Enterococcus faecalis Infection of Aortic Graft: A Case Report

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Abstract

We describe a rare case of aortic graft infection (AGI) due to *Enterococcus faecalis (E. faecalis)*. A 61-year-old man was admitted with a 3-days history of fever, chills, and myalgia. He received operation for aortic dissection five years ago. Upon admission, he was febrile, and white blood cell count was 6,600/mm^3, and C-reactive protein was 14.68 mg/dL. On the 3rd admission day, the bacterium from blood was identified as *E. faecalis.* Ampicillin was initiated and its doseage was 2000 mg drip every 4 hours. The report of Gallium-67 (Ga-67) scan and single photon emission tomography (SPET) described an increased uptake of Ga-67 in the aortic arch. AGI was diagnosed. Cardiovascular surgeon was consulted to evaluate the surgical indication. The treatment course was smooth, and antibiotic was administrated for a total of three months. *E. faecalis* AGI is a life-threatening disease with devastating complications. In this patient, the infection was limited to the endograft. Cardiovascular surgeon should be involved to evaluate the benefit and risk of operation in AGI patients. Ga-67 scan and SPET are helpful to establish the diagnosis. (J Intern Med Taiwan 2013; 24: 347-351)

Key Words: *Enterococcus faecalis*, Aortic graft, Infection

Introduction

Prosthetic aortic graft infections have a high mortality rate ranging from 24% to 75%, and the average 5-year survival rate for aortic graft infections (AGI) is approximately 50%[1,2]. *Enterococcus faecalis* (*E. faecalis*) is a normal inhabitant of humans and relatively low-virulence, but *E. faecalis* can cause serious infections[3]. The mortality associated with nonsurgical management of pyogenic infective aortitis may approach 90%[4]. Here we described a rare case of AGI caused by *E. faecalis* without graft manipulation.

Case Report

A 61-year-old man was admitted emergently with a 3-day history of fever, chills, and myalgia. He was operated for aortic dissection five years ago. An endograft was implanted without complications. Hence, he took warfarin and the international normalized ratio was controlled between 2 and 3. He had a history of using the manure for farming about

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a week before the onset of symptoms. Initially, he presented with fever and chills, and was brought to the emergency room of Changhua Christian Hospital in central Taiwan. There was no history of receiving invasive procedures, or traumatic injury in recent three months. Upon admission, he was febrile with a temperature of 38.5 °C, blood pressure 128/80 mmHg, heart rate 92 beats per minutes, and respiratory rate 24 breaths per minute. Upon ausculation, no significant cardiac murmur was noticed. Laboratory examination on admission revealed white blood cell count of 6,600/mm^3, hematocrit 35.2%, platelet count 74,000/mm^3, and C-reactive protein 14.68 mg/dL (normal range, < 0.3 mg/dL). A chest X-ray showed no abnormal pulmonary density, nor pneumonia patch were observed (Figure 1). Treatment initially started with penicillin drip 3 million units every 6 hours and gentamicin 160 mg everyday after blood cultures performed. On the 3rd admission day, blood culture yielded *E. faecalis* as identified by a Vitek-2 system (BioMérieux, Durham, N.C.). We changed penicillin to ampicillin 2000 mg drip every 6 hours. Cardiac echogram showed no vegetation, and liver echogram showed no liver abscess. To determine the infectious foci, we arranged further examinations, including Gallium-67 (Ga-67) scan. The computed tomography (CT) showed no leak of contrast material from the graft (Figure 2). The report of Ga-67 scan and single photon emission tomography (SPET) described increased accumulation of Ga-67 was noted in the aortic arch (Figure 3). Since AGI was suspected, we adjusted the interval of ampicillin from every 6 hours to every 4 hours. Cardiovascular surgeon was consulted, and there was no evidence of complications of AGI , including aneurysm formation , rupture of aorta, bleeding from graft, aortic thrombosis with embolization, aortic dissection, septic embolisms, aortic insufficiency, and acute coronary syndromes. Therefore the surgeon suggested no need to operate immediately. On the 6th admission day, he became afebrile. The follow-up blood culture became sterile and

