

Lymphatic system

The lymphatic system is composed of the following glands and tissues ;-

- 1- Lymph glands
- 2- Spleen
- 3- Thymus gland
- 4- Bone marrow
- 5- Tonsils

This system is depending on the defense mechanism of the body against the biological foreign bodies such as bacteria, viruses , fungi and parasites.

The concept of this system is by creating the immunity , so this could be called the immune system.

the components of this system are three things which are ,

The cells which are the lymphocytes and the fibers which are the reticular cells with reticular cells and the third thing is the endothelial cells , so this called the reticuloendothelial system.

The lymph glands or nodes; are distributed in the whole body organs and consider as a small spherical structures the gland is histologically consist of cortex and medulla , the cortex is the peripheral zone consist of many aggregations of the lymphocytes called lymphatic nodules which have the central area called the germinal center that containing lymphoblasts which are immature lymphocytes , but highly active and transform into lymphocytes which are less active and mature displaced to the periphery of the nodule of the same cortex .

The medulla of the gland containing many cords of lymphocytes and not arranged into nodules like in cortex.

The gland in general surrounded by capsule of dense connective tissue traversed by many lymph vessels called afferent lymph vessels filled with the lymph which is colorless serum -like fluid have many lymphocytes enter to the sinuses which are lymph channels under the capsule called

subcapsular sinuses , so the lymph circulate in these sinuses for filtration and clearance from the foreign bodies with association of macrophages in these sinuses and reticular cells for slow the lymph circulation, then the lymph will be pass to the cortex through the cortical sinuses in between the cortical nodules and continue to pass to the medullary sinuses in between the medullary lymphatic cords, after that the lymph after clearing from the foreign bodies will go outside the gland through the efferent lymph vessel at the hilum of the gland to be pass to other lymph gland.

The spleen

The splenic tissue is formed by the splenic parenchyma which are formed by the red pulp and white pulp, those are surrounded by thick capsule consist of dense connective tissue and smooth muscle fibers.

The red pulp is consist of splenic sinuses filled with blood , many lymphocytes and presence of hemosiderin pigments , the white pulp is consist of lymphatic nodules , aggregation of lymphocytes with presence of germinal center in each nodule for production of new lymphocytes from the lymphoblasts, also there is splenic small artery in each nodule called artery of white pulp, the function of spleen is that production of new red blood cells in emergency cases and consider as end result for the aged RBC to be destroy in the red pulp.

The thymus

Is present in the inlet of chest at early stages of life, this organ is surrounded by dense connective tissue and the interior of the gland is formed by cortex and medulla, the cortex is usually fissured into many lobules , while the medulla is one unit for whole these cortical segments .

The cortical lobules have many germinal centers for production of T-lymphocytes and the medulla have many reticular cells with scattered lymphocytes. The gland after production of lymphocytes will be degenerate and transform inti fibrous and adipose tissues , that the

medulla will form the thymic corpuscles or Hassall's corpuscles, which means end of the gland within few next years of life.

The T- lymphocytes after formation will migrate to the cortex of lymph glands to form T- dependent zone. The lymph cells produced by thymus responsible for the production of cell immunity.

The Bone marrow

Is responsible for production of whole lines of granular leucocytes (WBC) such as the neutrophils, eosinophils and basophils, also responsible for production of monocytes and B-lymphocytes which responsible for production of plasma cells. The whole white blood cells firstly produced in the bone marrow as neutroblast, basoblast, eosinoblast, monoblast and lymphoblasts then transform into neutrophils, basophils, eosinophils, monocytes and lymphocytes when pass from the bone marrow to the blood circulation. (The B- lymphocyte is responsible for production of Humoral immunity.... Systemic immunity of the body)

The tonsils

Consider as small aggregations of lymphocytes present in the mouth cavity surrounded by epithelial cells from the superficial surface facing the oral cavity and from inner surfaces in the lamina propria is surrounded by dense connective tissue or capsule, these are the

Palatine tonsil. Present in the oropharynx covered by stratified squamous epithelium.

The pharyngeal tonsil, is present in the pharynx and covered by pseudostratified columnar epithelium.

The both types of tonsil have only efferent lymph vessel, which means that production of lymphocytes from tonsils and pass either to the blood circulation or pass to the lymph nodes via afferent lymph vessels when traverse the capsule and drain into the subcapsular sinuses.