Port-site Infection with Atypical Mycobacteria Post-laparoscopic Procedure: A Case Series

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ABSTRACT
Surgical site infections with atypical mycobacteria are uncommon but not unheard of. Atypical mycobacteria are abundantly present in soil and water and can cause infections when the immune system is compromised. We present four cases of atypical mycobacterial infections at the port site following laparoscopy. In the first case, a laparoscopic cholecystectomy, there was histopathologic evidence of mycobacterial infection, although the smear and culture tests were negative. The second case, post-laparoscopic sterilisation, also showed histopathologic evidence, but the smear test was negative. Similarly, the third case, post-laparoscopic appendectomy, had histopathologic evidence but a negative smear. The fourth case, a post-laparoscopic hernia repair, had histopathologic evidence, a positive smear, and positive culture. The Catridge-Based Nucleic Acid Amplification Test (CBNAAT) for Mycobacterium Tuberculosis (MTB) was negative for all four patients, indicating the absence of tuberculous infection. The first three patients were treated with conventional anti-tubercular treatment using four drugs: Isoniazid (INH), rifampicin, ethambutol, and pyrazinamide, along with an additional quinolone. The fourth patient was treated with a combination of Ciprofloxacin, Clarithromycin, and doxycycline. All four patients responded well to treatment. The use of tap water to dilute disinfectants is considered a risk factor for atypical mycobacterial infection.

INTRODUCTION
Postoperative surgical wound infection is one of the most common complications faced by surgeons worldwide, despite the advancements in antibiotics and their extensive use [1]. While surgical port-site infection can occur in all types of laparoscopic procedures, mycobacterial infection is rare [2]. Tuberculosis is a prevalent infection, primarily caused by MTB, and is commonly found in developing countries, with pulmonary infections being the most common. Atypical mycobacterial infections are frequently observed in immune-compromised individuals [3].

CASE SERIES

Case 1
A 54-year-old female with no significant past illnesses other than well-controlled type 2 diabetes underwent a laparoscopic cholecystectomy at a tier-2 hospital in Palghat, Kerala. Her postoperative recovery was uneventful. However, she later visited the outpatient clinic with a history of swelling, pain, and redness at the umbilical port site, which started 20 days after the procedure and lasted for four weeks. Additionally, she complained of irritation at the right hypochondrial port site. There were no fever, cough, or weight loss symptoms reported.

On examination, she was found to be obese with a BMI of 30.26, and she had a significant amount of abdominal fat. The umbilical port-site wound showed redness around the margins with a 1.5 cm induration. A serous discharge was observed. The rest of her abdomen appeared normal, and there were no significant lymph node enlargements. Routine blood tests, including complete blood count, renal function tests, random blood sugar, and Hba1C, all came back normal. A CT abdomen was advised, which revealed a fluid collection (as shown in [Table/Fig-1]). A wound swab smear examination and culture were performed, and she was started on oral Co-Amoxyclav along with supportive treatment. She experienced symptomatic relief and was followed up. However, after 15 days, she presented with an unresolved infection. A biopsy was taken from the margin and sent for histopathology and CBNAAT for MTB. The wound was thoroughly debrided. The histopathology report indicated chronic granulomatous inflammation with multiple epithelioid granulomas on microscopy, along with the presence of Langerhans giant cells, suggesting a tuberculous etiology (as shown in [Table/Fig-2]). CBNAAT was negative for MTB, and liquid culture in Mycobacterium Growth Indicator Tube (MGIT) was also negative.

She was subsequently started on Anti-Tubercular Treatment (ATT), which included INH, rifampicin, pyrazinamide, and ethambutol, along with Levofloxacin (750 mg/day). A one-month follow-up showed complete resolution, and ATT was continued for six months.

Case 2
A 28-year-old female underwent laparoscopic sterilisation at a government facility. Subsequently, she developed redness and induration of the abdominal wall below the umbilicus, ten days after the procedure. She experienced mild fever and noticed a rise in temperature in the evenings. She received treatment at a tertiary care center in the city, where an incision and drainage of the wound abscess were performed. Cultures taken from the secretion and abscess were sent for CBNAAT, Cartridge Based Nucleic Acid Amplification Test, and liquid culture for MTB. The wound was thoroughly debrided. The histopathology report indicated chronic granulomatous inflammation with multiple epithelioid granulomas on microscopy, along with the presence of Langerhans giant cells, suggesting a tuberculous etiology (as shown in [Table/Fig-2]). CBNAAT was negative for MTB, and liquid culture in Mycobacterium Growth Indicator Tube (MGIT) was also negative.

