

## An infection in disguise

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### ABSTRACT

*Nocardia* is gram positive partially acid fast bacilli and widely present in soil, fresh water, marine water, organic matter habitats and so saprophytic in existence. Nocardiosis is a rare bacterial infection and thus bacteria can be localized or systemic suppurative disease in humans. They may be rarely present on the skin and in the upper respiratory tract. Here we present a rare case of buccal space infection where in the culture reported nocardial infection. In our case the nocardiosis seems to be opportunistic and could have been inoculated following fall in the mud in this alcoholic state. Patient was treated with Amoxicillin-clavulanic acid and Amikacin and he responded well.

**Key Words:** *Nocardia*, nocardia asteroid, nocardiosis, buccal space infection, immunocompromised

### Introduction

*Nocardia* are gram positive partially acid fast bacilli and widely present in soil, fresh water, marine water, organic matter habitats and so saprophytic in existence. They may be rarely present on the skin and in the upper respiratory tract. In our case the patient was an alcoholic and was found lying in the mud on the road. *Nocardia* asteroids are considered the most common species associated with humans. Even in our case the species isolated was *Nocardia* asteroids. [1]

Nocardiosis is a rare bacterial infection and thus bacteria can be localized

or systemic suppurative disease in humans in our case the patient developed a localized disease suspecting the inoculation could have happened when the patient was lying on the road, as the patient already had a buccal space abscess. Due to differences in antibiotic susceptibility isolates of *Nocardia* should sent for precise identification of the species as it is important in the management of serious disease in immunocompromised patients. These organisms are known to have high frequencies of antimicrobial resistance and high mortality rate.

We present a rare case of buccal space infection where in the culture reported nocardial infection. In this case the nocardiosis seems to be opportunistic and could have been inoculated following fall in the mud in this alcoholic state.

### **Case report**

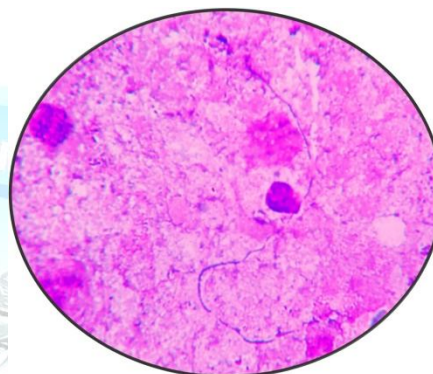
A 50 year old male diabetic came to the dental OPD with complaints of a painful swelling on the left side of the face. Swelling was present since one year which used to flare up and discharge pus intermittently. The swelling then extended extraorally 4 days back and became painful. Patient had personal history of smoking and drinking alcohol since 30 years.

Extraorally- a well-defined swelling was seen over the left lower half of face measuring 5x5 cm along the lower border of mandible. Skin was smooth, soft tender and warm.

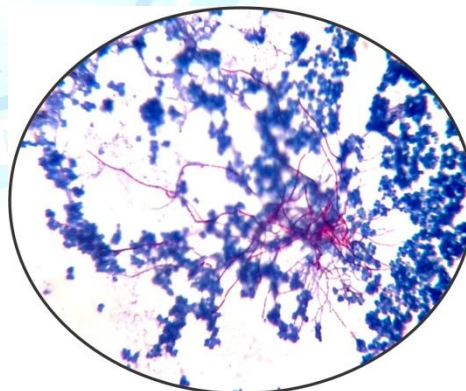
Intraorally- mouth opening was restricted, pus discharge seen near periodontal pocket of 2<sup>nd</sup> lower left molar. The patient was diagnosed as Buccal space infection secondary to periodontitis of 2<sup>nd</sup> lower left molar. Intra oral peri-apical radiograph revealed well defined radiolucency interspersed with radio opaque flecks.

Incision and drainage was done and pus sent for culture and sensitivity. On Gram's stain (Fig.1) numerous WBCs, occasional Gram positive cocci in clusters and numerous filamentous Gram positive bacilli were seen. Acid fast staining with 1% sulphuric acid (Fig.2) showed long filamentous branching acid fast bacilli. Culture put on various media showed the growth of Coagulase negative staphylococcus and nocardia species. Paraffin bait technique was done for isolating nocardia species from mixture.

Patient was given Inj. Amoxicillin-Clavulanic acid 1.2gm I.V thrice daily and Inj. Amikacin 500mg I.V twice daily that was continued after incision and drainage for 5 days. Extraction was done in relation to 37 under local anesthesia. He responded to it and the swelling resolved. On discharge he was started on Tab Cefpodoxime 200mg twice daily for and Inj. Gentamicin 80mg I.V twice daily for 5 days and asked for regular follow up.



