

# Multifocal Genito-Peritoneal and Pleuro-Pulmonary Tuberculosis with Bilateral Pyosalpinx in a 15-Year-Old Adolescent: A Rare Case Report

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## Abstract

## Case Report

Female genital tuberculosis is a rare form of extra-pulmonary tuberculosis, exceptional in adolescents, whose misleading clinical presentation exposes patients to diagnostic delay and permanent tubal damage. We report the case of a 15-year-old girl, with no notable medical history, admitted for pelvic pain evolving for two weeks in a context of vomiting, night sweats and foul-smelling leucorrhoea. Pelvic ultrasound and magnetic resonance imaging (MRI) showed bilateral salpingitis with a voluminous right pyosalpinx and a moderate pelvic effusion associated with signs of peritoneal irritation. Laboratory tests showed a mild inflammatory syndrome with a negative pregnancy test. Chest computed tomography, performed because of the persistence of the clinical picture, revealed a necrotic right pleural empyema associated with disseminated bilateral pulmonary micronodules. Diagnostic laparoscopy showed whitish granulations of miliary tuberculous appearance scattered over the parietal peritoneum, uterine serosa, diaphragmatic dome and hepatic surface, together with a 5 cm right hydrosalpinx and a loculated pseudocyst of the pouch of Douglas. Multiple peritoneal biopsies were taken and sent for histopathological analysis, which revealed a granulomatous lesion of the tubal mucosa composed of epithelioid and giant-cell granulomas, consistent with a tuberculous origin. Given this concordant set of clinical, radiological, intraoperative and histological findings, empirical anti-tuberculous quadritherapy was started. This case underlines the need to systematically consider genito-peritoneal tuberculosis in any adolescent presenting with pyosalpinx or pelvic infection poorly responsive to conventional antibiotics, particularly in tuberculosis-endemic countries, as well as the major diagnostic contribution of laparoscopy with biopsies.

**Keywords:** Genital tuberculosis; Bilateral pyosalpinx; Adolescent; Peritoneal tuberculosis; Pleural empyema.

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## INTRODUCTION

Despite advances in screening and management, tuberculosis remains one of the most lethal infectious diseases worldwide. According to the World Health Organization (WHO) 2025 Global Tuberculosis Report, approximately 10.7 million people contracted the disease and more than 1.2 million died from it in 2024, with progress remaining fragile owing to insufficient funding and persistent inequities in access to care [1]. In Morocco, a country with a high tuberculosis burden, between 27,000 and 30,000 new cases are notified each year, with urogenital involvement ranking, in both children and adults, among the most frequent extra-pulmonary forms after lymph node and pleuro-pulmonary disease [2,3].

Female genital tuberculosis most commonly results from haematogenous or lymphatic spread from a primary pulmonary focus, which may pass unnoticed, with an interval of several years between the primary infection and genital expression of the disease; it classically affects young women between 20 and 30 years of age in endemic areas [4]. Pelvic involvement is currently thought to account for 6 to 10% of all tuberculous localisations, with the fallopian tubes affected in 90 to 100% of cases, the endometrium in 50 to 80% and the ovaries in only 20 to 30% [4]. Its clinical and paraclinical presentation is highly polymorphic and non-specific, potentially mimicking ordinary salpingitis, a pyogenic tubo-ovarian abscess, or an adnexal tumour, which accounts for the frequency of diagnostic delay [5,6].

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In children and adolescents, this localisation remains exceptional, most published series involving prepubertal children presenting essentially with febrile ascites related to isolated peritoneal tuberculosis [7]. The combination, in an adolescent, of symptomatic bilateral tubal involvement, peritoneal miliary disease and concomitant pleuro-pulmonary localisation constitutes a rare presentation, likely reflecting recent multivisceral haematogenous dissemination rather than the classic mechanism of late reactivation described in adults. We report this observation to emphasise the value of systematically considering tuberculosis in any adolescent with pelvic infection poorly responsive to conventional treatment, and to highlight the central role of laparoscopy with biopsies in the diagnostic work-up.

## CASE PRESENTATION

The patient was a 15-year-old girl with no notable personal or family medical history, of uncertain BCG vaccination status, with no reported tuberculosis contact, not yet menarcheal on documented gynaecological assessment, and with no history of sexual intercourse. Symptoms had begun approximately two weeks before presentation, marked by the onset of food-related vomiting associated with sweats and foul-smelling leucorrhoea evolving over one week, with no other reported associated signs. She had initially sought care as an outpatient.

