

Pericardial Biopsy Revealed Gastric Signet-Ring Cell Cancer

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Key Words

Cardiac tamponade · Gastric signet-ring cell carcinoma · Pericardiostomy

Abstract

We describe the case of an 85-year-old man who presented with a large pericardial effusion. The patient was admitted because of anorexia and general malaise. Chest X-ray revealed an increased cardiothoracic ratio and a small amount of bilateral pleural effusion. Two-dimensional ultrasonographic echocardiography showed pericardial effusions with atrial and right ventricular early diastolic collapse, establishing the diagnosis of cardiac tamponade. Signet-ring cell cancer with pericardial involvement was diagnosed by subxiphoid pericardiostomy. The clear fluid was removed through pericardial drainage. The signet-ring cell carcinoma of the stomach was revealed by gastric fiberscope examination after pericardial biopsy proved malignancy. Virchow lymph node metastasis was also found. We diagnosed the patient with gastric cancer stage IV and suggested him the best supportive therapy. He died of cardiac arrest 1 month after best supportive care.

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Introduction

We report a patient with cardiac tamponade due to pericardial metastasis and pericardial effusion, originating from gastric signet-ring cell carcinoma, a rare condition with few reports, mostly case reports, in the literature. It is usually detected during the terminal stages of gastric carcinoma, and therefore, the prognosis is poor. Signet-ring cell cancer with pericardial involvement was diagnosed by pericardial biopsy following subxiphoid pericar-

diostomy [1, 2]. Here, we discuss the importance of pericardial biopsy as primary focus of malignancy and the proceeding treatment.

Case Presentation

An 85-year-old man was admitted with anorexia and general malaise on August 5, 2014. He reported a weight loss of 4 kg in the previous month. He had been operated by the Billroth I procedure when diagnosed with gastric ulcer at the age of 41 years. Physical examination revealed that he was febrile, with a heart rate of 118 bpm and a blood pressure of 117/95 mm Hg. He had distant heart sounds, normal lung sounds and left abdominal tenderness. Chest X-ray revealed an increased cardiothoracic ratio and a small amount of left pleural effusion. Electrocardiography showed low voltage, and 2-dimensional ultrasonographic echocardiography revealed pericardial effusions with atrial and right ventricular early diastolic collapse, establishing the diagnosis of cardiac tamponade (fig. 1). Laboratory studies showed a serum albumin level of 3 g/dl, a serum creatinine level of 1.70 mg/dl (reference value: 0.4–0.9 mg/dl) and a brain natriuretic peptide level of 71.7 pg/ml (reference value: 0–18.4 pg/ml). Subxiphoid pericardiostomy was performed. Pericardial biopsy and pericardial fluid were taken. The histopathological findings showed signet-ring cell cancer (fig. 2a). His anorexia was slightly recovered. Whole-body computed tomography showed Virchow lymph node metastasis. The signet-ring cell carcinoma of the operated stomach was revealed by gastric fiberscope examination (fig. 3a, b). After the fiberscope examination, we found elevations of carcinoembryonic antigen (CEA) and carbohydrate antigen (CA) 19-9 at 27.9 ng/ml and 8,424 U/ml, respectively. We diagnosed the patient with gastric cancer stage IV and suggested him the best supportive therapy. He died of cardiac arrest 1 month after best supportive care without severe cancer pain. The patient had given his consent for a case report to be published. Written informed consent was obtained from the patient's family for publication of this case report and any accompanying images.

Discussion

Pericardial biopsy is a unique diagnostic and therapeutic approach that reveals malignant and infective disorders. Maisch et al. [1] analyzed biopsies in 68 patients with a tumor anamnesis. Interestingly, the histology of the 42 patients who were classified later by a combination of cytology and histology as being affected by a malignant effusion was diagnostic only in 10 patients (24%). The larger contribution to the diagnosis was given in 37 of the 42 patients (88%) by cytology. But only the combination of both cytology and histology constituted the final diagnosis.

A pericardial biopsy can be performed via a subxiphoid or transthoracic pericardiostomy. Pericardioscopy allows direct visualization of the pericardial space; the reported sensitivity for the diagnosis of malignancy is as high as 97%. In contrast, the sensitivity for blind pericardial biopsy is lower, presumably because of sampling error [2]. The therapeutic drainage created by a subxiphoid or transthoracic approach yields a 4-cm² piece of tissue, which can be useful to confirm the diagnosis. We performed a visualized subxiphoid approach and reached the definite diagnosis of rare gastric cancer metastasizing to pericardium.

Primary gastric cancer metastasizes to the heart in rare cases. Abrams et al. [3] reported metastases of 119 consecutive autopsied cases of stomach carcinoma. The incidence rates of

primary gastric carcinoma metastasized to different organs were only 4.2% for the pericardium and 2.5% for the heart. Autopsy investigations of the stomach showed a pericardial metastasis incidence rate of 4.3–7.7% [4–7]. A search of the Medline database revealed 6 cases of signet-ring cell gastric carcinoma presenting as cardiac tamponade [8–12].

