

# A Case of Carcinoma Stomach Presenting as Cardiac Tamponade

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## Abstract

Cardiac tamponade originating from a primary gastric cancer (GC) is a rare condition. Patients are generally asymptomatic until the disease is advanced, and therefore, early diagnosis is difficult. We report a case of a 43-year-old male admitted with progressive dyspnea and diagnosed to have cardiac tamponade on two-dimensional (2D) echocardiography. Pericardial fluid cytological examination was suggestive of metastatic adenocarcinoma. He underwent abdominal computed tomography scan, which showed thickening of the gastric wall and several mesenteric lymph nodes. Endoscopic examination of the stomach disclosed malignant ulcer along the lesser curvature, and biopsy of gastric ulcer revealed signet ring cell adenocarcinoma. Our patient presented with cardiac tamponade as the first manifestation of primary GC.

**Keywords:** GC-Gastric Cancer, ADA - adenosine deaminase level, CT- computed tomography.

## Introduction

**M**alignant pericardial effusion is a serious and potentially life-threatening illness that requires, prompt evaluation, diagnosis, and management. Cardiac metastasis most commonly arise from pleural mesothelioma (48.4%), melanoma (27.8%), lung adenocarcinoma (21%), lung undifferentiated carcinoma (19.5%), lung squamous cell carcinoma (18.2%), and breast carcinoma (15.5%) <sup>[1]</sup>. Other origins such as ovarian carcinoma (10.3%), gastric carcinoma (8%), renal carcinoma (7.3%), and pancreatic carcinoma (6.4%) have also been found in autopsy studies <sup>[2]</sup>. Several mechanisms for cardiac involvement have been propounded as (1) direct cardiac involvement, (2) hematogenous spread, (3) lymphatic spread, (4) spreading from the venous system such as the pulmonary vein or inferior vena cava. Clinical manifestations of secondary tumor-associated cardiac metastases are refractory and diffuse pericardial effu-

sion, congestive heart failure, arrhythmia, pericarditis, and cardiac tamponade <sup>[3]</sup>. In this case report, our patient presented with cardiac tamponade as the initial manifestation of primary gastric cancer.

## Case Report

A 43-year old man presented with a 2-week history of shortness of breath which was insidious in onset and gradually progressive and associated with dry cough. For the last 48 hours, shortness of breath increased in severity and present even at rest and is associated with chest pain radiating to neck, shoulders and back which increases on taking deep breaths. On general physical examination, patient is anxious, restless, with shallow rapid breathing. His respiratory rate was 32 per minute, pulse rate 116 per minute and blood pressure of 100/70 mm Hg. He had distant heart sounds, absent breath sounds in bilateral lung bases, pulsus paradoxus and raised jugular venous pressure. His laboratory

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studies showed normal hemogram, normal renal and liver biochemistry and normal troponin levels. Sinus tachycardia, low QRS voltage and presence of ventricular electrical alternans were seen on electrocardiogram. Chest X-ray showed an increased cardiothoracic ratio and bilateral pleural effusion (Fig 1a). An emergency 2D echocardiography disclosed massive pericardial effusion with right atrial and ventricular early diastolic collapse (Fig 1b). Cardiac tamponade was diagnosed, and urgent pericardiocentesis performed and 800 ml of hemorrhagic fluid aspirated. Pericardial fluid examination showed total protein 5.3 gm/dl, adenosine deaminase level (ADA) of 27.12 iu /l ( normal value of < 40iu/l), Ziehl Neelsen stain and cartridge based nucleic acid amplification test (CBNAAT) did not reveal Mycobacterium tuberculosis. Cytology for malignant cell was suggestive of metastatic adenocarcinoma. Pale yellow fluid aspirated on thoracocentesis revealed total cell count of 500/cumm with predominant lymphocyte (75%), protein 4.8 gm% with low ADA. Pleural fluid cytological examination showed no malignant cell. Thoracic computed tomography (CT) scan (Fig 1c). demonstrated bilateral pleural effusion with

pericardial effusion without any evidence of intrathoracic lymphadenopathy or malignancy. Abdominal CT – showed asymmetric thickening along lesser and greater curvature of stomach with regional lymphadenopathy (Fig 1d).

