



## Cutaneous *Nocardia brasiliensis* infection in an immunocompetent host after ovarian cystectomy: A case study

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### CASE REPORT

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### Abstract

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*Nocardia brasiliensis* is a rare human pathogen that is usually associated with localised cutaneous infections. We report a case of primary cutaneous *Nocardia brasiliensis* infection causing delayed wound healing that developed after ovarian cystectomy in an otherwise healthy 32-year-old woman. The patient was initially treated with cotrimoxazole, however due to intolerance intravenous amikacin was given and gradually the wound healed. The diagnosis was confirmed by demonstrating the causative organism in exudates, and cultures. Early diagnosis as well as early institution of chemotherapy is effective in most patients, and antimicrobial susceptibility testing of the isolate should be performed to identify the best treatment options.

#### Key Words

*Nocardia brasiliensis*; immunocompetent; cutaneous Nocardiosis; ovarian cystectomy

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### Background

Nocardiosis is a rare localised or systemic infection caused by several species of the genus *Nocardia*. This genus

consists of strictly aerobic, Gram-positive, variably acid-fast, filamentous bacteria with a tendency to fragment into bacillary and coccoid forms.<sup>1</sup> *N. asteroides*, *N. farcinica*, *N. nova* (included in the *N. asteroides* complex) and *N. brasiliensis* are the species most often involved in human disease.<sup>2,3</sup> *N. brasiliensis* has been recovered from the soil in many tropical and subtropical areas but rarely in temperate areas. Traumatic inoculation of *N. brasiliensis* into the skin is the typical mode for acquisition of infection in immunocompetent hosts, resulting in an acute inflammatory response terminating in necrosis and abscess formation; granuloma formation is uncommon.<sup>4</sup>

Herein, we describe a case of cutaneous *Nocardia* infection in an immunocompetent woman after ovarian cystectomy.

### Case details

A 32-year-old immunocompetent female married for 10 years reported at an outpatient department (OPD) with primary infertility, pain abdomen and oligomenorrhoea. There was no history of fever, burning sensation with urination or loose motions, vomiting, loss of appetite or weight loss. Routine examination reports were unremarkable. Ultrasonography (USG) of her abdomen revealed a big cyst in the right ovary (9.6cm × 8cm). Laparoscopic cystectomy was performed at Medical College Hospital Kolkata during February 2011. The post-operative period was uneventful but on the seventh post-operative day the patient complained of discharge of a pus-like material from a laparoscopic wound which had been treated conservatively with a dressing and oral antibiotic (Ciprofloxacin 500mg for seven days). She was sent back home with the existing treatment. During this period there were no systemic symptoms except the discharge. Regular dressing was advised on an OPD basis but the patient did not turn up for next six weeks. She had not taken any antibiotic in this period and presented with an intermittent discharge from the wound. Mantoux test was negative and chest X-ray was reported as normal. No intra-abdominal pathology was detected on repeat USG. Pus was sent for routine microscopical examination and culture. The Gram-stained smear of the exudate revealed microorganisms

morphologically consistent with *Nocardia* spp. The exudate was inoculated in Sabouraud's dextrose agar as well as blood agar media. After 72 hours incubation the colonies appeared folded, heaped-up, chalky white and dry. Microscopically the organisms were Gram-positive, filamentous and branched. On modified Z-N stain they were acid fast.



**Figure 1: Rough chalky-white colonies of *Nocardia brasiliensis* grown on blood agar**



**Figure 2: Gram's stain shows filamentous, beaded, branched Gram-positive bacilli**



**Figure 3: Modified Z-N stain shows acid fast bacilli**

A 0.5 McFarland suspension of the organism was prepared in sterile distilled water for use in the biochemical and disk diffusion susceptibility tests. Antimicrobial susceptibility testing was done by Kirby-Bauer disk diffusion method and the isolate was sensitive to amikacin, amoxy-clav, cefotaxime, ceftriaxone, gentamicin, linezolid, cotrimoxazole and resistant to ciprofloxacin, clarithromycin, erythromycin, and ampicillin. Phenotypically it was identified as *Nocardia brasiliensis* by a battery of biochemical tests.

The isolate showed gelatine liquefaction at 37°C within seven days and in API 20C AUX Strips (bioMerieux, Marcy l'Etoile, France) showed positive assimilation of glucose, glycine, galactose, N-acetyl glucosamine, inositol and trehalose and negative for adonitol when incubated at 37°C for seven days.<sup>6</sup> The patient was initially treated with cotrimoxazole but due to intolerance intravenous amikacin (1gm once daily) was given for four weeks. Discharge from the wound stopped after 14 days and gradually the wound subsequently healed.

### Patient consent

Signed informed consent was given by the patient for publication of material pertaining to this case.

### Discussion

Nocardial infections occur worldwide, particularly in tropical and subtropical environments. The exact incidence of primary cutaneous nocardiosis in India is not clear. In a series of nocardiosis patients<sup>12</sup>, 7.8% of the patients had cutaneous disease, the commonest causative organism being *N. brasiliensis*.<sup>13</sup> *N. brasiliensis* although occasionally implicated in pulmonary and disseminated infections in immunocompromised patients, has been most commonly associated with cutaneous infections in immunocompetent patients.<sup>1,5</sup> *Nocardia* enters the skin after traumatic inoculation and cutaneous manifestations include: 1) mycetoma, 2) lymphocutaneous (sporotrichoid) infection, 3) superficial skin infection, and 4) disseminated infection with cutaneous involvement. The present case is consistent with the classical presentation of cutaneous infection as there were no systemic symptoms. The inoculation probably occurred from the cotton that had been contaminated by *Nocardia* with the organism entering the site during the dressing of the wound.

Diagnosis of nocardial infection can be established by cultural isolation of the microorganism, and identification to the species level can be successfully performed either by conventional biochemical methods or by molecular techniques.<sup>6</sup> Trimethoprim-sulfamethoxazole combination is recognised as the drug of choice for nocardiosis.<sup>7</sup> Primary lymphocutaneous nocardiosis may be curable after a course of two to four months, although several studies report clinical cures of cutaneous nocardiosis caused by *N. brasiliensis* after only two to three weeks of therapy.<sup>1,8-11</sup> In patients with sulfa intolerance or those who fail therapy with trimethoprim-sulfamethoxazole, alternative therapy must be based on sensitivity testing. Minocycline, tetracycline, amikacin and amoxicillin-clavulanic acid have been successfully used.<sup>8</sup>



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## CONSENT

The authors declare that:

1. They have obtained informed consent for the publication of the details relating to the patient(s) in this report.
2. All possible steps have been taken to safeguard the identity of the patient(s).
3. This submission is compliant with the requirements of local research ethics committees.