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Localized Disseminated Tuberculosis in A 3 Year's Old Bangladeshi Boy: A Case Study

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Abstract

Introduction and importance: An uncommon clinical variant of TB infection known as localized disseminated tuberculosis exclusively manifests as hepatic injury-related signs and symptoms with little to no extrahepatic involvement. It typically manifests as a generalized syndrome with systemic symptoms, which can occasionally create a diagnostic conundrum. It can be exceedingly challenging to make a conclusive diagnosis and calls for a high index of suspicion.

Case presentation: Male Three-year-old patient was taken to the medical department because of a weeping visible lump in the disseminated TB area. Physical examination revealed nothing unusual, save for a bad overall state and hepatosplenomegaly-related discomfort. Parents say that nothing has changed over time. Yet after two weeks, the situation started to shift.

Clinical Discussion: The specimen that was received in formalin with the correct lab number and the patient's identification is made up of an atypical fibrofatty piece of tissue. It is 2.5*1.5*1.0 cm in size. the gray-white sliced surface was discovered. incorporated two blocks. An inspection under a microscope revealed fibrofatty tissue that included granulation tissue. They have a significant infiltration of Lamghan's giant cells, epithelioid lesions, histiocysts, and degenerative polymorphs in certain regions.

Conclusion: Atypical clinical symptoms are typically linked to tuberculosis. To confirm a diagnosis, particularly in cases of extrapulmonary TB, imaging evaluation along with histological characteristics, a high index of clinical suspicion, and improvement with antibacilar therapy are required.

Keywords: Disseminated Tuberculosis; Epithelioid Lesions; Histiocysts; Antibacilar Therapy

Introduction

Even as we reach the next millennium, tuberculosis-one of the oldest illnesses known to mankind remains a significant issue. It continues to be the greatest cause of infectious illness mortality globally [1]. There is concrete proof that a worldwide pandemic [2] exists, and it has far from being completely eliminated. The emergence of multidrug resistant strains of Mycobacterium tuberculosis, migration of people from areas of high prevalence to areas of low endemicity, unfavorable social conditions, and ineffective public health surveillance programs are just a few of the factors contributing to the resurgence of tuberculosis. About 10% of TB cases are extrapulmonary, and cutaneous tuberculosis accounts for a very tiny part of these cases [3]. Children, whose immune systems are often underdeveloped and whose

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medicine compliance is typically poor, experience all of the aforementioned issues in greater detail. In India, 10%-15% of all fatalities in children under the age of 15 are thought to be related to tuberculosis [4]. Although though cutaneous TB only accounts for a small share of the tuberculosis cases in these kids, it is only reasonable that its prevalence has been rising accordingly. It is remarkable that there is so little research on children cutaneous TB given the complicating issues. Given that Mycobacterium TB (M. tuberculosis) was found in specimens taken from two non-contiguous organs, namely the lungs and the calcaneus, the patient in the case report had disseminated tuberculosis [5], by definition. When m. tuberculosis is isolated from blood, bone marrow, or specimens from two or more non-contiguous organs in a single patient, tuberculosis is said to have spread [6]. This concept has to take into account the molecular identification of M. tuberculosis in the current era of molecular diagnostics. Given that sufficient numbers of CD4 and CD8 T lymphocytes are needed to mount a host defense (via interferon gamma production) against M. tuberculosis infection [7] and in light of the observation that, even among subjects who do not have human immunodeficiency virus (HIV) coinfection, those with disseminated disease (military or localization in more than one location) were more likely to have the disease. Lymphocytopenia may have been a 4 Moreover, posttreatment CD4 levels in the study's disseminated illness remained considerably (P14 0.005) lower than comparable posttreatment cell counts in the study's localized disease [8]. Like in many high-burden nations, [9-10] Bangladesh has a shockingly low rate of pediatric tuberculosis (TB) detection. For children aged 0 to 14 years, the Bangladesh National Tuberculosis Programme (BNTP) reported a TB incidence of 9 per 100 000 [11]. Among of the more than 500 sub-districts in the nation, a 2008-2009 thorough study of two sub-districts reported a child TB prevalence of 52/100 000 children, which is over six times higher than official BNTP estimates. Adult TB prevalence in the same region was estimated to be 207/100,000 people, with children accounting for almost 20% of all cases identified. Considering these figures, it is predicted that the BNTP misses about 21 000 TB diagnoses in children each year [12]. According to our observations, the majority of children in Bangladesh who are diagnosed with TB are older than 8 years old, able to expectorate, or exhibit outward signs of the disease, including cervical lymphadenopathy or a gibbus [13-14]. This age and illness pro- le points to a serious underreporting of TB, particularly among the youngest and most fragile children, where it is most difficult to identify cases. We described a case report of a 3-year-old Bangladeshi kid who had localized, disseminated TB, and we emphasized the clinical illustration of this condition.

