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Pneumotosis Intestanalis: A Diagnostic Dilemma

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ABSTRACT
Pneumatosis intestinalis is a secondary finding caused by an underlying disease. Mucosal integrity, intraluminal pressure, bacterial flora and intraluminal gas have an interactive role in the formation of the pneumocysts. He challenge facing surgeons asked to evaluate patients with PI is to identify those who require surgery. Here is case report of a 62 yr old male who is presented with interesting features of pneumotosis instestinalis. A 62 yr old male with a known case of COPD came with complains of abdominal distension and features suggestive of intestinal obstruction such as vomiting and obstipation since 2 days He also complains of shortness of breath since the past 4 weeks for which he was on regular inhalers and nebdemonstrating air within the wall of the bowel wall. Intraoperatively shows air bubble within the wall of small bowel .No signs of ischemia/inflammation/perforation/peritonitis. Pneumatosis intestinalis is currently best diagnosed by plain abdominal radiography or ultrasonography and specifically delineated by CT scan. The challenge facing surgeons asked to evaluate patients with Pneumatosis intestinalis is to identify those who require surgery.

INTRODUCTION

Pneumatosis intestinalis is a secondary finding caused by an underlying disease. Mucosal integrity, intraluminal pressure, bacterial flora and intraluminal gas have an interactive role in the formation of the pneumocysts[1]. Pneumatosis intestinalis is currently best diagnosed by plain abdominal radiography or ultrasonography and specifically delineated by CT scan. The challenge facing surgeons asked to evaluate patients with PI is to identify those who require surgery[2]. Considering the wide range of possible causes and outcomes of this entity, the surgeon most often should pursue nonoperative management initially while searching for an irrefutable indication to operate. Surgery should be performed in patients who are not responding to nonoperative management, especially those with signs of perforation, peritonitis, or abdominal sepsis[3].

Case Report: A 62 yr old male with a known case of COPD came with complains of abdominal distension and features suggestive of intestinal obstruction such as vomiting and obstipation since 2 days. He also complains of shortness of breath since the past 4 weeks for which he was on regular inhalers and nebulisation at home. Per abdomen examination was soft non tender. No guarding or rigidity present. Diffuse abdominal distension was present. Bowel sounds were present. PR Examination was found to be normal Usg abdomen showed no evidence of obstruction with dilated bowel loops. Blood parameters shows rise in Total leucocyte count. Plain CT demonstrated lower quadrant bowel gas-filled loops demonstrating an additional crescentic gas lucency (Fig 1). There was no free air within the abdomen. Plain CT abdomen was performed demonstrating air within the wall of the bowel wall (Fig. 2). There was no bowel wall thickening. Intraoperatively Diagnostic laproscopy shows air bubble within the wall of small bowel (Fig 3). No signs of ischemia/inflammation/perforation/peritonitis.

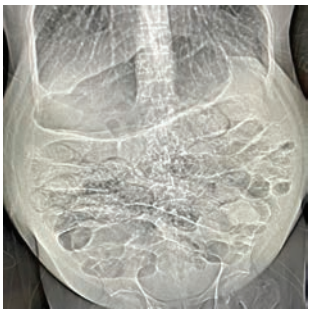

Fig. 1: Plain CT Demonstrated Lower Quadrant Bowel Gas-Filled Loops Demonstrating an Additional Crescentic Gas Lucency

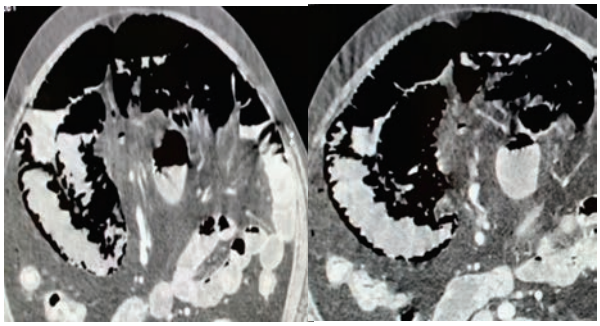

Fig. 2: Plain CT Abdomen was Performed Demonstrating Air within the wall of the Bowel wall

