Introduction

Pneumopericardium and pneumomediastinum caused by retrosternal gastric tube ulcer after esophagoplasty is rare. A 73-year-old man who had received retrosternal esophageal reconstruction with gastric tube presented to the emergency department with chest pain and dyspnea. Chest radiography revealed pneumomediastinum, and chest computed tomography (CT) revealed conditions of pneumopericardium and pneumomediastinum. Emergency surgery including removal of retrosternal gastric tube, duodenostomy, partial pericardiectomy and tube thoracostomy was performed to repair the lesion and prevent life threatening complications. Perforation of a peptic ulcer from the retrosternal gastric tube into the pericardium was found during surgery and the diagnosis was proved by pathology. The patient recovered uneventfully.

Key words: chest pain, esophagoplasty, peptic ulcer, pneumomediastinum, pneumopericardium

Case Report

A 73-year-old man was brought to emergency department with progressive chest pain and dyspnea for three hours. There was no referred pain, cough, diaphoresis, hemoptysis, fever or tarry stool passage.

The medical history of this patient included:
- Gouty arthritis
- Hypertension
- Peptic ulcer disease
- Chronic kidney disease
- Coronary artery disease

For which he underwent percutaneous transluminal coronary angioplasty 6 years ago.

He had suffered from esophageal stenosis because of chronic inflammation and received rigid esophagoscopy dilatation five years ago. After that, an exploratory thoracotomy and cervical esophagostomy were performed. He underwent retrosternal esophageal reconstruction with gastric tube the same year. Two years later, he also underwent minithoracotomy and wedge resection of left upper lung because of recurrent spontaneous pneumothorax.

On arrival, he was afebrile with a body temperature of 36.3°C, blood pressure 135/79 mmHg, pulse rate 86 beats/min, respiratory rate 19 breaths/min. He was in moderate distress. The physical examination showed no abnormal
findings except for pale conjunctiva. He had no
distended neck veins or paradoxical pulse. Routine
blood examination showed hemoglobin 7.3 g/dL,
platelet count 298000/μL and white blood cell
count 10160/μL. Serum biochemistry yielded blood
urea nitrogen, 48.7 mg/dL; creatinine, 2.1 mg/dL;
and normal cardiac enzymes including troponin-I.
Baseline blood gas measurement showed a pH
of 7.39, a PaO$_2$ pressure of 77 mmHg, a PaCO$_2$
pressure of 26.4 mmHg, bicarbonate of 15.7
mmol/L and SaO$_2$ of 95.6%. An electrocardiogram
showed sinus rhythm. Chest radiography showed
pneumomediastinum (Fig. 1). Computed tomographic
scan of the chest revealed pneumomediastinum and
pneumomediastinum (Fig. 2 and 3).

Perforation of a peptic ulcer from the
retrosternal gastric tube into the pericardium was
found during emergery surgery (Fig. 4). Removal
of the gastric tube, a duodenostomy, partial pericardiectomy and tube thoracostomy were performed. The patient recovered gradually after surgery and intensive care. The length of hospital stay was 20 days. Pathology showed a benign peptic ulcer from an intrathoracic gastric tube which perforated into the pericardium.

Discussion

Pneumopericardium and pneumomediastinum are relative rare but important in the differential diagnosis of chest pain. Pneumopericardium has been reported to result from blunt and penetrating chest trauma, complications from invasive procedures, barotraumas, paraquat poisoning, pericardial infection, and abnormal communication, such as fistulas, between the pericardium and adjacent structures containing air.\(^5,6\)

In the present case, the patient suffered from perforation of an intrathoracic gastric tube ulcer into the pericardium five years after reconstruction of esophagus. Early diagnosis and treatment can prevent purulent pneumopericarditis and cardiac tamponade.\(^7\).

Cardiac tamponade carries the highest fatality rate of all complications of pneumopericardium if allowed to progress.\(^1,5,8\) The most common symptom is dyspnea. Clinical signs such as distant heart sounds, shifting precordial tympany, and mill wheel murmur may be noted.\(^9\) Electrocardiogram shows low voltage QRS complexes and ST-segment elevation with PR-segment depression, but these signs are non-specific and unreliable.\(^10\) Most cases of pneumopericardium can be diagnosed by chest radiography. In posteroanterior chest radiographs, a continuous thin radiolucent rim of air follows the cardiac silhouette and is outlined by a fine line representing the pericardial sac. At the base of the heart, a continuous diaphragm sign can be seen on frontal radiographs and continuous left hemidiaphragm sign can be seen on lateral radiographs.\(^4\) Sometimes, pneumopericardium may be difficult to differentiate from pneumomediastinum. Computed tomography (CT) can confirm the diagnosis.\(^11\)
Pneumopericardium and pneumomediastinum are urgent, life threatening conditions. Emergency physicians should be alert to these conditions early, especially in patients with a history of esophagoplasty who complain of chest pain and dyspnea. Rapid diagnosis and surgical intervention are essential to save the patient’s life.

References

食道重建後之胃潰瘍引發心包膜及縱膈氣腫的病例報告

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因胃作食道重建後的胃潰瘍引發心包膜及縱膈氣腫的個案並不常見，在此報告一位曾接受利用胃作食道重建的73歲男性個案，其主訴是胸痛及呼吸困難。胸部X光檢查呈現縱膈氣腫，而電腦斷層則診斷為心包膜及縱膈氣腫，隨後立即安排緊急手術包括重建的胃摘除，十二指腸造口術，心包膜部分切除及胸管放置，一方面進行修補手術，另一方面則是避免致命性的併發症。手術發現及病理報告皆證實為胃潰瘍併胃穿孔至心包膜。此病人最後順利康復出院。

關鍵詞：胸痛，食道重建，胃潰瘍，縱膈腔氣腫，心包膜氣腫