Bronchial Papillomas of Various Origins*

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There were five cases of solitary papillomas and three of chronic infectious papillomatosis induced by a foreign body, one caused by broncholithiasis. The five isolated papillomas had verrucous appearances. The common opinion, that the solitary papilloma is likely to be a pedunculated tumor, seems untrue. Squamous or cylindric epithelium covering the same tumor may vary from region to region. We believe that multiple polyps caused by inhalation of hot, burning, and corrosive gases are of inflammatory origin. Once the causative factor (eg, a late diagnosed foreign body) is removed, the inflammatory papillomatosis may resolve spontaneously. After the removal of a benign papilloma, recurrence is usually caused by lack of operative radicality rather than by malignancy. Laser technique and other coagulation methods make it possible to remove most tumors by performing bronchoscopy with only little risk. Papillomas showing the signs of atypia and peribronchial spreading require later surgery.

Papillomas of the tracheobronchial system may appear alone, scattered, or in the form of papillomatosis. The first dissected polyp of the trachea was reported by LIEUTAUD in 1767, and the first case of bronchial papilloma was reported by Siegert in 1882 in works dealing with tumors of the lower respiratory system. Kilian was the first to diagnose in vivo polyps of the trachea by means of bronchoscopy, while Syme diagnosed and removed a bronchial papilloma in 1927. Since then, literature dealing with this disease has significantly increased, but the number of published articles barely exceeds 100.

The classification by Drennan and Douglas' of lower respiratory tract papillomas with regard to pathogenesis is accepted today. Their three categories are: (1) multiple papillomatosis, (2) inflammatory polyps, and (3) solitary papilloma.

Material and Methods
Over 21 years, among 15,000 bronchoscopic examinations of new patients, we observed five solitary and three inflammatory cases of papilloma. The most important data are shown in Table 1.

In cases 1, 2, 7, and 8 a suspicious shadow was observed during chest x-ray examination, making bronchoscopic examination advisable. In cases 2, 7, and 8 the x-ray shadow and papillomas were observed on opposite sides; thus, the bronchoscopic findings were obtained by chance. Patient 7 had microcystic cancer of the right upper lobe and a papilloma located in the bronchial tree of the left lower lobe, which were diagnosed simultaneously. In patients 3, 4, 5, and 6, bronchoscopy was performed because the clinical results of treatment were not satisfactory. In patients 1 and 3 the outer surface of the tumor was composed of nonkeratinized squamous epithelium (Fig 1), in patient 2, keratosed squamous epithelium (Fig 2), and in patient 4, partially metaplastic squamous epithelium and partially ciliated cylindric cells. In all the remaining cases it was composed of only ciliated cylindric cells (Fig 3). In case 1 the papilloma was of adenomatous structure. In case 3 the tissue showed signs of slight atypia due to mucosal dysplasia, and two years later, on the opposite side, an inoperable squamous epithelial cancer developed. Tumors in the intrabronchial region were removed by bronchoscopy. Therefore, we were able to prevent the total closing of the left main bronchus in patient 3 for two years. It was also due to the bronchoscopic treatment that during the course of the obduction, only the area of the right upper lobe papilloma was distinguishable.

Discussion
Multiple papillomatosis mainly attacks children and young adults. The disease originates primarily in the larynx, with a tracheal incidence of about 2 percent.

The papilloma has a tendency to spread, to recur, and to heal spontaneously. Malignant transformation has also been described. Assumed to be of viral origin, papillomatosis has been brought about by applying human cell-free extracts of the tumor to patient's skin and also to dogs' mouths and to vaginal epithelium. Some authors believe that multiple papillomatosis is caused solely by the human papilloma virus, which plays a role in the formation of condylomas and warts on the skin and on the genitals. Others disagree with the viral etiology.

The inflammatory polyps can be solitary (patients 1 and 5; Fig 4) or multiple (case 4). They usually are caused by some sort of irritation. In our three patients, the presence of a foreign body most likely played a role in the cause of this disease. Case 1 is noteworthy because we have not read about papillomas caused by broncholith before (Fig 5). The broncholithiasis is assumed to be caused by calcified lymph nodes.

Recently, cases of multiple polyps in the tracheobronchial tract caused by inhalation of hot, burning, and corrosive gases have been reported.

The tissue background of these cases was suitable for pyogenic granuloma. The irritation having ceased, the polyps must have been the consequence of a hyper-regenerative process following mucosal ulceration, with spontaneous regression. Based on the pathomechanism of tumors of this type of etiology, even if the structures of the papillomas differ somewhat, we believe these polyps to be of inflammatory origin.

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Table 1—Clinical Data on Eight Cases of Bronchial Papilloma*

