

## Case Report

# Tubercular lymphadenopathy

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## ABSTRACT

Tubercular mediastinal lymphadenopathy is a condition characterized by the abnormal enlargement of lymph nodes in the mediastinum also known as tuberculous lymphadenitis which can be acquired from close contact with an infected person. *Mycobacterium tuberculli* is one of the main causative agents of this dreadful infectious disease. The symptoms usually present are weakness or fatigue, weight loss, chills, fever, and sweating at night. After ruling out the clinical diagnosis it is treated in 2 phases i. e.; intensive phase or the initial phase and continuation phase followed by initial phase. It is also called as RIPE regimen for treating tuberculosis. The therapy recommended as per body weight of the patient.

**Keywords:** Extrapulmonary tuberculosis, Lymphadenitis, Anti-tubercular treatment, Fixed drug combination, National tuberculosis elimination programme

## INTRODUCTION

Tuberculosis (TB) continues to be a significant health burden in India, with the country contributing approximately 20% of the global TB caseload, as highlighted in the annual WHO report. TB is particularly concerning in individuals with compromised immunity, such as those living with HIV, due to its opportunistic nature. The disease is known for its diverse clinical manifestations, capable of affecting not just the lungs but almost any organ in the body.

Mediastinal lymphadenopathy refers to the enlargement of lymph nodes located in the mediastinum, the central region in the thoracic cavity situated between the lungs. This condition may develop due to a variety of causes, ranging from infections and autoimmune diseases to cancers. Symptoms often include chest discomfort, breathing difficulties, and a persistent cough. Because of the broad spectrum of potential causes, it is essential to conduct a

tissue biopsy and histological examination to arrive at an accurate diagnosis. In the case discussed, diagnostic testing confirmed tuberculosis as the underlying cause- a non-malignant, yet serious, infectious origin of lymph node enlargement.<sup>1</sup>

### Classification of tuberculosis

Tuberculosis (TB) is categorized based on the location of the infection within the body. The two primary forms are as followed (a) pulmonary tuberculosis (PTB)- this form of TB primarily affects the lungs and is the most common type. It is caused by the bacterium *Mycobacterium tuberculosis*. Individuals with PTB may experience symptoms such as a persistent cough lasting several weeks, fever, night sweats, unexplained weight loss, and occasionally, blood-tinged sputum. PTB is particularly significant from a public health perspective, as it can be transmitted through airborne droplets expelled when an infected person coughs or sneezes; and (b) extrapulmonary tuberculosis (EPTB)- in extrapulmonary TB, the infection

extends beyond the lungs, spreading via the bloodstream or lymphatic system to other areas of the body. This form can involve various organs, including the lymph nodes, pleura, abdominal organs, bones and joints, genitourinary system, skin, and the central nervous system (brain and spinal cord). When the lymph nodes are affected, the condition is referred to as tuberculous lymphadenitis or tubercular lymphadenopathy, which commonly presents as painless swelling of lymph nodes in regions such as the neck, chest, or abdomen.<sup>2</sup>

### **Etiology**

Tuberculosis develops when a person inhales airborne droplets that carry the *Mycobacterium tuberculosis* bacterium, often released when an infected individual talks, sneezes, or coughs. This organism primarily targets the lungs but can spread to other parts of the body, including the lymphatic system.

The chances of developing lymph node TB increase in people whose immune responses are weakened, such as those undergoing treatment for chronic illnesses or living with conditions like HIV or diabetes. Additional risk factors include residing in environments with poor hygiene, close quarters, or limited access to healthcare. Nutritional deficiencies can further compromise the body's ability to resist infection, making malnourished individuals more vulnerable.<sup>2</sup>

