carotid artery**. In the subcutaneous tissue lies the platysma muscle, below which are the branches of the nerve *transversus colli* and variably arranged superficial veins (described with other vessels below).

Veins

Superficially in this triangle is the **retromandibular vein**, which may connect with the **facial vein**. The facial vein pierces the fascia and usually opens into the **internal jugular vein**. Under the *lamina superficialis fasciae cervicalis*, it is the most superficially located vein that receives venous tributaries from the face and neck in the area of the carotid triangle. Lymph nodes (***nodī lymphatici profundi superiores***) are located along it.

Arteries

Medial to the internal jugular vein runs the **common carotid artery**, which branches in the middle of the triangle (C4 level) into the **external carotid artery** (located ventromedially) and the **internal carotid artery** (located dorsolaterally). The **external carotid artery arises from the carotid sheath**.

From the external carotid artery, most caudally leaves the **superior thyroid artery**, above it, at the level of the greater horns of the hyoid bone, the **lingual artery** and a little higher the **facial artery**, which continues to the submandibular triangle.

Ascending pharyngeal artery departs medially and **occipital artery** dorsally. The lingual artery passes through the **angle of Bécclard**, which forms the posterior belly of the digastric and the greater horns of the hyoid bone. It goes under the hyoglossus muscle and continues into the tongue.

Nerves

Of the nerve structures running in the carotid triangle, the **deep cervical ansa** (*ansa cervicalis profunda*) is the most superficially located. It is an arcuate junction between the hypoglossal nerve (from its upper root) and the cervical plexus (from its lower root), from which motor branches to the infrahyoid muscles emerge.

The **hypoglossal nerve** runs through the arc of the hypoglossal nerve, *arcus nervi hypoglossi*, in the upper part of the triangle between the internal jugular vein and the internal carotid artery, then continues inwards from the posterior belly of the digastric and the stylohyoid muscle to the topographic area of the submandibular triangle, where it sinks under the mylohyoid muscle and heads forward towards the sublingual region.

Vagus nerve runs between the internal carotid artery, the common carotid artery and the internal jugular vein, dorsal to them. Together with the mentioned vessels, the tenth cranial nerve forms a cervical **neurovascular bundle** surrounded by a fibrous sheath (*vagina carotica*). In the upper part, the **superior laryngeal nerve** departs from this nerve and runs mediocaudally.

The deepest is the **sympathetic trunk** taken into the *lamina prevertebralis fasciae cervicalis*. In the upper part of the carotid triangle, the **superior cervical ganglion** is formed on it, in the lower area it is expanded in the **middle cervical ganglion**.

Another junction of nerves and vessels in this topographical area is the ***glomus caroticum***. It lies in the bifurcation of the common carotid artery and receives thin branches from the cervical sympathetic nerve, from the glossopharyngeal nerve and from the vagus nerve.

Links

Related Articles

- Trigonum submandibulare
- Musculus digastricus
- Neck muscles

References

- GRIM, Miloš – DRUGA, Rastislav – STINGL, Josef, et al. *Základy anatomie, 5. Anatomie krajín těla*. 1. edition. Galén, Karolinum, 2008. 119 pp. ISBN 978-80-246-0573-9.