Fibroepithelial Polyps of the Bronchus: A Case Report and Review of the Literature

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Benign tumors of the bronchi are rare. Unless recognized and treated they may result in severe, even fatal pulmonary damage or unnecessarily radical surgery. The purpose of this case report is to describe such a lesion in a 38 year old man, to illustrate its pathologic anatomy, and to discuss its etiology.

A 38 year old policeman experienced a sharp right anterior chest pain 10 days prior to admission on July 12, 1961. The pain was aggravated by deep breathing and coughing and was accompanied by mild fever. Cough, productive of white-yellow to red streaked sputum, began eight days before admission and there was shortness of breath with progressive intensity.

Five years earlier he had sustained fractures of the right seventh to eleventh ribs and left ninth rib in an automobile accident. He recovered without incident. However, during succeeding years "pneumonia" developed in the right lung on an average of twice each winter. Each episode lasted approximately two weeks and responded promptly to penicillin and Terramycin therapy. He was bothered by a chronic non-productive cough. Until one year prior to admission he smoked three packs of cigarettes a day but thereafter smoking was limited to an occasional cigar. As an infant he had had two attacks of whooping cough.

Physical examination disclosed a well developed and well nourished white man. The blood pressure was 105/65 mm. Hg; pulse 76/ min; respirations 28/ min; and temperature 99.6° F. The chest expanded symmetrically and both diaphragms moved. Over the base of the right lung there was a decrease in resonance, vocal fremitus, and breath sounds. A few coarse rales were audible. The heart was normal; cyanosis, pallor, clubbing and edema were absent. The physical examination was otherwise not remarkable.

Laboratory Studies: The white blood cell count ranged between 10,500 and 21,100 (admission). There were 85 per cent neutrophils; hemoglobin 13.4 gram/100 cc.; hematocrit 43 per cent. The urine was negative. A precipitin test for syphilis was negative. Sputum smears and culture were negative for tubercle bacilli on six exami-

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FIGURE 1. The admission x-ray shows a pneumonic infiltrate involving the right middle lobe and the superior segment of the right lower lobe.

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nations and fungi were not seen in four specimens. Bacteriologic culture of the sputum yielded a mixture of organisms which included staphylococcus aureus hemolyticus. Subsequent sputum cultures were negative.

A chest roentgenogram on admission demonstrated an infiltrate in the right middle lobe and the superior segment of the right lower lobe (Figure 1). Progressive but incomplete clearing of the pneumonia ensued.

Administration of penicillin was discontinued after seven days because of rapid improvement of symptoms. Bronchoscopy one month after admission to the hospital disclosed the larynx and trachea to be normal. An annular multinodular white mass was noted 1 cm. below the level of the right upper lobe bronchial orifice. A biopsy specimen consisted of four gray-white fragments of tissue measuring as much as 2 mm. in the greatest dimension. Microscopic examination revealed a fibrovascular stroma containing a moderately severe lymphocytic inflammatory infiltrate. Normal bronchial glands were embedded in the stroma which was covered by mucosa varying from a respiratory to a stratified squamous epithelium. There was no evidence of neoplasm.

After a week, bronchoscopy was repeated and the previous observations were confirmed. Another biopsy specimen consisted of three fragments of gray-white soft tissue measuring as much as 5 mm. in diameter. The stroma was similar to that seen in the initial biopsy. The surface epithelium, however, was composed uniformly of stratified squamous epithelium.

A week after bronchoscopy the middle and lower lobes of the right lung were resected. Postoperatively mild temperature elevation was noted during the first few days. On the fifth postoperative day much mucoid secretion was aspirated through a bronchoscope. At the time of bronchoscopy the right upper lobe bronchus was patent and the amputation stump was hyperemic but it was otherwise normal. Thereafter the patient's progress was satisfactory. He was discharged one month after the pulmonary resection. He was examined two months after discharge at which time he was asymptomatic.

