

Simultaneous resection of left atrial myxoma and esophageal carcinoma via right thoraco-abdominal approach

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Abstract: Concomitant occurrence of atrial myxoma and esophageal carcinoma is an extremely rare entity. Here we present two cases of synchronously suffered left atrial myxoma and esophageal carcinoma. Both patients underwent simultaneous resection of two tumors via the right thoraco-abdominal approach and recovered well.

Keywords: Cardiac tumors; myxoma; esophageal carcinoma; surgery

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Introduction

Atrial myxoma represents the most common type of primary cardiac tumors in adults (1). Esophageal carcinoma prevails in China with the highest mortality throughout the world (2). To our knowledge, the concomitant occurrence of atrial myxoma and esophageal carcinoma hasn't been reported. Although there are few reports of concurrence of cardiac myxoma and other malignancies, no consensus on surgical strategy has been reached. Herein, we report our experience of simultaneous resection of left atrial myxoma and esophageal carcinoma via right thoraco-abdominal approach.

Cases presentation

Case 1

A 63-year-old woman was admitted to our hospital with 2-month history of dysphagia. An upper gastrointestinal endoscopy demonstrated a neoplasm at 28–33 cm from incisors (*Figure 1A*). Biopsy histology was squamous cell carcinoma. Enhanced thoracic CT scan showed incrassation of esophageal wall at middle segment without lymphadenopathy and a mass in the left atrium (*Figure 1B*).

A transthoracic echocardiography revealed a 3.0 cm × 3.0 cm mobile intracardiac mass with heterogeneous echogenicity attached to the atrial septum (*Figure 1C*). No evidence of distant metastasis was found in other preoperative workup. The patient underwent concomitant resection of the left atrial tumor and esophageal carcinoma via right thoraco-abdominal approach. A gelatinous mass was discovered from the transeptal incision in operation (*Figure 1D*). Histological examination of the resected tumors revealed esophageal squamous cell carcinoma (*Figure 1E*) and benign cardiac myxoma (*Figure 1F*). The pathologic staging of the esophageal carcinoma was T3N0M0. The patient recovered well and discharged uneventfully. After refusing chemotherapy and radiotherapy, she died of esophageal carcinoma local recurrence at 18 months after the operation.

Case 2

A 71-year-old male complained of dysphagia of two months duration admitted to a local hospital. Esophagoscopy revealed squamous cell carcinoma at 27–34 cm from incisors. CT and transthoracic echocardiography revealed a 4.0 cm × 3.0 cm mass in the left atrium. The patient

