

ATYPICAL MYCOBACTERIAL INFECTION OF PORT-SITE FOLLOWING LAPAROSCOPY: SUGGESTED INFECTION CONTROL POLICIES.

Dr. Aditya Rana¹, Dr. Anuradha Chaudhary*², Dr. S.C. Jaryal³, Dr. Anuradha Sood⁴, Dr. Isampreet Kaur⁵, Dr. Komal Sharma⁶

¹Senior Resident, Department of Microbiology, Dr. R.P. Govt. Medical College, Kangra at Tanda.

²Designated Assistant Professor, Department of Microbiology, Dr. R.P. Govt. Medical College, Kangra at Tanda.

³Professor and Head of the Department, Department of Microbiology, Dr. R.P. Govt. Medical College, Kangra at Tanda.

⁴Associate Professor, Department of Microbiology, Dr. R.P. Govt. Medical College, Kangra at Tanda.

⁵Assistant professor, Department of Microbiology, Dr. R.P. Govt. Medical College, Kangra at Tanda.

⁶Junior Resident, Department of Microbiology, Dr. R.P. Govt. Medical College, Kangra at Tanda.

***Corresponding Author:** anuradahchaudharyzh@gmail.com Address: Room No. 731, Department of Microbiology, Dr.R.P. Govt. Medical College, Tanda(176002) Distt. Kangra, Himachal Pradesh, India.

ABSTRACT

Background: The Surgical site infections (SSI's) put up to nearly 20% of all the Healthcare associated infections (HAI). Atypical mycobacteria have been known to colonize in water and soil and can therefore easily contaminate solutions, instruments and disinfectants used in hospital settings. Erroneous cleaning, disinfection and sterilization of laparoscopic instruments is predominantly responsible for such outbreaks.

Material and methods: Clinical suspicion by the surgeons of DRPGMC, Tanda of atypical mycobacterial infection from non-healing wounds after laparoscopic surgery was raised to the Infection control team. Pus samples from non healing ulcer sites, environmental and laproscope samples were collected and processed as per the standard guidelines.

Results: Out of 7 postoperative patients with non healing ulcers, 5 showed Acid fast bacilli (AFB) on Ziehl-Neelsen (ZN) staining. Out of these 5 samples only 3 were culture positive showing growth of LJ media slant and blood agar within 7 to 10 days of incubation at 37°C. Samples from laparoscopic lumen and reusable ports on ZN staining showed Acid fast bacilli. Similarly growth was obtained within 7-10 days from reusable ports on LJ media. On molecular diagnosis Mycobacterium abscessus was confirmed from the reusable port.

Conclusion: Nontuberculous Mycobacterial infections in post operative wounds though rare but should be suspected in all postoperative wound infections which occur late, lack local and systemic signs of pyogenic infections and have sterile cultures. Guidelines for strict sterilization procedures of laparoscopic instruments should be followed.

INTRODUCTION

A majority of the Mycobacterium species, other than causing tuberculosis and leprosy, are called the nontuberculous mycobacteria (NTM), atypical mycobacteria or Mycobacteria other

than tuberculosis (MOTT) which are usual inhabitants of environmental sources like water and soil. As a consequence of their ubiquitous distribution, humans are surrounded by these opportunistic pathogens.[1]

NTM infections can lead to a broad range of infections when medical instruments get contaminated from the environment sources. Infections like wound or surgical- site infection, lymphadenopathy, and bacteremia with disseminated disease are commonly reported. [2]

In modern day surgery the minimal incision surgeries like laparoscopic surgeries(LS) are a boon by reducing the morbidity such as post operative pain, swift recovery and less postoperative complications. However, LS has its own complications with Port site infection (PSI), although infrequent, but is one of the bothersome complications.[3]

Errors in sterilization techniques for laparoscopic instruments are mostly responsible for such outbreaks with NTM infections. This becomes a problem affecting mainly developing countries like India where single use instruments are not as widely available[4] The ability to form biofilms these atypical mycobacteria are able to survive in conditions, despite using the standard decontamination procedures and protocols[5]

