World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

DOUBLE INFECTIOUS CHALLENGE; WHEN TUBERCULOSIS MEETS THE PUERPERIUM: LATE PUERPERAL ENDOMETRITIS WITH INTRAUTERINE GAS ASSOCIATED WITH PULMONARY AND ABDOMINAL TUBERCULOSIS - A CASE REPORT

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World Journal of Advanced Research and Reviews, 2026, 31(03), 715–722

Publication history: Received on 31 July 2026; revised on 09 September 2026; accepted on 11 September 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.31.3.2338

ABSTRACT

Puerperal sepsis is a major cause of maternal morbidity and mortality, especially after cesarean section. Puerperal endometritis is usually polymicrobial in origin; however, persistent fever and the appearance of atypical respiratory or intra-abdominal manifestations should prompt investigation for concomitant infections. Tuberculosis during the puerperium can present with nonspecific manifestations and simultaneously affect pulmonary and extrapulmonary organs. We present the case of a 29-year-old woman from a rural area, ten days postpartum after a cesarean section due to breech presentation, with a history of prolonged rupture of membranes of approximately 20 hours, who developed persistent fever, chills, neutrophilic leukocytosis, abdominopelvic pain, and progressive respiratory deterioration. The chest CT scan revealed cavitary lesions and ground-glass opacities, while the abdominopelvic CT scan showed abundant intra-abdominal fluid, a subinvoluted uterus , and intrauterine gas. Given the suspicion of puerperal endometritis complicated by sepsis, an exploratory laparotomy and obstetric hysterectomy were performed. Peritoneal fluid was positive for Mycobacterium tuberculosis by Xpert MTB/RIF, with sensitivity to rifampicin, while the respiratory molecular study was also positive, confirming pulmonary tuberculosis. The patient did not have HIV infection, diabetes mellitus, was not on immunosuppressive therapy, or had any other known condition associated with immunosuppression. Clinical progress was favorable after surgical control of the focus of infection, antimicrobial

treatment, and antituberculosis therapy. This case highlights the diagnostic complexity of the coexistence of puerperal sepsis and pulmonary and abdominal tuberculosis. Intraoperative sampling allowed for the identification of extrapulmonary tuberculosis during the management of a complicated puerperal infection. Persistent fever or the presence of atypical respiratory and intra-abdominal findings should prompt a broader differential diagnosis, particularly in regions with a high burden of tuberculosis. The demonstration of peritoneal tuberculosis alone does not establish a tuberculous etiology for endometritis; therefore, it is essential to integrate clinical, radiological, surgical, and microbiological findings to establish a complete diagnosis.

Keywords: Puerperal Sepsis; Puerperal Endometritis; Pulmonary Tuberculosis; Abdominal Tuberculosis; Peritoneal Tuberculosis; Xpert MTB/RIF.

1 INTRODUCTION

Maternal infections during childbirth and the puerperium are a major cause of maternal morbidity and mortality worldwide. Among these, maternal sepsis represents one of the most serious complications, characterized by a dysregulated response to infection that can lead to organ dysfunction, the need for intensive care, and death. Puerperal infections can originate in the genital tract, urinary tract, surgical wound, or spread to pelvic and intra-abdominal structures. The World Health Organization emphasizes that early recognition, timely antimicrobial treatment, and adequate source control are fundamental elements for reducing maternal morbidity and mortality. [1,2]

Puerperal endometritis is one of the main infections of the postpartum period and occurs most frequently after a cesarean section. It is usually an ascending, polymicrobial infection, favored by factors such as prolonged rupture of membranes, chorioamnionitis, prolonged labor, and multiple vaginal examinations. Its presentation includes fever, uterine pain or tenderness, pelvic or abdominal pain, leukocytosis, and a decline in general condition; in complicated cases, it can progress to myometritis , pelvic abscess, peritonitis, bacteremia, and septic shock. Persistent fever despite antibiotic treatment should prompt a diagnostic reassessment and a search for complications, alternative foci, or concomitant infections. [2–4]

