Case Report

Nocardia asteroides Mediastinitis Complicating Coronary Artery Bypass Surgery

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Abstract

A 63 years diabetic male was admitted with mediastinitis and sternal dehiscence. Nocardia asteroides sensu stricto Type VI was isolated from the mediastinal tissue and fluid during debridement. Prompt surgical intervention and treatment with ofloxacin both intravenously and later orally led to the cure.

INTRODUCTION

Nocardia are aerobic Actinomycetes which are ubiquitous soil saprophyte. They are known to occur as opportunistic pathogens in immunocompromised patients and also AIDS patients. Primary pulmonary infection occurs most commonly. Localized extra-pulmonary infection occurs uncommonly at atypical sites. We report one such rare post-surgical infection which presented as mediastinitis.

CASE REPORT

A 63 years diabetic male, a case of coronary artery disease with unstable angina and systemic hypertension underwent coronary artery bypass grafting with three grafts on 07.11.2001.

He had an uneventful recovery and was discharged on the 12th postoperative day. He was readmitted after three weeks with high grade fever and for sternal wound dehiscence. His pulse was 90/minute, BP 126/96 mmHg. ESR was 130 mm at the end of one hour. The total WBC count was 8400/cmm. His differential count was 84% polymorphonuclear leucocyte, 16% lymphocytes and 4% eosinophils. The sternum was unhealthy and friable. The subcutaneous and underlying mediastinal tissue was infected. A pus swab sent from the wound site grew a dry powdery, white colony at the end of 72 hours. He had a wound debridement on 28.11.2001 and the mediastinal fluid and tissue sent at the time of surgery also grew a pure growth of the same organism after 72 hours. He had a pectoral flap repair and had drains inserted for the next 11 days.

Laboratory Identification

The pus swab as well as the mediastinal tissue and fluid on Gram stain showed Gram-positive, long and thin filamentous branching structures (Fig. 1) which were acid fast with Kinyoun’s acid fast stain. The specimen was cultured on blood agar, chocolate agar, brain heart infusion agar as well in thioglycollate broth and was incubated in carbon dioxide at 37°C. After 72 hours typical wrinkled, dull white, dry colonies appeared on all media (Fig. 2). They were acid fast with Kinyoun’s acid fast stain. It failed to hydrolyze casein, xanthine and tyrosine and was urease negative. It was identified as Nocardia asteroides by routine biochemical methods. The sensitivity of the organism was done on Mueller-Hinton blood agar and the organism was found to be atypical in that it was resistant to trimethoprim-sulphamethoxazole (TMP SMX), penicillin and tetracycline. It was sensitive to amoxycillin, gentamycin, erythromycin, amikacin, ciprofloxacin and ofloxacin. It was sent to the Centre for Disease Control, Atlanta, USA, for confirmation of its identify and it was identified as Nocardia asteroides sensu stricto Type VI.

He was empirically treated with injection teicoplanin 200 mg/day intravenously and injection amikacin 500 mg/twice daily.
daily intravenously upon admission. After the culture result was available he was treated with injection ofloxacin 200 mg/twice daily for 12 days. This was followed by oral ofloxacin 200 mg/twice daily for two months. He continued to remain febrile for eight days after wound debridement and also had copious discharge from the drains. Since the 9th post-operative day he remained afebrile and was discharged on the 12th post-operative day. A review after two months found the patient to be normal and the wound had healed well.

**DISCUSSION**

*Nocardia* species are ubiquitous saprophytes associated with environmental material and occasionally cause disease in humans especially in immunosuppressed patients. Pulmonary nocardiosis is the most common manifestation (73%) and it is also the site of initial infection in the majority of patients with disseminated infection. Cutaneous infection which is normally post-traumatic or iatrogenic has also been reported in literature. Mediastinitis caused by *N. asteroides* is a rare manifestation and only a few cases have been reported in the literature. Mediastinitis is normally post-surgical as was in our patient. The organism gets implanted into the wound site during surgery. Our patient presented with in three weeks after CABG with mediastinitis and with sternal wound dehiscence. The treatment for mediastinitis is aggressive surgical wound debridement, antibiotic therapy and dressing. An extensive wound debridement was done and he was started on injection teicoplanin and amikacin empirically till the results of the cultures were available. As the organism was found to be resistant to TMP SMX (which is the drug of choice for *Nocardia*) he was started on inj. ofloxacin 200 mg IV twice daily. The antibiotics recommended in cases of resistance to TMP SMX is a combination of imipenem and amikacin. This regimen was not used because of the cost factor. After 12 days of intravenous therapy the treatment was changed to oral ofloxacin for a further period of two months. Also the amikacin which was started empirically was discontinued after eight days as it was nephrotoxic. Cardiac tamponade with pyopericardium and native valve endocarditis in a drug addict are other unusual presentations reported to be caused by *N. asteroides* and affecting the cardiovascular system.

The species *Nocardia* is heterogenous and therefore most taxonomists agree that it should called *N. asteroides* complex. *N. asteroides* Type I and Type VI are considered a members of the same species (*N. asteroides sensu stricito*). They are identified on the basis of sugar assimilation tests using API 20C AUX system. The species identification can also help in determining the drug of choice for the patient as these species are known to be sensitive to the aminoglycosides. This case illustrates a rare etiological agent causing mediastinitis and its early diagnosis and successful treatment.

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**REFERENCES**