

TECHNICAL NOTE

Thymectomy and transpericardial nodal dissectionDomenico Galetta¹ & Lorenzo Spaggiari^{1,2}¹ Division of Thoracic Surgery, European Institute of Oncology, Milan, Italy² Department of Health Sciences, University of Milan, Milan, Italy**Keywords**

Mediastinum; neuroendocrine thymic tumor; thymectomy.

Correspondence

Domenico Galetta, Division of Thoracic Surgery, European Institute of Oncology, Via Ripamonti, 435 Milan, Italy.

Tel: +39 02 5748 9801

Fax: +39 02 9437 9218

Email: mimgaletta@yahoo.com

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Thoracic Cancer **6** (2015) 375–377**Abstract**

Neuroendocrine thymic tumors (NETTs) are rare neoplasms. Surgical resection of the tumor and the involved lymph node remains the treatment of choice. We describe the surgical technique adopted in a patient with preoperative diagnosis of thymic malignant tumor and subcarinal nodal involvement. Through a median sternotomy, an extended thymectomy was performed as a first step. Then, through the transpericardial approach (opening of the anterior and posterior pericardium and isolation of ascending aorta, superior vena cava, and main right pulmonary artery), mediastinal nodal dissection (#2R, #4R, #4L, #5 and #7) was performed. Definitive pathology showed a NETT without nodal involvement. The patient received adjuvant chemotherapy, and is alive without disease 19 months after the surgery. Complete surgical excision and adjuvant therapy appears to offer the best hope for prolonged survival for NETTs. The surgical technique should be individualized according to tumor location. Thoracic surgeons should be familiar with this technique, which provides a good technical and oncological result.

Introduction

Neuroendocrine thymic tumors (NETTs) are an extremely rare malignancy and no standard treatment has been established.¹ Compared with other neuroendocrine tumors, those of thymic origin more often exhibit malignant features and have a higher rate of metastatic disease.² Approximately half of the patients with NETT have lymph-node metastases at the time of surgical resection; however, this condition has not been found to be associated with poor prognosis.³ Nevertheless, extensive lymph node dissection, that is, dissection of more than 10 lymph nodes, has recently been advocated to accurately predict prognosis.⁴ Resection remains the gold standard for treatment of thymic tumors compared with non-surgical options, showing a statistically significantly better rate of survival ($P < 0.005$) according to Surveillance, Epidemiology and End Results database analysis.⁵

Median sternotomy is the optimal surgical approach for the resection of thymic tumors. In some instances, other approaches may be used: anterior, lateral, or posterolateral thoracotomy may be used alone or in combination with sternotomy if the tumor extends laterally or if there is major invasion of the lungs, providing excellent exposure. Herein, we report the case of a patient with NETT successfully treated with radical surgical resection of the tumor and the involved

lymph nodes through one-stage transsternal thymectomy and transpericardial mediastinal nodal dissection. Herein we describe the surgical technique.

Case description and surgical technique

A 66-year-old woman presented with fever and a dry cough, and chest roentgenogram revealed a left lateral mediastinal mass. Chest computed tomography (CT) showed an anterior mediastinal tumor associated with other thymic nodules (Fig 1a) and subcarinal nodal enlargement (Fig 1b). Fluoro-2-deoxyglucose positron-emission tomography (FDG-PET) showed significant FDG uptake of the thymic lesion (Fig 1c) and the subcarinal node (Fig 1d). As mediastinal lymphoma was suspected, a fine-needle biopsy was performed revealing a malignant thymic neoplasm without other specific features. Thus, a trans-carinal nodal biopsy was performed and revealed no nodal tumor localization. The multidisciplinary decision was to perform a one stage extended thymectomy associated with a mediastinal nodal dissection.

Double-lumen intubation was used. The patient was positioned supine. After routine preparation and draping, an extended thymectomy was performed as a first step through a standard full median sternotomy. After the mobilization of

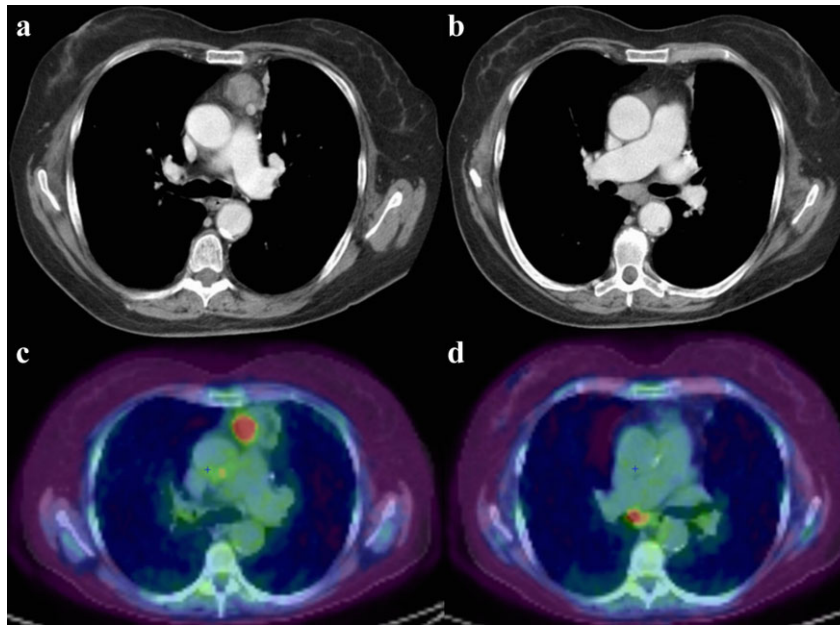


Figure 1 Radiographic images before surgical treatment. Chest computed tomography scan showing (a) the anterior mediastinal tumor, and (b) the subcarinal enlarged lymph-node. Positron emission tomography scan showing significant uptake (c) in the tumor, and (d) in the subcarinal lymph-node.

