

Major Salivary Glands

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Overview

- The major salivary glands are **paired organs** and include the **parotid, submandibular, and sublingual glands**.
- They are compound **tubuloacinar exocrine glands**.
- Each gland is surrounded by a **thin capsule**.
- The capsule extends **septa** into the glandular parenchyma, dividing it into **lobes** and **lobules**.
- Functions :
 - Produce and secrete **saliva** into the oral cavity.
 - Maintain **hydration** and **protect** the oral mucosa and teeth.
 - **Lubricate** the oral cavity during speech, mastication, and swallowing.
 - Begin carbohydrate **digestion** through salivary amylase.
 - Contribute to **oral immune defense** through antimicrobial components, including secretory IgA.
- **Parotid Gland :**
 - The parotid glands are the **largest major salivary glands**, located in the **parotid region**, anterior and inferior to the ear.
 - The main parotid duct is the **Stensen duct**. It opens into the oral cavity opposite the upper second molar.
 - May contain intraparenchymal lymph nodes.
- **Submandibular Gland :**
 - The submandibular glands are also called **submaxillary glands**, located beneath the mandible, in the **submandibular region**, with a deep portion extending toward the floor of the mouth.
 - The main submandibular duct is the **Wharton duct**. It opens at the sublingual caruncle, just lateral to the lingual frenulum.
- **Sublingual Gland :**
 - The sublingual glands are the **smallest major salivary glands**, located in the **anterior floor of the mouth**, beneath the oral mucosa.
 - Numerous **small ducts of Rivinus** drain directly into the floor of the mouth along the plica sublingualis.
 - A larger sublingual duct, the **Bartholin duct**, may join the submandibular duct near the sublingual caruncle.
- Microscopically, the functional structure of a salivary gland consists of secretory **acini** and a **duct system**.

Acini

- Each gland has a **different acinar composition** :
 - The **parotid** gland is almost **entirely serous**.
 - The **submandibular** gland is **mixed**, with **serous predominance**.
 - The **sublingual** gland is **mixed**, with **mucous predominance**.

Serous Acini :

- Serous acini are usually **rounded** or **spherical**.
- They are composed of **pyramidal serous cells** with **round nuclei**, usually **located basally**.
- The **basal cytoplasm** is **basophilic** because of abundant rough endoplasmic reticulum.
- The **apical cytoplasm** contains **eosinophilic zymogen granules**.

Mucous Acini :

- Mucous acini are usually **tubular** or **tubuloacinar**.
- They are composed of pale **mucous cells** with **flattened nuclei** displaced toward the **basal part** of the cell.
- The cytoplasm contains **mucin-rich secretory material**.

Mixed Acini :

- Mixed acini contain both **mucous cells** and **serous cells**.
- The mucous cells usually form the main portion of the acinus.
- Serous cells may appear as **crescent-shaped caps**, known as **serous demilunes** or **crescents of Giannuzzi**, at the periphery of mucous acini.

• Myoepithelial and Basal Cells :

- Myoepithelial cells are flattened contractile cells that are difficult to identify on routine H&E staining.
- They are located **between the secretory epithelial cells** and the **basal lamina**, mainly around acini and intercalated ducts.
- Their contraction helps **expel secretory products** into the duct system.
- **Basal cells** are noncontractile cells present mainly in **larger ducts**, especially excretory ducts.

Duct System

- The duct system carries saliva from the acini to the oral cavity.
- The duct system is branched and includes **intercalated ducts**, **striated ducts**, **interlobular ducts**, and **main excretory ducts**.
- **Intercalated Ducts** :
 - Intercalated ducts are **intralobular ducts**, located between the acini and the striated ducts.
 - Lined by **low cuboidal epithelium** and have a usually **narrow lumen**.
- **Striated Ducts** :
 - Striated ducts are also **intralobular ducts**, located between the intercalated ducts and the larger excretory ducts.
 - Lined by **simple cuboidal** to **columnar** epithelial cells with eosinophilic cytoplasm.
 - **Basal striations** are visible at the base of the cells.

- These striations correspond to basal plasma membrane infoldings.
- **Interlobular and Main Excretory Ducts :**
 - They are **larger than intralobular ducts** and are located within the connective tissue septa.
 - Their epithelium may be **simple columnar, pseudostratified columnar, or stratified columnar**.
 - **Near the oral cavity**, the epithelium may become **stratified squamous**.
 - Goblet cells may be present.

Distinctive Features

- **Parotid Gland :**
 - The parotid gland is composed **almost entirely of serous acini**.
 - It often contains **abundant mature adipose tissue**, especially in adults.
 - Large nerve bundles, including branches of the facial nerve, may be seen within the gland.
 - Intraparenchymal **lymph nodes** may be present and may contain benign salivary gland inclusions.
 - Occasional **sebaceous cells** may be observed.
- **Submandibular Gland :**
 - The submandibular gland contains **less adipose tissue** than the parotid gland.
 - It is a **mixed seromucous gland** composed mainly of serous acini, with fewer mucous acini.
 - Striated ducts are usually prominent.
- **Sublingual Gland :**
 - The sublingual gland is **predominantly mucous**, and **serous demilunes** may be seen around mucous acini.
 - Intercalated ducts and striated ducts are usually short and less conspicuous than in the parotid and submandibular glands.