

LYMPH NODES AND LYMPHATICS

Beginning externally, the lymph node has a collagenous capsule surrounded by loose connective tissue that contains blood vessels and afferent lymphatic vessels lined with endothelium and containing valves. Extending from the capsule inward throughout the lymph node are connective tissue trabeculae that incompletely divide the space into compartments. Deep in the node, in the medullary portion, the trabeculae divide repeatedly and blend into the connective tissue of the hilum of the node. Thus the capsule, the trabeculae and the hilum make up the framework of the node. Within this framework there is a delicate arrangement of connective tissue that forms the lymph sinuses within which lymph and free lymphoid elements circulate.

There is a subcapsular or marginal sinus between the capsule and the cortex of the lymph node. Normally this is a thin space that may become engorged with lymph and lymphoid elements or appear collapsed depending on the state of activity of the node.

Lymph passes from the subcapsular sinus into cortical sinus toward the medulla of the lymph node. Medullary sinuses represent a broad network of lymph channels that drain toward the hilum of the node; from there lymph is collected into several efferent vessels which run to other lymph nodes more proximally situated or drain directly into the thoracic duct or the right lymphatic duct.

The parenchyma of the node, beginning just beneath the subcapsular sinus, consists of the cortex—masses of densely packed lymphocytes that form medullary cords projecting deep into the node between medullary sinuses. Lymphoid follicles are present in the outer cortex and many show germinal centers, while deeper in the cortex (paracortical region) there are no germinal centers. Fat also infiltrates the node, especially in the hilar area.

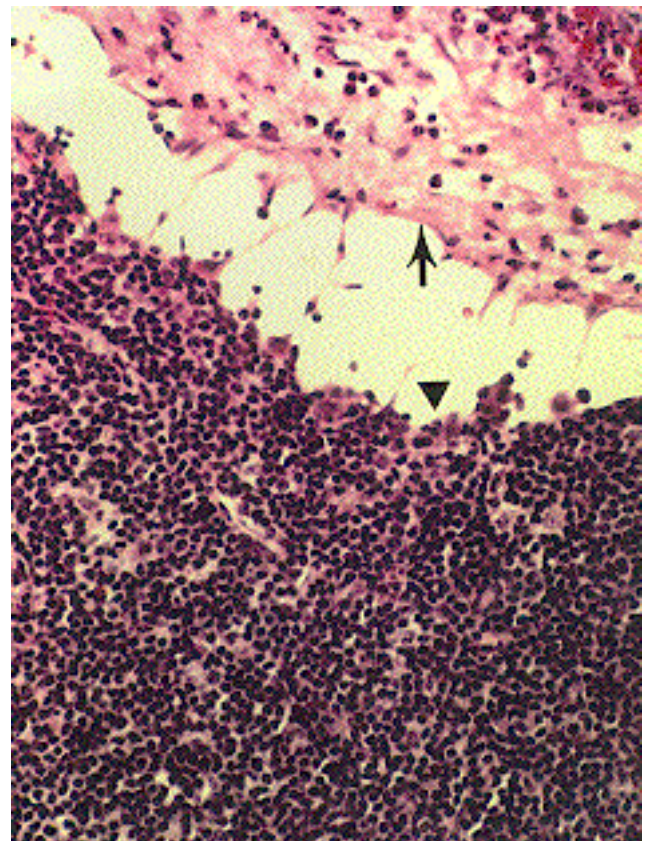
The blood supply of the lymph node enters at the hilum and efferent lymph vessels leave from the hilum.

