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Case Report: Pneumoperitoneum in the Setting of Altered Mental Status

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Abstract:
We report a case of an 80-year-old female who presented to the emergency department as altered mental status and diagnosed with pneumoperitoneum requiring immediate surgical intervention. The differential for altered mental status is vast but for a patient who initially hypoglycemic on ED arrival, suspected drug overdose was at the forefront until the patient was intubated for airway protection and chest radiograph for confirmatory endotracheal tube placement showed pneumoperitoneum.

Case Presentation:
An 80-year-old female with a past medical history of diabetes, Parkinson’s dementia, and hypertension initially presented to the emergency department via EMS for altered mental status. As per patient’s daughter, the patient had been suffering from decreased appetite, nausea, vomiting, and right sided abdominal pain for approximately 3 days with no reports of fall or trauma to the abdomen. While being evaluated in the ambulance bay, the patient’s pulse was weak, she had a syncopal episode, and a medical alert was activated.

The patient was taken to the resuscitation bay and on repeat examination was found to have decreased respiration, did not follow commands, nor withdrawing from noxious stimuli (e.g. sternum chest rub or pinching all four extremities). Due to patient’s low Glasgow coma scale, the patient was ultimately intubated for airway protection, placed on cardiac monitor, and had two large bore 18G IVs placed.

Patient’s initial blood pressure was 63/28 mmHg, respiratory rate 8 breaths/min, SpO2 97%, and point-of-care glucose was low 30s. So, prior to intubating the patient was given 1L normal saline and an amp of d50 to get vital signs to a safe range prior to intubation. After intubation, pneumoperitoneum was started peripherally and repeat vital signs were: BP 135/88 mmmHg, HR 85 bradacm, temp 96.5F, respiratory rate 19 breaths/min, and SpO2 99%.

Lab result in the ED showed the following abnormal values: lactate= 10.4 mmol/L, ABG (pH= 7.09, PO2=42 mmHg, PCO2=33 mmHg, CO2= 13 mEq/L, HCO3= 17 mEq/L, BE= -4 mEq/L, Hct= 33%, WBC= 22,000 cells/ul, neutrophils= 93%, lymphocytes= 7%, and band= 2%).

During resuscitation period, patient’s repeat blood sugar continued to be low requiring multiple doses of D50 (500 mL for glucose 2%) as well as multiple IV fluid boluses. Patient had profound hypotension and septic shock and was bleeding from her abdominal. Patient also had coagulopathy with prolonged PT (30s), decreased platelet count, and low peripheral pulses.

CT scan of the abdomen showed pneumoperitoneum associated with free air under the diaphragm. CT scan of the abdomen revealed a large pneumoperitoneum located within the abdomen. The cause of pneumoperitoneum was due to perforation of the gastrointestinal tract. The patient was taken to the operating room for exploratory laparotomy. Intraoperatively, the patient was found to have a perforation of the transverse colon with free air in the peritoneal cavity. The perforation was repaired with sutures and the abdomen was closed.

Postoperatively, the patient was transferred to the intensive care unit for monitoring. The patient’s postoperative course was uncomplicated and the patient was discharged home on postoperative day 14.

Discussion:

Pathophysiology:
The pneumoperitoneum is a flat or acute membrane that lines the abdominal cavity and is formed by two layers: parietal and visceral layers. Peritoneal peritoneal is the abdominal wall where the vascular layer covers the abdominal organs directly (source 1). Pneumoperitoneum is the air within the abdomen that can be classified as Surgical and Non-surgical Pneumoperitoneum.

Surgical pneumoperitoneum accounts for 85-95% of all cases of pneumoperitoneum while non-surgical causes account for 5-15% of all cases (source 1). A study done by Source 1 found that the most common cause of pneumoperitoneum is trauma (40.1%), diverticulitis (28.4%), and perforated appendicitis (22.9%).

Common signs and symptoms of pneumoperitoneum are abdominal pain, vomiting, abdominal distension, rebound tenderness, or guarding on abdominal examination. Laboratory studies are leukocytosis, increased inflammatory markers, hypotension, and shock. CT scan is more sensitive than radiograph in terms of diagnosis pneumoperitoneum. CT shows the presence of free air in the peritoneal cavity.

Management:
The cause of pneumoperitoneum and signs of peritonitis (e.g. rebound tenderness or guarding on abdominal examination) is typically managed with prompt surgical intervention for washout of the abdominal cavity of possible peritoneal or bowel rupture due to obstruction (source 1).

Surgical treatment: Exploratory laparotomy, abdominal washout, wound drainage placement, and abdominal closure.

Conclusions:
Prompt treatment can be vital in preventing shock from free air in the peritoneal cavity. Here we describe a case of a 80-year-old female who presented with altered mental status and sudden right-sided abdominal pain and was found to have pneumoperitoneum on chest radiograph. It is crucial to diagnose pneumoperitoneum promptly in order to quickly intravenous the OR for exploratory laparotomy.

References:
Available on request