

# MANAGEMENT OF TUBERCULOUS DESTROYED LUNG IN NIGERIA

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**Between 1969 and 1979, 20 patients underwent pneumonectomy for tuberculous destroyed lungs (TDL) at the University College Hospital (UCH), Ibadan, Nigeria. Their ages ranged from 9 to 57 years, with an average age of 24 years. The left lung was involved in 16 patients (80 percent) and the right lung in four patients (20 percent). All patients had received treatment for pulmonary tuberculosis (PTB) for over three years, and all patients had negative cultures of acid-fast bacilli (AFB) at the time of operation. Pulmonary function studies were performed in 15 patients, bronchography in 18, and pulmonary angiography in four. Nineteen patients had elective resection because of mild to moderate hemoptysis without mortality. The only death occurred in a 37-year-old man who had emergency resection because of massive hemoptysis. He died intraoperatively of cardiac arrest. One patient developed bronchopleural fistula (BPF), empyema, and wound infection. The fistula closed spontaneously following prolonged chest drainage and pleural irrigation with antibiotics and antituberculous drugs. As a result of our experience with pulmonary tuberculosis in our environment, the authors now recommend elective resection for patients with TDL in order to prevent massive hemoptysis which may prove fatal.**

Pulmonary destruction is a common but serious complication of PTB in the tropics where the disease is still endemic. It commonly involves the left

lung, and it affects males in the first three decades of life. Between 1969 and 1979, 20 patients were subjected to pneumonectomy for TDL as a result of varying degrees of hemoptysis at UCH, Ibadan. This review is therefore an attempt to highlight the problems, indications, and results of surgical management of this disease in Nigeria.

## CLINICAL MATERIALS

The record of patients treated for TDL at UCH, Ibadan, between 1969 and 1979 were reviewed to determine the clinical pattern, the indications for surgery, and the result of surgical therapy. In this period of time, 38 patients were referred to our service for surgical consideration, but only 20 patients were subjected to resectional surgery because of varying degrees of hemoptysis. The detailed analysis of these 20 patients forms the basis of this review.

## RESULTS

There were 13 males and 7 females (sex ratio, 2:1). Two of the patients were under ten years of age, seven were in the second decade, five each were in the third and fourth decades, and one patient was over 40 years old. Eighty percent were from low socioeconomic backgrounds.

## Clinical Features

All the patients had received a combination of drugs for treatment of PTB for over three years, and were referred to us following the development of total lung destruction. They presented with chronic cough, significant weight loss, malnutrition, chest pain, and occasional night sweats and fever. Seventy-five percent had been ill for five years and only 25 percent gave a three to five year

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history of PTB. All of them presented with varying degrees of hemoptysis, which was the sole indication for resection in all patients. Sixty-five percent had moderate hemoptysis, 30 percent had massive hemoptysis, and five percent had mild hemoptysis. Although six patients bled massively prior to surgery, only one patient required emergency operation because of continued bleeding. The remaining five patients stopped bleeding within 24 hours and were operated upon electively within the next one week.

### Laboratory Studies

The packed red cell volume (PCV) was less than 30 percent in eight patients. They were transfused with packed red cell or whole blood prior to surgery. The white blood count (WBC) and the differential count were normal in many of the patients. There was no significant elevation of monocytes. Forty percent had significant hypokalemia ( $K^+$  less than 3 mEq/liter) especially in patients with malnutrition and weight loss.

Bacteriological studies for AFB, mycology, and aerobic cultures were performed in all cases. Where necessary, gastric washings and bronchial biopsies were obtained. The Ziehl-Neelsen (ZN) smear of early morning sputum specimens was negative in all patients prior to surgery. The diagnosis of PTB was made from resected lung specimens in all patients.

Pulmonary function studies were performed in 15 patients, bronchography in 18, and pulmonary angiography in four patients. Pulmonary function studies showed slight decrease in forced vital capacity (FVC) and forced expiratory volume ( $FEV_1$ ). Arterial blood gases showed reduced  $PO_2$ , increased  $PCO_2$ , and normal pH.