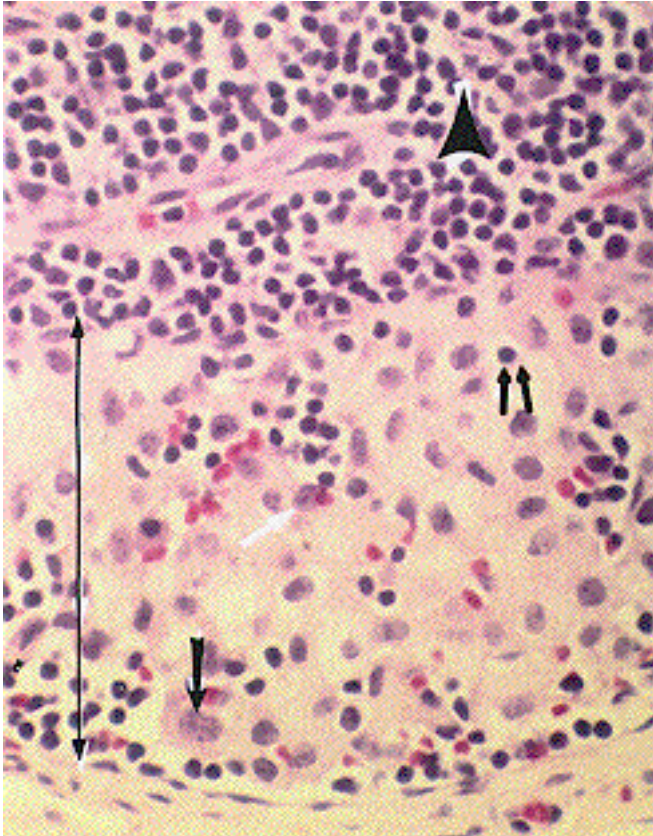
The afferent lymph vessels that enter the node provide only ten percent of all lymphocytes entering the node. The arterial system entering at the hilum brings the bulk of lymphocytes into the node. Lymphocytes then migrate through capillary walls to fill the node. Afferent lymph and efferent lymph differs. There are particulate matter and microorganisms in afferent lymph but not many lymphocytes, whereas efferent lymph contains little particulate matter but many lymphocytes.

Afferent lymphatic with valve (arrow). This lymphatic was just adjacent to the capsule and shortly would empty into the subcapsular sinus. Note well developed muscular wall and endothelial lining (triangle) resembling a small vein.

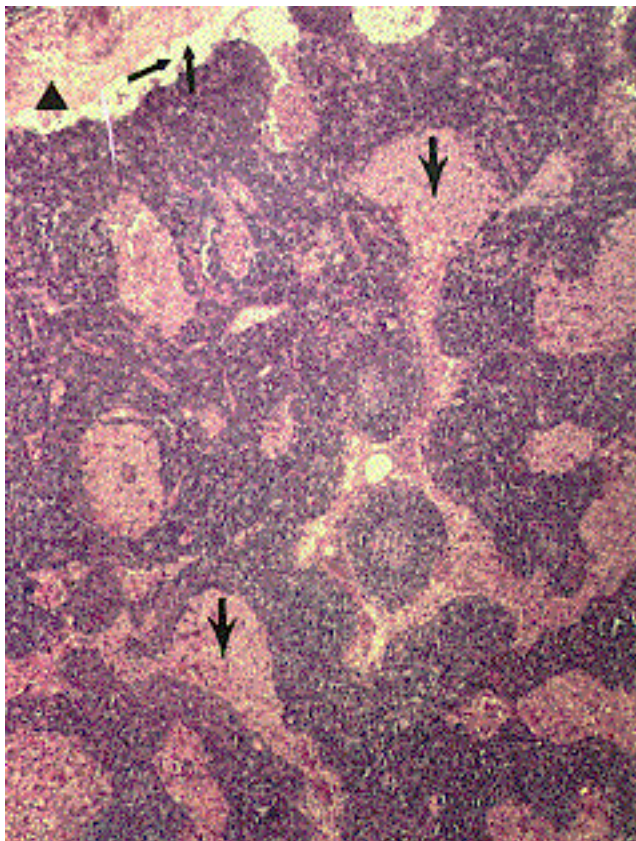


Lymphnode, subcapsular sinus at this point appears dilated but empty. Cortex space of node (triangle) and capsule (arrow) are on either side of the sinus. Lymph node sinuses (seen here) are traversed by fine reticular strands that are said to provide support for sinus macrophages which engulf material as presented by afferent lymph.