Pelvic ultrasound performed as an outpatient showed a pelvic effusion surrounding the uterus and ovaries, with the right ovary the seat of a complex tubo-ovarian mass suggestive of a “cold” tubo-ovarian pyosalpinx. This ultrasound was supplemented by a pelvic MRI, which confirmed inflammatory pelvic involvement in the form of bilateral salpingitis with a right pyosalpinx, associated with a moderate pelvic effusion with signs of peritoneal irritation. It was in this context that the patient was referred to our department for further management.

### Clinical examination on admission

On admission, the patient was in good general condition, with normally coloured conjunctivae and no clinical anaemic syndrome. Haemodynamic parameters were stable: blood pressure 120/80 mmHg, regular heart rate of 79 beats per minute, and she was afebrile at 35.5 °C. Abdominal examination showed no bulging or scarring on inspection; on palpation, the abdomen was soft, with no guarding or rigidity, and only limited tenderness in the right iliac fossa. The remainder of the physical examination, including the pleuro-pulmonary examination, was clinically unremarkable at the time of admission.

## Laboratory findings

Laboratory work-up on admission showed mild leukocytosis with a haemoglobin level of 12.2 g/dl and a C-reactive protein (CRP) of 9 mg/l (versus 10 mg/l on a previous sample), reflecting a discreet biological inflammatory syndrome. Plasma  $\beta$ -hCG was negative ( $< 2.30$  mIU/ml), ruling out an ongoing intrauterine or ectopic pregnancy. Urine culture was sterile, and coagulation studies (PT/aPTT) were unremarkable. A standard cytobacteriological examination of sputum, performed as part of the extension work-up, showed a mucoid appearance with no significant leukocytosis or red blood cells, with the routine aerobic culture remaining negative for any pathogen; no specific testing for acid-fast bacilli (direct smear, culture on Löwenstein-Jensen medium, or a molecular assay such as GeneXpert MTB/RIF) could be performed on this sample, so that this examination alone could neither confirm nor exclude associated pulmonary tuberculosis.

## Imaging findings

Follow-up pelvic ultrasound performed on admission confirmed a normal-sized uterus, measuring 7 x 3.52 cm, with a thin 1.44 cm endometrium. It also identified a latero-uterine adnexal mass of 5.41 x 6.55 cm, with a thick, heterogeneous wall and endoluminal vegetations, associated with a loculated effusion measuring 4.82 cm in its greatest dimension (Figure 1).

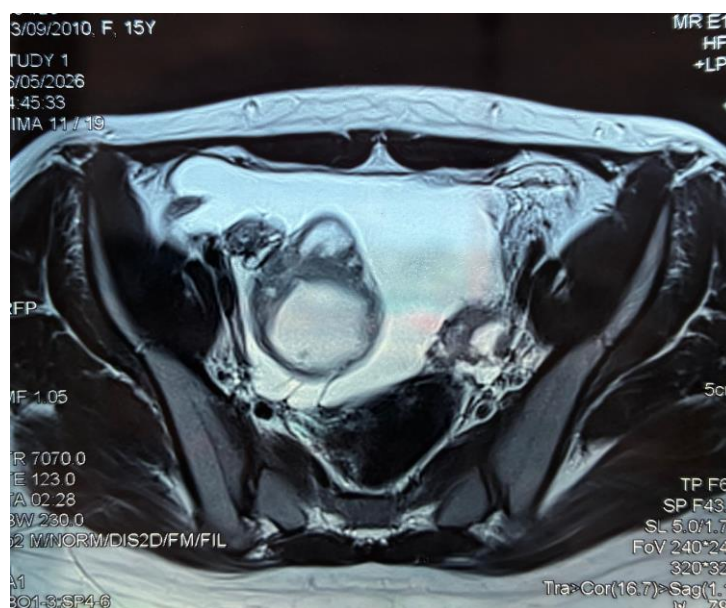


**Figure 1: Pelvic ultrasound (suprapubic approach) — dilated tubal cystic structure with a thickened wall and fine endoluminal septations, consistent with a hydrosalpinx**

Pelvic MRI, using T1- and T2-weighted sequences with fat saturation and gadolinium injection, showed a normal-sized anteverted-anteflexed uterus measuring 45 x 61 x 33 mm. There was a large right latero-uterine tubular structure, interposed between the uterine body and the right ovary, consistent with a substantial hydrosalpinx whose thickened, irregular wall showed diffuse, restrictive enhancement after gadolinium injection at the level of a distal cystic dilatation measuring 50 x 46 mm, in keeping with a pyosalpinx. This was associated with left latero-uterine

tubular thickening of the same semiological characteristics but of lesser degree, together with a moderate, loculated pelvic effusion with enhancement of the peritoneal leaflets and a thin rim of hydrometra.

