

Case Report

Malignant pleural mesothelioma treated as pulmonary tuberculosis

Aiyekomogbon Joshua Oluwafemi^{1,2*}, Chom Nuhu D.³, Tabari Abdulkadir Musa⁴, Igashi Joseph Bako³, Delia Zira Ibrahim⁵ and Adamu Abdullahi⁶

¹Departments of Radiology, Federal Staff Medical Centre Abuja, Nigeria.

²Ahmadu Bello University Teaching Hospital, Zaria, Nigeria.

³Department of Radiology, Ahmadu Bello University/Ahmadu Bello University Teaching Hospital, Zaria, Nigeria.

⁴Department of Radiology, Aminu Kano Teaching Hospital, Kano/Visiting Consultant ABUTH, Zaria, Nigeria.

⁵Cardiothoracic Unit, Department of Surgery, Ahmadu Bello University Teaching Hospital, Zaria, Nigeria.

⁶Department of Radio-Oncology/Radiotherapy, Ahmadu Bello University Teaching Hospital, Zaria, Nigeria.

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A 45 year old man with malignant pleural mesothelioma had symptoms of prolonged cough, haemoptysis, breathlessness, weight loss and low grade persistent fever. The high prevalence of pulmonary tuberculosis in this environment, coupled with paucity of radiologists in rural areas to competently review his chest radiograph, resulted in making the wrong diagnosis of pulmonary tuberculosis (PTB) as against malignant pleural mesothelioma. He was also wrongly treated for PTB for a period of nine months before referral to a Teaching Hospital. The correct diagnosis was made in a university teaching hospital where adequate specialized manpower was available. Distant metastasis to the liver was already observed at presentation. He was treated with six courses of chemotherapy (Peclitaxel and Cisplatin) and he did well before he was lost to follow-up.

Key words: Malignant pleural mesothelioma, PTB, liver metastasis.

INTRODUCTION

Mesothelioma (or, more precisely malignant mesothelioma) is a rare form of cancer that develops from transformed cells originating in the mesothelium, the protective lining that covers many of the internal organs of the body. In the lungs, it is usually caused by exposure to asbestos (CancerHelp UK, 2010; Ashrafian et al., 2005). The most common anatomical site for the development of mesothelioma is the pleura (visceral and

parietal pleura), but can also arise in the peritoneum, and the pericardium, or the tunica vaginalis (CancerHelp UK, 2010). There seems to be no association between mesothelioma and tobacco smoking, but smoking greatly increases the risk of developing other asbestos-induced cancers (Stahel et al., 2010).

Malignant mesothelioma of the lungs poses an extraordinary challenge to the Pulmonologists, Cardio-

*Corresponding author. E-mail: femimogbon2002@yahoo.com.

thoracic Surgeons, and Radiologists because radiological and clinical findings may be indistinguishable from closely related differential diagnosis like pulmonary tuberculosis (PTB) (Stahel et al., 2010; Bianchi and Bianchi, 2007). Late diagnosis is therefore common, as it was in the index case.

This case is reported to reiterate the fact that malignant pleural mesothelioma and pulmonary tuberculosis share common clinical features and high index of suspicion is needed to avoid diagnostic pitfall.

CASE REPORT

A 45 year old male primary school teacher was referred from Federal Medical Center (FMC) Azare to Ahmadu Bello University Teaching Hospital (ABUTH) Zaria on account of poor response to nine month course of anti-TB drugs. He presented to the FMC eleven months earlier with a five month history of cough, breathlessness, low-grade fever and weight loss. A chest x-ray done suggested features of pulmonary tuberculosis (PTB) which led to commencement of anti-TB drugs. Following a nine month course of the anti-TB, deterioration of the clinical state of the patient as well as worsening of the radiological features on chest x-ray was noted. He was not a known hypertensive or diabetic patient. He neither smoked cigarette nor drank alcohol and has never worked in an asbestos factory. He denied history of being a passive smoker prior to the onset of his illness. Clinical examination revealed an ill-looking middle aged man, asthenic, with puffy red eyes and facial swelling. Massively distended neck veins as well as veins of the anterior chest wall were noted. There was right supraclavicular and left axillary lymphadenopathy. The nodes were averagely 1 cm in dimension, multiple, discrete, firm and freely mobile. No tenderness was elicited over them and there was no finger clubbing. Chest examination revealed diminished right chest expansion associated with dull percussion note and decreased air entry in the upper, middle and lower zones of the right lung. The left lung field was clinically clear but the trachea was mildly buckled to the left. No remarkable findings were noted in the remaining systems. Investigations requested included Contrast-enhanced chest CT scan and CT-guided biopsy of the right pleura mass, abdominal ultrasound scan and retroviral screening.

