

CASE REPORTS

Nocardia asteriods spinal osteomyelitis in an immunocompromised host from South India

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Abstract

The clinical presentation of nocardiosis is protean. Very few cases of spinal nocardiosis have been reported in the past. A 50 year old man, who was HIV seropositive presented with low grade fever and lower limb weakness. MRI study showed an extradural compression between T3 – T5 level with huge paraspinal soft tissue collection. The patient developed acute paraplegia on admission, and was treated with emergency surgical decompression. The pus sample collected during surgery yielded *Nocardia asteroides*. The patient was treated with combination of doxycycline and co-trimoxazole. Postoperatively, fever and chest symptoms resolved. However, there was no significant improvement in the neurological symptoms at the time of discharge from the hospital. High index of suspicion is therefore necessary to diagnose nocardial infections due to its varied presentations especially in an immunocompromised host. Early diagnosis and treatment can improve the outcome.

INTRODUCTION

Nocardiosis is an uncommon worldwide infectious disease, with reported cases increasing in number among patients with immunosuppression.¹ Members of the Nocardaceae are gram positive, weakly acid fast, filamentous saprophytic organisms. *Nocardia brasiliensis*, *N. caviae* and *N. farcinica* are known to cause the disease in humans. *N. asteroides*, however is the most predominant human pathogen.² Inhalation and traumatic implantations are the usual modes of entry of the organism leading to pulmonary and cutaneous nocardiosis respectively. From these sites the infection may disseminate and result in metastatic lesions in any anatomical sites.

Bone involvement in nocardiosis is relatively rare and probably is caused by haematogenous spread. Seven of 12 reported cases of *Nocardia asteroides* were from immunocompetent persons.³ Here we report a case of spinal osteomyelitis due to *N. asteroides* in an immunocompromised host.

CASE REPORT

A 50 year old man, from low socioeconomic group, was referred to us for fever and lower limbs weakness. The patient was apparently healthy prior to 6 months, when he developed low grade fever for which he was treated by the family physician with no complete cure. Two weeks prior to hospital admission, he gradually developed lower limb weakness associated with sensory numbness below nipples. There was no history of trauma or family history of tuberculosis.

On examination he was moderately built and nourished, conscious, co-operative, oriented and obeyed commands. On physical examination his body temperature was normal, heart rate was 96/min, respiration rate was 22/min and blood pressure was 130/90 mm Hg. There was mild pallor. On chest examination, bilateral crepitations were heard. Cranial nerve examination was normal. There was no papilloedema and signs of meningeal irritation. Hyper-reflexia was observed in both the lower limbs and power was grade 3/5. Sensory examination revealed decreased

sensations on touch, pain and temperature below the nipples. Bladder and Bowel incontinence was present.

Routine hematological investigations revealed a total white cell count of 13,980/cumm with neutrophilic predominance. Erythrocyte sedimentation rate (Westergreens method) was 50 at the end of first hour. His serum was tested negative for typhoid and brucellosis by Widal test and Slide Agglutination Test (SAT) respectively. However, the serum was reactive for HIV antibodies. The dorsal spine X-ray showed partial collapse of dorsal vertebral body in T3-T4 region, suggestive of its involvement. (Figure 1). Considering his immunocompromised status, he was diagnosed clinically as Koch's spine with extradural compression at T3-T4 level.

On admission he developed sudden paraplegia and was treated with emergency surgical decompression. Magnetic Resonance Imaging (MRI) showed extradural compression from T3-T5 level with cord compression and huge paraspinal soft tissue collection (Figure 2). He underwent T3-T5 laminectomy with extradural decompression and evacuation of paraspinal collection (Figure 2). Gram stain of the pus revealed gram positive long branching filaments

and weakly acid fast branching filaments in Modified Ziehl Neelsen stain (Figure 3). Nocardia was grown on Sabouraud's medium at the end of tenth day and was confirmed as *N. asteroides* by biochemical tests.

The patient was started on doxycycline 100mg twice a day and co-trimoxazole DS twice a day for a week. Postoperatively, fever and chest symptoms resolved however, lower limb power, superficial sensations and bladder and bowel control did not improve. He was advised to continue the prescribed medications and to attend out-patient clinic for regular follow-up.

DISCUSSION

Nocardia are true bacteria and were described by Nocard in 1888. They are gram positive, partially acid fast and originally believed to infect humans only rarely. *N. asteroides* is identified as a common agent causing human disease among the Nocardia species.

