ANATOMY SHEET: SALIVARY GLANDS
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Salivary gland release secretion called saliva into oral cavity

Has two branch:

1) **Major salivary gland:** parotid, submandibular, sublingual gland
2) **Minor salivary gland**

Looking at horizontal section of the parotid gland has irregular shape, but it has got anteromedial, posteromedial surfaces, media side and lateral surface.
superiorly it’s between external acoustic meatus ( قناة الأذن) and temporal mandibular joint
Inferiorly it is sitting on the posterior belly of digastric muscle and a ligament called stylomandibular ligament (separating this gland from another gland called submandibular salivary gland)

From the anterior margin of the parotid gland, there’s a duct called parotid duct or (38:57). It exits the gland and moves along the masseter
muscle, and then pierces the buccinator to open into the vestibule of the mouth at the level the crown of the upper 2nd molar tooth. This gland is serous gland, means it has watery secretions, and the secretions reach the mouth through this duct running on the outer surface of the masseter muscle. The length of this duct is 5 cm.

As the person bites on his teeth, masseter muscle contraction and appreciate the feel of this duct and if we open the mouth we can see rounded pinkish area, we can inject it with radiopaque material to generate a radial image (X-ray) to this soft tissue.

The anteromedial surface of the gland is wrapped around the ramus of the mandible and the 2 muscles on the ramus sides:
1. the masseter muscle
2. the medial pterygoid muscle.

The posteromedial surface is wrapped around mastoid process and the 2 muscles on the sides of the mastoid process:
1. The sternocleidomastoid muscle (on the lateral side of the mastoid process)
2. The posterior belly of digastric muscle (on the medial side)

That mean in post. And ant. Side wrapped around (bone+2-muscle) Superficially, there are parotid lymph nodes and the gland is covered
by the investing layer of deep cervical fascia (the yellow layer), the superficial fascia and platysma muscle. Medially it is wrapped around styloid process, its 3 muscles (styloglossus muscle, stylohyoid muscle, stylopharyngeus muscle) and a ligament called stylohyoid ligament (between the styloid process of temporal bone and the lesser horn of the hyoid bone). All of these (medial surface only) separate the gland from carotid sheath (that contains internal carotid artery, internal jugular vein) and the pharynx.

Inside the gland, there’s an artery called extra carotid artery and a vein called retromandibular vein (in the picture beside)

Facial nerve: Enters the gland through posterior medial surface and divides into five terminal (temporal, zygomatic, buccal, marginal mandibular & cervical branches)

The terminal branches leave the gland through the anteromedial surface and emerge along its anterior border.
Retromandibular vein: Is formed within the gland by union of superficial temporal and maxillary veins. It divided into anterior and posterior divisions in the lower part of the gland.

- Anterior division joins facial vein to form the common facial vein.
- Posterior division joins posterior auricular vein to form external jugular vein.

Ext. Jugular ends in subclavian vein
External carotid artery:
• Enters the gland through the posteromedial surface.
• Divides into terminal branches – maxillary and superficial temporal.

*PS: Lymphatic drainage of the parotid gland is the parotid superficial lymph nodes, or into the deep cervical lymph nodes.*
Parasympathetic innervation is responsible of secretion (excitation):
medulla oblongata → inferior salivatory nucleus → glossopharyngeal nerve → exits through jugular foramen → branches into tympanic branch → tympanic plexus → branches into lesser petrosal nerve → parasympathetic ganglion that’s called Otic ganglion (on the medial side of the mandibular nerve) → gives us postganglionic fiber (along the auriculotemporal nerve) that supplies the parotid gland.

Sympathetic innervation is responsible of stopping secretion (inhibition):
T1 spinal segment → superior cervical ganglion along the arteries (int. carotid artery) and reaches to the gland.
Otic Ganglion

- is a parasympathetic ganglion that is located medial to the mandibular nerve just below the skull inferior to the foramen ovale
- it is adherent to the nerve to the medial pterygoid muscle.
- The preganglionic fibers originate in the glosopharyngeal nerve
- The postganglionic secretomotor fibers reach the parotid salivary gland via the auriculotemporal nerve.

4-paired parasympathetic ganglia:

- ciliary ganglion
- pterygopalatine ganglion
- submandibular ganglion (submandibular and sublingual glands)
- otic ganglion (parotid gland)

Summary of blood and nerve supply for parotid gland:

Artery supply: external carotid artery

Nerve supply: *sympathetic from T1 segment of spinal cord (sup. Cervical ganglion)*
*parasympathetic from glosopharyngeal nerve*
Now we are going to study submandibular salivary gland, which is a mixed gland: 50% secrets mucous and 50% secrets serous.

Its c shaped, it’s wrapped around free margin of mylohyoid.

Divided into superficial and deep lobes separated by mylohyoid muscle

**Superficial lobe:**
Covered by skin, below mylohyoid muscle, contain lymph node, bounded by (mylohyoid m. + mandible + skin + platysma)

**Deep lobe:**
Covered floor of mouth, bounded by (mylohyoid m. + hyoglossus m.)
The gland has a duct called submandibular duct, opens in the floor of the mouth (sublingual papilla) on both sides frenulum (a of mucous membrane connects the tongue with the floor of the mouth)

Medial relation: submandibular duct, lingual nerve and hypoglossal nerve.
Lateral side of the superficial part there’s facial artery passing on the lower margin of the mandible.
The blood supply of this gland is the facial and lingual arteries.
Nerve supply is through submandibular nerve, which receives parasympathetic innervation (preganglionic) from lingual nerve which is a branch of mandibular nerve. It’s secretomotor fibers.
Parasympathetic innervation from facial nerve.

Facial nerve has (motor, taste buds, parasympathetic fiber found in 4-nerves (3,7,9,10))

Sympathetic innervation is through superior cervical ganglion.

Sublingual gland, is found under the mucous membrane, in the sublingual fold (the floor of the mouth).

It’s a mucous gland, and it has 20 ducts opening into the floor of the mouth directly, and sometimes they secret the mucous into the submandibular duct that’s found on both sides of frenulum.

They are found lateral to sublingual gland: the lingual nerve and the submandibular duct. (Picture of relations in page 11)

And medially to sublingual gland: parotid duct + lingual nerve

Medially to deep of submandibular gland: its duct + lingual nerve

*** this relation very important in exam***
Histology of salivary glands
Salivary glands are made up of secretory acini (acini - means a rounded secretory unit) and ducts. There are two types of secretions - **serous** and **mucous**.

The acini can either be **serous**, **mucous**, or a mixture of **serous** and **mucous**.

A **serous acinus** secretes proteins in an isotonic watery fluid.

A **mucous acinus** secretes mucin - lubricant

In a mixed serous-mucous acinus, the **serous** acinus forms a serous **Demilune** (Crescent) around **mucous** acinus

The secretory units merge into **intercalated ducts**, which are lined by simple low cuboidal epithelium, and surrounded by myoepithelial cells (have a folded basal membrane) **striated ducts** (interlobular (excretory) ducts, lined with a tall columnar epithelium.

**Mucous acini** stain more weakly than serous acini