Lower Lung Field Tuberculosis*

SAMUEL S. ROMENDICK, M.D., F.C.C.P.
BERNARD FRIEDMAN, M.D., F.C.C.P.
HERBERT F. SCHWARTZ, M.D., F.C.C.P.

St. Louis, Missouri

It is a well-known fact that the roentgenological manifestations of the reinfection or adult type of pulmonary tuberculosis are usually first noted in the apical and infraclavicular regions of the lung. Persistent rales in the upper chest, along with hemoptysis, x-ray findings, pleurisy and positive sputum, are considered as the criteria for a clinical diagnosis of pulmonary tuberculosis. Tuberculous involvement of the lower lung fields was previously considered so infrequent that such a diagnosis was rarely ever made. As a matter of fact, as late as 1921, Landis1 stated, “My opinion concerning basal tuberculosis is still unchanged; children may have it at the base, but adults practically never.” Fishberg2 in 1922 stated, “Basal lesions in tuberculous patients are extremely rare; when they do occur they are terminal phenomena, when the diagnosis is beyond question. A lesion at the base, while the apex is free, should be considered non-tuberculous unless the sputum is positive as regards tubercle bacilli.”

On the other hand, Kidd3 (1886) stated that “The apex of the lower lobe is very prone to (tuberculous) disease and may be attacked before the apex of the upper lobe.” Fowler4 (1888) stated: “The upper and posterior part of the lower lobe is a spot only second in point of vulnerability to the apex itself.” Furthermore, Fishberg5 in the next edition of his book (4th ed.) in 1932 changed the above mentioned statement to read: “Basal lesions in tuberculous patients are extremely rare; when they do occur they are of the exudative variety and as such clearly seen on roentgen film.”

More recently, a number of authors6,7,8,9,10,11,12,13,14 have concluded that although much less frequent, the lower lobes may be the initial site of chronic pulmonary tuberculosis. We have found tuberculous involvement in the lower lung fields often enough to warrant a review of the experience at Robert Koch Hospital.

METHOD OF STUDY

This series is a roentgenographic study of over 2,000 consecutive discharges from February, 1933, to February, 1942. The first available film, which in most instances was taken prior to admission to

*From the Medical Service, Robert Koch Hospital, Department of Public Welfare, St. Louis, Missouri.

481
this hospital, was studied. We excluded all cases in which infiltration was present in the upper half of either lung. We further excluded all cases of primary infection tuberculosis. All cases of bronchiectasis, pleural effusion or pleural thickening were also discarded, unless there was concomitant tuberculous parenchymal involvement. Only those cases in which the disease was confined to the lower half of the lung was considered. Plates 1 and 2 illustrate typical cases chosen. Unfortunately, during this period

Plate I—Typical cases selected.
very few films in the lateral positions were being taken; therefore, we designate our cases as lower lung field tuberculosis rather than lower lobe tuberculosis, which most of them probably are.

PREVALENCE

There were 2,354 cases of pulmonary tuberculosis discharged from this hospital between February, 1933, and February, 1942. Of these, 3 satisfied our criteria for lower lung field tuberculosis, giving an

Plate II—Typical cases selected.
The incidence of 2.7 per cent. In the literature there is much variation in the reported incidence, varying from 0.003 per cent\(^7\) to 18.3 per cent.\(^7\) The majority of the figures fall between 1.5 per cent and 5 per cent. The authors who gave the low figures reviewed series from large municipal sanatoria where the patients are usually first seen in an advanced stage of their disease. On the other hand, the authors working with smaller and more select groups seen early, report the higher incidence. For example: Ross,\(^7\) who reported an incidence of 18.3 per cent was following a group of nurses and probably discovered their disease in the very early stages. The reason for these differences is that tuberculosis of the lower lung fields can be diagnosed as such only in the earlier stages before spreads to the upper fields have occurred.

Cases 1 and 2 demonstrate such instances. The films taken on admission appeared as ordinary chronic pulmonary tuberculosis. However, on going back to the first available films on these patients, we noted that the disease quite definitely originated in the lower lung field. Undoubtedly more such cases, where the earlier x-rays were not available, escaped our attention. Otherwise, our incidence would no doubt have been higher.

**Sex**—Of the 63 cases, 44 (69.8%) were female and 19 (30.2%) were male. Since the general proportion of female to male in this hospital during this period is approximately 1 to 1, these figures are significant. This is the usual experience of all observers. All report a

![](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21140/)

**Fig. 1a**—Case 1, L. G., 23-year-old negro female. Film taken on admission to hospital. **Fig. 1b**—Case 1, L. G. Film taken at the clinic about 8 months prior to admission.
preponderance of female over male. The explanation for this is obscure. An explanation has been offered by Reisner based on the supposed differences in the type of respiration between males and females.

