The Role of Intraoperative Parental Presence to Facilitate Anesthetic Management for Anterior Mediastinal Mass

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Abstract

- A 31-month old male with a large anterior mediastinal mass was scheduled for biopsy by interventional radiology.
- He presented with three days of perioral cyanosis, cough and fever.
- On physical exam, he was tachypneic but the exam was otherwise normal without any positional component to his symptoms.

Background

- Chest X-ray showed a very large right sided thoracic opacity.
- CT scan showed a large heterogeneous right chest mass, moderate leftward mediastinal shift, cardiac compression, right neural effusion, right lung complete atelectasis, and right pulmonary artery compression.
- The echocardiogram showed cardiac structures displaced into the left chest, complete atelectasis, and right pulmonary artery compression.
- Mediastinal shift with cardiac compression, right pleural effusion, right lung tachypneic

Chest X-Ray

CT Scan

Intraoperative Risk Stratification

Low Risk

Intermediate Risk

High Risk

- Signs
  - No significant signs
  - No bronchial compression
  - No tracheal compression
  - No SVC compression
  - No significant anterior mediastinal mass

- Symptoms
  - None
  - Mild
  - Moderate
  - Severe

Results

- The patient was sedated with small, incremental doses of ketamine and patients had direct
- The decision was made to bring the patient’s mother into the operating room.
- The anesthesia team organized a team huddle which included:
  - Anesthesiologist
  - Neonatologist
  - General Surgery/CT surgery for possible ECMO cannulation
  - ENT for potential rigid bronchoscopy
  - General anesthesia

Discussion

- Introduction

- Etiology of Anterior Mediastinal Mass (AMM): in descending frequency
  - Bronchogenic masses
  - Metastatic lesions
  - Thymoma
  - Germ cell tumors
  - Lymphoma
  - Thyroid

- Anesthetic risks associated with large AMMs
  - Obstruction of major airway
  - Cardiac compression (tamponade effect)
  - Compression of pulmonary artery or RVOT
  - SVC compression (SVC Syndrome)

- Signs and symptoms often depend on mass size, position and the rapidity of growth
- Children tend to experience
- Signs and symptoms
  - Tend to be malignant
  - May be infiltrative
  - Smaller intrathoracic volume
  - More central
  - Absence of significant signs and symptoms does not preclude the possibility of cardiovascular or airway collapse under anesthesia

- Absence of significant signs and symptoms does not preclude the possibility of cardiovascular or airway collapse under anesthesia

- Multidisciplinary Approach

- The role of intraoperative parental presence to facilitate anesthetic management for anterior mediastinal mass

- Strategies to restore cardiac output

- Repositioning the child in the decubitus or prone position
- Lifting the sternum by inserting one finger behind the sternal notch and one behind the xiphoid process.
- Severe cases: ECMO with femoro-femoral bypass

- Significant symptomatic (esp. orthopnea)
- Large mass by CT scan (esp. midline, distal tracheal)
- Tracheal compression to < 50% of predicted cross sectional area (children)
- PEFR < 50% of predicted (children)
- SVC syndrome
- Pericardial effusion

- High Risk Criteria for AMM

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Conclusions

- Tissue biopsy can be successfully obtained from tissue outside of the mass with minimal complications
- Highlights the importance of multidisciplinary preoperative planning to minimize anesthetic risks.
- Probably most prudent to maintain spontaneous ventilation
- No agent is superior as long as the agents are used judiciously

References

- Scrase B, McGregor K: Anterior mediastinal masses in pediatric anesthesia. Anesthesia tutorials of the week; September 2015