The clinical presentation of nocardiosis is protean and the findings on chest radiographs are non specific. The most common sites of infection are lungs, pleura and chest wall. The lung is the primary organ involved unless the organism is



Figure 1: Preoperative Dorsal spine X-ray showing partial collapse of dorsal vertebral body in T3-T4 region.

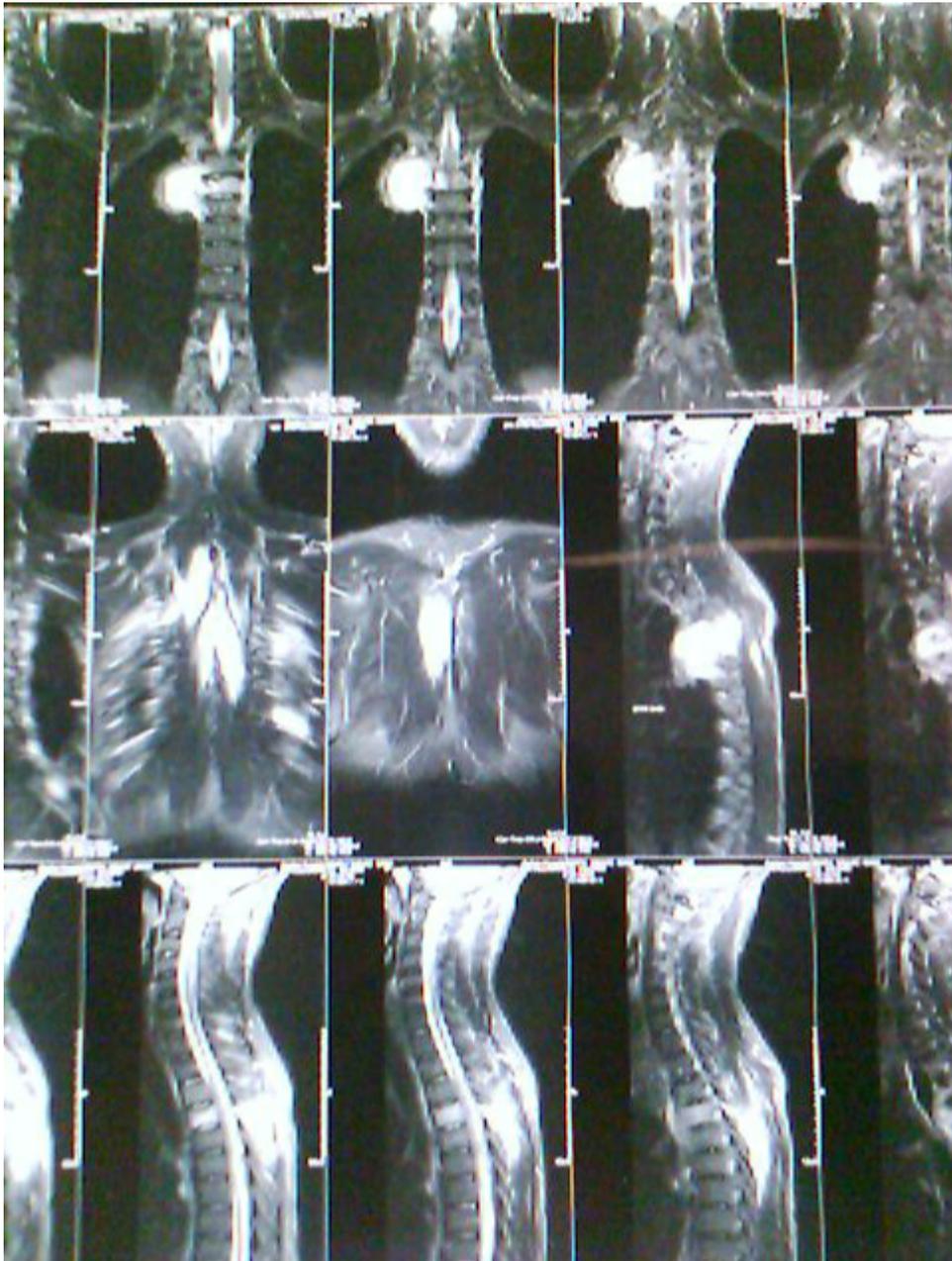


Figure 2: Preoperative MRI showing extradural compression at T3-T5 level with paraspinous soft tissue collection.

