However, in men between the ages of 29 to 35, they are the most commonly occurring neoplasms, and account for 11.4 percent of the cancer deaths in the age group 25 to 34. More than 90 percent of all testicular tumors are malignant, and in most, the presenting symptom is a mass or swelling in the testis. Doctor et al in their review of testicular tumors, found that 108 of the 112 patients with embryonal carcinoma had a mass in the testis as a presenting symptom. Sixty of them had testicular pain. Comparable figures as to the incidence of mass or swelling of testes and pain are reported in the study by the Armed Forces Institute of Pathology. It is of interest to note that in the AFIP study, one-third of the patients had clinically demonstrable metastases at the time of the first examination.

REFERENCES

4. Sulak MH: Classification of different pathologic types. JAMA 213:91-93, 1970

Bronchial Carcinoid: A Malignant Tumor*

Marian Wisniewski, M.D., and Alfred O. Fayemi, M.D.

A case of metastatic bronchial carcinoid in a 14-year-old girl is described. Necropsy demonstrated unusually extensive cardiac metastases as well as involvement of other organs. This case indicates the malignant potential of so-called bronchial "adenomas" of carcinoid type. A carcinoid syndrome was not present despite significant hyperserotonemia.

Bronchial adenomas of the carcinoid type are generally considered to have low grade malignancy, although they have occasionally been associated with widespread metastases. The following report describes a patient who died as a result of diffuse metastases from a primary bronchial adenoma of the carcinoid type. The case illustrates the aggressive character of the tumor and an extensive involvement of the heart.

*From the Department of Pathology, Mount Sinai School of Medicine of the City University of New York, New York City.
Reprint requests: Dr. Wisniewski, Department of Pathology, Mount Sinai Hospital, New York City 10029

Case Report

A ten-year-old Negro girl was admitted for the first time to The Mount Sinai Hospital on March 24, 1967 because of fever and cough. She had been treated as "asthmatic" since the age of five.

Physical examination revealed a chronically ill, asthenic girl. Pulse rate was 100 per minute, respiratory rate 34 per minute and temperature, 102°F. The right hemithorax was dull to percussion and the trachea was shifted to the right. Radiographs of the chest revealed infiltrates in the right lung and compensatory emphysema of the left lung. Tomograms of the right hilar region demonstrated a mass arising from the right main bronchus with atelectasis of the right upper lobe. Bronchoscopy revealed a firm polypoid mass occluding the right main bronchus. Biopsy showed a bronchial adenoma of the carcinoid type. On the 14th hospital day, the child underwent a right pneumonectomy. A 3.5 cm polypoid irregular tumor mass was seen in the upper lobe bronchus of the resected lung. Histologically, the tumor consisted of sheets and cords of small neoplastic cells separated by generally delicate connective tissue septa. In some areas a pseudoglandular pattern was obvious. The cells showed little pleomorphism or nuclear atypism, and distinct, pale eosinophilic cytoplasm. The nuclei were small, uniform and somewhat vesicular. No mitoses were found; however two superior mediastinal lymph nodes contained microscopic foci of metastatic tumor.

Proper operative determination of urinary 5-hydroxy-indol acetic acid (5-HIAA) yielded normal result; however, serum serotonin was slightly elevated (Table 1). Samples of the resected tumor showed serotonin values of up to 0.41 μg/gm of tissue.

The patient recovered from the operation and was well until late 1969, when she began complaining of headache, nausea, vomiting and decreased vision. Rontgenograms of the skull were interpreted as normal except for a "flattened sella." Electroencephalogram was within normal limits. Her complaints persisted and worsened during the following year and in January 1971, high levels of blood serotonin and its urinary metabolites were demonstrated (Table 1). Her final admission, in March 1971, was precipitated by a "status asthmaticus." Ventricular tachycardia ensued and the patient died.

Necropsy Examination

The pericardial cavity contained 500 ml of serosanguineous fluid. The heart was greatly enlarged, and weighed 670 gm. The pericardial surface was marked by multiple gray tumor nodules, the largest of which mea-

<table>
<thead>
<tr>
<th>Table 1—Values of Serotonin and Its Metabolites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Values</td>
</tr>
<tr>
<td>April 1967</td>
</tr>
<tr>
<td>January 1971</td>
</tr>
<tr>
<td>Serum serotonin (in μg/ml)</td>
</tr>
<tr>
<td>0.09-0.31</td>
</tr>
<tr>
<td>0.37</td>
</tr>
<tr>
<td>1.10-1.50</td>
</tr>
<tr>
<td>Urinary 5-HIAA (in mg/24 hrs)</td>
</tr>
<tr>
<td>1.50-7.50</td>
</tr>
<tr>
<td>3.82</td>
</tr>
<tr>
<td>156 and 193</td>
</tr>
<tr>
<td>Urinary tryptamine (in mg/24 hrs)</td>
</tr>
<tr>
<td>25-125</td>
</tr>
<tr>
<td>169</td>
</tr>
<tr>
<td>Urinary IAA (in μg/24 hrs)</td>
</tr>
<tr>
<td>3.0-8.0</td>
</tr>
<tr>
<td>18.4</td>
</tr>
</tbody>
</table>

CHEST, VOL. 62, NO. 6, DECEMBER, 1972
BRONCHIAL CARCINOID

The heart showing multiple tumor nodules (arrows). The myocardium and papillary muscles were diffusely infiltrated by metastatic tumor (Fig 2). The outflow tract of the right ventricle was considerably narrowed by intramyocardial tumor infiltrates and the right ventricular endocardium was moderately thickened. Tumor metastases were also found in left lung, liver, pancreas, both kidneys, both ovaries, gallbladder, thyroid and one parathyroid, as well as in mediastinal, mesenteric and retroperitoneal lymph nodes.

