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Case Report

Internal Medicine Section

Disseminated Tuberculosis Presenting Primarily as Amenorrhoea- A Case Report

MRINMAYEE VIJAY MAYEKAR[1], PANKAJ WAGH[2], BABAJI GHEWADE[3], ULHAS JADHAV[4]

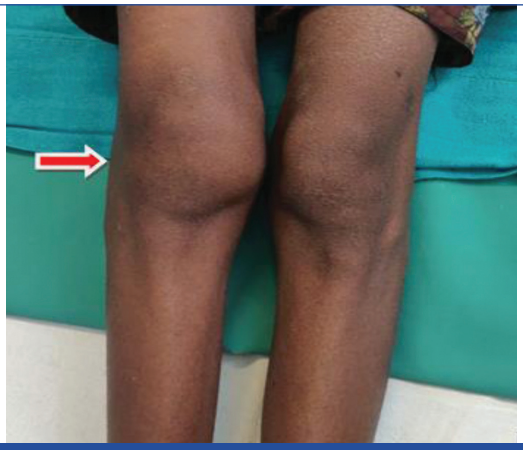
ABSTRACT

Mycobacterium Tuberculosis (MTB) primarily infects the lungs and spreads throughout the body after the initial infection. This dissemination occurs through the reactivation of a dormant focus, which is preceded by lymphohaematogenous spread. It can also spread through the bloodstream from active lung or miliary tuberculosis. Tuberculosis is the leading cause of amenorrhoea in young females in developing countries like India. Although disseminated tuberculosis with osteoarticular involvement is a rare occurrence, a 20-year-old female presented to Acharya Vinoba Bhave Rural Hospital (AVBRH) with primary complaints of amenorrhoea and swelling in the right knee joint, which were the primary symptoms of disseminated tuberculosis. The present case is exceptional because it lacks the typical pulmonary symptoms. The predominance of gynaecological symptoms over pulmonary involvement may have led to an incorrect diagnosis of malignancy instead of tuberculosis. Additionally, the suspicion of tuberculosis was delayed due to elevated ovarian tumour markers.

Keywords: Alpha-fetoprotein, Mycobacterium tuberculosis, Osteoarticular, Wet peritonitis

CASE REPORT

A 20-year-old female presented to the Department of Gynaecology at AVBRH with chief complaints of amenorrhoea (she had her first period at the age of 14 years), weight loss, and decreased appetite (approximately 7 kg weight loss in two months) despite no physical exercise according to the patient's history. The patient also had a low-grade fever for two months, along with pain and swelling in her right knee joint [Table/Fig-1]. She reported abdominal pain and distension, with no significant past medical history.



[Table/Fig-1]: Patient's bilateral knees showing visible swelling over the right knee joint (red arrow).

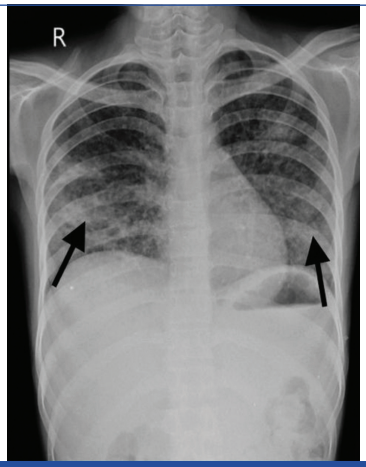
During examination, the patient appeared poorly built and malnourished. She had afebrile skin, a pulse rate of 132 per minute, a respiratory rate of 20 per minute, and a blood pressure of 90/70 mmHg. Physical examination of the right knee revealed redness, increased temperature, and tenderness. She was initially treated with intravenous antibiotics, including piperacillin 2.25 gm three times a day and metronidazole 100 mL three times a day, along with aceclofenac-serratiopeptidase tablets (a nonsteroidal anti-inflammatory drug and analgesic) for 15 days.

Abdominal palpation revealed diffuse tenderness, and systemic examination detected occasional bilateral crepitations on auscultation in the mammary region anteriorly and inter and infrascapular region posteriorly. No significant abnormalities were found in the cardiovascular and central nervous systems.

