

A CASE REPORT OF PULMONARY TUBERCULOSIS WITH EXTENSIVELY CALCIFIED EMPYEMA THORACIS DRAINED UNDER IMAGE GUIDANCE

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ABSTRACT

Pulmonary tuberculosis is a chronic granulomatous disease that affects the lung parenchyma and prevalent in developing countries. Empyema thoracis, otherwise known as pus in the pleural cavity, has become an associated, though uncommon, complication with the emergence of Human Immune-deficiency Virus (HIV).

We present a case of Pulmonary Tuberculosis (PTB) investigated radiologically and found to be complicated by extensive left pleural calcifications and empyema thoracis that was drained under ultrasound guidance.

KEYWORDS: Empyema thoracis, image guided drainage, PTB.

INTRODUCTION

Pulmonary tuberculosis (PTB) is a chronic granulomatous disease that affects the lung parenchyma and is prevalent in developing countries.¹ In Nigeria, a prevalence of 9.2% and a case fatality rate of 12% was reported in Ilorin.^{2,3} There is a resurgence of the incidence with the advent of Human Immune-deficiency Virus (HIV) infection.^{4,5} PTB can be a primary or secondary infection or reactivation of primary infections.

Empyema thoracis as a presentation in patient with PTB is not common because of the awareness on the need for anti-Koch's and availability of such drugs.⁶ Calcification in PTB can be seen in lymph nodes, and in the lungs field as evidence of previous infection⁶.

The following imaging modalities; chest radiograph, ultrasound scan of the chest wall and computed tomography scan can be used in investigating this patient.

A rare case of a 74-year-old man, with pulmonary tuberculosis and calcified empyema thoracis that was HIV negative.

CASE REPORT

Z. A, was a 74-year-old man that presented to the general outpatient department of Jos University Teaching Hospital (JUTH) with cough, weight loss and low back pain of 3 months duration. He had no associated night sweat, but had intermittent loose stool, constipation and poor appetite. He had presented to several hospitals before coming to JUTH.

Physical examination revealed an elderly pale and wasted man that was not dehydrated, anicteric and no lymphadenopathy. He had a respiratory rate of 20 breaths per minute with good air entry. There was dullness to percussion in the left lower zone. Crepitations were heard in all the lung fields but more marked on the left.

The cardiovascular, musculoskeletal and abdominal examinations were essentially normal.

An impression of pulmonary tuberculosis was made.

Full blood count (FBC) showed lymphocytosis, Packed cell volume (PCV) was 22%, Mantoux test was

positive, Retroviral screening (RVS) was non-reactive, sputum acid fast bacilli (AFB) was negative, erythrocyte sedimentation rate (ESR) was significant and urinalysis was normal. A fine needle aspiration produced foul smelling pus. Z-N stain was positive and Lowenstein-Jensen culture confirmed tuberculosis.

Chest radiograph (Figure 1) showed streaky opacities in both lung fields with pleural calcification in the right lower zone above the right hemi diaphragm. There was a lentiform opacity with a calcified rim in the left lateral chest. A gentle thoracic scoliosis with concavity to the left was noted. Slight trachea deviation to the right was noted, with left paratrachea soft tissue opacity.

Abdominal ultrasound scan showed normal prostate with a uniform echogenicity and regular outline. The urinary bladder contained clear urine and its wall was not thickened. The remaining intra-abdominal organs were essentially normal.



Figure 1: Chest radiograph shows streaky opacities in both lung fields with a lentiform opacity that has a calcified rim in the left lateral chest with associated blunting of the costophrenic angle. Tracheal deviation and paratrachea soft tissue opacities were noted.

Chest ultrasound showed hypoechoic collection in the left pleural cavity that has an echogenic calcific rim. The volume of the collection was 100mls.

Computed tomographic scan (Figure 2, 3 and 4) showed streaky and nodular densities in the lung fields. An oblong intermediate density collection with a calcified rim was seen in the left pleural, with pleural thickening beneath the calcified lesion. Pleural thickening was also seen in the lower lung zones bilaterally. There were calcifications seen in the right lower zone. Also noted were soft tissue densities in the para-tracheal areas bilaterally with associated narrowing of the tracheal.

Impression of pulmonary tuberculosis with calcified empyema thoracis was made.

The patient had ultrasound guided drainage of the pus, in which 85mls of thick pus was removed and was treated with anti-Koch's therapy and he is currently doing well.

