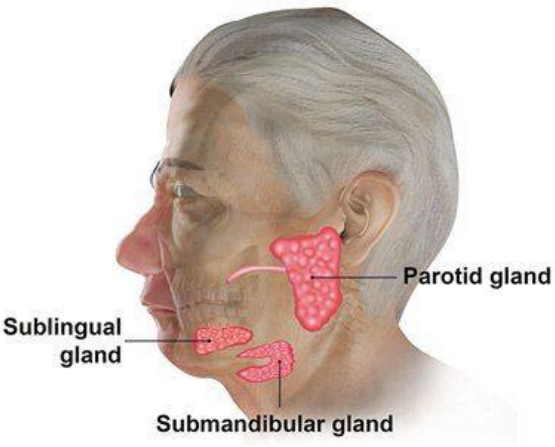
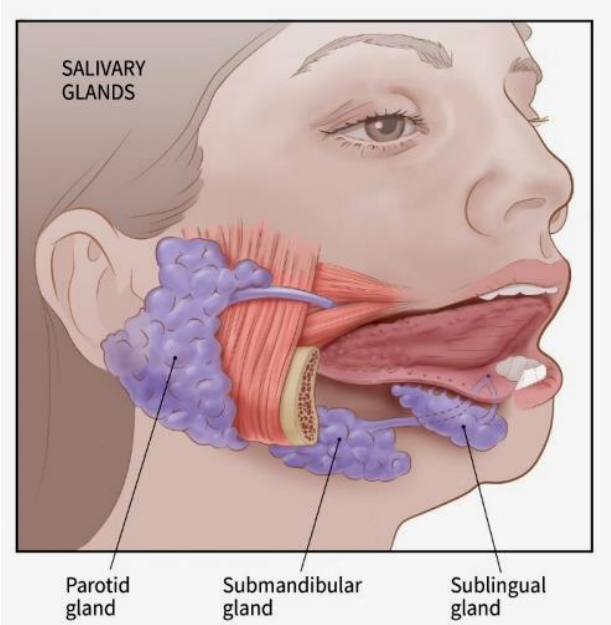
The Salivary Glands

Introduction

The salivary glands system is composed of three pairs of large paired aggregations of exocrine glandular tissue, known as the major Salivary glands and numerous small aggregations of glands distributed in the mucosa of the oral cavity and oropharynx known as the minor salivary glands.

The major salivary glands consist of the parotid, submandibular, and sublingual glands.





Some of the salivary major roles is the lubrication during speech and mastication, immune defense (IgG and IgM antibodies), and contain digestive enaymes as salivary lipase and salivary amylase (ptyalin).

On average about (0.5- 1.5) liters of saliva is produced each day from the salivary glands, but the rate of secretion varies throughout the day between rest and function (meal time).

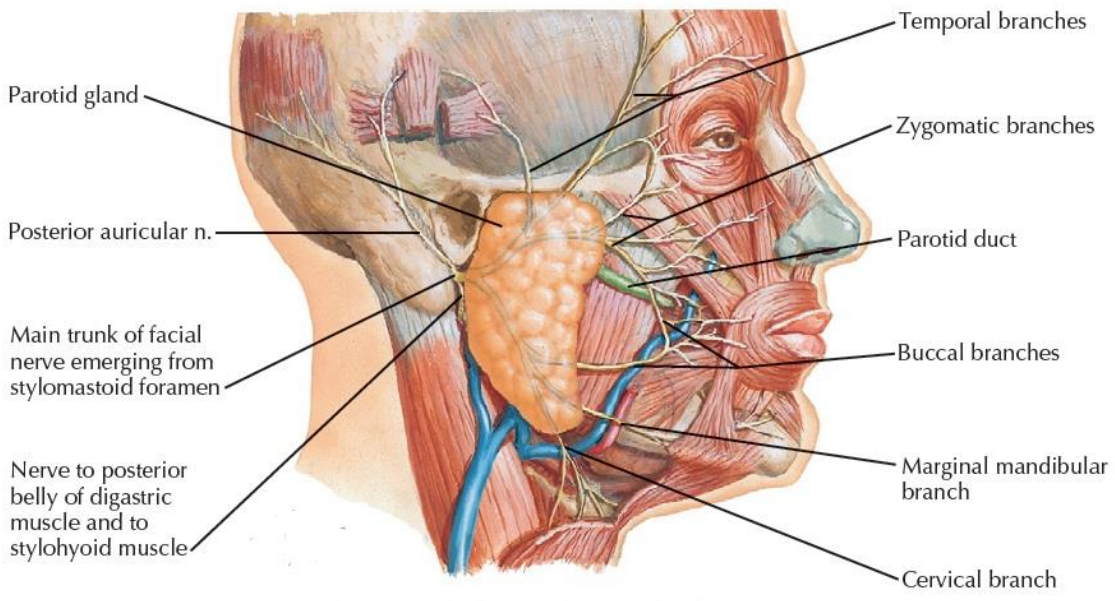
The functional secrertory units of the salivary glands are the acini. The single acinus is either serous (which produce serous watery secretion) or mucous (which produce mucous viscous secretion); that's why the salivary glands are either serous or mucous or mixed secretions.