### **Clinical features**

The signs and symptoms can be classified as into two categories i.e. Active TB Disease and Inactive TB disease. Symptoms of active tuberculosis depend on where in the body the TB germs are growing. TB germs usually grow in the lungs (pulmonary TB): (a) active TB: in the lungs it may cause symptoms such as: bad cough that lasts 3 weeks or longer, pain in the chest, Coughing up blood or sputum (phlegm) from deep inside the lungs. Other symptoms of active TB disease are-weakness or fatigue, weight loss, no appetite, chills, fever, and sweating at night. TB disease of the lymph nodes may cause a firm red or purple swelling under the skin. TB disease of the kidney may cause blood in the urine. TB meningitis may cause headache or confusion. TB disease of the spine may cause back pain; and (b) inactive TB: people with inactive type of tuberculosis do not have symptoms of TB disease. However, without treatment, they can develop active TB disease and become sick.<sup>3</sup>

### **Diagnostic findings**

A complete medical evaluation for TB disease has following components: (a) medical history- when conducting a medical history, the health care provider should ask about the presence of symptoms of TB, and if so, for how long is patient exposed to a person with TB disease, note risk factors for exposure to TB bacteria, and enquire if the person has underlying medical conditions,

especially HIV, other immunocompromising conditions, that can increase the risk for progression from latent TB infection to TB disease; (b) physical examination: a physical examination cannot be used to confirm or rule out TB disease. However, it is an essential part of any evaluation and can reveal factors that may affect treatment if the patient is diagnosed with TB disease. Some signs of extrapulmonary TB disease (for example, redness and swelling over the infected lymph nodes of scrofula) may be observed during a physical examination; (c) laboratory tests- the tests that is used to determine if a person has been infected with TB bacteria is TB skin test (Mantoux tuberculin skin test) Tuberculin test is an intradermal test which detects the delayed hypersensitive reaction against mycobacterial antigen, using PPD i.e. purified protein derivative as a reagent; (c) Chest radiographs (X-rays): it help differentiate between latent TB infection and in people with positive results from TB skin test. A posterior-anterior chest radiograph is used to detect chest abnormalities. Lesions may appear anywhere in the lungs and may differ in size, shape, density, and cavities; (d) imaging tests: Imaging tests are non-invasive procedures used to assess the size and number and position of lymph nodes in the chest using contrast-enhanced computed tomography (CECT); (e) bacteriologic examination- examinations of clinical specimens for bacteriologic examination includes- (i) Specimen collection, transport, and processing: Patients presumed to have pulmonary TB disease may cough up sputum (phlegm) into a sterile container for processing and examination. Patients should have at least three consecutive sputum specimens examined, each collected in 8 to 24-hour intervals (at least one collected early in the morning). In patients who have presumed extrapulmonary TB disease, the way specimens are obtained depends on the part of the body affected; (ii) AFB smear classification: specimens are smeared onto a glass slide and stained so that they can be examined for acid-fast bacilli (AFB) under a microscope. When AFB are seen in a smear, they are counted and classified as 4+, 3+, 2+ or 1+, according to the number of AFB seen. The greater the number, the more infectious the patient; (iii) nucleic acid amplification (NAA) tests- it is used to amplify DNA and RNA segments to rapidly detect *M. tuberculosis* DNA in specimens in just hours, compared to a week or more for detection of TB bacteria in culture; and (iv) molecular detection of drug resistance (MDDR) assays allow rapid detection of drug resistance through the detection of genetic mutations associated with resistance. AFB smear positive results or NAA test positive results should be sent for molecular drug resistance testing immediately; and (v) HIV testing- TB patients must be informed (e.g., through a patient brochure, practice literature/form, or discussion) that an HIV test will be included in the standard tests and that it is important test to be ruled out.<sup>4</sup>

