

CASE REPORT

Post-operative Wound Site Infection Caused by *Nocardia species*

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Abstract:

A 61 year old diabetic female who was a known case of breast carcinoma and had undergone mastectomy was admitted with discharge from the post-operative wound site. *Nocardia species* was isolated from the discharge. She responded to treatment with trimethoprim-sulfamethoxazole.

Keywords: *Nocardia*, Cutaneous Nocardiosis, Post-Operative Wound

Introduction:

Nocardiosis is a rare infection caused by Gram positive filamentous bacterium which is typically found in immunocompromised patients [1]. These are ubiquitous aerobic branching organisms and can affect various body sites. Accordingly, Nocardiosis can be classified as pulmonary, extrapulmonary, central nervous system, cutaneous or subcutaneous [2]. Cutaneous Nocardiosis (CN) is a rare human infection, more frequent in tropical countries which can be primary infection through direct inoculation into the skin or secondary to pulmonary infection. Surgical site infection is also a risk factor rarely involved in CN [3]. We report one such unusual case of post-operative wound site infection caused by *Nocardia*.

Case Report:

A 61-year-old Indian female, home-maker residing in another state, was admitted to our hospital seven months back with history of breast mass and nipple retraction of right side since one

month for which she had seen a local doctor. There was no history of trauma, fever, nipple discharge, fixation of lump to chest wall or muscle. Her left breast and both axilla were normal. She was a known case of diabetes mellitus and hypertension. Her mammography and Fine Needle Aspiration Cytology (FNAC) were done both of which were suggestive of right breast carcinoma. She was then referred to our hospital where her diagnosis was confirmed to be right breast carcinoma, duct type-grade two. She underwent Modified Radical Mastectomy (MRM) in our institute and was discharged. She was posted for chemotherapy later. On day ten post-surgery, there was white, non-foul smelling, minimal discharge from a small wound gap over lateral most aspect of suture line for which dressing was done and she was given oral amoxicillin-clavulanic acid. During her visits to the hospital for wound dressing, the discharge was persistent. Five months later, she was re-admitted to our hospital for skin flap revision and secondary suturing. As the wound had not yet healed and discharge was still persistent, it was sent for aerobic and anaerobic culture. On re-admission, all her routine blood investigations were within normal range. Material collected during revision surgery was sent for histopathology which showed ulceration with acute on chronic inflammation. Gram stain directly from the discharge showed Gram-positive branching filaments (Fig.1). Ziehl-

Neelsen (ZN) stain did not reveal Acid Fast Bacilli (AFB). Modified ZN stain (using Kinyoun stain and 1% sulfuric acid as decolouriser available from Himedia, Maharashtra) [4] showed acid fast branching filaments (Fig. 2).

Sample was plated on 5% Sheep Blood Agar (SBA), Chocolate agar and MacConkey agar (Himedia, Maharashtra, India) under sterile conditions and incubated at 37°C under aerobic conditions [4]. Chalky dry white colonies were seen on SBA (Fig. 3) and Chocolate agar after three days. There was no growth on MacConkey agar. Gram stain and modified ZN stain from the colonies showed Gram positive and acid-fast branching filaments respectively. Another set of similar plates was incubated at 42°C which also showed similar growth on SBA and Chocolate agar after three days. The sample was also inoculated on Sabouraud Dextrose Agar (SDA) and Tap Water Agar (Himedia, Maharashtra, India) which showed similar extensive growth at the end of three days at 37°C with yellow pigment on the reverse which was confirmed on Gram stain and modified ZN stain [4]. Anaerobic culture did not show growth at the end of seven days. The growth obtained from aerobic culture was inoculated on urease agar slant which changed to pink colour at the end of four days. Antibiotic susceptibility test of the isolate was done to certain antibiotics using antibiotic discs (Himedia, Maharashtra, India) which were amikacin (30mcg), cefotaxime (30mcg), erythromycin (5mcg), gentamicin (10mcg), tobramycin (10mcg), trimethoprim-sulfamethoxazole (23.75/1.75mcg) [4]. The isolate was sensitive to all antibiotics except erythromycin. On this basis, growth was reported as *Nocardia species*. The patient was treated with oral trimethoprim-sulfamethoxazole to which she responded.

