Localized Obstructive Emphysema Produced by an Extrapulmonary Lesion

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The purpose of this paper is to report a case of localized obstructive emphysema caused by extrapulmonary lymph-nodular giant follicular lymphoblastoma. No comparable case has been found in the literature of the past 30 years. In addition, there are very few reports of localized obstructive emphysema being produced by lesions of any nature that are entirely extrapulmonary.1,2

Case Report

J. P. (J. H. No. 415778), a 17 year old white student, was admitted to the hospital July 11, 1957 after demonstration of a left hilar mass on a routine chest film by a mobile unit. The mass was not present one year previously on a similar chest film. Except for occasional right paraesophageal pain on deep inspiration for the past year, he had been essentially asymptomatic. A cold one year prior to admission, followed by three weeks of non-productive cough, had responded to non-specific medication. He had smoked one pack of cigarettes per day for the past year and one-half.

Past history and family history were irrelevant.

Physical examination revealed him to be well developed, well nourished and in no distress. Multiple small, non-tender, moveable nodes were palpated in both cervical, axillary and inguinal regions. There was no other significant physical finding.

Laboratory Findings

Peripheral blood, bone marrow, heterophile agglutination and urinalysis were normal. Gastric washings for acid-fast bacilli were repeatedly negative. Biopsy of an axillary lymph node revealed only "fibrosis producing distortion of the nodal architecture; no tumor cells seen."

The chest film showed a well circumscribed, homogeneously dense, lobulated 5 cm. shadow at the left hilum, and emphysema at the left base (Fig. 1). At fluoroscopy, the mass neither pulsed, changed in size on Valsalva maneuver, nor moved on swallowing. There was no relation to the esophagus, and no mediastinal shift was noted. Tomograms suggested relationship of the mass to the left main bronchus (Fig. 2). Bronchoscopy revealed no abnormality of the major bronchi or their proximal branches, all of which were visualized. Bronchography showed a persistent filling defect in the proximal portion of the antero-medial segmental bronchus of the left lower lobe, contiguous with the hilar mass (Fig. 3). This was interpreted as the endobronchial component of a bronchial adenoma, and the cause of the left lower lobe emphysema.

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Left lower lobectomy was performed, the tumor mass was removed in its entirety. The pathologic report was "Giant follicular lymphoblastoma." No endobronchial component of the tumor could be found, the entire tumor being contained in a parabronchial lymph node (Fig. 4). Areas of atelectasis were not found. Because the tumor had been removed in toto, no further therapy was given. Recovery was uneventful and he is being followed in the tumor clinic.

Discussion

Peribronchial tuberculous adenopathy, frequently associated with edema of the bronchial mucosa, has been reported as a cause of regional obstructive emphysema. Aberrant vessels, aortic aneurysms and enlarged hearts are also mentioned as causes of bronchial compression and resultant localized obstructive emphysema. There are innumerable reports of:

1. Obstruction and atelectasis produced by extrabronchial lesions; and
2. Obstruction and emphysema produced by intrabronchial lesions, but aside from the few reports mentioned above, regional emphysema involving a lobe or segment of a lobe, which is not associated with aspiration of a foreign body, carcinoma, adenoma, or tenacious mucous, has received little attention.

The causal mechanism in regional obstructive emphysema is well known through the bronchoscopic studies of Jackson and his colleagues. They observed that bronchi expand and lengthen during inspiration, and contract and shorten during expiration. Thus, they pointed out, thick viscid inflammatory exudate, as well as foreign bodies, carcinomas, and adenomas can cause bronchial obstruction, and produce either atelectasis or emphysema. If obstruction is complete, regional atelectasis occurs (stop-valve mechanism); if incomplete, inflow of air is permitted and outflow restricted, resulting in regional emphysema.

There would appear to be no logical reason why an exobronchial lesion might not cause partial obstruction and localized emphysema prior to atelectasis. Either this period is brief and goes unrecognized, or the emphysema occurs only where one of the lesser bronchi, devoid of hilar structural support, is compressed. Even in cases of bronchial adenoma, where the phenomenon of obstructive emphysema is frequently observed, the great majority of cases present only atelectasis radiographically. Since
Symptoms are probably more pronounced in the presence of atelectasis, discovery of the emphysematous stage may only be by chance. It seems likely, therefore, that cases of bronchial obstruction which show atelectasis would have at some time earlier demonstrated emphysema, as this case did; and just as likely that this case would later have shown atelectasis when obstruction was more complete.

Lymphomas, associated with atelectasis either by lymph nodular compression or direct bronchial invasion, are well known.\textsuperscript{4,10,31} Obstructive emphysema has not to our knowledge received prior mention.

![Figure 4](image)

**Figure 4.** Section through the lymph node containing lymphoma and the bronchus which was compressed by the tumor.

**References**