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CASE REPORT

CHALLENGES IN DIAGNOSIS AND MANAGEMENT OF NON- TUBERCULOUS MYCOBACTERIAL INFECTION: REPORTED THREE CASES

ISHRAT BINTE REZA[1], MAHBUB MAYUKH RISHAD[2]. MD. AYAKUB NOBI[3] MD ZAHIRUDDIN[4] H.A.M. NAZMUL AHASAN[4]

Abstract:

Non-tuberculous mycobacteria (NTM) can cause a wide range of infections, from affecting the lungs (pulmonary) to the other parts of the body (extrapulmonary) like skin, soft tissue, surgical wounds, and areas around catheters and implants. A significant challenge is that NTM infections are often misdiagnosed as tuberculosis. This case series highlights these difficulties by exploring three patient experiences. The first case involves a 48-year-old man who developed a prolonged fever following coronary artery bypass grafting (CABG) surgery. He also presented with enlarged liver and spleen (hepatosplenomegaly). Imaging studies revealed a large saccular aortic ascending aneurysm. While surgery (ascending aortic and proximal arch replacement) addressed the aneurysm, the definitive diagnosis came later. Histopathological and microbiological examinations ultimately revealed the culprit to be NTM. In second case, a 56-year-old male underwent a laparoscopic bilateral total extraperitoneal inguinal hernia repair. However, he experienced persistent serous drainage from the incision site post-surgery. To investigate the cause, discharge was collected and subjected to various tests. Therefore, a PCR test for Non-tuberculous Mycobacteria (NTM) was performed. This test returned positive, confirming the diagnosis of NTM infection rather than tuberculosis. And our third case was post operative endophthalmitis following cataract surgery due to NMT. Through these case reports, our Aim is to raise awareness among healthcare professionals.

Keywords: *Challenges in Diagnosis, Non- Tuberculous Mycobacterial infection*

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Introduction:

Non-tuberculous mycobacteria (NTM) are increasingly recognized as human pathogens globally.[1] Of NTMs isolated, *Mycobacterium abscessus* is associated with the most severe infections including progressive pulmonary disease, skin and soft tissue, central nervous system and often fatal disease.[2] Bangladesh is an endemic zone for Mycobacterium tuberculosis (M.TB) but NTM infection is often under-detected. Diagnosing NTM infections is very challenging and they require prolong antibiotic therapy.

Case1:

A 48-year-old Hypertensive, Diabetic, known case of hypothyroidism with the history of CABG due to triple vessel disease presented with the complained of Fever for 3 months. Fever was initially low grade then became high grade continued in nature, highest recorded temperature was 103p F and was subsided by taking antipyretics. He had no other systemic complaints. He also had history of unintended 10kg weight loss duration his course of illness. On general examination, patient was ill-looking and anaemic. His vitals were

1. Associate Professor, Department of Medicine, Popular Medical College Hospital, Dhaka, Bangladesh
2. Assistant Professor, Department of Medicine, Popular Medical College Hospital, Dhaka, Bangladesh
3. Assistant Registrar, Department of Medicine, Popular Medical College Hospital, Dhaka, Bangladesh
4. Professor, Department of Medicine, Popular Medical College Hospital, Dhaka, Bangladesh

Address of Correspondence: Dr ishrat Binte Reza. Associate Professor of Medicine, Popular Medical College Hospital, Dhaka, Bangladesh; Email: mahbub.mayukh@gmail.com.

