

RADY 416 Case Presentation

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Thank you to chief resident Justin Rodriguez, MD

Focused Patient History and Workup

Chief Complaint: “productive cough”

History of Present Illness:

- **25 yo female** presented to UNC ED referred by her PCP for abnormal chest xray.
- Chest xray revealed “*markedly abnormal contour to the right aspect of the mediastinum including a right para-tracheal stripe... peripheral right thorax favored to represent extraparenchymal lesions*”

Past Medical History:

- Generalized Anxiety Disorder- well controlled on home Sertraline

Family History:

- Negative for lung cancer

Review of Symptoms:

- No fever, chills, URI sx
- No changes in weight, night sweats

Focused Patient History and Workup

Physical and Exam:

General: Tearful young female

HEENT: Atraumatic, normocephalic, EOMI, PERRLA, MMM.

CV: Tachycardic, regular S1, S2. No rubs or gallops

Lungs: CTAB, no wheezes, rhonchi, or rales

Abdomen: Normoactive bowel sounds, soft, NTND

Extremities: no clubbing, cyanosis, edema

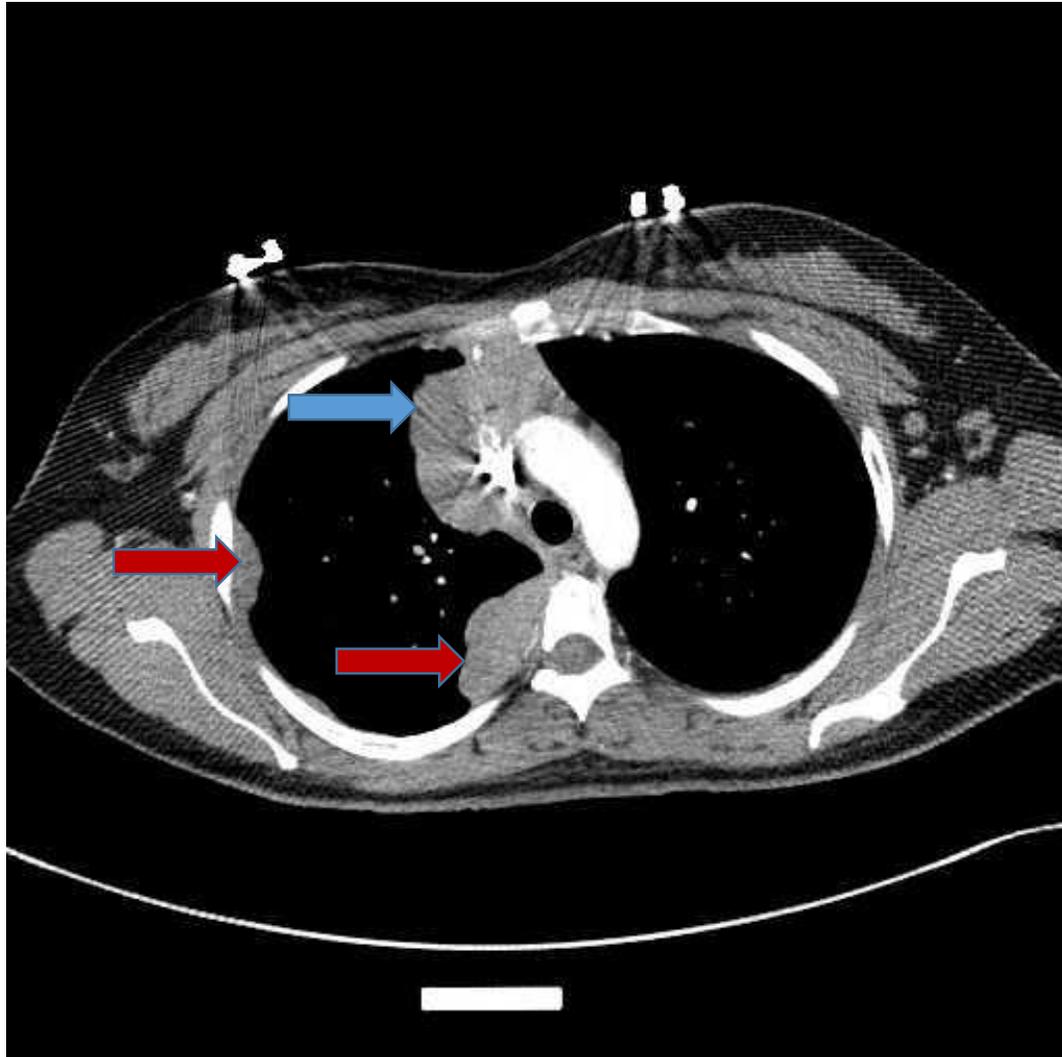
Skin: No rashes or lesions

Pt was admitted to inpatient and Interventional Pulmonology and Heme/Onc were consulted. Workup included contrasted LP, bronchoscopy w/ infectious panel and mass biopsy, respiratory viral panel, and TB.

List of UNC Imaging Studies

- **CTA Chest with contrast**
 - Obtained: 03/21/2019
- **CT Chest with contrast**
 - Obtained: 05/29/2019
- **PET Body**
 - Obtained: 07/02/2019

Computerized Tomography Chest Axial View (March and May)

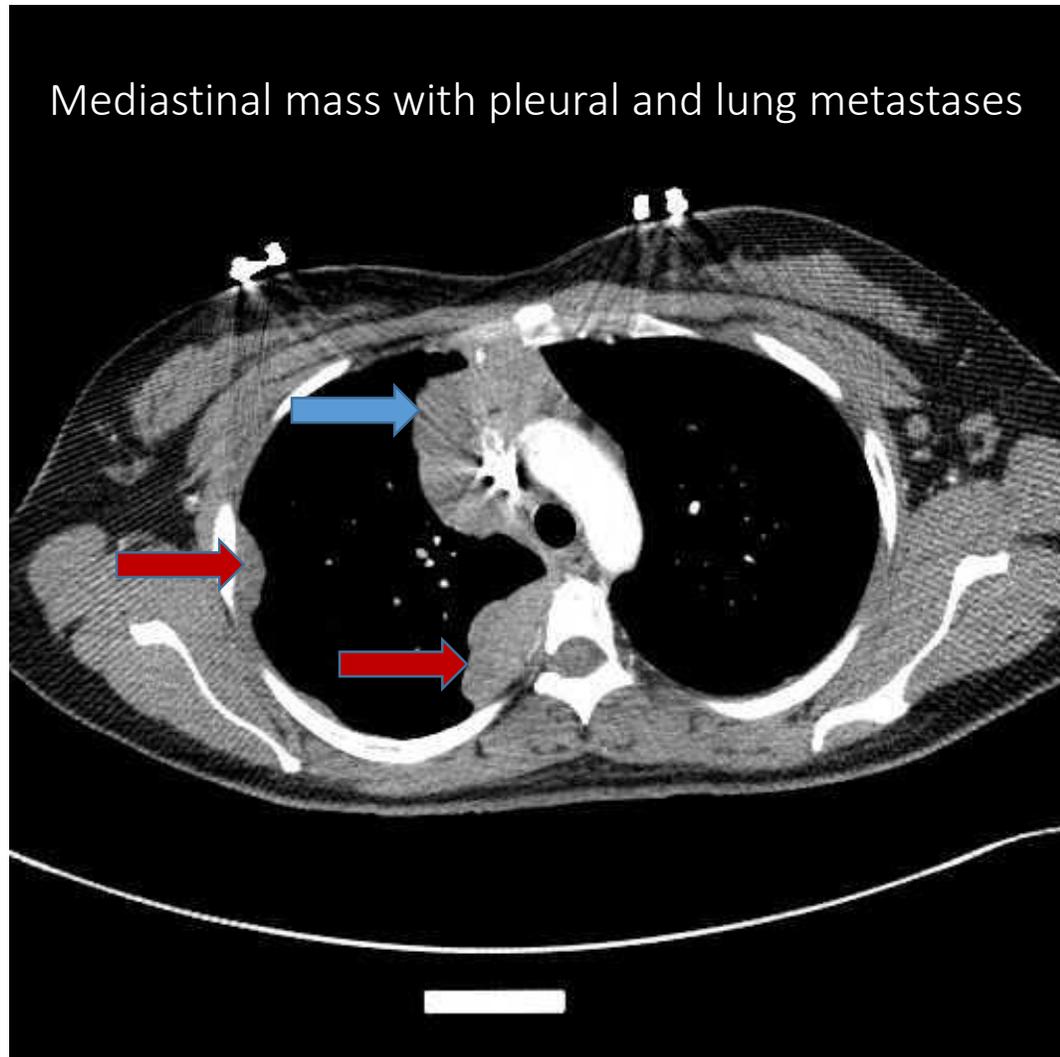


03/21/2019



05/29/2019

Computerized Tomography Chest Axial View (March)

