Primary Intrathymic Lymphangioma

Stefano Licci, MD,1 Francesco Puma, MD,2 Marta Sbaraglia, MD,3 and Stefano Ascani, MD3

From 1Department of Pathology, “Santo Spirito” Hospital, Rome, Italy; 2Department of Thoracic Surgery, University of Perugia, Perugia, Italy; and 3Institute of Pathologic Anatomy, University of Perugia–“Santa Maria” Hospital, Terni, Italy.

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ABSTRACT

Objectives: Lymphangiomas are relatively uncommon lesions of the lymphatic channels that can arise in virtually any part of the body provided by lymphatic vessels. The most common localization is the head/neck region, with only sporadic reports in other sites. The mediastinum is a rare location, with around 20 cases reported in the literature.

Methods: We describe one case of mediastinal lymphangioma with a true intrathymic localization, which to our knowledge has never been described.

Results: The gross features and microscopic findings are reported with a discussion of the clinicopathologic signatures of this pathologic entity.

Conclusions: Intrathymic lymphangioma should always be taken into consideration in the differential diagnosis of cystic mediastinal lesions in children and adult patients.

Lymphangiomas are relatively uncommon lesions of the lymphatic channels, considered by some authors as true neoplasms and by others as malformations, mostly occurring during the first 2 years of life.1 Although lymphangiomas can arise in virtually any part of the body provided by lymphatic vessels, the most common localizations are the head/neck and axilla regions, with only sporadic reports in other sites such as heart, lung, chest wall, breast, greater omentum, retroperitoneum, small bowel mesentery, colon, cauda equina, and extremities.1 The mediastinum is a rare location, with around 20 cases reported in the literature so far.2 Here we describe the first case of true intrathymic lymphangioma.

Case Report

A 66-year-old man was admitted for retrosternal chest pain. Clinical and laboratory investigations were unremarkable. Chest x-ray and computed tomography scan revealed a mass in the anterosuperior mediastinum. Smears from a fine-needle aspiration cytology were composed exclusively of several mature lymphoid elements. The mass was completely resected via a mid-sternotomy incision.

The surgical specimen was represented by the thymus, 8 cm in diameter, with a harder texture in the superior pole of the left lobe, corresponding, at cut surface, to a spongy, multicystic lesion 1.8 cm in diameter, more easily detectable after fixation in formalin, with an adjacent hemorrhagic area.

At histologic examination, the multiloculated thymic cyst was lined by flattened endothelium with no...
significant nuclear atypia and a strong positive immunoreaction for CD31 and CD34 endothelial markers. The cyst walls contained multiple smooth muscle bundles, highlighted by immunostain for desmin and smooth muscle actin. Lymphoid aggregates (Image 2B), and nerve structures, the latter easily detectable with S-100 protein immunostain. In the context of cyst walls, occasional thymic remnants were found, with Hassall corpuscles (Image 2C) and p63-positive thymic epithelial cells. The thymus proper showed features of senile involution. On the basis of the histologic and immunohistochemical findings, a diagnosis of cystic lymphangioma (CL) was made.

Discussion

Lymphangiomas are unusual vascular lesions of uncertain origin. They are generally considered vascular malformations resulting from sequestrations of lymphatic tissue that fail to communicate normally with the lymphatic system, although some studies have favored a neoplastic or hamartomatous origin. They might represent embryologic remnants of lymphatic tissue arising from either failure of connection to efferent channels or sequestration of portions of lymph sacs during development. They are usually observed at the sites of the primordial lymph sacs in fetuses, neonates, or young children. They have been described as intrauterine tumors...
Acquired lymphangiomas are described in areas of chronic lymphatic obstruction incidental to chronic infection, surgery, or radiation. The first detailed description of a lymphangioma is attributed to Redenbacker in 1828. Wernher first used the term cystic hygroma in 1843. They present as multicystic or sponge-like proliferations of well-differentiated lymphatic tissue and are classified into three pathologic subtypes: lymphangioma simplex (capillary lymphangioma), occurring as small, well-circumscribed cutaneous lesions composed of thin-walled lymphatic channels; cavernous lymphangiomas, in which thin-walled lymphatic channels are associated with stroma; and CLs (cystic hygromas), composed of large, well-circumscribed, multiloculated cystic spaces lined by endothelium with a supporting stroma rich in connective tissue. Some lesions display features of both cavernous lymphangioma and CL. The cystic spaces contain proteinaceous lymph fluid without erythrocytes. Damage resulting from surgical trauma or tissue handling during processing can cause an intralesional hemorrhage that can make the differential diagnosis with hemangioma or Kaposi sarcoma more difficult. The connective tissue stroma is composed of variable amounts of fibroblasts, spindle-shaped smooth muscle cells, lymphocytes, and collagen bundles. The presence of benign lymphoid aggregates is a distinctive

