

## Case Reports

# Thoracic Duct Cysts of the Neck

Yadranko Ducic, MD, FRCSC, and Tom T. Gallaher, MD

Although chylous fistulae have been noted after blunt and penetrating trauma, and as a consequence of iatrogenic surgical disruption, most commonly following posterior triangle lymphadenectomy, primary nontraumatic disease is unusual.<sup>1-5</sup> Cysts of the thoracic duct have been noted primarily in the mediastinum, with only a handful of cases reported to date.<sup>6-8</sup> Cysts of the cervical portion of the thoracic duct are exceedingly rare, with only two surgically confirmed cases reported in the literature.<sup>9,10</sup> In this brief article, we will present our recent experience with a confirmed case of a supraclavicular thoracic duct cyst.

### Case Report

Patient GF is a 46-year-old Caucasian otherwise healthy male smoker (three packs per day) who presented to our clinic with a progressively enlarging, painless left supraclavicular mass of 6 months duration. According to the patient, he had recently been evaluated at another clinic, where approximately 30 mL of "cloudy" fluid had been aspirated from what was thought to be a cystic mass. The fluid was sent for cytologic analysis, which was negative for malignancy. Unfortunately, no other analysis had been performed on that fluid sample.

Initial examination in our clinic was significant only for an indiscreet fullness deep to the sternocleidomastoid muscle (SCM) in the immediate supraclavicular area on the left. Subsequent review of the computed tomography (CT) scan of the neck (performed after aspiration) revealed the presence of a 6-cm indiscreet, possibly cystic mass extending from the supraclavicular area to the level of the clavicle (Figs. 1-2). Note was



**Figure 1** Axial CT scan at level of clavicles demonstrating a right thyroid cystic lesion and an indistinct lesion posterior to medial aspect of left clavicle. (This scan was obtained after cyst decompression at another clinic.)

also made of a 2-cm cystic lesion in the right lobe of the thyroid gland. The working diagnoses included a possible carcinoma of the thyroid gland with cystic metastases versus an incidental benign intrathyroidal cyst with a lymphangioma.