On the other hand, tuberculosis continues to represent a significant public health problem, particularly in regions with a high disease burden. Caused by Mycobacterium tuberculosis, it can affect virtually any organ, with the pulmonary form being the most frequent and extrapulmonary tuberculosis a relevant cause of multisystemic disease. Abdominal involvement, including peritoneal tuberculosis, can manifest as ascites, inflammatory fluid, lymphadenopathy, and intra-abdominal abnormalities, with nonspecific clinical and radiological features that can mimic infectious, inflammatory, or surgical processes. Obtaining extrapulmonary samples for microbiological and molecular testing is essential when disseminated or extrapulmonary disease is suspected. [5,6]

Pregnancy and the postpartum period are particularly important for recognizing active tuberculosis. The immunological and physiological changes characteristic of these periods can alter the clinical presentation of the disease and hinder its identification. Available evidence indicates an increased risk of tuberculosis during pregnancy and, particularly, during the puerperium, with approximate relative risks of 1.4 and 1.9, respectively. Furthermore, tuberculosis has been associated with increased maternal morbidity and mortality and adverse perinatal outcomes. The nonspecific nature of symptoms such as fever, asthenia, cough, and dyspnea may lead to the disease initially being attributed to other common conditions of pregnancy or the puerperium. [5,7,8]

The coexistence of tuberculosis with a bacterial puerperal infection presents an additional diagnostic challenge. In a woman who has recently undergone a cesarean section, with prolonged rupture of membranes, fever, leukocytosis, and abdominopelvic pain, endometritis is a reasonable initial diagnostic hypothesis; however, the persistence of the inflammatory response, the appearance of respiratory manifestations, and the presence of cavitary pulmonary lesions should prompt a broader differential diagnosis. In this context, tuberculosis may go undetected when there is an obstetric focus that partially explains the symptoms. Simultaneous evaluation of the obstetric, respiratory, and intra-abdominal components can be crucial for identifying concomitant diseases and avoiding premature closure of the diagnosis. [7–9]

Rapid molecular tests, particularly Xpert MTB/RIF, have acquired an important role in the diagnosis of tuberculosis due to their ability to detect Mycobacterium tuberculosis and provide information on rifampicin resistance. Their usefulness extends to extrapulmonary samples, although sensitivity in peritoneal tuberculosis is lower than that observed in pulmonary disease, so a negative result does not rule out the disease. In contrast, a positive result in a clinically compatible sample has high specificity and can expedite diagnosis and the initiation of treatment. Therefore, in the presence of suggestive or unexplained intra-abdominal findings, samples obtained during surgical procedures can represent a relevant diagnostic opportunity. [6,9]

We present the case of a 29-year-old postpartum patient, ten days postpartum following a cesarean section due to breech presentation and with a history of prolonged rupture of membranes, who developed persistent fever, leukocytosis, abdominopelvic pain, and progressive respiratory deterioration. Imaging studies revealed endometrial involvement with intrauterine gas and abundant intra-abdominal fluid, associated with cavitary lung lesions. Given the suspicion of late puerperal endometritis complicated by sepsis, an exploratory laparotomy and obstetric hysterectomy were performed, and peritoneal fluid was obtained for microbiological analysis. The Xpert MTB/RIF assay of the peritoneal fluid was positive for Mycobacterium tuberculosis with rifampicin sensitivity, while respiratory molecular testing confirmed pulmonary tuberculosis. The case is of particular interest due to the coexistence of a complicated puerperal infection and pulmonary and abdominal tuberculosis, identified during the management of puerperal sepsis in a patient without HIV infection, diabetes mellitus or another known immunosuppressive condition.

2 CASE PRESENTATION

A 29-year-old female patient from a rural area, with no known relevant medical history, and no prior diagnosis of diabetes mellitus, HIV infection, or any other condition associated with immunosuppression. No evident epidemiological history of contact with individuals diagnosed with tuberculosis was identified, and she had a documented vaccination record.

