PMB - Atti della Accademia Peloritana dei Pericolanti
Classe di Scienze Medico Biologiche
Vol. 109(2) 2021

ISSN 1828-6550

DOI: 10.13129 / 1828-6550 / APMB.109.2.2021.CCS2

Clinical Case Seminar **CCS2 (1-5)**

A case of thymoma mimicking an intra-thoracic thyroid nodule

Cristina Pizzimenti, Giovanni Tuccari, Antonio Ieni, Francesca Mazzeo, Rosaria M Ruggeri, Gianlorenzo Dionigi, Guido Fadda

Department of Biomedical, Dental, Morphological and Functional Imaging Sciences Department of Human Pathology in Adult and Developmental Age "Gaetano Barresi" University of Messina, Messina, Italy

Abstract

Thymomas are rare malignant tumour of the superior and anterior mediastinum. We report the case of a 77-year-old woman with a mediastinal nodule of uncertain origin. The clinical history of the patient and the imaging findings were suggestive of a lesion of thyroid origin. Histological and immunohistochemical analysis led to a histological diagnosis of thymoma with microscopic invasion of the surrounding tissue

Key Word: thymoma, mediastinal masses, ectopic thyroid goiter, differential diagnosis

Introducing Member: Guido Fadda
Corresponding Author: Cristina Pizzimenti - cristina.pizzimenti@unime.it

Introduction

Thymomas are rare tumours, comprising about 0,2-1,5% of all malignancies and occurring mostly in the fourth-sixth decade of life[1,2]. They are slow growing tumours usually located in the anterior mediastinum, typically composed by a mix of neoplastic epithelial cells originating from thymic tissue and non-neoplastic immature T-lymphocytes. Thymomas are frequently associated with neuromuscular disorders such as myastenia gravis, or with symptoms due to compression or invasion of adjacent structures (shortness of breath, wheezing, superior vena cava syndrome, etc.), but they can be asymptomatic and incidentally detected during imaging work-up. Due to the rarity and localization of these tumours, differential diagnosis between thymomas and other lesions of this region can be difficult, and their identification and staging can be particularly challenging. Imaging and histological examination are fundamental tools for an accurate diagnosis and the assessment of the extent and invasion of these tumours play a central role for the prognosis of these patients[3].

We report a case of a thymoma extended to the lower neck region mimicking an intrathoracic thyroid nodule, in a patient with history of thyroid surgery for hyperplastic goiter.

Case Presentation

A 77-year-old woman underwent total thyroidectomy in 2016 for hyperplastic goiter with colloid aspects and pseudo-glandular hyperplasia and she has been followed for therapy by the endocrinology department since then.

An ultrasound scan in 2019 revealed a hypoechoic, residual bilateral thyroid tissue; a further ultrasound scan in September 2020 confirmed the residual tissue contiguous to a hypoechoic nodular area with polycyclic outline whose lower margin deepens beyond the jugular notch.A subsequent neck/superior mediastinum computed tomography (CT) confirmed the presence of a voluminous nodular formation (size mm 45x40) located in the inferior part of the neck deepening in the upper mediastinum for approximately 50 mm, dislocating trachea and oesophagus. Finally, a thyroid scintigraphy demonstrated the presence of a non-enhanced nodule beside the enhanced residual thyroid tissue.In January 2021, the patient underwent to surgery for the removal of the lesions. Histological sections revealed a multinodular neoplastic proliferation represented by a solid pattern of epithelial and spindle cells, subdivided by fibrous septa, dislodging the large vessels, and infiltrating the surrounding tissue. Moreover, the lesion showed scarce lymphoid elements and a low mitotic count (<2/10hpf) (Fig.1). Neoplastic elements were strongly positive for CK7, CK5/6, and p63, whereas lymphoid elements were positive for CD5, CD1a and, CD99 (Fig.2). On the light of histopathological and immunohistochemical findings, the final diagnosis was type 3B thymoma, Stage IIb sec. Masaoka/Koga staging system, pT2 sec. IASCL/ITMIG (2015).

