

Primary Infected Left Ventricular Pseudoaneurysm and the Use of Omental Flap

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ABSTRACT

A 55-year-old man with autoimmune deficiency syndrome presented with an infected left ventricular pseudoaneurysm and sepsis. The aneurysmectomy consisted of a Dor-style pericardial patch plus debridement of the abscess cavities. The infected pseudoaneurysm recurred, much larger, within five months due to persistent infected abscess cavities. The second repair was done without a Dor-style patch and with an omental flap. No recurrence has occurred one year after the second repair, but the patient has asymptomatic, partial gastric herniation inside the pericardium. This is the first description of a primary infected left ventricular pseudoaneurysm. The omental flap contributed to the successful treatment.

INTRODUCTION

Left ventricular aneurysms (LVA) and pseudoaneurysms (LVPA) are less common today due to the widespread use of stents in the treatment of the acute phase of myocardial infarction. Infected LVPA (ILVPA) secondary to previous LVA repair has been reported only twice; therefore the treatment is not well defined. Primary ILVPA has never been reported. We successfully treated one such case and now present advice about the treatment.

CASE REPORT

A 55-year-old cachectic African-American male with autoimmune deficiency syndrome (AIDS) and a CD4 count of 500 was admitted for acute severe chest pain and was found to have congestive heart failure (CHF), methicillin-resistant staphylococcus aureus (MRSA) sepsis and respiratory failure. Chest x-ray, chest computerized tomography (CT) and transthoracic echocardiogram (TTE) showed the presence of a large calcified LVA, communicating with a LVPA, and a left ventricular ejection fraction (LVEF) of 25% (Figure 1). Due to the presence of sepsis, a preoperative diagnosis of ILVPA was made. Preoperative coronary angiogram demonstrated recanalized occlusion of the proximal left anterior descending coronary artery. The

Received November 11, 2015; accepted March 16, 2016.

*Tad Kim, MD participated in the treatment of this patient and passed away during the preparation of this manuscript.

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source of the sepsis was not identified prior to surgery; however, it was likely secondary to poor dentition. Medical therapy only was excluded due to the presence of acute and progressing chest pain, sepsis and the presence of abscess cavities. After 24 hours of intravenous antibiotics without improvement, urgent surgery was done through a full sternotomy approach, aortic and single atrial cannulation, and no aortic cross clamping.

Two large, pus-filled ILVPA cavities were found: one eroding into the pericardial diaphragm and one into the left lateral pericardial wall. Both abscess cavities were debrided with curettes and irrigated. The remaining ILVPA was resected together with part of the LVA, its calcifications and clots.

Two 2-0 polypropylene concentric Fontan's purse strings were placed deeply in the left ventricle between the scar and the contractile tissue and tied. Due to the poor left ventricular function and the reduced residual left ventricular cavity, it was decided to perform a traditional Dor-style repair. Because of



Figure 1. Left ventricular pseudoaneurysm before first surgery.

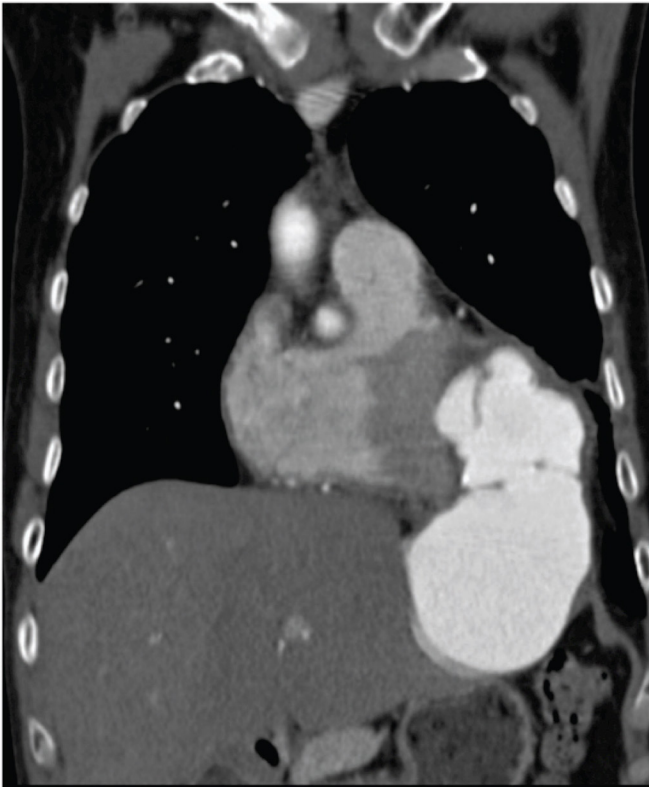


Figure 2. Left ventricular pseudoaneurysm before second surgery.

the presence of sepsis, instead of the traditional Dacron patch, a small bovine pericardial patch was chosen and secured in place with interrupted mattress 3-0 polypropylene sutures without pledgets.

