

Nocardia Osteomyelitis on OPAT

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INTRODUCTION

Nocardia Farcinica is an organism which is much **gram positive aerobic actinomycetes**. They are known to be a causative agent to cause infection in humans particularly in immunocompromised host. It is uncommon in immunocompetent people. **Nocardia infection is much related with soil.**

There are 251 species up-to date, 54 of them can cause disease in humans but only 13 are the commoner ones. Nocardia farcinica is **one of the common Nocardia** that can cause infections problem in human.

In this case, we are reporting 73 year old gentleman who is immunocompetent but developed **Nocardia Farcinica osteomyelitis** after cutting grass and sustained injury over right proximal tibial area while at home. MRI of right tibia showed evidence of osteomyelitis. Samples from **enrichment broth was positive but gram stain, culture and sensitivity came back negative.**

CASE DESCRIPTION

73 year old male who sustained injury while cutting grass. He went to GP who prescribed him oral antibiotics but he then attended initially to Cavan General Hospital due to worsening pain and swelling over site of trauma on right proximal tibia where he had incision and drainage done. He was then referred to Our Lady of Lourdes Hospital, Drogheda for further management.

Upon reaching OLOL, he was admitted under orthopaedics team having right tibial MRI which then revealed that he had ongoing **active osteomyelitis with a communicating sinus and cellulitis of the right tibia**. Patient was brought into operation theatre for a wound debridement, washout and corticotomy. He then had one more debridement prior to starting treatment under OPAT.

Blood test on arrival to hospital revealed normal C-Reactive Protein (CRP),normal white cell count (WCC) with lymphopenia (0.44 x10⁹/l). He was reported to have **Nocardia Farcinica which grew from enrichment broth** despite all his tissue sample from theatre were negative.

He was discharged from the OPAT service after prolonged course of treatment for Nocardia Tibial Osteomyelitis **completing 6 months of treatment** in combination of **intravenous and oral antibiotic.**