Fig.1 Neoplastic proliferation of epithelial spindle cells with solid architecture. (a) Areas of cystic differentiation; (b) Solid patter with fibrous septa; (c) Clusters of immature T-cells lymphocytes; (d) Invasion of the peritumoral adipose tissue. (a,b: H-E stain, original magnification X4; c,d: H-E stain, original magnification X10)

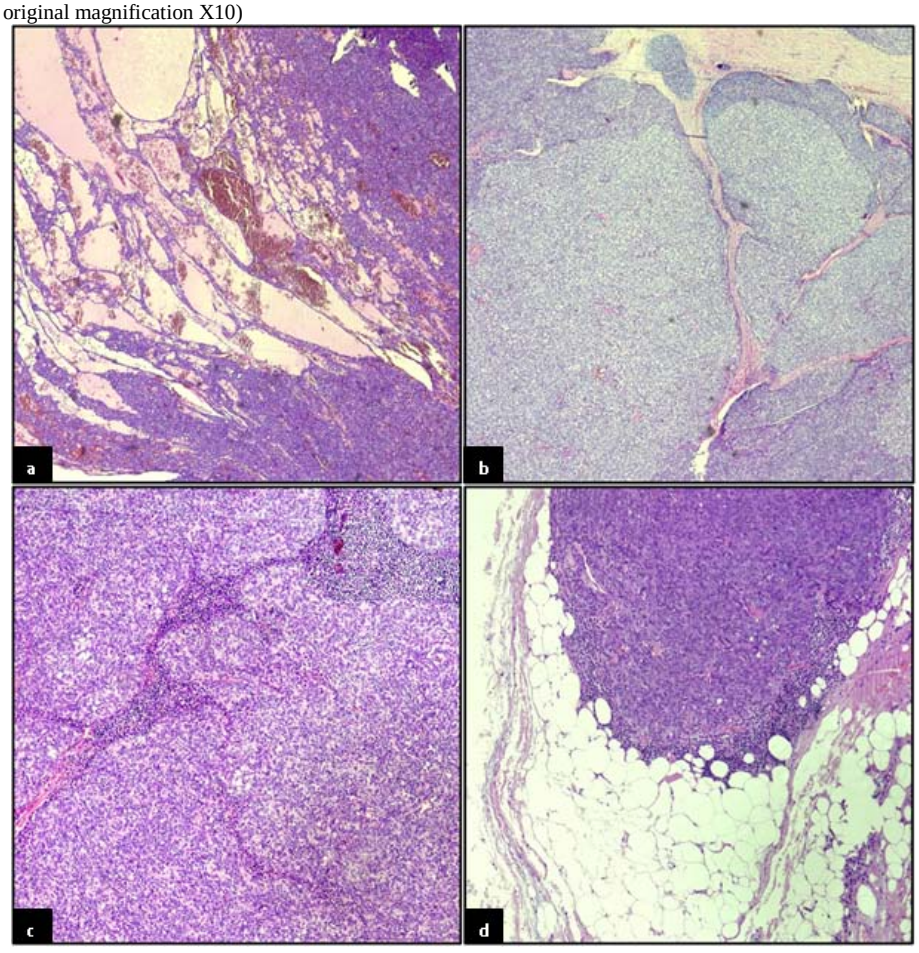
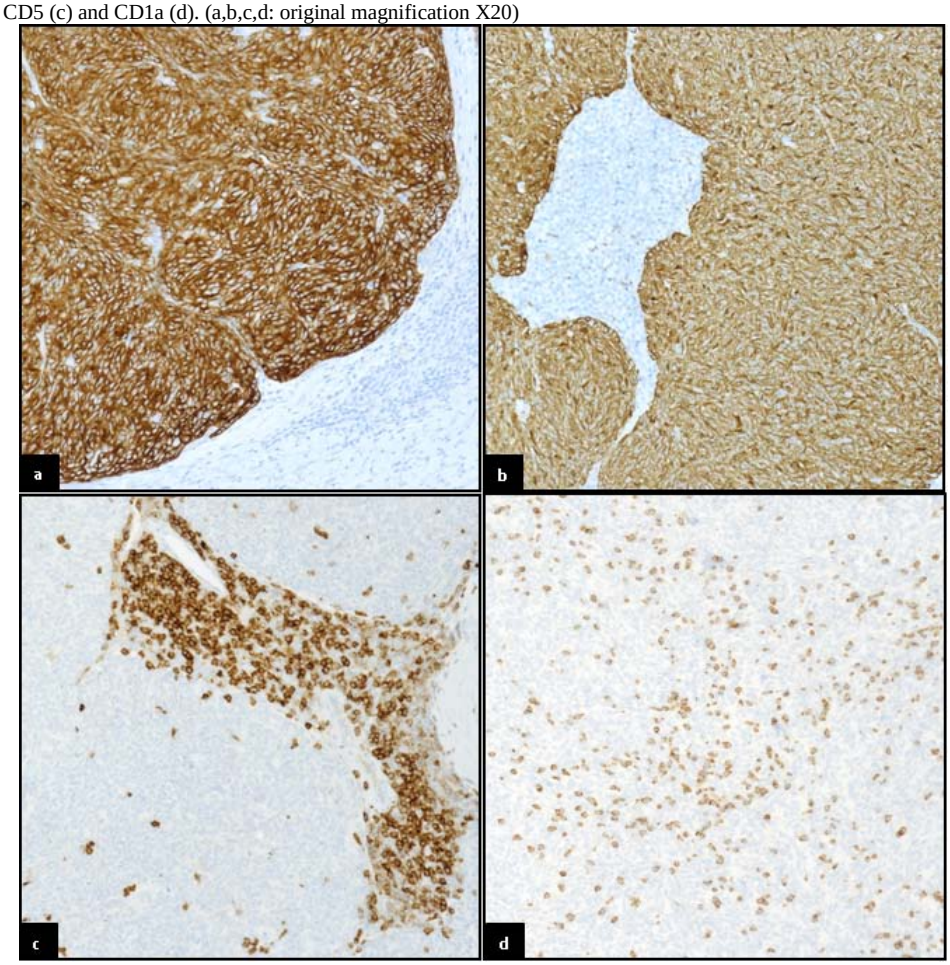


