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✓ Bronchiectasis in Nigerians

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Summary. A group of 155 Nigerian patients that had bronchographic studies done for various reasons is presented in an attempt to analyse the incidence and pattern of their bronchiectasis. Excluding pulmonary tuberculosis (twenty-two out of twenty-three patients), the most common cause of bronchiectasis in this group is really unknown. Of the nontuberculous group, pulmonary suppuration and fibrosis possibly from improperly treated bronchopneumonia and lung abscess appear to be the aetiology of their bronchiectasis (sixty out of 132 patients). Tuberculous bronchiectasis is commonly found in the apices whereas the left lower lobe harbours the majority of the nontuberculous bronchiectasis. The treatment and results of surgical management are mentioned. The results of this study are not different from studies on bronchiectasis among Europeans and Americans.

Résumé. Un group de 155 malades nigériens qui ont fait, pour des raisons diverses, l'objet des études bronchographiques est présenté dans le but d'analyser l'incidence et al phisionomie de leur bronchiectase. Exception faite de la tuberculose pulmonaire (22 sur 23 malades), la cause la plus commune de la bronchiectase dans ce groupe n'est pas réellement connu. Quant au groupe nontuberculeux, il semble que la suppuration pulmonaire et la bronchopneumonie mal soignée et la dégénérescence fibreuse, émanant sans doute de l'abcès pulmonaire soient l'étiologie de leur bronchiectase (60 sur 132 malades). La bronchiectase tuberculeuse se trouve généralement aux sommets, tandis que la lobe inférieure gauche abrite la majorité de la bronchiectase nontuberculeuse. Le traitement et les résultats de la gestion chirurgicale sont mentionnés. Les résultats de cette étude ne diffèrent pas des études faites sur la bronchiectase chez les Européens et les Américains.

INTRODUCTION

The pattern of bronchiectasis in Africans, including Nigerians is unknown. It is the aim of this communication to describe the pattern of bronchiectasis in a group of 155 Nigerian patients living in and around Ibadan, investigated with bronchographic studies at the University College Hospital (UCH), Ibadan, for various reasons. An attempt is made to

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TABLE I. Case illustrations

Case no.	UCH no.	Age	Sex	Summary and diagnosis	Treatment	Result and comment
1	196699	42	M	Minimal tuberculosis with right apical bronchiectasis. Farmer, with symptoms of pulmonary tuberculosis with haemoptysis, negative sputum for AFB, and right upper lobe cavities which cleared after antituberculous drugs. Bronchograms showed right upper lobe saccular bronchiectasis	INH, PAS, and streptomycin	Satisfactory. Haemoptysis had stopped. May need right upper lobectomy later (Fig. 1)
2	183096	52	F	Far advanced tuberculosis with bronchiectasis. Housewife, with treated, quiescent tuberculosis suddenly developed haemoptysis. Bronchograms showed severe bilateral bronchiectasis	Occasional broad spectrum antibiotics, and INH, PAS as symptomatic treatment	Satisfactory
3	238471	29	M	Far advanced tuberculosis with destroyed bronchiectatic left lung. Technical worker with treated quiescent tuberculosis, persistent cough, and left chest pain with occasional haemoptysis	Left pneumonectomy	Satisfactory (Fig. 2)
4	188906	26	M	Asymptomatic bronchiectasis sicca. University graduate with no symptoms; chest abnormality (right lung field infiltrate) discovered on routine prepassport chest X-ray. All investigations for pyogenic or tuberculous disease were negative	Trial treatment with INH, PAS and streptomycin yielded no change in X-ray picture	Patient continues asymptomatic (Fig. 3)
5	157011	19	M	Symptomatic left lower lobe bronchiectasis with normal chest X-ray. School boy, with normal chest X-ray and 5-year history of chronic cough productive of purulent sputum	Left lower lobectomy	Postoperative left upper lobe atelectasis which responded to bronchoscopy

Table 1 (cont.)

Case no.	UCH no.	Age	Sex	Summary and diagnosis	Treatment	Result and comment
6	218311	16	F	Right lower lobe bronchiectasis with schistosomal granuloma. Unemployed nonschool girl with 10-year history of chronic cough productive of purulent sputum, occasional haemoptysis, and right lower lobe mass. Postlobectomy sputum examination for schistosomal ova was negative, but urinary investigations yielded ova of <i>Schistosoma mansoni</i>	Right lower lobectomy and 1-(5-nitro-2-thiazoly)-2-imidazolidinon (Ciba: ambilhar)	Cessation of cough. Satisfactory. Resected lobe showed schistosomal granuloma on histological examination
7	183261	19	M	Bilateral lower lobes bronchiectasis. Unemployed nonschool boy with chronic cough and haemoptysis for several years. Right bronchograms showed right lower lobe bronchiectasis. Had a right lower lobectomy in Feb. 1968. Symptoms persisted. Left bronchograms showed left lower lobe bronchiectasis. Had a left lower lobectomy in July 1969	Staged bilateral lower lobes lobectomy	Satisfactory
8	191736	13	M	Bilateral bronchiectasis with cor pulmonale. School child with chronic cough from age 9. Bronchograms revealed right lower lobe bronchiectasis. Right lower lobe resection was refused by child's parents. Symptoms persisted. Bronchograms at age 13 showed bilateral severe bronchiectasis. Patient was in cardiac failure (cor pulmonale)	Rejected for surgery after cor pulmonale developed	Lost to follow-up in the clinic; presumed dead