The surgical specimen (Figure 2) consisted of the middle and lower lobes of the somewhat firmer than usual right lung. In the proximal bronchial segment there

FIGURE 2. The gross surgical specimen shows polypoid tumors at the line of resection and within the bronchus.
were two groups of pedunculated pearly white tumors, the largest measuring 9 x 6 x 3 mm. Similar lesions were present in the anterior basal segment bronchus 1 cm. distal to its origin. The tumors emerged on broad based pedicles from the bronchial lining and appeared covered by intact mucosa. They caused partial occlusion of the lumen.

Microscopically the mucosal surface was covered by normal bronchial respiratory epithelium focally replaced by nonkeratinizing stratified squamous elements. The core of the polyps consisted of a dense fibrovascular stroma containing a scattered lymphocytic exudate. At the base of one polyp a few groups of residual bronchial glands were manifest. None of these were of neoplastic nature. Pulmonary alveoli were partially collapsed but contained no exudate. In sections of the middle lobe there were foci of organizing chronic pneumonia. The pleura was thickened and fibrotic. No inclusion bodies were recognized.

FIGURE 3. A photomicrograph of a single tumor shows the squamous metaplasia which in large part replaces the normal surface epithelium. The fibrovascular nature of the stroma as well as the dearth of inflammation is well demonstrated.

Discussion

Polypoid overgrowths of bronchi are uncommon. In 1938, Pollak, Cohen, and Gnasst in a summary of the literature pertaining to benign bronchial tumors cited 27 cases recognized at autopsy and 77 encountered during life. A review of these disclosed that one necropsy case was a simple polyp and fibroepithelial polyps were observed in 11 living patients. The youngest of the 12 patients was 6 years and the oldest 63 years. The greatest proportion of patients were in the fourth and fifth decades of life. In this paper the case of a 55 year old man, thought clinically to have bronchial carcinoma was reported. Autopsy revealed an inflamed polyp obstructing the right upper lobe bronchus.

In 1940, Samson referred to a 34 year old male with a polypoid lesion of the bronchus associated with chronic purulent inflammation of the bronchus. The stroma of this polyp was highly vascular and exhibited early fibrosis. Regression of the lesion apparently occurred with improvement of the pulmonary infection. Ashmore in 1954 reported a tumor at the junction of the lateral and anterior basal divisions of the lower lobe bronchus in a 51 year old white woman. The mucosa was heaped up into frond-like projections and microscopically exhibited fibrovascular stroma covered by respiratory type epithelium. Schaff and Thomson in 1955 reported recurrent multiple small bronchial polyps with fibrovascular stroma in a 57 year old man who was followed for 17 years with frequent bronchoscopic examinations. In 1957 Rodo reported an additional case in a 40 year old man who remained well 1 1/2 years after adequate surgical therapy.
Inflammatory polyps should be distinguished from true papillomas of the respiratory tract which are characterized by papillary proliferation of the stratified squamous epithelium. Ullman has presented strong evidence for a viral etiology of papillomas of this type occurring in the larynx. However, no such evidence exists in relation to bronchial polyps. Jackson has emphasized the role of inflammation in their pathogenesis. Peroni was unable to produce bronchial polyps in dogs by trauma, experimental infection, or chemical irritation. He concluded that bronchiectasis and endobronchial suppuration were complications of bronchial tumors rather than causative factors.

Inflammatory polyps are readily distinguished from other polypoid bronchial tumors by microscopic examination. They exhibit neither the squamous epithelial overgrowth of papillomas nor the bizarre and varied patterns of bronchial adenomas and carcinoma. Highlighting the lesion is a polypoid overgrowth of fibrovascular stroma infiltrated by a variable number of inflammatory cells. These are frequently lymphocytes. The overlying mucosal epithelium retains its normal respiratory character but squamous metaplasia is not infrequent. The etiology is unknown. When confined to bronchi these lesions appear to occur most often in middle age. Pneumonia is a frequent complication and usually calls attention to the presence of the lesion.

Despite the temporal relation of the onset of respiratory symptoms in the present case to the severe chest injury sustained five years before operation, this instance may represent simply a coincidental occurrence.

REFERENCES