Case report

Systemic Nocardiosis with cerebral abscess in a case of untreated Non-Hodgkin Lymphoma

Abstract

Nocardiosis is a worldwide disease documented as an infection that predominantly affects patients with immunosuppressive conditions. Though localized lesions are well known, systemic nocardiosis is a an extremely rare condition which needs to be recognized and managed early. We describe a case of Non-Hodgkin lymphoma, who developed pneumonia, multiple suppurative skin lesions and eventually brain abscess, to which the patient ultimately succumbed.

Introduction

Nocardiosis is an infectious disease that may occur in cutaneous, pulmonary and disseminated forms. It is usually associated with host immunosuppression and the infection arises by direct skin inoculation or inhalation. Disseminated or systemic nocardiosis is extremely rare. We describe a case of Non-Hodgkin lymphoma, who developed multiple suppurative skin lesions, pneumonia and ultimately brain abscess who could not be salvaged.

Presentation of the case

A 60-year-old male farmer presented in a local hospital with fever, cough and weakness for four months. He received symptomatic management including packed red cell transfusion for anemia (Hb-65gm/L) and was referred to a higher center where he was found to have anemia, splenomegaly and right upper lobe pneumonia. He was treated with intravenous (iv) antibiotics Piperacillin+Tazobactam along with multiple blood transfusions. CT scan of thorax revealed a mass lesion in right lung with multiple diffuse hypoechoic nodules in bilateral lung

fields. As the clinical condition further deteriorated, he was referred to our hospital, a tertiary hematology care center. On clinical evaluation, he had generalized lymphadenopathy, hepato-splenomegaly and multiple tender nodular skin lesions of different sizes in both lower limbs and chest wall. Some of the lesions had purulent discharge while others had crusts over them (Fig.1). Peripheral blood examination revealed pancytopenia. He received blood transfusions and started on IV antibiotics (Meropenem and Linezolid) and IV antifungal agent Voriconazole. Repeated cultures from blood, sputum showed no growth. Bone marrow aspiration and trephine biopsy along with cervical lymph node biopsy performed; morphology and immunohistochemistry proven diagnosis was Small Lymphocytic Lymphoma (SLL). Punch biopsy from skin revealed hyperkeratosis and no atypical lymphoid infiltration. Microscopic examination of the pus from skin lesions revealed partially acid-fast filamentous bacteria. TB-PCR from the pus was negative but later culture from pus came out to be positive for *Nocardia asteroides*. He was given oral Trimethoprim-Sulfamethoxazole (TMP-SMX), IV Amikacin, Linezolid and Imipenem. Serum Immunoglobulin levels were low and he received Intravenous immunoglobulins (IVIG) as per protocol. He became afebrile after 4 days. Follow-up CT scan of thorax showed radiological improvement in lung lesions. Over next few days, skin lesions started healing with significant decrease in purulent discharge and no new lesions. But after day 8, he developed new spikes of fever again, disorientation, upper motor neuron type facial palsy and hyponatremia. Magnetic Resonance Imaging (MRI) and Magnetic Resonance Spectroscopy (MRS) of brain revealed ring enhancing space occupying lesion in right thalamus (Fig.2). Neurosurgery opinion was sought but before any further intervention could be planned, he succumbed to the disease on Day 9.

Discussion

Nocardia is a weakly staining gram-positive, partially acid-fast bacteria [1]. It can cause localized or systemic disease, mostly in immunocompromised patients, such as organ transplant recipients receiving immunosuppressant drugs, patients with low CD4 T-

lymphocyte counts and those with hematologic malignancies; one-third patients can be immunocompetent [2]. *Nocardia* can disseminate to virtually any organ like lungs, central nervous system (CNS), skin and cause disseminated disease. Commonly used antibiotics are TMP-SMX, Amikacin, Imipenem, third-generation Cephalosporins and Linezolid [3, 4]. It can relapse or progress despite appropriate therapy [5].Cerebral nocardiosis represents only 2% of all cerebral abscesses [2, 6]. CNS nocardiosis can also have an indolent course for several years [7]. Mortality rates of 55% and 20% in immunocompromised patients and immunocompetent hosts have been reported respectively [3]. Isolated cutaneous infection can be managed with monotherapy by oral TMP-SMX. But if they do not respond and for severe disseminated disease intravenous therapy is needed. Severe infections should be treated with combinations of two or three intravenous agents while awaiting results of susceptibility testing. In patients without CNS disease, TMP-SMX plus amikacin is usually used. In patients with CNS disease, TMP-SMX plus imipenem is preferred [3,4]. After intravenous therapy, oral monotherapy is given for a prolonged period and CNS infections should be treated for at least one year, though there is no established guideline for optimal duration [3,4]. Role of steroids is not established in CNS Nocardiosis and remains as a matter of discussion and requires further studies. Neurosurgical procedures can improve the outcome of CNS Nocardiosis and shorten the duration of treatment but it can't prevent the relapses [4,8]. In immunocompromised patients, lesions of *nocardia* in lungs and CNS may be mis-diagnosed as tuberculosis. In patients of tuberculosis it may appear as a fungal ball in pre-existing cavities, which may lead to delay in initiation of proper treatment and more complications [9-10].

