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CASE REPORT

Endobronchial nocardiosis

F.E. Casty, M. Wencel

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ABSTRACT: The presentation of a Nocardia infection is quite variable. We report a case of nocardiosis presenting as endobronchial obstruction with postobstructive pneumonia and atelectasis, in a patient with a low index of suspicion for bronchogenic carcinoma.

Our report emphasizes the importance of considering the diagnosis of endobronchial nocardiosis in patients with endobronchial obstruction and a low index of suspicion for carcinoma, as well as those with a high index of suspicion, but with repeatedly negative biopsies.
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Dept of Pulmonary Medicine, University of Vermont College of Medicine, Burlington, USA.

Correspondence: F.E. Casty, Glaxo Inc., Research Triangle Park, NC, 27709, USA

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The presentation of pulmonary nocardiosis is highly variable both clinically and radiographically [1–3]. Acute, subacute and chronic infections with Nocardia species have been reported to cause a variety of nonspecific manifestations, such as anorexia, cough, pleural pain, dyspnoea and haemoptysis. Similarly, chest radiographs demonstrate a variety of findings, such as lobar infiltrates, cavitation, nodules and pleural involvement. We report a case of endobronchial nocardiosis and review the literature for similar cases.

Case report

A 51 year old previously healthy male developed malaise, low-grade fevers, chills and cough productive of clear sputum. He was treated as an out-patient with a 2 week course of cephalexin, without improvement. His symptoms persisted for three months, when he again presented to his physician with cough, fever and a 15 lb weight loss. Chest X-ray revealed an infiltrate in the anterior segment of the right upper lobe, with atelectasis (fig. 1). He was then hospitalized for presumed community-acquired pneumonia.

The patient had a 15 pack-year smoking history, but quit smoking 20 yrs prior to this illness. He worked as a general construction foreman and denied significant occupational exposures or recent travel. On physical examination, temperature was 39.5°C, heart rate 120 beats·min^{-1}, respiratory rate 17 breaths·min^{-1}, blood pressure (BP) 134/78 mmHg. The patient's chest was clear to auscultation and percussion, including the right upper lung zone. There was no lymphadenopathy and the skin was normal. The remainder of the examination was unremarkable.

Laboratory studies demonstrated a haemoglobin level of 12.5 gm·dl^{-1}, haematocrit of 37.5%, white blood cell (WBC) count of 20,500 cells·mm^{-3}, with 75% segmented neutrophils, 20% band forms, 3% basophils and 2% eosinophils. The erythrocyte sedimentation rate (ESR) was elevated to 125 mm·h^{-1}. Liver function tests including serum glutamic pyruvic transaminase (SGPT), serum glutomic oxalo-acetic transaminase (SGOT), alkaline phosphatase and total bilirubin were all within the normal range. Evaluation of renal function revealed a blood urea nitrogen (BUN) of 9, creatinine 0.9 and a normal urinalysis. Results of blood cultures, serum protein electrophoresis, complement studies and purified protein derivative (PPD) were normal. The patient was unable to expectorate an adequate sputum sample.

The patient's hospital course was remarkable for twice daily temperatures reaching 39°C. After 5 days of intravenous erythromycin, he remained febrile and a pulmonary consultation was obtained.

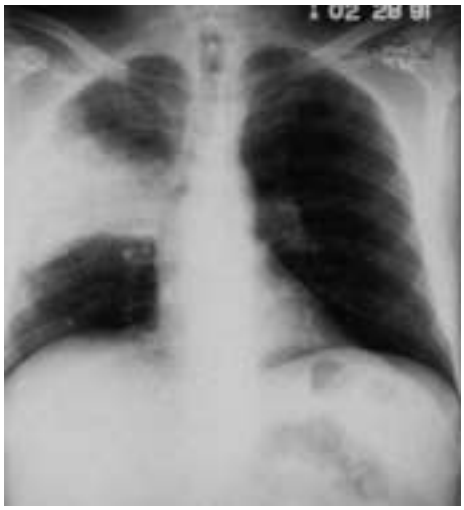

Fig. 1. – Initial chest radiograph, demonstrating infiltrate in the anterior segment of the right upper lobe with volume loss.

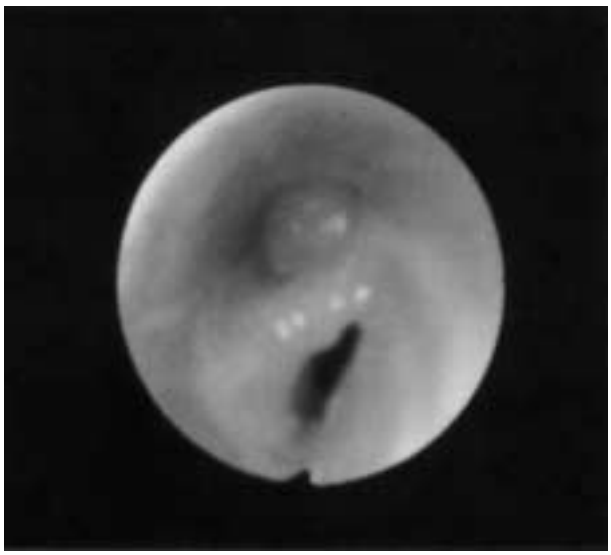

Fig. 2. – Bronchoscopic view of exophytic lesion obstructing anterior segmental bronchus of right upper lobe.

