

## RADIOGRAPHIC DEMONSTRATION OF INTERCOSTAL LYMPHATICS AND LYMPH NODES

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### ABSTRACT

*The anatomy of the posterior intercostal lymphatics and lymph nodes is reviewed. These lymph nodes are occasionally visualized by bipedal conventional lymphography. Opacified and/or enlarged posterior intercostal lymph nodes may also be identified with computed tomography of the chest. Familiarity with the lymphatic drainage patterns of the intercostal spaces and recognition of abnormal intercostal lymph nodes may provide additional information regarding disease status in patients with inflammatory or malignant disease of the thorax.*

The anatomy of the lymphatics of the thorax are well described. Imaging and evaluation of normal and abnormal intrathoracic lymph nodes are also extensively reported (1,2). The intercostal lymph nodes, however, have received less attention. Posterior intercostal lymphatics and nodes are occasionally depicted by bipedal conventional lymphography. Enlarged and/or opacified posterior intercostal lymph nodes are also infrequently identified with computed tomography (CT).

### ANATOMY

The parietal intrathoracic nodes may be divided into the anterior parietal or internal mammary nodes, the diaphragmatic nodes and the posterior parietal nodes. The posterior parietal nodes are in turn divided into posterior intercostal and juxtavertebral nodes (3). Lateral intercostal nodes occurring in the mid-axillary line have also been described although they are inconstant (4).

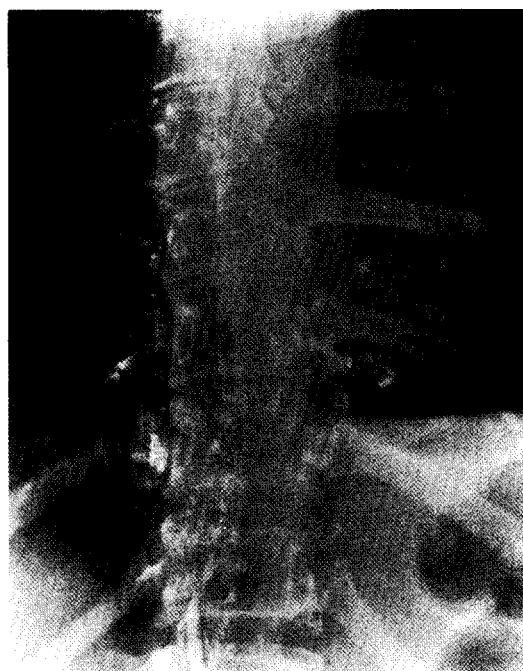
The intercostal lymph vessels and nodes of the thorax accompany the blood vessels and nerves with each intercostal space containing between one and six nodes (Figs. 1,2). The posterior intercostal lymph nodes receive drainage from the lymphatic trunks of the posterolateral aspect of the intercostal spaces, as well as from lymphatics from the parietal pleura, the vertebrae and the spinal muscles (3).

Both anastomotic and efferent vessels arise from posterior intercostal nodes. The anastomotic vessels connect adjacent intercostal spaces but are inconstant. The efferent vessels from the first two intercostal spaces ascend and terminate in the inferior jugular chain or at the jugulo-subclavian venous junction. Efferent vessels from the third through the sixth spaces travel medially terminating in the thoracic duct. The efferent lymphatic vessels from the lower intercostal spaces travel inferiorly along the lateral surface of the vertebral bodies and join to form a common trunk which continues inferiorly to approximately T12 and then ascends slightly to terminate in the thoracic duct at approximately T11 (Fig. 3). These lymphatic vessels anastomose both with each other as well as with lymphatics from the contralateral hemithorax to form a lymphatic plexus along the anterior surface of the vertebral bodies (3).