Case Report

Male Patient, 3 years old was brought to the medicine department due to a visible mass in the disseminated tuberculosis region, which protruded with crying. Physical examination was unremarkable, except for a poor general condition and a tenderness associated with hepatosplenomegaly. Parents report no changes in size over time in a resting condition. But the size got changes after two weeks. Laboratory investigation showed that hemoglobin, 12.0g/dL; white blood cell count, 13.80 K/ul, with a shift to the left; platelet cell count, 410 K/ul; ESR 9mm in hr, Total RBC count 5.06 M/ul, HCT 37.0 %, Lymphocyte 8.27 K/ul, RDW-CV 13.2%, RDW-SD 34.7%. The histopathology report showed that Specimen received in formalin with proper lab no and with patient's identification consists of an irregular fibrofatty piece of tissue. It measures 2.5X1.5X1.0 cm. The cut surface found as gray white. Embedded two blocks. Microscopic examination showed that fibro fatty tissue containing granulation tissue. These contain dense infiltration of degenerative polymorphs, histiocysts, focal collection of epithelioid cells and Lamghans giant cells in some areas. Areas of casearation nacrosis are seen. No maligency are seen. A computed tomographic (CT) scan of the thorax and abdomen revealed hepatomegaly, a thicker pericardium with symptoms of calcification, and a minor left pleural effusion. A chest X-ray indicated a distinct both side in bottom line effusion and there was now cardiomegaly. With a thicker pericardium and developing calcification mostly over the right heart and no obvious hemodynamic impairment, the echocardiography with color Doppler supported the diagnosis of constrictive pericarditis (CP).

Figure 1: Lymph Node of study Patients.