### **Treatment**

The approach to treating tuberculosis involves two main phases: an initial stage to quickly reduce the infection and

a follow-up stage to ensure complete elimination of the bacteria. This structured method is essential for achieving full recovery and preventing relapse. Under the National Tuberculosis Elimination Programme (NTEP), patients receive FDCs- tablets that combine several medications into one. This method helps avoid missed doses of individual drugs and lowers the chance of the bacteria becoming resistant. It also makes medication handling and distribution easier for healthcare systems- (a) initial (intensive) phase- this first stage of therapy is focused on aggressively targeting the TB bacteria during the early weeks of illness. It typically lasts two months and involves a combination of four drugs: isoniazid (H), rifampicin (R), pyrazinamide (Z), and ethambutol (E). Together, these form what is commonly called the RIPE regimen. The purpose of this phase is to rapidly bring down the number of active bacteria, reduce the chance of complications, and stop the infection from spreading. The amount of medication given depends on the patient's weight to ensure correct dosing; (b) follow-up (continuation) phase- once the intensive phase is complete, treatment moves into a maintenance stage that continues for an additional 4 to 7

months. During this time, the focus is on clearing out any remaining bacteria that may still be present in a dormant form. Typically, isoniazid and rifampicin are used, with ethambutol added in certain cases. A 4-month course is suitable for most patients with uncomplicated TB. A 7-month course is preferred if the person has HIV, extensive lung damage, or other medical complications.

To support this phase, NTEP supplies a different set of combination tablets that adjust to the changing drug needs: (a) for the initial phase: One tablet includes H 75 mg, R 150 mg, Z 400 mg, E 275 mg; and (b) for the continuation phase: The tablet includes H 75 mg, R 150 mg, and E 275 mg. These tablets are formulated to ensure consistent drug strength and effectiveness, especially for critical medications like rifampicin.

The Ni-kshay portal of the government also helps in real-time reporting of new TB cases. Also, by technological implementation of online platform E-Nikshay doctors can notify the cases who come across the infected patient.<sup>2</sup>

**Table 1: Depicting FDC schedule.<sup>5</sup>**

| Daily FDC Regimen-Revised May 2019, with new weight bands for TB treatment |                                          |             |                  |                                      |             |                  |
|----------------------------------------------------------------------------|------------------------------------------|-------------|------------------|--------------------------------------|-------------|------------------|
| FDC schedule for ADULTS, new and previously treated TB                     |                                          |             |                  |                                      |             |                  |
| Weight category (kg)                                                       | Intensive phase                          |             |                  | Continuation phase                   |             |                  |
|                                                                            | HRZE (4FDC) 75/150/400/275 mg per tablet | Doses in IP | Number of strips | HRZE (3FDC) 75/150/275 mg per tablet | Doses in CP | Number of strips |
| 25-34                                                                      | 2                                        | 56          | 4×28             | 2                                    | 112         | 8×28             |
| 35-49                                                                      | 3                                        | 56          | 6×28             | 3                                    | 112         | 12×28            |
| 50-64                                                                      | 4                                        | 56          | 8×28             | 4                                    | 112         | 16×28            |
| 65-75                                                                      | 5                                        | 56          | 10×28            | 5                                    | 112         | 20×28            |
| >75*                                                                       | 6                                        | 56          | 12×28            | 6                                    | 112         | 24×28            |

Note: \*-Weight more than 75 kg, may be treated with 5 dose regimens if not tolerating 6 doses.

## CASE REPORT

A 52-year-old male patient presented to the Surgery department of our hospital with chief complaints of soft tissue swelling over the chest area. On clinical examination, a whitish soft tissue bulge was noted over manubrium. The bulge measured approximately 3×2 cm, with overlying skin appearing mildly erythematous but intact. On palpation, it was soft, non-tender, and fluctuant in consistency, without any evidence of sinus formation or discharge.

Considering the clinical findings, the patient was advised a chest X-ray and routine blood investigations. The chest X-ray was normal. The patient did not exhibit any pulmonary symptoms, and sputum examination for acid-fast bacilli (AFB) was negative. Laboratory results revealed a raised erythrocyte sedimentation rate (ESR), and the Mantoux test was strongly positive. Based on these findings, the patient was taken to the operation theatre, and an excisional biopsy was performed. Tissue samples from the lesion and adjacent lymph nodes were collected and sent for histopathological examination.