The patient's pregnancy ended via cesarean section due to breech presentation. Her immediate obstetric history included premature rupture of membranes approximately 20 hours prior to the procedure. Therefore, due to the increased risk of puerperal infection associated with prolonged rupture of membranes and the surgical procedure, she received intravenous antibiotic therapy for three days following the cesarean. Initially, her postoperative course was unremarkable, with no evident clinical signs of genital tract infection. However, approximately four days after the cesarean, she developed quantifiable fevers accompanied by chills. She did not present with abnormal vaginal discharge or other evident local signs of genital infection. During this period, a urinalysis was performed, which revealed abnormalities suggestive of a urinary tract infection, and antibiotic treatment was initiated to address this diagnosis.

Despite the treatment initiated, the patient continued to have a fever for several days. Her clinical course was characterized by an increased inflammatory response, evidenced by leukocytosis with a predominance of segmented neutrophils, elevated procalcitonin and C-reactive protein, and the onset of moderate abdominopelvic pain. She subsequently developed progressive dyspnea associated with a dry, non-productive cough, prompting a broader diagnostic evaluation to include a possible systemic infection with pulmonary involvement.

Physical examination revealed respiratory compromise, with bibasilar crackles on pulmonary auscultation, without any other added respiratory sounds. The clinical picture, characterized by persistent fever, chills, neutrophilic leukocytosis, abdominopelvic pain, and progressive respiratory deterioration, raised suspicion of a complicated infectious process, so it was decided to perform more complex imaging studies.

A chest computed tomography scan was performed, which revealed cavitary lesions consistent with caverns located predominantly in the left lung, associated with areas of ground-glass opacity. Signs of cephalization of pulmonary vascular flow were also observed. These findings raised the possibility of a concomitant infectious pulmonary process and broadened the differential diagnosis beyond an isolated puerperal infection. Simultaneously, a computed tomography scan of the abdomen and pelvis showed abundant free intra-abdominal fluid, an enlarged and subinvoluted uterus for the puerperal period, associated with intrauterine gas and involvement of the uterine cavity. These findings, along with the persistent fever, leukocytosis, and abdominopelvic pain, were interpreted as highly suggestive of a complicated uterine infection with intra-abdominal extension.

Given the clinical presentation, a diagnosis of puerperal sepsis was established, with no evidence of septic shock at the time of evaluation. The main etiological hypothesis was late-onset puerperal endometritis, likely of polymicrobial origin, considering cesarean section and prolonged rupture of membranes as predisposing factors. However, due to the presence of intrauterine gas, significant involvement of the uterine cavity, and evidence of free intra-abdominal fluid, surgical control of the infectious focus was deemed necessary.

The patient was taken to the operating room for exploratory laparotomy, and an obstetric hysterectomy was performed due to findings of uterine compromise and suspected complicated puerperal infection. During the procedure, abundant inflammatory fluid was found within the abdominal cavity, and samples were taken for microbiological and molecular studies. Enlarged mesenteric lymph nodes with reactive characteristics were also identified.

During the surgical exploration, no evident granulomatous or ulcerative lesions were observed in the intestinal loops. The uterus was enlarged, with changes in color, pallor, and alterations consistent with a significant inflammatory process. The surgical procedure was performed without immediate complications. Considering the presence of

pulmonary cavitary lesions, the patient's rural origin, and the nature of the intra-abdominal fluid found, it was decided to expand the microbiological study with a molecular test for tuberculosis. An Xpert MTB/RIF assay was performed on the peritoneal fluid obtained during the laparotomy, which yielded a positive result for Mycobacterium tuberculosis, sensitive to rifampicin.

