

CHALLENGING SURGICAL ASPECT OF EXTRAPULMONARY TUBERCULOSIS DISEASE SPECTRUM

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ABSTRACT

Objectives: To find out challenging surgical aspect of extrapulmonary tuberculosis disease spectrum. **Material and Methods:** This study included 150 patients who had undergone surgery at Geetanjali Institute of Medical Sciences, Jaipur. The patients developed delayed surgical site infections (2 weeks to 24 weeks after surgery) that were not responding to antibiotics and were sent CBNAAT for Mycobacterium tuberculosis detection in tissue/Pus from wound. **Results:** A total of 150 surgical site infected cases 16 (10.66%) were found positive with MTB infection. Out of which 10 were males and 6 were females. Mean age of patient was 44±3.66. **Conclusion:** Surgical site infection by tuberculosis may be more common than diagnosed. Tuberculosis must be considered in wounds that show delayed, non-healing or recurrent surgical site infection with non-responding to antibiotics.

INTRODUCTION

Tuberculosis (TB) remains a major global health problem and is the second leading cause of death from an infectious disease worldwide, after human immunodeficiency virus (HIV). TB cases increase wherever there is poverty, crowding, and chronic debilitating illness. Surgical site infection by *M. tuberculosis* is uncommon and its diagnosis can be missed unless there is strong clinical suspicion coupled with laboratory confirmation with the global resurgence of tuberculosis, there have been reports of unusual sites being affected by the disease.^[1]

These infections typically exhibit an insidious onset, characterized by chronic wounds that remain unhealed despite standard antibiotic courses. Their progression is frequently marked by persistent drainage and a lack of overt inflammatory signs, factors that often contribute to substantial delays in recognition and clinical management (Lin et al., 2025).^[2] Additionally, confirming the presence of acid-fast bacilli via targeted culture or staining methods is vital to differentiate these infections from those involving atypical mycobacteria or alternative pathogens (Gad et al., 2022, Murmu et al., 2013).^[3,4] Successful treatment relies on a prolonged multi-drug antitubercular chemotherapy regimen, which is crucial to arrest the progression of deep-tissue infections and avoid the formation of chronic, recalcitrant sinuses (Akhter et al., 2015; Lin et al.,

2025).^[2,5] Implementing stringent infection control measures and meticulous surgical instrument sterilization within operating environments is likewise essential to reduce the risk of exogenous contamination (Patil et al., 2024).^[6] Ultimately, the failure to correctly identify these infections frequently leads to extended patient morbidity, exposure to unwarranted broad-spectrum antibiotics, and increased financial burdens on the healthcare system (Alagappan et al., 2021, p. 189).^[7] Present study was conducted to find out incidence of Mycobacterium tuberculosis infections at surgical wound site.

MATERIALS AND METHODS

This study included 150 patients who had undergone surgery for various ailments at Geetanjali Institute of Medical Sciences, Jaipur.

Inclusion Criteria

Delayed surgical site infection cases were included in this study which was more than two weeks after the surgery.

Exclusion Criteria

Non-surgical site TB suspected cases were excluded in this study. and known TB positive cases were excluded in this study

Permission and Ethical Consideration

Permission for this study was obtained from the Institutional Ethics Committee.

Methodology

This study included 150 patients who had undergone surgery for various ailments at Geetanjali Institute of Medical Sciences, Jaipur.

The patients developed delayed surgical site infections (2 weeks to 24 weeks after surgery) and they were not responding to antibiotics and were sent for CBNAAT for Mycobacterium tuberculosis of tissue from wound. Tissues from wounds were collected with sterile biopsy forceps/haemostatic forceps and after chemical fixation with 10% neutral buffered formalin the specimen was sent for histopathological examination. Pus/discharge from wounds was collected with the help of sterile cotton swabs and/or syringes and was sent immediately for culture and sensitivity test and for CBNAAT.