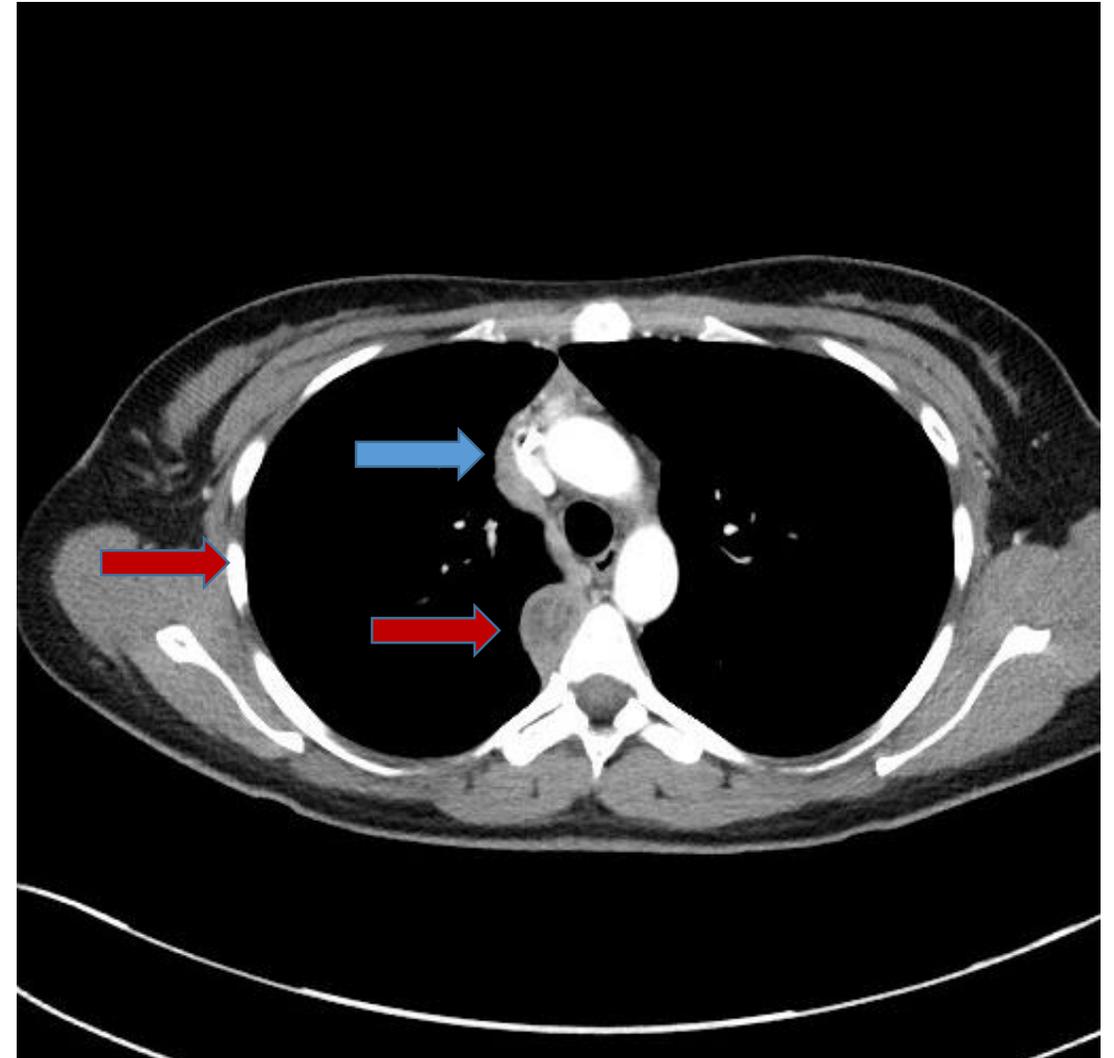


- Anterior mediastinal soft tissue mass and extensive **right pleural nodularity** noted.
- Confluent mediastinal adenopathy involving the anterior mediastinum, paratracheal nodes, subcarinal nodes, aortopulmonary window, and right hilar nodes.
- These findings are concerning for invasive mediastinal malignancy
- Diffuse pleural masses on the right with confluent mediastinal adenopathy and diffuse pulmonary nodules. Differential includes metastatic disease, lymphoma, or primary pleural malignancy.

03/21/2019

Computerized Tomography Chest Axial View (May)

- S/p CAPP (Cisplatin + doxorubicin + cyclophosphamide + prednisone)
- Marked decrease in size of **anterior mediastinal mass** (compatible with invasive thymoma), and **right pleural metastases**, compatible with response to therapy.



PET CT Axial View (note dates)

Mediastinal mass with pleural and lung metastases



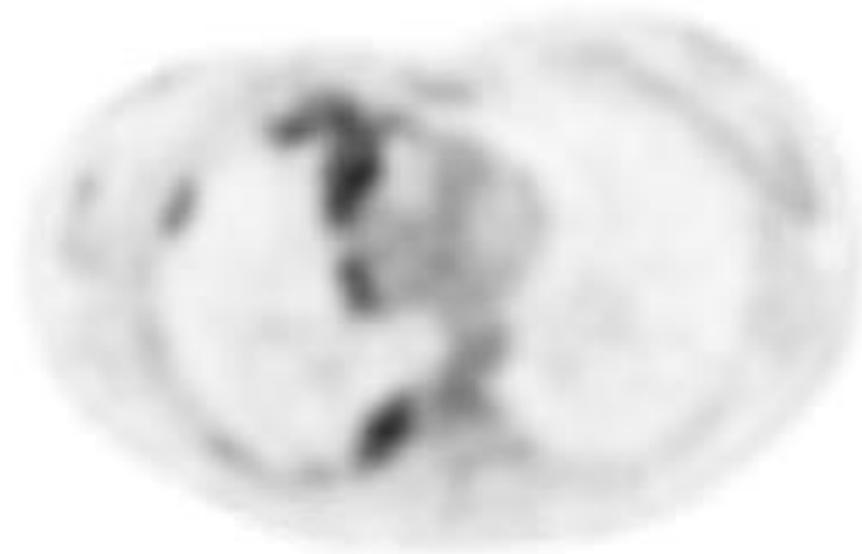
07/02/2019



05/29/2019

PET CT Axial View (June)

Mediastinal mass with pleural and lung metastases



- Anterior mediastinal mass demonstrating increased FDG uptake (CT 59) corresponding to known invasive thymoma.
- Multiple right-sided pleural-based lesions demonstrated FDG avidity. The lesions are predominantly medial, involving the anterior and posterior medial pleura, and inferior.
- Right-sided pleural-based lesions represent drop metastases from primary invasive thymoma. The most avid metastatic lesion is in the inferior right pleura.

Patient Treatment and Outcome

- Mediastinal mass with pleural and lung metastases found on CT were consistent with Stage IV invasive thymoma.
- Patient was followed by Heme Onc and received 4 courses of CAPP (Cisplatin + doxorubicin + cyclophosphamide + prednisone).
- Given tumor burden and lack of surgical options, CT surgery was consulted.
- On 8/5/2019 she underwent a right extrapleural pneumonectomy requiring resection of the right diaphragm, partial resection of the right hepatic lobe, pericardium, and SVC resection with bovine pericardium patch repair.
- She was discharged on 8/15/2019 and will follow up with CT surgery and Heme Onc as outpatient.

Approach to Thymoma

- Thymomas are slow-growing neoplasms that can exhibit aggressive behavior such as invasion of adjacent structures.¹
- Histologic classification primarily distinguishes thymic carcinoma from the different types of thymoma. However, management decisions rest primarily on the stage of disease and the completeness of resection.¹
- Treatment includes resection and postop radiation therapy.

