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Case Report

Unravelling the mystery microorganism: a case study of chronic surgical site discharge post laparoscopic hysterectomy linked to *Mycobacterium chelonae*

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ABSTRACT

In this case study, we explore the intricate surgical experience of a 45-year-old woman who post laparoscopic total hysterectomy for fibroid uterus, presented with persistent surgical site discharge. Despite multiple courses of antibiotic therapy, the symptoms persisted, and the infective organism remained unidentified.

Keywords: Laparoscopic hysterectomy, Surgical site discharge, Infection, Mycobacterium

INTRODUCTION

Since its inception in 1989, laparoscopic hysterectomy (LH) has witnessed a substantial global increase, with an annual rate of 85 laparoscopic procedures.[1] This growth aligns with trends in the United States and Finland. The Netherlands has notably embraced LH, with rates rising from 3% in 2002 to 36% in 2012. This transition coincided with a decline in abdominal hysterectomies (AH) (from 68% in 2002 to 39% in 2012) and vaginal hysterectomies (VH) (from 29% in 2002 to 25% in 2012). Significantly, in 2012, LH rates surpassed those of VH for the first time. This shift likely stems from various factors, including advancements in technology, enhanced surgeon proficiency, surgeon preferences, and increased exposure to minimally invasive techniques during training.[2,3]

Current standard guidelines, as per a Cochrane review, advocate for VH in cases of benign hysterectomies, except when vaginal access is unfeasible. The review notes that LH procedures are more time-consuming but lead to shorter hospital stays and quicker return to normal activities. However, the Cochrane review is limited by potential biases from older trial data, low event numbers for specific outcomes (common in randomized controlled trials), and a failure to distinguish between different LH subtypes (e.g., total LH, laparoscopic-assisted vaginal hysterectomy, robotic hysterectomy).[4,5]

Hysterectomy is a surgical procedure involving the removal of the uterus and associated structures. It is typically performed to address conditions such as uterine cysts or fibroids, uterine prolapse, various cancers (uterine, fallopian tube, cervix, or ovaries), heavy menstrual bleeding, pelvic pain, and thickening of the uterus.[6] There are different types of hysterectomy, including supracervical or subtotal hysterectomy, which removes the upper part of the uterus while preserving the cervix; total hysterectomy, which removes the entire uterus and cervix; and radical hysterectomy, which involves removal of the uterus, surrounding tissues, the top part of the vagina, and the cervix, and is typically used in cases of the malignancy.[7,8]

CASE REPORT

The patient underwent total LH for fibroid uterus in June 2023. Initially, her postoperative period was uneventful, but complications arose approximately two and a half months later, marked by serous fluid discharge from two laparoscopic port sites on the left side. Despite treatment with oral antibiotics and anti-inflammatory drugs, there was no improvement. Further investigations, including ultrasound and wound culture, yielded inconclusive results. Subsequent multiple changes in antibiotic therapy failed to alleviate the symptoms, leading to referral to a specialized gynaecologist. Upon further evaluation, MRI was revealed two sinus tracts with extensive involvement of surrounding fat tissue raising suspicion of atypical mycobacterial infection. Surgical wide local excision was performed followed by targeted antibiotic therapy leading to a successful recovery. Traditional pus culture sensitivity tests failed to identify the causative agent, prompting suspicion of atypical mycobacteria. Molecular testing targeting *M. tuberculosis* and non-*M. tuberculosis* was initiated on the infected sinus tissue to confirm the diagnosis. Molecular testing confirmed non-*M. tuberculosis* positivity, with subsequent Sanger sequencing identifying the specific strain as *M. chelonae* a type of rapidly growing *Mycobacterium*, corroborating with the patient's symptoms. The sequence was publicly shared through NCBI under accession number PP068764.1. With a definitive diagnosis, the patient underwent targeted antibiotic therapy with amikacin, linezolid, and clarithromycin, resulting in complete resolution of symptoms.

Figure 1: Excised sinus tracts with surrounding infected adipose tissue.

DISCUSSION

Atypical mycobacteria, commonly found in the environment, pose a significant risk of contaminating medical instruments and causing infections. Among these, *M. fortuitum* and *M. chelonae* are known to be associated with port site infections. Detecting these bacteria in such infections presents substantial challenges for both surgeons and microbiologists, complicating the diagnosis and treatment process. Notably, there is a lack of documented cases regarding *M. chelonae* specifically in laparoscopic hysterectomy-related port site infections.[9-12]

Late-onset infections, a characteristic feature of slow-growing mycobacteria, can lead to suspicion of atypical mycobacterial involvement. Although *M. abscessus* is also implicated in such infections, reports are limited.[13] *M. chelonae* demonstrates pathogenicity by causing skin and soft tissue infections, often following penetrating trauma with contaminated instruments.[14-16]

Atypical mycobacteria have the ability to form biofilms on reusable laparoscopic instruments, which is particularly challenging due to the instruments' intricate design, making proper sterilization difficult. While steam sterilization is a recommended method for sterilizing these instruments and has shown effectiveness, ethylene oxide treatment is also increasingly being used.[17-20]

Despite the advantages of laparoscopic hysterectomy over invasive procedures, ensuring thorough sterilization of instruments before reuse is paramount. This case highlights the critical importance of adhering to proper sterilization protocols for laparoscopic instruments in hysterectomy procedures.

Detecting non-tuberculous mycobacteria (NTM) using culture and GeneXpert methods may not always be feasible due to the complexity of these pathogens, which are slow-growing. Therefore, employing advanced techniques like Taqman probe-based RT-PCR and Sanger sequencing for identification can assist clinicians in achieving more accurate diagnoses. In our study, although culture and GeneXpert yielded negative results, PCR-based Sanger sequencing identified the presence of *M. chelone*. This finding, published on NCBI, underscores the high efficacy of this approach.

CONCLUSION

This case highlights the pivotal role of molecular testing in diagnosing rare infections like *M. Chelonae*, which may evade conventional diagnostic methods. Through a detailed examination of the patient's journey, this study provides valuable insights into managing postoperative complications caused by uncommon bacteria, emphasizing the importance of precision diagnostics and targeted medicine in such cases. Furthermore, it underscores the need for healthcare facilities to adapt sterilization techniques to cover rare and atypical microorganisms effectively.

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