His esophagogastroduodenoscopy (EGD) showed large ulcer along lesser curvature of stomach with everted margins and unhealthy surrounding mucosae (Fig 1e). His gastric ulcer histopathological (HPE) examination showed signet ring cell adenocarcinoma of stomach (Fig 1f). Diagnosis of stage IV carcinoma stomach was made and patient attached to medical and radiation oncology team.

## Discussion

Pericardial effusion with cardiac tamponade is an unusual first presentation of GC, with respect to the presenting symptoms of GC, patients may first complain of upper abdominal pain, anorexia, weight loss or other gastrointestinal symptoms such as nausea, vomiting, bleeding, or melena. Primary gastric cancer rarely metastasizes to the heart. Abrams *et al*<sup>[4]</sup> reported incidence rates of primary GC metastasized to different

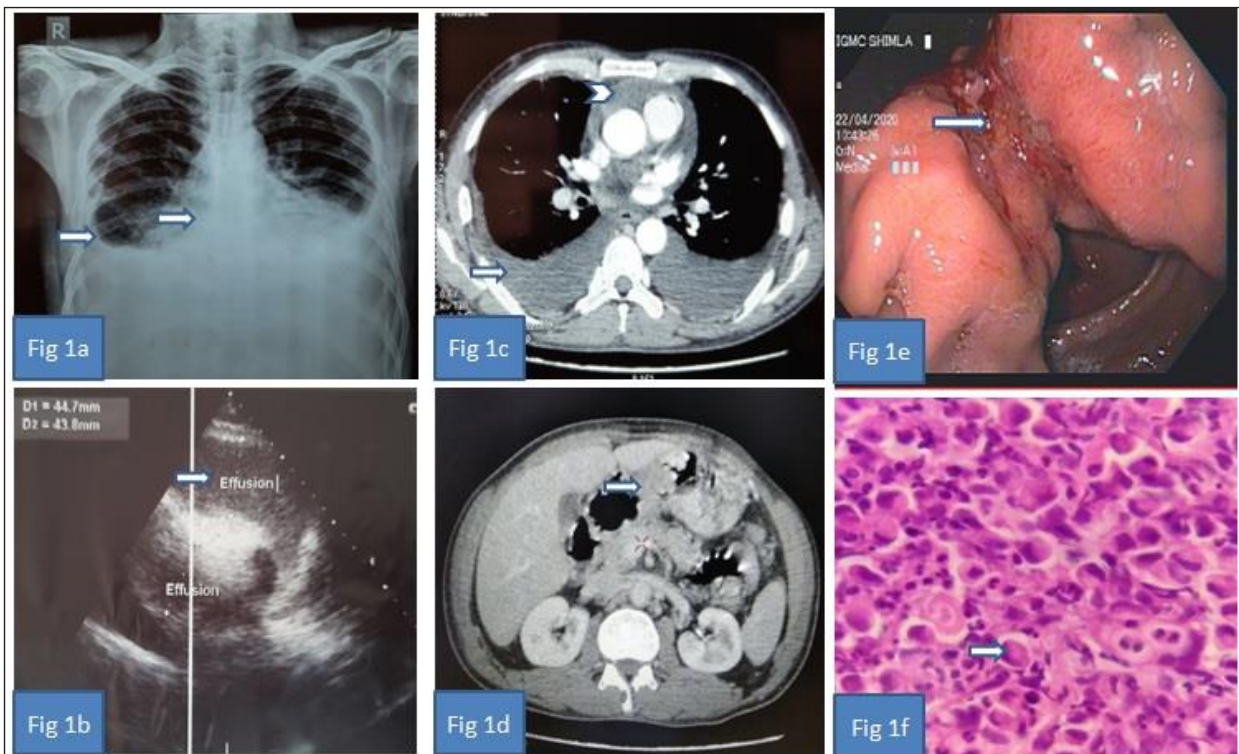


Fig 1a - Chest X-ray image showing bilateral pleural effusion and increased cardiothoracic ratio, Fig 1b- 2D echocardiography image with arrow showing massive pericardial effusion, Fig 1c- CECT - chest image, arrow showing pleural effusion and arrowhead showing pericardial effusion, Fig 1d- CECT-abdomen image, arrow showing asymmetric thickening of gastric wall, Fig 1e- EGD image, arrow showing ulcer with everted margins at lesser curvature of stomach, Fig 1f-HPE-image showing signet ring cell adenocarcinoma of stomach