TREATMENT AND MANAGEMENT

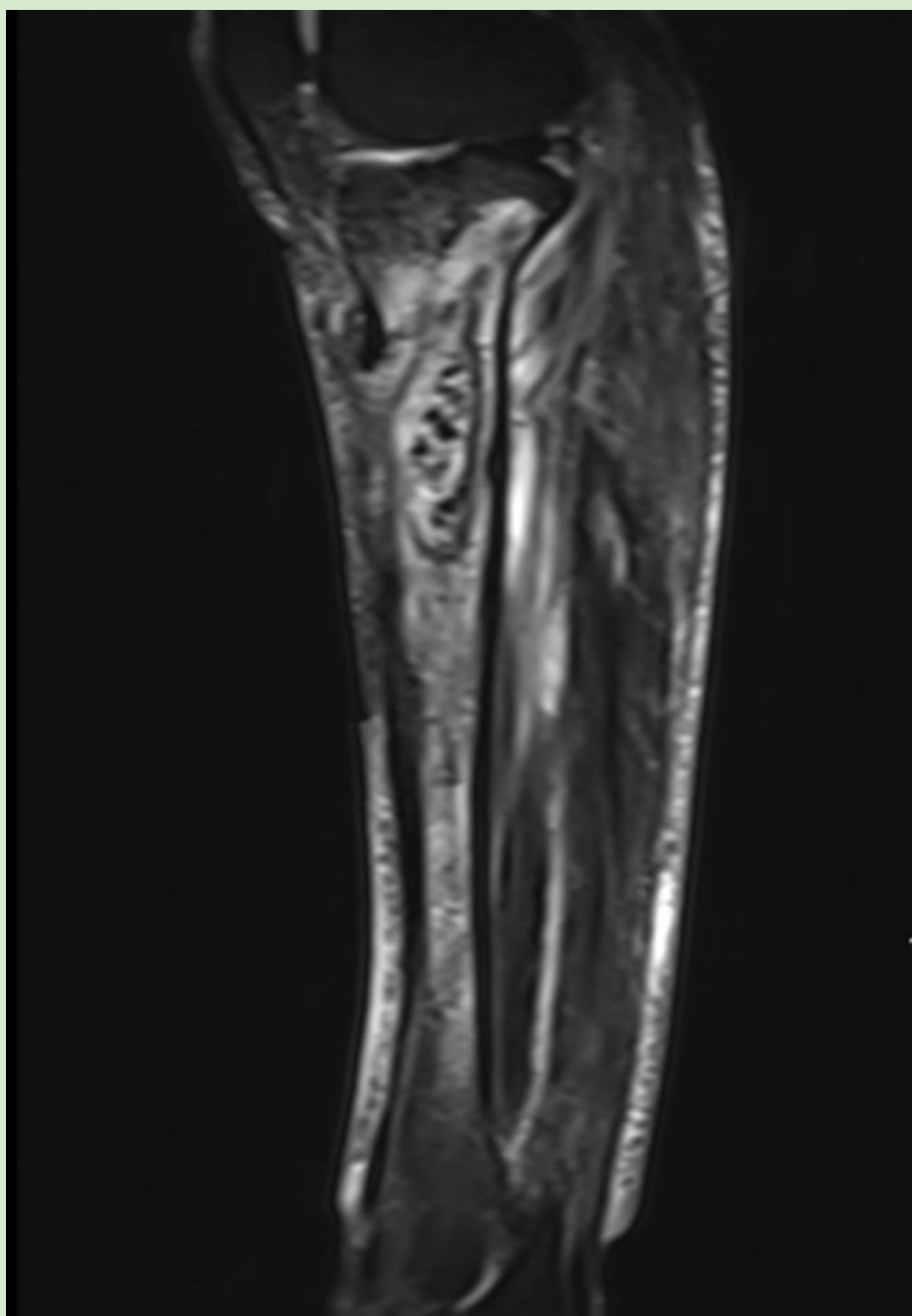
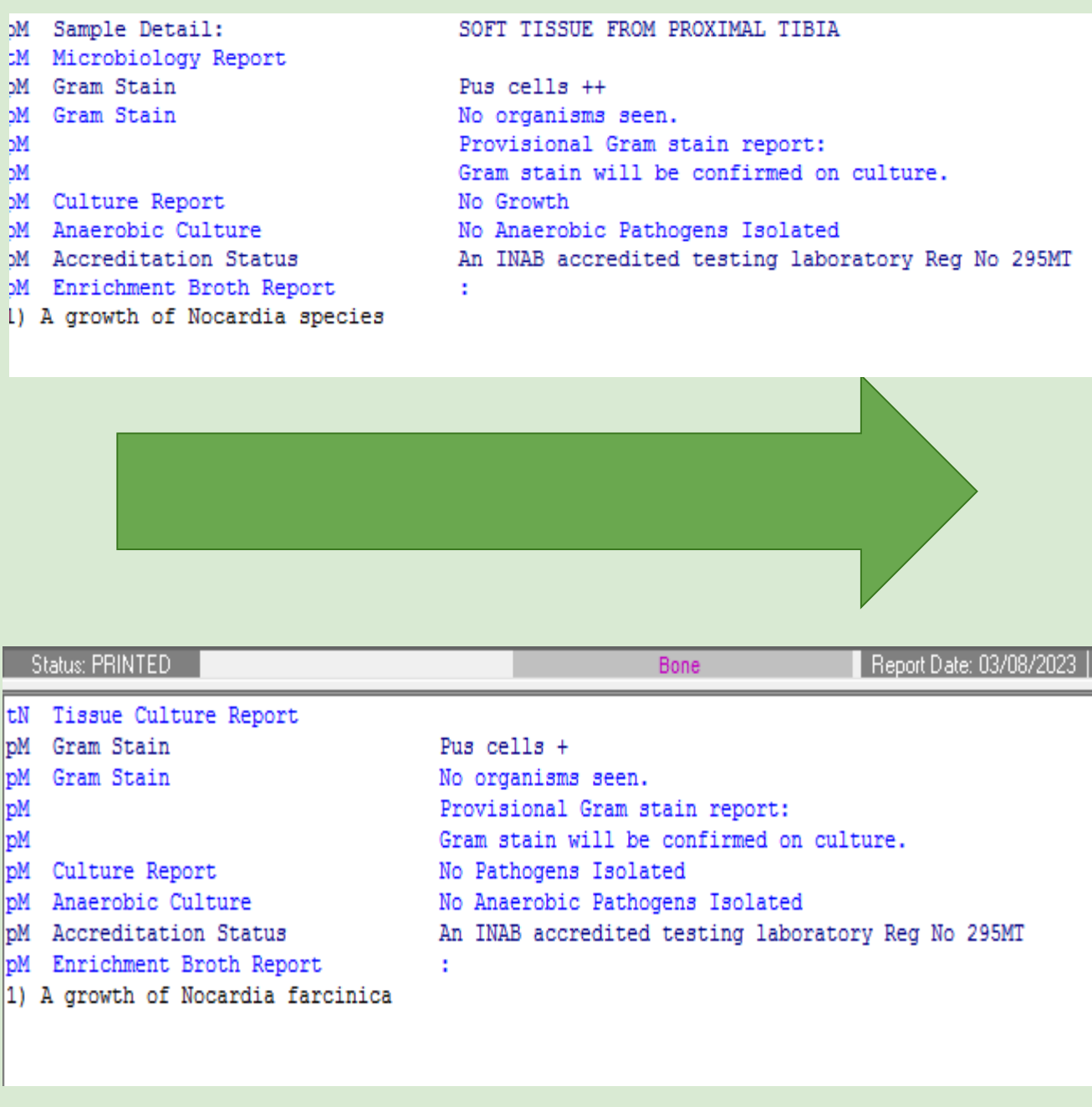
Patient was brought to theatre for **surgical intervention** where the **tissue sample grew Nocardia farcinica** on the **enrichment broth** on multiple occasions without confirmation on the culture and sensitivity. The decision to treat the patient based on the enrichment broth is due to the fact that MRI showed **acute osteomyelitis** and clinically patient was having symptoms of infection (ie fever, swelling, discharge from trauma site) .

