

## SALIVARY GLANDS

There are three major salivary glands—parotid, submandibular and sublingual. In addition, minor salivary glands are scattered throughout the oral mucosa. The major glands secrete copiously in response to mechanical, olfactory, psychic and thermal stimuli. These glands are under control of the parasympathetic nervous system with ganglions embedded in the gland or nearby. The minor glands secrete continuously so that altogether as much as a liter of saliva is produced daily, the purpose of which is more to moisten and clean than to act as an enzyme as was previously thought.

The parotid is entirely a serous gland giving it a basophilic appearance in H-E preparations. There are acini (alveoli) surrounded by a basement membrane and myoepithelial cells which serve as contractile elements to expel the primary secretion. The acinar cells are pyramidal shaped with round basally located nuclei. The cytoplasm is weakly basophilic. Under high power tiny secretory granules are seen in the apices of the cells lining the acini with the nucleus at the other end of the cell.

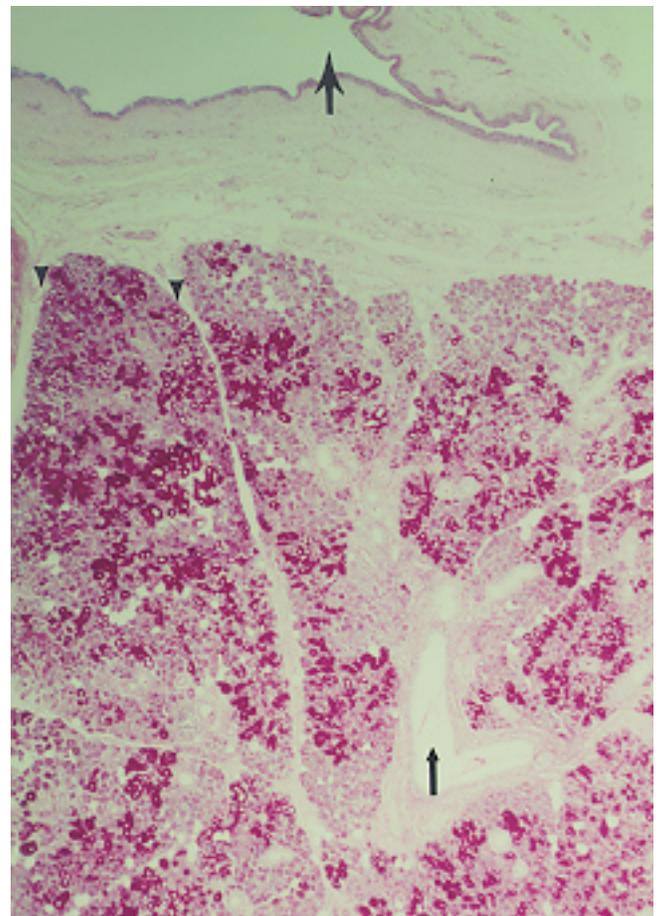
The parotid is classified as a compound tubuloacinar gland. Tubules in the gland are called intercalated ducts, striated ducts and lobular excretory ducts. Intercalated ducts have only small lumina or may appear to have none at all depending on the cut. They are surrounded by contractile myoepithelial cells usually with only a flat nucleus seen. Striated ducts with simple columnar epithelium gather secretions from the intercalated ducts. They are called striated because of striated basal structures visible on light microscopy. Finally, interlobular excretory ducts with progressively columnar, pseudostratified, and finally stratified columnar or squamous epithelium carry the secretion to the mouth. A fibrous capsule surrounds the gland and septa divide the gland into lobules. The septa convey blood vessels, nerves and excretory ducts. Fat cells are prominent in the parotid and there are intraparotid lymph nodes.

