

## Unusual Sites of Metastatic Malignancy

### CASE 1. Cardiac Metastasis in Hepatocellular Carcinoma

A 43-year-old white man was admitted to our hospital for severe dyspnea, orthopnea, cough, and peripheral edemas. Three years earlier, he underwent a partial left liver resection for a trabecular hepatocellular carcinoma (pT2, pN0, M0; stage II, International Union Against Cancer). Objective examination showed hepatosplenomegaly, en-

gorged jugular veins, right pleural effusion, edema of the legs, hypotension, and tachycardia. Chest x-ray (Fig 1A) documented a moderately enlarged heart and a right pleural effusion. The two-dimensional echocardiogram (Fig 1B) demonstrated a right ventricular (arrow) mass associated with moderate pericardial effusion. Total-body computed tomography scan highlighted a right intraventricular mass (arrow; Fig 1C) protruding into the pulmonary conus (arrow, Fig 1D), pericardiac effusion, bilateral subpleural metastases, and a liver

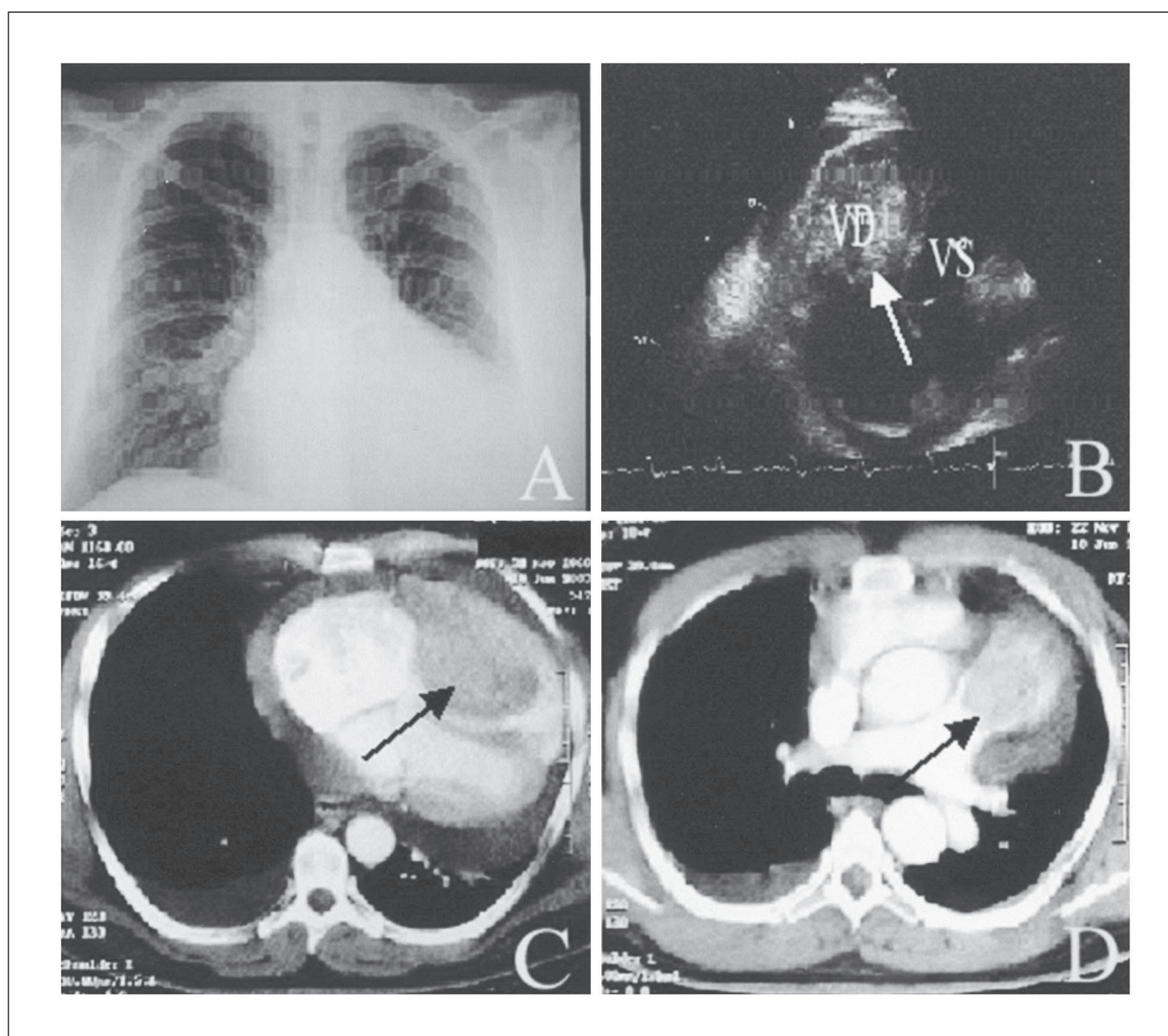


Fig 1.