examine the causes, the locations, the complications and methods of treatment of this problem in the Nigerian population.

MATERIALS AND METHODS

Between July 1968 and July 1970 inclusive, 155 patients (102 males and fifty-three females) were examined with bronchograms for various reasons. The patients that had bronchiectasis were analyzed for location and causative factors of their disease.

The methods of bronchography in the adult patients consisted of a percutaneous trans-tricothyroid entry into the trachea with a fairly blunt needle after the area and the tracheo-bronchial tree had been anesthetized with 4-6 ml of 2% plain lidocaine (xylocaine). An average of 15 ml of oily propylidone compound (dionosil) was injected into each lung of the patients, examining one lung first with postero-anterior, lateral and oblique films and then repeating the procedure on the other lung with postero-anterior and oblique films only. Delayed films were taken in most of the patients about 1 hr after the beginning of the procedure. The adult patients were examined in the Radiology Department. In children, (seven cases) the method was through the introduction of a small polyethylene catheter into an endotracheal (oropharyngotracheal) tube under general anesthesia usually after bronchoscopy in the operating theatre. An average of 5-8 ml of the oily dionosil was used in each lung in children and the films were taken as in adults. The methods of bronchography employed are similar to those reported by earlier workers (Stechel & Grillo, 1964; Craven, 1965).

CASE ILLUSTRATION

For a summary of the cases see Table 1.

RESULTS

Of the 155 patients examined, eight-two patients proved to have bronchiectasis in a total of 141 lobes (Table 2). Of twenty-three tuberculous patients included in this study, twenty-two had bronchiectasis in a total of forty-two lobes. Most of these were in the upper lobes (thirteen right upper and fourteen left upper lobes). Among 132 obviously nontuberculous patients examined, sixty patients had bronchiectasis in a total of ninety-nine lobes. Of these ninety-nine bronchiectatic nontuberculous lobes, fifty were on the right and forty-nine on the left side; with twenty-three in the right lower lobe and thirty-three in the left lower lobe. Sixteen patients had bilateral bronchiectasis distributed as shown in Table 3.

Among the nontuberculous patients with unexplained cough with or without haemoptysis, bronchographic studies yielded 50% positive findings of bronchiectasis. Thirteen out of the thirty-nine bronchiectatic lobes in this group were located in the left lower lobe. The right lower lobe was involved nine times. Where a pulmonary resection has been carried out for bronchiectasis or other diseases, twenty-seven patients with persistent postoperative cough investigated with bronchograms showed an incidence of nineteen cases of bronchiectasis with thirty-eight lobes involved, again, mostly located to the lower lobes (twelve in the left lower lobe and ten in the right lower lobe).

The sex distribution of bronchiectatic patients was fifty males to thirty-two females. The age range of the patients at the time of bronchograms was from 2 to 61 with the average age at 36.

Treatment

The treatment of bronchiectasis in this group of patients has been both medical and surgical. Where there is localized bronchiectasis with symptoms and absence of systemic illness contra-indicating surgery, a lobectomy is done after proper medical regimen including postural drainage, antibiotics, physiotherapy and bronchoscopy. The pattern of surgical treatment is shown in Table 4. There are more resections in the lower lobes than in the upper lobes and more resections on the left than on the right side, indicating a greater involvement of the left lung with surgically treatable bronchiectasis than on the right. In the bronchiectatic patient, the left side is apt to be bad enough for surgical treatment whilst the right side

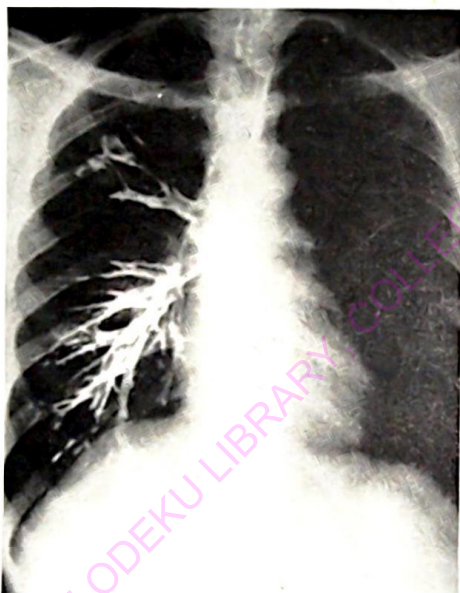


FIG. 1. Right upper lobe apical saccular bronchiectasis in a presumably tuberculous patient.

responds to conservative regimen with drainage through physiotherapy. Where a pneumonectomy is done for bronchiectatic destroyed lung (usually due to tuberculosis), the majority of the pneumonectomy has been on the left side. Where the bronchiectasis involves both lungs severely, the treatment has been primarily medical. One patient had a right lower lobectomy and later needed a left lower lobectomy which he underwent successfully (Case 7).

