Case Reports

Getting to a Man's Heart through His Colon

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A 69-year-old man presented with a progressively enlarging pulsatile mass in the left side of his chest. Because of a history of an ischemic cardiomyopathy, he had been randomized in 2003 to undergo coronary artery bypass grafting with a Dor procedure, as part of the Surgical Treatment for Ischemic Heart Failure (STICH) trial.

Our patient's imaging studies, including a thoracic computed tomogram and transthoracic echocardiogram, were now of concern for left ventricular pseudoaneurysm. He was taken immediately for surgical exploration. Purulent material, with empyema, extended from the anterior chest wall through the chest cavity into the mediastinum, with communication into the pericardial space. Notably, there was no compromise of the left ventricular cavity, and there was no pseudoaneurysm. The chest was copiously irrigated before closure. The epicardial patch placed 10 years earlier in the STICH trial was not thought to be the nidus of the abscess and was therefore not removed.

Three months later, the patient presented again, this time with hemorrhagic shock and bleeding from his left anterior thoracotomy site, which we then re-entered. He was found to have a left ventricular pseudoaneurysm with disruption of the ventricular apex. The epicardial felt-and-Dacron patch, placed 10 years previously during his Dor procedure, was found to be infected with Clostridium difficile *and was removed. The left ventricular apex was repaired.*

Whereas C. difficile *bacteremia is rare, the seeding of prosthetic cardiac material with delayed presentation, as in this case, is extraordinarily uncommon.* ***(Tex Heart Inst J 2016; 43(2):168-70)***

Key words: *Abscess/pathology; clinical trials as topic; Clostridium difficile/extraintestinal; debridement; empyema; pericarditis; postoperative complications; reoperation; ventricular dysfunction, left/surgery; ventricular remodeling*

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Evaluating the efficacy of the Dor procedure when that procedure is added to coronary artery bypass surgery was one of the 2 major objectives of the Surgical Treatment for Ischemic Heart Failure (STICH) trial, the results of which were reported in 2009.[1] The Dor procedure involves removing both akinetic and dyskinetic segments of the anterior wall and reshaping the left ventricle (LV), in order to restore its original elliptical form. Here, we describe the case of a patient who, 10 years after receiving a Dacron epicardial patch as a research subject in the STICH trial, presented with purulent pericarditis from *Clostridium difficile*.

Case Report

In March 2013, a 69-year-old man presented with a progressively enlarging pulsatile mass in the left side of his chest. He had no constitutional symptoms and reported no symptoms of decompensated heart failure, such as shortness of breath, dyspnea on exertion, orthopnea, paroxysmal nocturnal dyspnea, or peripheral edema. Nor did he have abdominal symptoms suggestive of volume overload. Physical examination revealed a temperature of 37.3 °C, a heart rate of 70 beats/min, a blood pressure of 122/58 mmHg, and a large, pulsating mass protruding from his chest wall, surrounded by erythema. His medical comorbidities included ischemic cardiomyopathy with an LV ejection fraction recently measured at 0.15, chronic obstructive pulmonary disease with emphysema, chronic kidney disease, alcohol abuse, and tubulovillous adenoma of the transverse colon. His surgical history included (in 2003) coronary artery bypass grafting combined with the Dor procedure (including placement of a felt-and-Dacron epicardial patch), as well as a transverse colectomy (in 2012).

Six months before this presentation, he had been admitted to another hospital for non-ST-segment-elevation myocardial infarction and cardiogenic shock, an admission that was complicated by *C. difficile* bacteremia without colitis. Two weeks of treatment with metronidazole achieved clearance of blood cultures and clinical resolution. No obvious cause for the *C. difficile* bacteremia was found; the evaluation included a negative computed tomographic (CT) scan of the abdomen and pelvis.

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An echocardiogram during that admission showed an apical pericardial fluid collection, which was not hemodynamically significant. The patient was later rehospitalized for gastrointestinal bleeding, for which he underwent upper and lower endoscopies. He was found to have an ulcer at the anastomotic site of his previous bowel resection, which was not bleeding. No intervention was performed.

