Unique Presentation and Treatment of a Rare Condition Cardiac Postpneumonectomy Syndrome

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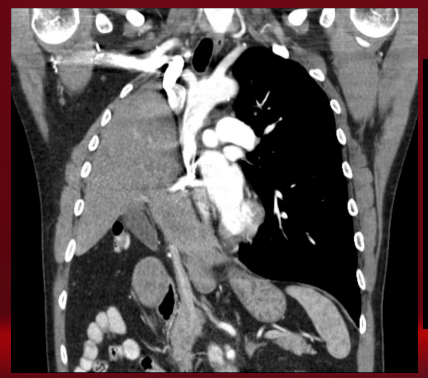
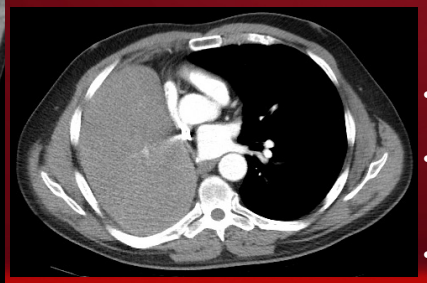
INTRODUCTION

- Postpneumonectomy syndrome (PPS) is an extremely rare condition that occurs in a small percentage of patients who undergo a pneumonectomy. Incidence in adults is 0.1-1.0% and in children is 1.0 to 17%.
- PPS more commonly affects women and younger patients.
- PPS is usually a late development (years) after surgery (PTXy).
- The condition is the result of excessive mediastinal shift to the pneumonectomy space. Rotation of the heart and mediastinal structures causes intermittent narrowing of distal trachea and/or main bronchus over the spine resulting in central airway compression and dynamic airway obstruction.
- Symptoms include shortness of breath, progressive dyspnea, persistent cough and stridor.
- Diagnosis is confirmed with bronchoscopy and CT imaging.

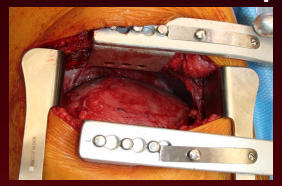




Coronal and axial images of chest CT scan one year after PTXy

Intraoperative Pictures

A



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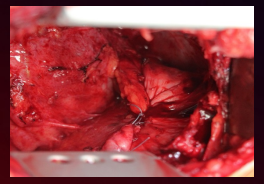

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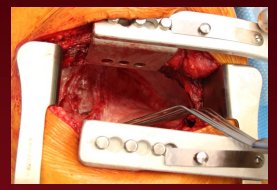

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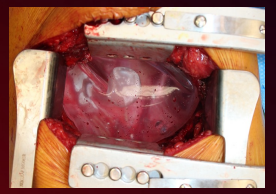
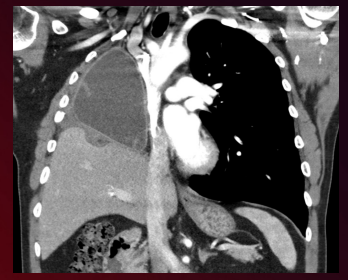


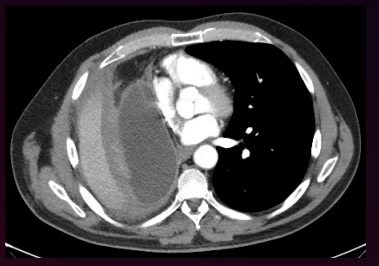
CASE REPORT

- A 56-year-old male with a history of stage IIIC atypical carcinoid of the right lung underwent a right intrapericardial pneumonectomy, resection of phrenic nerve secondary to tumor invasion, and lymph node dissection.
- Six months after surgery, he experience shortness of breath, dyspnea on exertion and significant tachycardia with exercise.
- Twelve-month CT scan demonstrated significant elevation of the right hemidiaphragm, near complete occupation of the pleural cavity with the liver and abdominal contents, and compression of the right side of the heart.
- PFTs - moderate restrictive disease (FVC 59%); Echo - compressed RA/RV.
- Patient was diagnosed with cardiac PPS secondary to an atrophied diaphragm and elevation of intrathoracic visceral without airway abnormalities.
- The patient underwent a redo thoracotomy, reduction of intrathoracic contents, diaphragm plication and placement of intrathoracic tissue expander (750cc).
- One month after repair, the patient had complete resolution of his symptoms; chest CT scan showed the tissue expander in good position without significant diaphragmatic elevation and no cardiac compression.

DISCUSSION

- Postpneumonectomy syndrome is a rare complication and affects mostly young women with airway compression.
- Our case depicts a rare presentation of cardiac PPS in a middle-aged man whose symptoms were related to an elevated diaphragm, intrathoracic viscera and cardiac compression.
- Treatment is surgical consisting of diaphragm plication and placement of a saline prosthesis to establish near-normal volume of the thoracic cavity and relief of the cardiac compression.
- Saline prosthesis success is related to its ability to adapt its shape to the chest cavity, the low pressure of the implant contents and the long-term durability of the material.





Coronal and axial images of chest CT scan postoperatively

CONCLUSION

- This case represents the first reported case of cardiac PPS.
- The combination of the intrapericardial pneumectomy and diaphragmic denervation led to the cardiac PPS.
- Surgery with plication and saline tissue expander placement corrected the chest anatomical abnormality.