Complications

The complications of bronchiectasis in this group of patients have been mostly related to the chronicity of their disease. Recurrent pulmonary infections and haemoptysis form the bulk of the complications. There was one patient with cor pulmonale (Case 8) who was refused surgery because of his cardiac failure and diffuse bilateral bronchiectasis. One patient with right apical tuberculous bronchiectasis and left lung bronchiectasis died of pulmonary insufficiency after a left upper lobectomy followed by a completion left pneumonectomy necessitated by nonexpansion of the left lower lobe from bronchopleural fistula.



FIG. 2. Extensive fibrosis and bronchiectasis in a destroyed tuberculous left lung.

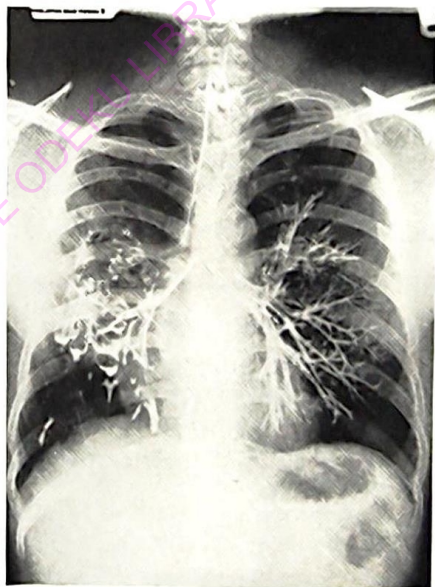


FIG. 3. Bronchiectasis sicca, right lung, in an asymptomatic 26-year-old university graduate.

TABLE 2. Pattern of bronchiectasis in 155 Nigerian patients

Indications for bronchograms	No. of patients	Bronchiectasis		Right lung			Left lung	
		Pts	Lobes	RUL	RML	RLL	LUL	LLL
Unexplained cough with or without haemoptysis	52	26	39	3	7	9	7	13
Postpulmonary resection with persistent cough	27	19	38	4	5	10	7	12
Pulmonary tuberculosis with haemoptysis	23	22	42	13	2	4	14	9
Unexplained intrathoracic mass lesion	21	2	4	2	1	1	0	0
Post-treatment pulmonary abscess	9	6	7	1	2	1	2	1
Unexplained pleural effusion or empyema	6	1	1	0	0	0	0	1
Unexplained haemoptysis	6	0	0	0	0	0	0	0
Resolving pneumonia suspicions of neoplasm	5	1	1	0	0	0	0	1
Pulmonary cyst	4	4	7	1	1	1	0	4
Chronic sinusitis with cough	1	1	2	0	0	1	0	1
Achalasia with chronic cough	1	0	0	0	0	0	0	0
Tuberculous cases	23	22	42	13	2	4	14	9
Nontuberculous cases	132	60	99	11	16	23	16	33
Total	155	82	141	24	18	27	30	42
				69			72	

RUL, Right upper lobe; RML, right middle lobe; RLL, right lower lobe; LUL, left upper lobe; LLL, left lower lobe.

TABLE 3. Bilateral bronchiectasis

Site	No. of patients
RLL and LLL	4
RUL and LUL	2
RUL and all left lung	2
RUL and LUL	1
RML and LLL	1
RML and lingula	1
RLL and LUL	1
RUL RML lingula and LLL	1
RML RLL lingula and LLL	1
All right lung and LUL	1
All right lung and LLL	1
Total number of patients	16

RUL, Right upper lobe; RML, right middle lobe; RLL, right lower lobe; LUL, left upper lobe; LLL, left lower lobe.

Two of the left pneumonectomized patients (out of a total of twelve) died postoperatively. In one, the cause of death was unknown; she developed cardiac arrest as she was being moved from the operating table to her bed. Autopsy did not reveal any specific cause of death. The other patient died 4 hr postoperatively as she sat up for upright chest X-ray, apparently from hypovolaemia.

