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Tracheobronchomalacia: An Unreported Pulmonary Complication of Acute Pancreatitis

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Abstract

- **Acute Pancreatitis (AP):** a common disease of the pancreas with systemic complications, including well-defined pulmonary complications.
- **TBM:** Results in an under-recognized diagnosis of airway collapse, which should be suspected in patients with Severe Acute Pancreatitis (SAP) who develop acute respiratory distress in whom no specific etiology has been determined.
- While Severe Acute Pancreatitis (SAP) and its complications have been well-documented, we believe this to be the first case report of *Tracheobronchomalacia* (TBM) as a respiratory complication of AP.

Case Presentation

- **Patient Demographics:** 54-year-old white male
- **Medical history:** diabetes mellitus with peripheral neuropathy and nephropathy as well as peripheral vascular disease and
 - No history of pulmonary disease.
- **Initial presentation:** admitted for elective right below-knee amputation for diabetic osteomyelitis.
- **Consulted:** Internal medicine evaluated the patient for NAP of undetermined etiology complicating his post-operative course.
- **Intervention:** Treated per protocol with hydration, meropenem, and pain management.
- **Complication(s):** Within one week of NAP onset, the patient developed rapid respiratory distress.
- **Lab/Imaging Findings:**
 - ABG's were consistent with hypercapnic respiratory failure with hypoxemia and $\text{PaO}_2/\text{FiO}_2 < 200$.
 - Chest radiography and ABG's did not support a diagnosis of ARDS.
 - CT scan with IV contrast ruled out pulmonary embolism but showed a significant narrowing of the trachea with a drop from 4 cm in tracheal diameter on inspiration compared to a previous CT scan done three weeks earlier for a pulmonary nodule follow up. (Figure 1)
- **Course:** The patient's respiratory status continued to deteriorate requiring mechanical intubation with weaning trials proving to be futile. The patient eventually developed fungemia and expired after his family opted for palliative extubation.