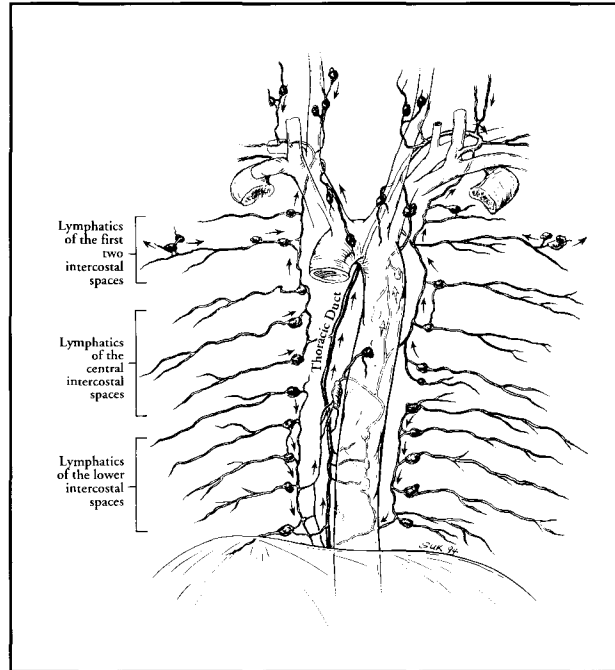
Juxtavertebral nodes are in the path of drainage of the efferent vessels from the intercostal nodes. The juxtavertebral nodes are divided into the laterovertebral and prevertebral nodes which lie along the lateral and anterior aspects of the vertebral bodies respectively. These nodes are most numerous from approximately T8 to T12 (3,4).



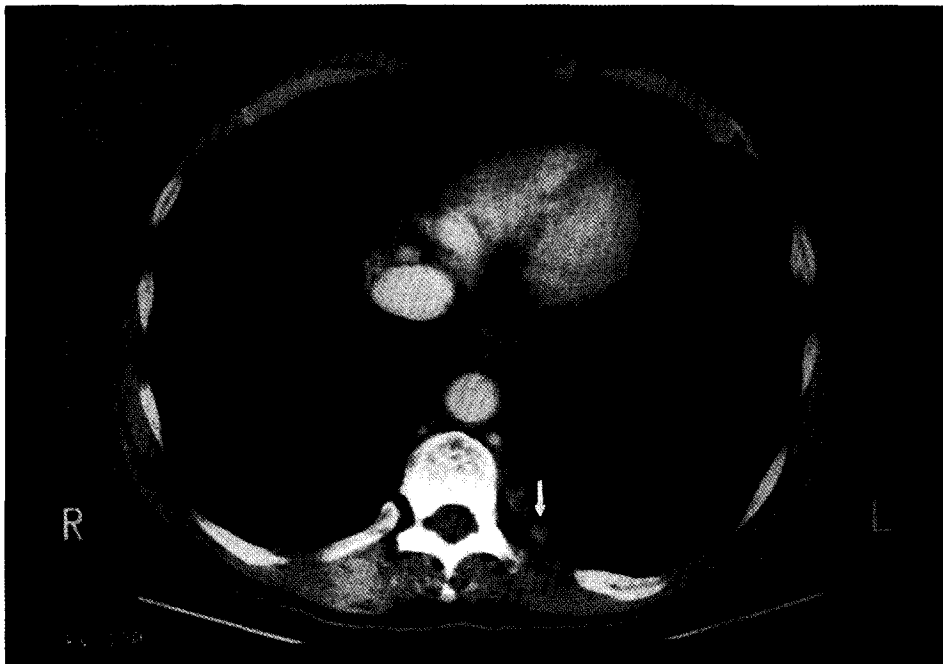
*Fig. 1. Frontal (left) and lateral (right) radiographs obtained during the vascular phase of conventional lymphography demonstrating normal intercostal lymph vessels (arrows) and laterovertebral lymph nodes. There was no obstruction to lymphatic flow.*



*Fig. 2. Intercostal lymph vessels and nodes in a 36 year old woman with Hodgkin disease. Left: A-P view demonstrating multiple intercostal lymphatic vessels and nodes. There was lymphatic obstruction above this level. Above: CT scan of the same patient demonstrating intercostal lymph nodes (arrows). A left pleural effusion is also seen.*



*Fig. 3. Diagram illustrating posterior intercostal lymphatic anatomy and drainage patterns. Modified from Haagensen, et al (4).*



*Fig. 4. 60 year old male with metastatic, poorly differentiated carcinoma of unknown primary with enlarged posterior intercostal lymph nodes demonstrated at CT scan (arrow).*



Fig. 5. 83 year old male with pulmonary adenocarcinoma of the left upper lobe with parietal pleural involvement demonstrated at thoracotomy. CT scan shows an enlarged posterior intercostal lymph node (arrow).