On gross examination, the specimen included grey-yellow soft tissue pieces along with fatty tissue bits. Histopathological analysis revealed caseous necrosis with focal epithelioid granulomas, consistent with a diagnosis of tuberculous lymphadenitis. Confirmation of Mycobacterium tuberculosis was achieved through CB-NAAT testing.

Following microbiological confirmation of extrapulmonary tubercular lymphadenopathy, the patient was started on anti-tubercular treatment (ATT) under the National Tuberculosis Elimination Programme (NTEP) as per the Fixed Drug Combination (FDC) regimen. At the time of initiation, the patient weighed 66 kilograms.

The intensive phase comprised daily administration of HRZE (isoniazid 75 mg, rifampicin 150 mg, pyrazinamide 400 mg, and ethambutol 275 mg) for a total of 56 doses. This was followed by a continuation phase with HRE (isoniazid 75 mg, rifampicin 150 mg, and ethambutol 275 mg) for 112 doses. Directly observed therapy (DOTS) was initiated on 27th November 2024, and the patient's Nikshay ID/TB Notification Number was 93179361.

During follow-up visits, the patient adhered well to treatment and reported no further symptoms, indicating satisfactory clinical response.



**Figure 1: Depicting chest X-rays of patient.**

**Table 2: Blood test values of patient.**

| LFT                                     | RFT                          |
|-----------------------------------------|------------------------------|
| <b>Bilirubin total- 0.73 mg/dl</b>      | Urea- 34 mg/dl               |
| <b>Bilirubin conjugated- 0.21 mg/dl</b> | Serum creatinine- 0.90 mg/dl |
| <b>SGOT- 53 IU/l</b>                    | Uric acid- 6.2 mg/dl         |
| <b>SGPT- 69 IU/l</b>                    |                              |
| <b>Albumin- 3.9 mg/dl</b>               |                              |
| <b>Total protein- 7.41 mg/dl</b>        | ESR- 60 mm/hr                |
| <b>Glucose- 96 mg/dl</b>                | HIV status- non-reactive     |

## DISCUSSION

Tubercular lymphadenopathy can be seen in individuals presenting history of contacts with respiratory tract infected patients. It may include systemic symptoms of fever, weight loss, fatigue. Cough may not be a prominent symptom. It may be clinically diagnosed with multiplicity and caseation of lymph nodes. Further it may be treated with antitubercular drugs. This case study can be supported by previous studies conducted by Iqbal et al on 29-year-old Indian Female who presented with a 3 month history of recurring fever, loose stools, and vomiting. There was no history of cough or skin lesions also her chest X-ray did not show any infiltrative hilar prominences. This similarity existed in previous study conducted in 2020 as well as the current study. There upon FNAC was done from right supraclavicular node that showed abundant caseous necrotic material of lymphoid cells resulting in tubercular lymphadenopathy.<sup>5</sup>

Similarly, the current study can also be supported by another case study conducted on tuberculosis lymphadenitis with systemic lupus erythematosus in young woman by Yunita et al. The patient complained of lump in right neck with diameter of 4cm in the past 4 months accompanied by fever and weight loss. Patient also experienced joint pain and hair loss. Chest radiography

showed no abnormalities and FNAC biopsy results confirmed tuberculous lymphadenitis. Patient had been taking advanced phase of antitubercular drugs. After undergoing the intensive phase of treatment, the submandibular lump got smaller to a diameter of 2 cm. Hence adherence to treatment regimen strictly is very important to prevent further complications.<sup>6</sup>

## CONCLUSION

Tubercular lymphadenopathy disease condition is complex to be diagnosed as well as its clinical presentation may be non-specific with just enlargement of lymph nodes being a common symptom present in patient. The location and size of affected lymph nodes requires advanced diagnostic techniques so that early diagnosis and treatment can be done to prevent complications like spread of infection or extensive tissue damage. Advance diagnostic procedures such as FNAC, biopsy with histopathological examination can aid in confirmation of disease. On the other hand, this case study also concludes strict adherence to treatment regimen. The case demonstrates that standard antituberculosis treatment is often successful only when adherence to prescribed medication is present i. e.; DOTS therapy.

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