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Case study

Combined thymoma–thymic seminoma. Report of 2 cases of a heretofore unreported association☆

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Summary Two cases of a primary mediastinal tumor showing both thymoma and seminoma elements are presented. The patients were 2 men, aged 32 and 34 years, respectively. Clinically, both patients presented with symptoms related to their mediastinal masses, namely, chest pain and shortness of breath. Neither patient had any previous history of malignancy elsewhere. Diagnostic imaging revealed the presence of large anterior mediastinal masses. Both patients underwent thoracotomy with complete resection of their tumors. Grossly, the lesions measured 6 and 8 cm in greatest diameter, respectively and were tan and firm without areas of hemorrhage or necrosis. Both tumors appeared to be well circumscribed and grossly not involving any adjacent structures. Histologic sections showed the presence of distinct areas in the same tumor mass corresponding to conventional thymoma, whereas other areas corresponded to seminoma. Both components appeared to be present in almost equal proportions in the tumor. Immunohistochemical studies showed distinct labeling for each component: the thymoma component was positive for CAM5.2, Pax8, and cytokeratin 5/6; the seminoma component was positive for CAM5.2, SALL4, OCT3/4, and placental-like alkaline phosphatase. Both patients are currently alive and well 12 and 18 months after surgery, respectively. The cases herein described highlight the importance of ample sampling in mediastinal tumors and document for the first time the existence of combined thymoma–thymic seminomas.

1. Introduction

Thymomas represent the most common primary epithelial tumors of the anterior mediastinum [1]. On the contrary, mediastinal "thymic" seminomas are rare tumors. In the past erroneously designated as "seminomatous thymoma" or "seminoma-like tumor of the thymus" [2-4], these tumors were subsequently shown to be a distinct entity unrelated to thymoma [5] and have been well recognized in the literature since [6-8]. Both of these tumors have been described as either having conventional histology or having unusual histologic features. For instance, thymomas can display a wide range of morphologic patterns, especially the spindle cell type (World Health Organization type A) [9] but also the conventional lymphocyte-rich tumors (World Health Organization types B1 and B2). The latter may contain a prominent plasma cell infiltrate or show a striking rhabdomyomatous component [10,11]. Thymomas may also occur in combination with thymic carcinomas in the same tumor mass [12]. On the other hand, thymic seminomas have also been described in association with other tumors or lesions such as smooth muscle tumors or multilocular thymic cysts [13,14]. However, the occurrence of a parallel growth of

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thymoma and seminoma in the same tumor represents a phenomenon not previously recorded in the literature. This occurrence once again underscores the importance of comprehensive sampling of any mediastinal mass followed by careful histologic evaluation of all tumor components.

Thymomas are tumors with a wide morphologic spectrum that can easily mimic other tumors. In this setting, the use of immunohistochemical stains may shed some light on any possible additional components that may be present in or associated with these tumors. Also important to highlight is the fact that the presence of individual components may not be easily identifiable on a mediastinoscopic biopsy due to sampling limitations. Depending on the interpretation of the initial biopsy, this may lead to misdiagnosis if not all components are represented in the biopsy or recognized as such. Because the treatment for thymoma and seminoma varies, this may have grave implications for patient care.

To this effect, a discussion of the possible scenarios and implications in treatment of such tumors are discussed both in the context of mediastinoscopic biopsies and surgical resections.

2. Case presentation

2.1. Clinical features

The patients were 2 men, aged 32 and 34 years. Both patients presented with chest pain and shortness of breath. Radiologic evaluation in both patients disclosed the presence of an anterior mediastinal mass that appeared to be confined to the mediastinal compartment with no invasion into adjacent structures. Neither patient had any previous history of a tumor elsewhere and reported to be otherwise in good health. They had initial mediastinoscopic biopsies, which were interpreted as compatible with thymoma. Based on that information, both patients underwent thoracotomy for removal of their mediastinal tumors.

2.2. Macroscopic features

The tumors were described as well circumscribed, measuring 6 and 8 cm in greatest dimension, respectively. The cut surface of the tumors was described as being firm and tan without areas of hemorrhage or necrosis.

2.3. Histologic features

At scanning magnification, the tumors although circumscribed did not contain a well-defined capsule. At low power, the growth pattern that was easiest to recognize was that of thymoma, demonstrated by the conventional dual population of lymphocytes and epithelial cells, which in some areas varied from predominantly lymphocytic to other areas containing an equal proportion of epithelial cells and lymphocytes. The epithelial cells had a bland appearance and were round to oval with vesicular nuclei, eosinophilic to amphophilic cytoplasm, and small inconspicuous nucleoli. Mitotic figures were absent in these cells. The epithelial cells were intermixed with variable numbers of small, mature-appearing lymphocytes. Collagenous bands separating the tumor into distinct lobules were identified focally. In addition, on closer inspection, there were distinct areas associated with hyalinized tissue that contained collections of epithelioid cells with different cytologic features to those of the thymoma component. Here, the epithelioid cells had a round-to-polygonal shape, pale cytoplasm, round nuclei with prominent nucleoli, and chromocenters attached to the nuclear membrane, reminiscent of the cytologic features typically seen in seminomas. Scattered mitotic figures were observed in this component. A more subtle lymphocytic infiltrate was also observed in this part of the lesion. Small epitheloid granulomas as commonly seen in seminomas were not identified in our cases. Overall, both components—thymoma and seminoma—were present in approximately equal proportions (Figs. 1-3).

2.4. Immunohistochemical features

A panel of immunohistochemical stains was performed including CAM 5.2, Pax8, cytokeratin 5/6, placental-like alkaline phosphatase (PLAP), OCT3/4, and SALL4. The results are summarized in the Table and illustrated in Figs. 4 to 6.

2.5. Clinical follow-up

Both patients remain alive and well 12 and 18 months postsurgical resection. Neither patient has received adjuvant therapy to date.

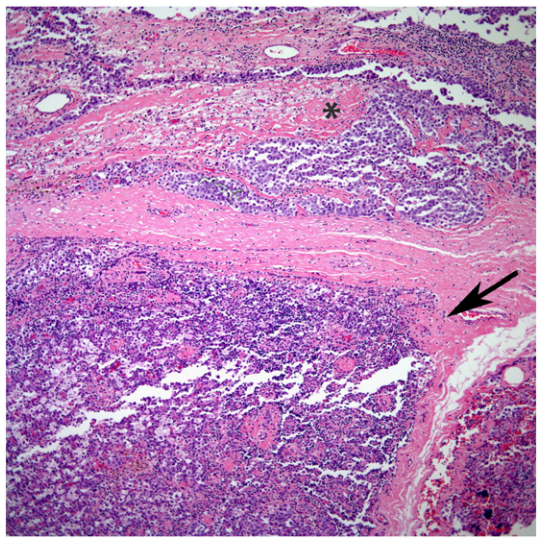

Fig. 1 Thymic neoplasm showing 2 distinct components—thymoma (arrow) and seminoma (asterisk). Both tumors contain a distinctive lymphoid infiltrate.