The remaining LVA was closed in double layer with 2-0 polypropylene sutures in horizontal mattress and running fashion. No Teflon felt was used. An intraaortic balloon pump was inserted, and the sternum was kept open for 24 hours since the patient needed substantial inotropic support with epinephrine, norepinephrine, milrinone and vasopressin. Eventually, the patient recovered and was discharged on postoperative day 22 with a percutaneous endoscopic gastrostomy (PEG) tube. TTE showed an improved LVEF of 30%.

Two months later, on the second postoperative visit, a chest radiogram showed a left lower lobe infiltrate adjacent to the left mediastinal border. Chest CT showed a 2.0 × 2.0 cm fluid collection near the apex of the left ventricle (LV), and a pigtail drainage was placed under CT guidance. The drainage grew MRSA, and home daptomycin therapy was started.

The patient remained asymptomatic, afebrile, and with normal white count. After two months, the pigtail drainage was accidentally pulled out by the patient and could not be replaced by the radiologist due to partial resolution of the cavity.

One month later, the patient returned to clinic for follow-up, still asymptomatic, afebrile and with a normal white count. CT of the chest and abdomen, however, showed a large (6.0 × 6.0 × 6.0 cm) complex cavity

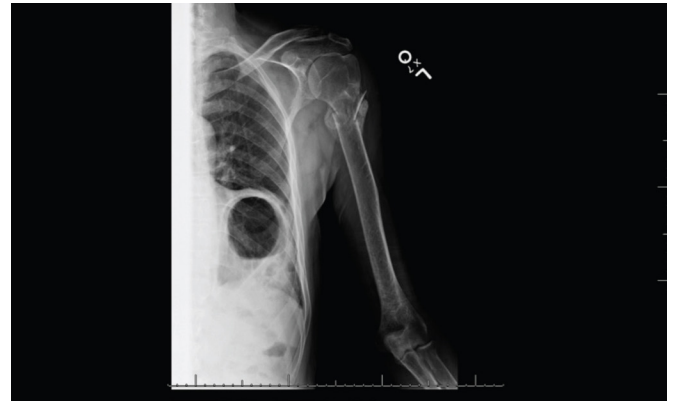


Figure 3. Stomach herniation through the pericardial diaphragm one year after second surgery. Note the intact left diaphragm.

extending toward the left upper quadrant of the abdomen (Figure 2). The patient was taken urgently to surgery and through a redo-sternotomy a large blood filled cavity partially formed by the pericardial diaphragm and communicating with the LV was found. The wall appeared whitish and possibly infected. It was impossible to resect this ILVPA because any attempt led inside the abdomen. The LVA was therefore repaired with two new 2-0 polypropylene Fontan's purse strings without a patch. The LVA was then closed with three 2-0 polypropylene layers: two interrupted horizontal mattress sutures (the first at the level of the Fontan's purse strings) and the outer one in a running fashion. A large omental flap was isolated through an extension of the sternotomy incision and placed between the left ventricular closure and the thinned-out pericardial diaphragm. The patient recovered promptly and was discharged on postoperative day 7. Repeat TEE showed a restored elliptical LV cavity.

One month later, a chest CT showed excellent repair without recurrence.

Four months later, repeat chest CT showed no recurrence but herniation of part of the stomach into the diaphragm, which persisted one year later when the patient was seen for left humeral fracture (Figure 3). Since the patient was totally asymptomatic, it was decided not to intervene. In the event that the herniation will become much larger and symptomatic, we plan to repair it through a laparoscopic and/or a left thoracoscopic approach.

DISCUSSION

On the STS Adult Cardiac Surgery Database Executive Summary, participating sites reported 1224 LVA in 2005, and the number progressively decreased to 698 in 2013. These numbers likely included most of the pseudoaneurysms.

On a Medline search we have not found any reported cases of primary ILVPA and only two cases of secondary ILVPA after repair of an LVA [Schneiderman 1984; Aoyama 2006]. Of the two, only the second, in whom an omental flap was also used, survived.

It is commonly advised to use a Dor-style patch in the repair of LVA, especially when the left ventricular function is depressed [Dor 2001]. In this patient, however, the elliptical shape of the residual left ventricle was preserved also without a patch.

Thus, this is the first reported case of primary ILVPA. We believe that urgent surgery with avoidance of any non-viable material plus use of monofilament sutures and of an omental flap gives the patient the best chance of healing from this otherwise lethal condition.

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