dure. The patient additionally demonstrates the usefulness of the urinary cyclic AMP, serum chlorides, carbon dioxide combining power, arterial pH, and the PTH radioimmunoassay as diagnostic aids.

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Benign tumors of the tracheobronchial tree are not infrequent. Although quite symptomatic at times, they rarely present life-threatening symptoms. Of the benign endobronchial tumors, lipomas of the bronchus were probably recognized earliest as reaching such size as to obstruct main bronchi, as the one found at necropsy by von Rokitansky in 1854.1 In this presentation, a giant bronchial polyp of the right upper lobe is described which produced dramatic upper airway obstruction by prolapsing into the opposite stem bronchus necessitating its removal by emergency thoracotomy. The uniqueness of the clinical presentation of the lesion, as well as its operative removal and histologic composition were thought to be of sufficient interest to warrant their description.

CASE REPORT

A 48-year-old merchant seaman became suddenly "asthmatic" four months prior to admission with continued wheezing and increasing shortness of breath, not only on exertion but also at rest. Broncholytic agents provided no relief. The patient rapidly gained weight during this period, owing mainly to severely reduced respiratory reserve and consequent inactivity. Chest x-ray films during that period showed normal findings.

On the night prior to admission, the patient experienced an acute exacerbation of his breathlessness and a feeling that something in his chest had moved. In September, 1972, he was admitted to our institution with extreme dyspnea, cyanosis of lips and nail beds, inability to recline, and such shortness of breath, he was barely able to furnish a history. He had been a cigarette smoker for most of his adult life. He denied fever, hemoptysis, and purulent expectorations. Breath sounds were audible over both lung fields with high-pitched inspiratory and expiratory wheezing and an episodic dry cough. The scant sputum revealed no traces of blood.

Giant Bronchial Polyp Treated by Emergency Thoracotomy*

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An unusual giant bronchial polyp of the right upper lobe is reported which produced sudden life-threatening airway obstruction in a man who had become dyspneic shortly before admission. The pedunculated tumor had suddenly prolapsed into the opposite stem bronchus. Immediate thoracotomy without prior endoscopic examination was chosen deliberately to avoid further compromise of the already dangerously limited airway. The course and management are described in detail and the etiology of this lesion is discussed. To our knowledge such a giant bronchial polyp has not been reported previously.

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Figure 1. Laminographic section of tracheal bifurcation showing two globular masses straddling the carina.

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Chest x-ray film on admission revealed a peculiar bowing of the midportion of the trachea to the right, but no parenchymal changes or mediastinal shift. Laminography demonstrated a lobulated tissue mass occupying the carinal region. One of the large lobules appeared to completely obstruct the left main bronchus while the majority of the opacification occluded the right main bronchus (Fig 1). The clinical condition and the laminograms prompted immediate action.

Operation

On the basis of laminograms, the lesion was thought to originate in the region of the right upper lobe or right main bronchus. The appearance of the tumor on x-ray examination suggested lobulation and the sudden near-complete airway occlusion indicated that it was probably pedunculated.

The patient, at this point in the recumbent position, was maintaining an adequate level of aeration of both lungs. It was debated whether to perform bronchoscopy in hopes of bypassing the obstruction, and thus facilitating endotracheal anesthesia. It was feared, however, that endoscopic trauma to the tumor might well lead to either brisk hemorrhage, if not separation of the tumor mass, with further impaction of the mass into the left main bronchus. Both possibilities would have most likely led to immediate asphyxiation. For that reason, bronchoscopy was not performed. The patient was intubated awake with a topical anesthetic, after which general endotracheal anesthesia was administered and a standard right thoracotomy was performed.

The right lower and middle lobes were completely expanded; the right upper lobe showed evidence of chronic induration and volume loss of the apical segment. Within the right upper lobe bronchus, a firm mass could be palpated which extended into the right main bronchus. The obstructive lesion could also be felt through the membranous portion of the tracheal bifurcation.

Through a right upper lobe bronchotomy, a pinkish grey mass with long furrows and crevices became immediately apparent. Its base in the apical segment of the right upper lobe was broad and firm. After encircling the mass, its distal end could be easily looped and prolapsed into the operative field. The tumor was hard, gritty and did not bleed on touch (Fig 2). This maneuver immediately released the left main bronchus for insufflation. Because of the firm adherence of the mass to the apical segment, right upper lobectomy was performed in standard fashion. After completion of the thoracotomy, bronchoscopy was done to insure that the tumor had not fragmented or that other lesions had not been overlooked.

The patient's postoperative course was uncomplicated, and he left the hospital 12 days later. Wheezing disappeared and there was no further shortness of breath. He has remained well.

Pathologic Findings

The right upper lobe was contracted with atelectasis of the apical segment. The polyp arose from the apical segmental bronchus and filled the entire cross section of the right upper lobe bronchus. It was 8 cm long and varied from 1.0 to 1.5 cm in diameter. The distal end was globular and had extended into the left main bronchus. Deep corrugations were present, explaining the aeration of the lungs and the absence of atelectasis on chest x-ray films. The polyp was firm and gritty on sectioning.

