Mediastinal Mass with Severe Kyphoscoliosis

- 46 year old female, 69 kg, height 152 cm, BMI 29.6
- Past medical history: spine surgery for scoliosis at age of 15
- Two weeks prior to surgery she developed severe respiratory failure requiring intubation
- Current CT scan shows mediastinal mass (5.4 x 9.9 x 7.7 cm)
- Pericardial effusion 1.3 cm maximum width

Mediastinal Mass with Severe Kyphoscoliosis

- Airway exam: - Mallampatti III, TM 3FB
  - Mouth opening normal
  - Neck extension very limited due to scoliosis
- Exercise tolerance: 5-6 met
- Scheduled for - right thoracotomy (mass excision)
  - pericardial window
Anesthetic Management

- Recognition of mediastinum anatomy
- Airway implications
- Lung separation techniques
- Intra/post-operative management of mediastinal mass patient
- Post-operative analgesia

Mediastinum Anatomy

- Identify the location of the mass
- Define its relationship to adjacent structures
- Determine the extent of tracheal/vascular compression
- Assess patency of the airway at the tracheal, bronchial level, and clinical signs
Role of Spirometry in Mediastinal Mass

- Is this test indicated?
- Upright, supine, and sitting position?
- Correlation with test results and complications


Upright and Supine Spirometry

<table>
<thead>
<tr>
<th>Author</th>
<th>n</th>
<th>Results Spirometry</th>
<th>Anesthetic Technique</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hnatiuk OW</td>
<td>37</td>
<td>10 had upright and supine spirometry</td>
<td>35 received general anesthesia (including 4 with upper airway obstruction)</td>
<td>No correlation with – spirometry &amp; symptoms – abnormal CT scan – anesthetic technique – postoperative complications</td>
</tr>
</tbody>
</table>

Abnormal FVL in Patients with Intrathoracic Hodgkin’s Disease

<table>
<thead>
<tr>
<th>Author</th>
<th>n</th>
<th>Results FVL (prior to tx)</th>
<th>Results FVL (after chemo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vander Els NJ</td>
<td>36</td>
<td>14 (56%) abnormal</td>
<td>6 (25%) abnormal</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>– 7 (flattening insp/exp loop)</td>
<td>– 1 (fixed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– 7 (flattening insp loop)</td>
<td>– 5 (flattening insp)</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>11 (44%) normal</td>
<td>19 (76%) normal</td>
</tr>
</tbody>
</table>

Campos, Javier, MD Difficult Clinical Scenarios in Thoracic Anesthesia

CRASH 2014
**Airway Management and Anterior Mediastinal Mass**

- Rigid bronchoscope always available (an experienced team)
  - McMahon CC: Anaesthesia 1997; 52:158
- Awake fiberoptic bronchoscopy (SLT)
- Flexible fiberoptic bronchoscopy SLT (armored)
  - Capdeville M: JCVA 2007; 21:259
- Helium and anterior mediastinal mass
  - Polaner DM: Anesth Analg 1996; 82:208

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**Airway Stent**

Shin HJ: J Vasc Interv Radiol 2006; 17: 657

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**Arndt Blocker**

Campos JH: SAJAA 2008; 14: 22-26

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**Right-Sided Spherical Shaped Bronchial Blocker**

Campos JH: Curr Opin Anaesthesiol 2009; 22: 4-10

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**A Comparison of the Cohen Blocker with the Arndt Blocker or Left Sided DLT (Carinal Hook)**

<table>
<thead>
<tr>
<th>PRCT</th>
<th>Cohen Group (n=16)</th>
<th>Arndt Group (n=16)</th>
<th>DLT Group (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to Position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right main bronchus (mean)</td>
<td>170 s</td>
<td>244</td>
<td></td>
</tr>
<tr>
<td>Left main bronchus (mean)</td>
<td>340 s</td>
<td>253</td>
<td></td>
</tr>
<tr>
<td>Number of patients requiring at least one additional intraop FOB</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of patients requiring 1, 2 or 3 additional intraop FOB</td>
<td>2/1/0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Intra/Post Operative Course

- Right thoracotomy and drainage of pericardial effusion
- Successful lung isolation (Arndt® blocker)
- Findings: cyst mass 8.0 cm diameter

Perioperative Cardiorespiratory Complications in Adults with Mediastinal Mass

- A cohort study of adults with mediastinal mass
- Objective to evaluate the incidence of perioperative complications
- Clinical signs and symptoms, radiologic evaluation and PFT evaluation in the assessment of anesthetic and perioperative risk


Anesthetic Management

- n=97/105 have received general anesthesia
  - 79/97 received neuromuscular blockade (NMB)
  - 15/97 spontaneous ventilation NMB CV
- n=3/97 received general anesthesia/spontaneous ventilation
- n=8 local anesthesia and sedation


Perioperative Cardiorespiratory (CR) Complications

<table>
<thead>
<tr>
<th>Author</th>
<th>n</th>
<th>Intraop CR compl</th>
<th>Postop CR compl</th>
<th>Airway collapse</th>
<th>Life threatening compl post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hnatiuk OW, et al: Chest 2001; 120: 1152</td>
<td>37</td>
<td>1 (unrelated)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>


Perioperative Complications and Outcome

- Pericardial effusion on preop CT scan associated with intraop complications (OR 19.8; 95% CI, 4.0 - 97.4)
- Postoperative complications were associated with tracheal compression > 50% on preop CT scan (OR, 7.4; 95% CI, 1.5 - 38.1)
- Incidence of intraop airway obstruction was 0%


Intra/Post Operative Course

- Transfer intubated to PACU
- Extubated successfully, 3 hrs later
- PCA analgesia

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Mediastinal Mass and Cardiopulmonary Bypass

- Cannulation of femoral vessels (airway)
- Standby CPB before induction (mediastinal mass)
- Use of CPB (mediastinal mass)
- Important facts:
  - 5-10 min. to cannulate and establish CPB
  - Femorofemoral CPB

Peripheral CPB for Thymoma Resection

- 52 yo F, Tumor size 15 x 9 cm
- SVC and tracheal compression
- RA and RV collapse


Recommendations

- Management will depend upon the size and location of the mass
- Patients with mediastinal mass can be at risk of upper airway obstruction
- Spirometry has no impact on the choice of anesthesia and outcomes
- CT of the chest (tracheal compression >50%) potentially will increase postoperative complications
- Fixed obstruction on FVL (flattening pattern insp/exp) may increase the risk of intra/postoperative complications

Reference List

3. Hlatiski OW: Spirometry in surgery for anterior mediastinal masses Chest 2001; 120: 1152
Reference List