Color—We have noted no definite differences in the incidence between white and negro patients. In our group there were 43 (68.2%) whites and 20 (31.8%) negroes. These figures approximate the general proportion of white to negro in our hospital during this period. Weinman and Campbell report similar findings; however, Dunham and Norton claim a markedly greater prevalence among the negroes.

Age—The ages of our patients varied between 15 and 58 years. There were 49 cases (91.5%) under 40 years of age. Among the negroes, however, 90 per cent were under 30 years, the oldest negro being 33 years. Reisner, Ross and others have also found a prevalence of lower lung field tuberculosis among the younger age group.

EXTENT AND DISTRIBUTION OF DISEASE

Side—Some authors report a preponderance of initial involvement on the right side. We, however, have not noted any marked prevalence on any one side. There were 37 (58.7%) of the cases on the right side and 26 (41.3%) on the left.

Degree of Involvement—Of the 2,291 cases of the usual type of
pulmonary tuberculosis reviewed, there were 1,672 (72.9%) far advanced; 518 (22.6%) moderately advanced; and 101 (4.4%) minimal. In the cases showing lower lung field disease there were 39 (61.9%) far advanced; 24 (38.1%) moderately advanced and no minimal cases. This was undoubtedly due to the fact that minimal tuberculosis in the lower lung field went unrecognized and, therefore, was not hospitalized. In our group, the percentage of moderately advanced was somewhat higher than for the ordinary type because after the case spread to become far advanced, the lower lung field origin very often cannot be definitely ascertained.

**Pathology and Symptomatology**—In respect to the mode of onset, symptoms and duration of disease prior to admission, we have found no essential differences between those cases in our series and the usual form of pulmonary tuberculosis. The majority of the cases had cavitation. All but one had a positive sputum. Over 75 per cent had a history of blood-spitting. This last figure would seem to be somewhat higher than usually seen.

**TREATMENT AND PROGNOSIS**

The end results in this group show that one-third (21 patients) were discharged as arrested; approximately one-third (20 patients) died, and approximately one-third (22 patients) left the hospital as quiescent, improved or unimproved. These, in general, are the same as the end results obtained in the usual type of pulmonary tuberculosis at this hospital. Of the series 44 (2/3) had received collapse therapy in some form: Pneumothorax, phrenic paralysis, thoracoplasty, pneumoperitoneum, or some combination. Of these again, the same end results were obtained, a third (15 patients) were arrested, approximately a third (11 patients) died, and approximately a third (18 patients) were quiescent, improved or unimproved. It is interesting to note that of the four cases receiving thoracoplasty, only one became arrested. In this instance the thoracoplasty was begun with the lower ribs and continued upward. Freedlander\textsuperscript{16} reports three such thoracoplasties, all with good results. It is quite generally accepted that cavities in the lower lobe, especially in the superior division, are not very amenable to surgical collapse by thoracoplasty. Of the 19 which did not receive collapse therapy, about a third (6 patients) were arrested and a half (10 patients) died. The slightly higher death rate in this latter group was probably due to the fact that some of these patients were too sick on admission for collapse therapy.

**CONCLUSIONS**

1) In the differential diagnosis of lesions occurring in the lower lung field, tuberculosis should be given due consideration.
2) In a review of the discharges over a period of nine years, at least 2.7 per cent of the cases originated in the lower half of the lung.

3) Many cases of lower lung field tuberculosis escape recognition because, when first seen, spread to the upper half has already occurred.

4) Females are more likely to have lower lung field tuberculosis in the ratio of approximately 2 to 1.

5) No notable deviations from the usual were observed in regard to race, symptomatology, duration of disease, pathology and prognosis.

6) The indications for collapse therapy are the same as for the usual form of pulmonary tuberculosis. However, in an occasional case, retrograde thoracoplasty may give good results.

CONCLUSIONES

1) La tuberculosis debe recibir debida consideración en el diagnóstico diferencial de las lesiones que aparecen en la zona pulmonar inferior.

2) En un repaso de los rechazos durante un periodo de nueve años, la enfermedad se originó en la mitad inferior del pulmón en, por lo menos, el 2.7 por ciento de los casos.

3) Muchos casos de tuberculosis de la zona pulmonar inferior pasan desapercibidos porque, cuando se ven por primera vez, ya ha tenido lugar propagación a la mitad superior.

4) La tuberculosis de la zona pulmonar inferior es más frecuente en las mujeres que en los hombres en la razón del 2 a 1.

5) No se observó desviaciones de lo común dignas de atención, en cuanto a raza, sintomatología, duración de la enfermedad, patología y pronóstico.

6) Las indicaciones para la colapsoterapia son las mismas que en la forma usual de la tuberculosis pulmonar. Sin embargo, en ciertos casos la toracoplastia retrógrada puede dar buenos resultados.

REFERENCES