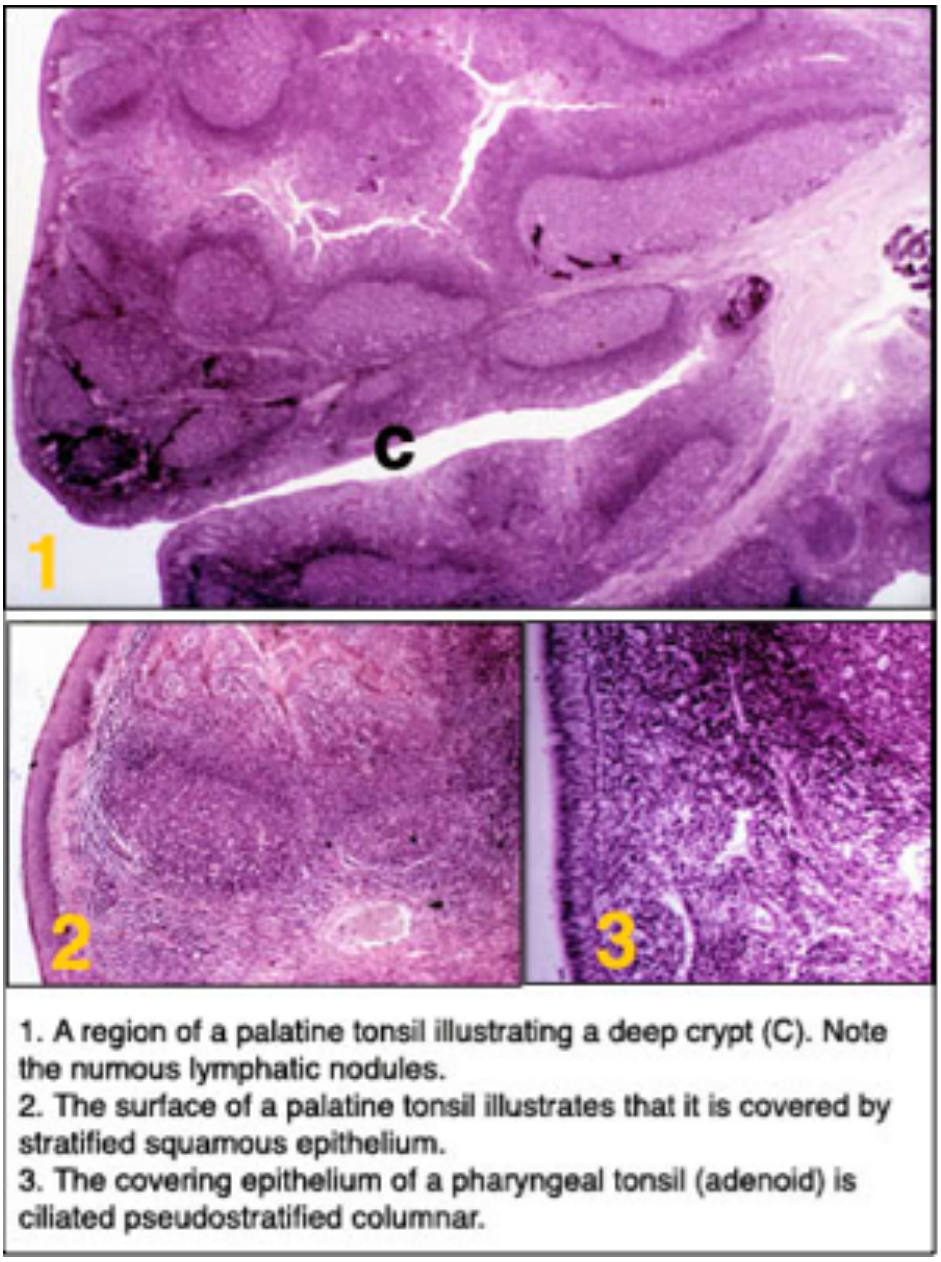
Tonsils



1. A region of a palatine tonsil illustrating a deep crypt (C). Note the numous lymphatic nodules.
2. The surface of a palatine tonsil illustrates that it is covered by stratified squamous epithelium.
3. The covering epithelium of a pharyngeal tonsil (adenoid) is ciliated pseudostratified columnar.

