Tracheal Occlusion from an Intrathoracic Stomach*

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A patient presented with recurrent respiratory failure following esophagectomy. Systematic evaluation detected a previously unreported process causing this problem. Simple therapeutic measures were effective once the diagnosis was established. *(Chest 1993; 103:822-23)*

We recently cared for an individual with recurrent respiratory failure following esophagectomy who eventually was demonstrated to have a previously unreported complication from this operation: tracheal obstruction due to distention of an intrathoracic stomach.

**CASE REPORT**

A 72-year-old man had total radical esophagectomy with gastric pull-through from an abdominopericardic approach for adenocarcinoma of the distal esophagus. The stomach was placed in the esophageal bed in the mediastinum.

A biosynthetic aortic valve had been placed two years earlier for a calcified aortic valve. A cardiac pacemaker was inserted during that hospitalization for high degree atrioventricular (A-V) block. The patient was retired, with an active lifestyle. He had a negative pulmonary history and was a nonsmoker.

The patient did well and was extubated on postoperative day 1. His nasogastric tube was also removed then. On the seventh day, progressive respiratory distress was noted. Respiratory rate was 36/min, breath sounds were diminished in all lung fields, and diffuse rhonchi were noted. An arterial blood gas (ABG) determination on high-flow oxygen showed a Ppo of 72 mm Hg and Pco2 of 50 mm Hg.

The patient was transferred to the intensive care unit (ICU), intubated, and mechanically ventilated, with marked improvement. He was extubated two days later. An ABG determination 4 h later showed a Pco2 of 37 mm Hg. One day later, diffuse rhonchi and decreased breath sounds were again noted bilaterally. Small bilateral pleural effusions were present and respiratory secretions had increased. Progressive respiratory deterioration again occurred and two days later, an ABG on supplemental oxygen showed a pH of 7.27, Ppo2 of 72 mm Hg, and Pco2 of 72 mm Hg.

The patient was reintubated and given bronchodilator treatment and diuretics with rapid improvement. He was extubated after three days, with an immediate postextubation ABG determination on supplemental oxygen of pH 7.43; Ppo2, 99 mm Hg; and Pco2, 41 mm Hg.

Progressive respiratory distress again developed and pulmonary consultation was obtained. Examination revealed an afebrile man with moderate dyspnea and a respiratory rate of 30 to 34/min. Heart rate was 100 and regular. His pacemaker was functioning properly. There was no evidence of congestive heart failure, his small pleural effusions were unchanged, and a peak expiratory flow rate was 90 L/min. Diffuse rhonchi were present. Maximal bronchodilator therapy including steroids was instituted.

The patient’s symptoms did not improve. An air-filled mediastinal mass persisted on the chest roentgenogram (Fig 1), and bronchoscopy was performed. Bronchoscopy revealed near total occlusion of the lower trachea by a compressible extrinsic mass collapsing the membranous trachea. Copious secretions were noted distal to this obstruction and were suctioned.

A computed tomographic (CT) scan (Fig 2) confirmed the clinical diagnosis of tracheal occlusion due to an air-filled intrathoracic stomach compressing the membranous trachea. Bedside spirometry showed an obstructive pattern with severe decrease of both FVC and FEV1.

Nasogastric suction was instituted, and metoclopramide therapy was started. Subjective and objective improvement rapidly ensued. Subsequent bronchoscopy showed only mild compression of the posterior tracheal wall, which remained patent even during forced expiration. Peak expiratory flow rates rapidly normalized. Diet was advanced as gastric distention resolved. The patient was discharged from the hospital and did well. The most recent spirometry shows no obstruction with return of FVC to normal.

**DISCUSSION**

Esophagectomy with gastric interposition is a widely performed surgical procedure in the treatment of esophageal cancer. Many series have been published detailing treatment of this cancer.13

Early postoperative complications are often of a pleuro-pulmonary nature. Pneumonia, often aspiration related, is

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FIGURE 1. Dilated stomach (S) on portable chest roentgenogram.

