# Two-stage surgical approach for ruptured *Salmonella* aortitis

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Disclosures: Authors have nothing to disclose with regard to commercial support.
Received for publication Aug 6, 2017; revisions received Sept 8, 2017; accepted for publication Sept 22, 2017.
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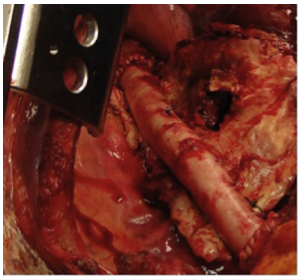
J Thorac Cardiovasc Surg 2017;■:e1-3
0022-5223/$36.00

https://doi.org/10.1016/j.jtcvs.2017.09.102



After TEVAR removal, descending aorta is replaced with homograft. *Arrowhead* marks rupture.

**Central Message**

Ruptured infected aortitis may be approached with endovascular repair for aortic stabilization, antibiotics to clear bacteremia, and definitive elective open surgical repair to minimize reinfection.

See Editorial Commentary page XXX.

*Salmonella* aortitis is an infrequent cause of abdominal and rarely, thoracic aortic aneurysm formation, with poor clinical outcomes unless treated surgically.[1,2] The optimal treatment strategy remains controversial, and the area of contention includes early endovascular repair combined with antibiotic therapy versus open surgery. We report here a case of a descending thoracic aortic rupture from *Salmonella* aortitis. The patient was treated on an emergency basis with an endovascular stent graft (by thoracic endovascular aortic repair), followed by definitive open surgical repair after resolution of infection.

## CLINICAL SUMMARY

A 70-year-old man with hypertension sought treatment at an outside hospital with a febrile illness and was discharged home after a positive test result for influenza. The patient returned 3 days later with hemoptysis, severe chest pain, and a computed tomographic scan that revealed an anterior rupture of a descending thoracic saccular aneurysm (7.4 cm) with air within the hematoma, suggesting a mycotic aneurysm (Figure 1). The patient was transferred to our institution in hemodynamically unstable condition and underwent a temporizing emergency thoracic endograft with a 34 mm × 15 cm Gore C-TAG prosthesis (W. L. Gore and Associates, Flagstaff, Ariz), bridging the point of rupture and extending to normal-appearing aorta proximally and distally. A computed tomographic scan after the endografting demonstrated proper positioning of the prosthesis with no evidence of endoleak. After the procedure, the patient became febrile to 39.2°C and had leukocytosis develop. We commenced empiric antibiotic therapy; when blood cultures from the outside hospital subsequently grew *Salmonella enterica*, the antibiotic regimen was switched to intravenous ceftriaxone. After a 10-day antibiotic course and negative results of blood cultures, the patient went to the operating room for definitive treatment.

After induction of general anesthesia, a double-lumen tube was placed. Neuromonitoring was used. A left anterolateral thoracotomy was performed. Partial cardiopulmonary bypass was instituted through the femoral vessels, with the patient staying warm systemically and the heart beating. A proximal clamp was placed distal to the left subclavian artery, and a distal clamp was placed at the level of the diaphragm. The descending aorta was opened, and the endograft was removed. A large amount of thrombus was evacuated, tissue was sent for culture, and a large medial aortic perforation was revealed (Figure 2). The area was débrided and irrigated with antibiotic solution. With a descending aorta homograft, the distal anastomosis was initially performed; the clamp was moved to the homograft, and flow was reestablished to a large pair of intercostal arteries (T10) though the pump retrograde. The proximal anastomosis was next performed, the graft was deaired, and both clamps were removed. Flexible bronchoscopy excluded the presence of an aortopulmonary fistula. The thoracotomy was closed in the usual fashion. Despite negative blood cultures after preoperative antibiotic therapy, intraoperative tissue cultures subsequently grew *Salmonella enterica*. The patient otherwise had an uneventful recovery, and he was discharged home with 6 weeks of intravenous antibiotic therapy per infectious disease physician recommendations. Unfortunately, the patient was involved in a motor vehicle accident approximately 1 month after discharge. Cardiopulmonary resuscitation was performed on the scene of the accident, with the return of spontaneous circulation, and the patient was transported to the hospital on an emergency basis. There, the patient arrived in extremis and repeatedly lost

