Micronodular Thymoma with Lymphoid Stroma: A Case Report

Takehiro TSUCHIYA, Atsushi SANO and Mitsuaki KAWASHIMA

Department of Thoracic Surgery, Chigasaki Municipal Hospital

(Received January 20, 2021; Accepted March 5, 2021)

Background: Micronodular thymoma with lymphoid stroma (MNT) is a rare subtype of thymic neoplasms. Therefore, clinical guidelines, histopathological diagnostic criteria, prognostic factors, and therapeutic regimens have not been established.
Case presentation: A 69-year-old woman was admitted to our hospital because of an abnormal shadow detected by chest radiography. Further imaging revealed an anterior mediastinal tumor measuring 65 × 28 × 15 mm. We performed thymectomy for diagnosis and treatment. Histopathological examination revealed spindle cells comprised multiple micronodules separated by abundant interstitial lymphocytes and lymphoid follicles. Immunohistochemical staining showed that the tumor was positive for cell adhesion molecule (CAM), cytokeratin (CK) 5/6, and terminal deoxynucleotidyl transferase. The histopathological diagnosis was MNT and the stage was I by the World Health Organization classification. The patient remained free of recurrence for seven years after surgery.
Conclusion: When the lesion is completely resected, MNT has a good prognosis. Therefore, MNT is considered to be a borderline tumor with good prognosis and no reports of recurrences, distant metastasis, or tumor-related deaths exist thus far. However, preoperative diagnosis is difficult in most cases. Hence, complete surgical resection is recommended for suspicious mediastinal masses, if feasible, for both accurate diagnosis and to ensure long-term survival.

Key words: Mediastinal tumor, Thymoma, Thymic carcinoma, Thymus, Surgery

INTRODUCTION

Micronodular thymoma with lymphoid stroma (MNT) is a rare subtype of thymic neoplasm that accounts for just around 1% of all thymoma cases [1]. Therefore, clinical guidelines, histopathological diagnostic criteria, prognostic factors, and therapeutic regimens have not been established. Herein, we report a case of MNT.

CASE PRESENTATION

A 69-year-old woman was admitted to our hospital because of an abnormal shadow detected on chest radiography. Chest computed tomography (CT) revealed an anterior mediastinal mass measuring approximately 65 × 25 × 15 mm (Fig. 1A). The tumor showed low signal intensity on T1-weighted magnetic resonance images, and slightly high signal intensity on T2-weighted images (Fig. 1B, C). It was difficult to differentiate between benign and malignant tumors. Hence, we performed thymectomy for diagnosis and treatment. The tumor was encapsulated, and the nodule measured 65 × 28 × 15 mm (Fig. 2A). The cut surfaces was firm-to-hard to touch and had tan-colored tissue (Fig. 2B). Pathological examination revealed spindle cells comprising multiple micronodules separated by abundant interstitial lymphocytes and lymphoid follicles with germinal centers and variable numbers of plasma cells. (Fig. 3A). Immunohistochemical staining showed that the tumor was positive for CAM, CK5/6, and terminal deoxynucleotidyl transferase (TdT) (Fig. 3B, C, D). The pathological diagnosis of the tumor was MNT and the stage was I according to the World Health Organization (WHO) classification [1]. The patient remained free of recurrence for 7 years after surgery.

DISCUSSION

MNT is more common in men than in women, with a male-to-female ratio of 1.3:1 [2]. Affected patient ages range from 41 to 80 years with a median patient age of 64 [3]. Patients are usually asymptomatic. Hence, in most cases, the tumor is an incidental radiographic finding. However, the CT appearance of MNT overlaps with the imaging features of other thymic neoplasms [4]; therefore, surgery is the first choice for diagnosis and treatment. Pathologically, MNT is characterized by multiple small, discrete, solid nests or cords of tumor cells, separated by an abundant lymphoid stroma that usually contains lymphoid follicles with or without germinal centers and variable numbers of plasma cells. The epithelial component in MNT stains positive for pancytokeratin, CK5/6, and CK19, but typically lacks CD20 expression. The lymphoid stroma usually harbors a population of TdT-positive immature T cells in the vicinity of the tumor nodules [1].

In addition, previous report has shown that many Langerhans cells are present within small solid nests. It is therefore hypothesized that lymphoid follicle formation results from the host immune response to tumor antigens. Thus, the immune response induced by

Takehiro TSUCHIYA, Department of Thoracic Surgery, Chigasaki Municipal Hospital, Honson 5-15-1, Chigasaki, Kanagawa 253-0042, Japan
Tel: +81-467-52-1111 Fax: +81-467-54-0770 E-mail: tatsuchiya-ths@umin.ac.jp