He was initially **started on treatment with Linezolid** but then **was switched to IV Augmentin from Oct 2023 to Jan 2024** due to side effects. He was then switched to **Oral Augmentin** for there onwards for the remainder of the duration of treatment. MRI of right tibia showed interval good progression with improving markers but however on clinical basis patient was still having discharges from the sinuses hence the decision to keep continuing patient on treatment. As patient noted to have slow recovery, the decision was to extend the course of his treatment whereby he was put on oral switch.

Initial presentation of the MRI Right tibia/fibula with contrast showing osteomyelitis with both the deep soft tissue/intramuscular and intraosseous collections. Also present is the cortical destruction of the anteromedial tibia

MRI Right tibia/fibula with contrast post washout showed placement of intraosseous antibiotic beads within the proximal tibial bone abscess. Noted as well overlying defect within the skin and a sinus extending from here through the overlying soft tissues to communicate with the intraosseous abscess

MRI Right tibia/fibula with contrast post IV antibiotic 3 months showing extent of oedema has only mildly improved/decreased when compared with previous. Other findings noted degree of rim enhancement of the intraosseous collection has probably reduced mildly



DISCUSSION

Nocardia spp. is documented as part of the **actinomycetes group** and infection is extremely rare especially in cases where dissemination is to occur. Nocardia infection is mainly due to inhalation as the primary source superseding direct inoculation as the second route of infection. The possibility for a patient to develop osteomyelitis is usually due to the case whereby patient would have a bacteraemia which then causes seeding into other organs (ie bone, hollow organs). In other cases, this kind infection can also be due to immunosuppressive state. Nocardia is much reported to be one of the causative agent to cause infection but rare in immunocompetent patients.

In the case of this patient, it is highly likely that patient might have **developed osteomyelitis due to direct inoculation** as result from a direct trauma near the tibia/fibula area. This would have cause an entry point for the patient’s Nocardia Osteomyelitis.

Mainstay treatment for any osteomyelitis would be for **immediate intervention as the aim of treatment would be to have source control**. Patient would then have to undergo extensive antibiotic treatment for a minimum of 6 weeks as per for osteomyelitis gold standard treatment. To relate in this case however, one would think of extending patient’s duration of antibiotics to an extended duration based on clinical, blood and radiological findings.

Guideline for **Nocardia treatment will be to start patient on Sulfamethoxazole/Trimethoprim (SMX-TMP)**, but however other sulfa antibiotics, amikacin, imipenem/meropenem, third-generation cephalosporin,,extended-spectrum fluoroquinolones, linezolid and dapsone are effective in vitro and in animal models. Combination therapy with other agents should be considered in patients with severe infections or profound and lasting immunodeficiency. **Prolonged therapy is important, and the duration of treatment (6–24 months)** should take into account the presence of disseminated disease and the extent of the patient’s underlying immunosuppression. **Surgical debridement is recommended for necrotic nodules or large subcutaneous abscesses.**

References :

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