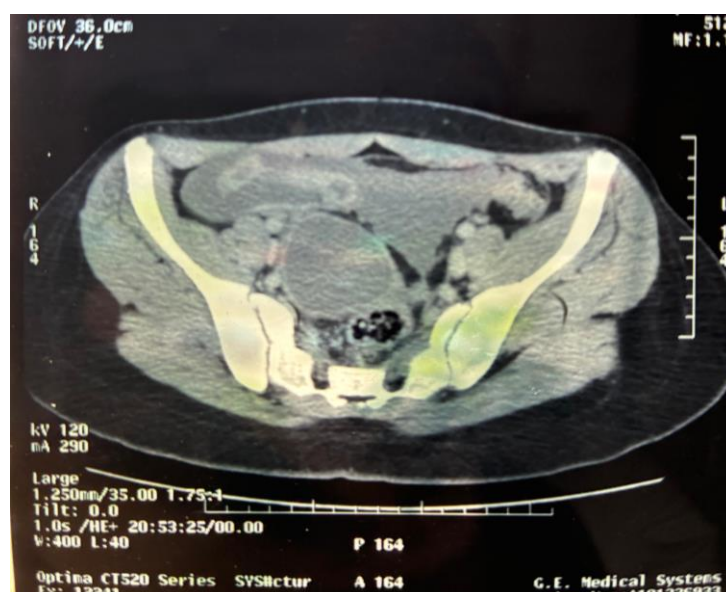
The bladder and rectum were unremarkable, and no suspicious pelvic or inguinal lymphadenopathy was noted (Figure 2). This examination concluded to inflammatory pelvic disease with bilateral salpingitis and a right pyosalpinx, associated with a moderate pelvic effusion with signs of peritoneal irritation.



**Figure 2: Pelvic MRI, axial T2-weighted image — tubal dilatation with a thickened wall and intraluminal fluid hyperintensity, associated with peri-adnexal pelvic effusion.**

Abdomino-pelvic computed tomography (CT), performed as part of the same work-up, confirmed bilateral fluid-filled tubular adnexal dilatation, with no

associated intra-abdominal lesion or suspicious mesenteric or iliac lymphadenopathy on the sections obtained (Figure 3).



**Figure 3: Contrast-enhanced abdomino-pelvic CT, axial section — bilateral thin-walled tubular adnexal dilatation of fluid density, suggestive of bilateral hydrosalpinx.**

Given the persistence of the clinical picture and as part of the extension work-up for suspected pelvi-peritoneal tuberculosis, contrast-enhanced chest CT was performed. It showed a heterogeneous right anterior pleural collection, with irregular enhancement after contrast injection and necrotic areas, measuring 35 x 33 mm, consistent with a right pleural empyema to be correlated with the clinico-biological findings; no mediastinal or axillary lymphadenopathy, no

individualised active-appearing parenchymal lesion, no intra-abdominal lesion and no suspicious bone lesion were described. On the parenchymal sections, discrete micronodules disseminated at both lung bases were also noted, an appearance which, considered alongside the subsequent intraoperative finding of peritoneal miliary disease, was consistent with haematogenous dissemination (Figure 4).



**Figure 4: Contrast-enhanced chest CT, parenchymal window — heterogeneous right anterior pleural collection (empyema) and disseminated bilateral parenchymal micronodules.**

### Management

The patient was admitted and a peripheral intravenous line was inserted. While awaiting bacteriological and histopathological results, empirical triple antibiotic therapy targeting pelvic infection was started, combining ceftriaxone 1 g/day as a single dose, metronidazole 500 mg twice daily for 10 days, and doxycycline 100 mg twice daily for 10 days, with clinical monitoring of temperature, heart rate and abdomino-pelvic pain.

