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Case Report

Emphysematous Abdominal Aortic Aneurysm by *Clostridium septicum* **with Synchronous Colon Cancer**

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ABSTRACT

Introduction: Clostridium septicum (C. septicum) aortitis is a rare condition frequently associated with colon adenocarcinoma and carries a poor prognosis.

Case Report: We report the case of an 80-year-old man who was waiting for an elective endovascular repair of an abdominal aortic aneurysm (AAA) with a diameter of 5.8×5.4 cm. He underwent a colonoscopy because of a thickening of the colon wall in the preoperatory CT. One week after that, he presented at the emergency with a 48-hour duration of fever and abdominal pain. Abdominal CT imaging revealed an increased aneurysm size to 6.1×6.6 cm including gas within the aorta. Treatment consisted of antibiotics, urgent axillar to femoro-femoral bypass, excision and ligation of the infrarenal aorta and right hemicolectomy with end-ileostomy. Aortic cultures were positive for *C. septicum*. The postoperative was complicated by renal failure and the patient died.

Conclusion: *C. septicum*-infected aortic aneurysm is a rare entity that is strongly associated with colon cancer. The presence of gas within the aorta or emphysematous aortitis is the most common sign of *C. septicum* infection. Broad-spectrum antibiotics should be initiated and emergency surgical management with excision of the infected aneurysm and grafting is required.

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Case Report

An 80-year-old man was transferred to our institution with a 48-hour duration of fever and increasing diffuse abdominal pain radiating to his back. He had a history of abdominal aortic aneurysm (AAA) and he was waiting for elective endovascular repair. The preoperatory CT scan performed 3 weeks before showed an infrarenal AAA with a maximum diameter of 5.8×5.4 cm and thickening of the colon wall at the hepatic flexure (Figure 1). A colonoscopy was performed after 2 weeks which revealed a moderately differentiated transverse colon adenocarcinoma. At admission, his laboratory values were significant for a white blood cell count of $19~000/\mu L$, a blood urea nitrogen level of 91~mg/dL and a serum creatinine level of 1.73~mg/dL. CT imaging of the abdomen showed an increased aneurysm size with a diameter of 6.1×6.6 cm,

including intrathrombus gas, emphysematous aortitis, surrounding inflammatory changes and a hepatic flexure colonic mass with a dilated colon (Figure 2).

Broad-spectrum intravenous antibiotic therapy with piperacillintazobactam was initiated and the patient was immediately taken to the operating room. He underwent an axillar to femoro-femoral bypass with an 8-mm ring-enforced polytetrafluoroethylene graft and excision and ligation of the infrarenal aorta. An omental pedicle was placed over the aortic stump. A right hemicolectomy with end-ileostomy were also performed. Operative tissue cultures were positive for *Clostridium* septicum. His postoperative course was complicated by acute renal failure and cardiopulmonary arrest on hospital day 3 and died.

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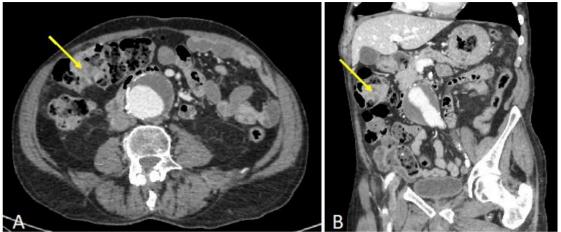


Figure 1: Preoperative CT scan: A) transverse and B) coronal view showed a 5.8×5.4 cm infrarenal aortic aneurysm and thickening of the colon wall at the hepatic flexure (arrow).

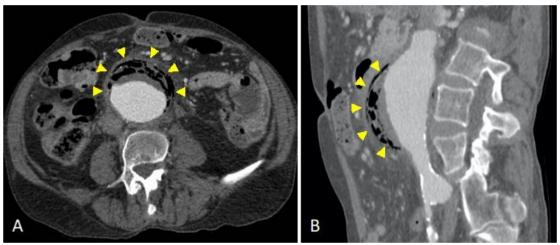


Figure 2: Admission CT scan: A) transverse and B) sagittal view revealed an increase of the aneurysm to 6.1×6.6 cm with gas in the aorta (head arrows).

Discussion

C. septicum is an anaerobic, gram-positive, spore-forming, motile bacillus and it is a known cause of gas gangrene [1-4]. C. septicum is not a typical organism of the intestinal flora and it represents only 1% of all Clostridium infections [5]. Infection with this organism may occur in the presence of trauma, but commonly presents without it. A review conducted by Kornbluth et al. reported that, out of 162 cases of atraumatic C. septicum infection, 23 patients had aortitis. Of these 23 patients, 21 (91%) had colonic adenocarcinoma or polyps, while 15 of the 21 (71%) had cancer of the ascending colon or cecum [6].

Seeding of the abdominal aorta by this organism can lead to the rapid development of an infected aneurysm, but this is a very rare entity with less than 70 cases reported in the literature [1, 2]. *C. septicum*-infected aortic aneurysm was associated with cancer in 82.5% of cases, with the most common being colon cancer [2, 3, 7]. It is believed that the pH, electrolyte and osmotic composition of the cecum provide an environment that is ideal for the growth of *C. septicum* [5]. This organism is thought to cause systemic disease by invasion through a defect in the bowel mucosal lining [1]. Although, in our case, we did not find a retroperitoneal colonic perforation, the colonoscopy could have

led to microperforations and consequent direct extension of *C. septicum* to the aorta.

Imaging findings concerning *C. septicum* aortitis include gas within and around the aortic wall. Periaortic gas and vessel wall emphysema are indicative of an advanced infectious aortitis [1, 2, 4]. The differential diagnosis for gas in the aorta or aortic wall with surrounding inflammatory changes includes aorto-enteric fistulae, mycotic aneurysm or seeding of the aorta secondary to an intra-abdominal infectious process.

If *C. septicum* is suspected, broad-spectrum antibiotics should be initiated to cover gram-positive, gram-negative and anaerobic organisms. Once established, *C. septicum* aortitis requires emergency surgical management with excision of the infected aneurysm, wide local debridement and remote grafting in the form of an extra-anatomic bypass through a clean surgical field [4]. However, *in situ* reconstruction has received emphasis in recent years [3]. Six to 8 weeks of antibiotic treatment has been recommended and life-long therapy should be considered in severe cases [3, 4]. The 6-month mortality for *C. septicum* aortitis has been reported to be as high as 100% in the absence of operative intervention and between 64% to 100% with the appropriate surgical intervention [1, 4].

Conclusion

This is a case report of a *C. septicum*-infected aortic aneurysm. Broad-spectrum antibiotics and emergency surgical management with excision of the infected aneurysm and grafting were performed. *C. septicum* aortitis is a rare entity that is strongly associated with colon cancer. The presence of gas within the aorta or emphysematous aortitis is the key to an early diagnosis.

Conflicts of Interest

None.

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