Conclusion

Nocardia is mostly neglected as a result of low index of suspicion of the treating physician, inadequate microbiological experience of laboratory technicians or lack of standard microbiological protocols. Although there are no pathognomonic signs or symptoms of

nocardiosis, it should be suspected in any patient who presents with brain, soft tissue or cutaneous lesions and a concurrent or recent pulmonary infection. A high index of suspicion may lead to an early diagnosis to tackle this infection. As per literature review, probably this is the first case of an untreated hematological malignancy presenting with systemic Nocardiosis with brain abscess in India.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

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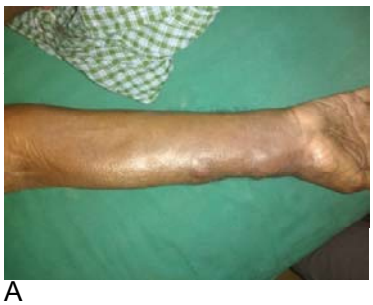
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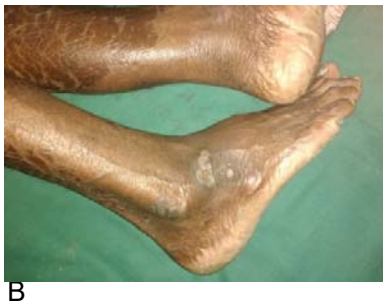
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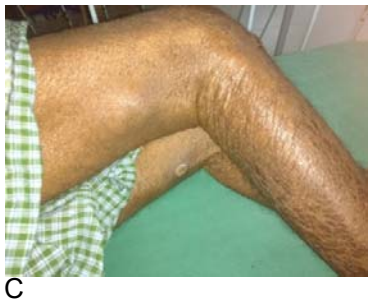
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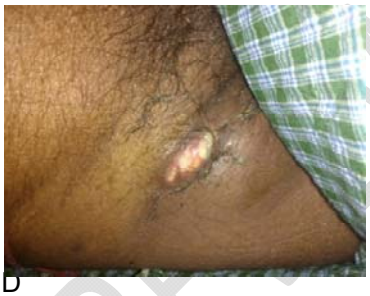
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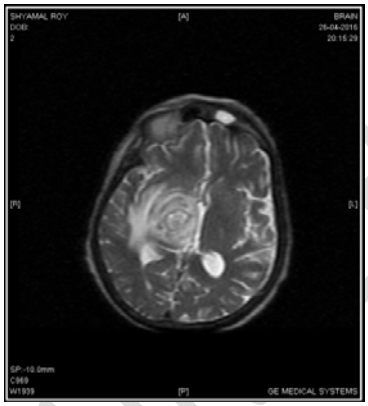
Fig. 1: Nodular lesion over forearm (A), dorsum of foot (B) and thigh (C). Ruptured lesion over inguinal region (D).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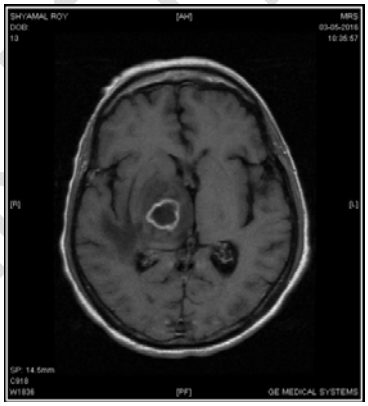
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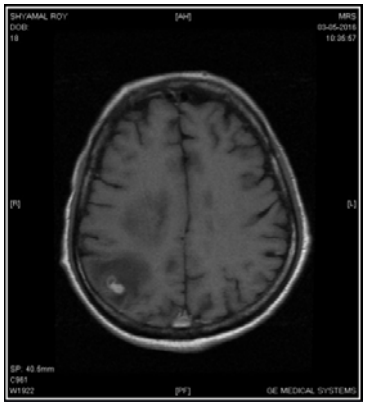
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Fig. 2: MRI brain (A) and MRS (B, C) showing ring enhancing space occupying lesion in right thalamus along with surrounding edema.