Case report

Multiple endobronchial polyposis; differentiation from squamous cell papillomas

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We report a case of multiple tracheobronchial inflammatory polyps, and discuss the differences between inflammatory polyps and squamous cell papillomas. Inflammatory polyps have been misdiagnosed as squamous cell papillomas, but only the latter have been found to undergo malignant transformation.

Case report

A 36-year-old woman was referred to the Cleveland Clinic with pleuritic pain in the left anterior chest, temperature of 100 to 101 F, and a nonproductive cough. She had been hospitalized for three episodes of left lower lobe pneumonia within a 3-month period. Sputum cultures from her last hospitalization grew normal flora and a few colonies of *Candida albicans*. Acid-fast bacillus smears and cultures were negative and the sputum revealed no malignant cells. Delayed hypersensitivity was found to be intact and quantitative immunoglobulins were normal.

Physical examination disclosed rales in the left base and the chest roentgenogram revealed residual alveolar infiltration in the left lower lobe (*Fig. 1*).

The patient underwent fiberoptic bronchoscopy. Multiple polypoid grayish-white masses were found in the carina extending to the base of the right main stem bronchus, at the superior segment of the right lower lobe, the lingula, and the superior segment of the left lower lobe, and two in the basal segments of the lower lobe.

The masses varied from 0.5 to 2.0 cm in diameter. On the following day a repeat bronchoscopy and excisional biopsy of the carinal lesion with the rigid bronchoscope revealed an inflammatory lesion with considerable granulation tissue (*Figs. 2 and 3*). The base of the lesion was composed of vascularized granulation tissue with collections of chronic inflammatory cells including plasmacytes, lymphocytes, and macrophages. The surface in some loci was covered by fibrin deposited in a laminar fashion. In neighboring regions, nonkeratinized squamous epithelium covered the surface. The epithelium was characterized by local zones of hypertrophy interspersed with a few large bizarre cells, but no distinct evidence of neoplasia. Epithelial cells had undergone a peculiar acidophilic necrosis with loss of nuclear definition in some regions; in other areas the epithelial cells were vacuolated. Bronchial washings were negative for tumor cells.

The patient was treated with doxycycline (Vibramycin), chest physiotherapy, and expectorants, and was discharged for follow-up in the Clinic. A repeat bronchoscopy 6 months later revealed no recurrence of the carinal lesion excised at the first bronchoscopy. Additional polyps were seen in the lateral aspect of the right main stem bronchus, in the posterior segmental bronchus of the right lower lobe, and in the lateral segmental bronchus of the left lower lobe.

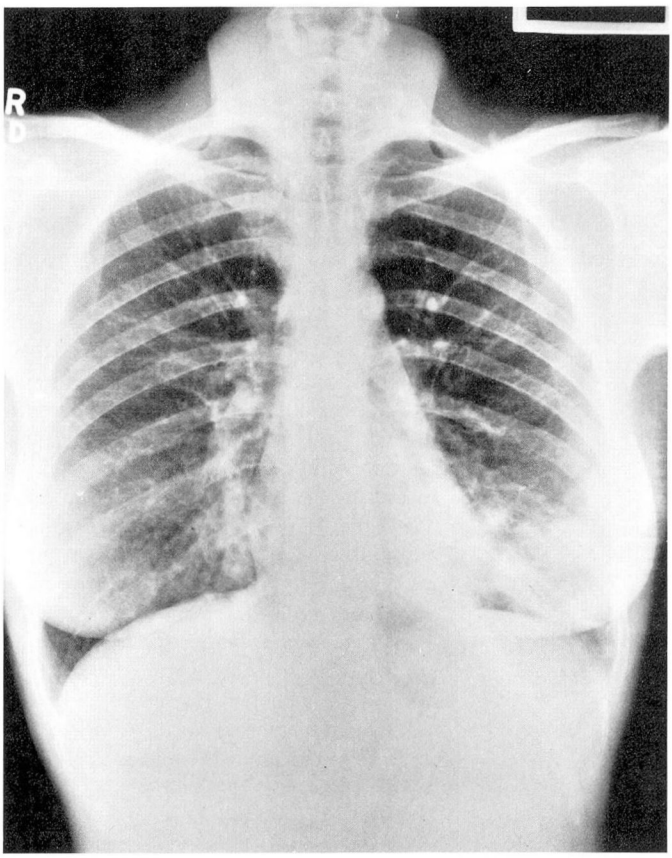

Fig. 1. Chest roentgenogram on first admission to the Cleveland Clinic showing alveolar infiltrate at the left base and some prominence of the interstitial markings at the right base.

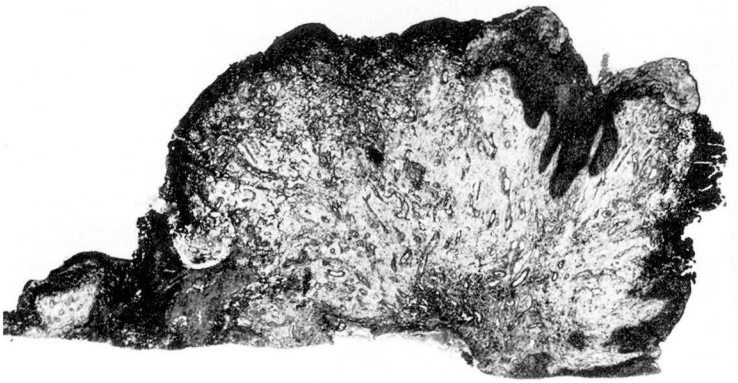

Fig. 2. Photomicrograph showing an inflammatory lesion with considerable granulation tissue (×16).

