DISCUSSION

Cancer metastasizes to the heart in from 1 to 21 percent of patients and may be characterized by one or more of the following features: (1) progressive, refractory cardiac decompensation; (2) the appearance of new outflow tract murmurs or new arrhythmias; (3) electrocardiographic changes without dynamic changes; (4) abnormalities on chest x-ray film including blurred contours of the heart and widened mediastinum; (5) echocardiographic features such as pericardial effusion, akinesis of a segment of myocardium, or masses within cardiac chambers.  

In case 1, the only evidence of cardiac metastasis on physical examination was the new onset of atrial fibrillation. The absence of a rub, gallop or murmur was falsely negative for metastatic cardiac involvement. The chest x-ray film, with evidence of a retrocardiac soft tissue density, was the earliest sign suggesting the possibility of cardiac metastasis. Echocardiographic evidence of left atrial invasion offered an explanation for the new-onset atrial fibrillation.

In case 2, the patient presented with dyspnea and pleuritic pain consistent with pulmonary embolism. Electrocardiographic findings of sinus tachycardia and incomplete right bundle branch block could be due to pulmonary embolism. The sudden worsening in symptoms with new electrocardiographic changes and multiple ventilation-perfusion mismatches by lung scanning were most likely due to pulmonary emboli. Echocardiography elucidated the evidence of the pulmonary emboli to be a right ventricular mass. The pericardial effusion and right ventricle-obliterating mass explained the patient's symptoms and guided further management.

The detection of cardiac involvement by metastatic tumor is important both prognostically and therapeutically. Although cardiac involvement carries a very high one-year mortality, prolonged survival associated with spontaneous disappearance of intracardiac mass metastases has been reported.  

In these cases of advanced esophageal carcinoma, a new cardiac event was the first sign of cardiac metastasis. Echocardiography revealed endomyocardial involvement with chamber invasion in these two patients with esophageal carcinoma and demonstrates the ease and effectiveness of this noninvasive procedure in the identification of this problem.

With the advent of laser palliative therapy for patients with obstructive esophageal carcinoma, patients can be kept free of esophageal obstruction longer. This may allow for better nutrition and survival and theoretically will allow more time for extra-esophageal tumor spread. For this reason, echocardiography performed periodically in patients with esophageal carcinoma can permit recognition of cardiac metastases before the occurrence of overt cardiac signs. With this earlier recognition of cardiac metastases, aggressive surgical therapy may be more effective.

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Diagnosis of Gastrobronchial Fistula by Measurement of Bronchial Secretion pH*  
Case Report and Literature Review  
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A patient with prior GBF and new-onset hemoptysis was diagnosed as having recurrent GBF by measurement of bronchial secretion pH. This is a previously unreported means of diagnosing this process. Bronchoscopic findings were substantiated by upper GI contrast study and surgical findings.  
(CHEST 1989; 96:935-36)

GBF = gastrobronchial fistula

Gastrobronchial fistula is an uncommon process usually diagnosed via upper GI contrast studies. Bronchoscopy and bronchial secretion pH have not previously played a role in its diagnosis. Inappropriately low pH of bronchial secretions in the absence of aspiration of gastric secretions should suggest the diagnosis of GBF.

CASE REPORT

A 67-year-old man presented with symptoms of light-headedness, dyspnea on exertion, and easy fatigability. He was severely anemic and was admitted for evaluation. Past medical history was remarkable for a Nissen fundoplication and Colles gastroplasty performed in June 1984 via the transthoracic route for chronic reflux esophagitis. Two months after discharge, he noted blood-tinged sputum, and in September 1985 he was readmitted with increasing GI complaints. An upper GI contrast x-ray study demonstrated barium in the left lower bronchial tree. The patient experienced an episode of upper GI bleeding and was taken to surgery for oversewing of the gastrobronchial fistula and left lower lobectomy. In June 1987 he developed left shoulder pain and was treated with aspirin and ibuprofen. Three months later he was admitted to another institution for evaluation of a decrease in his hematocrit reading. He received a transfusion and was discharged, his anemia being attributed to aspirin and ibuprofen use. He was then readmitted to this institution for reevaluation of his anemia.

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Diagnosis of Gastrobronchial Fistula (Joseph, Krumpe)

apparently patent left lower lobe bronchus despite prior history of left lower lobe lobectomy. Endobronchial inflammation was not observed, and a source of bleeding was not identified; however, a large amount of secretions was noted to be draining from the left lower segment. The secretions were aspirated and pH was demonstrated to be in the range of 2 to 3 (Gastrocult pH paper, SKF Diagnostics). Electrode measurement confirmed a pH of 2.29, and a recurrent GBF was diagnosed. An attempt to demonstrate the fistula by a sulfur colloid gastric emptying study was unsuccessful. An upper GI contrast study demonstrated a fistulous tract from the gastric fundus to a segmental bronchus (Fig 2). Upper endoscopy demonstrated a 5-cm fundal ulcer. The ostium of the fistula could not be identified. The patient was taken to surgery and underwent left thoracotomy with resection of the gastric fundus and pyloroplasty. He was noted to have a recurrent GBF, transdiaphragmatic from the area of the prior Nissen fundoplication wrap. Pathologic examination showed no malignancy, only chronic inflammation. Since surgery he has done well, and he reports that his shoulder pain has also resolved.

DISCUSSION

GBF is a relatively uncommon sequela to GI tract pathology. Moeller and Carpenter1 reviewed 13 previously described cases and presented a case of their own, classifying fistulas as being secondary to tumor, trauma, ulceration, surgery, or infection. Since their review, two other cases have been reported.4,5 Including our case, there are a total of 17 cases of GBF reported. Upper GI contrast studies have been the most frequently used modality in demonstrating GBF, being used in 15 of 17 cases. Other reported modalities for diagnosis include methylene blue (two cases), autopsy (one case), and an unexpected finding of GBF at the time of surgery. The diagnosis has also been suggested by history when patients have complained of coughing up food particles or by tasting previously ingested alcohol after coughing. (Some cases reported more than a single diagnostic modality.) Esophagoduodenoscopy has not been useful in establishing this diagnosis.

Measurement of bronchial secretion pH has not previously been reported in making the diagnosis of GBF. Since the pH of bronchial secretions is usually in the 6.0 to 8.5 range and the pH of topical anesthesia is usually in the 6.0 to 6.5 range in our laboratory, the acidic range of pH in bronchial secretions should raise the suspicion of GBF unless there is reason to believe the patient is aspirating gastric contents. A pH in the neutral range does not eliminate the possibility of a fistula, as small leaks may be neutralized by bronchial secretions, and gastric acid production is frequently decreased in patients receiving H4 blockers. Measurement of bronchial secretion pH may be useful when the diagnosis of GBF is suspected.

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