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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.

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/μL, 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 piperacillin-tazobactam 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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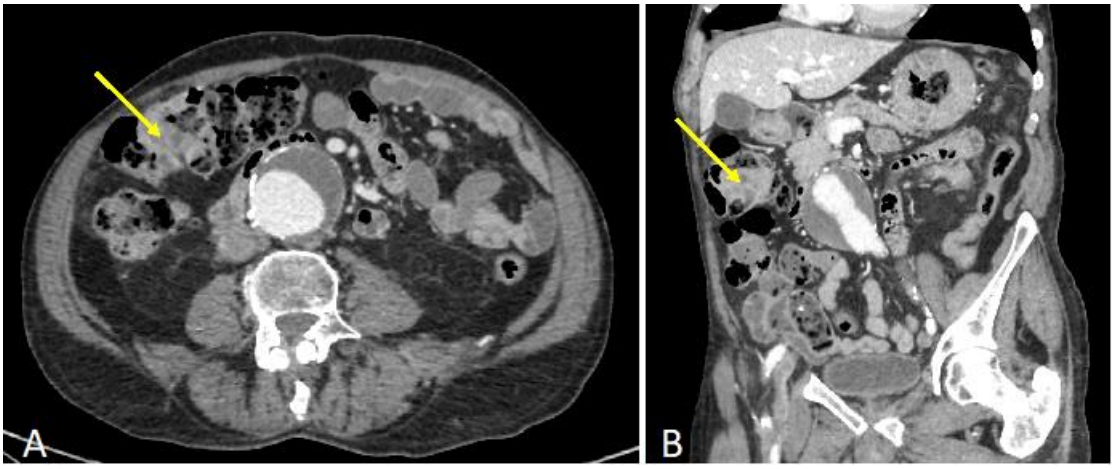

Figure 1: Preoperative CT scan: **A)** transverse and **B)** coronal view showed a 5.8×5.4 cm infrarenal aortic aneurysm and thickening of the colon wall at the hepatic flexure (arrow).

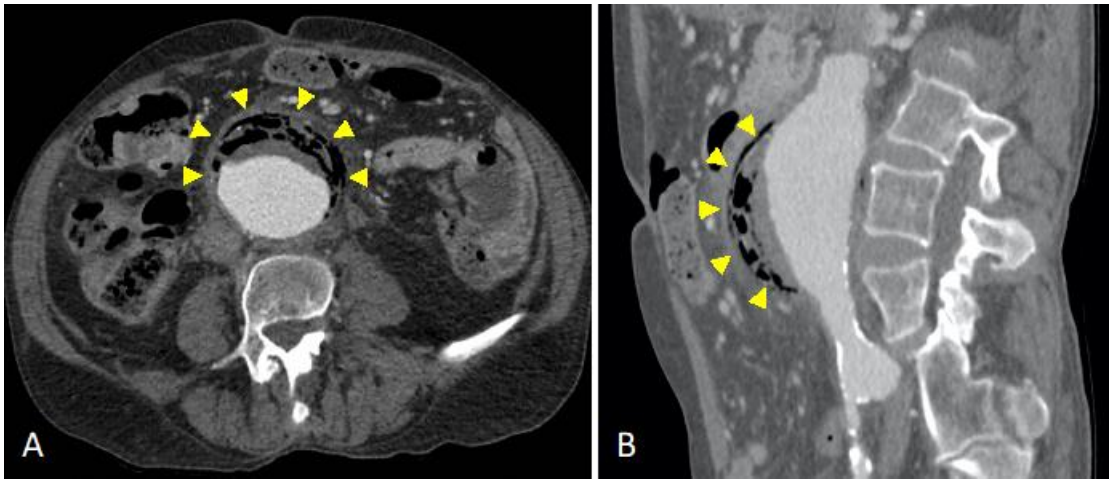

Figure 2: Admission CT scan: **A)** transverse and **B)** sagittal view revealed an increase of the aneurysm to 6.1×6.6 cm with gas in the aorta (head arrows).

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.

Funding

None.

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