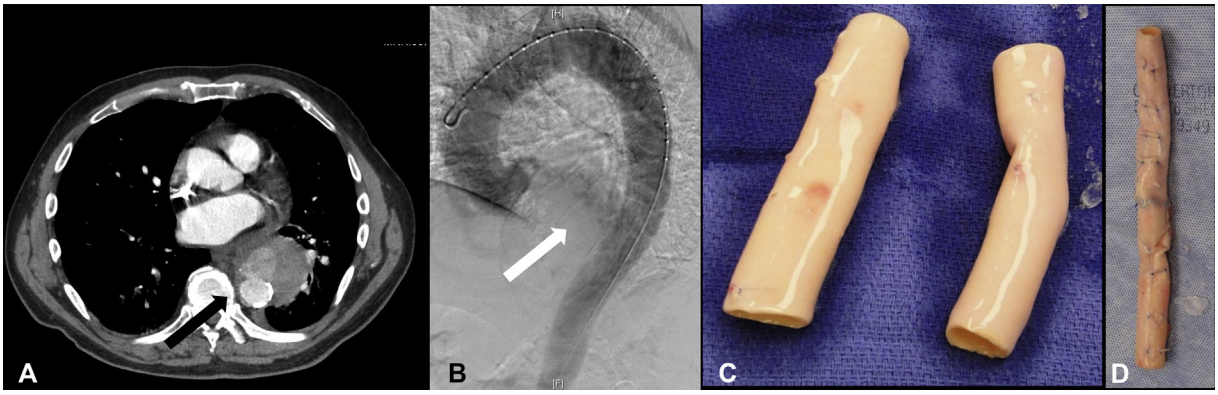



**FIGURE 1.** A, Axial preoperative computed tomographic image with *arrow* pointing to contained aortic rupture from *Salmonella* aortitis. B, Preoperative aortogram with *arrow* pointing to anterior leakage of contrast from the aortic lumen. C, Macroscopic view of 2 cryopreserved aortic homografts sutured together to create a replacement conduit of adequate length. D, Completed replacement conduit constructed from 2 aortic homografts with all intercostal branches ligated.

pulses, requiring more cardiopulmonary resuscitation. Despite aggressive resuscitation, the patient did not survive. Computed tomographic imaging demonstrated mediastinal hematoma without contrast extravasation; however, the etiology remains unclear. It is unclear if the mediastinal hematoma was a result of the motor vehicle crash, occurred before the motor vehicle crash, possibly leading to it, or was caused by cardiopulmonary resuscitation.

## DISCUSSION

*Salmonella* species are gram-negative bacteria that rarely lead to infectious aortitis, potentially progressing into

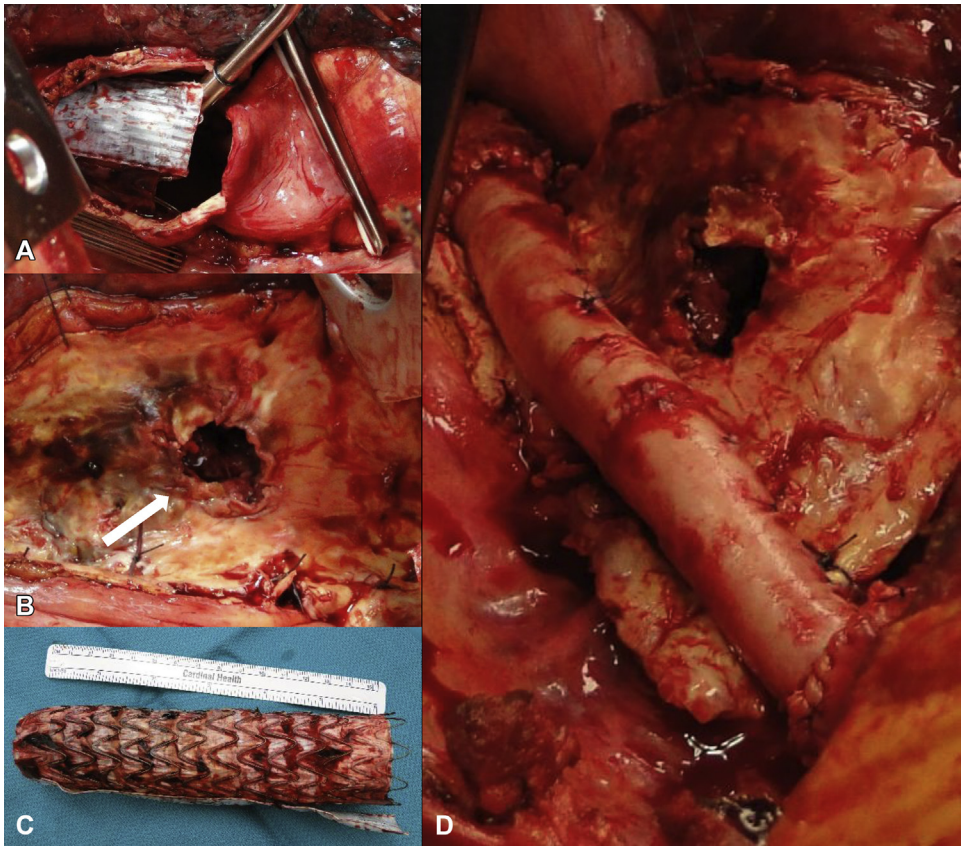



**FIGURE 2.** A, Descending aorta opened, demonstrating the thoracic aortic endograft. B, Descending thoracic aorta opened, with *arrow* pointing to site of transmural aortic rupture secondary to *Salmonella* aortitis. C, Explanted thoracic aortic endograft. D, Completed aortic replacement with homograft, encompassing most of the descending thoracic aorta to just above the diaphragm.