

Lymphatic system

(LLec.1)

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OBJECTIVES :

- Describe and state the functions of the lymphatic system.
- Describe the accessory organs of the lymphatic system.
- Describe the immune system response.

– Functions of this system:

- Return tissue fluid to the bloodstream.
- Transport fats from the digestive tract to the bloodstream.
- Defense.

– Lymphatic system is composed of:

Organs that are composed of lymphatic tissues.

Lymphatic tissue components :

1-Cells of the immune system: Antigen presenting cells(APC):

Interdigitating cells, dendritic cells, macrophages, B lymphocytes.

T-lymphocytes.

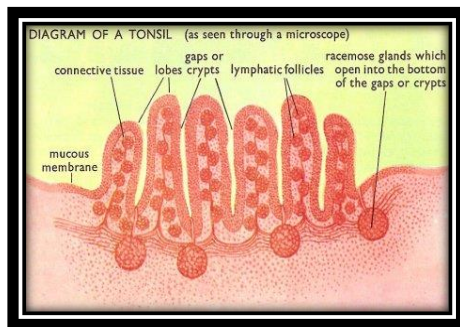
2- Stroma: reticular tissue which is composed of :

- reticular fibbers +reticular cells
- Functions to house and provide proliferation site for lymphocytes

Lymphatic tissue are found in two forms:

- 1- Diffused lymphatic tissue.**
- 2- Nodular lymphatic tissue.**

Diffused lymphatic tissue: The lymphatic tissue is infiltrated in the lamina propria of digestive, respiratory and urinary tract, as loose aggregation of lymphatic tissue.



Nodular lymphatic tissue : Solid, spherical bodies consists of tightly packed (dense aggregation of lymphatic tissue)as nodules or follicles

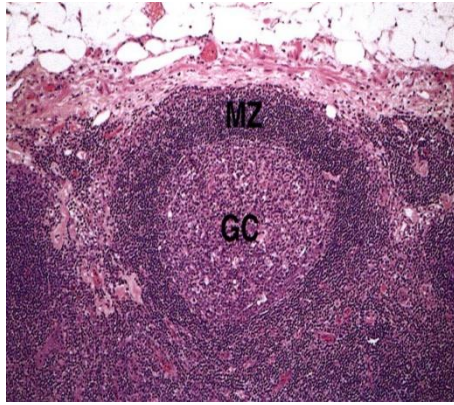
Each nodule has a diameter about (0.2-1) mm, composed of densely accumulation of(B- lymphocytes).

Two different areas are seen :

Peripheral area—darkly stained, mainly small, resting lymphocytes.

Germinal center (defines “secondary” follicles): lightly stained, large, activated B cells – lymphoblast and lymphocytes .

When antigenic stimulation occur, (germinal center)appears as faintly stained composed of large size lymphocytes. Plasma cells, macrophages are found in this area.



Germinal center appears when there are antigenic stimulation. The nodules are variable in size and number according to the stimulation, they are developed after birth.

Two types of nodular lymphatic organs:

Encapsulated by connective tissue capsule. (spleen , thymus, lymph nodes).

Non-encapsulated (or partially encapsulated) in tonsils, Peyer's patches in digestive respiratory , urinary & reproductive tracts.

— 2 Types of Lymphatic Organs

- **Central (primary) lymphoid organ: where lymphoid precursor cells undergo proliferation and differentiation**
 - **T cells in thymus**
 - **B cells in bone marrow**
- **Peripheral (secondary) lymphoid organ: lymph nodes, spleen, tonsils**

Tonsils

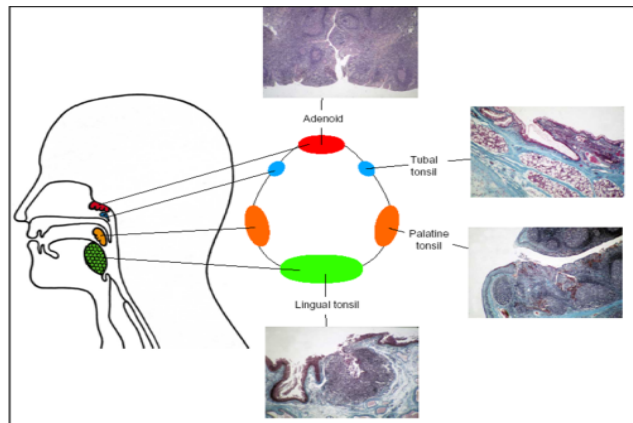
Are aggregations of incompletely encapsulated lymphoid tissue.

Three types of tonsils:

1- palatine tonsils.

2- Pharyngeal tonsil.

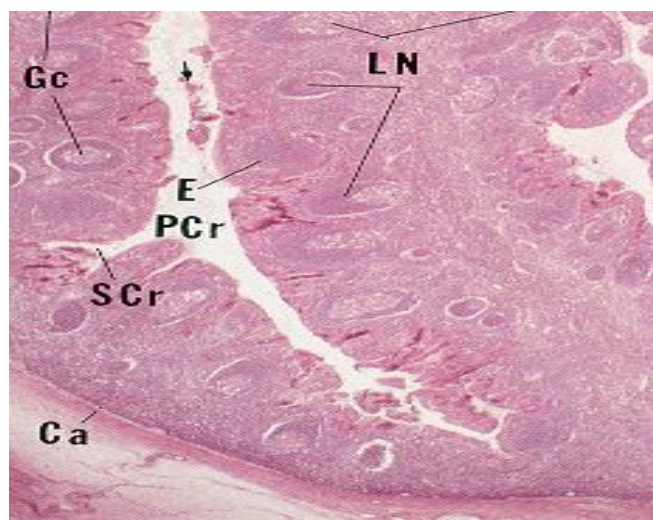
3- Lingual tonsils.



Palatine Tonsils: Are oval structure, paired found on each side of oral cavity and lined by stratified squamous non-keratinized epithelium that extended into tonsillar tissue to form deep imagination called crypts about(10-20).

Below the epithelium, lymphatic nodules and lymphatic tissue are found. Thin layer of dense connective tissue partially encapsulated the tonsils.

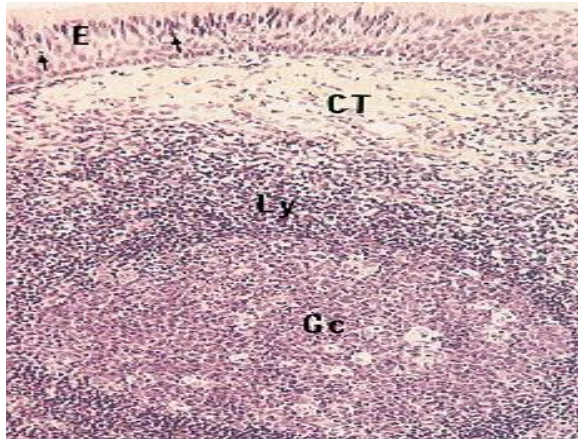
At this deep aspect the connective tissue act as a barrier.



Pharyngeal tonsil: Is single located in the posterior wall of nasopharynx, lined by pseudo stratified ciliated columnar epithelium.

No crypts, but it has folds in epithelium (pleats).

Lymphatic nodules are found in lamina propria. No clear capsule (thinner than in palatine).



Lingual tonsils:

Are smaller, more numerous than others located at the base of ton

Are lined by stratified squamous epithelium. Have one crypt .

Lymphatic nodules; some with germinal center located below the epithelium.

Thin capsule or not clear .

No afferent lymphatic vessels in tonsils but they have plexus of lymphatic capillaries.