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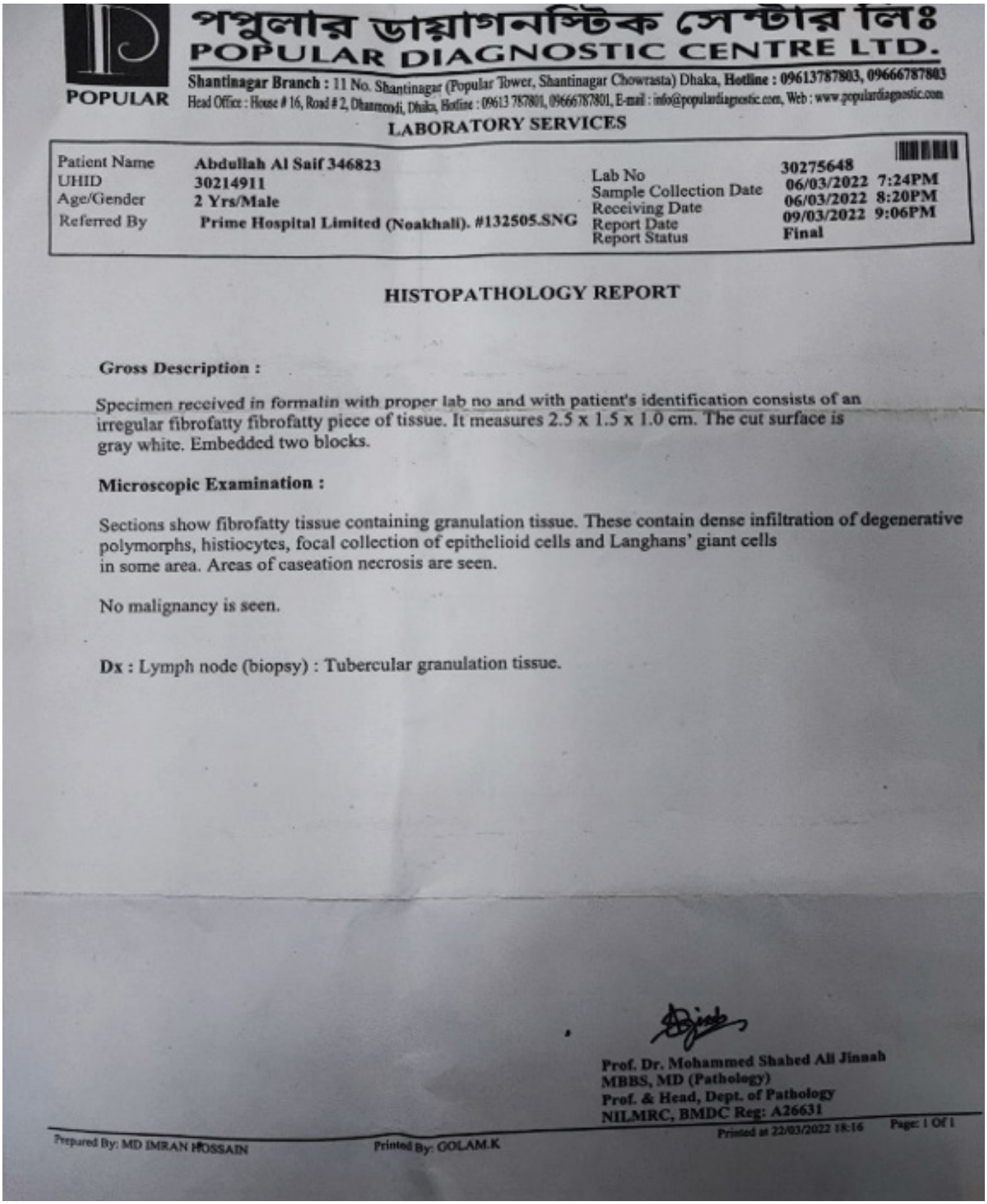

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Patient Name	Abdullah Al Saif 346823	Lab No	30275648
UHID	30214911	Sample Collection Date	06/03/2022 7:24PM
Age/Gender	2 Yrs/Male	Receiving Date	06/03/2022 8:20PM
Referred By	Prime Hospital Limited (Noakhali). #132505.SNG	Report Date	09/03/2022 9:06PM
		Report Status	Final

HISTOPATHOLOGY REPORT

Gross Description :

Specimen received in formalin with proper lab no and with patient's identification consists of an irregular fibrofatty fibrofatty piece of tissue. It measures 2.5 x 1.5 x 1.0 cm. The cut surface is gray white. Embedded two blocks.

Microscopic Examination :

Sections show fibrofatty tissue containing granulation tissue. These contain dense infiltration of degenerative polymorphs, histiocytes, focal collection of epithelioid cells and Langhans' giant cells in some area. Areas of caseation necrosis are seen.

No malignancy is seen.

Dx : Lymph node (biopsy) : Tubercular granulation tissue.

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Figure 2: Histopathological Report of Patient.

