

Occult Cardiac Metastatic Tumor

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Having two primary carcinomas is relatively rare. This report describes the case of a patient with an occult cardiac metastatic tumor. As a result of a pathologic review of the tumor that had metastasized to

the left atrium, a second primary tumor site was diagnosed.

Key words. Cardiac metastases; adenocarcinoma; pathologic review. (*J Fam Pract* 1994; 39:287-289)

Cardiac metastasis by malignant tumors is uncommon, with a prevalence ranging from 0.4% to 20.6%.¹⁻³ Primary tumors that most commonly metastasize to the heart are lung, breast, melanoma, and sarcoma.^{1,2} Gastric cancers uncommonly metastasize to the heart, with a reported prevalence of approximately 2.8%.¹ Metastasis to the heart can occur by hematologic dissemination (embolism of tumor cells), by lymphatic invasion, or by direct extension, as often occurs with a lung cancer invading the heart.

This case report describes a signet-ring gastric adenocarcinoma that had metastasized to the left atrium in a patient with a previously diagnosed colon adenocarcinoma. Pathologic examination of the cardiac metastasis demonstrated signet-ring cells, which were histologically different from those of the previous colon cancer. This finding prompted further investigation, leading to the discovery of a second primary tumor site.

Case Report

A 38-year-old man initially presented on January 8, 1987, to the University Medical Center in Jacksonville, Florida, with complaints of dyspnea on exertion, shortness of breath, cough, and weakness. His medical history included alcohol, tobacco, and intravenous drug abuse, and asthma in childhood.

A physical examination revealed a thin black man who was in moderate respiratory distress and afebrile, and

had a heart rate of 120 beats per minute, a respiratory rate of 24 breaths per minute, and orthostasis. HEENT was unremarkable: examination of the neck revealed no bruits, jugular vein distention, or lymphadenopathy. Auscultation of the chest revealed minimal bibasilar crackles. The patient was tachycardic, with a 3/6 systolic ejection murmur that was best heard over the left substernal border. The abdomen was benign, with no palpable masses or organomegaly. A rectal examination was normal, with guaiac negative stools. The patient's extremities had 1+ pedal edema. A neurologic examination revealed no focal deficits.

Laboratory analysis revealed a hemoglobin of 3.6 g/dL, hematocrit of 12.8%, and a white blood cell count of 10,400/ μ L. The red cell indices were microcytic and hypochromic (MCV, 55.1 fL; MCH, 15.3 pg; and MCHC, 27.8 g/dL red blood cells). All other laboratory values were within normal limits, including liver enzymes tests.

The chest radiograph at admission showed minimal cardiomegaly without pulmonary edema, and an electrocardiogram was consistent with sinus tachycardia. The patient was admitted with a diagnoses of severe anemia and high output cardiac failure. Further evaluation included a bone marrow biopsy, which demonstrated no stainable iron. Findings from an upper gastrointestinal (GI) tract series were normal. A barium enema, however, showed a presplenic polypoid mass in the proximal transverse colon. A subsequent biopsy revealed a poorly differentiated adenocarcinoma. The patient underwent a right-sided extended hemicolectomy with end-to-end ileotransverse colon anastomosis. No postoperative adjuvant therapy was given. The pathologic stage was T2b, N0, M0.

Submitted, revised, May 16, 1994.

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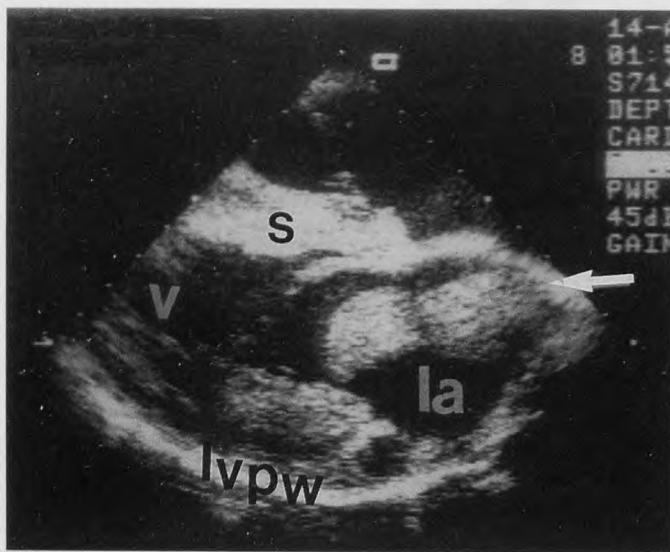


Figure 1. The long-axis view of the echocardiogram reveals the mass, designated by the arrow, within the left atrium; la denotes left atrium; v, left ventricle; lvpw, left ventricular posterior wall; s, septum.