### Radiological Features

The left lung was involved in 16 patients (80 percent) and the right lung in four (20 percent). The chest roentgenograms showed diffuse opacity of the involved lung with marked shift of the mediastinum to the involved side, elevation of the hemidiaphragm, and marked deviation of the trachea to the involved side (Figure 1). There may be evidence of miliary TB, apical cavities, or basi-

lar infiltrates in the contralateral lung.

Bronchogram showed contracted bronchiectatic lung with no functioning lung parenchyma on the involved side (Figure 2). Pulmonary angiogram revealed redistribution and shunting of blood into the other lung, and narrowing and pruning of the pulmonary artery with little or no pulmonary circulation in the involved side.

### Treatment

All patients were treated with rifampicin 600 mg daily, isoniazid (INH) 300 mg daily, and pyridoxine 20 mg daily for at least six weeks before surgery. Many of the patients had been on a combination of antituberculous drugs for several years.

The sole indication for surgery was hemoptysis in all cases. Six patients bled massively before surgery but only one required emergency operation because of continued bleeding. The remaining five patients stopped bleeding within 24 hours and were operated upon electively.

### Result of Treatment

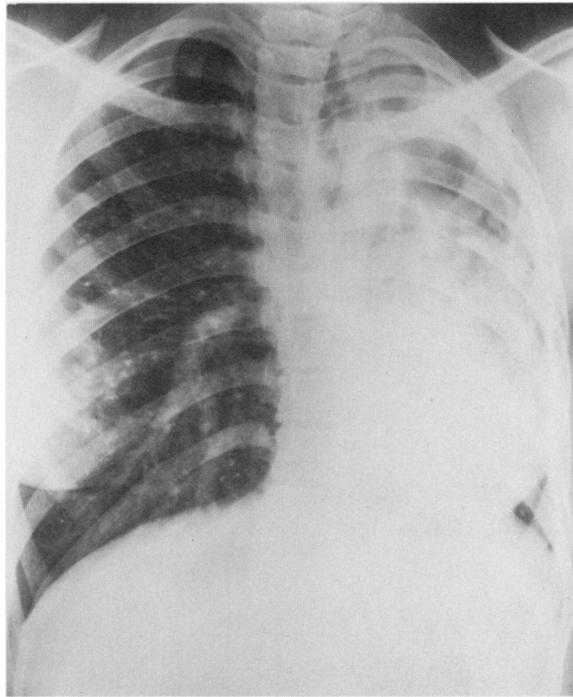
The overall mortality was five percent. The only operative death was a 37-year-old man who had emergency right pneumonectomy for massive hemoptysis. He developed cardiac arrest during the procedure and all resuscitative measures failed.

One patient developed postoperative bronchopleural fistula (BPF), empyema, and wound infection. His fistula closed spontaneously following prolonged chest intubation and pleural irrigation with appropriate antibiotics and antituberculous drugs.

### DISCUSSION

Pulmonary tuberculosis constitutes about 23 percent of our total hospital admissions to the cardiothoracic service and about 58 percent of our outpatient case load at the University College Hospital, Ibadan.<sup>1</sup> Although the most common complication of PTB of surgical importance is spontaneous pneumothorax, about 18 percent of patients with PTB eventually develop total destruction of the lung in spite of prolonged antituberculous therapy.<sup>2</sup>

The prevalence of this disease among children



**Figure 1. Posterior-anterior chest x-ray of a 28-year-old school teacher with tuberculous destroyed left lung. There is multiple calcification and increased pulmonary vasculature of the right lung**