The chest scanogram revealed a homogenous opacity of soft tissue density in the right lung apex, extending through the right hilum to the lower zone, obliterating the ipsilateral cardiac border (Figure 1). The right main bronchus was compressed by the mass. There was right pleural fluid collection and non-homogenous opacities with background streakiness and nodularity in the remaining right lung fields. The left lung field and the rib-cage were preserved. Computed tomographic scan

(Figure 2 to 4) revealed a pleural base lobulated isodense mass (HU = 40) making an obtuse angle with the chest wall. It extended to the adjacent lung parenchyma and hilum, encircling and narrowing the right main bronchus. The distal trachea was bowed and displaced to the contralateral side. Associated nodular right pleural thickening and isodense lesion of fluid density in keeping with pleural effusion were also noted. Abdominal ultrasound scan revealed oval-shaped hypoechoic masses with uniform margins in the right lobe of the liver. The largest measures 3.3 x 2.5 cm in dimension (Figure 5). A radiological diagnosis of malignant mesothelioma of the right lung with liver metastasis was made.

CT-guided biopsy of the mass lesion confirmed the diagnosis. He had six courses of chemotherapy at three weeks interval (Peclitaxel and Cisplatin) with marked clinical improvement, evidenced by cessation/reduced frequency of cough and haemoptysis coupled, with significant weight gain. He was lost to follow-up after the chemotherapy presumably due to financial constraints. Follow-up radiological assessment was not possible due to the aforementioned reason.

DISCUSSION

Mesothelioma is a rare type of cancer that primarily affects the lining of the lungs, but can also affect the heart, abdomen and other organs (CancerHelp UK, 2010). Mesotheliomas are classified into epithelioid, mixed, sarcomatoid and undifferentiated types, based on conventional histological examination. The classification provides important prognostic information. Furthermore, differential diagnosis is directly related to histological type (Corson, 1997). The Epithelioid form is the commonest type of the mesothelioma, which is the type diagnosed in the index case. Although reported incidence rates have increased in the past 20 years, mesothelioma is still a relatively rare cancer. The incidence rate varies from one country to another, from a low rate of less than 1 per 1,000,000 in Tunisia and Morocco, to the highest rate in Britain, Australia and Belgium, 30 per 1,000,000 per year (Bianchi and Bianchi, 2007). The incidence of malignant mesothelioma of the lungs currently ranges from about 7 to 40 per 1,000,000 in industrialized Western Nations, depending on the amount of asbestos exposure during the past several decades (Robinson and Lake, 2005). It occurs more often in men than in women and risk increases with age (Bianchi and Bianchi, 2007; Robinson and Lake, 2005). The index case was a 45 year old man.

Symptoms and signs of malignant mesothelioma of the lungs may not appear until 20 to 50 years (or more) after exposure to asbestos (Robinson and Lake, 2005). Shortness of breath, cough, haemoptysis and chest pain due to pleural effusion are the symptoms of pleural mesothelioma. Some may present with weight loss and