recurrence in the eighth segment, without evidence of neoplastic thrombus into the suprahepatic and inferior cava veins. The patient had cardiac catheterization with biopsy that confirmed a hepatocellular carcinoma with intraventricular metastasis. Serum alpha-fetoprotein levels were normal. Biochemistry documented abnormalities of hepatic and renal functions, increased levels of D-dimers (20 ng/mL; normal, 0.0 to 0.5 ng/mL), low value of antithrombin III (57 ng/mL; normal, 80 to 120 ng/mL), and thrombocytopenia. The patient died after 20 days from acute congestive heart failure. Autopsy revealed liver recurrence of a well-differentiated trabecular hepatocellular carcinoma, multiple metastatic lung emboli, and a large right ventricular neoplastic mass infiltrating the cardiac wall and the pulmonary conus (arrow, Fig 2). Microscopic examination confirmed the presence of hepatocellular cancer in liver, lung, and myocardium (Fig 3; hematoxylin and eosin, 20 $\times$ ).

Several reports have described cardiac tumor metastases, and their incidence appears to be approximately 10% in patients with hepatocellular carcinoma.<sup>1,2</sup> Such metastases, however, usually invade the heart through the vascular system or by infiltrating from neighboring organs. They mainly implant in the epicardium and myocardium, and rarely in the cardiac cavities.<sup>3</sup> Intracardiac neoplastic thrombus may flow up to the left and right cardiac cavities through the pulmonary and the cava veins, respectively. This latter event mainly occurs in hepatocellular carcinoma, testicular teratoma, smooth muscle sarcoma, and renal carcinoma.<sup>4,5</sup> The incidence of hepatocarcinoma tumor thrombus in the right atrium is rare (range of incidence, 0.67% to 3%).<sup>6</sup> Hepatocellular carcinoma mostly produces direct invasion of the inferior vena cava and possible extension to the right atrium. Right cardiac metastases without continuity from the primitive liver tumor are described in rare cases.<sup>7-9</sup> Patients who present with right cardiac cavities

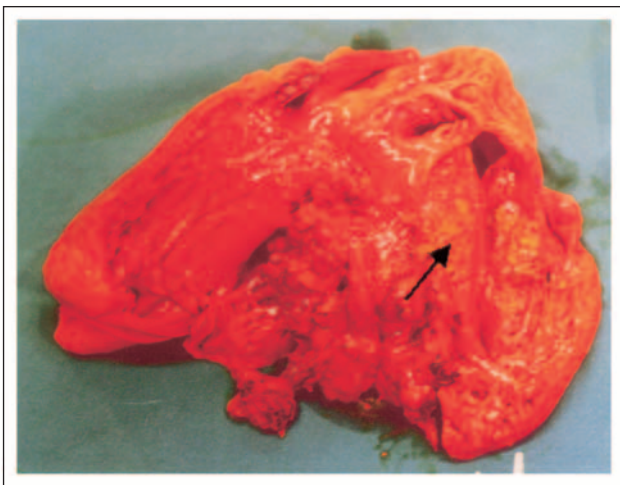


Fig 2.

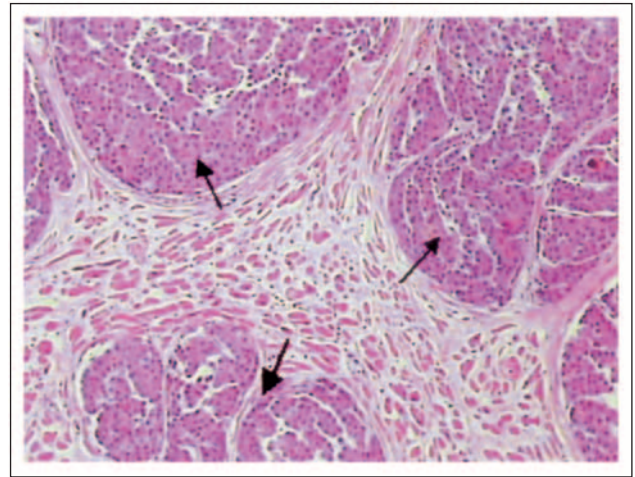


Fig 3.

tumor invasion are often misdiagnosed; however, even with correct diagnosis, effective treatment has not been well established. Palliative resection may be necessary owing to hemodynamic compromise, but the prognosis remains very poor.<sup>10</sup> In our case, a trabecular hepatocellular carcinoma surgically removed 3 years earlier produced a right massive intraventricular metastasis protruding into the pulmonary conus with extensive infiltration of the myocardial wall. This lesion was not due to a direct tumor extension to the right cardiac cavities, but to hematogenous spread, as well documented by the massive endocardium involvement.