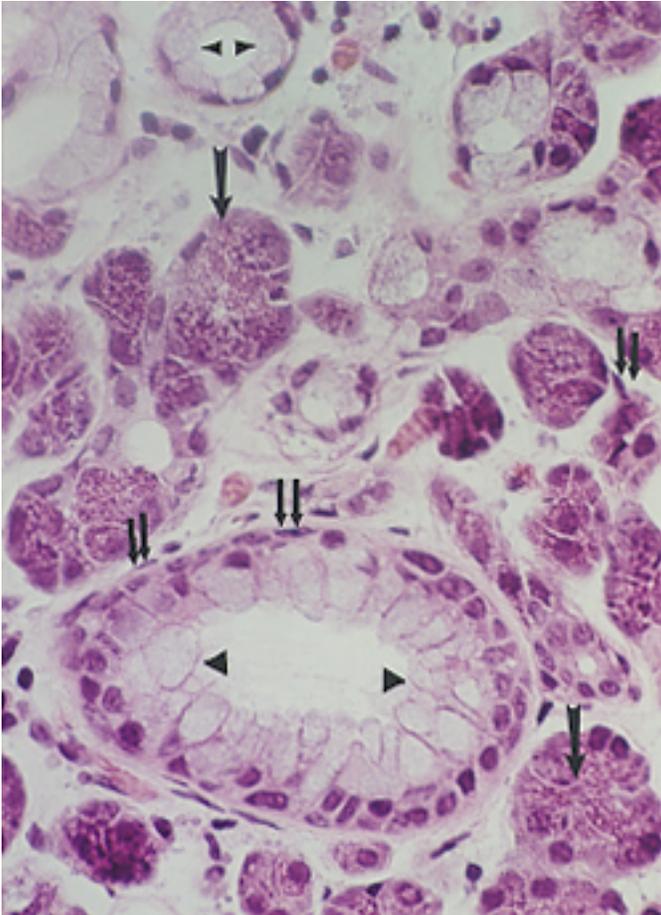
The submandibular salivary gland has mixed seromucous secretory units. Using H-E stains, the mucinous components are weakly stained so that the cells appear almost as clear spaces with a dark flattened basal nucleus. The serous glands, which contain enzymatic secretory granules, are strongly stained. Their nuclei are rounded and central or basal with dispersed chromatin.

Serous cells may sit on top of the mucus cells and then they are called demilunes (“half moons”) but most serous acini are unrelated to mucinous acini and overall the submandibular gland appears predominantly serous. Lumina of the acini of the mucus glands are larger and more apparent than are the lumina of serous glands. Myoepithelial (contractile) cells are present as in the parotid. The duct system is similar to that of the parotid.

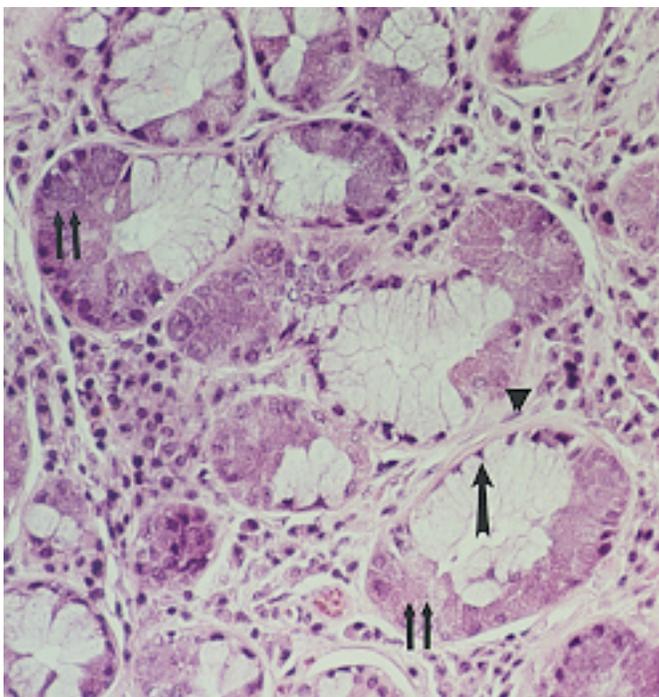
The sublingual gland is a compound mixed tubuloacinar gland like the submandibular but here the mucoid element predominates and pure serous acini are scarce. Unlike the parotid and submandibular glands, ducts from the sublingual gland open separately into the floor of the mouth.

