Bronchial Adenoma of Carcinoid Type with Distant Metastases

S. W. BERKHEISER, M.D.
Harrisburg, Pennsylvania

Bronchial adenomas comprise approximately 6 to 10 per cent of all primary neoplasms of the lung. Since most adenomas are usually resectable and are potentially curable, they constitute an extremely important group both from the pathologic and clinical viewpoints. Many aspects concerning their histology and clinical course, however, are still controversial.

Most authors agree with the subdivision of the broad general group into two main types: (1) the cylindroid, or cylindromatous form; (2) the carcinoid form. Considering the large number of bronchial adenomas reported, it is surprising to find only a few with distant or disseminated metastases. Survey of the available literature reveals that the adenomas producing distant metastases have been almost exclusively of the cylindroid type. During a recent study a most unusual case of the carcinoid form with distant metastases was observed. Because of the rarity it is believed worthy of presentation.

Case Report

The patient was a 73 year-old white man admitted to the hospital November, 1950. His presenting complaint was low back pain of two years duration. Except for slight ankle edema of several months duration, no other symptom was noted.

Physical examination disclosed a temperature of 100°F; pulse rate-100; respiration rate-20; and blood pressure 136/80. The physical findings were rather meager. A few expiratory rales were audible over both lung bases. There was slight edema of the extremities.

The red cell count was 3.72 million with 12.0 gm. of hemoglobin. The white blood cell count was 14,200, with a differential of 89 neutrophils, and 11 lymphocytes. Urinalysis disclosed 4 plus albuminuria, with a few red and white cells on microscopic examination. Other laboratory data including serology, carbon dioxide content, chloride determination, urea nitrogen, and electrolyte studies were within normal limits.

A chest roentgenogram disclosed an oval tumor mass in the anterior segment of the right upper lobe. Slight compression of the body of the 11th thoracic vertebra, possibly due to old fracture, was also noted. Treatment consisted of intravenous supportive measures, combined with penicillin administration.

His clinical course was characterized by stormy episodes of pulmonary edema with marked dyspnea. In spite of the usual therapeutic measures, he failed to improve, and he expired about one week after admission.

Pathology

Gross Autopsy Findings: Only the significant postmortem findings are recorded.

Approximately 150 cc. of clear yellow fluid was present in the right pleural cavity. The right pleural space was virtually obliterated by dense fibrotic adhesions. The weight of the right lung was 995 grams, and that of the left lung 500 grams. The entire tracheo-bronchial tree contained a large amount of thick yellowish mucus. Just within the main stem bronchus of the right upper lobe was an oval, 1.5 cm. mass, which produced almost complete bronchial obstruction (Fig. 1). The

From the Department of Laboratories, Harrisburg Polyclinic Hospital.

449
surface was fairly homogenous, gray-white, and slightly lobulated. The lesion was not encapsulated and there was apparent extension into the adjacent lung parenchyma for a distance of 2.0 cm. The right upper lobe distal to the tumor showed evidence of prolonged obstructive changes with some cavitation and numerous dilated bronchioles. The right and left lower, as well as the right middle lobes showed extensive confluent bronchopneumonia.

The liver was enlarged and weighed 4000 grams. The entire parenchyma was studded with metastatic nodules varying from 1 to 8 cm. in diameter. An estimated 80 per cent of the liver tissue was replaced by the metastatic nodules.

**FIGURE 1:** Gross photograph showing bronchial adenoma arising in main bronchus of right upper lobe.

**FIGURE 2:** Photomicrograph disclosing the organoid pattern of bronchial adenoma of carcinoid type. Note the regular cell outlines and the lack of mitotic activity (x 160).
Both kidneys were moderately enlarged and contained grayish-white nodular implants, averaging 0.5 cm. in diameter.

Moderate enlargement of the regional hilar lymph nodes was also observed. Multiple metastases were also present in the right fourth, fifth, seventh ribs, the left sixth rib, and the lower thoracic vertebrae.

**Microscopic Findings:** The bronchial neoplasm was composed of groups of small regular cells with a cuboidal or slightly elongated outline. The nuclei were uniform, oval, and abnormal mitotic figures were rare. There was a definite tendency to form small cords with an intervening fibrous stroma, which was thin and delicate. The cellular pattern was of a definite organoid type and closely resembled that of a carcinoid tumor (Fig. 2). Clumps of similar cells were present within the submucosal lymphatic vessels of the submucosa of the bronchus. None of the features was typical of the cylindromatous variety of bronchial adenoma. Other sections of right lung showed extensive pneumonitis of obstructive type. The left lung showed similar changes, but to a less marked degree.

The metastases present within the hilar lymph nodes, liver (Fig. 3), kidney (Fig. 4), and bone showed a virtually identical histologic pattern as the primary lesion within the right upper lobe.

**Discussion**

The natural history of bronchial adenomas indicates they are predominately slow-growing neoplasms, regional metastasis being observed in about 5 to 10 per cent of the cases. According to the literature, the cylindroid type of adenoma is more invasive microscopically than the carcinoid form. The potential malignant capacities of these two main types is subject to some dispute.

Until 1937, there had been no report of a case of adenoma with metastasis. By 1943, several cases with metastasis to adjacent lymph nodes, or microscopic metastases in the vertebrae and liver, had been recorded. Cases of adenoma with metastases have been described by Anderson, Graham and Womack, Geever and others, and by Soutter, Sniffen, and Robbins. As far as can be determined from the photomicrographs and descriptions of these cases, all of the adenomas producing distant metastases have been of the cylindromatous type. In some of the reported cases, the exact classification is uncertain. One of the cases described by Graham and Womack simulated the carcinoid form, but the neoplasm also contained sarcomatous-like components. Liver metastasis was observed in this particular case. Soutter and others studied one of the largest series of bronchial adenomas reported to date. After studying a group of 56 adenomas of carcinoid type and four of cylindromatous type, they concluded that the cylindromatous variety were much more malignant in behaviour than the carcinoid forms. No distant metastases, however, were noted in either group. Metastases in the carcinoid group were restricted primarily to the regional lymph nodes, and none was considered inoperable.
From study of the present case, none of the microscopic features was of aid in determining whether generalized metastases could be expected. The histology was identical with numerous cases previously reported as the benign carcinoid type of bronchial adenoma. The situation is analogous to the problem of the differentiation of benign and malignant tumors of endocrine gland origin, particularly those derived from the adrenal medulla. Unfortunately, the presence of metastases is the only reliable criterion of malignancy, since the histologic features of the benign and malignant forms may be quite similar.

It is well to emphasize that the incidence of metastasis in the bronchial adenoma group is low compared to other malignant pulmonary tumors. More patients will die of obstructive pneumonitis or hemorrhage than from metastases. The extensive study of McBurney, Clagett, and McDonald3 established this fact beyond any reasonable doubt.

Since the histologic differentiation of benign and malignant types of bronchial adenoma may present problems, it is logical that early diagnosis and adequate surgical removal offers the best opportunity for long term survival.

REFERENCES