Acquired Diaphragmatic Hernia in a Heart Transplant Patient

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Learning Objectives

Upon completion of this Learning Activity, the participant will be able to:

1. List various etiologies for acquired diaphragmatic hernias
2. Explain the anesthetic challenges presented by a patient with history of cardiac transplantation
3. Identify the symptoms of diaphragmatic hernias
4. Understand the importance of quickly diagnosing acquired diaphragmatic hernias in immunosuppressed patients

Introduction

- Acquired diaphragmatic hernias are infrequent.
- They usually result from trauma, but may also be iatrogenic, occurring after gastrointestinal or thoracic procedures.
- There have been rare reports of iatrogenic diaphragmatic hernias in pediatric populations after cardiac surgery [1-3].
- This case report describes a diaphragmatic hernia occurring as a complication after pediatric cardiac transplantation.

Imaging

Chest radiographs showing a lucency over right lung on admission (left) and complete opacification of right lung on hospital day 2 suggestive of a diaphragmatic hernia (right)

Case Description

A 5-month old male with a history of orthotopic heart transplant for heart failure secondary to dilated cardiomyopathy presented 7 weeks post-transplantation with tachypnea, poor oral intake, emesis, and abdominal distension.
- Exam revealed subcostal retractions and a distended, diffusely tympanic abdomen.
- Radiographs demonstrated mildly dilated bowel without obstruction, stable cardiomegaly, a small right pleural effusion, and a lucency over the right lung
- Transthoracic ECHO showed a worsening moderate pericardial effusion, and echodensity in the anterior pericardial space.
- He was treated for pericardial effusion and suspected clinical rejection with a steroid pulse and diuretics.
- On hospital day 2, he was admitted to the ICU for acute respiratory distress and a chest radiograph showed right lung opacification and an ill-defined lucency over the right hemithorax.
- He was intubated and a pigtail catheter was placed in his right chest with improvement in the right hemithorax.

Conclusions

- Altered physiology of a denervated heart presents additional concerns, since drugs acting through vagal or parasympathetic mechanisms will usually not affect heart rate [4], thus direct acting inotropes (epinephrine, isoproterenol) were available in the operating room.
- Additional considerations for this patient include infection, rejection, side effects of immunosuppressant medications, and interactions with anesthetic drugs.
- The etiology of this patient’s diaphragmatic hernia was the defect created during placement of the subxiphoid mediastinal drain during his cardiac transplantation.
- In immunosuppressed patients, the complications of incarcerated diaphragmatic hernias can be fatal, due to infectious complications.
- Clinical rejection may present with tachypnea, tachycardia, lethargy, and poor feeding, overlapping with symptoms of diaphragmatic hernias.
- There should be a high index of suspicion for acquired diaphragmatic hernia in any patient with a history of cardiac surgery presenting with respiratory distress and bowel obstruction.

Intraoperative Course

- The patient was taken to the operating room for mediastinal exploration.
- During mediastinal dissection, the transverse colon was found to be incarcerated through a 1 centimeter defect in the diaphragm.
- Oozing from the omentum had caused the right hemithorax.
- The fascial defect was enlarged for reduction of viable colon and then closed with autologous pericardium.
- He was extubated on postoperative day 1, antirejection medications were continued and feeds were advanced.

References