RADY 403 Case Presentation

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Focused patient history and workup

• 16-year-old male with no prior medical history presenting with chest pain that started 5 days ago, along with 3-4 days of subjective fevers, drowsiness, and decreased appetite.

• On exam, chest pain noted to be pleuritic and positional (worse with leaning forward).

• Vitals normal

• Labs (CBC, BMP, LDH, and Uric acid) all within normal limits.

• EKG performed and interpreted as normal.
List of imaging studies

• Chest X-ray (outside hospital) – reported mediastinal mass
• Chest CT with contrast
• FDG PET-CT skull base to mid thigh
Chest X-ray

- Initial Chest X-ray preformed at OSH (images not available).

- Follow-up Chest Xray preformed 2 days after presentation is seen here:
  - Post-biopsy, chest tube in place
  - Widened mediastinum with superior mediastinal mass (blue arrow)
Chest CT with Contrast

- Anterior mediastinal mass (blue arrow)
- Narrowing of SVC and innominate vein (yellow arrow)
- No invasion of surrounding structures
- No tracheal obstruction
- No calcification in mass
- No other mediastinal, hilar, axillary, or supraclavicular lymphadenopathy

- CT A/P showed no additional adenopathy
FDG PET-CT

- Hypermetabolic anterior mediastinal mass
- No other suspicious metabolically active sites
Differential Diagnosis - Anterior Mediastinal Mass

5 T’s

1. Thymus
   • Thymoma, thymic cyst, thymolipoma, thymic hyperplasia, thymic carcinoma

2. Thyroid
   • Thyroid neoplasms, parathyroid neoplasms, goiter

3. Thoracic aortic aneurysm

4. Terrible lymphoma
   • Hodgkin, non-Hodgkin

5. Teratoma (germ cell tumors)
   • Seminomas nonseminomatous
Patient treatment or outcome

• Thoracic surgery preformed VATs biopsy of mass.
• Surgical pathology: classic Hodgkin lymphoma, nodular sclerosing type
  • Stage 2A bulky
• Lost to follow-up and then restaged 2 months later due to concerns for progression in setting of new onset fatigue.
• PET/CT - new, mild uptake of R internal mammary chain lymph node.
• Started on chemotherapy, with good response on follow up PET/CT.
• Recommended XRT, but family declined.
• No concern for recurrence on most recent imaging.
Hodgkin Lymphoma

- Lymphoma (Hodgkin and Non-Hodgkin) is 3rd most common pediatric cancer and most common mediastinal mass in children.
- Presents with B symptoms
- Two groups: classical and non-classical
  - Classical – Nodular sclerosing, mixed cellularity, lymphocyte-rich and -depleted
  - Non-classical – Nodular lymphocyte predominant
- Classic Hodgkin lymphoma of mediastinum is usually the nodular sclerosing type
- Can cause compression of trachea or SVC syndrome
- 5-year survival rate of stage 1 or 2a is 90% and ~60% for stage 4
- FDG PET with CT is recommended for disease staging and follow-up
Imaging Findings of Mediastinal Masses in Children

• Thymic:
  • Thymic cyst – well-defined cystic mass with lack of enhancement
  • Thymic hyperplasia – diffuse symmetric enlargement
  • Thymolipoma – rare benign fatty mass, nodular appearance, well-defined

• Lymphoma:
  • Hodgkin – lobulated heterogenous mass on CT
  • Non-Hodgkin – diffuse enlargement, nodularity of thymus

• Germ cell tumors:
  • Teratoma – includes fat, fluid, and calcifications
  • Seminomas – lobulated mass with poorly defined margins, mild enhancement, no calcifications

• Vascular:
  • Lymphatic malformation – multiseptated cyst, no prominent vessels or solid enhancement
  • Venous malformations – slowly enhancing vascular channels that communicate with venous system
ACR Appropriateness Criteria

Variant 1: Clinically suspected mediastinal mass. Initial imaging.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
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<tbody>
<tr>
<td>Radiography chest</td>
<td>Usually Appropriate</td>
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<tr>
<td>MRI chest without and with IV contrast</td>
<td>Usually Appropriate</td>
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<td>MRI chest without IV contrast</td>
<td>Usually Appropriate</td>
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<td>CT chest with IV contrast</td>
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<tr>
<td>CT chest without IV contrast</td>
<td>Usually Appropriate</td>
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<tr>
<td>US chest</td>
<td>Usually Not Appropriate</td>
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<td>Image-guided transthoracic needle biopsy</td>
<td>Usually Not Appropriate</td>
<td>Varies</td>
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<td>CT chest without and with IV contrast</td>
<td>Usually Not Appropriate</td>
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<tr>
<td>FDG-PET/CT skull base to mid-thigh</td>
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- Imaging in this case followed ACR Appropriateness Criteria
UNC Top Three

• 5T’s mnemonic for anterior mediastinal masses including thymus, thyroid, thoracic aortic aneurysm, terrible lymphoma, and teratoma.

• Lymphomas, including Hodgkin and Non-Hodgkin lymphoma, are the most common mediastinal masses in children.

• On CT, Hodgkin lymphoma will appear as a lobulated heterogenous mass that can have a mass effect on surrounding structures.
References