**Image 2** Histologic features. The lesion was composed of a multiloculated cyst lined by flattened endothelium, with no significant nuclear atypia. The cyst walls contained multiple smooth muscle bundles and lymphoid aggregates. In the context of cyst walls, occasional thymic remnants were found with the presence of Hassal corpuscles. (A, B, H&E, ×100; C, H&E, ×200, inset ×400).
Image 3: Immunohistochemical findings. Endothelial lining is highlighted by immunostain for CD31 (A, ×200) and CD34 (B, ×200). Immunohistochemistry for desmin (C, ×100) and smooth muscle actin (D, ×100) shows the presence of smooth muscle bundles in the cyst walls, and S-100 protein immunoreaction (E, ×200) stains some nerve structures. Remnants of thymic parenchyma are better appreciated with the p63 immunoreaction showing a nuclear positivity of thymic epithelial cells (F, ×100).
feature of lymphangiomas. The cellular components are well differentiated and do not usually show cytologic atypia.9

The most common localizations are the head/neck and axilla regions, but a small number of lymphangiomas have also been described in adult patients in locations other than the neck, such as heart, lung, chest wall, breast, greater omentum, retroperitoneum, small bowel mesentery, colon, cauda equina, extremities, and mediastinum.2

Primary lymphangiomas of the mediastinum are extremely rare, with fewer than 20 cases reported so far.10-27 They are often found incidentally as slowly growing mediastinal masses detected on chest x-rays, although large lesions in adult patients can result in chest discomfort, cough, hoarseness, chest pain, and/or dyspnea and can grow very rapidly as a result of acute hemorrhage within the lesion.

Primary CLs of the mediastinum need to be distinguished clinically from the more frequent forms of neck cystic hygromas extending into the chest wall and from very rare primary intrapulmonary or chest wall lesions. The clinicoradiologic differential diagnosis includes other intrathoracic multicystic lesions such as mature teratomas, thymic and other mediastinal cysts, and congenital cystic adenomatoid malformations of the lung.2 Surgical excision and histologic examination of the cystic lesion allow making the correct diagnosis.

The pathologic differential diagnosis of CL includes cavernous hemangiomas from which they can be readily distinguished based on the features of the cyst contents and the presence of smooth muscle and lymphoid tissue in the walls of the cystic spaces of CL. Immunoestains for vascular markers such as CD31, CD34, and factor VIII–related antigen usually decorate the endothelial cells of both hemangiomas and lymphangiomas and are not particularly helpful for their differential diagnosis. Vascular endothelial growth factor receptor 3 has been proposed as a marker of tumors with presumed lymphatic differentiation, although it can stain a subset of angiosarcomas.28

To our knowledge, an intrathymic localization of lymphangioma has never been described. In 2006, Marchevsky et al2 reported a case of giant cystic hygroma of the thymus in a child. Actually, they described a huge multicystic mass, 18 cm in diameter, involving the anterior mediastinum and approximately 80% of the left chest cavity. Thymic tissue was found in the context of the lesion, but there was no evidence the lesion represented a primary intrathymic lymphangioma rather than a large mediastinal multicystic lesion involving ab extrinseco mediastinal structures, including the thymus.

To our knowledge, our case represents the first description of true thymic lymphangioma with an unequivocal intrathymic localization. The age of the patient suggests that thymic lymphangioma can also arise in older patients with involute thymus.

In conclusion, thymic lymphangioma represents a lesion to take into consideration in the differential diagnosis of mediastinal cystic masses in all patients. It is a biologically benign benign vascular proliferation. Nevertheless, surgical excision is mandatory most times to histologically confirm the diagnosis and to prevent complications that arise from compressive effects on vital structures, since lymphangiomas may grow and surround large blood vessels, airways, and other mediastinal organs.

References


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