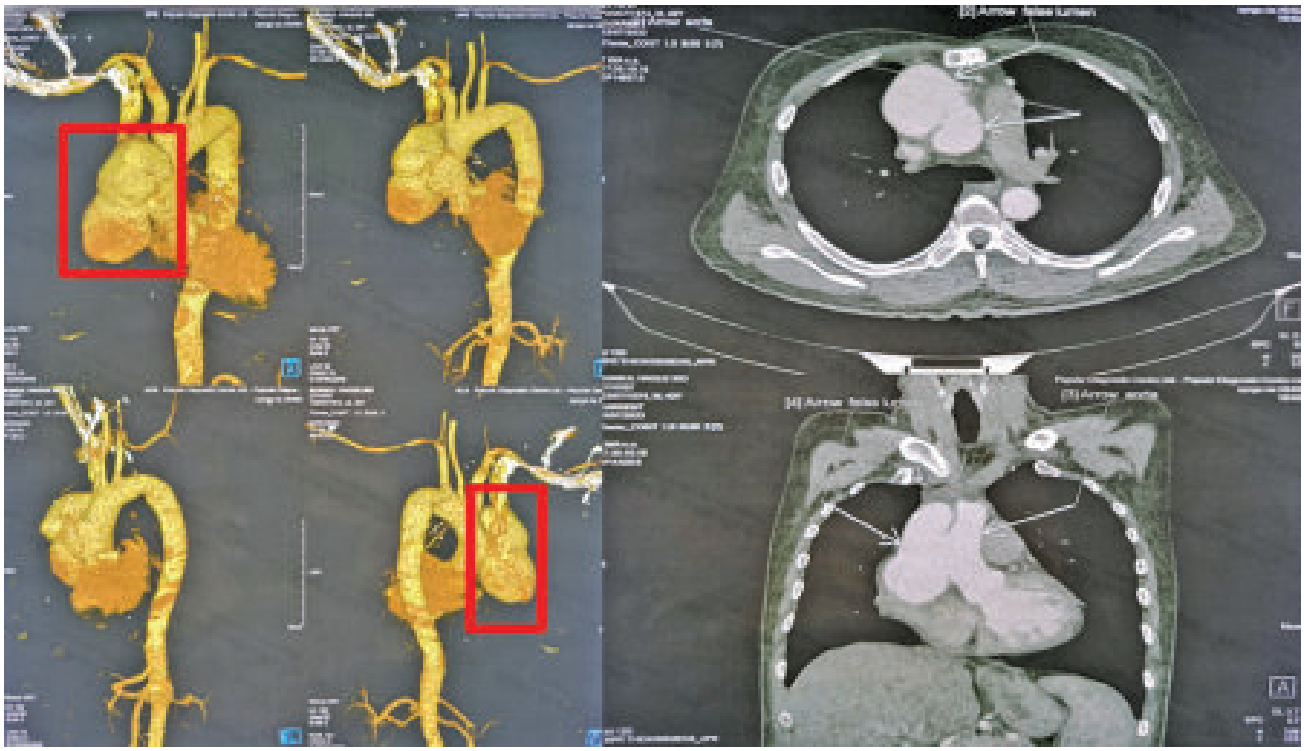

Fig.-1 **Fig.-2**

Fig. 1 and 2 : *Showing pouching and false lumen in ascending aorta*

normal. On abdominal examination there was hepatosplenomegaly. Other systems examination revealed no abnormality. On Routine investigation, CBC showed HB was 8.5g/dl with normal leucocytes level. Liver and renal function were normal. Chest X-ray showed cardiomegaly. Urine culture, 3 sets of blood sample taken from 3 different sites for culture were normal. ICT for Kala-Azar, ICT for Malaria, Febrile Antigen, all were normal. Tuberculin test were negative. Colour doppler echocardiography showed no abnormality but Transesophageal echocardiography showed No definite dissection in ascending aorta. But A large rounded luminal structure seen beside right atrium measuring about (54X50cm)

Dynamic view of CT scan of chest showed double lumen of ascending aorta with intimal flap suggestive of Aortic dissection CT aortogram : Shows,Large lobulated irregular saccular ascending aortic aneurysm Figure 1 & 2.

Empirical antibiotic therapy considering infection of aortic aneurysm including Amoxicillin, Gentamycin and vancomycin was started and shifted to cardiac surgery unit. Redo sternotomy - Ascending aortic and proximal arch replacement using 28mm VASCUTEK GRAFT done. Excised sample was sent for Gram stain and Z-N stain which showed AFB but no pus cell or bacteria. In Gene x pert no MTB was detected but PCR showed NTM (Mycobacter abscessus). Finally patient was treated with four drugs regimen (clarithromycin 500mg 12 hourly, ciprofloxacin 500mg 12 hourly, linezolid 400mg 12 hourly, and amikacin 500mg 12 hourly) for initial 6 weeks.Followed by 5months with three drugs regimen (clarithromycin 500mg 12 hourly, ciprofloxacin 500mg 12 hourly, and linezolid 400mg 12 hourly).

