



## Review article

## A review of mediastinal lesions encountered on fine needle aspiration and small biopsy specimens

Christopher J. VandenBussche

Johns Hopkins University School of Medicine, United States



Upon hearing that a mediastinal mass will be biopsied, I am often filled with a mixture of intrigue and dread. Primary mediastinal neoplasms are relatively uncommon, but the differential diagnosis can often contain numerous and diverse entities, including lymphomas, sarcomas, thymic neoplasms, and germ cell tumors. Metastatic disease from possibly occult primary sites can further complicate the diagnostic approach. While some mediastinal lesions are found incidentally on imaging studies, other patients may be critical ill and require an efficient workup to at least preliminarily guide the clinical team. The use of rapid on-site evaluation (ROSE) can be valuable in providing a quick initial differential diagnosis, as well as immediately triaging material for microbiologic studies, flow cytometric analysis, and/or guiding tissue biopsies to viable areas of a neoplasm. Initial tissue biopsies are often small specimens that may be rapidly depleted after an initial battery of immunostains. In this issue, I have gathered experts from relevant pathology subspecialties to provide you with a practical and up-to-date approach to mediastinal fine needle aspiration and small tissue biopsy specimens, accompanied by numerous, high-quality images.

First, Drs. M. Lisa Zhang and Aliyah Sohani discuss lymphomas of the mediastinum, as well as neoplastic and non-neoplastic entities that should be considered in the differential diagnosis. Their review provides a pattern-based approach, with focus on the main primary lymphomas arising in the mediastinum (i.e. classic Hodgkin lymphoma, primary mediastinal large B-cell lymphoma, T-lymphoblastic lymphoma, and thymic marginal zone lymphoma).

Drs. Peter Illei and Susan Shyu then cover thymic lesions, discussing entities that include non-neoplastic thymic cysts, benign epithelial neoplasms, and thymic carcinoma. Their review includes discussion of the WHO classification of thymomas and key immunohistochemical markers.

Next, Drs. Jordan Reynolds and Shiguang Liu dispense their

expertise on the work up of germ cell neoplasms discovered in the mediastinum. The authors provide practical considerations for how to approach these neoplasms, including the integration of clinical information, immunohistochemistry, morphology, and ancillary testing for isochromosome 12p, a chromosomal abnormality found in testicular germ cell tumors as well as in a subset of extragonadal germ cell tumors.

Drs. Erika Rodriguez, Robert Jones, Daniel Miller, and Fausto Rodriguez then review neurogenic tumors of the mediastinum, which includes entities such as schwannoma, neurofibroma, malignant peripheral nerve sheath tumors, and ganglioneuromas. They discuss a diagnostic approach that is specifically applicable to small cytologic and tissue samples, as well as relevant differential diagnoses.

Drs. Alexander Smith, Julie Dueber, and Derek Allison concisely cover the wide gamut of other malignant neoplasms that may be found in the mediastinum, focusing on the salient diagnostic features of malignancies of epithelial and mesenchymal origin, excluding tumors of neurogenic, thymic, hematolymphoid, and germ cell origins. They highlight important clinical information, diagnostic features, and ancillary studies, and discuss the pearls and pitfalls of commonly used immunohistochemical markers in this location.

Finally, Drs. Brian Stewart, Marino Leon, and I end this review issue by covering benign mediastinal lesions otherwise undiscussed in the previous reviews. We first divide these lesions into cystic and solid lesions, and then discuss a generalized approach to cystic lesions. We cover common as well as potentially treacherous lesions, along with their differential diagnoses. Because these lesions are often small or cystic, discussion focuses on the most important cytomorphologic clues.

I am grateful to all the authors for their outstanding contributions, and hope you will keep this review handy for your next encounter with a mediastinal lesion biopsy.

E-mail address: [cjvand@jhmi.edu](mailto:cjvand@jhmi.edu).

[https://doi.org/10.1053/j.sem\\_dp.2020.05.001](https://doi.org/10.1053/j.sem_dp.2020.05.001)