the left brachiocephalic vein and the superior vena cava, upper right paratracheal nodal dissection (#2R) (Fig 2a) and lower right paratracheal dissection (#4R) (Fig 2b) were accomplished. The anterior pericardium was then longitudi-

nally opened between the ascending aorta and the diaphragm. After the mobilization of the aorta on the left side and retraction of the superior vena cava on the right side, the posterior pericardium was vertically opened to ensure satis-

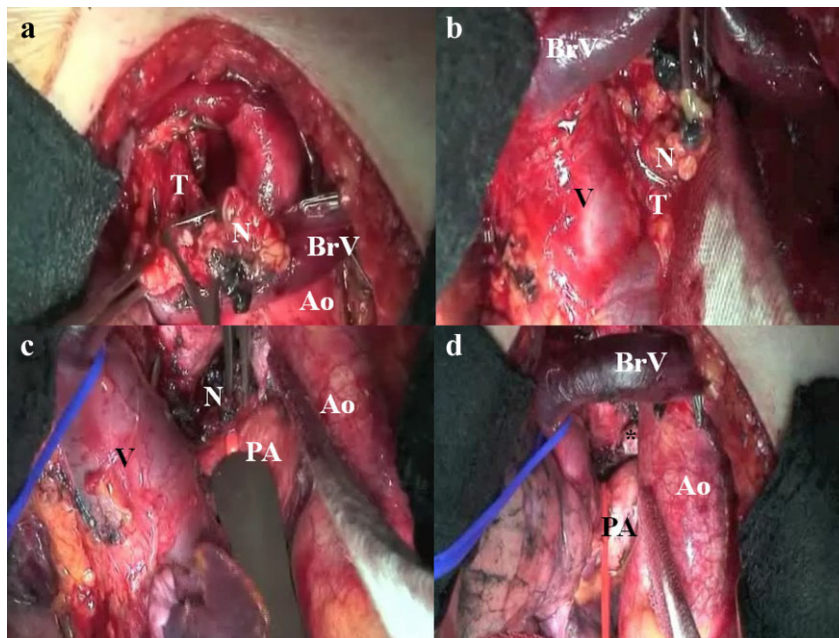


Figure 2 Intraoperative view of the mediastinal lymph-node dissection: (a) upper right paratracheal nodal (#2R); (b) lower right paratracheal dissection (#4R); (c) subcarinal node (#7); and (d) lower left paratracheal (#4L) dissection. T, trachea; N, node; BrV, brachiocephalic vein; Ao, ascending aorta; V, superior vena cava; PA, right main pulmonary artery; *, #4L node.

factory exposure of the trachea, after which bifurcation was possible. Care was taken to avoid injury to the left recurrent nerve. The right main pulmonary artery was isolated, mobilized, and inferiorly retracted to affect better exposure of the subcarinal space. The subcarinal node (#7) (Fig 2c) was completely removed, followed by the removal of the lower left paratracheal (#4L) (Fig 2d) and aortic-window (#5) nodes. A single anterior mediastinal drain was inserted. The sternotomy was conventionally closed with five absorbable stitches. The total surgical time was 240 minutes. During the procedure no intraoperative complications were observed. The postoperative period was uneventful and the patient was discharged five days after surgery. Definitive pathology showed a NETT without nodal involvement. The patient received adjuvant chemotherapy, and is alive without disease 19 months after surgery.

Discussion

Median sternotomy is often the most versatile approach for patients with mediastinal resectable diseases because it provides exposure to the upper visceral mediastinum, anterior mediastinum, both lungs, and pulmonary hilum. The anterior transpericardial approach to access the mid visceral mediastinum is particularly beneficial in patients with multiple sites of mediastinal disease in order to be able to remove all possible disease in one procedure and avoid the need for an additional right thoracotomy or thoracoscopic approach.

The technique of a transsternal transpericardial approach was first reported by Abruzzini⁶ and Perelman and Ambatjello⁷ for the closure of chronic bronchopleural fistula following pneumonectomy. This technique was also used for the treatment of acute descending necrotizing mediastinitis,⁸ and for the exposure of the distal part of the esophagus and descending thoracic aorta.⁹ In our experience, we have used this technique both for the closure of a left bronchopleural fistula and for the resection and reconstruction of the carina (one case each). We have found this approach simple and effective, allowing us to reach and remove all of the mediastinal nodes with a complete surgical radicality, along with radical thymectomy.

In light of the pathological evidence in this specific case, we think that more confidence should be given to endobronchial ultrasound results. This could avoid an extended resection and possible related complications.

In conclusion, the technique of a transsternal transpericardial approach provides adequate exposure to perform one-stage thymic tumors and mediastinal node resection. In addition to providing access to the carina, subcarinal space, and retropericardial collection, this transsternal transpericardial approach should be considered for the resection of tumors, cysts, and residual adenopathy located in the retrocardiac mediastinal space. For these reasons, this technique should be placed in the armamentarium of all thoracic surgeons as a useful and effective surgical approach.

Disclosure

No authors report any conflict of interest.

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