Fig 1: Post operative stitches inflamed with SSI

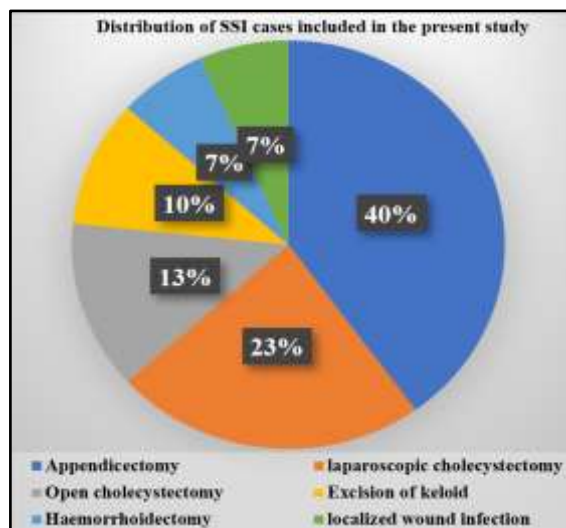


Figure 2: Distribution of SSI cases included

RESULTS

A total of 150 surgical site infected were studied. Out of which the patients had undergone Appendicectomy(n=60), laparoscopic cholecystectomy (n=35), Open cholecystectomy (n=20), Excision of keloid(n=15), Haemorrhoidectomy (n=10) and localized wound infection (n=10). Among 150 cases 16 were found positive with mycobacterium tuberculosis infection. Out of 16, 10 cases were males while 6 were females. Mean age of patient was 44 ± 3.66 . mostly patients were labour and factory workers. Out of 10 patient, one patient was found MDR with Rifampicin resistance.