Submandibular gland. PAS stain in which mucus glands appear magenta. Parts of several lobes are seen with interlobar connective tissue (triangles). One major and several lesser ducts (small arrow) are present. The large duct (large arrow) surrounded by fibrous tissue is Wharton's. The light colored areas are serous glands and fat.



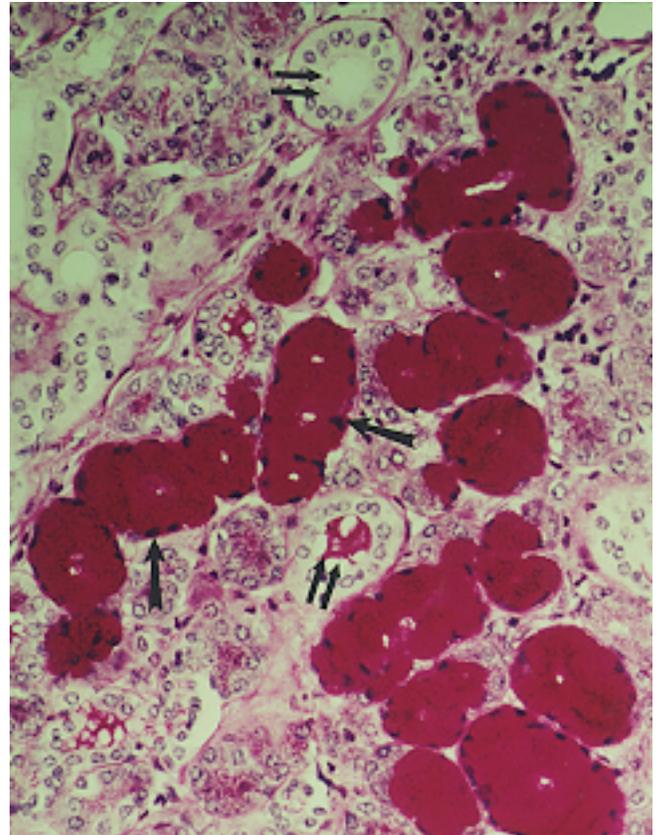


Submandibular salivary gland. High power showing enzymatic secretory granules which stain deeply (single arrows). Myoepithelial cells (double arrows) surround the glandular structures and there are ducts (triangles) with cuboidal or low columnar epithelium. Nuclei of mucus cells are peripherally placed.