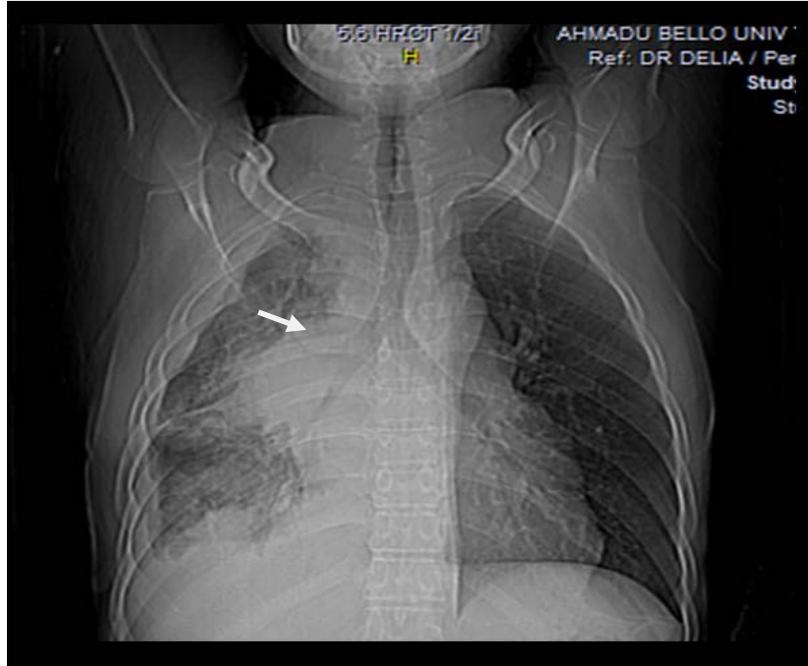


Figure 1. A scanogram of the chest in a CT study showing homogenous opacity of soft tissue density with spiculated margins in the right hemithorax, extending through the right hilum to the right lower zone (white arrow). The distal trachea and the right main bronchus are compressed. Right pleural effusion and non-homogenous opacity with background streakiness are also noted in the remaining right lung parenchyma. (ORIGINAL IMAGE).

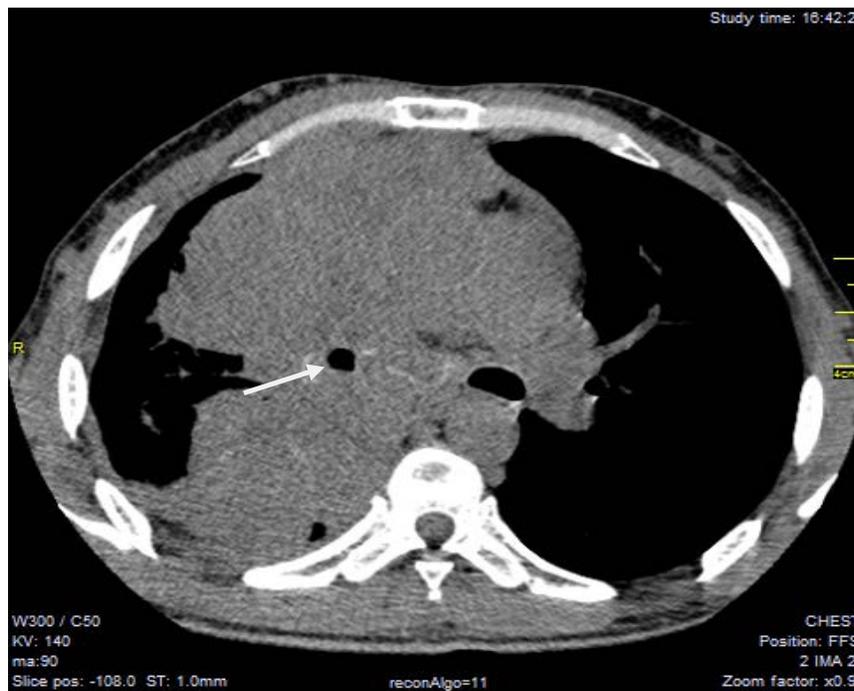


Figure 2. Non-contrast chest CT at the level of the hilum (mediastinal window) showing a pleural base lobulated isodense soft tissue mass (HU=52) in the right anterior mediastinum, extending posteriorly and making an obtuse angle with the posterior chest wall. There is encroachment of the right lung parenchyma and hilum; with encasement and narrowing of the right main bronchus (white arrow) (original image).



Figure 3. Axial contrast enhanced chest CT (mediastinal window) at the level of the heart showing the lobulated isodense mass which did not show contrast enhancement (HU = 54). Infiltration of the pericardium and irregular nodular pleural thickening are also noted (white arrows) (original image).

low grade fever. If the cancer has caused obstructive symptoms or has spread beyond the mesothelium to other parts of the body, pain, dysphagia, odynophagia, or swelling of the neck or face may be experienced. Most of the enumerated symptoms, though non-specific, were found in this patient. These symptoms coupled with chest x-ray and CT findings may make one to suspect the diagnosis but must be confirmed histologically as it was in the index case. This confirmation is necessary as malignant pleural mesothelioma simulates a number of other disease conditions other than PTB; these include: adenocarcinoma of the lung, non-small cell lung cancers, oath cell (small cell) lung cancer, drug-induced pulmonary reactions, actinomycosis, benign mesothelial hyperplasia, lymphoma, carcinoma metastatic to the pleural from Breast, ovarian, renal and colonic adenocarcinomas (Zandwijk et al., 2013; Husain et al., 2013).