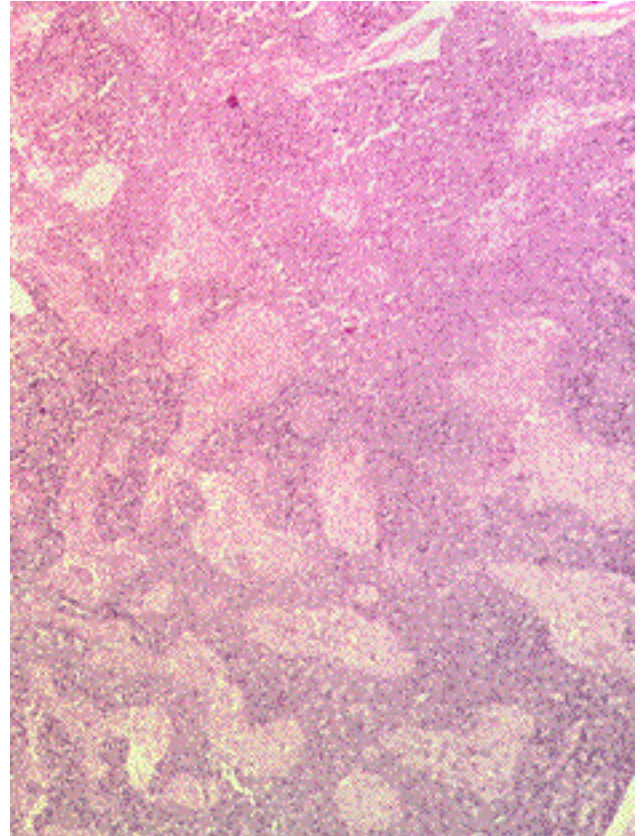


Lymph node, subcapsular sinus engorged with histiocytes and a few small lymphocytes. Large triangle indicates cortex of node; double arrows — lymphocyte; single arrow, histiocyte; long arrows — width of subcapsular sinus between cortex and capsule.