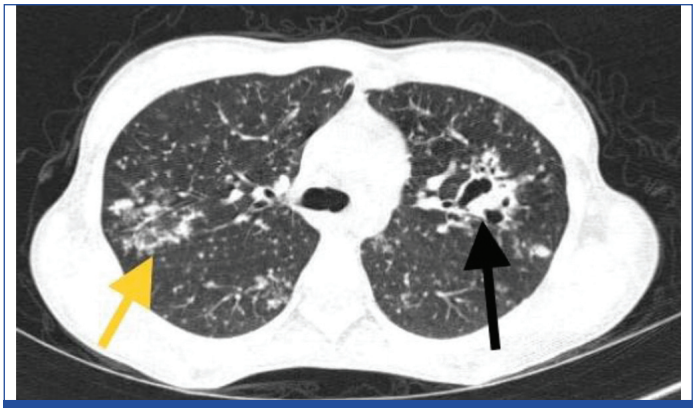
All routine investigations were conducted, revealing a haemoglobin level of 8.6 gm%, a total White Blood Cell (WBC) count of 8600, and a platelet count of 3.06 lac [Table/Fig-2]. Liver and kidney function tests, as well as urine analysis, were normal. Sputum examination for acid-fast bacillus was negative. Ovarian tumour markers were assessed, with Cancer Antigen-125 (CA-125) showing an elevated level of 336 (compared to the baseline), Carcinoembryonic Antigen-A (CEA) at 3.20 (0-35 units/mL), Alpha-fetoprotein (AFP) at 3.31 (less than 12 ng/mL), and Beta Human Chorionic Gonadotropin (BHCG) at 2.39 (<5 mIU/mL). As indicated in the report, radiological investigations were performed. The chest X-ray in the Posteroanterior (PA) view suggested bilateral pulmonary infiltrates [Table/Fig-3]. High-Resolution CT (HRCT) of the thorax revealed active pulmonary tuberculosis with some fibro-bronchiectasis changes [Table/Fig-4].

Investigations	Results
Haemoglobin	8.6 gm%
Total leucocytic count	8600 (4000-11000 cells/mm^3)
Total platelet count	3.06 (50,000 to 450,000/mL of blood)
Cancer Antigen-125 (CA-125)	336 (0-35 units/mL)
Alpha-fetoprotein (AFP)	3.31 (less than 12 ng/mL)
Human Chorionic Gonadotropin (HCG)	2.39 (less than 5 mIU/mL)

[Table/Fig-2]: Laboratory investigations and ovarian tumour markers.

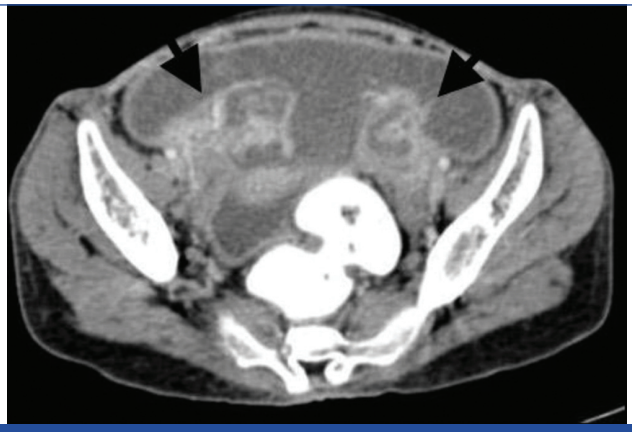


[Table/Fig-3]: Chest X-ray shows bilateral lung infiltrates indicated by black arrows.



[Table/Fig-4]: HRCT thorax suggestive of cavitatory lesion (black arrow) with the surrounding area of patchy consolidation of 8×7 mm in the apicoposterior segment of the left upper lobe as in active pulmonary Koch's and an area of consolidation involving a superior basal segment of the right middle lobe (yellow arrow).

A contrast-enhanced abdomen and pelvis CT scan was conducted to rule out suspected malignancy, which revealed wet tubercular peritonitis with bilateral salpingitis and ovarian involvement [Table/Fig-5]. Ultrasound-guided aspiration of the pelvic cavity collection was performed, and the sample was sent for TrueNat testing, which yielded a positive result for MTB. Needle aspiration of synovial fluid from the right knee was also done and sent for Cartridge-based Nucleic Acid Amplification esting (CBNAAT) testing, which again confirmed the presence of MTB. Rifampicin resistance was not detected in any of these samples, ruling out multidrug resistance.



[Table/Fig-5]: CECT abdomen and pelvis suggestive of bilateral convoluted peripherally enhancing tubular structures noted in bilateral adnexa with salpingitis indicated by black arrows.

The patient was initiated on antitubercular therapy following the category 1 Directly Observed Short Course Treatment (DOTS) regimen, consisting of isoniazid (75 mg), rifampicin (150 mg), pyrazinamide (400 mg), and ethambutol (275 mg) based on her weight. Significant improvement was observed after starting the treatment. The patient had a follow-up visit after 15 days in the Outpatient Department (OPD) and showed reduced swelling in the knee joint and experienced less pain while walking. However, she continued to have amenorrhoea even after one month of antitubercular treatment, which necessitates long-term gynaecological follow-up.

DISCUSSION

The MTB can spread throughout the body through primary infection or the reactivation of a dormant focus, preceded by lymphohaematogenous spread. The exact mechanism of this spread is still being determined. One theory suggests that tuberculosis infection in the lungs erodes the epithelial layer of alveolar cells, allowing the infection to migrate into a pulmonary vein. Once the bacteria reach the left side of the heart and enter systemic circulation, they can infect extrapulmonary organs, leading to disseminated tuberculosis [1].