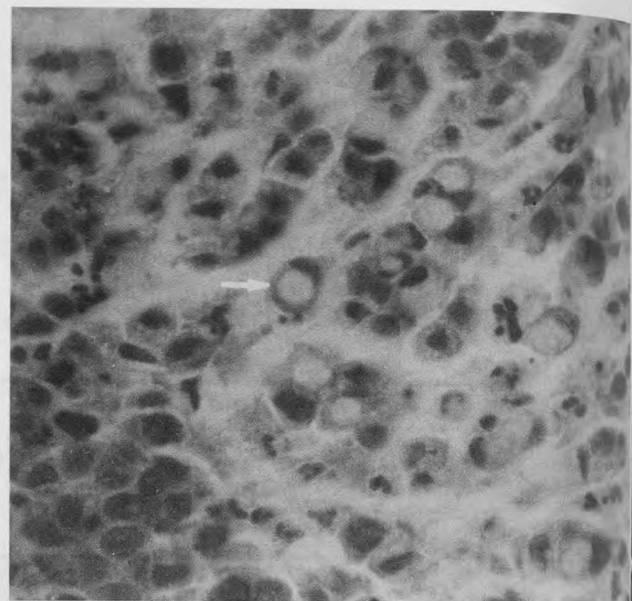


Figure 2. A mucin-containing cell (signet-ring cell), designated by the arrow. Note that the nucleus is displaced to the periphery.

Following discharge from the hospital, the patient had postoperative colonoscopies and was tested for carcinoembryonic antigen (CEA) levels on an annual basis. The colon examinations remained normal, except for a benign colonic polyp removed in 1989. Two years after removal of the polyp, the CEA level was noted to be elevated. In July 1991, the CEA level was 62.11 ng/mL, and in December of that same year it increased to 103.4 ng/mL. Despite these elevated levels, the patient's subsequent colonoscopies were unremarkable.

The patient remained clinically stable until March 16, 1992, when he presented with complaints of chills, congestion, and dehydration. He was admitted to the hospital with a diagnosis of pneumonia. The heart murmur present during his previous hospitalization was not audible.

After admission, the patient developed progressive respiratory distress requiring intubation and was transferred to the medical intensive care unit. Evaluation in the MICU included a computed tomography (CT) scan of the chest, which demonstrated a left atrial mass, thickening of the gastric antrum, and bibasilar pneumonia. An echocardiogram showed the same left atrial mass (Figure 1). The patient underwent surgical removal of the cardiac mass because it was believed to be a primary cardiac tumor. The pathology department reported a poorly differentiated adenocarcinoma with signet-ring cell differentiation (Figure 2). A review of the previous colon cancer pathology report showed no signet-ring cells. This finding suggested the possibility that the current metastasis was arising from a second primary gastrointestinal tumor.

Postoperatively, the patient developed an upper GI bleed, prompting upper endoscopy that revealed a gastric tumor. Biopsies of the gastric mass demonstrated signet-ring cell adenocarcinoma, with histologic findings similar to the metastatic left atrial tumor. The patient developed continual gastric bleeding and had a progressive decline. Death occurred 2 weeks postoperatively, secondary to massive GI bleeding and complications from the heart tumor that contributed to an embolic stroke. An autopsy was not performed.

Discussion

Although gastric carcinoma is decreasing in incidence, it still represents the seventh most common cause of cancer death in the United States.⁴ The etiology of gastric carcinoma is still unclear, but several risk factors have been suggested, including diet (eg, smoked fish and meats, nitrosamines, and pickled vegetables), genetics (blood type A), social factors (low socioeconomic status and cigarette smoking), and other disease entities (eg, atrophic gastritis, pernicious anemia, subtotal gastrectomy, and gastric polyps).⁵⁻⁷

Gastric cancers are classified into macroscopic and microscopic types^{5,8} (Table). Adenocarcinomas account for more than 95% of all gastric malignant tumors.

In this case report, our patient had signet-ring cell differentiation, the least common microscopic variant. Signet-ring cells are tumor cells containing clear mucin that displaces the nucleus to the periphery of the cell, producing the characteristic appearance (Figure 2).⁸

Table. Gastric Cancer Classifications

Macroscopic type of gastric cancer
 Polypoid fungating
 Ulcerating
 Diffuse or infiltrating

Microscopic types
 Adenocarcinoma
 Papillary
 Tubular
 Mucinous
 Signet-ring cell

Adenosquamous carcinoma
 Squamous cell carcinoma
 Undifferentiated carcinoma
 Unclassified carcinoma

Symptoms of gastric cancer are often vague, making the diagnosis difficult. Symptoms of epigastric discomfort, early satiety, anorexia, and weight loss may suggest gastric cancer. Ulcer-type pain that does not respond to therapy or iron deficiency anemia without an obvious source may justify an investigation for gastric disease. Physical findings may include a left supraclavicular Virchow's node.

Investigation for gastric cancer should include an upper GI series and upper endoscopy with biopsy of suspect lesions. Anemia is present in 40% of patients.⁹ Elevated CEA levels often indicate extensive metastasis. Gastric analysis may be consistent with achlorhydria.

The treatment for gastric cancers is surgical resection of the tumor and the regional lymph nodes, although the surgical approach varies according to tumor location. Adjuvant chemotherapy after curative surgery has not been proven effective. In metastatic diseases, doxorubicin hydrochloride, fluorouracil, or both have been used as palliative therapy.

Because of vague nonspecific symptoms, most gastric cancers are discovered after they have metastasized. The

patient in this case, who presented with disseminated disease and nonspecific symptoms, was no exception. To our knowledge, cardiac metastasis to the left side of the heart has not been previously reported.

Acknowledgments

The authors would like to thank Troy Guthrie, MD, and Bruce Villas, MD, for their contributions to this project. We are also indebted to John Grundig for his research assistance, and to Duaine Murphree, MD, and Mark J. DeHaven, PhD, for assistance with earlier drafts of this report.

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