Fig.2 Neoplastic epithelial cells positive for CK7 (a) and CK5/6(b); Immature T-cells lymphocytes positive for CD5 (c) and CD1a (d). (a,b,c,d: original magnification X20)



Discussion

The anterior-superior mediastinum is the location of a variety of tumours that differ from each other by cell composition, prognosis, diagnostic process, and therapeutic approach.Thymomas are the most common lesions of the anterior mediastinum, accounting for approximately the 50% of the masses of this region and the 20% of all mediastinum tumours[4]. They originate from the neoplastic transformation of the epithelial cells of the thymic gland admixed to a variable amount of immature non-neoplastic T-lymphocytes. Thymomas have a wide spectrum of histology diversity and are classified based on cell type predominance. Primary lymphomas represent nearly 20% of the anterior mediastinal tumours with a predominance of Hodgkin lymphoma of 50-70%[5].Goiter accounts up to the 15% of the mediastinal masses in patients who underwent thyroidectomy with a latency period before its onset up to 40 years after the surgery. It can arise from autonomously functioning residual or ectopic thyroid tissue[6]. Teratomas represent the 15% of all the mediastinal masses and originate from the failed migration of germ cells during the embryonal development.More uncommon mediastinal masses are represented by parathyroid adenomas, neuroendocrine tumours, or metastasis[5,7]. Differential diagnosis of the variouslesions localized in this anatomical region is guided by clinical and pathological parameters (age, gender, associated symptoms), and imaging exams of the patient[3]. For example, teratomas and other germ cell tumours affect mainly young adult males and the

measurement serum tumour marker levels of alpha fetoprotein (αFP) and the beta subunit of human chorionic gonadotropin (βHCG) is important to the diagnosis. Goiter and other thyroid lesions involving the anterior mediastinum are usually identified on CT scan as contiguous with the thyroid gland. Lymphomas occur mainly in younger patients and usually with different symptoms compared to the thymoma ones, such as night sweats, fever, and/or weight loss. CT scans could be suggestive as well as adenopathies that could be revealed during the physical examination. Anyway, however suggestive these diagnostic procedures can be, biopsy is required to establish the definitive diagnosis[3].

Our case concerned a woman with a history of total thyroidectomy for hyperplastic goiter, with no symptoms and ultrasound and CT scans showing a nodular mass in the lower neck region deepening in the mediastinum suggesting a thyroidal pathology such as goiter or a primary thyroidal neoplasia. Eventually, histopathological and immunohistochemical examinations revealed the presence of a thymoma of the upper anterior mediastinum invading the surrounding tissue and extended to the lower cervical area.

There are many classifications regarding epithelial tumours originating from the thymus.

Tab.1 The 2015 World Health Organization (WHO) classification of thymoma: morphological features and overall survival[8]

Subtype	**Morphology**	**OverallSurvival**
Type A	Neoplastic spindle or ovoidal epithelial cells Absent or scarce immature T-lymphocytes Variety of architectural patterns	~100%
Type AB	Neoplastic spindle or ovoidal epithelial cells Abundant intratumoral or focal immature T-lymphocytes	80-100%
Type B1	Lobular thymus-like architecture with abundant immature T-lymphocytes Scarce, individual neoplastic polygonal epithelial cells	85-100%
Type B2	Lobular thymus-like architecture with abundant immature T-lymphocytes Increased number of neoplastic polygonal epithelial cells in small clusters	70-90%
Type B3	Solid architecture with poorly circumscribed margins Sheets of neoplastic polygonal epithelial cells Scarce or absent immature T-lymphocytes	50-70%
Thymic carcinoma	Neoplastic epithelial cells withfeatures of malignancies Scarce or absent T- and B-lymphocytes	57-65%

