Case 108

4. Pneumatosis cystoides coli

【Discussion】

The bowel necrosis under vessel occlusion called necrotizing enterocolitis produces gas production in the bowel wall which require surgical laparotomy. However, in the clinical situation, gas formation without bowel wall necrosis exists, which is called pneumatosis cystoides intestinalis (PCI) (1-3). PCI is seen in the small intestine in 42%, in the colon in 36%, in the colon and the small intestine in 22% (1). Pneumatosis cystoides coli (PCC) is used when pneumatosis cystoides is limited to colon. In our four cases, CT showed gas formation surrounding cecum and ascending colon but not surrounding small intestine, implying PCC. The pathogenesis is not clarified but the most acceptant theory includes bacterial and/or mechanical factors with the increase in the mucosa permeability (1-3). In short, bacterial infection causes fragility of the intestinal mucosa and/ or elevation of intraluminal pressure induce gas break into the bowel wall. Respiratory infection, collagen disease, trauma, acquired immune deficiency syndrome (AIDS) are known to be associated wiht PCI (4-8). The use of steroid, immunosuppressive drugs, alpha-glucosidase inhibitor (α-GI) are also associated with PSI. Carbohydrate is catalyzed by alpha-glucosidase into glucose which is absorbed in small intestine. The use of α-GI delays the absorption of glucose and carbohydrate prolongs in the digestive organ, inducing fermentation of flora and production of methane, carbon dioxide and hydrogen and constant stay for long time (8, 9). Two cases of our four cases had diabetes mellitus II and got the medicine for DM.

The incidence of free air and pneumoperitoneum in PCI is not known. Pneumatosis cystoides exist submucosal and/or sub-serosal spaces which are not to histologically communicate with each other (10). The rupture of sub-serosal gas induces free air and pneumoperitoneum. We encountered four cases with PSC in our hospital during the terms of two years and a half, one of the four cases had the free air and pneumatoperitoneum.

The symptoms of PCI are generally asymptomatic but at times symptomatic. Treatment for PCI depends on the symptoms (11-14); when acute abdomen occurs, laparotomy is a possible choice; in case of being asymptomatic, watchful observation is possible. Our four cases including one case with free air and pneumoperitoneum were almost asymptomatic or non-specific symptomatic such as distension and epigastralgia. Two of them received colon endoscopy which revealed no perforation and mimicked pleural subcutaneous tumors (Fig. 4D). They received no specific treatment and watchful observation.

【Summary】

We present four cases with pneumatosis cystoides coli (PCC). Two cases of them were asymptomatic and other two experienced epigastalgia and abdomen distension. Abdomen CT showed pneumoperitoneum and free air in one case, and air collection surrounding cecum and ascending colon in all cases. It is borne in mind that air collection of PCC generally exists in submucosa and sub-serosa, and the rupture of sub-serosa gas causes free air and pneumoperitoneum. Further, PCC is probably caused by mechanical and bacterial factors: especially alpha-glucosidase inhibitor delay absorption of carbohydrates and induce fermentation of flora and production of gas, and constant stay of gas for long time, leading to PCC.

【References】

1. Jamart J. Pneumatosis cystoides intestinalis. A statistical study of 919 cases. Acta Hepatogastroenterol (Stuttg) 1979;26:419–422. [PubMed
2. Heng Y, Schuffler MD, Haggitt RC, Rohrmann CA. Pneumatosis intestinalis: a review. Am J Gastroenterol. 1995;90:1747–1758. [PubMed]
3. St Peter SD, et al. The spectrum of pneumatosis intestinalis. Arch Surg. 2003;138:68–75. [PubMed]
4. Luks FI, et al. Pneumatosis and pneumoperitoneum in chronic idiopathic intestinal pseudoobstruction. J Pediatr Surg. 1991;26:1384–1386. [PubMed]
5. Wood BJ, et al. Pneumatosis intestinalis in adults with AIDS: clinical significance and imaging findings. AJR Am J Roentgenol. 1995;165:1387–1390. [PubMed]
6. Yale CE, et al. The natural course of Clostridium perfringens--induced pneumatosis cystoides intestinalis. J Med. 1992;23:279–288. [PubMed]
7. Galm O, et al. Pneumatosis intestinalis following cytotoxic or immunosuppressive treatment. Digestion. 2001;64:128–132. [PubMed]
8. Hisamoto A, et al. Pneumatosis cystoides intestinalis after alpha-glucosidase inhibitor treatment in a patient with interstitial pneumonitis. Intern Med. 2006;45:73–76. [PubMed]
9. Önder A, et al. Pneumatosis cystoides intestinalis: Clinical experience in a single center. Eur J Gen Med. 2012;9:27–32.
10. Haltaş H, et al. Pneumatosis intestinalis associated with massive intraperitoneal free air mimicking intestinal perforation: case report. JIUMF. 2012;19:184–187. http://dx.doi.org/10.7247/jiumf.19.3.11.
11. Morris MS, et al. Management and outcome of pneumatosis intestinalis. Am J Surg. 2008;195:679–683. http://dx.doi.org/10.1016/j.amjsurg.2008.01.011. [PubMed]
12. Yellapu, RK, et al. SchianoPneumatosis intestinalis and mesenteric venous gas – a manifestation of bacterascites in a patient with cirrhosis. J Postgrad Med, 57 (2011), pp. 42-43
13. Greenstein AJ, et al. Pneumatosis intestinalis in adults: management, surgical indications, and risk factors for mortality. J Gastrointest Surg. 2007;11:1268–1274. [PubMed]
14. Knechtle SJ, et al. Pneumatosis intestinalis. Surgical management and clinical outcome. Ann Surg. 1990;212:160–165. [PMC free article] [PubMed]

back