



Case Report

Pneumatosis intestinalis and pneumoretroperitoneum post steroid use in a patient with superior mesenteric artery syndrome



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ARTICLE INFO

Article history:

Received 11 June 2019

Accepted 23 June 2019

Keywords:

Pneumatosis intestinalis

Pneumoretroperitoneum

Steroid

Superior mesenteric artery syndrome

ABSTRACT

Pneumatosis intestinalis (PI) refers to the presence of gas within the wall of the small or large intestine. PI can be both asymptomatic and life-threatening. The patient was a 50-year-old man with previous cervical spine abscess and osteomyelitis post debridement 4 years ago, with a heroin abuse history. He presented with abdominal distension ongoing for 4 days and vomiting for 3 times with fluid content. Abdominal computed tomography revealed pneumatosis with pneumoretroperitoneum.

A surgeon was contacted and antibiotic treatment was started. The patient was kept on nothing per os and intravenous fluid supply. A drainage tube was inserted into retroperitoneum space on the same day. Tracing back his history, our patient was discharged from the hospital recently with a diagnosis of superior mesenteric artery syndrome (SMAS), hypersensitivity pneumonitis, and asbestosis with soft tissue pleural plaques and calcified pleural plaques. During the hospitalization period, hydrocortisone dexamethasone and methylprednisolone were prescribed for hypersensitivity pneumonitis. Steroid use and SMAS maybe the cause of PI. Finally, he was discharged 5 days later with a nasojejun and drainage tubes and was arranged for OPD follow-up. PI can be asymptomatic or life-threatening, and patient management varies based on the clinical condition. Although in this case PI was found in the emergency department, a patient's past history of underlying disease and medication should be reviewed to find the most possible etiology.

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1. Introduction

Pneumatosis intestinalis (PI) refers to the presence of gas within the wall of the small or large intestine. PI can be both asymptomatic and life-threatening. The causes of PI include pulmonary diseases, systemic diseases, intestinal diseases, medications, iatrogenic causes, and trauma. We report a case of pneumatosis intestinalis after steroid use in a patient with superior mesenteric artery syndrome (SMAS).

2. Case presentation

The patient was a 50-year-old man with previous cervical spine abscess and osteomyelitis post debridement 4 years ago, with a heroin abuse history. He had SMAS post nasoduodenal tube indwelling about 3 weeks ago before arriving to our emergency department. He presented with abdominal distension ongoing for 4 days and vomiting for

3 times with fluid content. He first went to the gastrointestinal (GI) outpatient department (OPD); his abdominal X-ray suggested pneumoretroperitoneum, pneumoretroperitoneum, and PI (Fig. 1). The status on arrival at emergency department was as follows: body temperature, 36.7 °C; heart rate, 96 bpm; blood pressure, 99/55 mmHg. Blood examination showed no leukocytosis or C-reactive protein elevation, normal renal function and electrolyte including potassium and sodium, and mild elevation of liver function test (aspartate aminotransferase: 58 IU/L, alanine aminotransferase: 90 IU/L). Abdominal computed tomography revealed pneumatosis with pneumoretroperitoneum (Fig. 2). A surgeon was contacted and antibiotic treatment was started. The patient was kept on nothing per os and intravenous fluid supply. A drainage tube was inserted into retroperitoneum space on the same day. Then the patient was admitted to the gastrointestinal ward for further management. During hospitalization, the patient had decreasing drainage amount, from 70 mL to 0 mL in the following 4 days. The patient felt improvement in abdominal fullness, and he tolerated oral intake well. Finally, he was discharged 5 days later with a nasojejun and drainage tubes and was arranged for OPD follow-up. The patient revisited GI OPD for a regular follow-up 10 days after discharge, his image showed decreased air amount (Fig. 3). The drainage tube was

Abbreviations: PI, pneumatosis intestinalis; SMAS, superior mesenteric artery syndrome; GI, gastrointestinal; OPD, outpatient department.

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removed after about a month. His nasojejunal tube was also removed on 2018.09.26.

3. Discussion

Benign causes of PI include pulmonary diseases (like asthma, pulmonary fibrosis), systemic diseases (like scleroderma, systemic lupus), intestinal diseases (like enteritis, peptic ulcers, bowel obstruction, diverticulitis), medications (like corticosteroids, chemotherapeutic agents, lactulose, sorbitol), iatrogenic causes (barium trauma, jejunostomy tube, endoscopy, post-surgical anastomosis). Life threatening causes include intestinal ischemia or obstruction, trauma, and toxic megacolon [1].

Most patients with PI are asymptomatic [2]. However, vomiting, abdominal pain, abdominal distension, weight loss, diarrhea are the common symptoms of small intestinal PI [3], and hematochezia, abdominal pain and distension, diarrhea and constipation are the most common symptoms of large colonic pneumatosis.