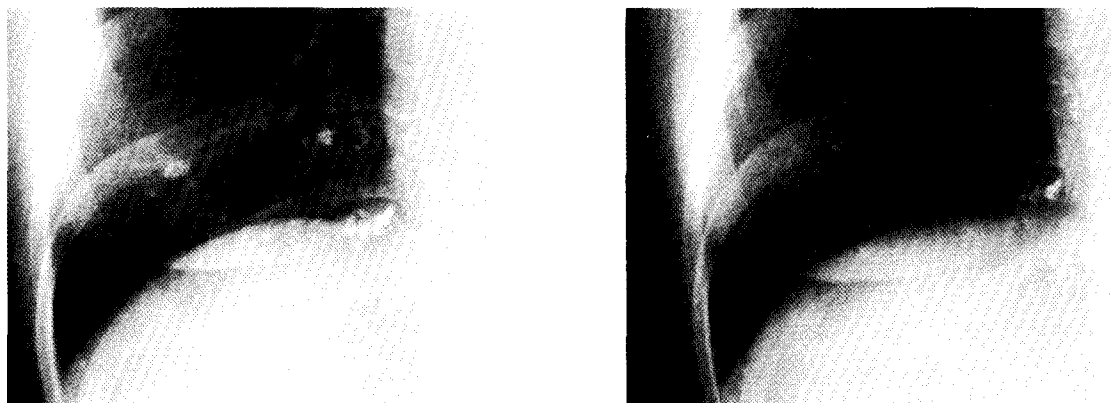
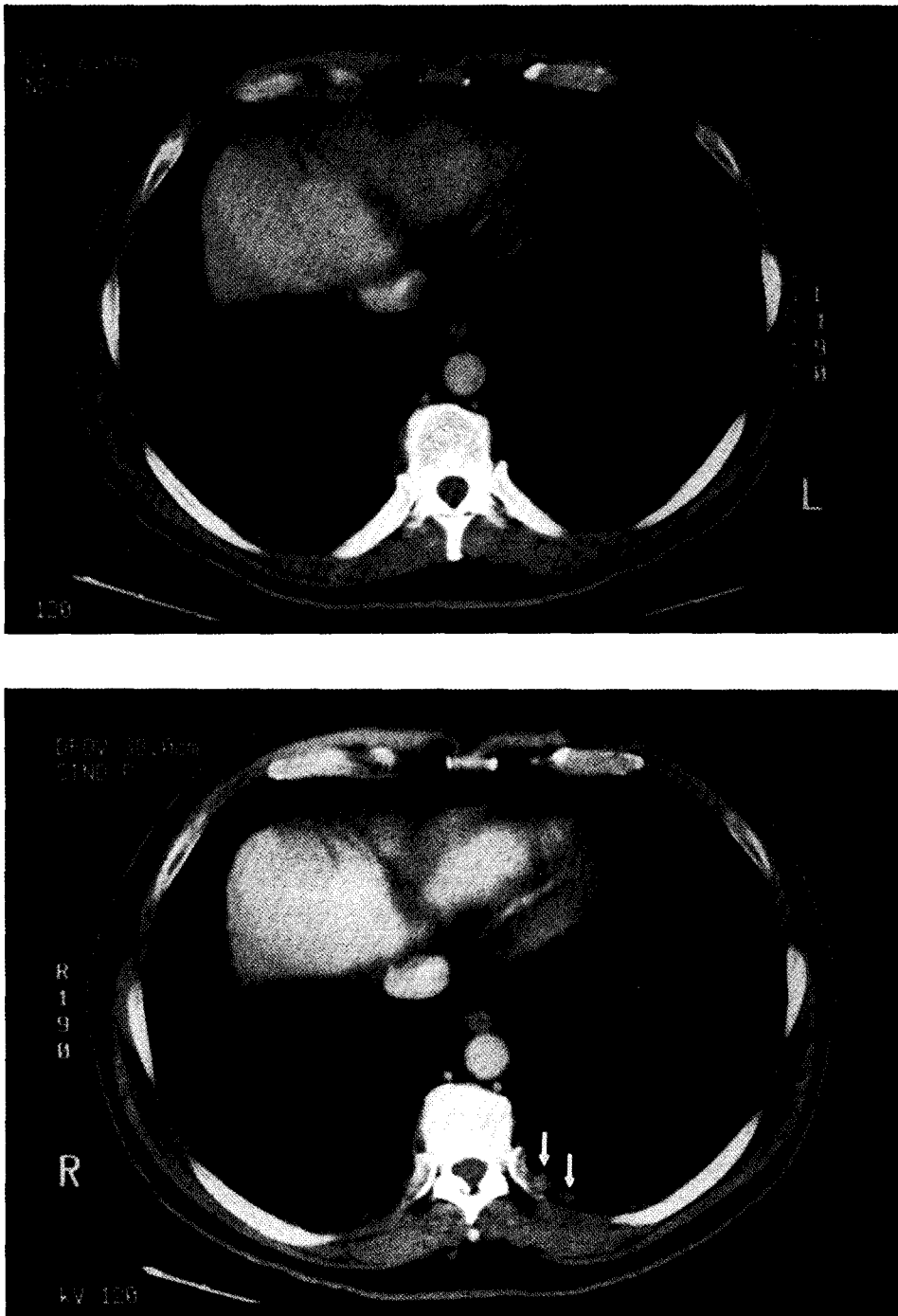