<table>
<thead>
<tr>
<th>Case No., Sex, Age, yr</th>
<th>Diagnosis</th>
<th>Chest X-ray</th>
<th>Bronchial Disorders</th>
<th>Therapy</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ♀ 35</td>
<td>Papillomatosis and lithiasis of the left main bronchus; pneumonia of the left lower lobe</td>
<td>![Chest X-ray Image]</td>
<td>Bronchoscopy</td>
<td>Free from relapse since 1967</td>
<td></td>
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<tr>
<td>2. ♂ 49</td>
<td>Papilloma of the right main bronchus; pneumonia of the left lower lobe</td>
<td>![Chest X-ray Image]</td>
<td>Bronchoscopy</td>
<td>Free from relapse since 1978</td>
<td></td>
</tr>
<tr>
<td>4. ♀ 43</td>
<td>Papillomatosis and foreign body in the bronchus intermedius</td>
<td>![Chest X-ray Image]</td>
<td>Bronchoscopy</td>
<td>Papillomatosis regressed</td>
<td></td>
</tr>
<tr>
<td>5. ♂ 55</td>
<td>Papillomatosis of the bronchus intermedius. Foreign bodies in the bronchus intermedius and the right upper lobe bronchus</td>
<td>![Chest X-ray Image]</td>
<td>Bronchoscopy</td>
<td>Residuum bronchoscopic excision because of partial regression</td>
<td></td>
</tr>
<tr>
<td>6. ♂ 53</td>
<td>Papilloma of the left main bronchus</td>
<td>![Chest X-ray Image]</td>
<td>Bronchoscopy</td>
<td>Free from relapse since 1984</td>
<td></td>
</tr>
<tr>
<td>7. ♂ 58</td>
<td>Papilloma of the left main bronchus; microcellular carcinoma of the right upper lobe</td>
<td>![Chest X-ray Image]</td>
<td>Bronchoscopy Surgery because of cancer</td>
<td>Free from relapse since 1984</td>
<td></td>
</tr>
<tr>
<td>8. ♂ 54</td>
<td>Papilloma of the bronchus intermedius, pneumonia of the left lower lobe</td>
<td>![Chest X-ray Image]</td>
<td>Bronchoscopy</td>
<td>Removed totally: 1986</td>
<td></td>
</tr>
</tbody>
</table>

*Legends: papilloma, cancer, bone of chicken, pea, broncholith

The solitary papillomas of the bronchi are among the rarest types known. Their genetic predisposition is assumed. We have observed that these tumors are most commonly diagnosed in older patients who are in their 50s. These tumors are six times more common in men than in women. All of our cases were in men. According to Drennan and Douglas, the solitary papilloma is known to be a pedunculated tumor. How-
However, according to our observations, this opinion needs to be revised, because, besides its exterior appearance, the tumor can be seated on a large base, have a sharp border, have the raspberry or blackberry shape of a papillary structure, or may be cauliflower-like. Each of our patients had a tumor-like wart (cases 2, 3, 6, 7 and 8).

The papilloma usually spreads exophytically; however, rarely, it penetrates the deeper layers of the bronchial wall ("ice-mountain" type). The macroscopic picture of the papilloma depends much on the type of the epithelial cells, the degree of its differentiation, the characteristics of its growth, the intracellular connections, the structure of the stroma, the surroundings with which the outer surface of the tumor is in contact, or the composition of the secretion and the stage of its development. Fibrous stroma is the base element of the papilloma composition, which can be edematous, hyperplastic, or compact hypervascular, and, depending on its etiology, can be infiltrated with cells of inflammatory nature. The endobronchial polyps do not contain a large number of eosinophil...
did not occur. However, squamous epithelial cancer did develop later, on the opposite side.

Clinical symptoms are caused by papillomas which are widespread, block the lumen, and complicate drainage. Thus, atelectasia, secondary pneumonia, abscess, and bronchiectasis may occur. From this point of view, mainly multiple papillomatoses and polyps of inflammatory origin may be considered, while the smaller, solitary tumors may remain unnoticed and be revealed only by accident. Among the complaints, the most common are cough, increased sputum, sometimes bloody, and dyspnea. This is why asthma, chronic obstructive bronchitis, or other disorders are mistakenly diagnosed. Sometimes papillomas are detected, but their causative factor stays hidden. This was the case in patient 4 (Table 1). She had bronchoscopic study in another department earlier, then came to us for the bronchoscopic resolution of her papillomatosis. We also performed endoscopy, when we discovered the cause of the patient's bronchial papilloma. A chicken bone (vertebral) was situated in the distal part of bronchus intermedius. In patient 5 we made observations for two weeks; lacking any other anamnesis, we assumed the patient's condition to be chronic obstructive bronchitis. Because his condition did not improve satisfactorily with treatment and care, we performed bronchoscopy before discharging him from the hospital. This was when we discovered two foreign bodies positioned in two different locations. First, a chicken bone situated in the initial part of the bronchus intermedius was surrounded by a warty proliferation. It was extracted with the aid of a stare tube to ensure an airway to the middle and lower lobe and to moderate the patient's heavy breathing. Second, a green pea impacted in the right upper lobe bronchus was removed with the aid of fiberscope because there was no other way to reach it (Fig 6).

The induced papillomas in most cases spontaneously resolved after removal of the causative factor, although not in case 5 (Fig 4), in which bronchoscopic treatment was needed.

Thoracotomy resection was offered for the removal of solitary papillomas in most previous reports to ensure major radicality and to avoid the danger of bleeding. Today, however, the laser technique and other developed coagulation methods (electrocoagulation, chircoagulation) make it possible to remove most of the tumors by performing bronchoscopy, with little trouble to the patients and only a small risk. Papillomas that show signs of atypia and peribronchial spreading or that cannot be reached by bronchoscopy also require later chest surgery.

Bronchoscopic evaluation is advisable even for palliative purposes, as well as the following: (1) if the patient's condition is not satisfactory enough to undergo thoracotomy; (2) if there are multiple papillomas; (3) if radical removal is not possible by chest operation; (4) if bronchoscopic study can aid a possible chest operation; (5) if, owing to the tumor or to its complications, surgery is required, including chest operation, but the patient does not consent even after intensive consultation with the surgeon.²

References


Figure 5. The broncholith removed from the left bronchial system (case 1).

Figure 6. The chicken vertebra removed from bronchus intermedius and the green pea extracted from the right upper lobe bronchus (case 5).
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13 Williams DO, Vanekko RM, Glassroth J. Endobronchial polyposis following smoke inhalation. Chest 1963; 44:774-76