Given the combination of bilateral pyosalpinx, a right pleural empyema and a mild inflammatory syndrome in an adolescent, a tuberculous origin was strongly suspected, and diagnostic exploratory laparoscopy was performed on 23 June 2026 under general anaesthesia with orotracheal intubation, with the patient positioned in Trendelenburg. Entry into the abdominal cavity was achieved with a Veress needle at Palmer's point in the right hypochondrium, after creation

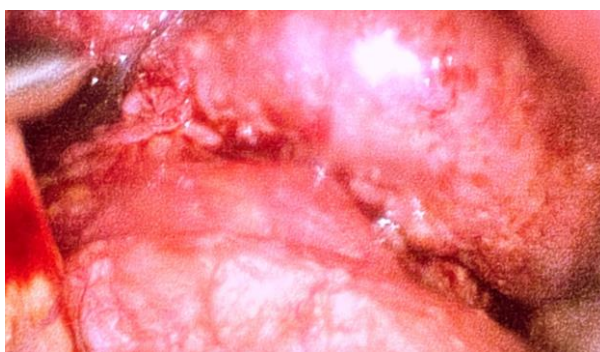
of the pneumoperitoneum, followed by insertion of a 10 mm optical trocar in the supraumbilical position.

Exploration revealed a scattering of whitish granulations, a few millimetres in size, disseminated over the anterior parietal peritoneum, the digestive wall, the uterine serosa, the hepatic surface and the diaphragmatic dome, giving an appearance suggestive of tuberculous miliary disease. Multiple peritoneal biopsies were taken and sent for histopathological analysis. The right adnexa was the site of a hydrosalpinx measuring 5 cm in its greatest dimension, and there was a loculated pseudocyst occupying the pouch of Douglas. After confirming haemostasis, the trocar was removed, the entry site closed with a running absorbable suture, and a sterile dressing applied.

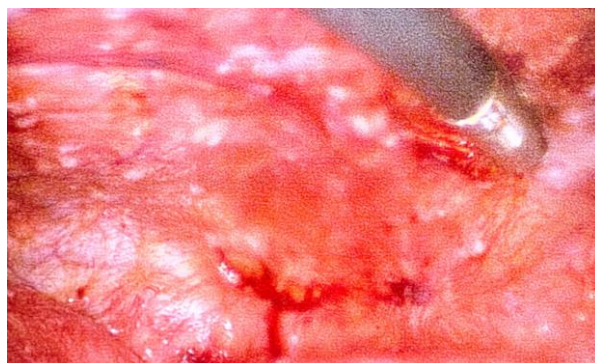
These lesions were documented photographically during the procedure (Figures 5 to 8), confirming the macroscopic appearance typical of tuberculous peritoneal miliary disease.



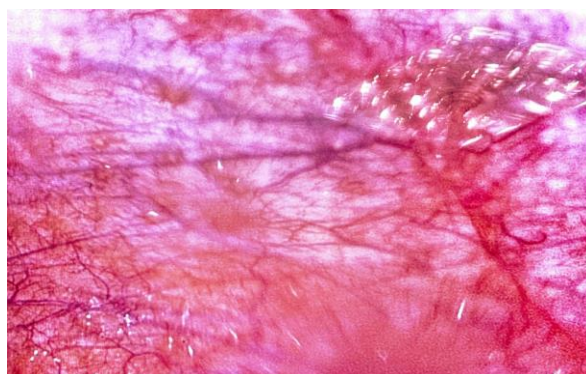
**Figure 5: Intraoperative laparoscopic view — scattered whitish granulations, a few millimetres in size, disseminated over the parietal peritoneum, producing a “millet seed” appearance suggestive of tuberculous miliary disease**



**Figure 6: Intraoperative laparoscopic view, same operative field — whitish granulations confluent in places, contrasting with the adjacent haemorrhagic mucosa**



**Figure 7: Intraoperative laparoscopic view — punctate whitish granulations scattered over the peritoneal serosa adjacent to a vascular pedicle, away from the biopsy site**



**Figure 8: Panoramic laparoscopic view of the peritoneal surface — fine whitish granulations disseminated over a richly vascularised background, confirming the diffuse nature of the miliary involvement**

At the conclusion of this exploration, the diagnosis of multifocal genito-peritoneal and pleuro-pulmonary tuberculosis was retained on the basis of a

concordant set of epidemiological (age, endemic setting), clinical (subacute deterioration in general condition, sweats), radiological (bilateral pyosalpinx, necrotic