Because this was a chronic, unresolving pneumonia, bronchoscopy was performed to obtain culture specimens and to evaluate the possibility of an obstructing endobronchial lesion. Bronchoscopy demonstrated a white exophytic lesion completely occluding the anterior segmental bronchus of the right upper lobe (fig. 2). The lesion was not friable and the surrounding mucosa appeared oedematous and erythematous. Biopsy of the lesion revealed an acute and chronic cellular infiltrate, without evidence of malignancy. Acid-fast stain demonstrated several filamentous, branching organisms consistent with Nocardia. Two weeks later, cultures identified *Nocardia asteroides* based on modern taxonomic criteria.

The patient was treated with oral trimethoprim/sulphamethoxazole (TMP/SMX) at a dose of four double strength tablets·day^{-1}, in divided doses. The patient's fever abated over the next week, and within two weeks the cough and malaise had resolved. Therapy with TMP/SMX was continued for 12 weeks, and a follow-up chest X-ray at 5 months showed significant improvement of the right upper lobe abnormality (fig. 3). Laboratory studies at this time demonstrated a normal ESR of 25 mm·h^{-1} and WBC count of 9,000 cells·mm^{-3}, with normal differential. The patient declined a follow-up bronchoscopy.

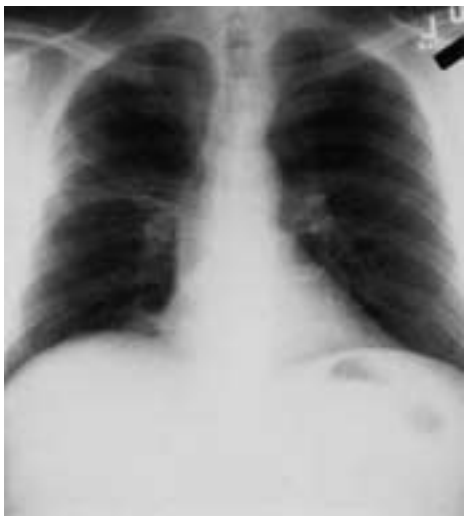

Fig. 3. – Chest radiograph five months after therapy showing significant improvement of right upper lobe infiltrate.

The patient remains asymptomatic 18 months after therapy was discontinued.

Discussion

Nocardiosis was first described in 1888 by NOCARD [4], as a disease of cattle characterized by pulmonary lesions, cutaneous abscesses and draining sinuses. Since then, it has been recognized as a human pathogen acquired primarily through the respiratory tract. It is often associated with a variety of immunocompromised states, although normal hosts are also at risk of infection [5].

Nocardia is characteristically a beaded, Gram-positive, branching organism. The organism is weakly acid-fast, but this is usually lost on subculture. A modified Ziehl-Neelsen stain is best for demonstrating Nocardia. Growth of the organism in culture may take 2–4 weeks [5]. Therefore, the laboratory should be alerted to the possibility of Nocardia in order to ensure that proper staining and culturing techniques are used and to hold the cultures a minimum of 4 weeks.

In 1961, a review of the world's literature revealed just 179 cases of Nocardia infection [6]. In 1976, the incidence of Nocardia infection in the United States was estimated to be 500–1,000 cases annually [7]. This incidence is probably an underestimate because of a low index of suspicion, the ability of Nocardia to masquerade as more common illnesses, such as malignancy and granulomatous diseases, and the ability of Nocardia to coexist with illnesses more easily diagnosed [3].

The presentation of pulmonary nocardiosis includes lobar infiltrates, nodules, cavities and empyema, among the more common manifestations. A variety of treatment regimens have been effective in treating infections caused by *Nocardia asteroides*. Recent studies have demonstrated that imipenem, either alone or in combination with other agents, such as amikacin, is effective therapy. Sulphonamide-based regimens, such as trimethoprim/sulphamethoxazole, have also been effective, as was the case in our patient [3, 5]. The results of *in vitro* susceptibility testing should guide treatment. Therapy is recommended for a minimum of 6 weeks, although relapses occur less frequently if treatment is continued to 12 weeks [8, 9].

We report this unusual case of Nocardia infection presenting as an endobronchial lesion mimicking a bronchogenic tumour. Two additional cases of endobronchial nocardiosis have been reported. BROWN *et al.* [10] reported the case of a 28 year old man with a right upper lobe exophytic lesion who, because of nondiagnostic biopsy results, had three bronchoscopies and a mediastinotomy before diagnosis of Nocardia infection.

The patient required a thoracotomy for right upper lobe resection, as well as antimicrobial therapy before recovering.

HENKLE and NAIR [11] reported the case of a 56 year old man with a left upper lobe endobronchial lesion that was clinically suspicious for malignancy. The first biopsy showed only acute and chronic inflammation. A second bronchoscopy and biopsy showed no evidence of malignancy. Recovery of Nocardia was made fortuitously by growth of the organism on a fungal culture, an uncommon occurrence since fungal media often contain antibiotics that inhibit growth of Nocardia [5].

These cases illustrate that diagnostic delays and the need to perform multiple, more invasive procedures prior to diagnosing endobronchial Nocardia infection might be avoided if Nocardia is considered earlier in the evaluation of an endobronchial lesion. Although uncommon, nocardiosis should be considered in the differential diagnosis of an endobronchial lesion when a low index of suspicion for malignancy exists, and in patients with a high suspicion of malignancy and non-diagnostic biopsy results. Additionally, alerting laboratory personnel to the possibility of Nocardia is essential to ensure proper specimen processing and recovery of the organism.

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