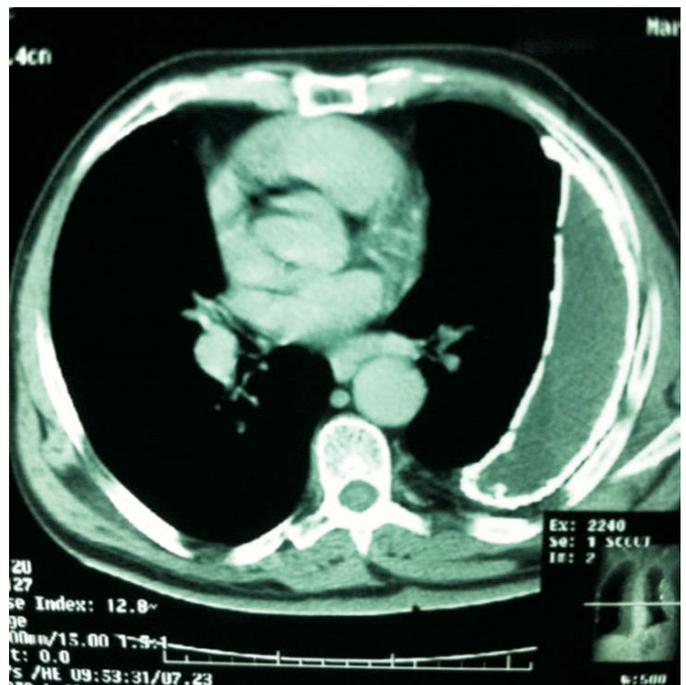


Figure 2: Axial contrast enhanced computed tomography of the chest on mediastinal window shows a left pleural collection that has a calcified rim.

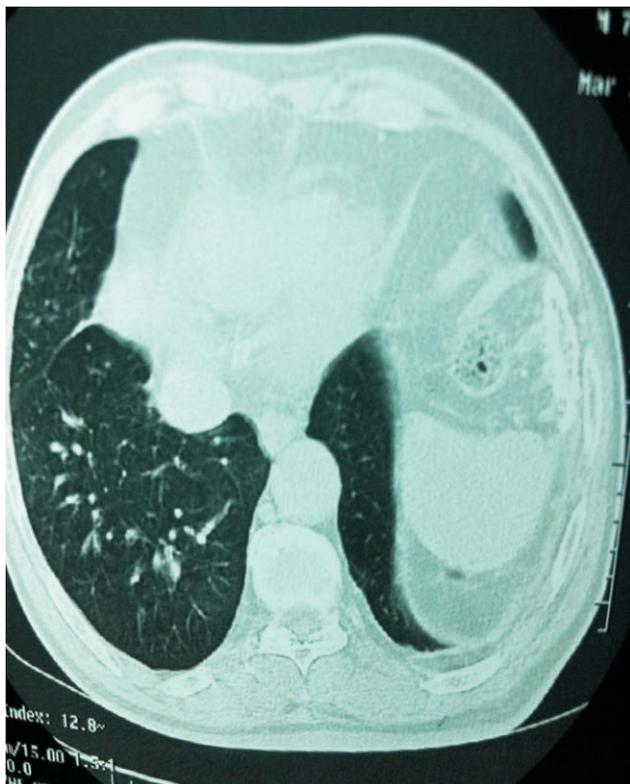


Figure 3: Axial computed tomography in lung window shows streaky and nodular in both lung fields with a left pleural mixed density collection that has a calcific rim. Left posterior pleural thickening is noted.

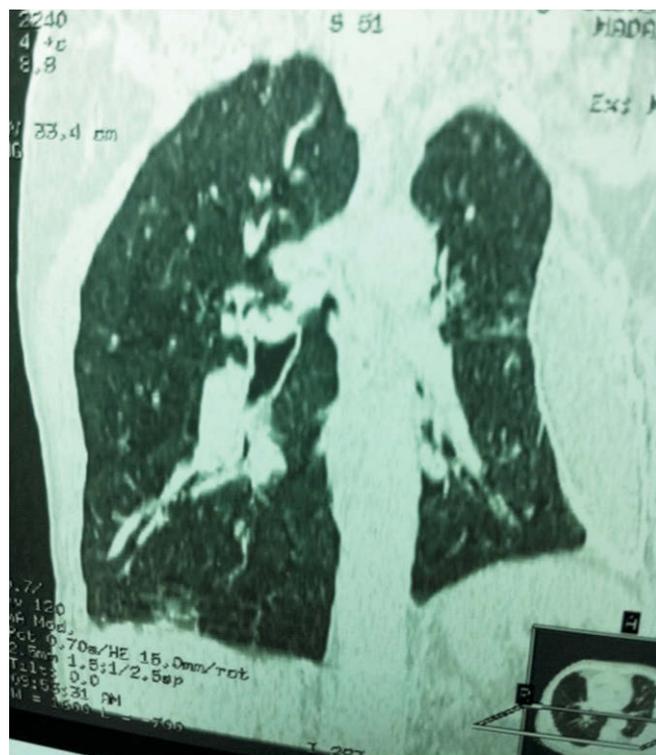


Figure 4: Coronal reformatted chest computed tomography shows streaky and nodular densities in both lung fields with left lateral collection that has a calcified rim.