We found late-stage primary gastric signet-ring cell carcinoma from surgical biopsy, despite the fact that there were gastrointestinal symptoms and signs such as anorexia, abdominal pain and weight loss. The patient died without severe pain 1 month after best supportive therapy. Since his symptoms of cardiac tamponade were more obvious than his gastrointestinal symptoms, we focused on heart examination and did not do tests such as an endoscopic examination of the stomach of the patient at first. Moreover, due to the rapid progression of the disease, serum levels of tumor markers, including CEA and CA 19-9, would have shown the patient's malignancy.

The diagnosis of pericardial disease in patients with cancer is often extremely difficult because patients present with nonspecific symptoms and physical findings. Therefore, clinicians must consider pericardial disease in any patient with a known malignancy who develops unexplained dyspnea, tachycardia, arrhythmia or symptoms of heart failure [13]. This shows that primary gastric carcinomas presenting as cardiac tamponade are rare, and medical practitioners should be aware of malignancy of the stomach when patients present with unexplained cardiac manifestations.

Conclusion

We conclude that pericardial biopsy is a useful tool for the causal diagnosis of cardiac tamponade from primary gastric cancer. Our patient died without severe cancer pain 1 month after best supportive care.

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Disclosure Statement

No competing interests exist.

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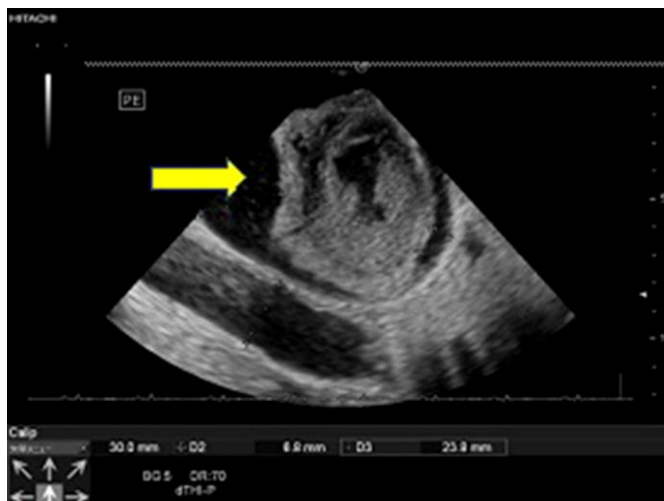


Fig. 1. Ultrasonography showed a large amount of pericardial effusion (arrow).

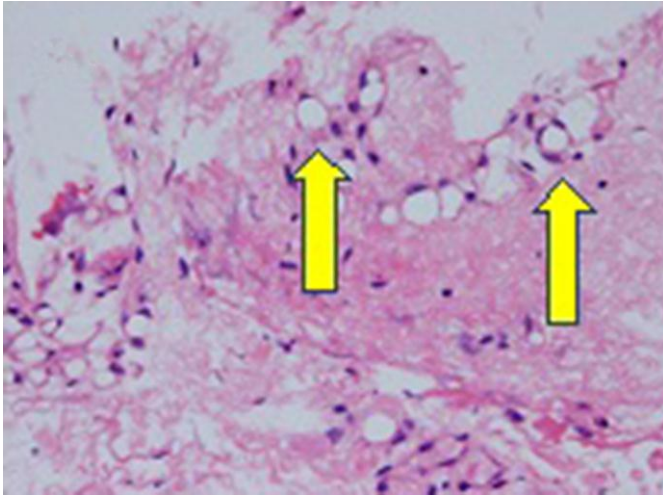


Fig. 2. Pericardial biopsy revealed signet-ring cell cancer (arrows) of the stomach. HE. $\times 400$.

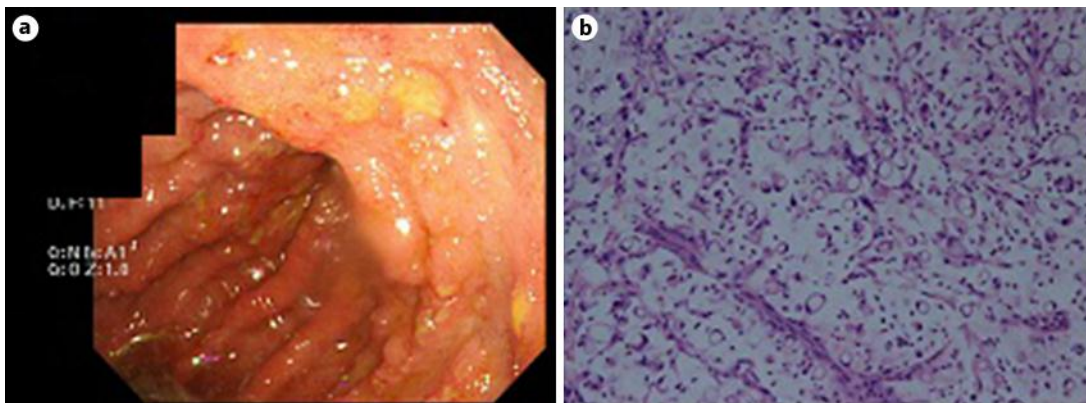


Fig. 3. a Upper gastric fiberoptic examination showed irregular mucosa of the postoperative gastric wall. **b** The signet-ring cell cancer was diagnosed by histological examination. HE. $\times 200$.