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Case 3
A 22-year-old female presented with complaints of pain and tenderness at the right hypochondrial port site 20 days after a post-laparoscopic cholecystectomy. She had a history of obesity with a BMI of 30.26. She was started on oral Co-Amoxyclav along with supportive treatment. She experienced symptomatic relief and was followed up. However, after 15 days, she presented with an unresolved infection. A biopsy was taken from the margin and sent for histopathology and CBNAAT for MTB. The wound was thoroughly debrided. The histopathology report indicated chronic granulomatous inflammation with multiple epithelioid granulomas on microscopy, along with the presence of Langerhans giant cells, suggesting a tuberculous etiology (as shown in [Table/Fig-2]). CBNAAT was negative for MTB, and liquid culture in Mycobacterium Growth Indicator Tube (MGIT) was also negative.

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Case 4
A 35-year-old female patient presented with complaints of pain and redness at the umbilical port site 15 days after a post-laparoscopic nephrectomy. She had a history of obesity with a BMI of 30.26. She was started on oral Co-Amoxyclav along with supportive treatment. She experienced symptomatic relief and was followed up. However, after 15 days, she presented with an unresolved infection. A biopsy was taken from the margin and sent for histopathology and CBNAAT for MTB. The wound was thoroughly debrided. The histopathology report indicated chronic granulomatous inflammation with multiple epithelioid granulomas on microscopy, along with the presence of Langerhans giant cells, suggesting a tuberculous etiology (as shown in [Table/Fig-2]). CBNAAT was negative for MTB, and liquid culture in Mycobacterium Growth Indicator Tube (MGIT) was also negative.

She was subsequently started on Anti-Tubercular Treatment (ATT), which included INH, rifampicin, pyrazinamide, and ethambutol, along with Levofloxacin (750 mg/day). A one-month follow-up showed complete resolution, and ATT was continued for six months.

Case 5
A 40-year-old female presented with complaints of pain and tenderness at the right hypochondrial port site 20 days after a post-laparoscopic appendectomy. She had a history of obesity with a BMI of 30.26. She was started on oral Co-Amoxyclav along with supportive treatment. She experienced symptomatic relief and was followed up. However, after 15 days, she presented with an unresolved infection. A biopsy was taken from the margin and sent for histopathology and CBNAAT for MTB. The wound was thoroughly debrided. The histopathology report indicated chronic granulomatous inflammation with multiple epithelioid granulomas on microscopy, along with the presence of Langerhans giant cells, suggesting a tuberculous etiology (as shown in [Table/Fig-2]). CBNAAT was negative for MTB, and liquid culture in Mycobacterium Growth Indicator Tube (MGIT) was also negative.

She was subsequently started on Anti-Tubercular Treatment (ATT), which included INH, rifampicin, pyrazinamide, and ethambutol, along with Levofloxacin (750 mg/day). A one-month follow-up showed complete resolution, and ATT was continued for six months.
CBNAAT test results were negative for MTB.

Histopathology revealed chronic granulomas with Langerhans giant cells [Table/Fig-5]. A biopsy taken from the margin and sent for CBNAAT and histopathology. Histopathology revealed chronic granulomas with Langerhans giant cells, and CBNAAT tested negative for MTB [Table/Fig-4].

She was initiated on Category-1 ATT with four drugs, along with moxifloxacin 400 mg per day. Follow-up showed gradual resolution over a period of more than a month, and ATT was continued for six months.

Case 3
A 41-year-old individual with no known comorbidities underwent laparoscopic appendectomy one month prior to presentation. They experienced itching and swelling at the infra-umbilical port site, and there was serous fluid oozing from the port site wound. The individual was prescribed an oral antibiotic, cefpodoxime proxetil 200 mg twice daily, along with supportive measures, cleaning, and dressing, which provided some symptomatic relief. After two weeks, they returned with a discharging sinus, surrounding erythema, and induration. The sinus was explored under local anesthesia and debrided. A biopsy taken from the side revealed non-caseating epithelioid granuloma with Langerhans giant cells [Table/Fig-5]. CBNAAT test results were negative for MTB.