**Fig.1 Gram Stain showing numerous WBCs, occasional Gram positive cocci in clusters and numerous filamentous Gram positive bacilli**



**Fig.2 Acid Fast staining with 1% sulphuric acid showed long filamentous branching acid fast bacilli**

### **Discussion**

Nocardia are saprophytic organisms with a worldwide distribution in soil. Isolation of any species of Nocardia from human specimens is significant. The observation of

thin Gram positive, irregularly stained or beaded branching filaments is important in the recognition of *Nocardia* species.<sup>[1]</sup> The order Actinomycetales includes phylogenetically diverse but morphologically similar aerobic and anaerobic bacteria that exhibit filamentous branching structures which fragment into bacillary or coccoid forms. The aerobic actinomycetes are a large, diverse group of gram-positive bacteria including *Nocardia*.<sup>[1]</sup>

The genus *Nocardia*, gram-positive organisms are partially acid fast due to the mycolic acid content of the cell wall. *Nocardia* species are now classified using a range of genotypic and phenotypic data, and combinations of such characteristics have been used to describe many novel species more than 30 having been described in the last decade. The prevalence of different species may vary according to different geographic areas.<sup>[2]</sup> *Nocardia* is found in soil rich in organic matter. They also form a part of oral microflora. Human infections result from direct inoculation of the skin or soft tissue or by inhalation of contaminated soil.<sup>[3]</sup> The hallmark of the organism is its ability to disseminate to virtually any organ, particularly the central nervous system.<sup>[4]</sup>

Nocardiosis usually occurs in patients who have either impaired local pulmonary defenses or systemic immunosuppression due to leukemias, lymphomas, organ transplants, AIDS, and prolonged corticosteroid or cytotoxic therapy. More recent reviews have noted nocardiosis in immunocompetent hosts with no predisposing factors identified. Host resistance to nocardial infection depends on neutrophils in early lesion and then the cell mediated immune response.<sup>[5]</sup> Nocardial infections can be difficult to

recognise, which leads to misdiagnosis and consequently underestimation of its incidence.<sup>[6]</sup> Although rare, nocardial infection can occur in immunocompetent patients. A study, in which 253 cases of nocardiosis were reviewed, found no evidence of underlying illness or immunosuppressive treatment in 15% of patients and this figure ranges from 10% to 25% in other reports.<sup>[1]</sup>

*Nocardia* commonly cause infection in immunocompromised patients, but has been reported to cause infections in immunocompetent patients also. Nocardiosis can be divided into 2 categories: disseminated and cutaneous. Disseminated nocardiosis is commonly seen in immunocompromised patients whereas in immunocompetent patients, they commonly present as pustules, abscess or cellulitis which can mimic diseases caused by more common organisms.<sup>[3]</sup> Direct inoculation of *Nocardia* species by transcutaneous routes results in three forms of infection: cellulitis, lymphocutaneous disease, or actinomycetoma.<sup>[1]</sup> Traumatic inoculation of the organism into the skin is the most typical mode of acquisition of this infection.<sup>[7]</sup> Primary cutaneous nocardiosis accounts for 5% of all nocardial infection.<sup>[8]</sup> It can be divided into four clinical types: mycetoma, lymphocutaneous infection, superficial infection (abscess or cellulitis), and disseminated disease with cutaneous involvement.<sup>[8]</sup> Our case is an example of primary superficial cutaneous infection following traumatic inoculation.

Primary cutaneous nocardiosis usually occurs in an immunocompetent individual 1 to 3 weeks after some type of local trauma with subsequent environmental contamination of the wound. Cellulitis presents with pain,

swelling, erythema and warmth at the affected sites, which typically do not drain and rarely disseminate to bone, muscles, and joints. Lymphocutaneous nocardiosis is sometimes referred to as “sporotrichoid-type” disease owing to its similar appearance to cutaneous sporotrichosis. This *Nocardia* infection is marked by the presence of a primary pyodermtous lesion frequently associated with areas of chronic drainage and crusting. In contrast to primary cutaneous disease, the organism invades more deeply to involve the lymphatic system and progresses to the formation of lymphatic abscesses.