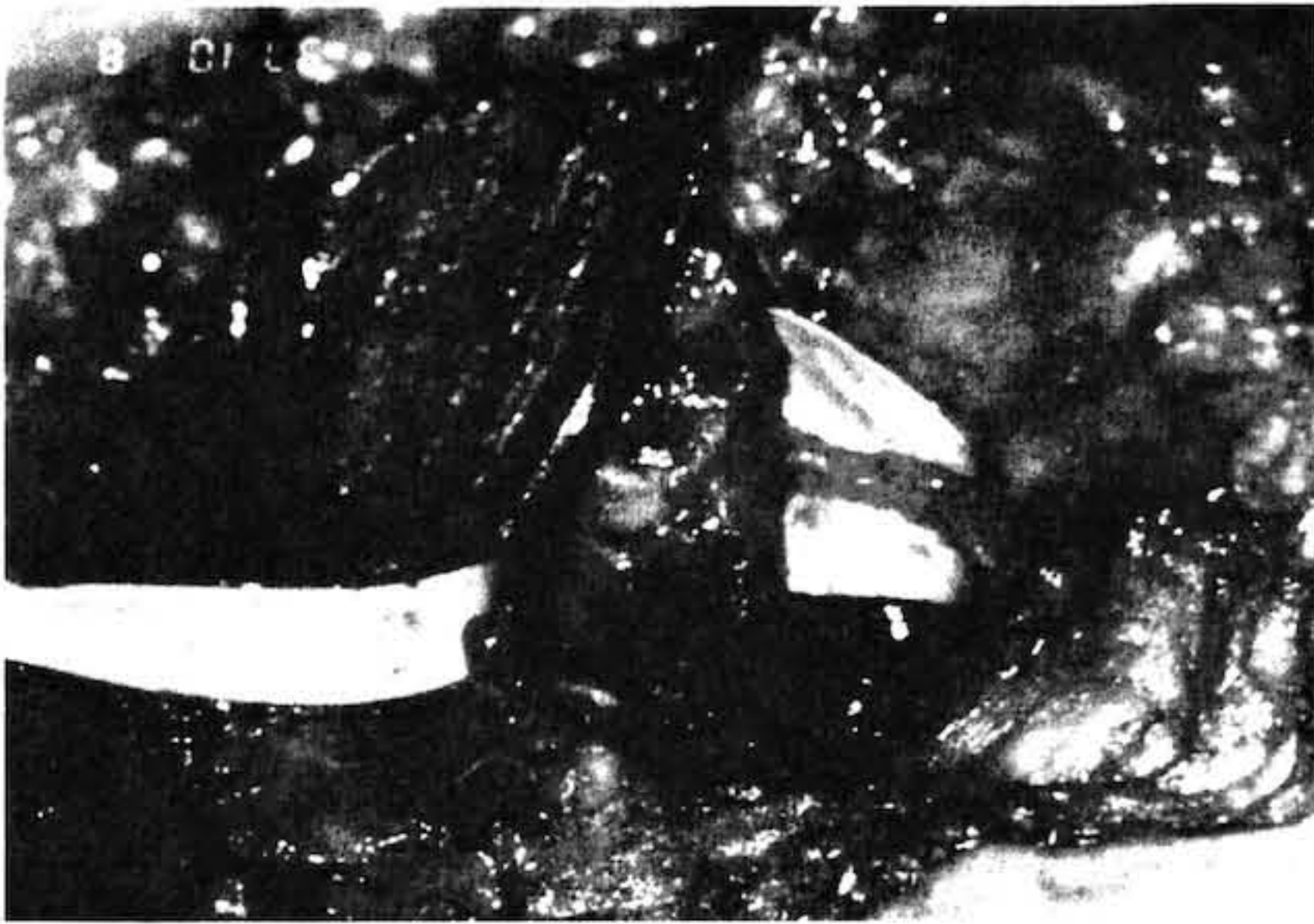


**Figure 2** Axial CT scan at a slightly more superior level demonstrating, once again, an inhomogenous, partially cystic mass posterior to the lateral aspect of the left sternocleidomastoid muscle.

Received 5/21/98. Received revised 2/8/99. Accepted for publication 2/23/99.

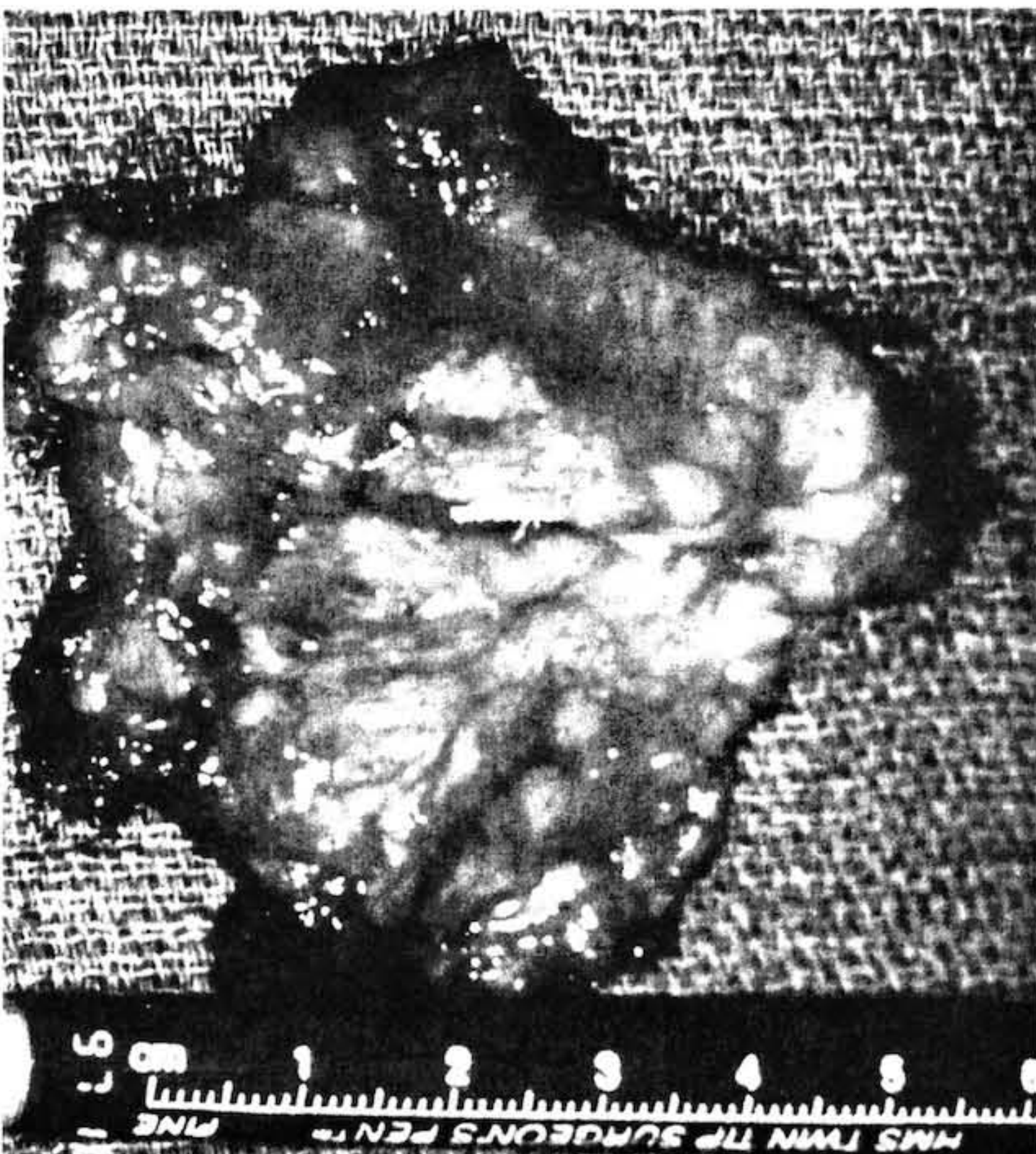
Yadranko Ducic: Department of Otolaryngology, University of Texas SouthWestern Medical Center, Dallas, Texas and the Division of Otolaryngology and Facial Plastic Surgery, John Peter Smith Hospital, Fort Worth, Texas; Tom T. Gallaher: Division of Plastic Surgery, John Peter Smith Hospital, Fort Worth, Texas.