Additionally, due to the findings on pulmonary CT scans, a molecular test for tuberculosis was performed on a respiratory sample, which was also positive for Mycobacterium tuberculosis, confirming active pulmonary tuberculosis. Thus, during the study of a patient with puerperal sepsis and an initial suspicion of complicated bacterial endometritis, pulmonary tuberculosis and abdominal tuberculosis were identified concurrently. This finding was particularly relevant because the patient had no known history of HIV infection, diabetes mellitus, immunosuppressive treatment, or any other evident clinical condition associated with immunosuppression. Furthermore, no known epidemiological contact with tuberculosis had been previously identified.

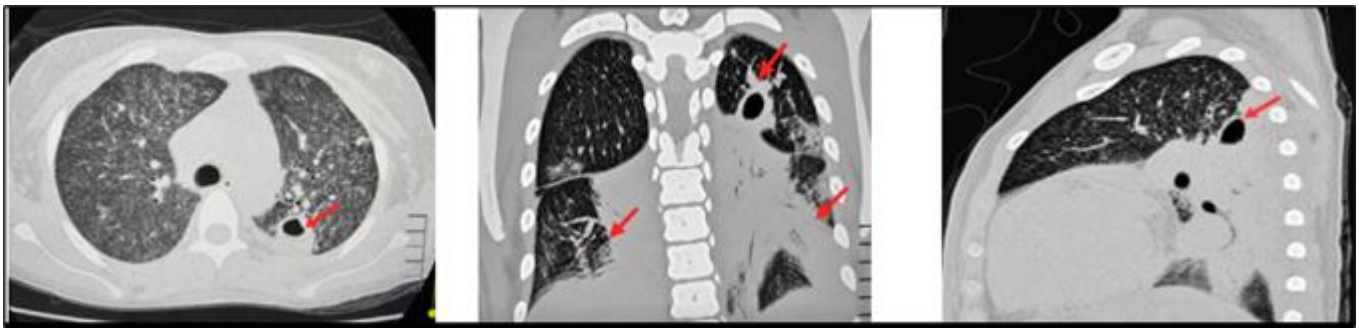

Figure 1: Computed tomography images of the chest in different planes, with evidence of cavitated pulmonary lesions and parenchymal infiltrates, indicated with red arrows, compatible with pulmonary involvement due to tuberculosis.

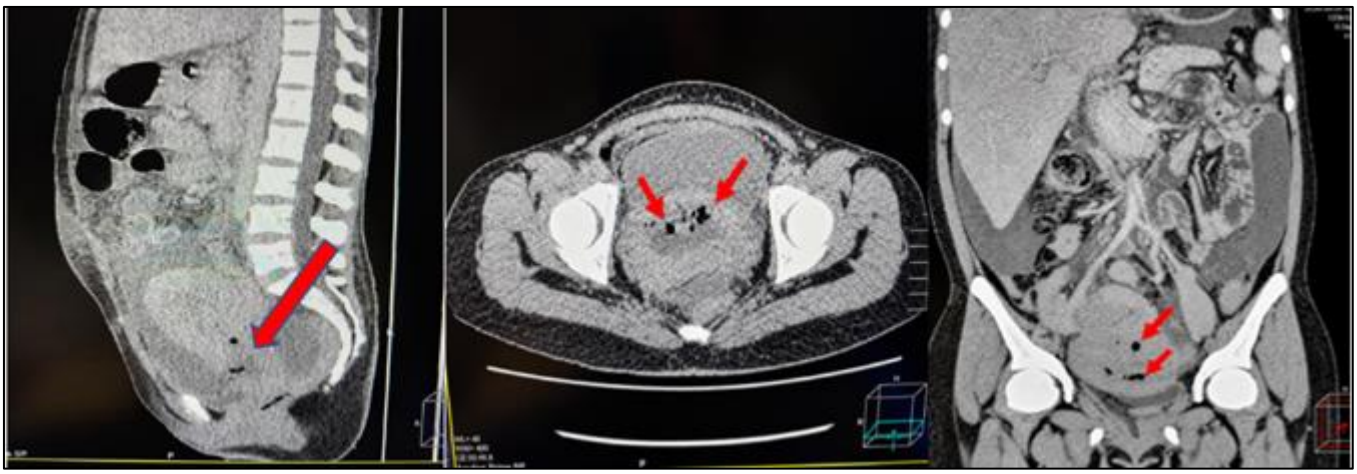

Figure 2: Computed tomography of the abdomen and pelvis in different planes, showing the presence of intrauterine gas located in the endometrial cavity, indicated by red arrows, associated with uterine inflammatory changes compatible with puerperal endometritis.