Approach to Thymoma

- Tumors with a favorable outcome are those that are encapsulated and amenable to complete resection. Invasive and unresectable tumors have a poor prognosis regardless of their histologic characteristics.¹
- A 2001 review showed invasive thymomas were more likely to have lobulated (16/27, 59%) or irregular (6/27, 22%) contours than noninvasive thymomas (8/23, 35% and 1.5/23, 6%, respectively) ($p < 0.05$).²
- Invasive thymomas had a higher prevalence of low attenuation areas within the tumor (16/27, 60%) than noninvasive thymomas (5/23, 22%) ($p < 0.001$) as well as foci of calcification (14.5/27, 54% vs. 6/23, 26%; $p < 0.01$).²

WHO Histologic Typing of Tumors of the Thymus

Epithelial tumors
Thymoma
Type A
Type AB
Type B1
Type B2
Type B3
Micronodular thymoma with lymphoid stroma
Metaplastic thymoma
Thymic carcinoma
Squamous cell carcinoma
Basaloid carcinoma
Mucoepidermoid carcinoma
Lymphoepithelioma-like carcinoma
Sarcomatoid carcinoma
Clear cell carcinoma
Adenocarcinomas
NUT carcinoma
Undifferentiated carcinoma

Lymphomas of the mediastinum
Primary mediastinal large B-cell lymphoma
Extranodal marginal zone lymphoma of mucosa-associated lymphoid tissue (MALT lymphoma)
Other mature B-cell lymphomas
T lymphoblastic lymphoma/leukemia
Anaplastic large cell lymphoma and other rare mature T- and NK-cell lymphomas
Hodgkin lymphoma

Histiocytic and dendritic cell neoplasms of the mediastinum
Langerhans cell lesions (thymic Langerhans cell histiocytosis, Langerhans cell sarcoma)
Histiocytic sarcoma
Follicular dendritic cell sarcoma
Interdigitating dendritic cell sarcoma
Fibroblastic reticular cell tumour
Indeterminate dendritic cell tumour
Myeloid sarcoma and extramedullary acute myeloid leukemia

Neuroendocrine tumors
Typical carcinoid tumor
Atypical carcinoid tumor
Large cell neuroendocrine carcinoma
Small cell carcinoma
Germ cell tumors of the mediastinum
Seminoma
Embryonal carcinoma
Yolk sac tumour
Choriocarcinoma
Mature teratoma
Immature teratoma
Mixed germ cell tumour
Germ cell tumour with somatic type solid malignancy
Germ cell tumour with associated haematological malignancy

4. Data from: *Tumours of the thymus: WHO classification of tumors of the thymus. In: WHO Classification of tumours of the lung, pleura, thymus and heart, Travis WD, Brambilla E, Burke EP, et al (Eds), IARC Press, Lyon, France 2015.*

Take Home Points

- Thymomas are the most common primary neoplasms of the anterior mediastinum.¹⁻²
- Preoperative differentiation of invasive from noninvasive thymoma has important implications for treatment planning such as preoperative chemotherapy or radiation therapy and prognosis.²
- The presence of lobulated or irregular contour, areas of low attenuation, and multifocal calcification are suggestive of invasive thymoma.²
- However, CT has a low specificity in assessment of the infiltration of adjacent mediastinal structures, pleura, lung, and chest wall.²

References

1. Benevinste, M., Rosado-de-Christenson, B., Sabloff B., Moran, C., et al. Role of Imaging in the Diagnosis, Staging, and Treatment of Thymoma. RadioGraphics 2011; 10.1148. 388-398
2. Tomiyama, Noriyuki; Müller, Nestor L.; Ellis, Samantha J.; Cleverley, Joanne R.; Okumura, Meinoshin; Miyoshi, Shinichiro; Kusumoto, Masahiko; Johkoh, et al. Invasive and Noninvasive Thymoma: Distinctive CT Features. Journal of Computer Assisted Tomography. 2001
3. Travis WD, Brambilla E, Burke EP, et al (Eds). WHO Classification of tumours of the lung, pleura, thymus and heart. IARC Press, Lyon, France 2015.