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Rapidly Expanding Infectious Aortic Aneurysm Caused By Perforated Colon Cancer

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Brief running title: Infectious Aortic Aneurysm Due to Perforated Colon
Abstract

A 50-year-old male smoker presented with a perforated colon cancer and underwent extended right colectomy. Feculent peritonitis was covered with empiric antibiotics. Post-operatively he developed severe back pain and rising leukocytosis. Serial computed tomography revealed a rapidly expanding infrarenal aortic aneurysm. He was urgently taken for extra-anatomic bypasses and aortic resection. No organisms grew from the resected aortic wall. He was discharged in stable condition and the ileostomy was taken down 9 months later.
Introduction

The etymology of aneurysm derives from the Greek word for dilation (ἀνεύρυσμα). Aortic aneurysms are full-thickness dilations of the aorta that exceed its normal diameter by 50% (1). The role of infectious microorganisms in the development of aortic aneurysms was classically described by Sir William Osler in 1885 (2). With the advent of antibiotics, such infectious aortic aneurysms have become very rare (3, 4). Here we describe an infectious aortic aneurysm caused by perforated colon cancer.

Case Presentation

A 50-year-old male smoker presented with acute onset abdominal pain and peritoneal signs. Exploration revealed a perforated transverse colon mass that was treated by extended right colectomy with mobilization of the splenic flexure and end ileostomy. Pathology of the mass showed medullary colon carcinoma with stage T4b N1a (1 out of 30 positive regional lymph nodes). Postoperatively the patient was started on empiric vancomycin and piperacillin/tazobactam to cover feculent peritonitis. His postoperative course was complicated by delayed return of bowel function and persistent leukocytosis. Computed tomography on post-operative day 6 demonstrated evidence of partial bowel obstruction. The patient also complained of progressive back pain that was not controlled with opiates. Therefore a second opinion on the CT scan was sought from a cardiovascular radiologist, who noted mild retroperitoneal
stranding around the aorta (Figure 1). The patient made a good further recovery but continued to complain of back pain. Repeat CT scan on post-operative day 15 showed new aneurysmal dilation of the infrarenal aorta with a dramatic increase in diameter from 3.3 cm to 5.5 cm since the first CT scan 9 days earlier. Moreover, a saccular contour irregularity at the left posterior aspect of the aneurysm and worsened peri-aortic stranding were noted (Figure 2). Taken together, these findings were suggestive of an infectious aortic aneurysm with concern for impending rupture. Therefore the patient was urgently taken to the operating room.

In the first part of the operation, axillary to femoral and femoral to femoral polytetrafluoroethylene bypass grafts were constructed in a sterile field. In the second part of the operation, the contaminated abdominal field was addressed. The old laparotomy was re-entered and dense adhesions were taken down. Exposure of the infrarenal aorta revealed a prominent aortic aneurysm with surrounding necrotic and inflamed tissue but no frank purulence. Proximal and distal control were obtained by clamping the infrarenal aorta and common iliac arteries respectively. The involved aortic segment and both proximal iliac arteries were resected. Bleeding lumbar arteries were oversewn with figure-of-eight polypropylene sutures. The aortic stump was closed with a polypropylene continuous horizontal mattress suture to obtain intimal apposition and a top layer polypropylene whip-stitch to obtain hemostasis. The common iliac stumps were closed in the same fashion. The contaminated field was then debrided and irrigated by pulsed lavage with 3 liters of normal saline solution.
containing cefazolin, vancomycin and gentamycin. The retroperitoneum was closed over the arterial stumps, but no omental pedicle flaps were available for additional coverage. Pathology of the resected aorta showed a polymorphonuclear infiltrate but no organisms were seen. Culture did not reveal any organisms either. The patient’s further course was unremarkable and he was discharged on intravenous Vancomycin and Meropenem to a rehabilitation facility. His ileostomy was taken down 9 months later and he was well on post-operative follow-up after 1 year.

Discussion

Infectious aortic aneurysms feature amongst the most challenging problems in vascular surgery because they are rare, difficult to diagnose, difficult to manage and rapidly fatal. Infectious aortic aneurysms constitute less than 1% of aortic aneurysms (3, 4). The diagnosis is based on history as well as clinical, laboratory and radiographic manifestations of the infection and the aortic mass effect. In our patient, empiric antibiotics started at the time of colon cancer perforation masked the stigmata infection and explain the negative culture results. Expeditious surgical management is critical because over half of infectious aortic aneurysms are already ruptured at the time of surgery (5, 6). In our patient, a saccular protuberance on the computed tomograph was concerning for an impending rupture. Therefore he was urgently taken for surgery. In such cases, extra-anatomic bypass grafting in a sterile field, followed by aortic resection and retroperitoneal debridement achieves the objectives of surgery...
by preventing aortic rupture, controlling sepsis and reconstructing the vasculature.

This case highlights that a high index of suspicion with active investigation to seek
the diagnosis and expeditious surgery are critical for successful management of
infectious aortic aneurysms.

Figures

**Figure 1**: CT scan on post-operative day 6 in cross-sectional and coronal views. The
arrows show mild stranding around the aorta.
Figure 2: CT scan on post-operative day 15 in cross-sectional and coronal views. The arrows show aneurysmal dilation of the infrarenal aorta.
References