Following the surgical procedure, the patient was admitted to the intensive care unit for close monitoring due to the risk of hemodynamic and respiratory deterioration. Upon admission, she did not present with signs of shock and remained cardiovascularly stable; however, respiratory compromise associated with the pulmonary disease persisted, requiring support with a high-flow nasal cannula. Broad-spectrum antimicrobial therapy was initiated to manage puerperal sepsis and the likely polymicrobial intra-abdominal component. In addition, specific treatment for tuberculosis was started using a combination tablet regimen, based on the molecular results and preserved susceptibility to rifampicin.

The patient showed favorable clinical progress during her stay in the intensive care unit. Progressive resolution of fever and chills was observed, along with improvement in abdominopelvic pain and hemodynamic stability without the need for vasopressor support. She also showed progressive improvement in respiratory status and laboratory parameters, with a favorable trend in leukocytosis and inflammatory response markers. After four days of management and monitoring in the intensive care unit, the patient was clinically stable, with improvement in respiratory failure and no

signs of hemodynamic deterioration. Therefore, it was decided to transfer her to the maternity ward to continue antimicrobial treatment, antituberculosis therapy, clinical monitoring, and multidisciplinary follow-up.

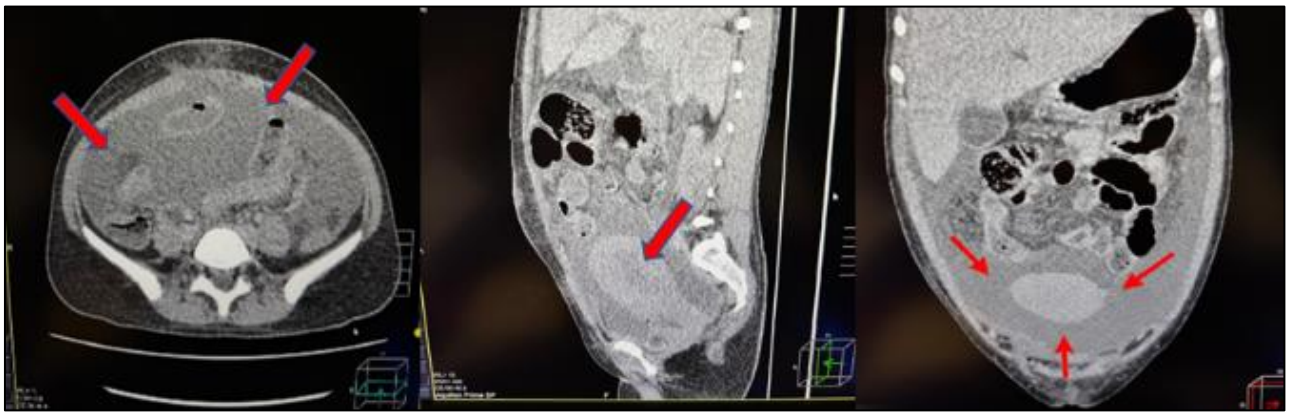

Figure 3: Computed tomography images of the abdomen and pelvis in different planes, showing the presence of free fluid in the abdominal cavity, indicated by red arrows.

