A 55-year-old white woman with a five-year history of seropositive rheumatoid arthritis and Sjogren's syndrome treated with multiple medications, including long-term prednisone, was found to have a right lower lobe nodule on routine chest x-ray examination.

Past medical history was significant for tobacco use and mild obstructive airways disease. She had normal vital capacity and an FEV1 to FVC ratio of 71 percent.

Evaluation revealed a 2-cm noncalcified nodule. Right lower lobe lobectomy revealed a poorly differentiated adenocarcinoma with one positive parabronchial lymph node. Metastatic work-up was negative. A one month post-surgical visit was unremarkable. She presented two months later in moderate respiratory distress with marked hypoxemia and FVC of 54 percent predicted and FEV1 49 percent of predicted and the following chest x-ray film (Fig 1).

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Figure 1

Figure 2
Diagnosis: Postoperative bronchopleural fistula and empyema

The first film (Fig 1) shows a thickened linear density coursing from the lower right chest wall to the mediastinum. Lung markings can be seen throughout. The lateral view (Fig 2) shows an air fluid level in the posterior diaphragmatic angle.

The patient returned shortly thereafter with the chest x-ray films shown in Figures 3 and 4. These films reveal the same curvilinear density and an obvious large air fluid level.

The patient underwent exploratory thoracotomy after unsuccessful attempts at tube thoracostomy. At thoracotomy, the chest cavity was found to be filled with air under pressure and covered with a purulent exudate. There was an obvious air leak from the bronchial stump. The lung was compressed superiorly and posteriorly. The linear density seen on chest x-ray film extending across the mid-chest field was formed by the inferior surface of the lung at the anterior chest wall. The remaining portion of the inferior surface of the lung inclined downward toward the posterior chest wall, giving the two-dimensional view of lung markings below the inferior edge of the lung. The chest was irrigated and chest tubes were placed to re-expand the lung.

Comment

Bronchopleural fistulae (BPF) after pulmonary resection occur in 3-5 percent of cases. Appearance of BPF in the first 24 to 48 hours after operation represents technically poor closure of the bronchial stump and is recognized by a massive air leak from the chest tubes, subcutaneous emphysema and coughing up of large amounts of serosanguinous fluid.

One to two weeks postoperatively, bronchopleural fistulae is the result of poor healing or rupture of an empyema cavity into the bronchial stump and can be recognized by the appearance of an air fluid level in the affected chest.

Management of bronchopleural fistulae immediately postoperatively requires reoperation and closure of the bronchial stump. Occurring after 48-72 hours, the bronchopleural fistula is managed by adequate drainage and obliteration of the pleural space. Drainage of the pleural space with or without antibiotics is required to treat the empyema which invariably accompanies bronchopleural fistula. Rib resection and stoma creation may be necessary for adequate prolonged drainage.

Most bronchopleural fistulae close after adequate drainage of the chest cavity and pleural obliteration. Should the bronchopleural fistula remain open, thoracoplasty may be necessary to collapse the residual pleural space.

Our patient may have been at increased risk for postoperative bronchopleural fistula because of long-term prednisone therapy. Bronchopleural fistula was suggested even in the absense of chest pain, fever or hemoptysis by the subtle air fluid level seen on chest x-ray film and also by respiratory symptoms and decreased lung volume on pulmonary tests out of proportion to that expected after lobectomy.

Reference