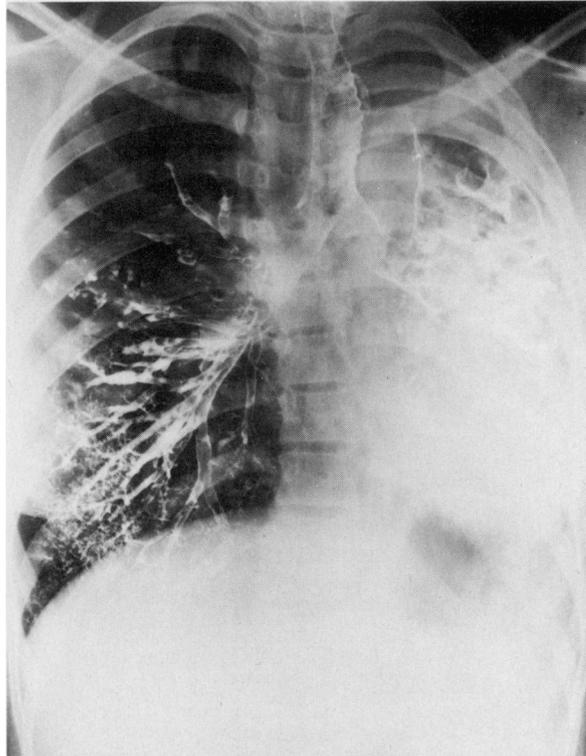
and young adults may be due to ineffective therapy and emergence of resistant strains. Many of our patients with active PTB are treated as outpatients; and, as a result, they often neglect to take their medications or follow the prescribed doses. Because many patients live very far from the hospitals, follow-up visits are poor and prescriptions are often not renewed.

The frequent occurrence of TDL on the left has been the subject of much speculation. Grille<sup>3,4</sup> believed that the left main stem bronchus is more prone to obstruction by the enlarged hilar lymph nodes, resulting in bronchostenosis, lung collapse, and subsequent destruction. The local custom of feeding children in the left lateral decubitus position on the mother's lap increases the chances of aspiration pneumonia and chronic inflammation of the left lung, thus promoting rapid destruction of a tuberculous infected lung.

Bronchography should be performed in all patients to determine the extent of the destruction of

the lung parenchyma and the condition of the contralateral lung. The procedure should be performed cautiously, especially in the presence of significant disease in the contralateral lung. The presence of active PTB is a relative contraindication to surgery. The bronchographic appearance of TDL is quite characteristic and is diagnostic of PTB in our environment. The lung is contracted and has the appearance of a bunch of grapes (Figure 2). The upper lobes are more frequently involved initially but as the disease progresses, all the lobes become involved.

It is our policy to treat patients with TDL with an intensive course of antituberculous drugs consisting of rifampicin 600 mg daily, INH 300 mg daily, and pyridoxine 20 mg daily for at least six weeks before operation. Our surgical approach is through a generous posterolateral thoracotomy incision with the removal of the fifth or the sixth rib for better exposure. The lung is usually densely adherent to the surrounding structures making the



**Figure 2. Bilateral bronchogram of patient in Figure 1. The left lung is contracted and severely bronchiectatic. There are minimal bronchiectatic changes in the right lung**

dissection very tedious and bloody. The bronchus is carefully dissected from the vascular pedicle and closed tightly with little bronchial stump.

The development of massive hemoptysis portends a grave prognosis, and every attempt should be made to clear the airway of blood to prevent asphyxiation and exsanguination. Since elective surgery carries a better prognosis, it is often possible to arrest the bleeding, replace blood loss, and operate electively. But if the bleeding continues, emergency resection may become inevitable. In our experience, patients with massive hemoptysis due to suppurative lung disease do not stop bleeding and they often require emergency operation with its attendant high operative mortality.<sup>5</sup>

We have performed pulmonary angiography in four patients to determine the pattern of pulmonary blood flow and other hemodynamic changes in TDL. Initial studies have shown significant re-

duction in pulmonary blood flow and increased bronchial circulation on the involved side. Further studies are necessary to elucidate the hemodynamic changes of this disease.

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