



Post Operative Persistent Discharging Sinus: A case report of Non-tuberculous Mycobacteria infection in Dhaka Medical College and Hospital

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Abstract

Nontuberculous *Mycobacteria* (NTM) are ubiquitous in nature can usually cause diseases in skin and soft tissue, post-surgical wound infection, pneumonia, infective endocarditis in healthy individual. A patient from neurosurgery department of Dhaka Medical College Hospital was referred to the Department of Microbiology, Dhaka Medical College with the complaints of chronic serous discharge from a pre-auricular sinus after 3 months of craniectomy operation. To detect the causative organism microbiological evaluation was done thoroughly including Gram stain, Zeihl-Neelsen stain, microscopy for fungus, culture and GeneXpert. NTM was identified and antibiotic combination of different classes was used which included clarithromycin, ciprofloxacin, linezolid and amikacin for extended duration. Regular follow-up was taken and patient improved gradually and completely cured.

Keywords: Acid fast bacilli; chronic wound infection; nontuberculous Mycobacteria; Zeihl-Neelsen stain

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Introduction

Nontuberculous mycobacteria (NTM) are usually widely distributed in nature having been isolated from natural water, tap water, soil, dust and water used in showers and surgical solutions¹. They can usually cause diseases in skin and soft tissue, post-surgical wound infection, pneumonia, infective endocarditis and rarely may do disseminated infections in immunocompromised individuals². But now-a-days NTM are increasing attention in infectious diseases by causing infection in healthy individuals³. Various environmental factors like warm and humid climate in

various geographical regions may increase a four-fold risk of infection of any NTM species⁴. The overall isolation rate of NTM in India ranges from 0.5% to 8.6% with a higher prevalence reported from south India⁵.

Recently we experienced a case of post-surgical wound infection in an immunocompetent individual, who presented with delayed wound healing, discomfort over site of incision and chronic serous discharge for 3 months without any constitutional symptoms. The detection and identification of the causative agent may be missed unless a direct Ziehl-Neelsen (Z-N) stain for acid fast bacilli, culture on Lowenstein Jensen (LJ) media and polymerase chain reaction (PCR) is done since routine aerobic culture does not yield growth and antibiotics for pyogenic infections do not work satisfactorily.

NTM incidence is increasing worldwide in last decade.

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However, actual incidence of NTM is unknown in Bangladesh due to lack of awareness, difficulties of detection methods, lengthy time and cost of identification.

Case Presentation

A 35 years old male was admitted in the Neurosurgery department at Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh with the history of head injury due to road traffic accident. A craniectomy operation was done in neurosurgery department of DMCH. After initial recovery, patient developed serous discharge from a sinus in left pre-auricular region which was 3 months later of operation (figure I). Discharge was non-purulent, thin, clear and not associated with pain or fever. The patient took several antibiotics such as fluoroquinolone, ceftriaxone and cefixime previously; however, the lesion was not healed. Preliminary culture from discharge showed growth of Methicillin Resistant Staphylococcus aureus (MRSA) and linezolid was prescribed but no improvement occurred.

In the Department of Microbiology, discharge was collected with proper aseptic technique by a sterile swab stick. Gram stain, Z-N stain, fungal microscopy, TB GeneXpert© test and culture were done in microbiology department. Discharge was inoculated on blood agar media and MacConkey agar media for culture and incubated at 37°C aerobically. Discharge was also inoculated to Lowenstein Jensen media (LJ media) at 37°C aerobically for six weeks to rule out mycobacterium tuberculosis.

On Gram staining, no pus cell but few gram positive cocci were seen under light microscope and Z-N stained smear revealed a few acid fast bacilli (AFB) (Figure-II). No fungal element was found on microscopic examination of the discharge. No Mycobacterium tuberculosis was detected in TB GeneXpert© for MTB. Culture on MacConkey agar media did not show any growth but on blood agar media, pale and opaque colored colonies were found after 4 days of incubation at 37°C (Figure III) which became yellow-pink after 7 days of incubation resembling growth of non tuberculous mycobacteria. Again Z-N stain of culture isolates from blood agar media revealed Acid fast bacilli. LJ Media yield no growth after 6 weeks of incubation aerobically.

The patient was treated as infected by non tuberculous mycobacterium, initially for 6 weeks with 4 drugs regimen (clarithromycin 500mg 12 hourly, ciprofloxacin 500mg 12 hourly, linezolid 400mg 12 hourly and amikacin 500mg 12 hourly) for 6weeks,

followed by 5 months with 3 drugs regimen (clarithromycin 500mg 12 hourly, ciprofloxacin 500mg 12 hourly and linezolid 400mg 12 hourly) as a maintenance dose. Follow up was done after completion of proposed drug regimen. Cessation of discharge occurred after treatment and the wound was healed (Figure IV). Cranioplasty was done after 8 months of diagnosis as a NTM case and patient was recovered successfully without any significant complications.