DISCUSSION

Pulmonary TB affects all age group but is not very common in the extreme of ages.^{4,8} It is mostly the first form of tuberculosis infection in man.⁷ Empyema remains an important cause of morbidity, mortality and hospital admissions in the UK.⁹

Empyema thoracis is a purulent collection in the pleural cavity (frank pus) with thickening of its wall.⁵ It is mostly caused by bacteria, in which Staphylococcus is the main culprit, Mycobacterium tuberculosis can also be the cause,^{6,9} as seen in this case. Chest tumors can be associated with empyema thoracis.^{6,9} Pleural thickening and calcification was noted in secondary tuberculosis^{6,9} as demonstrated in this case.

PTB is associated with considerable morbidity and mortality worldwide.⁹ Its incidence is on the increase in western countries despite improvement in medical care and availability of effective antimicrobial therapy.⁹ Mycobacterium

tuberculosis is one of the most important causes of pleural infection, often associated with HIV co-infection.^{5,9} However this case is HIV negative.

Chronic and productive cough, weight loss and anorexia¹⁰ are some of the classical presentations of pulmonary tuberculosis, and these were seen in our case. There may be night sweat and fever^{11, 12, 13, 14} which was not seen in this case. Haemoptysis can also be a presentation,^{11,12} but was not in this patient.

The diagnosis of this disease was dependent on microbial and radiological investigations.⁹ Deranged laboratory results such as lymphocytosis, raised erythrocyte sedimentation rate, elevated mantoux and decreased packed cell volume may be seen in pulmonary tuberculosis,¹² as seen in this case. Retroviral screening may be negative and urinalysis may also be normal as seen in the index case.⁹ However, there has been an increase incidence of pulmonary tuberculosis with HIV infection. Pleural fluid aspirate may reveal M tuberculosis

after Ziel-Nelson and Lowenstein Jenson stains⁹ as seen in this case.

Chest radiograph may show nodular opacities and pleural thickening and calcification⁹ as seen in this case. Empyema thoracis was noted in this case which is not a common manifestation of pulmonary tuberculosis.¹ Radiography is commonly used in making the diagnosis in conjunction with laboratory investigation.⁹ Cavitory lesions, pleural effusion, lymphadenopathy and basal infiltrates may be present in post primary tuberculosis⁶ as in this patient. However, cavitory lesion were not seen in this case. The radiograph may be normal, which was not so in this case.⁶ The chest radiograph has been the initial diagnostic tool for the detection and evaluation of pleural effusion.¹⁵ For the detection of pleural effusion, more than 175 ml of fluid is required; this can obliterate the costophrenic angle on upright posteroanterior chest radiograph¹⁵ as seen in the index case. However, the lateral decubitus chest radiograph can demonstrate as little as 10 ml of free pleural fluid.¹⁵

Ultrasound is useful for the evaluation of a small amount of pleural fluid and as guidance for the thoracentesis or drainage catheter placement.¹⁵ Over the last decade, ultrasound has played a major role in the management of patients with pleural effusion¹⁵ as seen in this case. The advent of affordable and portable ultrasound has made bedside procedures possible not only in hospital rooms, but in intensive care units and emergency departments.¹⁵

Computed tomography (CT) is the imaging study of choice for the evaluation of pleural pathology and underlying lung disease.¹⁵ CT is more accurate to separate empyema from underlying compressed lung than a plain chest radiograph¹⁵ as seen in this case. CT with contrast enhancement may differentiate empyema from lung abscess and transudate from exudate.¹⁵ As a guidance tool, CT is especially useful to locate a skin entry site for thoracentesis or drainage catheter placement when ultrasound has a limited role due to adjacent bony structures, large patients, or air in the lung parenchyma.¹⁵

The goal in the management of pleural effusion is to provide symptomatic relief by removing fluid from the pleural space and to allow the treatment of the underlying disease.¹⁶ The management options often depend on the type of pleural effusion, stage in the evolution, and underlying disease.¹⁶ The first step for the treatment of pleural effusion is to determine

whether the fluid is a transudate or an exudate. Light and Rodriguez have proposed a classification and treatment scheme for pleural effusion based on the amount of fluid, gross and biochemical characteristics of fluid, and whether the fluid is loculated.¹⁷ According to their classification, a transudate is considered as uncomplicated effusion, which can be managed by conservative treatment or antibiotics alone. However, an exudative effusion or a large amount of loculated effusion, which is classified as complicated effusion, should be managed by drainage.¹⁷ The patient had ultrasound-guided drainage of the empyema. He was subsequently placed on 12 months anti-Koch therapy and he is currently doing well clinically.

CONCLUSION

A case of a 74-year-old man with complicated pulmonary tuberculosis is presented. Clinical and radiological findings were discussed. Ultrasound guided drainage of the pus was done and literature was reviewed.

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