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Thoracoscopic Pericardial Drainage for Gastric Tube Ulcer Penetrated into the Pericardium

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Abstract

Peptic ulcer occurring in the gastric conduit for esophageal reconstruction sometimes penetrates into mediastinal structures. We herein reported a case of pericardial penetration of gastric tube ulcer successfully treated with thoracoscopic pericardial drainage. A 66-year-old Japanese man, who had undergone esophagectomy for esophageal cancer 20 months before, visited our emergency room complaining severe back pain. Computed tomography revealed gastric tube ulcer penetrated into the pericardial space. Thoracoscopic pericardiotomy and drainage was performed and the patient made an uneventful recovery. Thoracoscopic pericardial drainage is useful to manage acute pyogenic pericarditis due to penetration of peptic ulcer which occurred in the gastric tube.

Key words: Gastric tube • Ulcer • Pericardial drainage • Esophagectomy

Introduction

Peptic ulcer occurring in the gastric conduit for esophageal reconstruction sometimes penetrates into mediastinal structures and thus can be fatal12. Especially, ulcer of the retrosternally reconstructed gastric tube can penetrate into the pericardium and cause serious pericarditis. We experienced a case of gastric tube ulcer penetrated into the pericardium successfully treated with thoracoscopic pericardial drainage. In this case report, we demonstrated details of this case and discuss the usefulness of the minimally-invasive approach.

Case report

A 66-year-old Japanese man had undergone esophagectomy for esophageal cancer. Seventeen months after surgery, multiple lung metastases were found and then he underwent chemotherapy. During the chemotherapy, he complained of back pain and was given loxoprofen. Three months after the introduction of chemotherapy, he complained of sudden-onset severe back pain and visited our emergency room. Although he was conscious, tachycardia with 142 beat per minute and hypotension with systolic pressure of 83 mmHg were observed. Computed tomography revealed large amount of pericardial effusion with air bubbles and cardiac tamponade was suspected (Fig. 1A). In addition, a sagittal view demonstrated disappearance of continuity of gastric wall adjacent to the pericardium, suggesting gastric ulcer penetrated into the pericardium (Fig. 1B).
Although emergency pericardial drainage was mandatory, ultrasound-guided drainage could not be performed due to retrosternally reconstructed gastric tube. Therefore, we decided to perform surgical drainage under a left thoracoscopic approach. Under satisfactory general anesthesia, the patient was placed in a right lateral decubitus position. A double-lumen endotracheal tube was used for one-lung ventilation and carbon-dioxide insufflation was not performed. A 12-mm trocar was inserted through the 7th intercostal space (ICS) on the anterior axillary line for thoracoscopy. Small amount of purulent pleural effusion was observed in the left thoracic cavity and the pericardium was significantly enlarged with effusion (Fig. 2A). Two other 12-mm trocars were inserted through the 5th ICS on the anterior axillary line and through the 9th ICS on the mid axillary line, respectively. After two stay sutures were placed on the pericardium, the pericardium between the sutures was incised by scissors. Large amount of purulent pericardial effusion spouted from the pericardial space (Fig. 2B). After the pericardial incision was extended to approx-

![Fig. 1](image1.png)

**Fig. 1** Findings of computed tomography: A) A coronal view revealed large amount of pericardial effusion. B) A sagittal view demonstrated discontinuity of gastric wall adjacent to the pericardium suggesting penetrating gastric ulcer.

![Fig. 2](image2.png)

**Fig. 2** Operative findings: A) The pericardium was enlarged with fluid. B) When the pericardium was incised, purulent pericardium effusion spouted from the pericardial space. C) The pericardiectomy was extended to approximately 3cm in length. D) After irrigation of the pericardial space, a 15-mm BLAKE* drain was placed in the pericardial space.
approximately 3 cm in length, both the pericardial space and left thoracic cavity were irrigated sufficiently with normal saline (Fig. 2C). A 15-mm BLAKE® drain (Ethicon Inc, Somerville, NJ) and two 28-Fr thoracic tubes were placed in the pericardial space and the left thoracic cavity, respectively (Fig. 2D).