For evaluation of the pulsatile mass, the patient underwent thoracic CT with contrast medium. He was found to have an apical periventricular fluid collection with the suggestion of an LV pseudoaneurysm (Fig. 1). The fluid extended into the left side of the chest with the formation of a left pleural fluid collection, which further extended into soft-tissue structures of the left anterior chest wall. Transthoracic and transesophageal echocardiograms were also obtained (Fig. 2). These imaging studies also suggested the presence of an LV pseudoaneurysm.

The patient was taken urgently to the operating room and placed on cardiopulmonary bypass (CPB) via the right axillary artery and femoral vein. A left anterior thoracotomy was performed, and we immediately saw purulent material, with empyema, that extended from the anterior chest wall through the chest cavity into the mediastinum, with communication into the pericardial space. Notably, there was no compromise of the LV cavity, and there was no pseudoaneurysm. We copiously irrigated the chest before closure. The epicardial patch placed 10 years before, during the STICH trial, was not removed, because we did not consider it to be the nidus of the abscess. Intraoperative specimens exhibited no organisms or white blood cells upon gram staining.

After surgery, the patient remained afebrile. He was treated initially with intravenous vancomycin and piperacillin/tazobactam. He experienced repeat hypoxic/hypercarbic respiratory failure on postoperative day (POD) 3, requiring reintubation. On POD 5, he underwent placement of tracheostomy and gastrojejunostomy tubes. On POD 6, intraoperative cultures grew *C. difficile*. All other cultures, including blood and fungus, remained without growth. Antibiotic therapy was streamlined to intravenous metronidazole. His postoperative course was complicated by acute renal failure, for which he did not need renal replacement therapy. By POD 15, his tracheostomy was decannulated, and several days later he passed a swallow study. Repeat abdominal CT scans again did not show a possible source of infection. He was discharged from the hospital 30 days after surgery, having completed 21 total days of appropriate antibiotic therapy with metronidazole. He was discharged with a device for negative-pressure wound therapy.

Three months later, the patient presented at another hospital in hemorrhagic shock, with bleeding from his left anterior thoracotomy site. A CT angiogram was again worrisome for LV pseudoaneurysm formation. He was transferred to our facility intubated, sedated, and placed on continuous norepinephrine. He was again taken to the operating room and placed on CPB via the right axillary artery and femoral vein. The left anterior thoracotomy site was re-entered. He was found to have an LV pseudoaneurysm with disruption of the LV apex, presumably from the infected felt-and-Dacron patch that had not been removed during the previous surgery. The patch, placed 10 years previously during his Dor procedure, was removed, and the LV apex was repaired with 2-0 Prolene sutures. The patient was extubated and weaned from inotropic agents on POD 1. Blood cultures throughout the admission yielded no growth. He was discharged from the hospital on POD 11, without antibiotics.

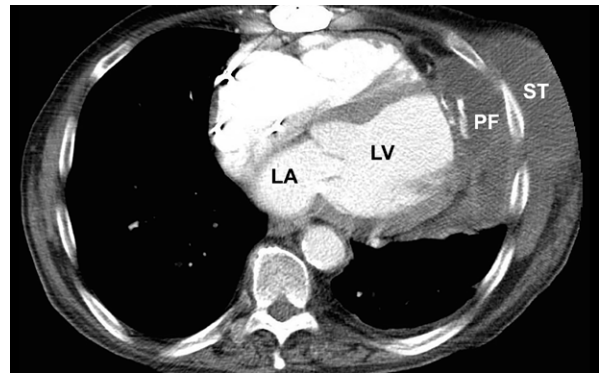

Fig. 1 *Computed tomographic angiogram of the chest shows the pericardial fluid collection (PF) extending through the chest wall into the subcutaneous tissue (ST) of the left anterior chest wall.*