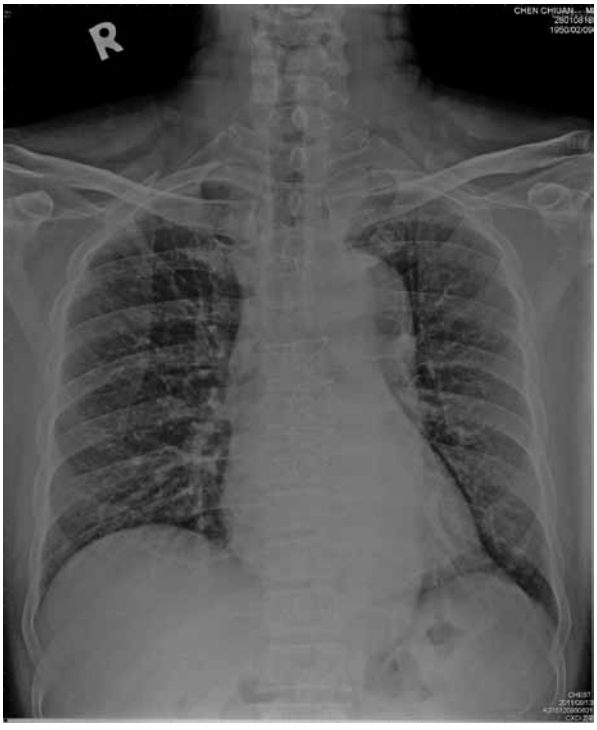

Fig. 1. The chest plain film showed that there are elongation and tortuosity of the thoracic aorta with cardiomegaly, no other abnormal pulmonary process or density, no pneumonia patch, and s/p surgical intervention with metallic wire suture materials on the sternum.

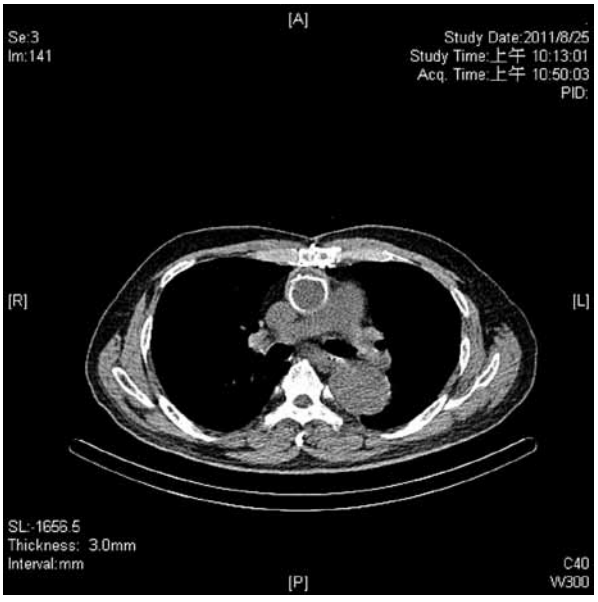

Fig. 2. The chest CT showed no evidence of aortic aneurysmm ,and no gas formation of graft.

laboratory data revealded WBC 12,900/mm^3, erythrocyte sedimentation rate (ESR) 49 mm/hr. He recovered well and was discharged on the 17th admission day. The follow-up laboratory data showed WBC 6,600/mm^3, and ESR 40 mm/hr. Then, he received oral amoxicillin 750mg every 8 hours. During the follow-up at outpatient department for two and a half months, amoxicillin was discontinued until the ESR became normal. The follow-up blood culture did not grow *E. faecalis*, and he recovered well.

Discussion

We describe a rare case of AGI due to *E. faecalis*. To establish an early diagnosis of AGI is extremely important, because this condition is potentially life-threatening. Here we described this patient who was diagnosed on the 4th admission day. Because of no development of complications of AGI and early diagnosis and effective antibiotics and low-virulence of *E. faecalis*, this patient was successfully treated without surgical correction. The diagnosis is frequently delayed since clinical manifestations are usually nonspecific. A history of cardiovascular operation and no significant evidence of infection focus for *E. faecalis* are important clues for AGI. The important diagnostic tools includs CT scan, Ga-67 scan and SPET. Milder degrees of inflammation or wall edema shown on CT image may be missed[5-6]. In this patient, increased accumulation of Ga-67 was noted in the aortic arch on 4th admission day.

Various microorganisms have been associated with infectious thoracic aortitis, most commonly *Staphylococcus, Enterococcus, Streptococcus*, and *Salmonella* species[7]. *E. faecalis* is an uncommon cause of graft infection. The *E. faecalis* could originate from manure through the abrasion wound of hands, and seeding into an existing endo-graft. The *E. faecalis* was susceptible to ampicillin, ampicillin was administered for 3 months totally to eradicate *E. faecalis*. *E. faecalis* is relatively low-virulent pathogen[3].

