Case Report

Medical Principles and Practice

Med Princ Pract 2016;25:394–396
DOI: 10.1159/000443310

Received: January 7, 2015
Accepted: December 13, 2015
Published online: December 14, 2015

# *Aspergillus* Vertebral Osteomyelitis Complicating Pulmonary Granuloma in an Immunocompetent Adult

Yun Li[a] Yanyi Cen[c] Yuwen Luo[a] Zhe Zhu[a] Shaoxiong Min[b] Xin Chen[a]

Departments of [a]Respiratory Medicine and [b]Orthopedics, Zhujiang Hospital, Southern Medical University, and [c]Department of Anesthesiology, First Affiliated Hospital, Guangzhou Medical University, Guangzhou, China

**Key Words**

*Aspergillus* · Aspergillosis · Osteomyelitis · Granulomatous inflammation

**Abstract**

***Objective:*** The aim of this report is to describe a case with *Aspergillus* vertebral osteomyelitis complicating pulmonary granuloma in an immunocompetent adult. ***Clinical Presentation and Intervention:*** A 53-year-old male patient was found to have lesions on lumbar vertebra 5 months after thoracoscopic resection of pulmonary granuloma that lacked a definite etiology. Three operations on the lumbar lesions were performed successively; however, an *Aspergillus* infection was not confirmed until hyphae were clearly detected at the last surgery. The patient was treated with voriconazole and recovered well. ***Conclusion:*** This case shows that simultaneous occurrence of granulomatous nodules in the lung and vertebral lesions should raise suspicion of aspergillosis, even in immunocompetent patients.



## Introduction

*Aspergillus* osteomyelitis is a debilitating and severe form of invasive aspergillosis that occurs most commonly in hosts with underlying diseases or immunocompromised conditions [1, 2]. Although various diagnostic tests are available, early diagnosis of *Aspergillus* osteomyelitis remains a challenge due to its rarity, diversity, and variability in the clinical presentations.

## Case Report

A 53-year-old male patient was admitted to a local hospital with recurrent fever and cough in December 2013. He had a smoking history of 40 years, but there was neither immunosuppressive drug intake nor underlying diseases such as tuberculosis, diabetes, and malignancies. Physical examination and laboratory findings were normal except for a body temperature of 37.8°C. Chest computed tomography (CT) showed a 3 × 3 cm mass in the right middle lobe along with multiple nodules in both lungs (fig. 1a). A thoracoscopic wedge resection of the lesion was then performed, and the biopsy showed suppurative granulomatous inflammation. The patient's symptoms improved after surgery and 1 week's use of piperacillin-tazobactam.

However, he was readmitted with cough, fever, and new-onset low back pain in May 2014. Chest CT scan indicated an emerging nodular lesion in the left lower lobe (fig. 1b), and magnetic resonance imaging (MRI) revealed bony destruction in the L5 vertebral body and L2/3 pedicle (fig. 1c). Biopsies from both tracheoscopy and percutaneous vertebral puncture showed chronic inflammation. Meanwhile, tissue sections of lung specimens were rechecked and the suggestion was suppurative inflammation probably caused by *Nocardia*. However, no further pathogenic evidence was provided. Although the patient was treated with antituberculosis drugs empirically, he still had persistent back pain and developed bilateral lower extremity weakness, which prompted surgical in-

KARGER

E-Mail karger@karger.com
www.karger.com/mpp


1011–7571/15/0254–0394$39.50/0



Xin Chen
Department of Respiratory Medicine, Zhujiang Hospital
Southern Medical University, 253 Gongye Road
Guangzhou 510282 (China)
E-Mail chen_xin1020@163.com