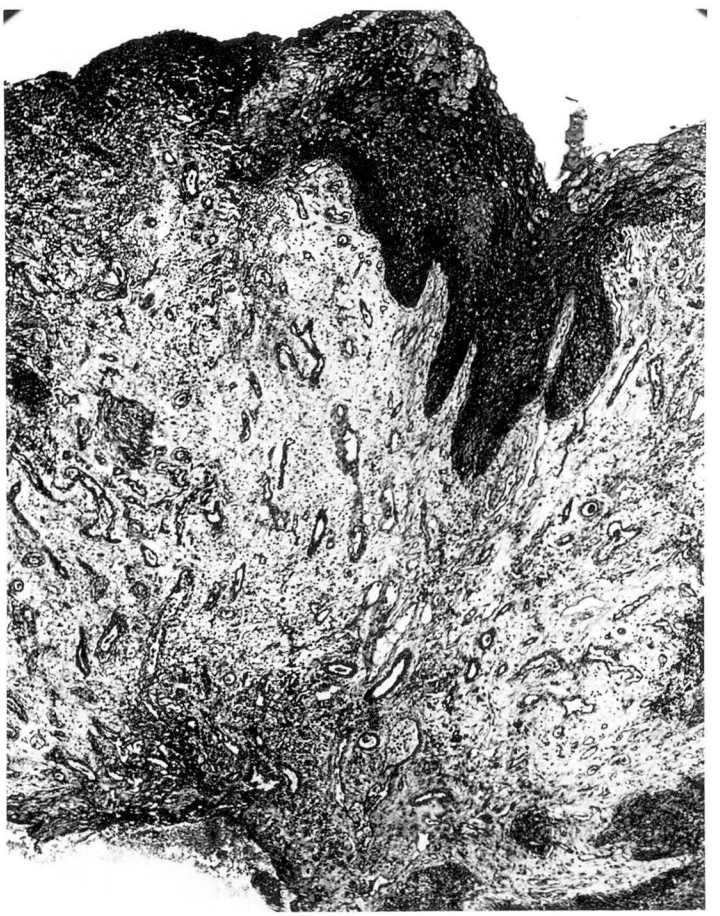

Fig. 3. Photomicrograph showing a magnified view of the same section as shown in *Figure 2* (×40).

Discussion

Inflammatory polyps are well-defined, sessile or polypoid lesions with a connective tissue stroma with or without infiltration by lymphocytes and plasma cells, usually surrounded by squamous epithelium or normal columnar epithelium. They are usually solitary benign lesions. Peroni[1] has divided inflammatory polyps into three groups depending on their histology: (1) fibrous connective tissue with inflammatory cell infiltration, (2) edematous connective tissue with cystic spaces, and (3) angiomatous polyps. This case is classified in the first group. The epithelium overlying these polyps consists of ciliated and nonciliated columnar epithelium or squamous metaplasia. Several pathologic diagnoses have been ascribed to inflammatory polyps. In a number of cases that Jackson and Jackson[2] reviewed and diagnosed as inflammatory polyps, other diagnoses previously ascribed were angioma, hamartoma, myoma, papilloma, fibroma, fibrolipoma, ecchondroma, tracheopathia osteoplastica, granuloma, granulomatous polyp, cyst, and teratoblastoma.

An inflammatory polyp usually forms in an area of chronic bronchial inflammation. The mucosa becomes injured, granulation tissue forms, and epithelialization ensues over the granulation tissue. The shape of the polyp is determined by the nature of the granulation tissue.

Endobronchial papillomas may be multiple or solitary. Multiple papillomas appear as flat, nodular masses. A solitary papilloma occurs as a wartlike excrescence. Histologically, they are characterized by multiple fingerlike projections lined by squamous or stratified ciliated or nonciliated columnar epithelium with a core of connective tissue with varying degrees of vascularity. In cases of juvenile papillomatosis, the histologic findings of the tracheobronchial papillomas are the same as that of the laryngeal lesions. Malignant changes may be seen in papillomas of adults, but are extremely rare in the papillomas in childhood.[3,4] Ashmore[5] reported four cases of endobronchial papillomas and found that two patients had inflammatory polyps, one patient had an endobronchial hamartoma, and one had papillomas.

Benign tracheobronchial papillomas and inflammatory polyps cannot be differentiated clinically or grossly from one another or from other benign endobronchial tumors. These lesions may be sessile or polypoid, and their appearance may vary from smooth and white to granular and red[6] (*Table*). Without histologic studies it is difficult to differentiate between an inflammatory polyp and a true papilloma of the tracheobronchial tree.

