

Tuberculosis Cases Resembling Mediastinal Masses

**Fatih Meteroglu¹, Atalay Sahin¹, Ozlem Abakay², Bulent Ozturk³,
Canan Eren⁴, T. Sevval Eren¹**

¹Dicle University, Medical School, Thoracic Surgery, ²Chest Disease
Diyarbakır Education and Research Hospital, ³Thoracic Surgery
Diyarbakır Children's Hospital, ⁴Microbiology

Abstract

Aim: Positron emission tomography/computed tomography (PET/CT) has been commonly used especially in thoracic cancer staging. However, it can yield false positive results in infectious and inflammatory diseases such as tuberculosis. We aimed to present cases of mediastinal and hilar lymph node tuberculosis with standart uptake value (SUV) max >2.5 and undiagnosed with non-surgical procedures.

Methods: Between April and June 2012, invasive procedures were performed in 11 patients who could not be diagnosed as tuberculosis despite laboratory and imaging tests.

Results: Patients included 3 men and 8 women with a mean age of 40.18 years. They underwent invasive surgical interventions for definitive diagnosis. Mediastinoscopy and thoracoscopy demonstrated tuberculosis.

Conclusion: Mediastinal and hilar masses may be seen in any age. They may have an asymptomatic course. They can be found on chest x-rays by chance. In differential diagnosis of these masses, tuberculosis is kept in mind where it is endemic.

Keywords: Mediastinal, Mass, Hilar, PET, Tuberculosis

INTRODUCTION

Mediastinal evaluation for thoracic diseases is important before choosing the best management strategy. The encountered controversial issues are associated with clinical mediastinal involvement. It depends on different imaging modalities such as PET/CT. Patients' clinical findings can not yield diagnostic clues and invasive interventions are required when non invasive procedures are in question. Controversial issues about PET/CT false positive or negative results. A SUV max > 2.5 implies the possible malignancy. This may also give false positive results in granulomatous diseases. False results mean that invasive procedures are necessary.

Lymph node tuberculosis (LNTB) is a common non-pulmonary tuberculosis (NPTB) location (1). Its incidence can vary in geographical distribution according to the populations. Non specific findings seen in pulmonary tuberculosis are less common in NPTB. Patients with NPTB manifest a relatively slow growing course although they rarely admit with acute onset. Few clinical findings and unnoticeable physical examination have caused delaying in diagnosis (2). Tuberculosis can mimic any disease and imaging finding clinically and radiologically (3). LNTB is the commonest non-pulmonary type in the reports from our country. Early diagnosis is essential for successful treatment. Routine laboratory studies including hemogram, C-reactive protein may fail in the diagnosis. Isolation of bacilli is required because of non-specific features of imaging tests. Invasive procedures are essential due to slow growth of TB bacilli. We aimed to present cases with tuberculosis diagnosed as lymphadenitis with the literature.

METHODS

Between April and June 2012, 11 patients were evaluated for clinical diagnosis of malignancy or infection in the chest clinic. They included patients with hilar and mediastinal lymph node enlargement and were not diagnosed as tuberculosis since their laboratory and imaging tests did not indicate TB infection. Before video assisted thoracoscopic surgery (VATS) and mediastinoscopy, all chest x-ray (CXR), computed tomography (CT) and positron emission tomography (PET-CT) of all patients were evaluated. Flexible bronchoscopy and transbronchial needle aspiration (TBNA) were carried out for all patients. Acid fast bacteria in sputum and bronchoalveolar lavage (BAL), bacteriologic and cytologic studies were carried out. Pathological examinations were irrespective.

RESULTS

Patients were 3 men and 8 women with a mean age of 40.18 years (23-82). Their prominent symptoms included cough, fatigue and loss of weight. Three of them did not have any sign of BCG vaccine. Tuberculin skin tests were not done because we did not think of pre-diagnosis of tuberculosis. Erythrocyte sedimentation rate of all cases were within normal limits (4-29 mm/h). PET-CT were undertaken in all patients who were undiagnosed with TBNA and other tests in the chest clinic. Hilar enlargement in CXR and hilar and mediastinal lymph node enlargement on CT were seen (Figure 1). Increased ¹⁸Fluorine-Fluoro Deoxy Glucose (¹⁸F-FDG) levels consistent with malignancy were found. Their mean standart uptake values (SUV) max was 3.51 (range 4.2-15.7) (Figure 2). Causes were discussed by multidisciplinary team. Cervical mediastinoscopy in 7 patients and VATS in 4 patients were performed in these undiagnosed cases (Table 1). Peroperative frozen section examinations

were non-malignant. Routine pathological examinations were necrotizing granulomatous caseifications consistent with tuberculosis. Patients received anti-tuberculosis treatment.