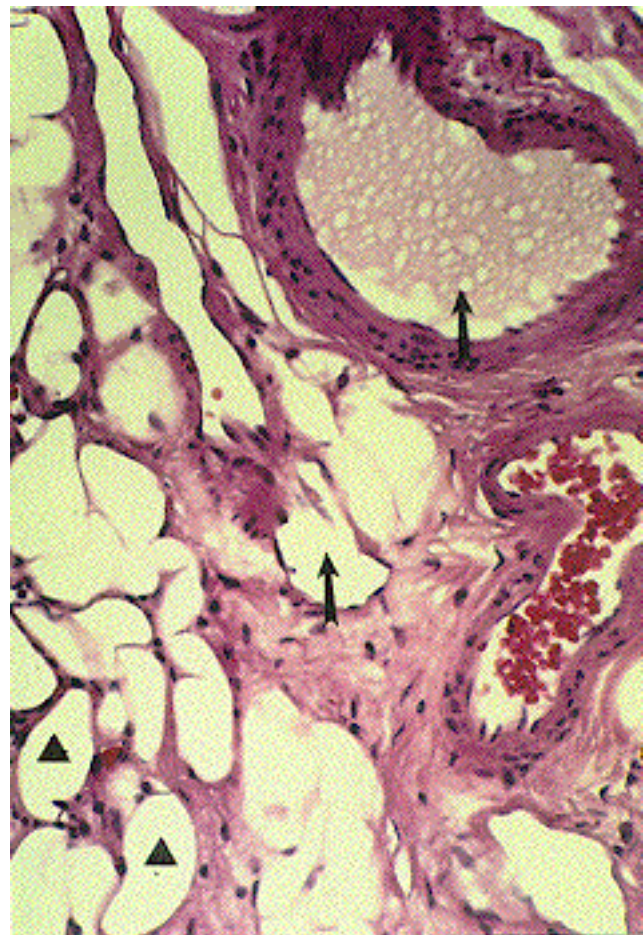


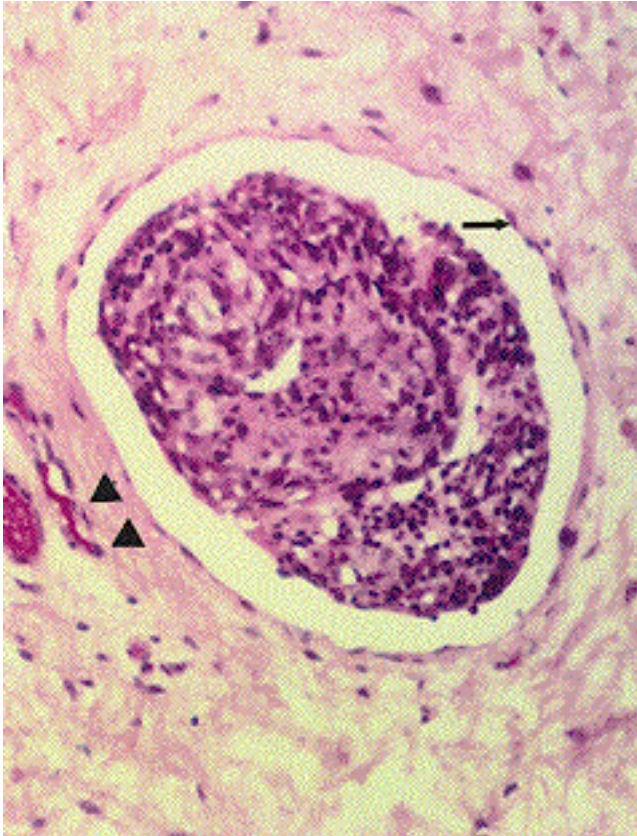
Lymph node, showing medullary cords extending inwardly from capsule (triangle) and separated by lighter colored medullary sinuses (large arrows). The light colored space (double arrows) between capsule (triangles) and dark cortex is the subcapsular sinus.

Lymph node, sinus hyperplasia, in which the medullary sinuses (lighter colored) are dilated by abundance of cellular elements.

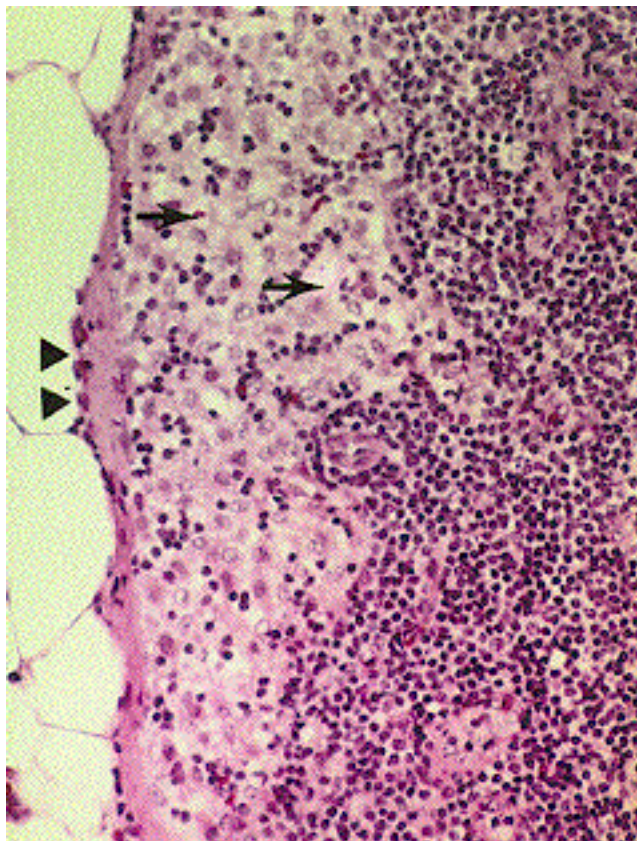


Lymph node, hilus, showing large and small efferent lymphatics (arrows) and a blood vessel filled with erythrocytes entering the node. Fat (triangles) is present in lymphnodes, particularly at the hilus.