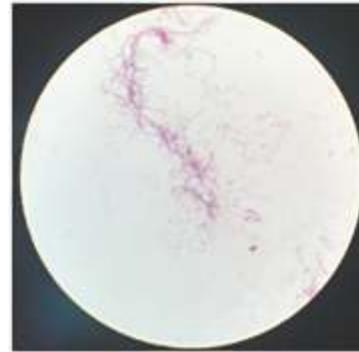


Fig 1: Direct Gram Stain from the Sample



Fig 2: Modified ZN Stain from the Sample

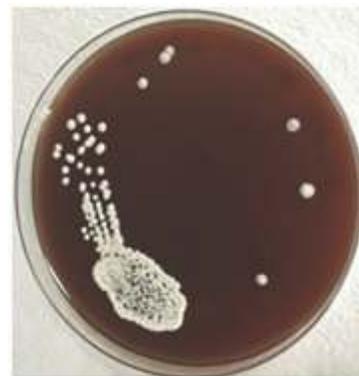


Fig 3: Growth on Sheep Blood Agar

Discussion:

Nocardia is an aerobic actinomycete which is ubiquitously present in the environment and is common in tropical countries. It causes localised or disseminated diseases mostly in immuno-

compromised patients [5,6]. It usually manifests as pulmonary, skin or subcutaneous or soft tissue infection and disseminated form. Primary nocardiosis includes pulmonary and cutaneous forms acquired by direct inhalation and direct inoculation respectively [6]. Disseminated disease occurs when the infection spreads haematogenously from a primary site to other organs, commonest being lung followed by skin, brain and others like eyes, joints, heart, kidneys, skin etc [6,7]. The species that cause human infections are *N. asteroides* complex (consisting of *N. asteroides sensu stricto*, *N. farcinica* and *N. nova*), *N. brasiliensis*, *N. transvalensis* and *N. otididiscavarium* [6]. CN may manifest as secondary or primary form. Secondary form occurs due to dissemination from a primary site and is commoner in the immunocompromised. Primary type follows puncture or traumatic inoculation with *Nocardia* which mostly happens in immunocompetent individuals [7,8] but rarely in immunocompromised host [7]. Our patient was a known case of breast carcinoma who got operated and also had received chemotherapy and hence significantly immunosuppressed with diabetes as an underlying risk factor. Solid organ malignancy is the commonest predisposing factor for *Nocardia* infection [7]. Also, post-operative wound infection and iatrogenic cutaneous infections caused by *Nocardia* are well documented in literature [9,10]. *Nocardia* infection of Post-Coronary Artery Bypass Graft (CABG) surgical site has been reported by Varghese *et al.* and Sumana *et al.* [10,11]. Hence, based on above findings and growth at 42°C, the probable species was *sensu stricto*, *farcinica* or *otididiscavarium* but it was sensitive to cefotaxime and tobramycin. So, *N. farcinica* was ruled out [4].

Further biochemical tests for species identification were not available with us and hence not done. *N. brasiliensis* is the commonest causative organism of primary cutaneous and rare cause of disseminated Nocardiosis [12] but this species was ruled out as *N. brasiliensis* does not grow at 42°C. *N. otididiscavarium* is extremely rare and very few cases of this isolate have been reported [2]. In our patient, this infection could also possibly be due to haematogenous dissemination from lungs as she was immunosuppressed. So, the involved species could be also be *N. sensu stricto* as one of the species belonging to *N. asteroides* complex [13]. All *Nocardia* species may not be identified by the available biochemical tests and these tests are time consuming [4]. Molecular methods of identification like 16s RNA gene sequencing can be helpful in establishing diagnosis of *Nocardia* but are not available routinely and hence not performed [3,7]. So was the constraint in our case and hence it was reported as *Nocardia* species. The isolate was sensitive to trimethoprim-sulfamethoxazole which has remained the drug of choice for this isolate [6]. The patient responded to oral trimethoprim-sulfamethoxazole along with regular wound dressing. Thus, in an immunosuppressed female who underwent a major surgery, CN presenting as infection of the post-surgical wound site is rare and needs to be reported.

Conclusion:

Our case emphasizes the fact that Nocardiosis is re-emerging as an important opportunistic pathogen which could be clinched in our case due to a high index of suspicion. Also, re-emphasised is the importance of asepsis and instrument sterilisation during surgery.

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