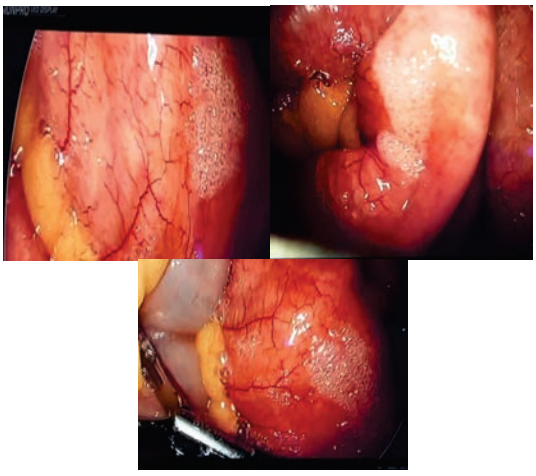

Fig. 3: Intraoperatively Diagnostic Laproscopy Shows Air Bubble within the wall of Small Bowel

RESULTS AND DISCUSSIONS

Pneumatosis intestinalis is currently best diagnosed by plain abdominal radiography or ultrasonography and specifically delineated by CT scan[4]. Considering the wide range of possible causes and outcomes of this entity, the surgeon most often should pursue nonoperative management initially while searching for an irrefutable indication to operate. Surgery should be performed in patients who are not responding to nonoperative management, especially those with signs of perforation, peritonitis, or abdominal sepsis[5]. When considering ischemia or infarction, rapid recognition of the overall clinical picture is imperative. There are several key features of the current clinical scenario, patient past medical history, physical exam and laboratory data, which can heighten suspicion for life-threatening Pneumatosis intestinalis. Arrhythmias, which can cause both low-flow states as well as precipitate embolic phenomena, should also be taken into account[6]. The patient's past medical history should be examined for peripheral vascular disease and coronary artery disease as well as risk factors for vascular disease such as hypertension, hyperlipidemia, diabetes and smoking[7]. Physical examination should focus upon the abdomen. Signs of peritonitis, although uncommonly present, may also suggest ischemia.

Laboratory data should include a lactate level, with an elevated lactate raising serious concern for ischemia. Furthermore, details of the radiographic findings can help define the nature of Pneumatosis intestinalis. The finding of additional gas in the vasculature, particularly portal venous gas, can be an ominous sign and correlates to transmural bowel necrosis. Other authors have suggested that so-called crescentic or linear gas collections may indicate bowel infarction and are more often associated with more sinister pathology[8]. This should be contrasted with so-called cystic Pneumatosis intestinalis, which represents discrete bubbles of gas attached to one another along the digestive tract wall and is usually considered benign. Small bowel Pneumatosis intestinalis is more frequently associated with ischemia than large bowel Pneumatosis intestinalis alone[9]. Thus, radiographic details may be used to aid in identifying life-threatening causes of Pneumatosis intestinalis. After the more serious etiologies have been ruled out, non-urgent pathologies should be considered. Mechanical trauma such as recent surgical anastomosis and endoscopy can impair the normal mucosal barrier and may represent the underlying cause. The differential also includes an abundance of infectious etiologies which can cause inflammation and thereby induce microbreaks in the mucosa. Perhaps the most prominent of these is Clostridium Difficile[10]. This infectious differential expands with the immunocompromised host to include such etiologies such as cytomeglovirus, mycobacteria, pneumocystis carinii and the HIV/AIDS virus itself[11]. Alternatively, autoimmune processes such as the inflammation stemming from Crohn's disease and ulcerative colitis may manifest as Pneumatosis intestinalis[12,13]. Conversely, any localized condition causing increased translumenal pressure such as chronic pseudo-obstruction may cause Pneumatosis intestinalis. The cause of pneumatosis intestinalis is not exclusively limited to GI tract pathology. While debatable, it has been suggested that cystic fibrosis, asthma and other obstructive broncho pathologies such as COPD can cause Pneumatosis intestinalis[14,15]. This may be due to these entities resulting in chronic cough which increase transabdominal pressure and could thereby cause transmucosal air dissection. After evaluation by surgery, it was noted that the lactate was normal and urgent surgical exploration was not deemed necessary. With this and other serious pathologies also ruled out, pneumatosis intestinalis secondary to a less emergent cause was considered. While the patient did have a history of COPD, absence of signs and symptoms of COPD exacerbation and history of prior CTs without evidence of Pneumatosis intestinalis make COPD an unlikely cause.

CONCLUSION

Pneumatosis intestinalis is a secondary finding caused by an underlying disease. Pneumatosis intestinalis is currently best diagnosed by plain abdominal radiography or ultrasonography and specifically delineated by CT scan[4]. The challenge facing surgeons asked to evaluate patients with Pneumatosis intestinalis is to identify those who require surgery. Considering the wide range of possible causes and outcomes of this entity, the surgeon most often should pursue nonoperative management initially while searching for an irrefutable indication to operate. Surgery should be performed in patients who are not responding to nonoperative management, especially those with signs of perforation, peritonitis, or abdominal sepsis[3].

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