Cardiac Tamponade due to Nocardia asteroides

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Pericarditis with hemodynamic compromise is a rare manifestation of infection with Nocardia asteroides. To our knowledge, only six cases have been reported previously. In contrast to other cases of pericardial disease due to Nocardia, culture of the pericardial fluid in our case was negative while culture of pericardial tissue led to the diagnosis. Surgical intervention and appropriate antibiotic therapy are essential in the treatment of Nocardia pericarditis.

Nocardia asteroides is an uncommon cause of human illness. The spectrum of disease ranges from benign, self-limited supplicative skin infections to aggressive pulmonary infections that may disseminate hematogenously. Pericarditis with hemodynamic embarrassment is an extremely rare manifestation of infection with N. asteroides. Six cases of culture positive Nocardia pericarditis resulting in hemodynamic compromise have been reported previously.

We describe the case of a man who became hemodynamically unstable secondary to cardiac tamponade caused by N. asteroides. In contrast to the other reported descriptions of pericarditis due to Nocardia, culture of the pericardial fluid from our patient was negative while culture of pericardial tissue led to the diagnosis.

CASE REPORT

A 45-year-old farm worker was admitted to a community hospital with a one-month history of worsening dyspnea, fever, pleuritic chest pain, and a 7-kg weight loss over two months. Cough and sputum expectoration were denied. His medical history was significant for a seizure disorder treated with phenytoin, alcohol abuse, and a recent diagnosis of latent syphilis treated with penicillin. Tobacco and illicit drug use were denied. Initial examination revealed an oral temperature of 39.2°C, pulse rate of 112/min, respiratory rate of 24/min, and blood pressure of 110/80 mm Hg.

The patient appeared cachectic and acutely ill. The neck veins were not distended. Examination of the heart and lungs revealed decreased breath sounds on the right. The liver span was 16 cm at the midclavicular line, extending 4 cm below the right costal margin. By report, the chest roentgenogram at the community hospital revealed a right upper lobe infiltrate with cavitation and widening of the mediastinum. The leukocyte count was 13,900 μl with a normal differential cell count.

Antibiotic therapy was initiated with cefotaxime. A computed tomography scan of the chest confirmed the presence of a cavitary lesion in the anterior segment of the right upper lobe (Fig 1) and revealed a pericardial effusion. Purified protein derivative (PPD) and Candida antigen (control) were both unreactive at 48 h. Sputum Gram stain and smears for acid-fast bacilli (AFB) were negative. On the sixth hospital day he developed jugular venous distention and pulsus paradoxus. He was transferred to our hospital with a diagnosis of cardiac tamponade.

On arrival, the patient was in respiratory distress. The temperature was 38.8°C and the blood pressure was 90/50 mm Hg with 18

![Figure 1](image-url) A computed tomography scan of the chest revealing a cavitary lesion in the anterior segment of the right upper lobe.

![Figure 2](image-url) A chest roentgenogram remarkable for bilateral pleural effusions, an enlarged cardiac silhouette, and a right upper lobe cavity.
mm pulsus paradoxus. A chest roentgenogram revealed bilateral pleural effusions, an enlarged cardiac silhouette, and a right upper lobe cavity (Fig 2). An echocardiogram revealed a large pericardial effusion and impaired right ventricular filling consistent with cardiac tamponade.

The patient became hemodynamically unstable and an emergency left thoracotomy was performed. A pericardial window was created and approximately 200 ml of straw-colored fluid was drained from the pericardial space. The pericardium was thickened (1.5 cm) and irregular with a fibrinous exudate. After decompression of the tamponade, the patient’s hemodynamic status improved immediately. Bacterial, AFB, and fungal smears and cultures of the fluid were negative.

Antibody testing for the human immunodeficiency virus (HIV) was negative. Fiberoptic bronchoscopy was unremarkable. Cytology, cultures, and smears obtained during that examination were negative.

On the tenth postoperative day, *N. asteroides* was grown from cultures of pericardial tissue. Treatment was initiated with trimethoprim-sulfamethoxazole, imipenem-cilastatin, and amikacin for two weeks followed by oral sulfadiazine. The patient required prolonged ventilatory support but eventually improved.

**DISCUSSION**

*Nocardia* are Gram-positive, partially acid-fast, aerobic Actinomycetes. The species *N. asteroides* is a ubiquitous, soil-borne pathogen that uses the respiratory tract as the portal of entry. The initial respiratory illness is often transient or subclinical but occasionally can be recognized as pneumonitis. The occurrence of significant nocardial infections in the United States has been estimated to be between 500 and 1,000 cases per year. However, this is regarded to be an underestimate due to the inherent limitations of data gathering in this study. Predisposing factors include corticosteroid use, alcoholism, and immunologic impairment. Men are affected two to three times more commonly than women.

Sulfonamides remain the most effective agents used in the treatment of Nocardia infections and resistance is uncommon. Additionally, there is evidence that trimethoprim may potentiate the effect of sulfonamides on Nocardia. Because *in vitro* synergism has been demonstrated for amikacin and imipenem-cilastatin with trimethoprim-sulfamethoxazole, our patient was treated with a combination of these agents. As his condition improved, he was treated with sulfadiazine alone.

In a recent review, Poland et al. described six cases of pericarditis in which Nocardia species were isolated from pericardial tissue or fluid. Additionally, one case of purulent pericarditis due to *N. asteroides* has since been reported. To our knowledge, in five cases, including ours, hemodynamic compromise from pericardial infection was the manifestation of a disease that led to the diagnosis.

The diagnosis was elusive in our patient and was not made until 16 days after his initial presentation. Furthermore, the diagnosis would have been missed entirely had pericardiocentesis been performed rather than the operative procedure. In previous reports of Nocardia pericarditis, the organism has grown from cultures of the fluid. The pericardial fluid and pericardial tissue from our patient was cultured synchronously on Sabouraud agar. It is not known why colonies were grown from the pericardial tissue but not from the fluid.

To our knowledge, no patient with culture-proven Nocardia pericarditis and pericardial effusion has survived without a surgical drainage procedure such as pericardiectomy or a pericardial window. In one case, a pericardiectomy was required 15 days after a subxiphoid pericardial window was performed due to constrictive pericarditis. Pericardiectomy and appropriate antibiotic therapy may be superior to tube pericardiostomy alone and may prevent acute constriction or recollection of fluid and hemodynamic compromise. Additionally, as our case demonstrates, tissue specimens obtained at surgery may be necessary for diagnosis.

This case underscores the need to consider this diagnosis when a patient presents with a pericardial effusion accompanied by cavitary lung disease or other factors suggesting the possibility of Nocardia infection. Further, treatment requires appropriate surgical intervention in combination with antibiotics.

**REFERENCES**

7. Chavez CM, Causey WA, Conn JH. Constrictive pericarditis due to infection with *Nocardia asteroides*. Chest 1972; 61:79-81

**Pulmonary Hypertension Secondary to Thrombocytosis in a Patient with Myeloid Metaplasia**

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A 72-year-old physician with myeloid metaplasia developed marked thrombocytosis, pulmonary hypertension, and right

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