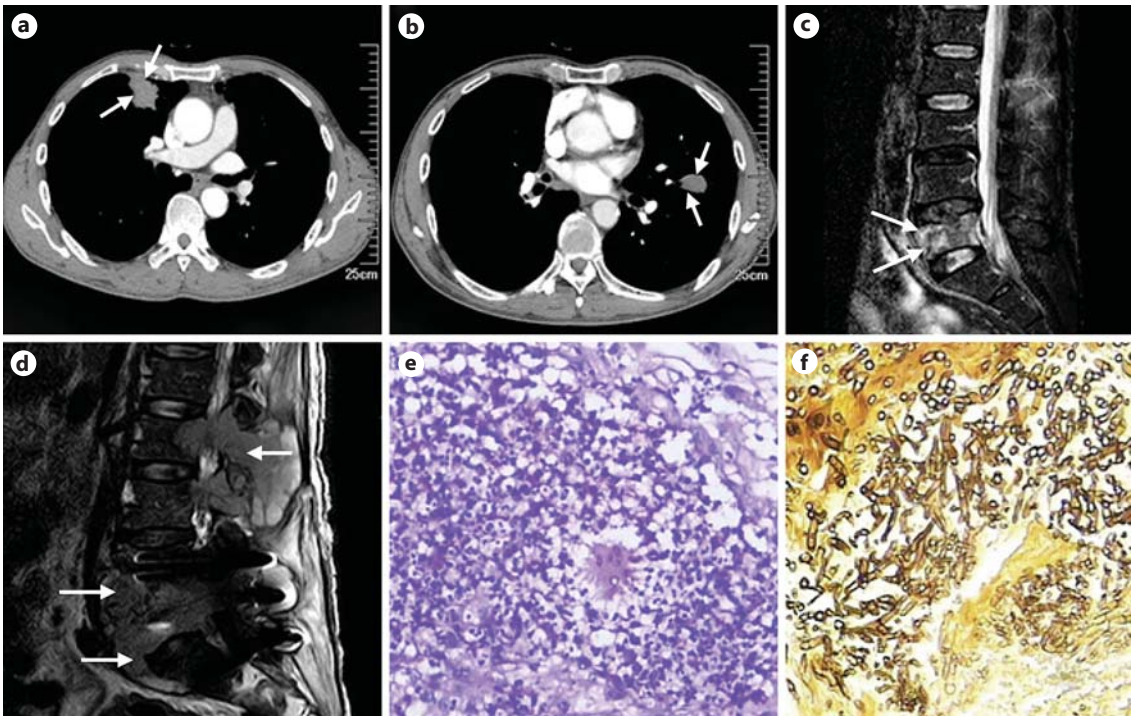


**Fig. 1. a** Chest CT in December 2013 showed a 3 × 3 cm mass in the right middle lobe (arrows). **b** Chest CT in May 2014 revealed an emerging nodular lesion in the left lower lobe (arrows). **c** MRI showed bony destruction in L5 vertebral body (arrows). **d** MRI taken 1 month after the first lumbar surgery showed extensive bone lesions with paravertebral abscess at L2–L5 (arrows). **e** Specimens from the second lumbar surgery revealed a few spore or hyphae analogues. Periodic acid-Schiff. ×200. **f** Specimens from the third lumbar surgery revealed septate hyphae of *Aspergillus* species. Gomori methenamine-silver. ×200.

tervention including drainage, debridement, decompression, and stabilization of the lumbar spine.

Nevertheless, he suffered from a repeated moderate fever after surgery and was then transferred to our hospital. A 2 × 2 cm soft mass was palpable in the right paravertebral area. Muscle strength was 4/5 for both lower extremities. A new MRI showed deterioration of the imaging findings (fig. 1d). Consequently, we performed a second surgery including removal of the original internal fixation, debridement, decompression, and drainage. A few spore or hypha analogues were visualized in tissue sections with Gomori methenamine-silver stain and periodic acid-Schiff stain (fig. 1e). Then, the patient was initially treated with voriconazole (a loading dose of 6 mg/kg of body weight on the 1st day followed by 4 mg/kg, every 12 h intravenously). Two weeks later, he had pain relief and recovered his normal temperature. Resolution of the lumbar lesions was also distinctly observed. Notably, specimens from the third lumbar surgery primarily for spinal stabilization revealed septate fungal hyphae, dichotomously branching at acute angles (fig. 1f). So far, the patient had taken voriconazole for more than 3 months, and no recurrence was detected. However, the muscle strength of both lower extremities did not improve significantly.