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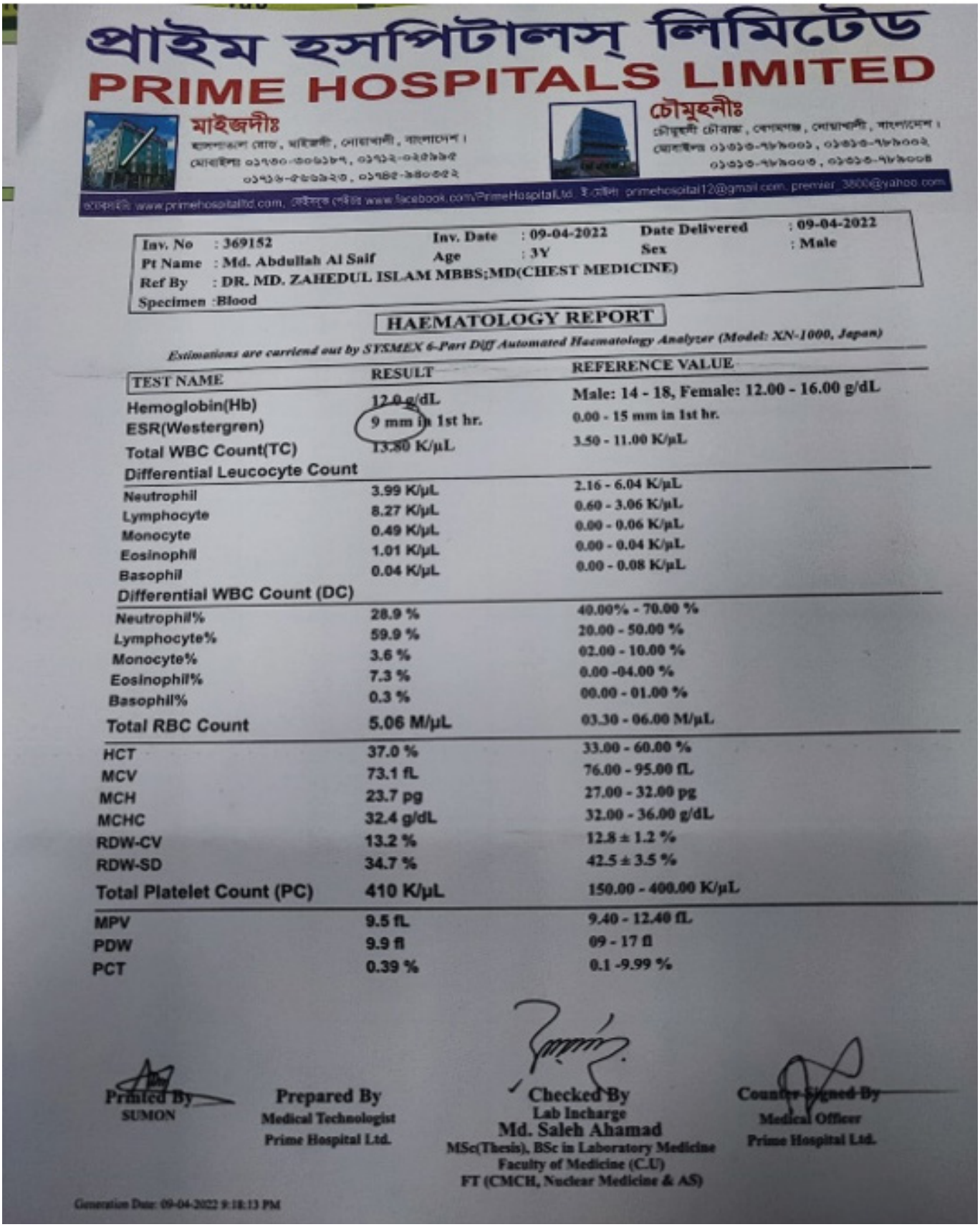

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Inv. No	: 369152	Inv. Date	: 09-04-2022	Date Delivered	: 09-04-2022
Pt Name	: Md. Abdullah Al Saif	Age	: 3Y	Sex	: Male
Ref By	: DR. MD. ZAHEDUL ISLAM MBBS;MD(CHEST MEDICINE)				
Specimen	:Blood				