LA = left atrium; LV = left ventricle

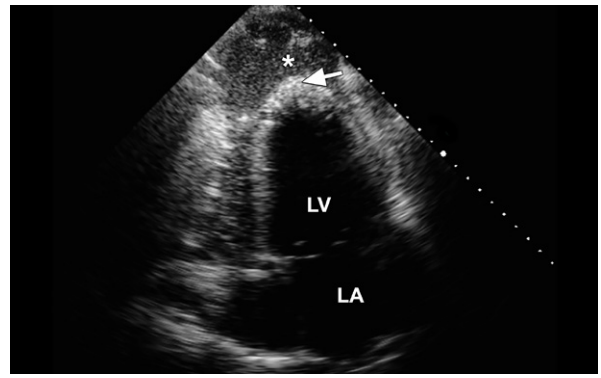

Fig. 2 *Transthoracic echocardiogram (apical 4-chamber view) shows an echogenic fluid collection in the pericardial space (asterisk), a thickened left ventricle (LV), and a dilated left atrium (LA). The thickened, hyperechoic structure at the apex (arrow) is the pericardial patch from the previous Dor procedure. The LV function is reduced, and there is no evidence of communication between the LV apex and pericardial space.*

Supplemental motion image is available for Figure 2.

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As of March 2015, he continued to do well, with no recurrence of infection.

Discussion

Although they are infrequent, extraintestinal *C. difficile* infections occur most often in patients with multiple comorbidities.[2] Extraintestinal infection has been described in visceral organs, skin and soft tissues, joints, and, in cases of empyema, brain empyema in association with chronic subdural hematoma, and bacteremia.[3-7] *Clostridium difficile* pericarditis has been described once before[8] in the presence of acute colitis with presumed bacteremia, but indolent infection of an epicardial patch occurring months after documented *C. difficile* bacteremia has not previously been reported.

The pathophysiology of this patient's *C. difficile* infection is presumably related to bacterial translocation within the inflamed and ischemic bowel, which probably occurred during the described episode of cardiogenic shock. Whereas *C. difficile* bacteremia is rare, the seeding of prosthetic cardiac material with delayed presentation—as in this case, 6 months after treatment—is extraordinarily uncommon. A small number of delayed, recurrent extraintestinal *C. difficile* infections have been reported in various circumstances: in an aortic aneurysm,[2] in a prosthetic shoulder,[6] in vertebral osteomyelitis associated with prosthetic hardware,[9] and in a prosthetic hip.[10]

During the initial surgery, our patient was placed on CPB, because this lesion was presumed to be a pseudoaneurysm. Although an empyema was discovered, he remained on CPB for purposes of safety, and serial repeat blood cultures remained sterile.

References

1. Jones RH, Velazquez EJ, Michler RE, Sopko G, Oh JK, O'Connor CM, et al. Coronary bypass surgery with or without surgical ventricular reconstruction. N Engl J Med 2009; 360(17):1705-17.
2. Mattila E, Arkkila P, Mattila PS, Tarkka E, Tissari P, Antilla VJ. Extraintestinal Clostridium difficile infections. Clin Infect Dis 2013;57(6):e148-53.
3. Jacobs A, Barnard K, Fishel R, Gradon JD. Extracolonic manifestations of Clostridium difficile infections. Presentation of 2 cases and review of the literature. Medicine (Baltimore) 2001; 80(2):88-101.
4. Vaishnavi C. Clinical spectrum & pathogenesis of Clostridium difficile associated diseases. Indian J Med Res 2010;131: 487-99.
5. Gravisse J, Barnaud G, Hanau-Bercot B, Raskine L, Riahi J, Gaillard JL, Sanson-Le-Pors MJ. Clostridium difficile brain empyema after prolonged intestinal carriage. J Clin Microbiol 2003;41(1):509-11.
6. Ranganath S, Midturi JK. Unusual case of prosthetic shoulder joint infection due to Clostridium difficile. Am J Med Sci 2013;346(5):422-3.
7. Hudson DA, Gibb AP, Gill MJ. Empyema caused by Clostridium difficile. Can J Infect Dis 1999;10(2):170-1.
8. Koehler R, Mone M, Kimball E, Vargo D, Lonardo N, Barton R. Clostridium difficile pericarditis complicating pseudomembranous colitis in a trauma patient. J Trauma 2003;55 (4):771-3.
9. Al-Najjar A, Al-Rawahi GN, Hoang LM, Kollmann TR. Clostridium difficile vertebral osteomyelitis. Pediatr Infect Dis J 2013;32(9):1030-2.
10. Bedimo R, Weinstein J. Recurrent extraintestinal Clostridium difficile infection. Am J Med 2003;114(9):770-1.

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