The individual was initiated on anti-tubercular therapy (ATT) with four drugs, along with Levofloxacin 750 mg per day. By the third week, their symptoms had resolved, and ATT was continued for six months.

Case 4
A 32-year-old male underwent laparoscopic hernia repair at a hospital in a satellite town two months prior to the presentation. He was apparently normal for three weeks after the procedure, with good initial wound healing. By the end of the third week, he developed redness and itching at the right-sided port site, along with swelling. He also reported serosanguinous discharge from the port site. He visited the same hospital where incision and drainage were performed, and he was prescribed broad-spectrum antibiotics (two courses). Routine evaluations were unremarkable, except for a raised Erythrocyte Sedimentation Rate (ESR). Magnetic Resonance Imaging (MRI) of the abdomen revealed the presence of a necrotic abscess in the abdominal wall in the intermuscular and fat planes [Table/Fig-6]. After visiting us, he underwent wound debridement and a biopsy. A smear for Acid Fast Bacilli (AFB) was taken from the discharging fluid, and it tested positive. However, the Cartridge-Based Nucleic Acid Amplification Test (CBNAAT) from the biopsy specimen was negative for Mycobacterium tuberculosis (MTB). The biopsy showed a chronic granulomatous lesion with multiple granulomas and Langerhans giant cells [Table/Fig-7]. Liquid culture from the secretion in Mycobacteria Growth Indicator Tube (MGIT) showed positive results within forty-eight hours. The bacteria were identified as Mycobacterium chelonae using the Matrix-Assisted Laser Desorption-Ionisation-Time Of Flight (MALDI-TOF) technique. The patient was started on Ciprofloxacin 500 mg twice daily, Clarithromycin 500 mg twice daily, and Doxycycline 100 mg daily for four weeks, followed by Clarithromycin and Ciprofloxacin 500 mg each twice daily for four months. He experienced symptomatic relief during the first four weeks of treatment.
prevalence in India is not well known. The inadequacy of laboratory facilities also contributes to the lack of Indian data [4].

The ability of these bacteria to form biofilms makes them resistant to many adverse conditions [5]. Usually less virulent, these bacteria do not cause disease in a healthy host [6].

Port site infection is a preventable complication of laparoscopic surgery, which nullifies the advantages of this technique over conventional surgery [7]. Despite advances in anti-microbial treatments, sterilisation techniques, and operation theatre environments, surgical wounds are still susceptible to infections. The infection is not associated with the technique of primary port entry [8]. Many species of Mycobacteria, including the fortuitum-chelonae complex, are known to cause diseases in humans and animals [9].

In the present series of four cases, three were negative for acid-fast bacilli and showed negative cultures when tested. The one case that tested positive was identified as Mycobacterium chelonae and was treated with clarithromycin, clarithromycin, and doxycycline. The other three cases were treated with conventional anti-tubercular treatment (ATT) along with added quinolones. All four cases responded well to treatment.

As of today, guidelines for the management of atypical mycobacterial infections are lacking. However, treatment with first-line ATT often fails due to bacterial resistance. The addition of quinolones to conventional treatment complex can be beneficial. Mycobacterium fortuitum-chelonae complex may respond to macrolides only, thus requiring a macrolide-based regimen [10].

A recent study from Haryana, including fourteen cases of port site infections following laparoscopic surgery in a tertiary hospital, showed acid-fast bacilli that grew in Lowenstein-Jensen medium. The practice of using tap water to dilute disinfectants, such as glyceraldehyde, which is then used to sterilise laparoscopic equipment, has been accused as a cause for the development of atypical mycobacterial port site infections.

CONCLUSION(S)

Port-site infections, although not uncommon, can be relentless to routine treatments when caused by atypical mycobacteria. Therefore, prompt clinical suspicion is essential for evaluating and treating such cases. Recognising these infections is important because they respond well to targeted and appropriate treatment.

REFERENCES