Management of *Nocardia* infections also requires a combination of appropriate surgical drainage or debridement and chemotherapy. Owing to differences in antibiotic susceptibility, isolates of *Nocardia* should be sent to a reference laboratory for precise identification and susceptibility testing. In our study the sample was sent to higher centre for identification and hence *Nocardia asteroides* was isolated. In immunocompromised patients various predisposing factors have been reported in literature like Diabetes mellitus, patient on corticosteroids therapy, HIV infection. Susceptibility testing is especially important for patients with serious disease, immunocompromised patients, and those patients who fail to respond to initial therapy.<sup>[1]</sup> The patient in our case was an uncontrolled diabetic and was on irregular medications since 2 years and patient was chronic alcoholic (180ml/day for 30 yrs).

Several *Nocardia* species are known to have high frequencies of antimicrobial resistance, such as *N. farcinica* or other newly identified species. Patients with systemic disease require antibiotic therapy. Sulfonamides are the standard therapy for nocardiosis and are effective in the majority

of cases. Several other drugs such as amikacin, minocycline, amoxicillin clavulanic acid and third generation cephalosporins, have been used in these patients. Surgery is usually reserved for the drainage of abscesses.<sup>[9]</sup>

Conventional regimens include trimethoprim-sulfamethoxazole (TMP-SMX), amikacin, imipenem, cephalosporin, minocycline and so on.<sup>[10]</sup> However in our case we proceeded with the clinical diagnosis of buccal facial space infection secondary to an odontogenic infection, we started the patient on Inj Amoxicillin-Clavulanic acid 1.2gm TID and Inj Amikacin 500mg BD empirically. The patient however responded well. Therefore a high degree of suspicion is needed to diagnosis these infection especially when such a strong history of traumatic inoculation is reported by the patient. The identification and isolation and prompt and timely management is required or otherwise it can be catastrophic especially in immunocompromised patients.

### **Conclusion**

This case reports the fact that *Nocardia* was inoculated into an already existing buccal space infection through the oro-cutaneous sinus draining the buccal space and would have become opportunistic and not a primary potential oral pathogen. As the patients attender gives a history that the patient was found on the road after consumption of alcohol. We assume this to be the cause and site of traumatic inoculation. Hence this case report highlight that *Nocardia* can be a super added infection into an already existing odontogenic facial infection.

### **References**

1. Donna C. Sullivan, Stanley W Chapman. Bacteria that masquerade as fungi-Actinomycosis/ Nocardia. Proceeding of the American thoracic society 2010;7:216-221.
2. CK Tan, CC Lai, SH Lin, CH Liao, CH Chou, HL Hsu, et al. Clinical and microbiological characteristic of nocardiosis including those emerging nocardia species in Tiwan 1998-2008. Clin Microbiol Infect 2010;16:966–972.
3. Beena, Rameez Raja, Sandeep, Kavitha Karur, Perlam Yneswaran Prakash Indumathi VA. Nocardia in buccal space abscess- An oral manifestation: A case report. International journal of health sciences and research 2014;4(3):238-241.
4. Yossi Rosman, Ehud Grossman, Nathan Kellet, Michael Thaler, Tali Eviatar, Chen Hoffman, Sarah Apter. Nocardiosis: a 15-year experience in a tertiary medical center in Israel. European journal of Internal Medicine 2013;(24):552-557.
5. Kuo-Wei Chen, Chun-Wei Lu, Ting-Chi Huang, Chin-Fang Lu, Yea-Ling Liao, Jeng-Fong Lin, et al. Cutaneous manifestations of Nocardia brasiliensis infection in Taiwan during 2002 2012—clinical studies and molecular typing of pathogen by gyrB and 16S gene sequencing. Diagnostic Microbiology and Infectious Disease 2013;(77):74–78.
6. R Matulionyte, P Rohner, I Uckay, D Lew, J Garbino. Secular trends of noardia infection over 15 years in a tertiary care hospital. J Clin Pathol 2004;(57):807-812.
7. Sofia Maraki, Efstathia Scoulica, Kalliopi Alpentaki, Michael Dialynas, Yannis Tselentis. Lymphocutaneous nocardiosis due to Nocardia brasiliensis. Diagnostic Microbiology and Infectious Disease 2003;(47):341-344.
8. Kiran Chawla, Chiranjay Mukhopadhyay, Prashanth V Shetty. First report of submandibular and parotid abscess due to Nocardia asteroides. Braz j infect Dis 2011;15(5):486-489.
9. Marcelo E Corti, Maria F Villafafie Fiotti. Nocardiosis: a review. International journal of infectious Diseases 2007;7(4):243-250.
10. Tian Shen, Lihua Wu, Lei Geng, Zequng Wei, Shusen Zheng. Successful treatment of pulmonary Nocardia fracinica infection with linezolid: case report and literature review. Braz j infect Dis 2011;15(5):486-489.

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