directly introduced through an open traumatic wound. The infection often spreads to the kidneys, brain, bones and deep seated soft tissues. The host usually has underlying immunosuppressive conditions like HIV infection as in our patient.⁴ The disease can masquerade as a neoplasm or granulation disease and can coexist with other diseases.⁵

The causative agent in 11 previously reported cases of culture proven nocardial spinal

osteomyelitis was *N. asteroides*, so is the finding in our patient. Mean age of these patients was 43 years² whereas our patient was 50 year old. Eight of them were men and 3 were women. They presented usually with backache, productive cough, lower limb weakness, malaise, weight loss and fever. Spine sites were lumbar (n=4, all L4-L5), thoracic (n=3), cervical (n=2) and sacral (n=1). In one case, there was involvement of cervical, thoracic, and lumbar spine. An epidural abscess complicated 5

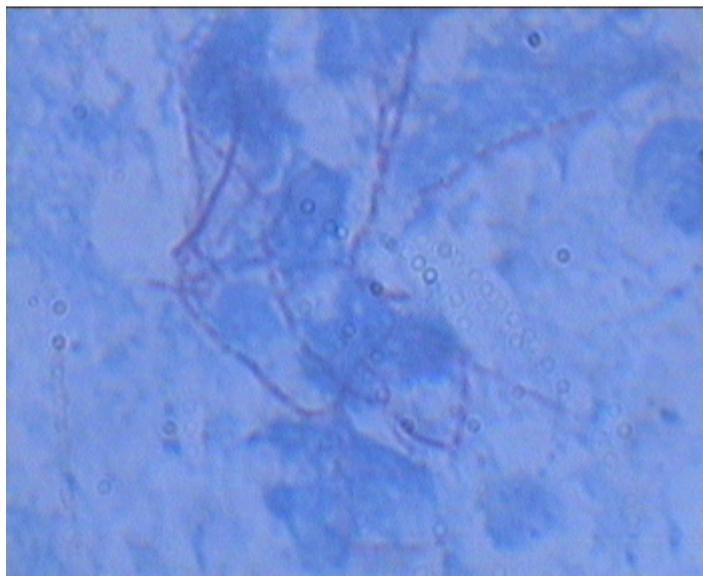


Figure 3: Picture showing the acid fast branching filamentous forms in Modified ZN stain.

cases (42%). Two among 11, involved 5 or more different sites with nocardiosis. One of these 2 patients died and the other showed persistent paralysis.³

The lesions present radiographically as expanding masses or diffuse infiltrates. The dorsal spine X-ray of our patient showed bilateral infiltrates. Diagnosis of nocardiosis is mainly based on the isolation of the organism, as it clinically mimics any granulomatous disease or a neoplasm. The mainstay of treatment remains combination of antibiotics, especially sulfonamides and trimethoprim. Many other antibiotics have also been used with varying degrees of success.⁵ Surgical treatment of the spine is indicated when antibiotic treatment alone fails or when complicated by an epidural abscess, vertebral collapse and neurological signs. Recently, spine instrumentation after debridement has been tried successfully to treat nocardial spine infections.³ The authors believe that, due to the increasing frequency of nocardiosis and the significant morbidity and mortality associated with its delayed diagnosis and treatment, an early diagnosis is paramount.

In conclusions, this case emphasizes the critical importance of early diagnosis of nocardial spine infection by high index of suspicion especially in immunocompromised hosts, combined with culture confirmation. Early diagnosis is indicated to achieve good outcome and prevent irreversible neurological deficits. Modified ZN staining is simple, quick and an important investigation

which can be used as a rapid method for screening the clinical specimen.

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REFERENCES

1. Servo CB, Oliveira FM, Cunha L, Cantarelli V, Servo LC. Disseminated nocardiosis due to *Nocardia farcinica*: diagnosis by thyroid abscess culture. *Rev Inst Med Trop S Paulo* 2005; 47(6):355-8.
2. Schwartz JG, Tio FO. Nocardial osteomyelitis: A case report and review of the Literature. *Diagn Microbiol Infect Dis* 1987; 8:37-46.
3. Graat CA H, Ooij AV, Day GA, McPhee IB. *Nocardia farcinica* Spinal Osteomyelitis. *Spine* 2002; 27(10): E253-E257.
4. Torres OH, Domingo P, Pericas R, *et.al*. Infection caused by *Nocardia farcinica*: case report and review. *Europ J Clin Microbiol Infect Dis* 2000; 19:205-12.
5. Yanoff DB, Church ML. Nocardial vertebral osteomyelitis. *Clin Ortho* 1983; 175; 223-6.