Appropriate management of prosthetic vascular graft infections is challenging and requires a multidisciplinary team approach involving both medical and surgical subspecialties[8]. Treatment decisions need to be individualized based on the pathogen, and its in vitro antibiotic susceptibility, type of surgical intervention, and clinical response during follow-up

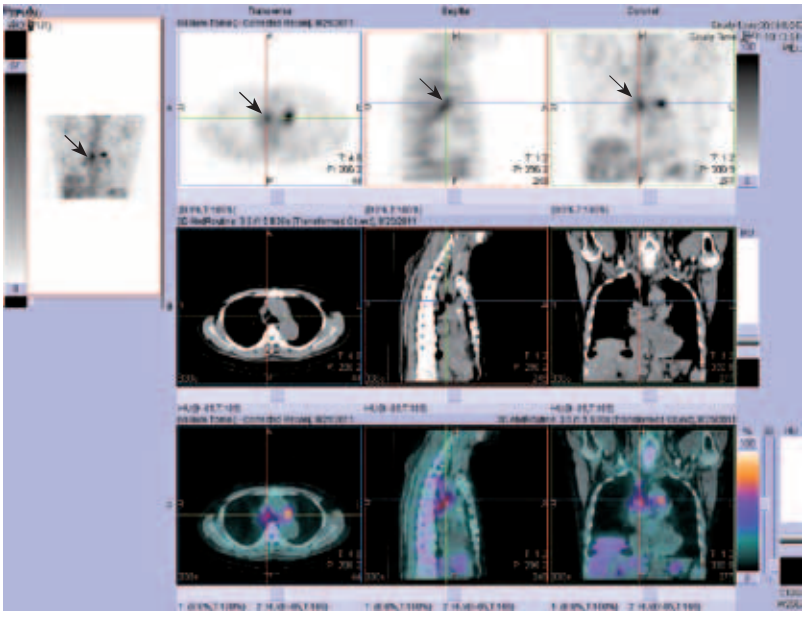

Fig. 3. The Gallium-67 scan and single photon emission tomography showed increased accumulation of Ga-67 was noted in the aortic arch. Ga-67 scan was performed following intravenous of 3 mCi of Ga-67. Images were taken 2 and 3 days later. Moderately increased accumulation of Ga-67 was noted in the aortic arch (arrow). The abdomen was essentially normal. Mildly increased accumulation of Ga-67 was noted in the hilar regions, and it may suggest reactive lymphadenopathy. There was no definite abnormality in the peripheral limbs.

evaluation. If complete removal of the infected graft is not feasible due to multiple comorbid conditions or limited revascularization options, long-term suppressive antimicrobial therapy is recommended after an initial 4-week course of induction therapy[9]. Open surgical management of infected arterial aneurysms remains the gold standard[10], and some reported successful outcomes. In general, surgical debridement and repair should be planned at the earliest possible, when medically permissible[10]. Lopes described that antibiotic therapy in combination with complete surgical excision of the infected aorta is the best choice of treatment[7]. The intents of surgery are to confirm the diagnosis, to control sepsis, to stop hemorrhage, and to reconstruct the arterial vasculature[5]. Bronze described that the mortality rate associated with nonsurgical management may approach 90% if only aggressive antimicrobial therapy without surgical intervention[4]. How this patient was treated with high-dose of ampicillin therapy alone because *E. faecalis* is low virulence the infection was limited to endograft, and the effective antibiotics are used within 72 hours since admission.

E. faecalis AGI is a life-threatening disease, accompanied by devastating complications and a poor prognosis. In this patient, the infection was limited to the endograft. Surgical intervantion should be carefully evaluated in high-risk patients. The key to early diagnosis is previous history of cardiovascular operation. Ga-67 scan and SPET are helpful to make a diagnosis.

Acknowledgements

We thanks Dr. Po-Ling Chang, Department of Nuclear Medicine, Changhua Christian Hospital for the interpretation of the Gallium-67 scan; and SPET scan.

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糞腸球菌感染主動脈人工血管的病例報告

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摘　要

我們描述了一個罕見的糞腸球菌感染主動脈人工血管。一名61歲的男子被送往急診前3天開始發燒，發冷，和肌肉疼痛。在五年前，他因爲主動脈剝離接受手術。入院時，他有發燒，白血球爲6,600 mm^3，C-反應蛋白是14.68 mg/dL。在入院第三天，血液培養長出糞腸球菌 (*Enterococcus faecalis*)。使用 ampicillin 每4小時2000毫克治療，67鎵 (Ga-67) 的報告，與單光子斷層掃描 (SPET) 發現主動脈弓有異常訊號。會診心血管外科醫生與評估手術時機。治療過程順利，抗生素總共使用三個月。腸球菌感染主動脈人工血管是一種危及生命的疾病。臨床醫師需要與心血管外科醫生評估手術條件並慎選抗生素治療。