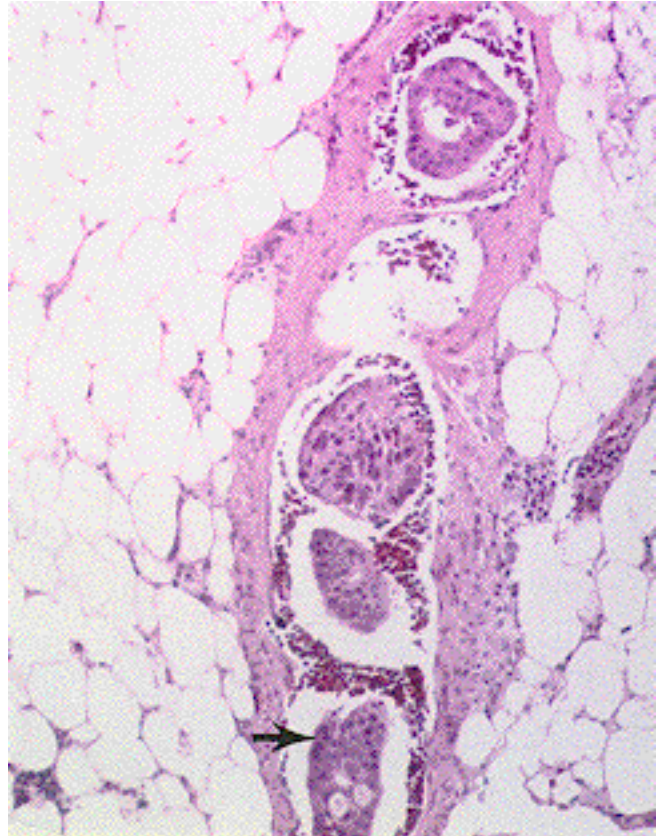


Lymphatic vessel, containing embolic squamous cell carcinoma. Note endothelial lining (arrow) and the rather minimal surrounding supporting tissue (triangles) in this thin vessel.