HAEMATOLOGY REPORT

Estimations are carriend out by SYSMEX 6-Part Diff Automated Haematology Analyzer (Model: XN-1000, Japan)

TEST NAME	RESULT	REFERENCE VALUE
Hemoglobin(Hb)	12.0 g/dL	Male: 14 - 18, Female: 12.00 - 16.00 g/dL
ESR(Westergren)	9 mm in 1st hr.	0.00 - 15 mm in 1st hr.
Total WBC Count(TC)	13.80 K/µL	3.50 - 11.00 K/µL
Differential Leucocyte Count		
Neutrophil	3.99 K/µL	2.16 - 6.04 K/µL
Lymphocyte	8.27 K/µL	0.60 - 3.06 K/µL
Monocyte	0.49 K/µL	0.00 - 0.06 K/µL
Eosinophil	1.01 K/µL	0.00 - 0.04 K/µL
Basophil	0.04 K/µL	0.00 - 0.08 K/µL
Differential WBC Count (DC)		
Neutrophil%	28.9 %	40.00% - 70.00 %
Lymphocyte%	59.9 %	20.00 - 50.00 %
Monocyte%	3.6 %	02.00 - 10.00 %
Eosinophil%	7.3 %	0.00 -04.00 %
Basophil%	0.3 %	00.00 - 01.00 %
Total RBC Count	5.06 M/µL	03.30 - 06.00 M/µL
HCT	37.0 %	33.00 - 60.00 %
MCV	73.1 fL	76.00 - 95.00 fL
MCH	23.7 pg	27.00 - 32.00 pg
MCHC	32.4 g/dL	32.00 - 36.00 g/dL
RDW-CV	13.2 %	12.8 ± 1.2 %
RDW-SD	34.7 %	42.5 ± 3.5 %
Total Platelet Count (PC)	410 K/µL	150.00 - 400.00 K/µL
MPV	9.5 fL	9.40 - 12.40 fL
PDW	9.9 fl	09 - 17 fl
PCT	0.39 %	0.1 -9.99 %

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Figure 3: Hematology Report of Patient.

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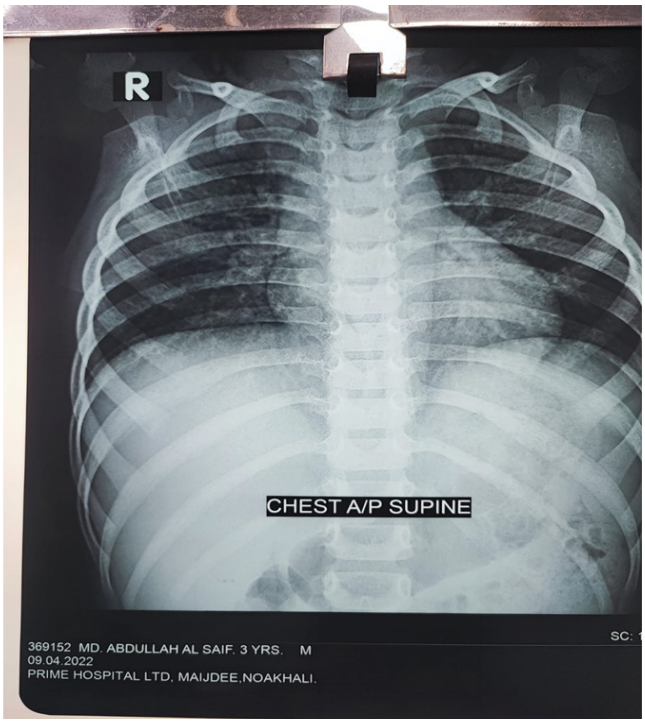

Figure 4: X-ray Report.