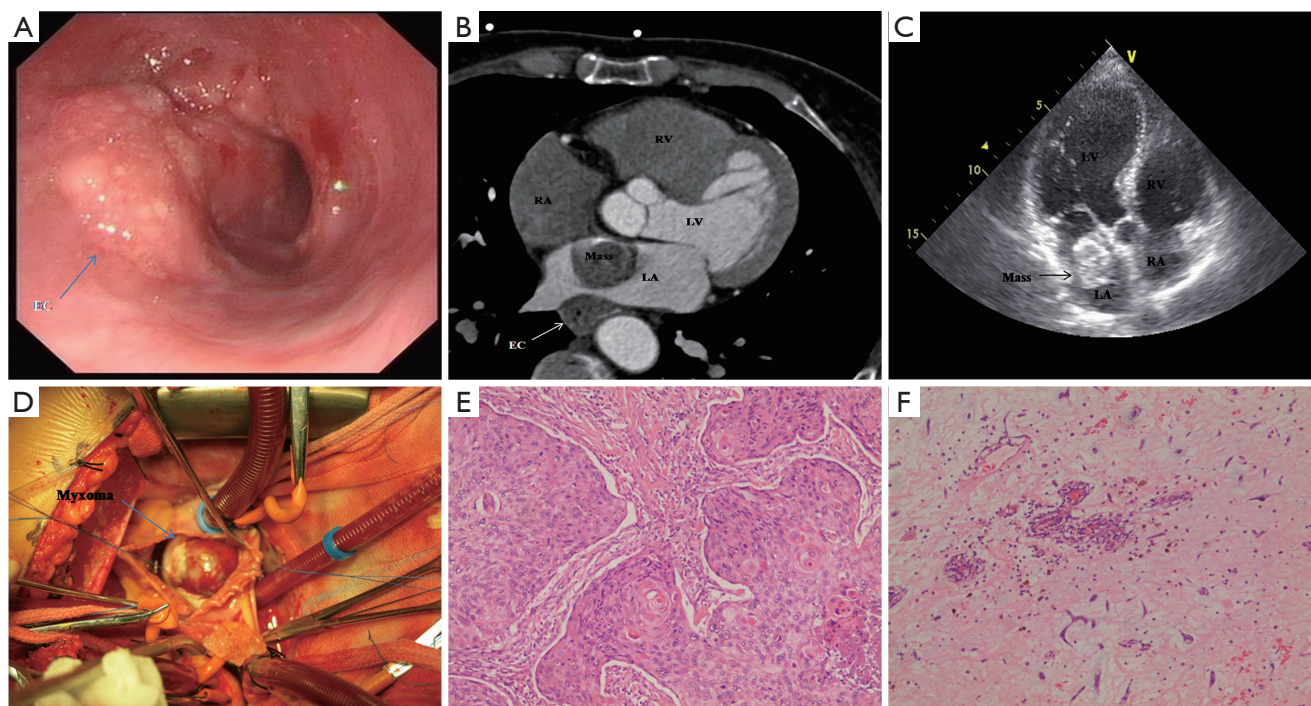


Figure 1 Images of preoperative workup, intraoperative finding and postoperative pathological view. (A) Gastrointestinal endoscopy demonstrates an ulcerative and infiltrative neoplasm (arrow) at middle esophagus; (B) enhanced thoracic CT scan shows incrassation of esophageal wall (arrow) at middle segment without lymphadenopathy and a mass in the left atrium; (C) transthoracic echocardiography reveals a mobile intracardiac mass with heterogeneous echogenicity attached to the atrial septum; (D) intraoperative view shows a gelatinous mass (arrow) from the transeptal incision; (E) histology of the esophageal tumor reveals moderately differentiated squamous cell carcinoma with lymphovascular invasion (Hematoxylin-eosin stain; original magnification $\times 100$); (F) micrograph of the left atrial mass demonstrates tumor cells arranged around endocardium-lined spaces, surrounded by a highly myxoid stroma, indicative of a myxoma (Hematoxylin-eosin stain; original magnification $\times 100$). EC, esophageal carcinoma; RA, right atrium; RV, right ventricle; LA, left atrium; LV, left ventricle.

referred to our institution for synchronous resection of these two tumors. The diagnoses of cardiac myxoma and esophageal squamous cell carcinoma (stage T2N0M0) were confirmed by histology. The postoperative course was uneventful, and he has been asymptomatic without evidence of disease during 40 months of follow-up.

Operative procedure

Both patients underwent general anesthesia with double lumen endotracheal tube, and were positioned with right chest elevated at 45° angle. The chest was entered through the 4th intercostal space via an anterolateral incision. The right lung was deflated and cardiopulmonary bypass (CPB) established with mild hypothermia. Carbon dioxide was infused into operative field to prevent air embolism. A transeptal approach was used to remove the left atrial

mass. The atrial septal defect was repaired with autologous pericardium. After weaning from CPB, protamine sulfate was infused to completely reverse heparinization. Then esophagectomy was performed via right thoraco-abdominal approach. Esophagectomy was performed with regional lymphadenectomy followed azygous vein dissected. Abdomen was explored through an upper midline incision. The stomach was mobilized with the right gastroepiploic and right gastric artery pedicle and divided with a stapler along the lesser curve to accomplish gastric tube. This tube pulled up through hiatus and anastomosed to the esophagus by a stapler.

Discussion

There are few reports of concurrence of cardiac myxoma and other malignancies, including lung cancer, colorectal

cancer, hepatocellular carcinoma (3-6). However, literature search revealed no previously published documents that described the synchronous occurrence of atrial myxoma and esophageal carcinoma. The treatment of patients who require surgery for both cardiac myxoma and other malignancy is still controversial. Canver and Nuño *et al.* reported that staged resection of concomitant left atrial myxoma and lung or colorectal cancer resulted in good outcome (4,5). They thought staged resection could avoid the simultaneous procedures increasing the surgical morbidity and mortality. However, the left atrial myxoma must be excised firstly due to more life-threatening. A staged procedure reduces the mortality related to cardiac myxoma, but the untreated cancer may progress during the interval prior to the second operation (3).

Primary cardiac tumors are rare condition, with frequency of 0.02% by autopsy. However, metastatic cardiac tumors occur more frequently than primary tumors (7). Herein, in the patients who diagnosed concurrence of cardiac tumor and other malignancy, the first consideration for the therapeutic strategy is differentiation of the origin of the cardiac neoplasm. The two common primary tumors invading the heart are lung and breast. Intracardiac metastasis from esophageal carcinoma is very scarce. Only few report described the cardiac metastasis occurred in the right atrial (8). Multimodalities imaging of our two cases showed intracardiac mass with heterogeneous contents attached by a stalk to the septum. These findings were consistent with the presentation of benign primary tumor.

Whether cardiac tumor and thoracic malignancy should be resected simultaneously or in two stages is still controversial, but the safety and feasibility of concomitant cardiac and thoracic surgery have been previously confirmed (9). Consequently, we planned synchronous resection of the two tumors via right thoraco-abdominal approach. This operative strategy included two advantages. Firstly, the right thoracic anterolateral incision is frequently used to perform cardiac surgery. Institution of CPB and exposure of the left atrial anatomic structure can be easily accomplished. Subsequently, we can successfully excise the cardiac tumor; Secondly, after confirm the primary origin of the atrial mass, we can perform esophagectomy through the same thoracic incision and the additional upper midline laparotomy so that no essential of change position in operation. At the same time, the sequence of resection should be taken in consideration. For the reasons that cardiac tumors have the tendency of embolization and sudden death, we decided to excise the atrial myxoma prior to esophagectomy.

However, this surgical strategy has some limitations pertinent to CPB, including bleeding disorders, thrombotic complications, massive fluid shifts and immunosuppression. A complex presentation of concurrent tumors should prompt the surgeons to treat the most immediate life-threatening disease first, so we have to balance the pros and cons of surgery according to the patient's general condition.

Our cases suggest that left atrial myxoma and esophageal carcinoma can coexist, and simultaneous resection of both tumors via the right thoraco-abdominal approach may be a feasible alternative, but the long-term efficacy still needs to be evaluated.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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