The parotid and submandibular glands are surrounded completely by fibrous capsule unlike sublingual and minor salivary glands that are lacking for the capsule or incomplete encapsulation.

Parotid Gland

- Parotid gland is roughly triangular in shape with an apex just inferior to the angle of the mandible and the superior base along the zygomatic arch; it is the largest salivary gland and is composed mostly of serous acini.

- The facial nerve divides the gland into superficial and deep lobes. The superficial part is located within the triangle surrounded superiorly by the zygomatic arch, anteriorly by the masseter muscle, and posteriorly by the sternocleidomastoid muscle.



- The inferior pole (the tail) is confined to the angle of the mandible and extends inferiorly to the upper part of sternocleidomastoid muscle. The deep lobe of the gland extends into the parapharyngeal area and is confined by the styloid process (with its attachments), diagastric muscles and carotid sheath**.**

- Approximately 75% or more of the parotid gland overlies the masseter muscle (superficial lobe); the rest lies in retromandibular area (deep lobe).

- The parotid gland is surrounded by a thick capsule derived from the investing layer of deep cervical fascia. Parotid lymph nodes are found within the parotid parenchyma**.**

- The main parotid duct is about (5-6) cm long, 3 mm diameter, known as Stensen's duct which extends forward from the superficial part of the parotid gland, superficial to the masseter muscle, a finger breadth inferior to the zygomatic arch then follow a sharp turn at the anterior border of the masseter muscle medially piercing through the buccinator muscle. It courses between the buccinator and buccal mucosa before opening into a small papilla opposite the upper second molar tooth. The intraoral course provides a valve-like mechanism preventing reflux.

- **Nerve Supply**: Parasympathetic secretomotor postganglionic fibers from otic ganglion which are carried by auriculotemporal nerve.

Submandibular Gland

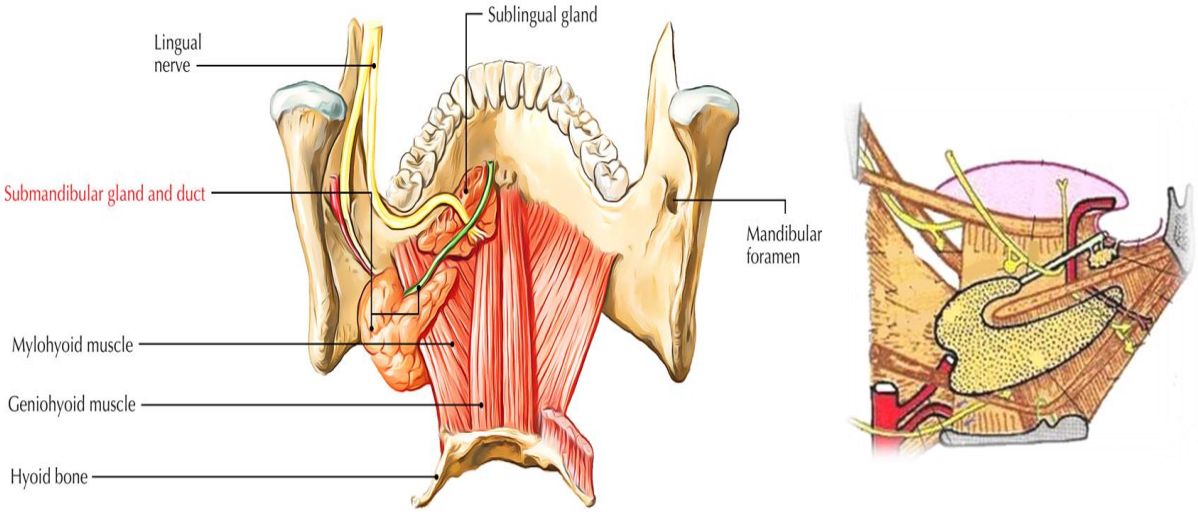
- The submandibular gland consists of a mixture of serous and mucous acini.
- It lies beneath the lower border of the body of the mandible and is divided into superficial and deep parts by the mylohyoid muscle. The larger superficial lobe is lying within the digastric triangle in the neck while the smaller deep lobe is lying within the floor of the mouth posteriorly. The two lobes are continuous with each other around the posterior border of the mylohyoid muscle.