He was sent to the intensive care unit and has undergone respiratory care under mechanical ventilation for 7 days. After he recovered from respiratory failure, he had uneventful postoperative course and transferred to a referral hospital. Upper endoscopy on postoperative day 5 revealed an open ulcer covered with white moss in the posterior wall of the gastric body. Follow-up endoscopy after administration of proton-pump inhibitor (PPI) on postoperative day 74 confirmed significant shrinkage of the gastric ulcer. He underwent radiofrequency ablation for metastatic lung tumors, and is still alive 19 months after the thoracoscopic pericardial drainage.

**Discussion**

Peptic ulcer of the reconstructed gastric conduit is not uncommon and the incidence has been reported to be 3 to 13%[^1-3]. Causes of peptic ulcer are considered to be preserved acidity, ischemia due to gastric tube creation, helicobacter pylori infection and use of non-steroidal anti-inflammatory drugs (NSAIDs). Mori et al. investigated changes of gastric acidity between preoperative stomach and postoperative gastric tube and revealed that the acidity of gastric tube at 1 year after surgery was significantly lower than that of preoperative stomach[^4]. In addition, they reported that acidity of gastric tube in patients with helicobacter pylori infection was significantly lower than that in patients without such infection[^4]. Although helicobacter pylori infection was negative in the present case, he regularly used NSAIDs for his back pain. Neither PPI nor H2-blocker had been used to prevent peptic ulcer. In addition, chemotherapy for recurrent cancer might affect the occurrence of peptic ulcer.

Peptic ulcer of the gastric conduit for esophageal reconstruction is usually asymptomatic unless serious complications such as perforation or penetration occur[^5]. Therefore, preventive administration of PPI should be considered when we use NSAIDs, steroids, or anticancer drugs for patients who underwent esophagectomy with gastric tube reconstruction. Annual follow-up endoscopy is also recommended to detect early gastric cancer or gastric ulcer in patients following esophagectomy for esophageal cancer, even when they have no symptom[^6].

Emergency drainage is needed for tamponade due to pericardial effusion. Although ultrasound-guided drainage is the first choice in such a situation, we could not find an appropriate approach to the pericardial space due to retrosternally reconstructed gastric tube. In addition, as we considered that not only reduction of the pericardial fluid but also irrigation of the pericardial space is needed for the pyogenic pericarditis, we decided to perform surgical pericardiectomy and drainage.

Video-thoracoscopic pericardial drainage in the diagnosis and management of pericardial effusions has first been reported by Mack et al. in 1993[^5]. They described that the video-assisted thorascoscopic pericardiectomy was well tolerated even by gravely ill patients. Muhammad et al. conducted prospective study to compare surgical and thorascoscopic pericardial window and reported that video-assisted thoracoscopy allows the physician to fashion a pleuropericardial window for effective drainage while avoiding the complications of classic surgical procedures[^6]. In this case, thorascoscopic pericardiectomy and irrigation of the pericardial space was also effective to manage the acute pyogenic pericarditis.

In conclusion, thoracoscopic pericardial drainage is useful to manage acute pyogenic pericarditis due to penetration of peptic ulcer which occurred in the gastric tube.
References


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食道癌術後の胃管潰瘍心嚢穿破に対し胸腔鏡下心嚢切開ドレナージが有効であった一例

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食道切除再建術後の胃管にできる消化性潰瘍は時として縦隔組織に穿通し、重篤な合併症を引き起こす。特に胸骨後経路に挿上された胃管の潰瘍は時として心嚢に穿通し、重篤な心外膜炎や心タンポナーデを引き起こす。今回われわれは、心嚢に穿通を来した胃管潰瘍に対して胸腔鏡下に心嚢切開ドレナージにより治癒した1例を経験したので報告する。症例は66歳男性。20か月前に食道癌に対して食道切除術を施行し、胸骨後経路で胃管再建が施行されていた。急激な胸背部痛を主訴に救急外来を受診し、CTにて胃管潰瘍が心嚢に穿通し、心タンポナーデを来している所見を認めた。左胸腔経路で胸腔鏡下に心嚢切開ドレナージを行い、術後は合併症なく軽快した。胸腔鏡下心嚢ドレナージは低侵襲で胃管潰瘍の穿通に伴う感染性の心嚢液貯留の治療に有用と考えられた。