orange vegetation which resembled a cauliflower plant (Fig 1). The aortic cusps were excised and the aortic annulus soaked in a 25 mg percent solution of amphotericin B in Ringer’s lactate. The valve was replaced with a Starr-Edwards prosthesis. Postoperatively, intravenous amphotericin B was continued, but a BUN increase to 78 mg percent stimulated a decrease in the daily dose to 20 mg/day.

A diastolic murmur which developed during the third postoperative week was attributed to some breakdown of the annulus at the noncoronary cusp. This area was quite friable at the time of surgery. His course was satisfactory with no hemodynamic abnormality until he was lost to clinical follow-up approximately two months after surgery. We have subsequently learned that he died in November, 1971. Details of his death are not known.

Final cultures from the excised aortic valve revealed Candida guilliermondii to be the causative organism (Fig 2).

**COMMENTS**

Results of medical treatment of this disease have been poor. Of 21 patients treated prior to the advent of the use of amphotericin B, only one patient survived, having been treated with parenteral nystatin. Since 1960, 24 patients are known to have been treated with amphotericin B alone or in combination with other antimicrobials, with four survivors, for a 17 percent cure rate.

Kay and associates have reported a total of four patients with Candida endocarditis that have been treated surgically. All cases involved the aortic valve and each had aortic valvular replacement. Of the four patients operated upon, three have survived.

In the treatment of this patient, the principles derived from Kay’s experience with the first four patients have been followed. These include preoperative amphotericin, early surgical intervention, irrigation of the heart with amphotericin during surgery, and continuation of amphotericin therapy after surgery.

Although Kay’s criteria for cure were not satisfied by this patient because of the relatively short survival period, the prospects for this form of therapy are encouraging. In this particular patient there was another major obstacle which may have been the most important factor in his recovery—achieving rehabilitation and cure from addiction. Carey and Hughes reviewed 47 cases of Candida endocarditis in 1967, nine of which occurred in narcotic addicts and 21 of which occurred after open heart surgery. They concluded that Candida endocarditis was a clear hazard to the addict and to the open heart patient and a particular hazard to the addict with open heart surgery because of the likelihood of relapse of the narcotic habit. The decision for surgery in the life-threatening situation of Candida endocarditis must be made without regard to the coexistence of narcotic addiction—a problem to be resolved after initial salvage of the patient.

It appears that the combination of amphotericin therapy and timely surgical intervention is the treatment of choice of Candida endocarditis. This mode of treatment seems to be gradually reversing the bleak mortality figures obtained by medical therapy alone.

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**Diagnosis of a Case of Embryonal Carcinoma by Bronchial Biopsy**

**Basil Varkey, M.D.** and **Margaret G. Heckman, M.D.**

Embryonal carcinoma of the right testis in a young man who had no testicular mass, swelling, pain or tenderness is reported. The diagnosis was established by bronchial biopsy of an exophytic endobronchial lesion and confirmed at autopsy.

**CASE REPORT**

A 22-year-old white man was admitted to the orthopedic section of the Veterans Administration Hospital, Wood, Wisconsin on October 6, 1970 with low back pain of about two months’ duration. There was no history of weight loss, and no past history of trauma to any part of the body. He had had slight shortness of breath even at rest for about a month. The

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CHEST, VOL. 62, NO. 6, DECEMBER, 1972
EMBRYONAL CARCINOMA DIAGNOSED BY BRONCHIAL BIOPSY

Figure 1. Multiple masses in the left lung, and hilar and suprahilar masses in the right lung are seen.

initial chest roentgenogram (Fig 1) showed multiple masses and he was transferred to the pulmonary disease section.

Physical examination revealed an adult man, well developed and well nourished, complaining of severe low back pain. Pulse and blood pressure were normal. Both breasts were slightly enlarged and tender. Mild inspiratory and expiratory wheezing was present on auscultation of the lungs. Neurologic examination and straight leg raising test were normal. He had no tenderness over the spinous processes of the vertebral bodies, no hepatosplenomegaly and no lymphadenopathy. Both testicles were descended and were without enlargement, masses, or tenderness.

The laboratory tests showed normal urinalysis, normal hemoglobin, hematocrit and red blood cell count. White blood cell count was 14,800 per cubic mm with a differential count of neutrophils 82 percent, bands 3 percent, lymphocytes 8 percent and eosinophils 3 percent. Sedimentation rate was 71 mm/hour. Blood urea nitrogen, serum electrolytes, calcium, alkaline phosphatase, bilirubin, glucose, glutamic oxaloacetic transaminase and protein electrophoresis were normal. Liver and spleen scans, intravenous pyelogram, roentgenograms of the vertebrae, bone survey and strontium⁸⁸ bone scan were all normal. A bone marrow aspiration biopsy from the sternum and six sputum specimens were negative for malignant cells. The urinary gonadotropin level was between 500 and 1000 international units per liter.

On October 27, scalene lymph nodes were biopsied and were negative for neoplasia on histologic examination. The next day, the patient underwent bronchoscopy and an endoscopic friable lesion was noted in the left main stem bronchus at the level of the left upper lobe orifice which was biopsied. The pathologist reported a poorly differentiated neoplasm suggestive of an embryonal cell carcinoma (Fig 2).

Hospital course of the patient was one of progressive and rapid deterioration with increasing back pain and respiratory distress. At no time during his hospital course was there any testicular enlargement, tenderness or palpable mass. Combined treatment with actinomycin D and vincristine was instituted on a weekly basis, but did not alter the patient's symptoms or downhill course. The patient expired on November 21, 1970.

At autopsy, the patient was found to have a 5 mm tumor mass in the lower half of the right testis (Fig 3), which had not invaded the tunica albuginea. The tumor was a poorly differentiated embryonal cell carcinoma and had metastasized to the mediastinum, surrounded and invaded the left main stem bronchus, and extensively involved the parenchyma of both lungs. Metastases were also found in the thoracic and lumbar vertebral bodies.

**DISCUSSION**

Testicular tumors constitute only a small percentage (0.52 to 2 percent) of all malignant tumors in men.¹

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Figure 2. Microscopic (x 250) view of biopsy specimen taken from the left mainstem bronchus showing metastatic embryonal cell carcinoma.

Figure 3. Embryonal cell carcinoma, lower pole of right testis.
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. 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.

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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.

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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.

Preoperative 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 mg/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. Tomograms 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 1—Values of Serotonin and Its Metabolites

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