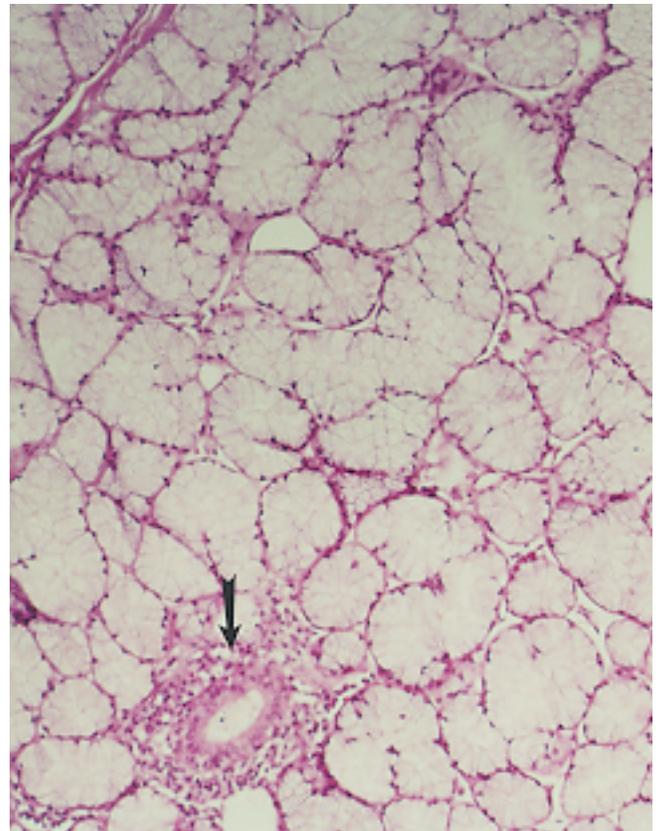


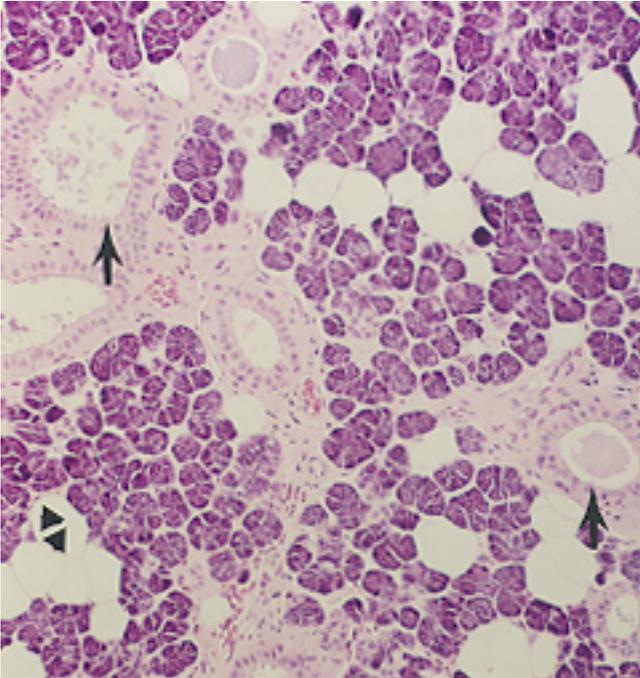
Submandibular salivary gland. Demilunes of serous glands (double arrows) are seen atop mucus glands which in this H-E stain are pale and foamy. Their dark basal nuclei (large arrow) are flattened against the faintly seen basement membrane. The serous glands are lightly basophilic, granular, with spheroidal nuclei placed more centrally. In this section there are also many chronic inflammatory cells.

Submandibular gland, PAS stain. Showing mucous cells in deep magenta with small dark nuclei located at periphery of cell (single arrows). There are also serous cells with granular appearance and ducts (small arrows) with cuboidal lining. One contains red staining mucus.

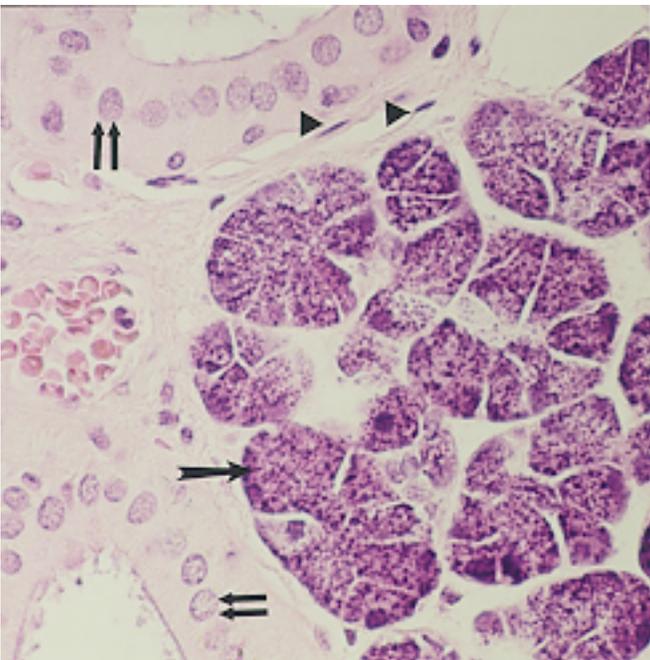


Sublingual salivary gland, in which there normally is a preponderance of mucous cells. Minor periductal inflammation (arrow).





Parotid, showing only serous cells. Fat (triangles) and ducts (arrows) with cuboidal lining and inspissated secretions.



Parotid. The parotid has only serous acini. Here secretory granules (single arrow) are seen and there are two striated ducts with large cuboidal cells (double arrows) and myoepithelial cells (triangles) just outside of the duct. A blood vessel with red cells nests in a fibrous septum.