Different types of mesothelioma have been described, based on the site of origin. These includes: pleural

mesothelioma, peritoneal mesothelioma, pericardial mesothelioma and tunica vaginalis mesothelioma which almost always affect the testicles (CancerHelp UK, 2010). History of asbestos exposure exists in most cases. However, mesothelioma has been reported in some individuals without any known exposure to asbestos as it was in the index case (CancerHelp UK, 2010).

The non-specificity of the symptoms, signs and radiological features in patients with mesotheliomas has further complicated the issue of prognosis as most patients are only diagnosed at advanced stage. Generally, the prognosis for malignant mesothelioma remains disappointing, although there have been some modest improvement in prognosis from newer chemotherapies and multimodality treatment (Borasio et al., 2008). Treatment of malignant mesothelioma at earlier stages has a better prognosis, but cures are exceedingly rare (Borasio et al., 2008). Histological subtype, patient's age and health status are important

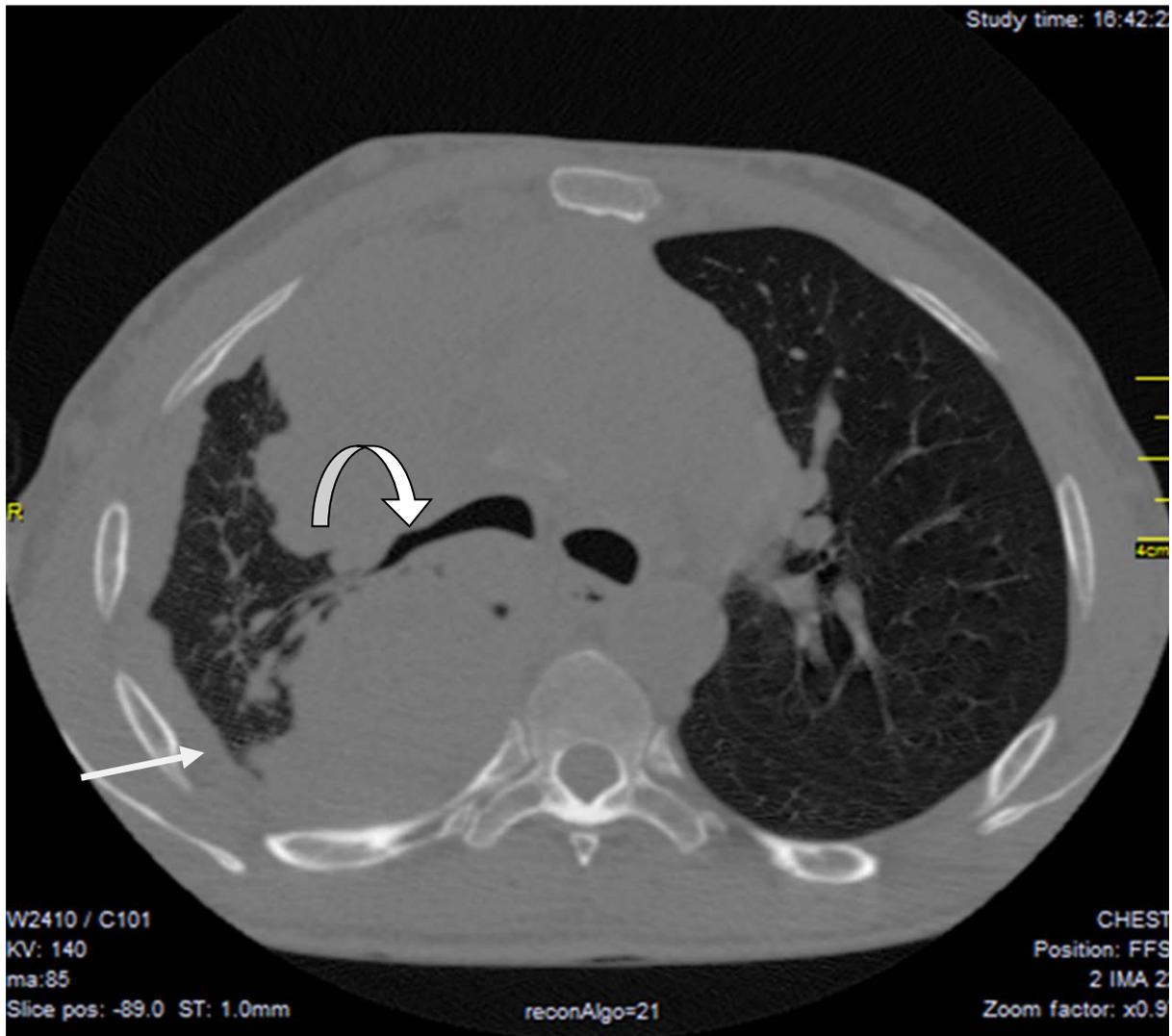


Figure 4. High resolution CT at the level of the hilum demonstrating the isodense mass (HU= 59) infiltrating the adjacent lung and compressing the right main bronchus (curved arrow). Pleural fluid is noted in the dependent pleural cavity on the right side (straight arrow). Pulmonary infiltrates are also seen in the remaining right lung fields (original image).

prognostic factors. The epitheloid histologic type responds better to treatment and has a survival advantage over sarcomatoid histologic type (Haber and Haber, 2011).

Diagnosing mesothelioma is often difficult, because the symptoms are similar to those of a number of other conditions (Stahel et al., 2010; Haber and Haber, 2011), as noted in the index case. Chest x-ray is helpful and may reveal pleural thickening commonly seen after asbestos exposure. The radiographic appearance is of a well defined lobulated mass with a pleural base; the mass may be small or occupy most of the hemithorax. On CT, large tumors may show areas of differential enhancement, and also areas of low attenuation due to necrosis (Micheal and Simon, 2003). The extent of malignant mesothelioma is best assessed by CT or magnetic resonance imaging

