Case Report

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Atypical Mycobacterial Infection in Post Abdomino-Thoracic Trauma: A Case Report

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Abstract

Objective/Background: SSIs remain a significant cause of morbidity and mortality after surgery. One in eight patients develop SSI after exploratory laparotomies making it one of the major factors responsible for post-operative mortality and morbidity.

Atypical mycobacteria are responsible for a spectrum of diseases ranging from superficial skin infections to widely disseminated systemic infections.

Health care associated infections due to non-tuberculous mycobacteria is on the rise due to contaminated hospital water supplies, solutions, improperly sterilized instruments and devices. Our case is of an atypical mycobacterial infection in a patient with abdomino-thoracic trauma who underwent multiple surgeries.

Case presentation: A 24 year old gentleman presented with a penetrating stab injury to the abdomen and left hemi-thorax following an assault. Patient underwent an emergency exploratory laparotomy which revealed a 4 x 4 cm defect in the left hemi-diaphragm, through which the stomach was herniating into the left thoracic cavity. During the 2nd post-operative week, patient developed empyema thorax, for which pigtail drain was placed initially and later thoracotomy with decortication and intercostal drainage were performed. Following discharge after 2 weeks, he presented with fever, body pain and pus discharge from the previously inserted intercostal drain site. Pus obtained was positive for acid fast bacilli and gene expert was negative. Atypical mycobacterial infection was diagnosed based on high index of suspicion and he received treatment for 6 months.

Conclusion: This case highlights that identification of atypical mycobacterial infections in post-operative patients require a high index of suspicion. Management requires multi-drug approach and surgical intervention wherever necessary. Even with the existing sterilization techniques and preventive measure, atypical mycobacterial infection cannot be completely eliminated from a hospital set-up and hence must be considered in all nosocomial infections.

Keywords: Atypical mycobacterium infections; Post-surgical atypical mycobacteriosis (PSAM); Non-tuberculous mycobacterium (NTM); Mycobacterium fortuitum.

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INTRODUCTION

Surgical site infections occur in 2% to 4% of all patients undergoing inpatient surgical procedures. SSIs contribute to almost 20% of the nosocomial infections.[1] One in eight patients develop SSI after exploratory laparotomies[2] which makes it one of the major factors responsible for post-operative mortality and morbidity.

Atypical mycobacteria or non-tuberculous mycobacteria (NTM) are a group of organisms that can cause a spectrum of diseases ranging from superficial skin infections to widely disseminated systemic infections. They are classified based on the rate of growth as rapid growers and slow growing NTM.

Nosocomial infections caused by NTM is on the rise mostly due to contaminated hospital water supplies, solutions and improperly sterilized instruments and devices. In addition to being responsible for post operative infections called post-surgical atypical mycobacteriosis (PSAM), they also contaminate respiratory tracts of susceptible individuals and infect people undergoing dialysis and immune-compromised individuals.[3] Here we present a case of atypical mycobacterial infection in a patient with abdomino-thoracic trauma who underwent multiple surgical interventions.

CASE PRESENTATION

A 24 year old gentleman presented with a penetrating stab injury to the abdomen and left hemithorax following an alleged history of assault by two men at his work place. He was provided initial first aid at a local hospital and then referred to our tertiary care teaching hospital for further management.

Patient presented with features of hypovolemic shock. Patient was stabilized with infusion of IV fluids and was prepped for surgery. Per abdomen examination revealed features of peritonitis. CT scan revealed intrathoracic migration of stomach with suspected hollow viscus perforation. On Exploratory laparotomy a 4 x 4 cm defect in the left hemi-diaphragm, through which the stomach was herniating into the left thoracic cavity. After reducing the contents, it was noticed that stomach had a 12 x 8 cm laceration on its anterior wall. Edges of the laceration were freshened and viability was confirmed followed by primary closure of stomach done using delayed absorbable monofilament sutures. The rent in the diaphragm closed using non-absorbable monofilament sutures. An intercostal tube was inserted in the left fourth intercostal space and 400ml of haemorrhagic fluid drained. Post-op work up showed reduced hemoglobin and elevated white cell counts. Blood cultures were sterile, tracheal aspirate showed growth of Aspergillus fumigatus and wound swab revealed Staphylococcus aureus. On POD 5, the ICD tube was removed. A repeat chest X-ray showed homogenous opacities on the left side. CT chest performed on POD 8 revealed hyperdense loculated lesions in the pleural cavity suggestive of an infective etiology. On POD 9, USG guided pigtail drain insertion was done on the posterior aspect of the left thoracic cavity and haemorrhagic purulent collection was drained. A wound swab showed growth of Enterococcus faecalis and Staphylococcus aureus for which he was started on Inj.Vancomycin and intrapleural Vancomycin for two weeks. On POD 30, even though the drain output reduced to less than 20 ml, the patient continued to have low grade fever spikes. As a result, thoracotomy with deloculation, and ICD placement were performed on POD 32. Following thoracotomy, drain fluid was less than 25 ml and hence the patient was discharged after removal of ICD tube on POD 38.