Another mechanism involves the damage of alveolar cell lining by the bacilli, allowing them to penetrate the lymph nodes. The bacilli then enter the systemic venous blood through lymphatics and circulate back to the lungs through the bronchus. This results in pulmonary disseminated tuberculosis with a military appearance [2]. Peritoneal tuberculosis, a rare form of extrapulmonary tuberculosis, can occur when MTB reaches the peritoneal cavity. This can happen either transmurally from the diseased small intestine or concomitantly from tuberculous salpingitis [2]. Tuberculous peritonitis, although less common with the availability of powerful anti-tuberculosis drugs, has seen an increase in rich countries in the past decade. It is more prevalent in individuals with immunodeficiencies caused by factors such as alcoholism, steroid treatment, intravenous drug use, chemotherapy, and Acquired Immune Deficiency Syndrome (AIDS) [1,2].

Skeletal tuberculosis accounts for approximately 3% of all tuberculosis cases but represents 10%-35% of extrapulmonary tuberculosis cases. In the United States, nearly one-fifth of tuberculosis cases are extrapulmonary [3]. Lymphohaematogenous dissemination from a major organ can result in various manifestations, including spinal arthritis (Pott's disease), osteomyelitis, and tubercular arthropathy. The most commonly affected osteoarticular regions reported in a study by Lidder S et al., are the spinal vertebrae (40%), hip (25%), and knee (8%) [4]. Surprisingly, 50% of individuals with skeletal tuberculosis show no clinical or radiological evidence of pulmonary involvement, as studied by Hodgson SP and Ormerod LP [5]. Clinical symptoms of tubercular arthritis include pain, swelling, and restricted range of motion in the affected joint, even though other signs of inflammation such as erythema and warmth may be absent. Approximately 33% of individuals with skeletal tuberculosis also experience weight loss and fever [6]. Despite the increasing association of tuberculosis with Human Immunodeficiency Virus (HIV)/AIDS, primary bone involvement remains infrequent [7]. Diagnosing knee joint tuberculosis is challenging due to its low prevalence, non specific symptoms, indolent clinical history, and the low specificity and sensitivity of traditionally used diagnostic tools. Triplett D et al., reported 13 cases of TB arthritis in the knee joint with delayed diagnosis ranging from two months to 10 years, which is much longer compared to wealthy countries where tuberculosis is uncommon [7].

Tuberculous peritonitis can present in three main types. The most common type is the wet type, characterised by a large amount of free or loculated viscous fluid. The fibrotic-fixed form and the dry or plastic form are rare. Other conditions such as non-tuberculous peritonitis, carcinoma, and mesothelioma can also present with a similar peritoneal appearance [8]. Amenorrhoea is associated with tuberculosis of the female genital tract, although its occurrence can vary. Perdhana R et al., reported a case of a 33-year-old female who presented with a chief complaint of no menstruation for the past five years. The diagnosis of secondary amenorrhoea due to tuberculosis was made, and treatment was done using category I anti-tuberculosis drugs for six months [9]. It is important to note that amenorrhoea associated with tuberculosis of the female genital tract is typically secondary amenorrhoea, which means that the menstrual periods cease after they have already begun. Primary amenorrhoea, where a woman has never had a menstrual period, is considered a rare manifestation of this disease [10].

In the present case, the patient was sputum smear positive-negative but had both skeletal and peritoneal involvement. The patient presented with pulmonary tuberculosis, tubercular arthritis in the right knee, tubercular wet peritonitis, and bilateral salpingitis. In the literature, the coexistence of pulmonary tuberculosis with tubercular arthritis in peripheral joints, as well as wet peritonitis and bilateral salpingitis, is uncommon [8].

CONCLUSION(S)

When considering the differential diagnosis for arthritis of the knee joint, along with wet peritonitis and bilateral salpingitis, tuberculosis should be considered as a significant possibility, particularly in areas where the disease is prevalent. In regions where tuberculosis is common, a high index of suspicion should be maintained when evaluating patients with predominant extrapulmonary symptoms. A vigilant attitude toward the complaints expressed by patients, especially in developing countries, can help in making an early diagnosis and initiating treatment for disseminated tuberculosis.

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PARTICULARS OF CONTRIBUTORS:

1. Junior Resident, Department of Respiratory Medicine, Jawaharlal Nehru Medical College, DMIHER, Sawangi, Wardha, Maharashtra, India.
2. Assistant Professor, Department of Respiratory Medicine, Jawaharlal Nehru Medical College, DMIHER, Sawangi, Wardha, Maharashtra, India.
3. Professor and Guide, Department of Respiratory Medicine, Jawaharlal Nehru Medical College, DMIHER, Sawangi, Wardha, Maharashtra, India.
4. Professor and Head, Department of Respiratory Medicine, Jawaharlal Nehru Medical College, DMIHER, Sawangi, Wardha, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Pankaj Wagh,
Assistant Professor, Department of Respiratory Medicine, Jawaharlal Nehru Medical College, DMIHER, Sawangi, Wardha-442005, Maharashtra, India.
E-mail: mr.mayekar29@gmail.com

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