(MRI), but biopsy is generally needed to confirm its diagnosis (Stahel et al., 2010). This patient had a CT-guided biopsy which confirmed the diagnosis. Surgery, radiation therapy and chemotherapy are the treatment protocols available for mesothelioma. Surgery, by itself, has proved disappointing. In one large series, the median survival with surgery (including extrapleural pneumonectomy) was only 11.7 months (Borasio et al., 2008). However, the research indicated varied success when used in combination with radiotherapy and chemotherapy.

Chemotherapy is the only singular treatment protocol that has been proven to improve survival in randomized and controlled trials. The combination of cisplatin and peclitaxel (Pemetrexed) has been found useful,



Figure 5. abdominal ultrasound scan at the level of the liver of the same patient as in Figures 1-4 showing oval shaped hypo-echoic masses in the liver, connoting metastatic deposits (white arrows). The largest measures 3.3 × 2.5 cm (original image).

particularly with supplementation with folate and vitamin B₁₂ (Vogelzang et al., 2003). The index case had this combination therapy and his response was satisfactory before he was lost to follow-up. Treatment regimens involving immunotherapy have yielded variable results (Gregoire, 2010). Trials involving interferon alpha have proved encouraging with 20% of patients experiencing a greater than 50% reduction in tumour mass with minimal side effects (Gregoire, 2010). This was not contemplated due to the cost implication as this patient could not even commence chemotherapy until after 2 months, which is much cheaper than immunotherapy.

Conclusion

A case of malignant Pleural Mesothelioma with liver metastasis wrongly managed for pulmonary tuberculosis has been presented. The case history, radiological findings, treatment options and literature have been

reviewed. It emphasizes the role of imaging and high index of suspicion in the management of patients with malignant pleural mesothelioma. The need for adequate specialized manpower in every major hospital in Nigeria cannot be overemphasized, as that will enhance the quality of patient care and avert the diagnostic pitfalls initially encountered in the index case. Also, microbiological assessment of the sputum (Sputum AFB) will go a long way to establish a diagnosis of Tuberculosis and this must be done in all suspected cases of PTB before commencing treatment.

Conflict of interests

Authors have not declared any conflict of interest

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