Recent studies have suggested that port- site infection due to NTM by direct or indirect contamination at the time of laparoscopic surgery is rising [6,7]

Strict protocols for sterilization of laproscope's is a must for prevention of post laparoscopic port-site infections. The present study thus focused on identification of such infections in order to evaluate the sterilization protocol which was being followed in the hospital. Therefore, the present study was undertaken by the infection control team to investigate the outbreak of post laparoscopic lumen site infection caused by atypical mycobacteria.

MATERIAL AND METHOD

Clinical suspicion by the surgeons of Dr. RPGMC Kangra at Tanda of atypical mycobacterial infection from non-healing wounds after laparoscopic surgery was raised to the Infection control team. They had observed that patients on post operative follow up presented with non healing ulcers at port sites, the duration varied from 3 to 4 weeks and not responding to antibiotics for pyogenic infection

On routine microbiological tests and aerobic culture sensitivity of these non healing wounds did not reveal any growth of pathogens. This raised suspicion of other causes of non healing ulcers apart from normal aerobic pathogens.

Subsequently an extensive microbiological surveillance was conducted by the Department of Microbiology, Dr. RPGMC Kangra at Tanda to find out the probable source of infection.

Specimen collection and processing: Pus and biopsy was collected from the site of wound infection aseptically from patients with SSI's after laparoscopic surgeries.

Environmental sampling and processing: To further investigate the source of the outbreak, samples were also collected from OT Tables, Trays, Trollies, AC vents, Switches, OT light,

Electrical cables, Tap water, Sterile water, Sinks swabs and disinfectant were analyzed. Samples were also collected from laparoscopy lumens and sterile ports. Beside these samples routine air sampling and samples from operating staff were taken (nasal)

All samples were processed by standard microbiological techniques namely staining(gram staining,KOH & ZN) aerobic bacterial cultures, culture on Lowenstein Jensen (LJ) media and SDA culture.[8]

RESULTS

Out of 7 postoperative patients with non healing ulcers, 5 showed Acid fast bacilli (AFB) on Ziehl-Neelsen(ZN) staining. (fig. 1)

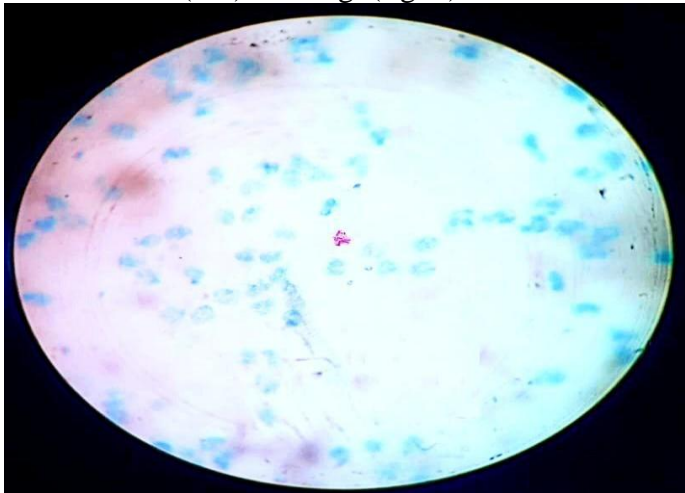


Figure 1: Acid fast bacilli's (AFB) on Ziehl Neelsen (ZN) staining.