FIGURE 2. Computed tomographic scan of chest (lung window) showing dilated stomach (S) and compressed trachea (T).
frequently reported. Pleural effusions, empyema, chylothorax, pneumothorax, lung abscess, and respiratory failure requiring tracheostomy and prolonged mechanical ventilation are well described.1,2 Preexisting lung disease is often contributory.3

Many other complications are well described, including anastomotic leaks, mediastinitis, fistula formation, gastric outlet obstruction, volvulus of the intrathoracic stomach, incisional infections, recurrent laryngeal nerve paralysis, myocardiad infarction, cardiac dysrhythmias, pulmonary embolism, hypocalcemia (from hypoparathyroidism), small-bowel obstruction, acute pancreatitis, subphrenic abscess formation, hepatic failure, gastric necrosis, peritonitis, and anastomotic stricture.1,2,3

Complications directly attributable to the intrathoracic stomach are also described. These include persistent gastric outlet obstruction with recurrent aspiration pneumonia and compression of the pulmonary artery with production of an abnormal ventilation/perfusion scan.4 Other roentgenographic findings following esophagectomy are also described.5

Our patient represents a previously unreported complication of direct tracheal compression by a dilated, air-filled stomach in the postoperative period in a patient with an esophagectomy. We documented this by direct bronchoscopic observation and roentgenographic study. The problem resolved after decompression of the stomach by nasogastric suction.

Why this complication developed is unclear, but it may have been due to one or more factors. The patient's prior cardiac surgery may have changed mediastinal compliance in some fashion, but this seems unlikely since only the anterior mediastinum is entered during such procedures. It is generally recommended that the nasogastric tube remain in place for the first four or five postoperative days. This patient's nasogastric tube was removed on the first postoperative day. This may have allowed early gastric distention to develop and impede resolution of postoperative gastric atony.

The vagotomy that occurs with this operation promotes gastric atony. A pyloroplasty or pyloromyotomy is sometimes done to minimize postvagotomy effect but was not done in this case since the pylorus was widely patent on preoperative endoscopy. A "gastroplasty," in which the stomach is tailored to render it smaller and more tubular as it resides in the chest, is also optional and was not performed in our patient. This may have allowed a larger volume of air to remain trapped in the intrathoracic stomach and cause the resultant tracheal obstruction.

We would advise that clinicians consider this entity when confronted with a similar situation. Our own initial skepticism that this might be occurring delayed the therapy that resulted in a successful outcome.

REFERENCES

**Levitating Lung Lesions due to Bronchiolitis Obliterans Organizing Pneumonia**

Jerome Reich, M.D.; and David Scott, M.D.

A 65-year-old man developed symmetrical bibasal infiltrates. Transbronchial lung biopsy specimen demonstrated abnormalities consistent with bronchiolitis obliterans organizing pneumonia (BOOP). The infiltrates appeared to migrate cephalad over a period of months, gradually disappearing after reaching the pulmonary apices.

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| BOOP = bronchiolitis obliterans organizing pneumonia |

Migratory pulmonary infiltrates represent an unusual roentgenographic pattern that is most often due to Löeffler's syndrome. A less frequent cause is bronchiolitis obliterans organizing pneumonia (BOOP). The pathogenesis of the migration is not well understood. The pattern of cephalad migration of symmetrical bibasal infiltrates has not, to our knowledge, been reported. This case is reported to illustrate the latter pattern and to attempt to account for its pathogenesis.

**CASE REPORT**

A 68-year-old retired nonsmoking sawmill worker, previously in good health, developed fatigue in February 1990, accompanied by a nonproductive cough, shortness of breath, and end-inspiratory pleuritic pain at the costal margins. In March, he sought medical attention because of persistence of these symptoms. Results of physical examination were unremarkable, and the chest was free of adventitious sounds.

A chest roentgenogram revealed bibasilar infiltrates (Fig 1). A complete blood cell count revealed a white blood cell count of 10,900/μL mm an electronic differential cell count was normal. Hemoglobin was 11 g/dL; red blood cell indices were normal. Platelet count was 434,000/μL mm. He underwent fiberoptic bronchoscopy and transbronchial biopsy in mid-March. The tracheobronchial tree was found to be free of abnormalities. Bronchial

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