Discussion

M. tuberculosis, which causes TB, is a chronic infectious illness that can affect any organ but primarily affects the lungs. The symptoms of TB vary depending on the underlying organ implicated in the disease. It typically manifests as a generalized constitutional illness with systemic symptoms, which can occasionally create a diagnostic conundrum. Less than 1% of all TB cases are hepatic, making it a rare [10] illness. 4 As a result of the lack of distinct clinical symptoms and imaging characteristics, the rate of clinical misdiagnosis is significant [11]. As in our case, the presenting symptoms were fever, night sweats, malaise, anorexia, weight loss, and abdominal discomfort, which are often vague and primarily constitutional in character. The primary symptom, hepatomegaly, is present in over 50% of patients [11] and is often discovered with an increase in liver tests. Nevertheless, these characteristics are not specific and can be seen in a variety of other illnesses and situations, including amyloidosis, echinococcosis, metastatic cancer, liver abscess, and granulomatous disorders with other etiologies. [12] Alkaline phosphatase and gamma glutamyl-transpeptidase levels are occasionally noticeably high, although serum aminotransferases and bilirubin levels might be modestly elevated or normal. [14] In some series, abnormal prothrombin times have frequently been discovered. Anemia, leukocytosis, and elevated erythrocyte sedimentation rates are typical non-specific test abnormalities. [16]. In our case study, all these laboratory abnormalities were seen. As the majority of granulomas are often found close to the portal system and liver function is only mildly perturbed, most patients have relatively moderate symptoms or are asymptomatic [17]. In disseminated TB autopsy series, liver involvement was discovered in 80-100% of the patients [18]. There were no indications of pulmonary illness in our patient. The emergence of a distinctive pleuritic discomfort and a tiny left pleural effusion, however, suggested this was another location of the illness. After lymph node involvement, pleural tuberculosis is the second most common extrapulmonary TB location [13]. Although the rupture of a subpleural caseous focus inside the lung into the pleural space is assumed to be the cause of pleural TB infection, it is possible that it occasionally results from hematogenous spread or contamination from nearby infected lymph nodes [13]. Since additional illnesses might be linked to a positive reaction, the tuberculin skin test is of limited utility as a diagnostic tool. It can also come back negative, especially in individuals with extrapulmonary TB [5]. T-cells that are specific for the M. tuberculosis antigen are discovered using more precise interferon gamma release assays (IGRAs) [5] When used in conjunction with strong clinical suspicion, radiography, and other medical and diagnostic assessments indicative of TB illness, this indirect test for tuberculosis infection-including infection leading to active disease-is authorized and of substantial value [14]. Sometimes the clinical diagnosis of TB is only verified after a patient has fully recovered as a result of antitubercular treatment [5]. In addition to the presence of epithelioid granulomas in the liver biopsy, pleural effusion, and signs of constrictive pericarditis on CT and echocardiography, the patient's low-grade fever, loss of appetite, hepatomegaly, and laboratory data that indicate a chronic inflammatory or infectious process all pointed toward tuberculosis as the primary diagnosis. Non-Hodgkin lymphoma was not suspected in a patient with systemic involvement because there was no lymphadenopathy and no aberrant blood morphology.

Conclusion

Extrapulmonary tuberculosis lacks the traditional clinical signs and imaging diagnostic, making it simple to make a false diagnosis and postpone treatment. The epithelioid granuloma with central caseating necrosis is the distinguishing feature of disseminated and extrapulmonary TB histopathology, and the diagnosis is made based on the discovery of acid-fast bacilli in a smear or culture and/or the presence of caseous granulomas in a tissue specimen. Yet, TB bacilli are hardly ever seen. The diagnosis of this entity, which is easily controlled medically but can be fatal if untreated, requires a high level of clinical suspicion.

Abbreviations

None

Conflicts of interest

None.

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Ethical approval

Hospital exempts ethics approval for reported cases

Consent Written

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Authorship contribution statement

All authors equally contributed to the analysis and writing of the manuscript.

Research registration

Not applicable.

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