Fig. 6. Coned down views of chest radiographs in a 36 year old woman with Hodgkin disease. Above: Opacified intercostal lymph nodes are seen in the nodal phase of a conventional lymphogram. Below: The intercostal lymph nodes have decreased in size two months after chemotherapy.

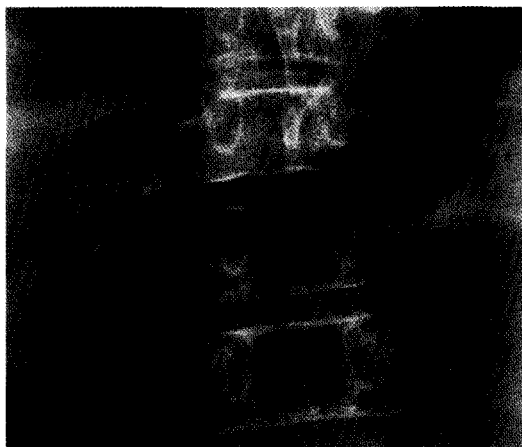
### PATHOLOGY

Primary or metastatic malignancies that involve the pleura or the chest wall can cause enlargement of the intercostal lymph nodes because of the lymphatic drainage patterns

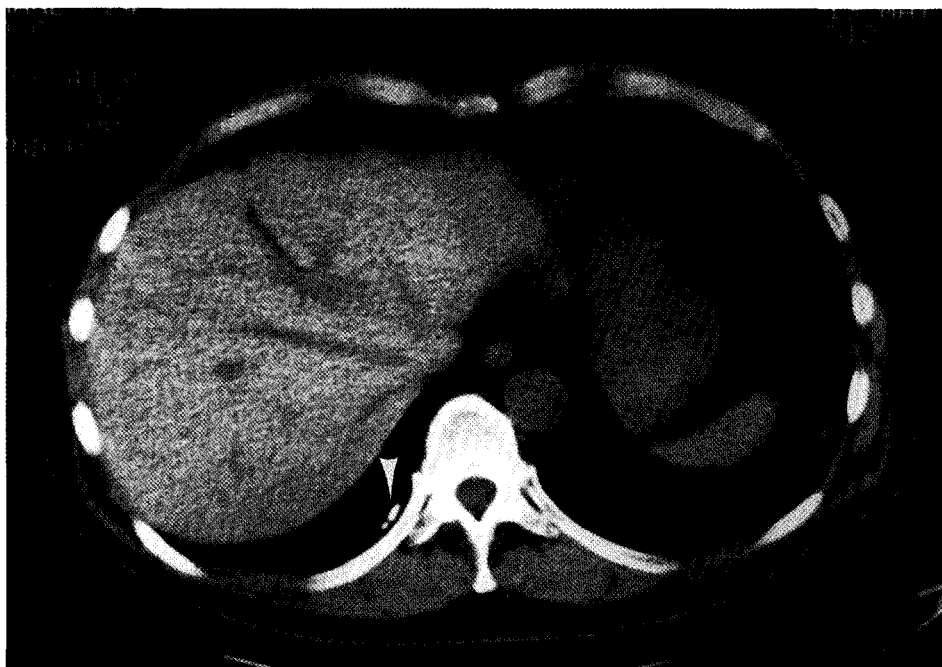
(Figs. 4,5). Lymphoma is another malignancy that can cause enlargement of intercostal lymph nodes (Figs. 6,7). Similarly, inflammatory conditions of the pleura or chest wall also may cause intercostal lymphadenopathy (Fig. 8).



*Fig. 7. Development of intercostal lymph nodes in a patient with a large cell lymphoma. Above: No intercostal lymph nodes seen in the initial CT scan of the chest. Below: Intercostal lymph nodes are well seen five months later (arrows).*



*Fig. 8. Conventional (above) and CT (below) views of calcified intercostal lymph nodes (arrowhead) believed due to prior granulomatous infection in a 63 year old man with bladder cancer.*



## REFERENCES

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