Successful treatment of Salmonella mycotic aneurysm of the descending thoracic aorta

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Abstract
Salmonella mycotic aneurysms of the descending thoracic aorta are exceedingly rare. There are few case reports and even fewer reports of long term survival. The case of a 68-year-old female presenting with a mycotic aneurysm of the descending thoracic aorta caused by Salmonella species is described, which involved successful surgical intervention.

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1. Introduction
Mycotic aneurysms are localized, abnormal vessel dilatation caused by a septic process that destroys the vessel wall. Mycotic aortic aneurysms are unusual, accounting for less than 1% of aortic aneurysm repairs [1]. The majority of patients with mycotic aneurysms due to Salmonella species have lesions that involve the abdominal aorta or iliac arteries, with less than 10% of such lesions involving the intrathoracic vessels [2]. This case is presented owing to the extremely uncommon, life-threatening location of the patient’s mycotic aneurysm.

2. Case report
A 68-year-old diabetic female was admitted to the authors’ hospital following an episode of hemoptysis. She had been well until a week earlier, when she began to note increasing malaise, intermittent fever and a non-productive cough.

On admission, the patient looked unwell, with a temperature of 37.3 °C, a heart rate of 110 beats per minute, a respiratory rate of 25 respirations per minute, and a blood pressure of 93/50 mmHg. Her hemoglobin was 11.1 g/dl, her white blood cell count was 7600 and her platelet count was 75 000/µl. The blood glucose was 249 mg/dl and other biochemical values were within normal limits. The prothrombin and partial thromboplastin times were normal. A chest roentgenogram revealed a widened mediastinum and the presence of mediastinal air. Computed tomography (CT) of the chest identified a large thoracic aneurysm with surrounding air (Fig. 1). Blood cultures yielded growth of Salmonella group C1 bacteria. A preoperative diagnosis of an infective thoracic aneurysm was made.

The patient was prepared for surgery and underwent a median sternotomy combined with a left lateral thoracotomy. A 10-cm aortic aneurysm was found just distal to the left subclavian artery which appeared to be inflamed and accompanied by pus formation and large amounts of necrotic debris. Resection of the aneurysm and ligation of the proximal and distal ends of aorta was undertaken. Pericardium was resected for coverage of bilateral stumps. An extra-anatomic bypass from the ascending aorta to the abdominal aorta with a Hemashield vascular graft was then performed (Fig. 2).

The patient recovered from surgery without complications, and antibiotic treatment using intravenous ceftriaxone was continued for a period of 6 weeks. Bacterial culture of the involved aortic wall revealed Salmonella group C1 species. Tissue pathology identified an acute necrotizing inflammation with calcification that was...
consistent with a mycotic aneurysm. The patient has remained afebrile and free of symptoms for 12 months.

3. Discussion

Salmonellae have a propensity for infection of vascular sites such as the aorta and other large- and medium-sized vessels. The clinical picture consists almost invariably of recurrent fever and chills, with other symptoms related either to the primary source of infection, such as diarrhea, or to the site of the aneurysm itself, such as chest discomfort, dyspnea, or hemothysis. It should be noted that the primary source of the bacteremia is often unknown. The diagnosis of a thoracic mycotic aneurysm is usually first suspected when mediastinal widening is seen on a chest roentgenogram and subsequently on a CT scan or arteriogram. CT scanning is the most diagnostic imaging modality, with arteriography typically being performed for confirmation or surgical planning.

The recommended management of mycotic aneurysms includes combined surgical and antibiotic treatment. There are usually two options for operative treatment of mycotic aneurysms available to the surgeon: either extra-anatomic or in situ reconstruction. The standard surgical procedure for the treatment of mycotic aneurysm involves aortic or arterial ligation, excision of all infected tissue and then extra-anatomic bypass grafting through a clean non-infected plane. Multiple operations are usually required for restoration of the usual direction of blood flow. In recent years, in situ reconstruction, particularly with cryopreserved homografts, has received coverage [3]. It offers the potential to treat the disease with one single operation and preliminary results are encouraging, since it may reduce postoperative infection rates and improve survival in this group of high-risk patients. Unfortunately, most patients require emergency intervention because their mycotic aneurysm has typically ruptured by the time of diagnosis, and access to a tissue bank is generally not available.

The optimal duration of systemic antimicrobial therapy has not been clearly established, and recommendations range from several weeks to lifelong [1]. Most authors advocate 4–6 weeks of intravenous antibiotics. Notwithstanding this, in cases involving mycotic aneurysm repair with prosthetic material, some experts have recommended...
permanent antibiotic treatment since late recurrent infections have been reported [4]. Untreated thoracic mycotic aneurysms due to Salmonella species are invariably fatal, and there have been no reports of long-term survival without surgical intervention.

References