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### Authors' Disclosures of Potential Conflicts of Interest

The authors indicated no potential conflicts of interest.

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## CASE 2. Burkitt's Lymphoma Involving the Gallbladder

A 51-year-old man with a history of gallstones presented with 2 to 3 weeks of intermittent fever, nausea, vomiting, anorexia, weight loss, jaundice, and progressive postprandial abdominal discomfort. Initial physical examination was notable only for fever to 101°F, jaundice, and right upper quadrant abdominal tenderness to palpation. Laboratory evaluation revealed leukocyte count of  $7.3 \times 10^9$  cells/L with normal differential and smear. Liver function tests were abnormal, with a total bilirubin of 10.0 mg/dL, alkaline phosphatase of 921 U/L, AST 261 U/L, ALT 187 U/L, amylase 560 U/L, and lipase 7,257 U/L. Routine radiologic evaluation with computed tomography scan showed a significantly thickened gallbladder wall at 2.25 cm and a solitary hepatic lesion that was consistent with an abscess. (Fig 1). The patient underwent a percutaneous fine-needle aspiration of the liver lesion to evaluate for infection and was treated empirically with intravenous ampicillin/sulbactam and metronidazole for presumed complicated cholecystitis. Before planned cholecystectomy, the biopsy of the liver lesion demonstrated non-Hodgkin's lymphoma instead of an infection. Another percutaneous core biopsy, this time of the gallbladder wall itself, revealed an infiltration of monotonous small noncleaved cells (Fig 2). Flow cytometry and immunohistochemical stains were positive for CD20, CD10, HLA-DR, Ki-67 (99%), and kappa light chain restriction, and negative for CD3 and CD23. Bone marrow and CSF were uninvolved. A gastroenterologist performed esophagoduodenoscopy showing diffuse lymphomatous studding of the upper gastrointestinal tract. (Fig 3)

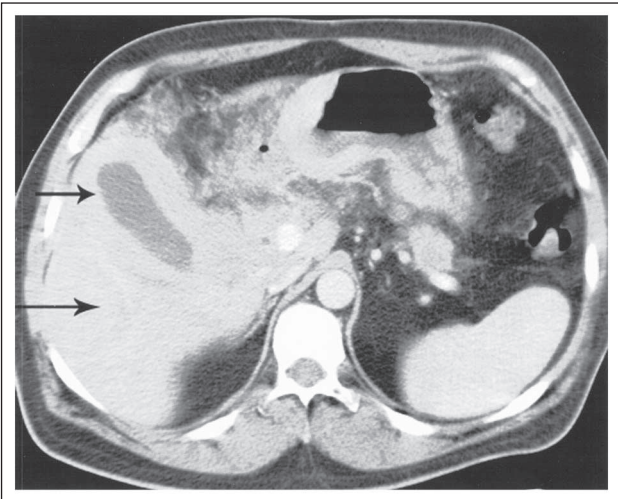


Fig 1.

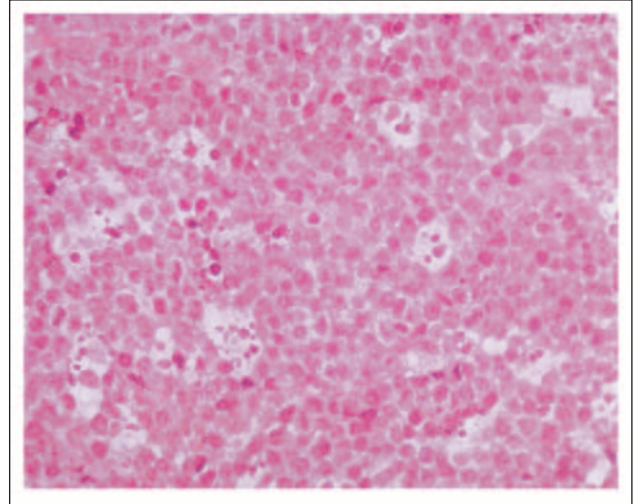


Fig 2.

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