Case 2: A 56-yr-old man presented with persistent discharging sinus from anterior abdominal wall for 1 year. He had History of laparoscopic bilateral TEP hernia repair for inguinal hernia. He had no history of fever, cough, abdominal pain or any other systemic illness. On General examination there were no abnormality but local examination of the wound revealed single discharging sinus (Fig. 3). There was no local rise of temperature, tenderness or regional lymphadenopathy.

On routine investigation, Complete blood count, liver function, renal function and chest x-ray all were normal. Serosanguinous exudate was collected and was subjected to a Grams stain, Ziehl– Neelsen (ZN) stain. Pus cell was not found in gm stain but Z-N stain showed AFB. Biopsy was taken and Histopathology showed granulomatous inflammation, inflammatory granulation tissue, foreign body giant

Fig.-3 : *Discharging sinus in the port.*

cell reaction & fibrosis. Anti –TB was started but patient didn't showed any response. Again, discharge was sent for Gene-Xpert and PCR for NTM. No Mycobacterium tuberculosis was detected in Gene-Xpert but PCR showed *M. abscessus*. Finally patient was treated initially for 6weeks with four drugs regimen (clarithromycin 500mg 12 hourly, ciprofloxacin 500mg 12 hourly, linezolid 400mg 12 hourly, and amikacin 500mg 12 hourly), Followed by 5months with three drugs regimen (clarithromycin 500mg 12 hourly, ciprofloxacin 500mg 12 hourly, and linezolid 400mg 12 hourly).

Case 3: A 70-yr old man underwent for an uneventful cataract surgery with intraocular lens (IOL) implantation of the left eye. One year later he developed progressive painless visual loss in the operated eye. His vision was 6/36 in the left eye. Slit-lamp examination showed ciliary injection, 2+ cells in the anterior chamber, and posterior synechiae (Fig.-4).

There was white plague deposited on the posterior capsule which was noted as posterior capsule opacity. The fundus examination was normal. Initially treated conservatively but as it was progressive, B-scan ultrasound was done which revealed heterogenous vitreous echogenicity. As a result, pars plana vitrectomy (PPV) done. Vitreous scraping sent for culture and PCR revealed M. Abscessus . He was treated with intravitreal injection of vancomycin for 14 days followed by 6 month-course of oral clarithromycin and ciprofloxacin.

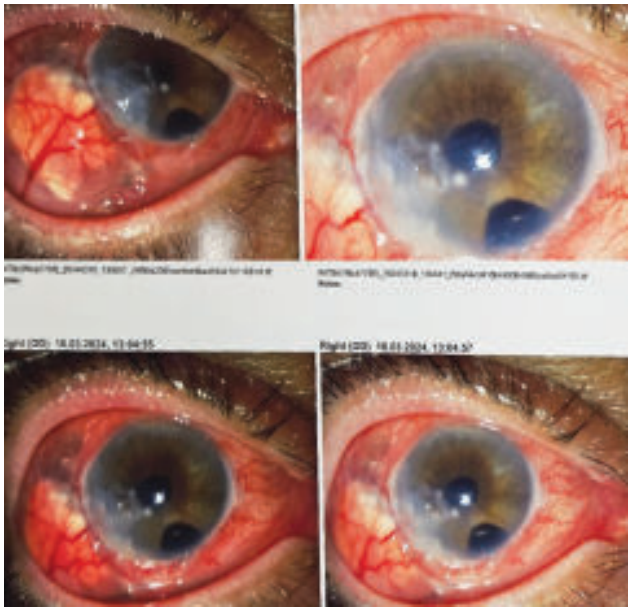

Fig.-4: *Slit lamp examination of left eye*

Discussion:

Now a days Nontubercular mycobacteria are increasingly reported because of improved microbiological diagnostic methods and enlarged immunocompromised hosts in recent years.[3]

Our first case was infective aortic aneurysm due to NTM. The aorta, as a major blood vessel is resistant to damage or destruction compared to other body blood vessels. However, a few factors can weaken the aortic wall, cause aneurysms, and also predispose the aorta to infectious etiologies. These factors include uncontrolled diabetes mellitus or hypertension, cancer, iatrogenic inoculation as a result of surgical intervention or the use of medical equipment or devices in and around the aorta, atherosclerotic diseases, vascular malformations, or medial cystic necrosis of the vascular wall. The route by which aortitis occurs includes hematogenous seeding of an existing intimal injury, septic emboli, direct spread from an infectious site, and bacterial inoculation.

In this case, aortic aneurysm developed most likely following CAG.

CT angiography is currently the best imaging technique for diagnosing mycotic aneurysms.4 In particular, the CTA enables the early detection of changes in the vascular wall and thus a faster diagnosis.[4]

In our second case, post operative wounds were healed initially, then within the next 1–2 months, incision sites became erythematous, and indurated, small blisters formed, burst out, and started serous discharge in

small quantities. Several antibiotics were recommended but did not respond to any of them. Even anti TB was started and didn't respond, moreover discharge continued and persisted. During operation, wounds are contaminated with NTM from environmental sources and take some time to make their clinical appearance. After infection with NTM, the operation scar breaks down and develops a nonhealing superficial ulcer with the sinus tract from which non-purulent serous discharge comes out.[5] Bhalla et al.[6] reported that 10.9% of postoperative wound infections occurred by NTM in South India.

In our third case, the infection often occurred within 1 month after ocular surgery. Cataract surgery was accounted for the most common procedure related to the infection. On the other hand, NTM endogenous endophthalmitis mainly took place in immuno-compromised patients. Our patient was diabetic. In 2015, Kheir et al reported that NTM endophthalmitis had no gender differences and the median age of presentation was 44 years. Among all exogenous endophthalmitis patients, the infection usually occurred after ocular intervention which 48.6% was cataract surgery with an average time of 11.5 weeks after ocular surgery. [7]

Skin or soft tissue infection is the most common manifestation seen in NTM-infected individuals whose wounds may be exposed directly or indirectly to the soil, colonized tap water, unsterilized operative instruments, or medical devices contaminated with environmental NTM after traumatic injury, during surgery, or cosmetic procedures.[8] Strict sterilization of all OT equipment, proper hand washing, and prevention of wound contamination with dust, soil, and tap water are needed to prevent wound infections with NTM.

In All three cases are infected by Mycobacterium Abscessus. The most preferred choice is a varying combination of antibacterial drugs like imipenem, amikacin, fluoroquinolones, doxycycline, linezolid, and clarithromycin.

Until now, there has been a lack of data regarding prevalence, diagnostic methods and treatment of NTM infections in Bangladesh. Therefore, such cases usually treated initially as general wound infections and sometimes by therapeutic anti tubercular regime. Recently, NTM infections have attracted more attention to the clinicians due to the increase in such cases; but still, there is a lack of awareness. When persistent chronic discharge from postoperative wound infections occur after operations that cannot be cured by usual antibiotics, NTM infections should be suspected and Z-N stain, culture, Gene-Xpert, and PCR must be considered as diagnostic tools to treat the patients with appropriate anti-NTM drug regimen.[9]

Conclusion:

All three case reports emphaseze that despite the rarity, clinicians should still consider the possibility of mycobacterial infection, in cases of no improvement following treatment with broad-spectrum antibiotics. Our Aim is to raise awareness among healthcare professionals through these case reports. A high degree of suspicion is necessary for accurate diagnosis as NTM infections often mimic the symptoms of other bacterial infections, making them difficult to distinguish.

Conflict of Interest:

The authors stated that there is no conflict of interest in this study

Funding:

This research received no external funding.

Consent:

For the purpose of publishing this case report and any related photos, the parents are written informed consent was acquired.

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