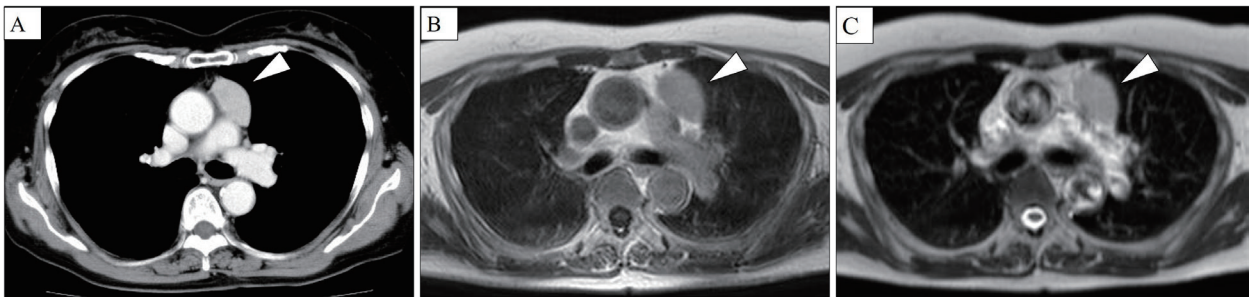

Fig. 1 A: Chest computed tomography shows an anterior mediastinal tumor (arrowhead).
B: A T1-weighted image in the axial plane shows a mass with low signal intensity (arrowhead).
C: A T2-weighted image in the axial plane shows high signal intensity (arrowhead).

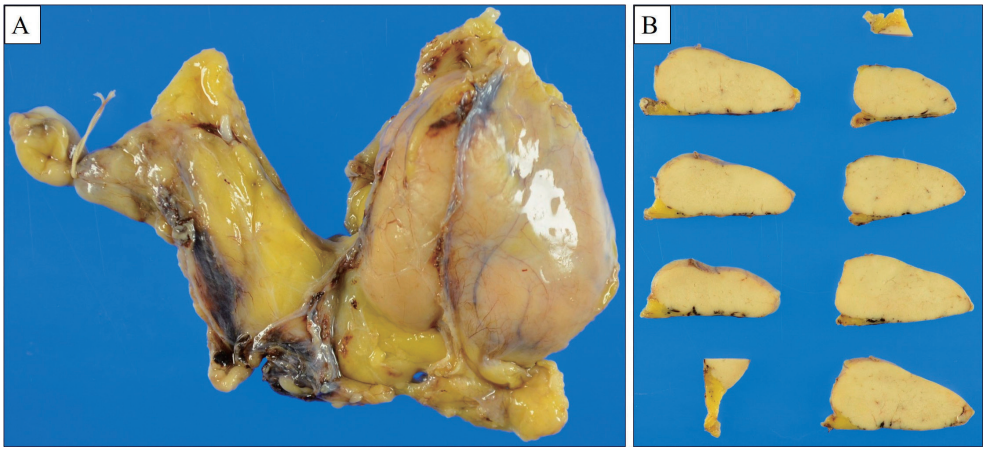

Fig. 2 Resected specimens of the thymic tumor.
A: The tumor was encapsulated and the nodule measured 65 × 28 × 15 mm.
B: The cut surfaces show a firm-to-hard lesion composed of tan-colored tissue.