Amongst these 5 samples which showed acid fast bacilli on ZN staining were cultured on Lowenstein Jensen media, Out of these 5 samples , 3 were culture positive showing growth of LJ media slant and blood agar within 7 to 10 days of incubation at 37°C.(fig. 2 & 3)

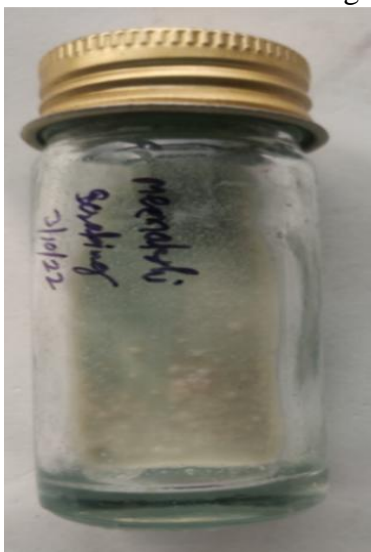


Figure 2: Growth on Lowenstein Jensen Media.

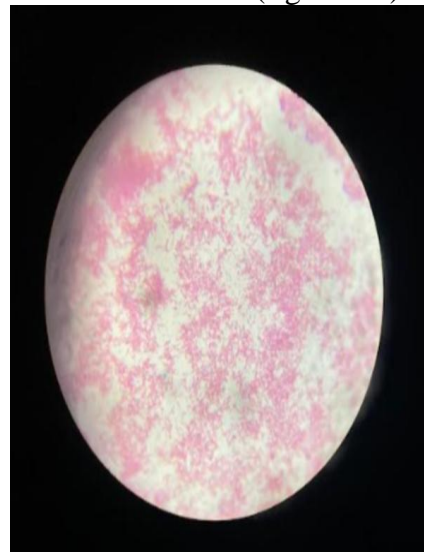


Figure 3 : AFB on ZN staining

The samples from laparoscopic lumen and reusable ports on ZN staining showed Acid fast bacilli. Growth obtained within 7-10 days from reusable ports on LJ media. Growth was dry, dull, wrinkled and non pigment.

Further confirmation of NTM was done by growth on PNB(Para-nitrobenzoic acid) media and the nitrate reduction test gave negative results.

On molecular diagnosis *Mycobacterium abscessus* was confirmed from the reusable port.

DISCUSSION

Non-healing postoperative wound infections that do not respond to antibiotics used for pyogenic infections and have sterile routine aerobic bacterial cultures should raise a suspicion of Nontuberculous mycobacteria (NTM). Atypical mycobacteria have been known to colonize in water and soil and can therefore easily contaminate solutions, instruments and disinfectants used in hospital settings. These infections have thus been a source of significant morbidity for patients recovering from laparoscopic surgeries.

Erroneous cleaning, disinfection and sterilization of laparoscopic instruments is almost always responsible for such outbreaks.

The common practice of immersion of laparoscopy in 2-2.5% glutaraldehyde solution for 15-20 minutes does not achieves sterilization completely leaving the spores behind.[9] Commonly the source of infection is boiled tap water used for cleansing of the instruments after immersion in glutaraldehyde as NTM are inhabitant of water sources.[1]

In resource limited countries like India the use of reusable instruments is a common practice. Application of single use disposable instruments should be applicable to prevent infection.

Incorporating detergent with water (preferably RO water) for mechanical cleaning removes the organic material deposits and significantly reduces the bioburden. Increasing concentration of glutaraldehyde to 3.4% with contact time of 8-10 hours achieves sterilization and helps in removal of spores.[10] Use of autoclaved water rather than boiled water for rinsing of laparoscope should be used to prevent recontamination of sterilized instruments.

Better sterilization techniques should be used for sterilization of laparoscopes such as ethylene oxide (ETO), peracetic acid, orthophthaldehyde (0.55%), Formalin chambers and Plasma sterilization

CONCLUSION

Nontuberculous Mycobacterial infections in post operative wounds though rare but should be suspected in all postoperative wound infections which occur late, lack local and systemic signs of pyogenic infections and have sterile cultures.

Strict sterilization procedures of laparoscopic instruments should be followed. High index of suspicion, early diagnosis and proper treatment is a must for early control of the disease. Finally, the use of disposable single use laparoscopic instruments should be strongly advocated.

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