Patient's Dynamic Computed Tomography

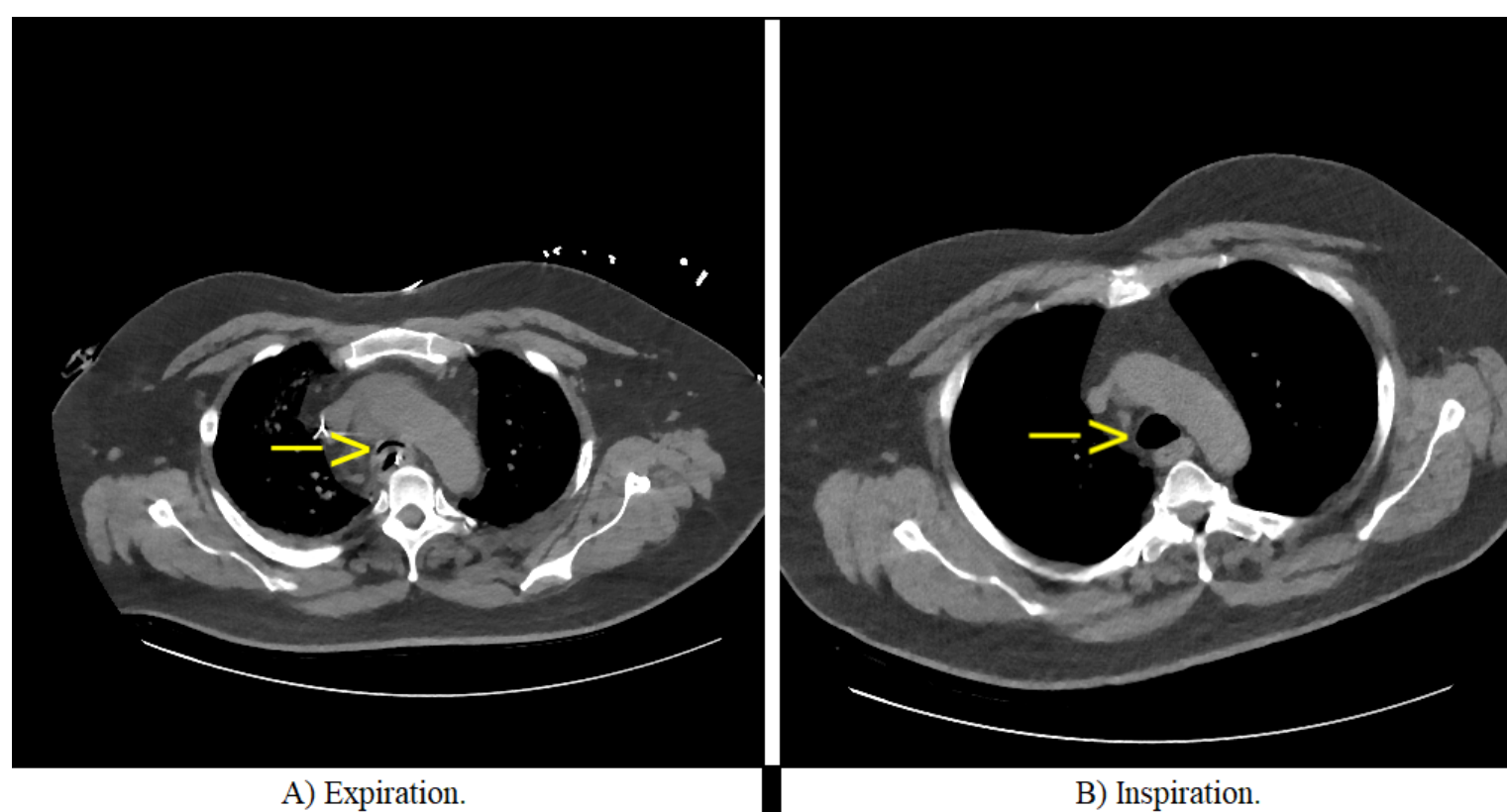


Figure 1: CT scan of the chest with IV contrast within one week of SAP onset
Left: axial view during expiration
Right: axial view during inspiration

Discussion

Acute pancreatitis and severe pancreatitis differ in that severe pancreatitis is associated with organ failure, which can further be classified as moderate or severe, transient (resolves within 48 hours) or persistent (lasts more than 48 hours). If organ failure is persistent, rates of mortality are reported to reach 42%. As described in the literature, the spectrum of pulmonary sequelae of severe acute pancreatitis ranges from a subclinical reduction in arterial oxygen tension to ARDS. The latter is often coupled with a poor prognosis, especially if ventilatory support is required.

TBM, a rare disease, is defined as a weakness of the trachea that is frequently due to either impaired cartilage integrity or reduction and/or atrophy of the longitudinal elastic fibers of the pars membranacea. A diagnosis of TBM can be made upon the finding of a dynamic airway collapse by dynamic flexible bronchoscopy (DFB), dynamic airway computed tomography (DACT), and/or pulmonary function testing. Furthermore, TBM is classified as either congenital or acquired. The congenital form is typically self-limiting by the age of two. The acquired form is secondary to recurrent infections, chronic inflammation from obstructive lung diseases, relapsing polychondritis, endobronchial intubation, tracheostomy, mechanical ventilation, lung transplant, and airway compression.

Our patient progressed from necrotizing acute pancreatitis to severe acute pancreatitis upon the onset of respiratory failure. After chest radiography and ABG's could not rule in ARDS, a CT scan with IV contrast of the chest was ordered to rule out a pulmonary embolism and instead revealed a dynamic instability of the main airways consistent with TBM. A comparison of the patient's prior CT scan of the chest revealed this was a new manifestation.

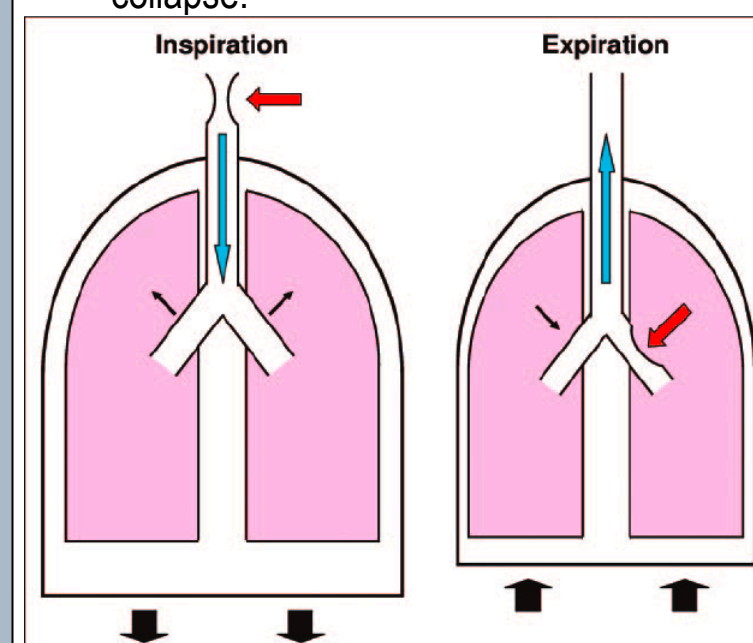
In our review of the literature, we believe this is the first reported case of TBM secondary to severe acute pancreatitis.

Conclusion

After an extensive review of the literature, we believe this to be the first report to describe the occurrence of TBM as a complication of SAP. Although it is unclear to the authors the impact of that diagnosis of this patient's outcome, TBM might have contributed to the failure of weaning trials off ventilation. In a patient with respiratory failure following severe acute pancreatitis, managing clinicians should be suspicious of a new-onset of TBM.

About TBM

- TBM: a rare condition that occurs when the walls of the airway (specifically the trachea and bronchi) are weak. This can cause the airway to become narrow or collapse.



- Acquired TBM is a rare occurrence. A variety of local and systemic diseases (such as recurrent infections, chronic inflammation from obstructive lung diseases, relapsing polychondritis, endobronchial intubation, tracheostomy, mechanical ventilation, lung transplant, and airway compression) have been linked to its development.

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