Microscopically, it was composed of loose fibrovascular stroma with sparse infiltration of lymphocytes and plasma cells. The epithelial lining was partially folded forming a somewhat papillary configuration (Fig 3). The epithelium was of a ciliated pseudostratified columnar type with areas of squamous metaplasia. No atypia was seen.

Discussion

Bronchial polyps of this histologic composition appear to be quite unusual. Descriptions of a few apparently similar lesions were found in the literature, although in none of the cases was the polyp so large (8x1.5x1 cm) or the clinical presentation so dramatic.

In a review of benign tumors of the trachea and bronchi at the Mayo Clinic, Caldarola et al cited...
lengths of various lesions, such as squamous papillomata, inflammatory polyps, and hematomata of not more than 2 cm. Bjork\(^1\) reported an inflammatory polyp of 2.5 cm in length removed endoscopically. Ashley\(^2\) treated two such lesions, one 2.5 cm, the other 4 cm in length, by thoracotomy.

Liebow\(^6\) informed us that he had not seen a similar case and suggested the term "giant bronchial polyp." Because of the nonepithelial appearance of the epithelium in this polyp and the presence of an abundant fibrovascular stroma, we regard this lesion as reactive or inflammatory, possibly analogous to inflammatory polyps of such areas as the cervix or nasal passages.

Pollak et al\(^8\) reported in their compilation of the world literature the incidence of such epithelial tumor-like masses as 22 percent of all endobronchial tumors, second only to that of adenomas. The dimensions of their lesions, however, did not reach the proportions found in our patient. Such a high incidence is also contradicted by the experience of others.\(^7\)

The etiology of the tumor-like growths remains unclear. Jackson and Jackson\(^4\) favored the hypothesis that the lesions are secondary to suppurative pulmonary conditions, the infectious bronchial exudate being one of the main causative factors. One would expect, then, that their occurrence would be more frequent in patients with chronic suppurative lung disease such as bronchiectases, cystic fibrosis and others. Experience, however, does not bear this out. Our patient had no evidence of suppurative lung disease prior to the onset of symptoms due to bronchial obstruction. In contrast to the majority of patients cited in the literature, our patient had no hemoptysis.

The decision to proceed with emergency thoracotomy without prior endoscopic examination was based primarily upon the appearance of the tumor on laminography and the fact that the patient showed a sudden change in his breathing pattern suggestive of a prolapse of the lesion into the left main bronchus. It was feared that stimulation by endoscopy with its probable irritative effect might have caused further swelling, if not bleeding, both of which would have sealed the fate of the patient by complete obstruction of an already critically compromised airway.

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Mycobacterium Tuberculosis Infection of the Middle Ear*

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A diagnosis of tuberculous infection of the middle ear was made in two cases 25 years and one year after the onset of symptoms. The patients experienced purulent otitis media without fever or otalgia and progressive deterioration in auditory acuity. The diagnosis was established by culture of the aural discharge. There was no definite evidence of tuberculosis infection in the lungs or other organ systems. Treatment was instituted with antituberculosis chemotherapy, with improvement in symptoms. It is necessary to consider this etiologic possibility in all tuberculosis patients with otitis media as well as those patients without apparent tuberculosis with recurrent otitis media that does not respond to the usual therapy.

At the beginning of this century 3 to 5 percent of all cases of suppurative otitis media were probably caused by the tubercle bacillus.\(^1\) After the introduction of tuberculous chemotherapy, this form of tuberculosis has become rare but, unfortunately, has not disappeared. We have recently treated two patients with this disease.

CASE REPORT

CASE 1
A 31-year-old accountant had had middle ear infections since early childhood. At age four or five years he had a left mastoidectomy. A cholesteatoma was also present on the right at the time. During subsequent years the bilateral ear infections persisted, and a number of additional surgical procedures were performed. In April of 1971 reconstructive surgery was attempted on the left ear, but was complicated by a bacterial infection, which improved with local antibiotic therapy. During September, 1971, the infection worsened. Material was scraped from the left ear and cultured for various pathogens, including mycobacteria. A culture was positive for Mycobacterium tuberculosis, and the patient was referred to National Jewish Hospital for treatment.

However, during his many medical evaluations he could not recall ever having a tuberculous skin test or had tuberculosis ever been considered as a possible diagnosis. On examination, both ear drums were absent and replaced by fibrous scar tissue. Purulent material was draining from the middle ear area into the left ear canal. Both ear canals were distorted and enlarged as a result of the previous surgical procedures. Hearing was diminished bilaterally. A skin test with five tuberculin units (TU) of purified protein derivative (PPD-S) was positive, with 17 mm of induration. Findings on a chest roentgenogram were normal except for a small calcified granuloma in the right base. X-ray films of the

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