Tonsils are aggregates of lymphatic nodules associated with the pharynx and oropharynx. A ring of lymphatic tissue (Waldeyer's ring), in varying degrees of completeness, is present at the entrance to the esophagus and respiratory tract. The structures are spread through different areas - oropharynx, nasopharynx, and tongue - and form the palatine, pharyngeal, and lingual tonsils, respectively. Tonsils do not filter lymph; they have no afferent vessels leading to them, nor do they have an internal system of sinuses for the filtering of lymph. However, at the inner surfaces of the tonsils, plexuses of blindly ending lymph capillaries form the beginnings of efferent lymphatic vessels. Tonsils contribute to the formation of lymphocytes, many of which migrate through the covering epithelium and appear in the sputum as salivary corpuscles. Bacteria that penetrate the lymphoid tissue of the tonsils act as antigens to stimulate the production of antibodies. Tonsils are the major bulwark against oral and pharyngeal routes of infection. They contribute to the formation of lymphocytes, are able to mount immunologic

responses, and take part in the immunologic defenses of the body. Tonsils appear to be especially valuable sources of interferon, an antiviral factor, and may be of greater importance in fighting infection than has been recognized previously.

Palatine Tonsils

The palatine tonsils are paired, oval lymphatic organs located laterally at the junction of the oral cavity and oropharynx. A wet stratified squamous epithelium continuous with that of the oral cavity and oropharynx covers the free surface of the tonsil and is very closely associated with the lymphatic tissue. Deep invaginations of the epithelium form the tonsillar crypts that reach almost to the base of the tonsil. Secondary crypts may branch from these deep pockets and also are lined by stratified squamous epithelium that tends to thin out in the deeper parts of the crypts. Lymphatic nodules, many with prominent germinal centers, usually are arranged in a single layer beneath the epithelium, embedded in a mass of diffuse lymphatic tissue. Large numbers of lymphocytes infiltrate the epithelium, especially that lining the lower ends of the crypts, often to such an extent that the demarcation between epithelium and lymphatic tissue is obscure. A partial capsule beneath the basal surface of the tonsil separates it from surrounding structures to which the capsule adheres. Septa of loosely arranged collagen fibers extend from the capsule into the tonsillar tissue and partially divide the crypts and their associated lymphatic tissue from one another. Fibers from the septa spread out and become continuous with the reticular fibers of the lymphatic tissue. The connective tissue is infiltrated by lymphocytes of various sizes, plasma cells, and mast cells. Neutrophil granulocytes may be present and are numerous during inflammation of the tonsils. Small compound tubuloacinar mucoserous glands lie outside the capsule, and their ducts drain to the free surface of the tonsil or, rarely, empty into a tonsillar crypt.

Lingual Tonsils

The lingual tonsils form nodular bulges in the root of the tongue, and their general structure is similar to that of the palatine tonsil. Crypts are deep, may be branched, and are lined by a wet stratified squamous epithelium that invaginates from the surface. The associated lymphatic tissue consists of diffuse and nodular types. Compound tubuloacinar mucous glands embedded in the underlying muscle of the tongue drain by ducts, most of which open into the bases of the crypts.

Pharyngeal Tonsil

The pharyngeal tonsil is located on the posterior wall of the nasopharynx. Its surface epithelium is a continuation of that lining the respiratory passages - namely, ciliated pseudostratified columnar epithelium that contains goblet cells. Patches of stratified squamous epithelium may be present, however, and tend to become more common with aging and smoking. The crypts are not as deep as in the palatine tonsils, and the epithelium forms numerous shallow folds. A thin capsule separates the pharyngeal tonsil from underlying tissues and provides fine septa that extend into the substance of the tonsil. Small compound tubuloacinar mucoserous glands lie beneath the capsule and empty onto the surface of the folds.