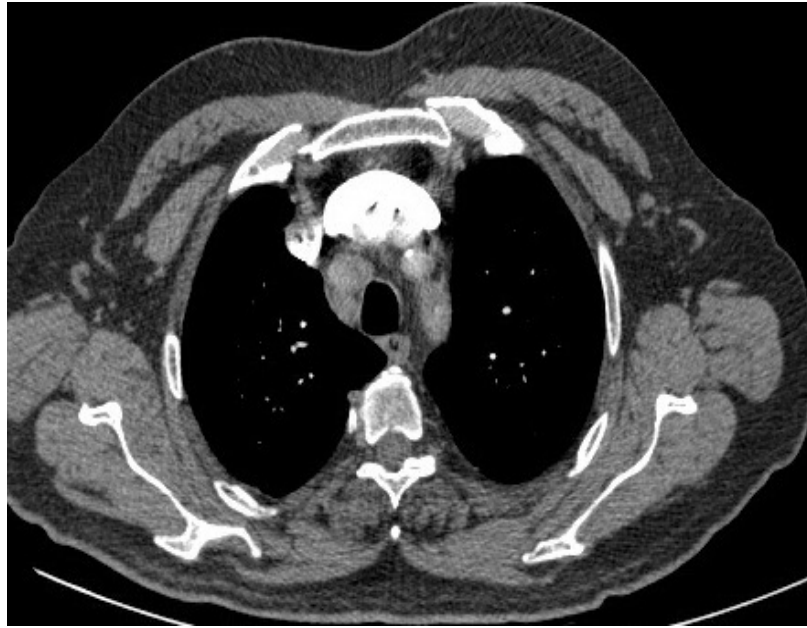


Figure 1. Right mediastinal lymph node enlargement on CT

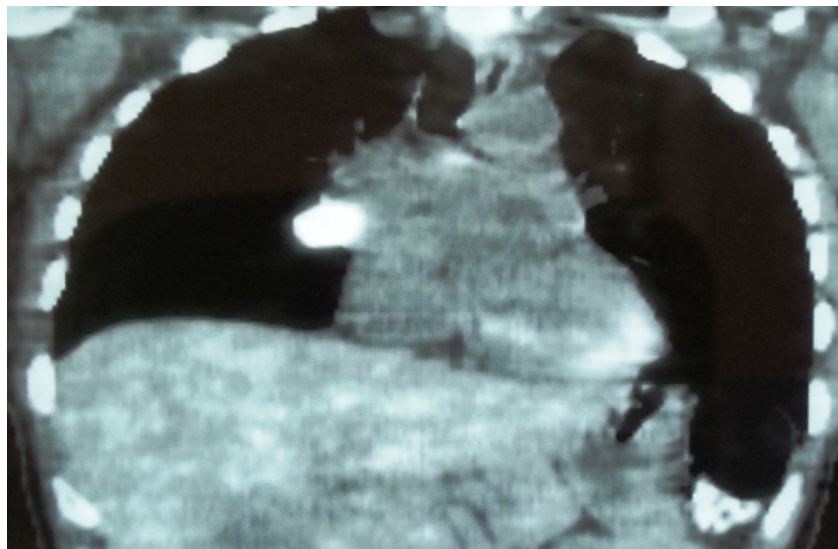


Figure 2. Right hilar lymphadenomegaly on PET/CT

Table 1: Characteristics of the patients and surgical procedures carried out.

No	Age	Gender	CT/CXR	PET-CT (SUV max)	Diagnostic Method
1	38	F	Mediastinal LAP	Subcarinal LAP, right hilar mass	15,7 3.5 Mediastinoscopy
2	57	F	Mediastinal LAP	Right # 2,4 LAP	4.2 Mediastinoscopy
3	83	M	Mediastinal LAP	Right # 2,4 LAP :	7,3 Mediastinoscopy
4	33	M	Mediastinal LAP	Right # 4 LAP	5,6 Mediastinoscopy
5	23	M	Conglomerated mediastinal LAP + left hilar mass?	Left lower paratracheal LAP aorticopulmonary, subcarinal, hilar LAP	14 VATS biopsy
6	43	F	Left hilar mass?	Left hilar mass?	6,3 VATS biopsy
7	34	F	Left hilar mass?	Left hilar mass?	6,7 VATS biopsy
8	29	F	Right hilar mass?	Right hilar mass?	8,4 VATS biopsy
9	41	F	Mediastinal LAP	Upper & lower paratracheal, aorticopulmonary LAP	7,3 Mediastinoscopy
10	29	F	Mediastinal LAP	Subcarinal LAP	5,4 Mediastinoscopy
11	32	F	Mediastinal LAP	Upper & lower paratracheal LAP	7,5 Mediastinoscopy

CT: Computed tomography, LAP: Lymphadenopathy, VATS: Video assisted thoracoscopic surgery, CXR: Posteroanterior chest graphy, PET-CT: Positron emission tomography-CT

DISCUSSION

Incidence of LNTB varies according to communities. In our country, pleura in 38 % and lymph node in 31.4 % were found the most common among 648 NPTB cases in 2011(4).