The tumor was histologically identical with the carcinoid resected four years previously. Myocardial fibers adjacent to deeply infiltrating tumor nodules showed secondary compression, atrophy and necrosis with patchy fibrosis (Fig 3). Intracytoplasmic argentaffin granules could not be demonstrated by Fontana-Masson silver stain. Determination of serotonin in necropsy material revealed elevated levels in serum (0.74 μg/ml) and heart (0.51 μg/gm).

DISCUSSION

The malignant behavior of the carcinoid variety of bronchial adenoma was suspected as early as 1932. However, considerable confusion existed among surgeons as well as pathologists until the late 1940's regarding the nature of these tumors. Many observers considered them benign and nonmetastasizing, whereas others noted and stressed their malignant potential. Subsequently multiple reports have indicated the malignant character of these tumors, which cause both regional and distant metastases. Bronchial carcinoids are now generally considered as usually slow growing tumors, which “... exceptionally may infiltrate the pericardium. ...” Despite mediastinal and extrathoracic metastases, prognosis is good since most patients survive for ten or more years.

In the present case, although widely metastasizing, the tumor retained its original histologic appearance which included the more or less orderly arrangement of fairly uniform cells with sparsity of mitoses. Despite this “benign” histologic picture the tumor behaved as a very malignant, invasive and metastasizing carcinoma. This contradicts the assumption of Donahue and associates, who have postulated that a tumor with orderly morphology does not metastasize and that therefore the histologic pattern of the primary tumor helps in predicting the likelihood of metastasis. Instead, our case fully supports the conclusion of Smith, that the original histopathologic picture of the bronchial carcinoid tumor is not of reliable prognostic value.

Cardiac involvement associated with a widely metastasizing bronchial carcinoid has only rarely been mentioned. Massive involvement of the heart in this case suggests the highly malignant nature of this tumor, similar to that of malignant melanoma, bronchogenic carcinoma, malignant lymphoma and other malig-
nont neoplasms, which are known to metastasize to heart.20

Hypersecretion without a clinical carcinoid syndrome has been recognized in association with bronchial adenoma of carcinoid type.21 In the present case neither the heart nor the lungs showed the lesions frequently seen in the carcinoid syndrome, ie the characteristic endocardial thickening or intimal changes in the pulmonary veins. Rather, a small area of a nonspecific endocardial fibrosis was seen. Conspicuous narrowing of the right ventricular outflow tract by the tumor as well as the large pericardial effusion may have contributed to the patient's dyspnea and eventual death. Therefore, this patient's fulminating course was not caused by an excess of circulating serotonin or related compounds, but it can be ascribed to a highly malignant neoplasm, a bronchial carcinoid.

ACKNOWLEDGMENTS: Dr. P. A. Kirschner performed the pneumonectomy. Determinations of serotonin and its metabolites were done in the Serotonin Laboratory of Dr. R. P. Warner. This work was supported by Carcinoid Tumor and Serotonin Research Foundation Inc. and by USPHS Training Grant No. GM00115-13.

REFERENCES
5 Foster-Carter AF: Bronchial adenoma. Quart J Med 10:139-174, 1941
14 Williams ED, Azzopardi JD: Tumors of the lung and the carcinoid syndrome. Thorax 15:30-36, 1960
17 Evans RW: Histological Appearances of Tumors. Balti-

come, The Williams and Wilkins Company, 1968, p 1120
19 Reingold IM, Escovitz WE: Metastatic cutaneous carci-

Alveolar Soft-Part Sarcoma

Report of a Case Presenting as Asymptomatic Pulmonary Nodules

CDR James C. McClamory, MC, USN** and
LCDR James O. Harris, MC, USNR†

Alveolar soft-part sarcoma is an unusual tumor of uncertain histogenesis which usually presents as a painful mass in the right thigh in young women and progresses slowly but inexorably to death. A search of the English literature revealed only 65 cases, none of whom presented with asymptomatic pulmonary nodules. The authors recently had the opportunity to see a young man with multiple pulmonary nodules whose biopsy diagnosis revealed alveolar soft-part sarcoma. It is the purpose of this report to add this tumor to the list in the differential diagnosis of pulmonary nodules.

Alveolar soft-part sarcoma, described by Christopher-
son et al1 in 1952, as an unusual tumor of uncertain histogenesis, usually presents as a painful mass in the right thigh in young women. We have recently had the opportunity to study the first reported case of this tumor presenting as multiple pulmonary nodules in a routine chest roentgenogram in a totally asymptomatic young man. It is the purpose of this report, therefore, to add this tumor to the differential diagnosis of asymptomatic pulmonary nodules.

CASE REPORT

An asymptomatic 24-year-old white man on active duty with the United States Navy was found to have multiple pulmonary nodules on a routine chest roentgenogram (Fig 1). He was a one-pack-per-day cigarette smoker and had had one bout of pneumonia at the age of three. He had lived in the mid-west briefly, but had spent most of his life in...