

The Lymphatic System...2

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Lymph nodes is one of the secondary (peripheral) organs. It is involved in the transport of lymph. There are afferent and efferent lymphatic vessels. The lymph node is “kidney” shaped organ so they have convex surface and a depression/concave surface. Convex surface is the entering site of vessels and depression is the exiting site. Now remember when you say afferent it means entering vessels of any structure and efferent means existing any structure. At the concave site we have a hilum; the site where the efferent vessels leave the lymphatic node as well as the veins and the site where arteries and nerves enter.

Again the lymph node is involved in the lymphocyte proliferation and transformation into plasma cells which then produce anti-bodies and therefore involved in the immune response.

Lymph node consist of a capsule, surrounding the node which is made up of connective tissue, cortex, medulla, and intervening paracortex. The paracortex is between the cortex and medulla. The cortex consists of different cells which are the reticular cells, lymphocytes. Of course you know there are the lymphoid nodules which are spherical of the lymphoid tissue.

Then you have the sub-capsular sinus which are the spaces just beneath the capsule. they are the spaces where the afferent vessels open. So they are the beginning of the lymphatic system of the lymph node. The sinuses are continuous with the cortical sinuses which are in the cortex between the lymphatic nodules.

Now the second part is the paracortex. In contrast to the cortex, the paracortex don't have lymphoid nodules but it has an accumulation of T-lymphocytes. Remember lymphatic nodules have B-lymphocytes but the paracortex in the nodules having the B-lymphocytes in the cortex. Paracortex doesn't have B-lymphocytes but has T-lymphocytes. So lymph node has both lymphocytes. –B lymphocytes in the lymphatic nodule in the cortex and T lymphocyte in the paracortex.

There is something unique in the paracortex is the **post capillary venules (high endothelial capillary/venules)**. This area has elongated endothelial cells and they facilitate diapedesis of the lymphocyte from the blood into the venules.

The medulla consists of the medullary cords which is lymphatic tissue extensions from the paracortex. Even though from the paracortex they consist primarily of B-lymphocytes not T-lymphocytes. Also there are medullary sinuses which are the dilated spaces which are continuous with the cortical sinuses. They deliver lymph to the efferent lymph vessels. They are the last sinuses of the lymphatic system in the lymph node after the lymph to be received from the afferent vessels.

How is the lymph transported through the lymph node?

The afferent lymph vessels enter the node and penetrate through the capsule of node then they open into the subcapsular spaces which then open into the cortical sinuses and again into subcapsular and cortical then into the medullary sinuses and finally delivered to the afferent vessels at the hilum.

The spleen is involved in the blood filtration. It provided defense against blood pathogens, destroys lymphocytes, produces antibodies and activated lymphocytes. It is covered by a connective tissue capsule and has two types of pulps

White pulp –where different masses can be seen. It is composed of lymphoid nodules and composed of another area called **periarteriolar lymphoid sheet**, the sheet that surrounds the arterioles the **central arterioles**. Remember the outer most margin of the lymphoid nodules called the **marginal zone**, containing blood sinuses and lymphoid tissue. Now remember that the lymphoid nodules is where B-lymphocytes are present in the spleen where the T-lymphocytes are in the **periarteriolar lymphoid sheet**

Red pulp –composed of splenic cords and many venous sinuses. Splenic cords consists of reticular cellular fibers supporting the cells, such as lymphocytes plasma and macrophages. The venous sinuses are just spaces that are lined by the stab cells which are specialized cells that are capable of selecting the healthy erythrocytes so it won't be destroyed by the spleen. The stab cells are elongated epithelium

cells where as the cells in the high epithelium venules or post capillary venules are cuboidal cells. The sequence of the intrinsic blood vessels of the splenic bulb: The splenic artery enters the spleen at the hilum and branches into different splenic arteries and then branches in the trabecular arteries then the central arterioles surrounded by the periarteriolar lymphatic sheet forming the white pulp then branches into the penicillar arterioles then into slightly developed capillaries and are sheathed by phagocytic cells macrophages then to capillaries then to the trabecular veins and finally to splenic vein and hilum.

The central arteriole is surrounded by the periarteriolar lymphatic sheet and the lymphatic nodule with a germinal center (B-lymphocytes and T-lymphocytes).