Female preponderance was reported in the literature (1,5). This rate was 1.75 (f/m) in our study population. On evaluation the results of studies discussing the relationship between tuberculosis focus in lungs and locations of LNTB, bacilli have been thought to be draining into the lymph nodes with a lymphatic flow (6). Mediastinal conglomerated nodes in eight cases, enlarged lymph node mimicking left hilar mass in two cases and the right hilar mass in one case were present. To omit that enlarged hilar or mediastinal lymph node can be part of tuberculosis in adults, is one of the common misdiagnosis of tuberculosis (7). It is difficult to verify the diagnosis bacteriologically because number of bacilli is low in NPTB and providing the tissue or the organ involved is troublesome (8). Further radiological evaluation and sometimes invasive interventions are necessary.

LNTB occurs: 1- after primary infection 2-Endogen reactivation of previously located bacilli in the node 3-through the neighboring infection (9,10). LNTB is recognised with typical histological view of granulomas with caseifying necrosis histopathologically. They were not found in cases of NPTB in immunocompromised patients. Cellular components of granulomas can not be found in HIV (+) patients (5).

Intrathoracic lymphadenitis in childhood is common as a part of primary pulmonary tuberculosis and seldom in adults. Mediastinal lymphadenitis is common in young females, elderly and patients with HIV (11). Our study population is an adult group. They had no history of tuberculosis. They had cough, fatigue and loss of weight.

Other causes of lymphadenopathy and cervical masses are kept in mind in differential diagnosis (10). Lymphadenopathy is caused by bacterial and fungal infections out of tuberculosis, benign conditions such as drug sensitivity and reactive hyperplasia and

malignant processes such as metastasis or lymphoma. Needle aspiration or incisional biopsy under local anesthesia in superficial lymphadenopathy for diagnosis is easy. This is difficult in mediastinal or hilar lymphadenopathy, so mediastinoscopy or VATS are important and essential.

FDG, like glucose molecule, is taken up according to the tissue metabolism. Its uptake is higher in malignancy and inflammatory disease due to higher metabolic rate. This condition can present similar results on PET/CT. Our patients exhibited higher density at PET imaging with SUV max >2.5 . PET/CT is an integrated diagnostic imaging modality commonly and increasingly utilized in managing and staging patients with malignancy. It yields false positive results in tuberculosis, inflammation and infection. Today, it is known that increased ^{18}F -FDG uptake in lung and thoracic malignancies has a high sensitivity and specificity. False (+) ^{18}F -FDG uptake for malignancies has been demonstrated in granulomatous inflammations such as tuberculoma (12,13). The increase of glycolysis of neutrophils, active inflammatory cells such as lymphocytes and macrophages is the main cause of raising in ^{18}F -FDG uptake of granulomatosis inflammation (14). Knight et al (15) found and reported SUV max of 9.3 in pulmonary tuberculosis and 8.7 in tuberculoma. Nordin et al (16) found SUV max 5.2-7.7 in ^{18}F -FDG in tuberculosis cases. Kim et al (17) evaluated 118 cases with mediastinal lesion and 24 of them were tuberculosis and had SUV max of 3.3 ± 1.2 and 4.2 ± 1.7 . In our cases, we did not diagnose TB despite TBNA, bronchoscopic biopsy, cytological studies. They had SUV max of 4.2-15.7 and we diagnosed surgically.

As evaluating any case with lymphadenopathy, tuberculin skin test and contact history should be investigated (1,6). Histopathological and microbiological examination of lymph

node biopsy is of choice in making diagnosis (6). Diagnostic value of TBNA in tuberculosis diagnosis of intrathoracic enlarged lymph nodes was reported to be high (18). Our patients, however, were undiagnosed cases despite TBNA and BAL cultures. Diagnosis was provided by VATS in 4 cases and mediastinoscopy in 7 cases.

CONCLUSION

Tuberculosis infection may mimic any disease especially where it is endemic. This is to be kept in mind during procedures regarding mediastinal and hilar lymph nodes .in endemic regions. LNTB can be present among lesions thought to be malignant on imaging of adult patients and manifest an increase in 18F-FDG uptake in PET/CT. Invasive procedures for the diagnosis are sometimes necessary besides microbiological tests. Bacteriological and histological diagnosis becomes mainstay before treatment. Mediastinal involvement should be carefully explained since metastasis may resemble TB lymphadenitis. Our study demonstrated PET/CT should not replace the tissue sampling. NPTB can involve any tissue or organ. As a routine proper evaluation method for diagnosis, it contribute the localization of the lesions to be biopsied.

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