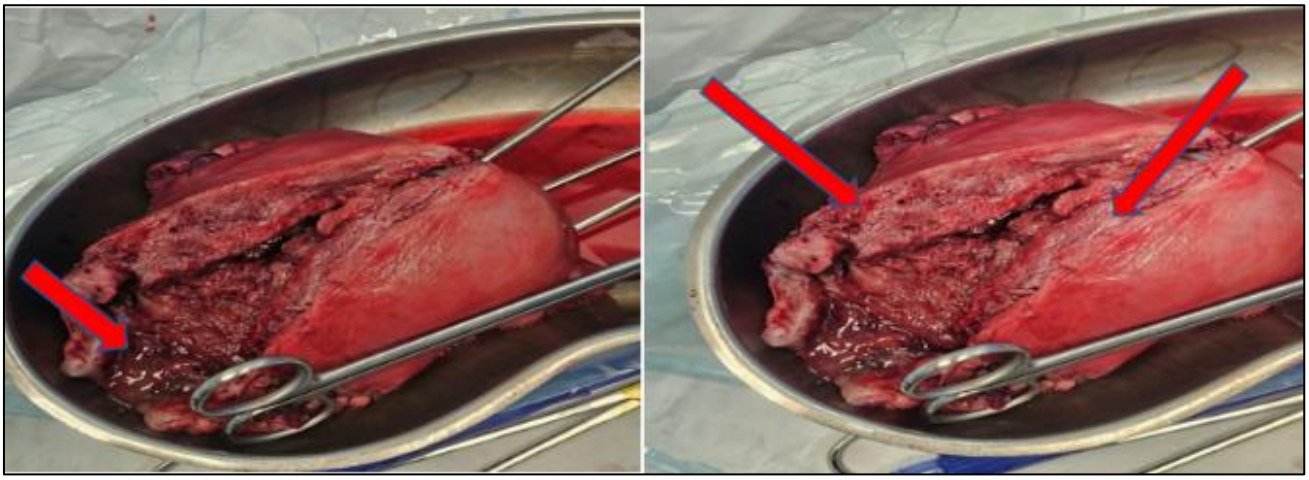

Figure 4: Uterine surgical specimen under macroscopic evaluation, showing inflammatory changes with infiltration of the myometrium and the presence of chocolate-colored secretion, indicated by red arrows.

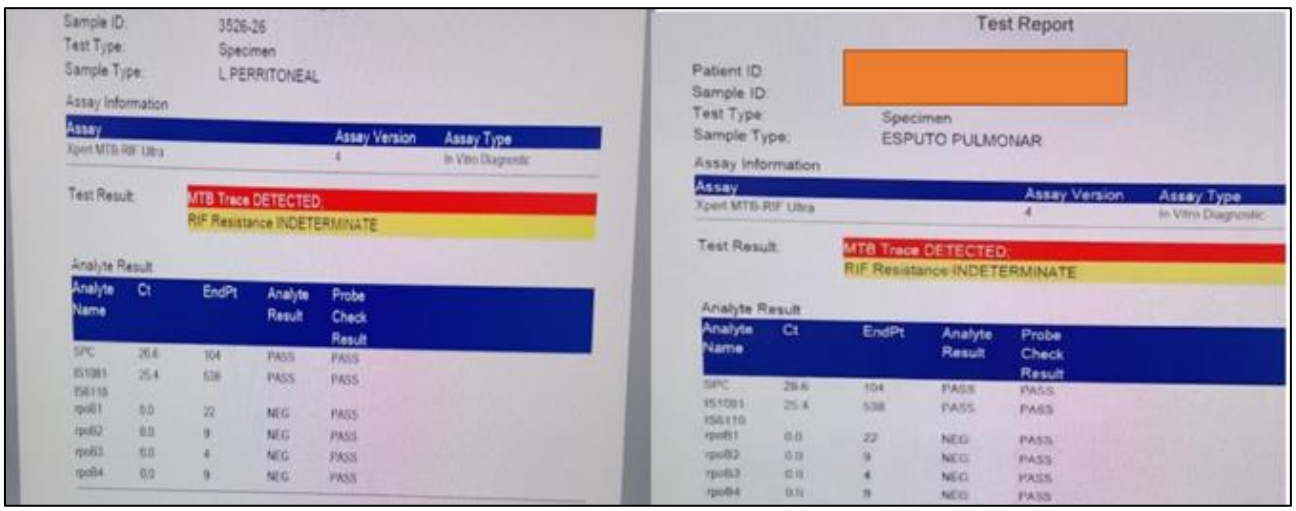

Figure 5: Results of Xpert MTB/RIF molecular tests performed on sputum and peritoneal fluid samples, with detection of Mycobacterium tuberculosis in both samples and absence of rifampicin resistance, confirming pulmonary tuberculosis and concomitant abdominal involvement.