## Discussion

Here, we showed an immunocompetent patient who initially presented with pulmonary granulomatous lesions of undetermined origin and had vertebral osteomyelitis due to *Aspergillus* a few months later. *Aspergillus* osteomyelitis is frequently associated with immunosuppression such as organ transplantation, hematopoietic malignancies, diabetes mellitus, or other predisposing conditions [1, 3], but it also develops in nonimmunocompromised patients [4–6].

Pulmonary granulomas are nonspecific findings and a large proportion of them lack a definite etiology even after histological examination [7]. In our case, we found that new pulmonary nodules emerged with the existence of lumbar lesions, and the pulmonary lesions resorbed as well as the lumbar ones after antifungal therapy. So the original pulmonary granuloma was probably invasive pulmonary aspergillosis, which might not be completely under control in the absence of antifungal therapy and

might then hematogenously spread to the spine and cause vertebral destruction.

Histological examination and microbial culture are the gold standard diagnostic methods of aspergillosis, but they tend to take a long time and have low sensitivity. For instance, sometimes hyphae are hard to obtain from specimens, because the position and the size of sampling or the amount of bacteria contained in the relevant lesions might have an influence. In one case, hyphae were barely detected in 2 slides among over 100 slides [5]. Similarly, we failed to find hyphae in abundant lung specimens and could not clearly detect hyphae in lumbar lesions until the last surgery. Unfortunately, the delayed diagnosis may aggravate the neurologic deficits and delay surgical intervention.

Management of *Aspergillus* osteomyelitis optimally combines antifungal treatment and selective surgery based upon site and local complications [1, 2]. Voriconazole, having high oral bioavailability and good bone penetration, clearly demonstrated a decrease in mortality in invasive aspergillosis [8]. Amphotericin B and itraconazole also have proved to be effective in most cases. Surgical intervention can improve the general conditions of patients, especially those with vertebral involvement [2]. Undoubtedly, our patient has benefited from the combined treatment strategy, but still has muscle weakness probably due to permanent neurologic damage.

## Conclusion

This case highlights the importance of the early recognition of the simultaneous occurrence of granulomatous nodules in the lung and vertebral lesions, and should alert physicians to the possibility of invasive aspergillosis, even in immunocompetent patients.

## References


1 Koehler P, Tacke D, Cornely OA: Aspergillosis of bones and joints – a review from 2002 until today. Mycoses 2014;57:323–335.

2 Gamaletsou MN, Rammaert B, Bueno MA, et al: Aspergillus osteomyelitis: epidemiology, clinical manifestations, management, and outcome. J Infect 2014;68:478–493.

3 Gabrielli E, Fothergill AW, Brescini L, et al: Osteomyelitis caused by Aspergillus species: a review of 310 reported cases. Clin Microbiol Infect 2014;20:559–565.

4 Stratov I, Korman TM, Johnson PD: Management of Aspergillus osteomyelitis: report of failure of liposomal amphotericin B and response to voriconazole in an immunocompetent host and literature review. Eur J Clin Microbiol Infect Dis 2003;22:277–283.

5 Yoon KW, Kim YJ: Lumbar Aspergillus osteomyelitis mimicking pyogenic osteomyelitis in an immunocompetent adult. Br J Neurosurg 2015;29:277–279.

6 Vaishya S, Sharma MS: Spinal Aspergillus vertebral osteomyelitis with extradural abscess: case report and review of literature. Surg Neurol 2004;61:551–555.

7 Nazarullah A, Nilson R, Maselli DJ, et al: Incidence and aetiologies of pulmonary granulomatous inflammation: a decade of experience. Respirology 2015;20:115–121.

8 Krcmery VJ: Antifungal chemotherapeutics. Med Princ Pract 2005;14:125–135.