In one series[6] of six cases of inflammatory polyps and five cases of papillomas, the average age of the six patients, three men and three women, with inflammatory polyps was 45.5 years and the average age of the five patients, three men and two women, with papillomas was 37 years. Cough was present in all patients. Four of the patients with inflammatory polyps averaging 12.6 mm in length had dyspnea and one patient with papillomas averaging 4.6 mm in length had dyspnea. Four patients with squamous cell papillomas and two patients with inflammatory polyps had hemoptysis. There was one case of expectoration of a papilloma with hemoptysis of 300 cc following bronchoscopy. Three patients with squamous papillomas and one patient with an inflammatory polyp experienced wheezing. One patient in each group had chest pain.

Table. Characteristics differentiating inflammatory polyps from papillomas

	Inflammatory polyps	Papillomas
Category	Usually solitary	Solitary or multiple
Location	Predominantly right main stem bronchus	Frequently distributed throughout lungs
Clinical manifestations	Dyspnea	Hemoptysis and wheezing
Histology	Well-defined sessile or polypoid lesion lined by squamous and/or columnar epithelium. Connective tissue stroma with chronic inflammatory cells	Flat nodule or excrescence lined by multiple projections of squamous and/or columnar epithelium
Malignancy	Not reported	May occur; rare in children
Etiology	Chronic bronchial inflammation	Viral?

Inflammatory polyps occurred predominantly in the right main stem bronchus, whereas papillomas were more evenly distributed. Roentgenographic changes occurred in both groups.

Atelectasis and pneumonitis may develop distal to an obstructed airway(s) and persist or recur in that airway(s) following successful antibiotic treatment. Bronchiectatic cysts have been reported in one or more areas as a result of recurrent pneumonitis. These cysts must be differentiated from cavities secondary to lung abscesses and tuberculosis, both of which were reported to coexist with squamous cell papillomas in two of three cases in one series.[4] A small percentage of squamous cell papillomas become malignant.[3,7,8] Malignant degeneration has been reported in papillomas in juveniles without prior irradiation, but this is extremely rare.[8] Features that should lead one to suspect malignancy include lobar atelectasis, hilar adenopathy, fixation of the esophagus, and the appearance of an umbilicated lesion rather than a well-defined lesion.

The diagnosis of an endobronchial polyp may be strongly suspected from the signs and symptoms of persistent or recurrent pneumonitis in the same lobe or segment, persistent cough, and localized wheezing. Chest films usually show focal atelectasis, and persistent or recurrent pneumonic infiltrates. Roentgenograms of the lateral neck may reveal narrowing of the tracheal air column. Laminograms of the trachea will confirm a polypoid mass within the lumen. Bronchoscopy delineates soft tissue masses that may bleed easily.

In most cases the treatment of inflammatory polyps and papillomas of the tracheobronchial tree is bronchoscopic fulguration. DiMarco et al[9] proposed that removal by thoracotomy be considered in the treatment of all patients with adult onset and of those patients with juvenile onset of papillomatosis previously irradiated, since bronchoscopic biopsy of a squamous papilloma may miss an area of malignant degeneration. If the lesion grossly resembles a bronchial adenoma, a thoracotomy should be done because of the risk of excessive bleeding. If bronchiectasis or persistent or recurrent pneumonitis of one lobe supervenes while the other lung is free of disease, a lobectomy should be considered. Operation may be required repeatedly for removal of recurrent papillomas. In the series described,[6] the patients with inflammatory polyps have been followed an average of 6 years, the longest being 12 years. There had been

no recurrence of the lesions following removal. No deaths resulted from therapy, which consisted of bronchoscopic removal in five cases. In one of these cases residual parenchymal disease in the superior segment of the right lower lobe failed to clear over an 8-week period following bronchoscopic excision of the polyp. A right lower lobectomy was performed and irreversible bronchiectatic changes secondary to obstruction were found.

The patients with papillomas had been followed an average of 4½ years, the longest being 15 years. A second papilloma developed in the right bronchus of one patient 2 years after total excision of the first. Two patients had thoracotomies, one of which was done after massive unilateral hemoptysis developed. A papilloma was found in the excised lingula.

The only indication for irradiation in the treatment of juvenile papillomas may be an obstructing tracheal lesion where surgical resection is technically impossible, particularly with malignant degeneration of the lesion. Recurrent operative procedures for removal of laryngeal and tracheal polyps increase the risk of operative complications. Several surgical procedures on the trachea may lead to stenosis.

Summary

Clinically, it is not possible to differentiate between inflammatory polyps, squamous cell papillomas, or other benign endobronchial tumors. The clinical manifestations are a result of varying degrees of obstruction of the airways and the complications. It is important to differentiate between an inflammatory polyp and a squamous cell papilloma, because the latter may become malignant. The histologic findings should be carefully studied to exclude malignant changes that may occur in the solitary as well as in the multiple papillomas. Endobronchial resection is usually the treatment of choice. Although inflammatory polyps are benign lesions, significant morbidity may result from recurring obstructive pneumonitis, lung abscess, and bronchiectasis. Therefore, early diagnosis and treatment should benefit the patient.

Acknowledgment

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