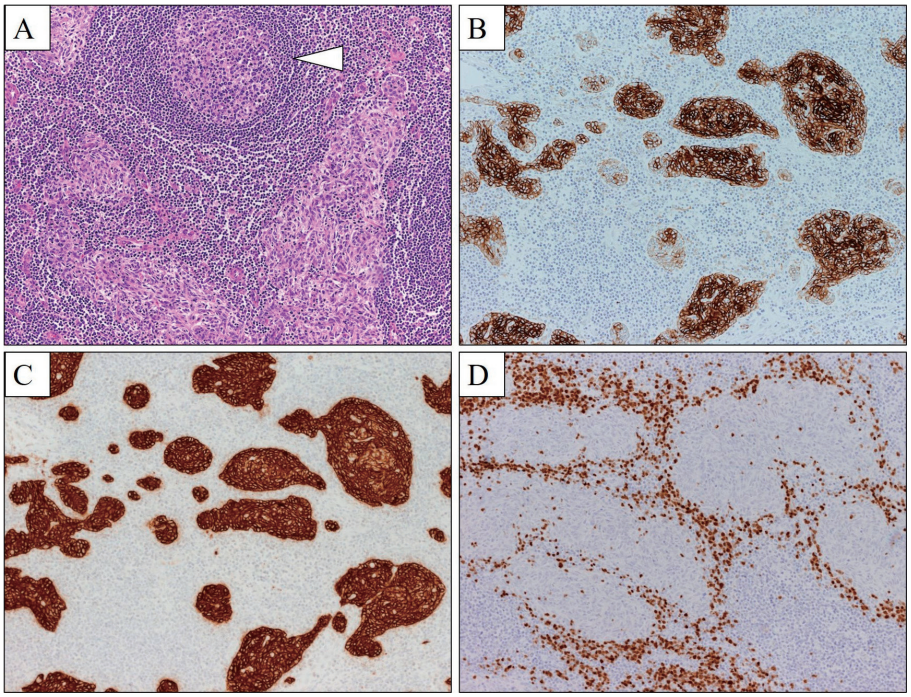

Fig. 3 Pathological findings of the resected specimens.
A: Pathological examination revealed spindle cells forming multiple micronodules separated by abundant interstitial lymphocytes and lymphoid follicles with germinal centers (arrowhead) and variable numbers of plasma cells. Hematoxylin and eosin stain, original magnification × 10.
B: The epithelial component was positive for CAM. Original magnification × 10.
C: The epithelial component was positive for CK5/6. Original magnification × 10.
D: The lymphoid stroma typically harbors a population of TdT-positive immature T cells in the vicinity of the tumor nodules. Original magnification × 10.

intratumorale MNT Langerhans cells may be involved in favorable clinical behavior [5]. In fact, a clinical feature of MNT is its slow growth, with approximately 95% of cases being pathological stage I or II according to the WHO classification at the time of diagnosis [6], which was true in our case. With regard to prognosis, the International Thymic Malignancy Interest Group database shows recurrence rates at 5 and 10 years after complete resection at around 5% and 9%, respectively [6]. One publication described a case of MNT that regrew after incomplete resection 10 years earlier [7], but there have been no reports of recurrence, distant metastasis, or tumor-related deaths when MNT is completely resected.

Hence, pathological differentiation is important. The differential diagnoses were thymic follicular hyperplasia, type AB thymoma, and micronodular thymic carcinoma with lymphoid hyperplasia. Crucial for differentiation, thymic follicular hyperplasia shows lymphoid follicles in the medulla and perivascular spaces. Next, type AB thymoma is composed of spindle cells in variable lymphocyte-rich and lymphocyte-poor areas. Lymphocyte-rich areas invariably contain abundant keratin-positive epithelial cells. Finally, the tumor cells of thymic carcinoma demonstrate high-grade cytological atypia, and immature T cells are absent [1, 8]. With regard to prognosis, thymic carcinoma in particular, is likely to have a poor outcome and it has been recently suggested that type AB thymoma with epithelioid cellular morphology may be associated with a higher risk of recurrence [9]. On the other hand, MNT is considered to be a borderline tumor with good prognosis, with no reports of recurrence, distant metastasis, or tumor-related deaths. When the lesion is completely resected, micronodular thymoma with lymphoid stroma has a good prognosis. Hence, care should be taken to distinguish it from other thymic neoplasms. However, preoperative diagnosis is difficult in most cases. Hence, complete surgical resection is recommended, if feasible, for both accurate diagnosis and long-term survival.

REFERENCES

1) Travis, W.D., Brambilla, E., Burke, A.P., Marx, A., Nicholson, A. G. World Health Organization Classification of Tumors. Pathology and Genetics of Tumors of the Lung, Pleura, Thymus and Heart. Lyon: IARC. 2015; 205–206.
2) Mneimneh WS, Gökmen-Polar Y, Kesler KA, Loehrer PJ Sr, Badve S. Micronodular thymic neoplasms: case series and literature review with emphasis on the spectrum of differentiation. Mod Pathol. 2015; 28: 1415–1427.
3) Suster S, Moran CA. Micronodular thymoma with lymphoid B-cell hyperplasia: clinicopathologic and immunohistochemical study of eighteen cases of a distinctive morphologic variant of thymic epithelial neoplasm. Am J Surg Pathol. 1999; 23: 955–962.
4) Kim NR, Lee JI, Ha SY. Micronodular thymoma with lymphoid stroma in a multilocular thymic cyst: a case study. Korean J Pathol. 2013; 47: 392–394.
5) Ishikawa Y, Tateyama H, Yoshida M, Takami K, Matsuguma H, Taniguchi T, *et al*. Micronodular thymoma with lymphoid stroma: an immunohistochemical study of the distribution of Langerhans cells and mature dendritic cells in six patients. Histopathology. 2015; 66: 300–307.
6) Weis CA, Yao X, Deng Y, Detterbeck FC, Marino M, Nicholson AG, *et al*. Contributors to the ITMIG Retrospective Database. The impact of thymoma histotype on prognosis in a worldwide database. J Thorac Oncol. 2015; 10: 367–372.
7) Kaminuma Y, Tanahashi M, Yukiue H, Suzuki E, Yoshii N, Fujino T, *et al*. Micronodular thymoma with lymphoid stroma diagnosed 10years after the first operation: a case report. J Med Case Rep. 2019; 13: 69.
8) Weissferdt A, Moran CA. Micronodular thymic carcinoma with lymphoid hyperplasia: a clinicopathological and immunohistochemical study of five cases. Mod Pathol. 2012; 25: 993–999.
9) A Moran, Neda Kalhor, Saul Suster. Invasive Spindle Cell Thymomas (WHO Type A): A Clinicopathologic Correlation of 41 Cases. Am J Clin Pathol. 2010; 134: 793–798.