TABLE 4. Surgical treatment

Right-sided operations	Left-sided operations
Upper lobectomy (5)	Upper lobectomy (11)
Middle lobectomy (with upper or lower lobectomy) (5)	
Lower lobectomy (8)	Lower lobectomy (11)
Pneumonectomy (3)	Pneumonectomy (12)
Upper lobectomy with RLL superior segmentectomy (1)	
Decortication (2)	Decortication (3)
Thoracoplasty (1)	
Total (25)	Total (37)

DISCUSSION

Among Nigerians around Ibadan who constitute the majority of patients included in this study, it would appear that bronchiectasis is not an uncommon complication of pulmonary infection. As illustrated in Table 2, a tuberculous patient presenting with haemoptysis is most likely to have apical bronchiectasis. The importance of tuberculosis and other forms of bronchopulmonary necrosis in the pathogenesis of bronchiectasis is well documented in the literature (Rosenzweig & Stead, 1966).

According to this study, excluding pulmonary tuberculosis, the most common cause of bronchiectasis in this group of Nigerians is really unknown. Pulmonary suppuration and fibrosis following untreated or poorly treated bronchopneumonia may be the primary cause of nontuberculous bronchiectasis in Nigerians. One patient (Case 6) had bronchiectasis in association with schistosomal granuloma. In the present study, there was no case of bronchiectasis with situs inversus and sinusitis as reported by Siewert (1904) and popularized by Kartagener (1933), although some observers have reported this association in '20% of the cases' (Reed & Allbritten, 1962).

The common location of bronchiectasis in the nontuberculous group studied is the lower lobe, the left being slightly more common than the right (33 : 23). The left lateral decubitus position in which many children are traditionally placed during feeding and the strategically placed position of the left main stem bronchus between the rigid arch of the aorta and infected indurated mediastinal lymph glands (Grillo, 1970) are probably causative factors in the destruction of pulmonary parenchyma leading to bronchiectasis and fibrosis, especially on the left side. Earlier studies, however, in other countries confirm the fact that the left side is more predominantly affected than the right (Perry & King, 1940). Duken & Van den Steinen (1928) suggested that the right bronchus, as a continuation of the trachea, is more easily drained and that the left main stem bronchus is narrower than the right in children and easily compressed by the pulmonary artery that crosses it. The only patient with dry

asymptomatic bronchiectasis in this series had the entire right side involved; apparently the good drainage from the right main stem bronchus is protecting him from having symptoms at present (Case 4).

Among the tuberculous group, bronchiectasis is located mostly in the upper lobes. The pathogenesis of this has been referred to in the literature by many authors (Rosenzweig & Stead, 1966; Curtis 1957; Roberts & Blair, 1950; Jones *et al.*, 1950). Bronchial obstruction by intrinsic tuberculous bronchial mucosal granuloma or extrinsic lymph nodal compression, and pulmonary parenchymal fibrosis with bronchial dilatation as the lung heals by scarring are factors in the pathogenesis of bronchiectasis in the tuberculous patient. That the left lower lobe is spared in the tuberculous patient is illustrated in Fig. 4 in which all other lobes save the left lower lobe are affected by bronchiectasis.

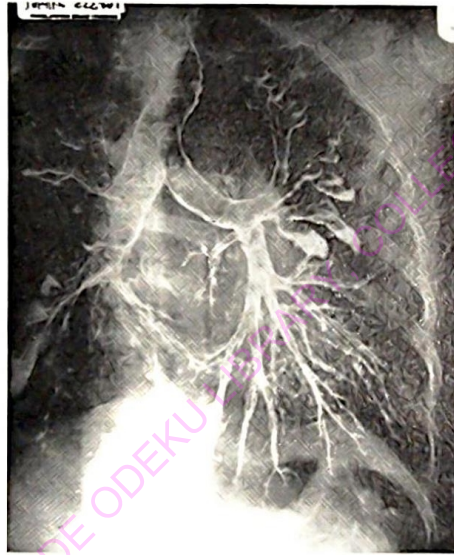


FIG. 4. Sparing of lower lobe in tuberculous bronchiectasis.

This study is not extensive enough to include the natural course of bronchiectasis in untreated cases over a long period of time. The studies of Perry & King (1940) indicate that the mortality in the nonsurgically treated cases was 26% with 41% of the patients dying within 5 years of the onset and 15% living 20 years or longer after the onset of their disease. McKim (1952) on the other hand, who followed-up forty-nine cases, over a minimum period of 9 years, showed that 'the prognosis in bronchiectasis in respect to groups of patients may vary widely under differing circumstances. Bronchiectasis as encountered in military hospitals or ambulant chest clinics tends to follow a much more benign course than it does in patients seen on the wards of a large general hospital.' He concluded that 'the prognosis and consequently the most desirable treatment, for any individual patient can be decided only on the basis of thorough clinical study, often requiring a period of judicious observation. Treatment by pulmonary resection is of unquestioned value in many cases, but surgery is not indicated whenever resectable bronchiectasis is discovered.' Procrastination,