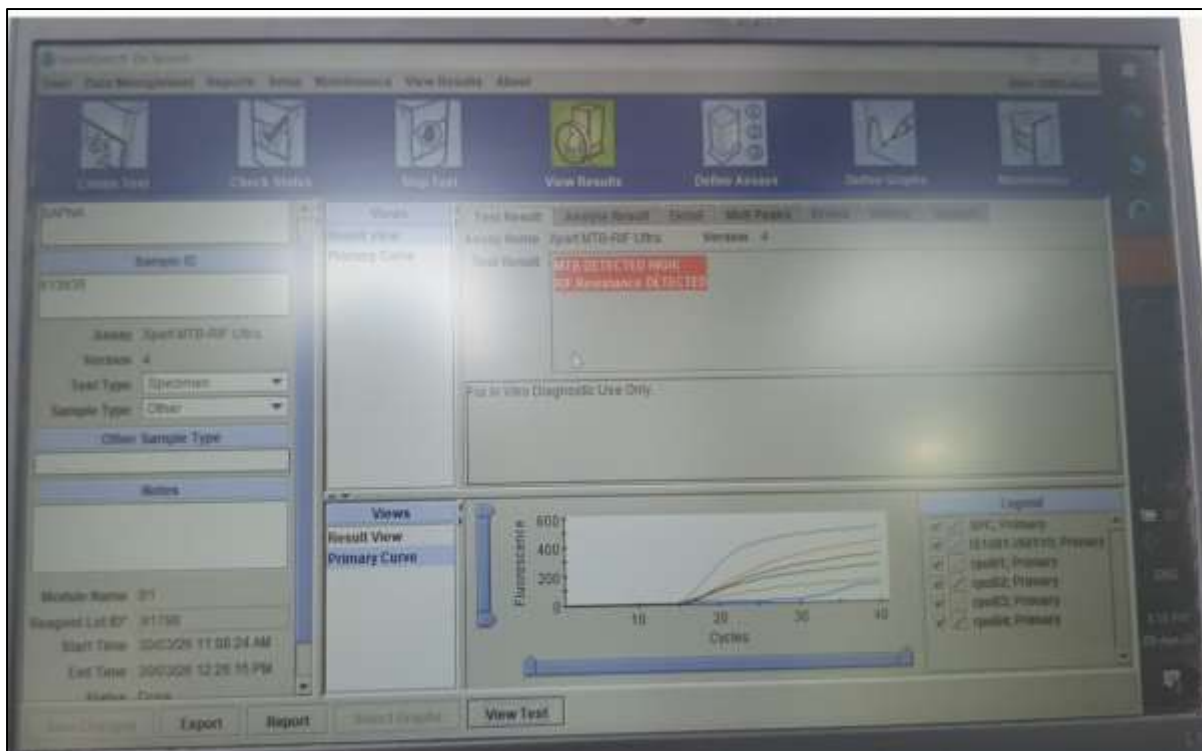


Fig 3: Mycobacterium tuberculosis detected of CBNAAT in Pus sample

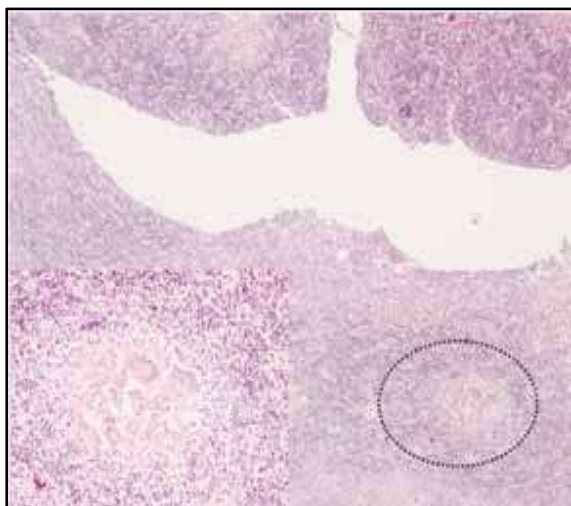


Fig 4: Histology of the appendix shows granulomas near the inflamed lumen

DISCUSSION

This study evaluates the clinicopathological features and diagnostic challenges associated with mycobacterial surgical site infections, which frequently elude conventional pyogenic investigation due to their indolent progression. In our analysis of 150 patients presenting with delayed postoperative surgical site infections, we observed consistent clinical manifestations, including scar breakdown, sinus formation, and recurrent stitch abscesses, which typically emerged 12 to 28 days postoperatively despite initially satisfactory wound healing. Notably, these cases lacked systemic symptoms of tuberculosis and failed to respond to conventional antibiotics, leading to significant diagnostic delays. Routine cultures in these instances were consistently sterile, underscoring the critical necessity of advanced diagnostic modalities; our results demonstrate that in such persistent, non-healing wounds, histopathological examination—often revealing granulomatous inflammation—and confirmatory molecular testing via GeneXpert Mycobacterium tuberculosis/rifampicin are essential for identifying the causative mycobacterial etiology, as exemplified by the 16 cases definitively confirmed in this cohort. n, highlighting the frequent diagnostic ambiguity that often necessitates surgical biopsy to distinguish between reactive pyogenic processes and mycobacterial pathology (Lin et al., 2025; Mazid et al., 2015).^[2,8] Furthermore, while standard bacteriological assessments typically yield negative results, the high index of suspicion required for non-healing surgical sites remains paramount to avoid the long-term morbidity associated with delayed diagnosis (Nimbkar et al., 2022; Parolari et al., 2022).^[9,10] Even in the absence of systemic markers, clinical suspicion should be elevated for any chronic, non-healing surgical wound that fails to resolve following standard debridement or broad-spectrum antibiotic therapy (Patil et al., 2024).^[6] Given the ubiquity of environmental mycobacteria, clinicians

must also maintain awareness that non-tuberculous mycobacterial species may occasionally contribute to these recalcitrant infections, necessitating rigorous molecular identification to differentiate them from *Mycobacterium tuberculosis* complex (Gad et al., 2022; Halder et al., 2023).^[3,11] and in routine bacterial cultures often fail to isolate the causative pathogen, underscoring the limited diagnostic utility of conventional microbiological assessments in these clinical scenarios (Jan et al., 2025).^[12] Consequently, clinicians must prioritize histological analysis and molecular diagnostic techniques to identify the specific mycobacterial etiology, as these infections often induce significant emotional and physical distress due to their chronic, relapsing nature (Kannaiyan, 2015).^[13] Ultimately, these findings reinforce that the absence of pulmonary involvement or systemic symptoms does not preclude a diagnosis of surgical site tuberculosis, requiring clinicians to maintain a high index of suspicion for refractory soft tissue lesions (Zhang et al., 2025).^[14] Furthermore, integrating such diagnostic approaches remains essential, as non-tuberculous mycobacteria are increasingly recognized as emerging pathogens in recalcitrant postoperative wounds that mirror these clinical features (Hasan et al., 2024).^[15]

CONCLUSION

For surgical wounds that fail to heal or recur despite standard antibiotic therapy, clinicians must maintain a high index of suspicion for tuberculosis and utilize a comprehensive diagnostic strategy—incorporating histopathological evaluation, mycobacterial cultures, and rapid molecular testing—to overcome the limitations of conventional assessments and ensure appropriate, timely intervention.

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