Figure I: Persistent discharging sinus after 3 months of operation when patient came to microbiology department

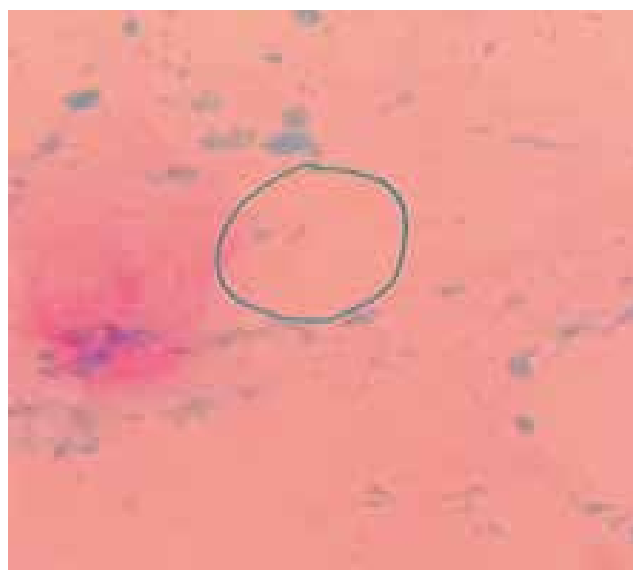


Figure II: AFB in discharge from the wound in Z-N stained smear under microscope (OIF)



Figure III: Culture on Blood agar media yielded growth of NTM on day 4



Figure IV: Healed lesion after 6 months of getting treatment

Discussion

Recently NTM have been reported as a cause of abscesses and post-surgical wound infections but the distribution of NTM and incidence of disease caused by them is not fully understood⁶. In our study the initial wound was healed satisfactorily after surgery. Then after a period of about 60 days, he developed serous discharge from the incision site. The discharge did not

cease even after taking several antibiotics and persisted for long time before the patient was referred by the clinician to the department of microbiology for further evaluation. Usually, wound infections due to NTM do not occur as an immediate post-operative complication but after few days, a non-healing superficial ulcer develops with discharging sinus^{6,7}. Sethi et al⁸ reported seven patients with NTM infections in post laparoscopic tubectomies.

Specimens in such case usually have no organism on Gram stain and culture shows no growth of aerobic and anaerobic organisms in routine culture media. Hence, such specimen must be stained by ZN stain method for AFB and incubated at 37°C for culture on LJ media.

In a study in Thailand on 88 extrapulmonary lesions caused by NTM, 61.4% cases were *Mycobacterium abscessus*, followed by 10.2% *Mycobacterium haemophilum* and 8.1% *Mycobacterium marinum* respectively; most of the *Mycobacterium haemophilum* infected patients were immunocompromised⁹. In the present study, however, the species of the NTM was not identified. In this case, NTM infection was diagnosed based on observation of AFB in Z-N stained smear from discharge under microscope, negative result of TB GeneXpert© test, positive culture in blood agar media for colony of *Mycobacterium* which was Z-N stain positive for AFB, and finally response of the patient to anti-NTM drugs.

Now-a-days post-operative delayed surgical site infections due to NTM are well documented¹⁰. Delayed wound healing with prolonged course of various antibiotics and frequent changing of non-responsive antibiotics make it a serious nosocomial infection. The NTM frequently contaminate the wound directly or indirectly. But the routine surveillance of environmental culture from tap water, floor dust, basin and operation theatre may not yield growth of NTM¹¹. Strict sterilization of all OT equipment and proper hand washing must be under taken to prevent such kind of wound infections.

NTM cannot be treated with classical anti-TB drugs. Though first line anti-tubercular drugs like ethambutol and rifampicin are effective against some species of NTM but they are not used commonly. The preferred choice is a varying combination of antibacterial agents like amikacin, fluoroquinolone, doxycycline, carbapenem, linezolid and clarithromycin^{1,12}. Poor nutritional status and vitamin deficiency especially vitamin A is associated with increased adverse effects and drug intolerance, thereby resulting in a poor therapeutic response¹³. So, nutritional aspects of this

type of patients should also be taken in consideration during the treatment.

Conclusion

The current increase in the frequency of NTM infections has attracted more attention from clinicians but still there is a lack of awareness. So, the aim of this case report is to draw attention and increase awareness of the clinicians and microbiologists about the importance of the diagnosis and treatment of NTM. When an infection persists after a few weeks of operation, NTM infections should be considered along with other usual cause of post-operative wound infections. Active diagnostic efforts are required using Z-N stain followed by microscopy, culture, TB GeneXpert© test and PCR. Proper sterilization of OT instruments, reduced contamination of surgical wounds, rapid laboratory diagnosis and specific drug combination therapy may reduce the patient sufferings due to NTM infection.

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Conflict of Interest

The authors declared no conflict of interest.

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This study was not funded.

Authors' contributions

Kakali Halder- concept generation, analysis, project supervision, original manuscript writing; Rizwana Zaman- Analysis, Investigation, Data analysis; Noor-E-Jannat Tania- Methodology, Investigation, Resources; Rubaiya Binte Kabir- Formal analysis, Methodology, Investigation; Azmeri Haque- Investigation, Resources; Farjana Binte Habib- Formal analysis, Methodology, Investigation; Nusrat Noor Tanni- Methodology, Investigation, manuscript writing and editing; Meherun Nesa- Methodology, Investigation, Resources, manuscript review and editing, Investigation, Methodology, Resources; Mahbuba Chowdhury- Resources, manuscript review and editing; Administration, funding acquisition; Sazzad Bin Shahid- Resources, funding acquisition, manuscript editing and review; Sazzad Bin Shahid: Over all supervision, validation, funding acquisition, manuscript editing and review; All authors read and approved the final manuscript.

Data Availability

Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate

Ethical approval for the study was obtained from the Institutional Review Board. As this was a prospective study the written informed consent was not obtained from all study participants. All methods were performed in accordance with the relevant guidelines and regulations. Patient's safety was maintained and secrecy was preserved accordingly.

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