Pericardial Biopsy Revealed Gastric Signet-Ring Cell Cancer

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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 pericardial biopsy following 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.

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-
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 pericardiotomy. 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.

**References**


**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. ×400.

Fig. 3. a Upper gastric fiberscope examination showed irregular mucosa of the postoperative gastric wall. b The signet-ring cell cancer was diagnosed by histological examination. HE. ×200.