3 DISCUSSION

Puerperal sepsis is a potentially serious complication of the postpartum period, and post-cesarean endometritis, in particular, is one of its main causes. In the patient described, the cesarean section, prolonged rupture of membranes, persistent fever, pelvic and abdominal pain, leukocytosis, and uterine and intra-abdominal CT findings were consistent with complicated puerperal endometritis. This interpretation is consistent with the main risk factors and the usual clinical presentation of puerperal infection, the treatment of which requires early antibiotic therapy, identification of the focus of infection, and timely control of the source when complicated intra-abdominal or uterine infection is present. [1–3]

However, certain findings exceeded the expected spectrum of an isolated puerperal infection and warranted etiological re-evaluation. The presence of endometrial gas, fever, leukocytosis, pelvic pain, and inflammatory intra-abdominal fluid pointed to a diagnosis of puerperal endometritis and justified the surgical procedure to control the infectious focus. In contrast, the presence of cavitary pulmonary lesions and ground-glass opacities, associated with persistent fever and intra-abdominal alterations, raised the possibility of a concomitant infectious disease and constituted an element to broaden the differential diagnosis to include tuberculosis and other deep infections. [4,5].

The microbiological confirmation of Mycobacterium tuberculosis in respiratory and peritoneal fluid samples is the central finding in this case. The Xpert MTB/RIF test has high specificity for extrapulmonary tuberculosis, although its sensitivity in peritoneal samples is considerably lower, so a negative result does not rule out the disease. Conversely, the detection of Mycobacterium tuberculosis in peritoneal fluid, particularly when it is consistent with pulmonary microbiological evidence and compatible clinical and radiological findings, provides a solid basis for the diagnosis of concomitant abdominal tuberculosis. The use of rapid molecular tests in extrapulmonary samples is especially important in scenarios where the clinical presentation is nonspecific and conventional diagnosis may be delayed. [6–8]

The described presentation is similar to previously published cases of peritoneal tuberculosis during the puerperium. Lavrynenko et al. reported a post-cesarean patient with fever, chills, and abdominal distension, in whom the presence of ascites, peritoneal abnormalities, and pulmonary findings ultimately led to the diagnosis of pulmonary and peritoneal tuberculosis through microbiological studies and biopsy. The clinical similarity is particularly relevant, given that in both scenarios, tuberculosis initially manifested as a postpartum infectious disease. However, the present case differs in that it identified the tubercle bacillus in peritoneal fluid obtained during surgery indicated for suspected puerperal infection, demonstrating the potential diagnostic value of intraoperative samples in patients with sepsis of initially uncertain etiology. [9]

The association between tuberculosis and pregnancy/puerperium also represents a scenario of particular diagnostic vulnerability. Available evidence indicates an increased risk of progression to active tuberculosis during pregnancy, and especially in the postpartum period. Furthermore, clinical manifestations can be nonspecific and confused with common conditions of this period, leading to diagnostic delays. In the patient presented, the presence of sufficient obstetric factors to initially explain the febrile syndrome may have facilitated a diagnostic anchoring process, initially limiting the consideration of a concomitant systemic infection. The coexistence of pulmonary and abdominal tuberculosis thus demonstrates the need for a comprehensive etiological evaluation when the clinical course is inconsistent with the expected response to treatment for a puerperal infection. [10–12]