Address reprint requests to: Dr. Yadranko Ducic, Director, Division of Otolaryngology and Facial Plastic Surgery, John Peter Smith Hospital, 1500 South Main Street, Fort Worth, TX 76104.



**Figure 3** Intraoperative view demonstrating sternocleidomastoid muscle retracted medially (to the left side of the photo) with a penrose drain, dilated thoracic duct (overlying some background material) passing into cyst, which is being retracted laterally with surgical hemostats.

Thus, the patient was brought to the operating room where an initial panendoscopy was completed to evaluate his upper aerodigestive tract mucosal surfaces. No lesions were noted. Next, a right hemithyroidectomy was performed. Subsequent pathologic analysis confirmed the presence of a focus of papillary carcinoma within the cyst wall, necessitating completion thyroidectomy. The left supraclavicular mass was exposed with an extension of the lateral aspect of the thyroidectomy incision, curving superiorly along the



**Figure 4** Thoracic duct cyst removed in toto, measuring 6 cm in greatest dimension.

posterior margin of the SCM. Subplatysmal flaps were elevated, allowing exposure and preservation of the SCM, carotid sheath, brachial plexus, spinal accessory, and phrenic nerves.

At this point, the dissection proceeded along the cyst wall, freeing it circumferentially. The dissection was not difficult. Interestingly, the inferior aspect of the cyst arose directly from the slightly dilated thoracic duct (Fig. 3). This branch was divided and oversewn with a suture ligature. Chyle was noted to be flowing freely from this branch prior to oversewing it. The cyst had a single cavity and measured approximately 6 cm in greatest dimension once it was removed from the operative field (Fig. 4).

The patient's postoperative course was uneventful. He has not had any persistence or recurrence of his pathology.

Pathologic analysis of the cyst confirmed the presence of a thin-walled true cyst lined by a single layer of flattened epithelial cells with an underlying loose fibrous stroma and occasional lymphoid inclusions (Fig. 5). There was absolutely no evidence of atypia or malignancy in any of the specimens examined.



**Figure 5** Photomicrograph of thoracic duct cyst wall demonstrating a flattened epithelial cell layer. There is a loose underlying stroma with lymphoid inclusions.