The World Health Organization (WHO) histological classification system subdivides thymic epithelial tumours in 6 groups: Type A, AB, B1, B2, B3 and thymic carcinoma based on the amount of neoplastic

epithelial cells, their architecture and grade of atypia, and the lack or presence of immature T-lymphocytes[7,8](Tab.1). The modified Masaoka-Koga staging system[1,10] and the TNM-based staging system (IASCL/ITGMIG)[1,11] take into consideration the extension and spreading of these tumours to the adjacent structures, subdividing these tumours into 4 stages. It is known that prognosis depending on anatomical extension and invasion, histological features, and complete resection of these tumours. Tumours that progress from type A to carcinoma or from stage I to IV, or tumours who are not completely resected, show a progressive poor prognosis, from >80% 10-years survival rate for Type A and AB or stage I-II tumours to approximately 50% 10-years survival rate for carcinoma or stage IV tumours[3,10].

Conclusion

The present case highlights the importance of the differential diagnosis of the anterior mediastinal masses through the study of the clinical history of the patients, imaging, histological, and immunohistochemical findings since their heterogeneity may lead to different diagnostic and therapeutic approaches

Conflicts of interest: The authors declare no conflict of interest.

References

1. Markowiak, T., Hofmann, H.S., Ried M. (2020). Classification and staging of thymoma. J Thorac Dis, 12(12):7607–12. doi: 10.21037/jtd-2019-thym-01
2. Engels, E.A. (2010). Epidemiology of thymoma and associated malignancies. J Thorac Oncol, 5 (10 Suppl 4):S260-5. doi: 10.1097/JTO.0b013e3181f1f62d.
3. Scorsetti, M., Leo, F., Trama, A., D'Angelillo, R., Serpico, D., Macerelli, M., Zucali, P., Gatta, G., Garassino, M.C. (2016). Thymoma and thymic carcinomas. Crit Rev Oncol Hematol, 99:332-50. doi: 10.1016/j.critrevonc.2016.01.012
4. Duwe, B.V., Sterman, D.H., Musani, A.I. (2005) Tumors of the mediastinum. Chest, 128(4):2893-909. doi: 10.1378/chest.128.4.2893.
5. Patel, K.M., Parsons, C.C. (2016) Forgotten goiter: Diagnosis and management. A case report and literature review. Int J Surg Case Rep, 27:192-194. doi: 10.1016/j.ijscr.2016.08.036.
6. Juanpere, S., Cañete, N., Ortuño, P., Martínez, S., Sanchez, G., Bernado, L. (2013) A diagnostic approach to the mediastinal masses. Insights Imaging, 4(1):29-52. doi: 10.1007/s13244-012-0201-0.
7. den Bakker, M.A., Roden, A.C., Marx, A., Marino, M. (2014). Histologic classification of thymoma: a practical guide for routine cases. J Thorac Oncol, 9(9 Suppl 2):S125-30. doi: 10.1097/JTO.0000000000000297.
8. Marx, A., Chan, J.K., Coindre, J.M., Detterbeck, F., Girard, N., Harris, N.L., Jaffe, E.S., Kurrer, M.O., Marom, E.M., Moreira, A.L., Mukai, K., Orazi, A., Ströbel, P. (2015) The 2015 World Health Organization Classification of Tumors of the Thymus: Continuity and Changes. J Thorac Oncol, 10(10):1383-95. doi: 10.1097/JTO.0000000000000654.
9. Detterbeck, F.C., Nicholson, A.G., Kondo, K., Van Schil, P., Moran, C. (2011) The Masaoka-Koga stage classification for thymic malignancies: clarification and definition of terms. J Thorac Oncol, 6(7 Suppl 3):S1710-6. doi: 10.1097/JTO.0b013e31821e8cff.
10. Ried, M., Eicher, M.M., Neu, R., Sziklavari, Z., Hofmann, H.S. (2017). Evaluation of the new TNM-staging system for thymic malignancies: impact on indication and survival. World J Surg Oncol. 2017 Dec 2;15(1):214. doi: 10.1186/s12957-017-1283-4.

Communicated and Received May 20, 2021, revised August 3, 2021 accepted August 5, 2021 published on line August 26, 2021