

Costochondritis Caused by *Aspergillus flavus* Following Cardiac Surgery

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Abstract- Mediastinitis is an infrequent complication after coronary artery bypass graft (CABG) that is associated with prolonged intensive care unit and hospital stay, and increased early and late morbidity and mortality. Patients with mediastinitis have an osteoporotic, fragile, and broken sternum. All foreign bodies as well as infected tissue should be removed. Osteomyelitis of sternum often perseveres after debridement for mediastinitis. In this report, we describe an unusual case of costochondritis caused by aspergillosis following off pump CABG surgery in a male patient in Yazd-Iran.

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Keyword: *Aspergillus flavus*; Cardiac surgery; Costochondritis

Introduction

Coronary artery bypass graft (CABG) is one of the most important open heart surgeries in world. Deep sternal wound infection (DSWI) following CABG is a rare but major disorder associated with aggravates clinical outcomes (1). Mediastinitis is an infrequent complication after CABG that is associated with prolonged intensive care unit and hospital stay, and increased early and late morbidity and mortality. Patients with mediastinitis have an osteoporotic, fragile, and broken sternum. All foreign bodies as well as infected tissue should be removed. Osteomyelitis of sternum often perseveres after debridement for mediastinitis (2).

Aspergillosis occurs in patients with immune insufficiency typically. Dissemination of spores in the surgical units through the ventilation system, which may lead to the contamination of exposed tissue, the wound dressing, and the surgical materials, can be associated occurrence of postoperative aspergillosis (3). In this report, we describe an unusual and interesting costochondritis caused by *aspergillus flavus* following off pump CABG surgery in a male patient in Yazd, Iran.

Case Report

The patient was a 54-year-old man with hypercholesterolemia, hypertension, renal failure and diabetic mellitus. He was active smoker who had undergone CABG in July 2011 in one of the cardiovascular centers in Kerman, Iran. His medical dossier shows that he suffered from severe occlusion of left anterior descending and right coronary arteries during surgery. The patient referred to our department of cardiac surgery in Yazd with fever and intense chest pain around the previous sternal incision and mild and severe pain in upper region of abdomen and shoulders respectively. On evaluation, at time of admission, increase in plasma C-reactive protein, hemoglobin 12.3 mg/dl; white blood cells 12.3×10^3 ; platelets 290×10^3 ; urea 38 mg/dl; and creatinine 0.7 mg/dl. In first stage of assessment of his complaints, consultant of infection, pulmonary and oncology diseases reported that osteomyelitis, mild atelectasis and high level of ESR respectively. Results of para-clinical examinations indicated that moderate left ventricle dysfunction (Ejection Fraction: 37%), apical akinesis of heart, normal right atrium and ventricle. According to technetium-99m/ Gallium-67 scintillography, osteomyelitis was detected in the region of the sternum.

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Our final diagnosis was necrotic costochondritis following previous CABG.

He underwent surgical debridement by cardiothoracic surgeons and revealed infection in ninth to eleventh and tenth to twelfth left and right ribs respectively. We send cartilage tissue biopsies after surgery to laboratory of pathology immediately. The culture from biopsies showed that infection with *Aspergillus flavus* in this patient. Treatments with ciprofloxacin 500 mg for 2 weeks and amphotericin B 50 mg for ten days and itraconazole 200 mg for six months were continued. We examine this case 2 month after drug therapy C-reactive protein was normal. Further technetium-99m/ Gallium-67 scintillography indicated that there is no evidence about osteomyelitis or costochondritis. At the time of preparation of this report he has good condition and there is no chest pain.

Discussion

Deep sternal wound infection (DSWI) is a rare complication after cardiac surgery, with prevalence of 1% - 4%. This infection is usually caused by *Staphylococci* or *Enterobacteriaceae* (1). Few reports indicated that *Aspergillus flavus* can be very rare reason of DSWI. *Aspergillus flavus* is widely distributed fungus, presence in soil, water and decaying vegetation. This fungus is an important cause of nosocomial invasive infections in patients with immune insufficiency (4).

In a report performed by Vandecasteele *et al.* indicated that median 14 days after cardiac surgery revealed DSWI in nine from 149 patients (5), however, Siciliano *et al.* reported that at least two months after surgery in incubation period their case had chest pain and four month after symptoms of osteomyelitis appeared (6). This report is in line with our reports. Our case 8 months after CABG revealed with severe chest pain and fever and we diagnose immediately his problem. Much space between time of cardiac surgery and presence of symptoms of osteomyelitis because of aspergillosis in Elahi *et al.* report was 2 months (7). Verghese *et al.* reported a case of osteomyelitis of the rib and chest wall abscess caused by *Aspergillus flavus* after 3 months following CABG (8). In a report carried out by Barzaghi *et al.* indicated that sternal osteomyelitis because of aspergillosis after surgery occurred in two non-immunosuppressed patients. The clinical features of the infection were different in them. In the first *versus* second patient,

late and insidious onset with slow progression *versus* acute onset and rapid progression respectively. Treatment of sternal wound infection due to *Aspergillus flavus* is based on a combined surgical and medical approach (9). Our medical treatments were ciprofloxacin, amphotericin B, itraconazole. Surgical treatment including: marsupialization of abscesses, removal of the sternal wires, and curettage of affected tissue. Vandecasteele *et al.* reported that itraconazole oral solution was chosen for *Aspergillus flavus* and the need for prolonged outpatient treatment (5). Therapeutic approaches in cases of Vandecasteele *et al.* report are in line with our report. Siciliano *et al.* reported that voriconazole may be safe drug for the treatment of *Aspergillus osteomyelitis*, and aggressive surgical debridement is recommended to improve the rate of treatment success (6). Verghese *et al.* indicated that *Aspergillus flavus* in a CABG patient, which was treated successfully with voriconazole (8). An interesting difference in this case and other patients was region of incision for entering of chest tube thus surgeons of previous CABG perforate chest in region of lower cartilage ribs, however, other patients this place were in region of 5th ribs. Perhaps, this difference provides condition for infection in cartilage tissue. Finally, we can report that costochondritis with aspergillosis has slowly progressive chest wall wound infections after CABG. Itraconazole can be the drug of choice for osteomyelitis/costochondritis and surgical debridement is recommended to increase successful rate of treatment.

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