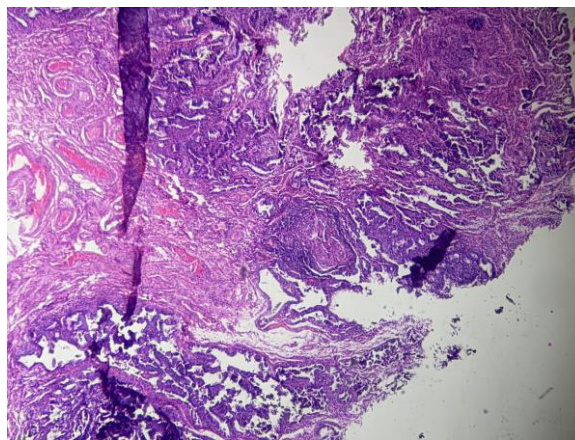
pleural empyema, pulmonary micronodules) and intraoperative (typical peritoneal, hepatic and diaphragmatic miliary disease) findings. Anti-tuberculous quadritherapy (rifampicin, isoniazid, pyrazinamide, ethambutol) was started without waiting for definitive histological and bacteriological confirmation, following multidisciplinary discussion, with the aim of a two-month intensive phase followed by a four-month continuation phase with dual therapy (rifampicin, isoniazid), together with close clinical, biological and radiological follow-up and long-term monitoring of future fertility.

### Histopathological findings

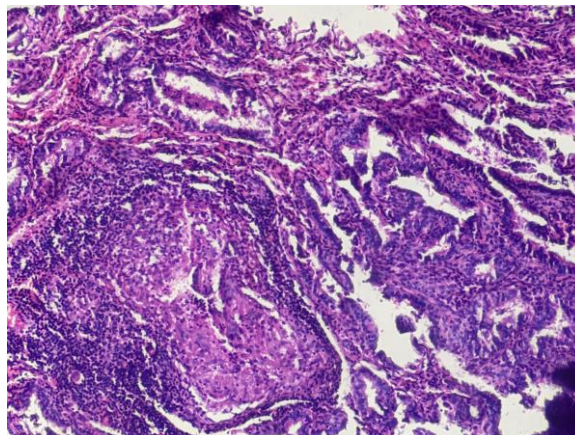
The peritoneal and tubal biopsies obtained during laparoscopy were sent to the pathology

laboratory. Examination was performed on a tissue fragment weighing 0.28 g and measuring 1.2 x 1 x 0.4 cm, whitish-grey in colour, entirely embedded for microscopic study.

Histological analysis showed a tubal wall with a generally regular epithelial lining forming mucosal folds with connective-tissue cores containing occasional calcospherites. The underlying lamina propria showed a moderate inflammatory infiltrate, within which several epithelioid and giant-cell granulomas were identified in places, with no identifiable caseous necrosis (Figures 9 and 10). The muscularis appeared focally dissociated by fibrosis, and the adventitia was congested.



**Figure 9: Histological study of the tubal wall (H&E, low power) — granulomatous lesion involving the tubal mucosa, composed of epithelioid and giant-cell granulomas within an inflammatory lamina propria**



**Figure 10: Histological study of the tubal wall (H&E, high power) — epithelioid granuloma with a multinucleated giant cell, with no visible caseous necrosis, consistent with a tuberculous origin**

Overall, this examination concluded to chronic, specific granulomatous salpingitis, suggestive in the first instance of a tuberculous origin, with no histological evidence of malignancy. This histopathological result subsequently supported the diagnosis already established on the basis of the concordant clinical, radiological and intraoperative findings, and justified continuation of the anti-tuberculous quadritherapy already initiated.

### DISCUSSION

Female genital tuberculosis is an important, albeit underdiagnosed, cause of chronic pelvic pain and infertility in endemic countries [4,8]. Its true incidence is difficult to establish, as at least 11% of patients are thought to be asymptomatic, and concomitant pulmonary or digestive involvement, when present, may be absent in 30 to 50% of cases, making the diagnosis even more challenging in the absence of an obvious tuberculous

context [4]. Classically described in young women aged 20 to 30 years, isolated genital involvement remains exceptional in adolescents and prepubertal children, in whom abdomino-pelvic tuberculosis is most often limited to isolated ascitic peritoneal disease, without associated symptomatic tubo-ovarian involvement [7,9].

Our observation is notable for combining, in a patient of only 15 years, genuine symptomatic bilateral tubal involvement (pyosalpinx), peritoneal, hepatic and diaphragmatic miliary disease, and concomitant necrotic pleural involvement. This multifocal presentation, with a relatively rapid onset, is more suggestive of recent haematogenous dissemination from a poorly controlled primary tuberculous infection than of late reactivation of a latent genital focus, the mechanism classically invoked in young adults [4,8]. The association with pleuro-pulmonary involvement, found in approximately 21% of adult peritoneal tuberculosis cases in some series [10], illustrates the readily plurifocal nature of disseminated primary tuberculous infection, particularly in young patients.