A fundamental methodological aspect is differentiating between proven abdominal tuberculosis and potential uterine tuberculosis. The identification of Mycobacterium tuberculosis in peritoneal fluid establishes microbiological evidence of abdominal involvement, but does not in itself prove that the endometritis was caused by tuberculosis. In the absence of microbiological, histopathological, or molecular evidence of the microorganism in endometrial or myometrial tissue, the most accurate diagnosis is late puerperal endometritis complicated by sepsis and concomitant pulmonary and abdominal tuberculosis. This distinction is essential to avoid an unsupported causal attribution and allows for a proper interpretation of the therapeutic response. The favorable evolution after the start of antituberculosis treatment supports the clinical relevance of the identified tuberculosis, although it does not allow for retrospective determination that this was the primary etiology of the uterine process. [6,9,13]

The relevance of this case lies in the coexistence of a clinically plausible puerperal infection and pulmonary-abdominal tuberculosis in a patient without evident predisposing factors, as well as in the identification of extrapulmonary tuberculosis during the surgical management of puerperal sepsis. This scenario illustrates a diagnostic challenge of particular importance: the presence of an evident obstetric infectious focus can coexist with a second systemic infectious disease and lead to premature closure of the diagnosis. From a clinical perspective, the case supports the need to reconsider the diagnosis in cases of persistent puerperal fever, atypical pulmonary findings, or an incomplete response to treatment, and highlights the value of obtaining extrapulmonary microbiological samples during focus control procedures. Rather than demonstrating a causal relationship between tuberculosis and endometritis, this case

contributes to our understanding of the possibility of concomitant pulmonary and abdominal tuberculosis in the context of puerperal sepsis and the need to integrate obstetric, radiological, and microbiological findings to achieve a complete etiological diagnosis. [1,6,9,10].

4 CONCLUSION

The coexistence of puerperal sepsis and pulmonary and abdominal tuberculosis constitutes a rare clinical scenario with high diagnostic complexity. In this case, the obstetric factors and initial presentation were consistent with late puerperal endometritis, justifying an approach focused on source control; however, the concomitant presence of respiratory manifestations and intra-abdominal abnormalities allowed for the identification of tuberculosis that could initially have gone undetected.

This case highlights the importance of maintaining a broad differential diagnosis for persistent puerperal fever, particularly when the clinical course does not correspond to the expected response to antimicrobial treatment or when extrapelvic radiological findings are present. In regions with a significant tuberculosis burden, the disease should be considered in the differential diagnosis of postpartum patients with systemic and respiratory symptoms, even in the absence of a known history of tuberculosis or immunosuppression.

The use of rapid molecular tests, such as Xpert MTB/RIF, enabled the diagnosis of pulmonary and abdominal tuberculosis from respiratory and peritoneal samples. Obtaining samples during surgery represented a crucial diagnostic opportunity and demonstrates the value of integrating clinical, radiological, surgical, and microbiological findings in patients with sepsis of complex etiology.

Finally, this case emphasizes that the identification of tuberculosis in peritoneal fluid does not, by itself, allow for attributing a tuberculous etiology to endometritis; therefore, establishing an unproven causal relationship should be avoided. The main clinical lesson lies in recognizing that puerperal infection and extrapulmonary tuberculosis can coexist, and that systematic diagnostic reassessment in the face of an atypical course can be crucial for establishing a complete diagnosis and promptly initiating specific treatment.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Acknowledgments

We extend our gratitude to the medical team and hospital administration for their support in this case.

Disclosure of conflict of interest

The authors declare that they have no conflicts of interest, financial or otherwise, related to the preparation, authorship, or publication of This case report.

Statement of informed consent

Written informed consent was obtained from the patient for the publication of This case report and the accompanying clinical information and images. Patient confidentiality was strictly maintained , and all identifying information was anonymized in accordance with the ethical principles of the Declaration of Helsinki.

Author Contributions

All authors contributed to the clinical management of the patient, collection and analysis of clinical data, literature review, and preparation of the manuscript. All authors critically reviewed and approved the final version of the manuscript and agreed to be accountable for its content.

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