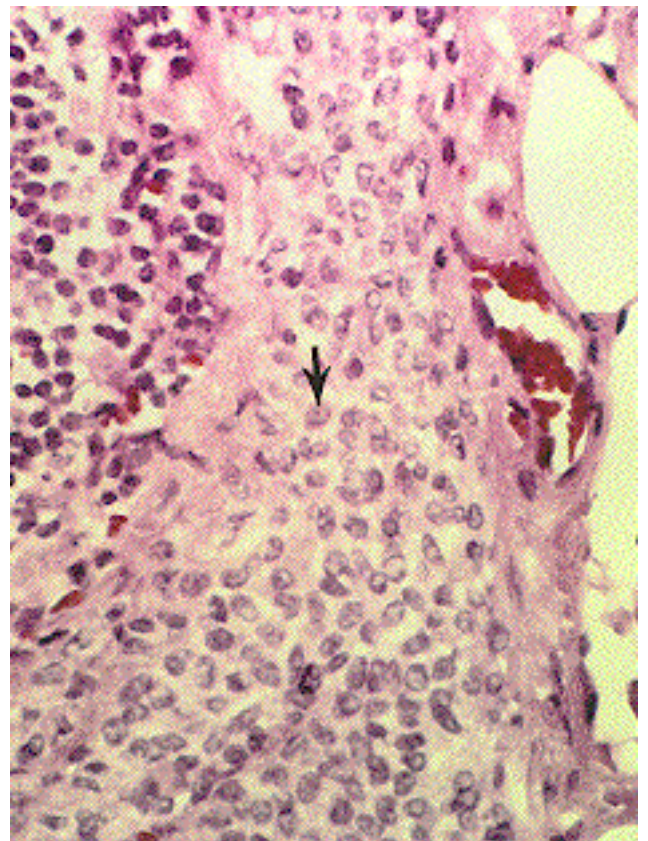


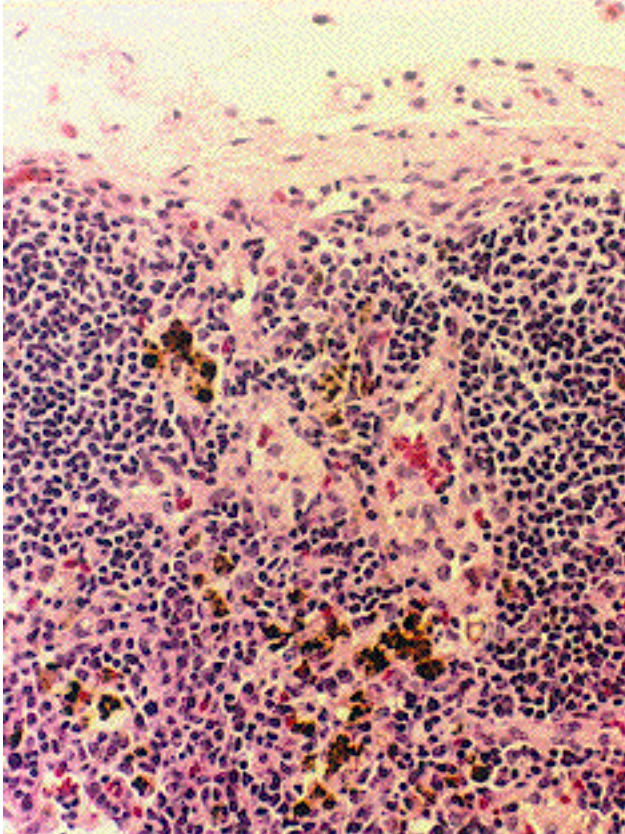
Lymph node, histiocytosis as seen in engorged subcapsular sinus (arrows). Triangles indicate capsule outside of which is fat of the neck.

Blood vessel with embolic mucoepidermoid carcinoma (arrow) for comparison with lymph vessel seen at previous. Note presence of erythrocytes and thicker walls in the blood vessel.

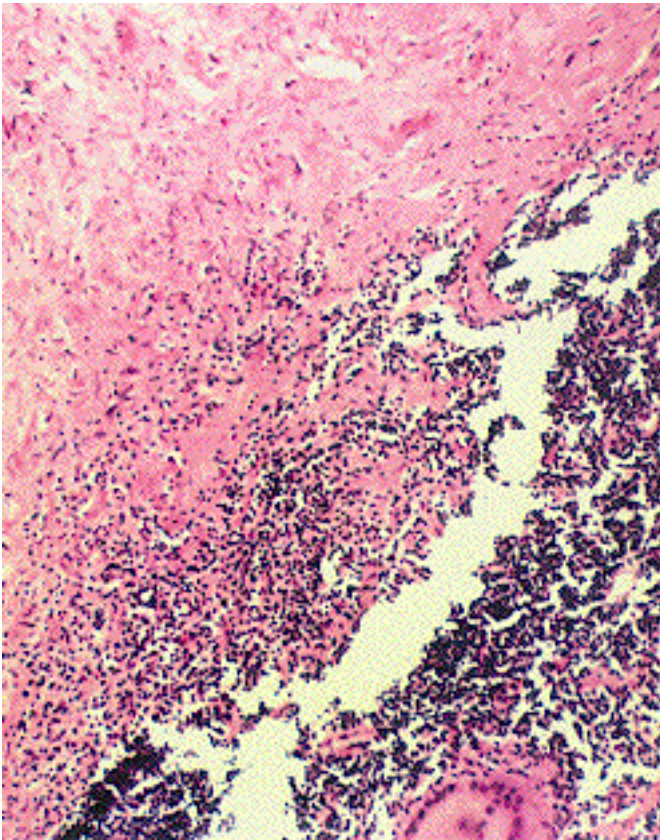


Lymph node, showing capsular nevus cells (arrow), an unusual finding in which nevus cells looking identical to those of intradermal nevi are found in the capsule (not capsular sinus) of lymph nodes, and rarely within the node or hilum. The importance is that they not be mistaken for malignant neoplastic cells.





Lymph node, deposit of hemosiderin.



Lymph node, granulomatous disease, tuberculosis. A Langhans giant cell is seen at bottom of photo and there is caseous necrosis.

Lymph node, metastatic papillary carcinoma, thyroid, with a shell of remaining node.