organs is: abdominal lymph nodes 79.8%, liver 44.5%, and lung 32.8%, ovary 15.1% and only 4.2% for pericardium and 2.5% for heart. Some more autopsy investigations also summarized the pericardial metastasis incidence rate from stomach as 4.3%-7.7% [5,6]. Kobayashi *et al.* reviewed clinicopathological studies in 17 patients with cardiac tamponade originating from gastric cancer [7]. In them, 7 patients had signet ring cell carcinoma, 3 had poorly differentiated adenocarcinoma, and 3 had well and moderately differentiated tubular adenocarcinoma [7]. In previous studies, most cases of gastric cancer with cardiac involvement result from signet ring cell gastric carcinoma [7,8]. Our patient also had signet ring cell adenocarcinoma of stomach. Signet ring cell gastric carcinoma, characterized by deeper gastric wall invasion and more lymph node spreading than non-signet ring gastric carcinoma, leads to rapid intra-abdominal or peritoneal metastasis, or distant spreading. Generally, signet ring cell GC comprises approximately 10% of all gastric cancers and they are frequently observed in relatively young populations [9,10]. Our patient had signet ring cell carcinoma on histology and was 43 years of age.

The prognosis of cardiac tamponade caused by malignant pericarditis is grave, and survival is limited [7]. Although no standard treatments for malignant pericardial effusion have yet been established, the effectiveness of pericardiocentesis and pericardial sclerotherapy has been reported [7]. While a specific chemotherapeutic strategy has not yet been developed for these cases, the use of paclitaxel for systemic, and cisplatin for local chemotherapy may be promising for the treatment of cardiac tamponade caused by primary cancer arising from GC [7].

## Conclusion

This report shows that primary gastric carcinomas can rarely present as cardiac tamponade as its initial manifestation; therefore medical practitioners should consider malignancy of the stomach as one of the possibilities.

## References

1. R. Bussani, F. De-Giorgio, A. Abbate, F. Silvestri. Cardiac metastases. *J Clin Pathol*, 60 (2007), pp. 27-34.
2. A. Al-Mamgani, L. Baartman, M. Baaijens, I *et al.* Cardiac metastases. *Int J Clin Oncol*, 13 (2008), pp. 369-372.
3. A. Moriyama, I. Murata, T. Kuroda, *et al.* Pericardiac metastasis from advanced gastric cancer. *J Gastroenterol*, 30 (1995), pp. 512-516.
4. Abrams HL, Spiro R, Goldstein N. Metastases in carcinoma; analysis of 1000 autopsied cases. *Cancer*. 1950; 3:74-85.
5. Mukai K, Shinkai T, Tominaga K, Shimamoto Y. The incidence of secondary tumors of the heart and pericardium: a 10-year study. *Jpn J Clin Oncol*. 1988; 18:195-201.
6. Klatt EC, Heitz DR. Cardiac metastases. *Cancer*. 1990; 65:1456-1459.
7. Kobayashi M, Okabayashi T, Okamoto K, Namikawa T, Araki K. Clinicopathological study of cardiac tamponade due to pericardial metastasis originating from gastric cancer. *World J Gastroenterol*. 2005; 11:6899-904.
8. Y. Baba, S. Ishikawa, K. Ikeda, *et al.* A patient with 43 synchronous early gastric carcinomas with a Krukenberg tumor and pericardial metastasis. *Gastric Cancer*, 10 (2007), pp. 135-139.
9. E. Otsuji, T. Yamaguchi, K. Sawai, T. Takahashi. Characterization of signet ring cell carcinoma of the stomach. *J Surg Oncol*, 67 (1998), pp. 216-220
10. S. Di Cosimo, G. Ferretti, N. Fazio, *et al.* Breast and ovarian metastatic localization of signet-ring cell gastric carcinoma. *Ann Oncol*, 14 (2003), pp. 803-804.