Clinically, our patient's presentation — vomiting, sweats, foul-smelling leucorrhoea followed by iliac fossa pain — was entirely non-specific and could initially suggest ordinary pyogenic salpingitis or, given the ultrasound appearance of a complex tubo-ovarian mass with vegetations, an adnexal tumour, as has been reported in several accounts of genital tuberculosis mimicking ovarian neoplasia [5,11]. Similarly, although essential for the initial characterisation of the lesions, ultrasound and CT do not reliably differentiate a tuberculous pyosalpinx from an ordinary pyogenic pyosalpinx or an adnexal tumour [5]. In our observation, it was the persistence of the pelvic inflammatory picture, together with the incidental discovery of a necrotic pleural empyema on chest CT — an examination that would probably not have been requested as a first-line investigation for isolated pyosalpinx — that oriented the diagnostic work-up towards a tuberculous origin, even before histological confirmation.

Exploratory laparoscopy with peritoneal biopsies remains, in the literature, the reference examination for the diagnosis of peritoneal and genital tuberculosis, particularly for tubal, ovarian and peritoneal involvement, with a reported diagnostic yield exceeding 70–97% across series, whether through macroscopic identification of typical tuberculous granulations (found in more than 75% of cases explored by laparoscopy in some series) or histological confirmation by the presence of epithelioid-giant-cell granulomas, with or without caseous necrosis, on peritoneal biopsies [10,12,13]. A Moroccan series of children managed for peritoneal tuberculosis confirmed the diagnosis by laparoscopy and histological study of biopsies in more than 70% of cases, with a strongly suggestive macroscopic appearance from the time of surgical exploration in the majority of observations [9].

Another Moroccan series, focusing specifically on the pseudo-tumoral form of peritoneal tuberculosis in women, similarly highlighted the value of laparoscopy in excluding ovarian peritoneal carcinomatosis in the setting of a misleading picture combining an adnexal mass with peritoneal effusion [11]. In our patient, the intraoperative macroscopic appearance, combining diffuse peritoneal miliary disease, hepatic and diaphragmatic involvement, and hydrosalpinx, was highly suggestive, justifying the initiation of empirical anti-tuberculous treatment while awaiting definitive histopathological and microbiological confirmation, a customary approach when faced with a strongly concordant set of findings in an endemic area [9].

From a therapeutic standpoint, treatment of genital and peritoneal tuberculosis relies primarily on standard anti-tuberculous polychemotherapy, combining, during a two-month intensive phase, rifampicin, isoniazid, pyrazinamide and ethambutol, followed by a four-month continuation phase with rifampicin and isoniazid, for a total duration of six months, in accordance with Moroccan national guidelines for the management of tuberculosis in children and adolescents [3,4,14]. Surgery, apart from its diagnostic role, is reserved for complicated forms (persistent collections, occlusive syndrome, persistent diagnostic uncertainty) and does not replace medical treatment [4]. Functional prognosis, particularly future fertility, remains the primary concern in such a young patient: the risk of post-tuberculous tubal infertility is estimated at approximately 39% in the literature, warranting prolonged gynaecological follow-up after treatment [4]. Finally, in a global context marked by the persistent fragility of progress against tuberculosis owing to insufficient funding [1], this case underscores the importance of maintaining a high index of diagnostic suspicion for extra-pulmonary tuberculosis, including its atypical, multifocal forms in adolescents.

## CONCLUSION

Multifocal genito-peritoneal tuberculosis associated with pleuro-pulmonary involvement is an exceptional presentation in adolescents. Its non-specific symptomatology, which may mimic ordinary pelvic infection or an adnexal tumour, exposes patients to the risk of diagnostic delay and permanent tubal damage compromising future fertility. This diagnosis should be systematically considered in any adolescent with pyosalpinx or pelvic infection that responds poorly to conventional antibiotic therapy, particularly in tuberculosis-endemic areas, and should prompt a search for associated pleuro-pulmonary involvement. Laparoscopy with peritoneal biopsies retains a central role in the diagnostic work-up, allowing both confirmation of the diagnosis and exclusion of tumoral differential diagnoses, while enabling early initiation of appropriate anti-tuberculous treatment, the sole guarantor of a favourable outcome, both vital and functional.

**Conflicts of interest:** The authors declare no conflict of interest.

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