- The Submandibular gland is invested in its own capsule, which is also continuous with the superficial layer of deep cervical fascia.

- The submandibular duct (Wharton s duct) is about 5 cm long and 2-4 mm in diameter. It emerges from the anterior end of the deep part of the gland and runs forward beneath the mucous membrane of the mouth. It opens into the mouth on a small papilla lateral to the lingual frenum. The Lingual nerve wraps around Wharton's duct, starting lateral and ending medial to the duct.

- The facial artery, the tortuous branch of the external carotid artery, is the main arterial blood supply of the submandibular gland. It runs medial to the posterior belly of the digastric muscle and then hooks over to course superiorly deep to the gland. During submandibular gland resection, the artery must be sacrificed.

- **Nerve Supply:** Parasympathetic secretomotor postganglionic fibers from submandibular ganglion pass directly to the gland. The preganglionic fibers for submandibular ganglion are carried by chorda tympani nerve (branch of facial nerve).



Left: Posterior view of the mandible, floor of the mouth (mylohyoid) and the lobes of submandibular gland. **Right**: sagittal view showing the C shape of submandibular gland lobes around the mylohoid muscle

The Sublingual Gland

The smallest of the major salivary glands is the sublingual gland, it has mixed serous and mucous acini but mostly mucous in secretion.

The gland lies as a flat structure in a submucosal plane within the anterior part of the floor of the mouth, it is located between the mucosa of the floor of the mouth and the mylohyoid muscle in the sublingual space. There is no true fascial capsule surrounding the gland.

The sublingual gland actually consists of 15 to 30 smaller glands, each secreting through a short duct of Rivinus to the sublingual plica. Some individuals have a greater sublingual gland with an excretory duct known as Bartholin duct; that either joins with Wharton duct or opens next to it at the sublingual caruncle.

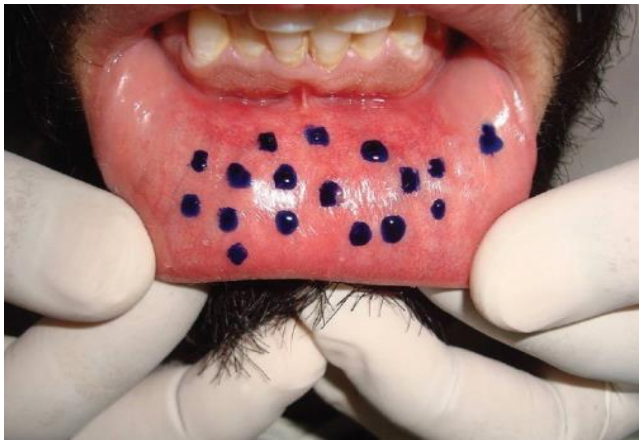
Nerve Supply: Parasympathetic Postganglionic fibers from submandibular ganglion.

The Minor Salivary Glands

The submucosa of the oral cavity and oropharynx is lined extensively by groups of minor salivary glands, which are distinguished from major salivary glands by their reduced size with abbreviated duct systems and capsular tissues.

It is estimated that there are approximately 500 to 1000 lobules of minor salivary gland tissue dispersed throughout the oropharyngeal mucosa.

The largest aggregation of minor salivary glands are found in the palate mainly at the posterolateral aspect of hard and soft palate junction, followed by the labial mucosa then the buccal mucosa.



Sites of minor salivary glands secretions in the lip (detected by toluidine blue stain)

This is the End of the Lecture – Good Luck