PI management includes emergent exploratory laparotomy and non-emergent treatment. Emergent exploratory laparotomy should be considered in patients with signs of peritonitis, metabolic acidosis ($\text{pH} < 7$, $\text{HCO}_3^- < 20$ mmol/L), lactate > 2 mmol/L, or portal vein gas [4]. The non-emergent management includes antibiotic treatment, elemental diet, inhalation oxygen therapy and surgery. Non-emergent surgery is reserved for patients who undergo unsuccessful conservative treatment or complications such as perforation, bowel obstruction, or peritonitis. The underlying cause of PI should be treated in all patients, regardless of the presence of symptoms.

In the present case, our patient was discharged from the hospital (2018/05/28 to 2018/06/26) with a diagnosis of SMAS, hypersensitivity pneumonitis, and asbestosis with soft tissue pleural plaques and calcified pleural plaques. During the hospitalization period, hydrocortisone



Fig. 2. Abdominal computed tomography revealed pneumatosis with pneumoretroperitoneum.



Fig. 1. Plain abdominal X-ray suggestive of pneumoperitoneum, pneumoretroperitoneum and pneumatosis intestinalis.

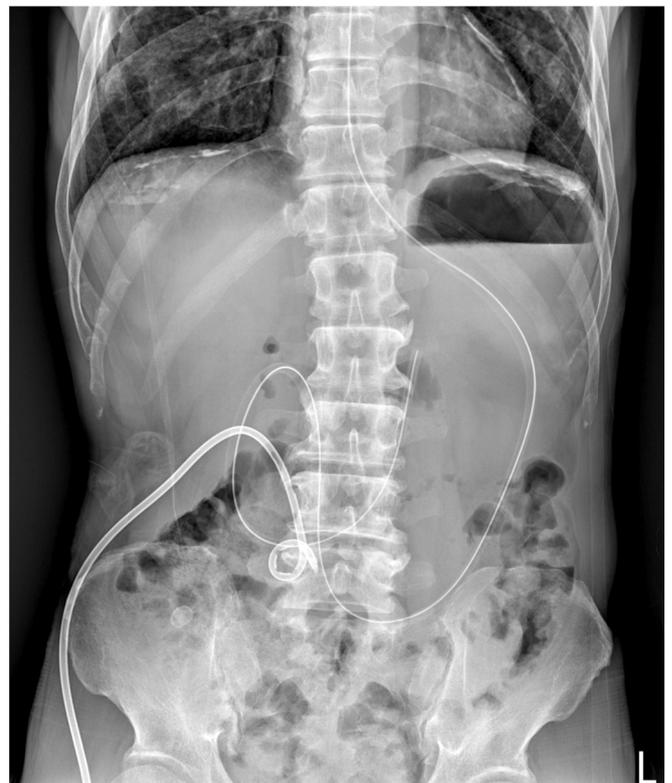


Fig. 3. Plain abdominal X-ray showed decreased air in the retroperitoneum and pneumatosis intestinalis.

Table 1
Steroid use during hospitalization.

Hydrocortisone	100 mg Q8H intravenous	5 days	5/28–6/1
Dexamethasone	4 mg TID oral	18 days	6/2–6/19
Methylprednisolone	40 mg BID Intravenous	5 days	6/19–23
Dexamethasone	4 mg TID oral	9 days	6/24–7/2

dexamethasone and methylprednisolone were prescribed for hypersensitivity pneumonitis (Table 1). SMAS was diagnosis on 2019/06/05 using abdominal computed tomography with contrast. The nasoduodenal tube was inserted on 2019/06/13. The follow up X-ray of abdominal plain film showed the tube was in position and no pneumoperitoneum. The patient presented back to our emergency department 1 week after discharge, with clinical manifestation of abdominal distention and vomiting.

Studies suggest that steroids may induce PI [5,6]. Thus, steroid use maybe the primary cause PI in this patient. Insertion of nasoduodenal tube may also have caused PI, but the follow up abdominal X-ray after insertion showed no obvious PI or pneumoretroperitoneum. Martínez-Pérez reported a case of massive gastrointestinal pneumatosis in a patient with celiac disease and SMAS [7]. Severe vomiting induced by SMAS and pneumoretroperitoneum make it hard to reject that the duodenal wall disruption induced by SMAS maybe the cause of PI. Similar condition of pneumoretroperitoneum and vomiting with distension was also present in our patient. Thus, steroids and SMAS may be the cause of PI in the present case.

4. Conclusion

PI can be asymptomatic or life-threatening, and patient management varies based on the clinical condition. Although in this case PI was found in the emergency department, a patient's past history of underlying disease and medication should be reviewed to find the most possible etiology.

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