OUTCOME AND FOLLOW UP

On POD 53, the patient presented with complaints of pus discharge from the previously inserted ICD site accompanied by fever. On examination, left infra-scapular tenderness was present with pus discharge from the ICD insertion site. On auscultation, reduced air entry was noted on left side of chest. An ultrasound of the chest revealed a possible abscess in the left extra-pleural space which was drained using USG guided pig tail insertion. Pus obtained was positive for acid fast bacilli and gene expert was negative. A high index of suspicion allowed us to consider atypical MTB infection and the patient was continued on broad spectrum antibiotics as atypical mycobacteria requires species identification. The patient presented 15 days later with complaints of pain at the drainage tube site with pus discharge from thoracotomy suture site and also upper aspect of the upper midline laparotomy scar. Pus culture confirmed Mycobacterium fortuitum species of atypical mycobacterium. Mutlidisciplinary discussion was done and the patient was put on a regimen of 6 months

DISCUSSION

Surgical site infections by NTM do not occur in the immediate post-operative period but rather take ten days to three weeks to manifest as in our case wherein the patient developed pus discharge from ICD site fifteen days following hospital discharge. They are characterized by the lack of local and systemic signs of pyogenic infection, sterile cultures and unresponsiveness to common antibiotics. Our case highlights all of these features and emphasizes that a chronic non-healing infection must raise suspicion of non-tuberculous mycobacterial infection.

Post-surgical atypical mycobacteriosis are more prevalent in abdominal surgeries especially those involving video laparoscopes according to a Brazilian study.[4] They were commonly attributed to Mycobacterium massiliense and presented with drainage, redness, induration, nodules and wound dehiscence. Improper sterilisation and tolerance of M.massiliense to glutaraldehyde are considered responsible for the outbreak.

ANVISA (Agência Nacional de Vigilância Sanitária-Brazilian Health Regulatory Agency) classified patients with PSAM as suspected, probable and confirmed cases with suspected being those with clinical symptoms following video surgery. Probable cases are patients meeting the criteria for suspected cases along with the presence of granulomas in wound site or acid fast bacilli but negative cultures. Confirmed PSAM cases are those with positive mycobacterial cultures from wound site.[5]

In the United States, Mycobacterium fortuitum, Mycobacterium chelonae, and Mycobacterium abscessus are the most commonly isolated species of RGM. While M.chelonae affects immunocompromised people and M.fortuitum in immunocompetent people with trauma or laceration, M.abscessus infect both.[6,7]

An Indian study conducted in 2009 noted that M.fortuitum was the most frequently isolated organism among post-operative NTM infections and treated mostly with clarithromycin and ciprofloxacin for a period of 6 to 9 months.[8]

A diagnosis of post-operative NTM infection is established by wound swabs, pus swabs or skin biopsies followed by cultures and histopathology revealing granulomas. They require specific stains and cultures for mycobacteria as gram stains and regular cultures do not yield results.[6,9-11] Furthermore, since atypical mycobacteria are sensitive to decontamination and discoloration procedures, a negative smear does not rule out infection.[12] In our patient, pus culture revealed atypical mycobacteria and direct smear showed acid-fast bacilli with negative Gene Xpert, thus confirming the diagnosis.

Conventionally, treatment includes drugs that NTM are susceptible to like macrolides (clarithromycin, azithromycin), fluoroquinolones (ciprofloxacin, levofloxacin), tetracyclines (doxycycline, minocycline) and linezolid[7,9,11,13] Parenteral therapy with amikacin, imipenem, and levofloxacin can also be used.[14,15] Monotherapy with a single drug is not recommended due to increased resistance and treatment failure.[9] In this case, the patient was treated with Inj. Amikacin and T. Levofloxacin for a month along with Tab. Doxycycline 100 mg BD and Tab. CoTrimoxazole BD for 6 months with serial monitoring of serum creatinine.

Atypical mycobacterial infections are increasingly seen in post abdominal surgeries. It has been attributed to various reasons like use of instruments contaminated with blood and tissue, use of glutaraldehyde with a 20 minutes exposure time as a disinfectant that fails to kill the mycobacterial spores and usage of boiled tap water to clean the instruments after immersion in glutaraldehyde. In order to curb nosocomial infections like PSAM, it is crucial to ensure that all the instruments undergo proper mechanical cleaning to remove tissue remnants. Additional measures include limiting use of glutaraldehyde and replacing it with ethylene oxide gas sterilisation and autoclaving of the water used to rinse the instruments post-sterilisation.[16]

This case highlights that identification of atypical mycobacterial infections in post operative patients require a high index of suspicion due to delayed presentation and sterile blood cultures. Management requires multi-drug approach and surgical intervention wherever necessary. Even with the existing sterilization techniques and preventive measure, NTM cannot be completely eliminated from a hospital set-up and hence must be considered in all nosocomial infections.

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