## Discussion

The thoracic duct follows a tortuous intrathoracic course after its origin at the level of the cisterna chyli in the upper abdomen. After passing deep to the brachiocephalic artery, it enters the neck on the left side, coursing between the carotid sheath and the phrenic nerve, to empty into the confluence of the internal jugular and subclavian veins. Thoracic duct anatomy is highly variable. In fact, 50% of patients have multiple ducts present.<sup>11,12</sup>

The etiology of cysts of the thoracic duct remains undetermined. They may represent a congenital weakness in the wall of the duct, or they may arise as a consequence of atherosclerotic calcification and subsequent weakening of the duct wall.<sup>13</sup> Thoracic duct cysts are rare enough that the diagnosis is usually not entertained preoperatively and is, instead, made at the time of surgical excision. Absolute pathologic confirmation is often difficult to make, with a differential diagnosis of lymphangioma, branchial cyst, or parathyroid cyst. However, as in the reported case, diagnosis is typically suspected intraoperatively by noting the cyst to be arising directly from a dilated thoracic duct or one of its tributaries. Computed tomography (CT) scanning is useful in the delineation of most cervical masses. In the case of thoracic duct cysts, it allows for the determination of the degree of retrosternal extension. Histochemical analysis of a fine-needle aspirate of these lesions would note an increased triglyceride concentration as compared to serum.<sup>14</sup> Lymphangiography may also be useful in both the diagnosis and localization of these cysts.<sup>15</sup>

It is not known what, if any, long-term problems would be associated with simple expectant management of thoracic duct cysts. An increased awareness of this entity, coupled with suggestive ancillary investigations, may allow for simple observation as a reasonable alternative to surgery. However, the literature supports the fact that there has been no recurrence of thoracic duct cysts of the mediastinum or neck after surgical excision.<sup>6,8-10,13</sup> Thus, we would recommend surgical removal at this time. Careful localization and preservation of the vital neurovascular structures present in the supraclavicular area are facilitated by broad field exposure. Suture ligation of the thoracic duct attachment to

the cyst should be performed only once the duct has been clearly identified and isolated. Such a strategy should be associated with no significant morbidity in experienced hands.

## References

1. Postma GN, Keyser JS. Management of persistent chylothorax. *Otolaryngol Head Neck Surg* 1997; 116:268-270.
2. Butscher K, Charpentier C, Audibert G, et al. Chylothorax following closed thoracic injury. *Ann Fr Anesth Reanim* 1996; 15:186-188.
3. Whiteford MH, Abdullah F, Vernick JJ, Rabinovici R. Thoracic duct injury in penetrating neck trauma. *Am Surg* 1995; 61:1072-1075.
4. Pollack CV, Kolb JC, Griswold JA. Chylous drainage from a stab wound to the neck. *Ann Emerg Med* 1990; 19:1450-1453.
5. Rodier JF, Issert B, Gadonneix P, et al. Injuries of the thoracic duct during neck surgery. *J Chir (Paris)* 1986; 123:729-732.
6. Tsuchiya R, Sugiura Y, Ogata T. Thoracic duct cyst of the mediastinum. *J Thorac Surg* 1980; 79:856-859.
7. Morietta LB, Allen TE. Thoracic duct cyst: diagnosis with needle aspiration. *Radiology* 1986; 161:437-438.
8. Cohen EB, Kompaniez E. Supradiaphragmatic thoracic duct cyst. *N Engl J Med* 1962; 266:1319-1321.
9. Barlow D, Gracey L. Cystic dilation of the thoracic duct. *Br J Clin Pract* 1965; 19:101-102.
10. Wax MK, Treloar ME. Thoracic duct cyst: an unusual supraclavicular mass. *Head Neck* 1992; 14:502-505.
11. Van Mulders A, Lacquet LM, Van Mieghem W, Deneffe G. Chylothorax complicating pneumonectomy. *Thorax* 1984; 39:954-955.
12. Sachs PB, Zelch MG, Rice TW, et al. Diagnosis and localization of the thoracic duct: usefulness of lymphangiography and CT. *AJR Am J Roentgenol* 1991; 157:703-705.
13. Luosto R, Koikkalainen K, Jyrälä A, Mäkinen J. Thoracic duct cyst of the mediastinum. *Scand J Thor Cardiovasc Surg* 1978; 12:261-263.
14. Kassel RN, Haves TE, Gullane PJ. The age of topical tetracycline in the management of persistent chylous fistulae. *J Otolaryngol* 1987; 16:174-178.
15. Lopez OL, Rodriguez Maisano E, Deleveaux JL. Thoracic duct malformation lymphoscintigraphic diagnosis. *Clin Nucl Med* 1986; 11:479-481.