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Left anterior intra-thoracic reconstruction of esophagus with omental flap for infective proximal aortic repair

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Glossary of Abbreviations:

AAAD: acute typeA aortic dissection, CTA: computed tomographic angiography

Central message

The left anterior intra-thoracic route is useful for attaching the omental flap to the ascending aorta and reconstructing the gastric conduit through median sternotomy.
Case presentation

The patient reported herein provided informed written consent for the publication of study data (IRB/ERB number and date: TGE02114-025, January 26, 2023).

A 63-year-old woman presented to the emergency department with chest and back pain 5 months after the graft replacement surgery for acute type A aortic dissection (AAAD).

Computed tomographic angiography (CTA) revealed an abscess around the middle portion of the intra-thoracic esophagus and a pseudoaneurysm at the proximal anastomosis of the previous surgery (Figure 1A).

The patient required ascending aortic repair and esophagectomy due to the risk of developing an aorto-esophageal fistula risk. Moreover, there was a possibility of infection of the ascending aorta. In addition, the pseudoaneurysm needed to be repaired first because of its high risk of rupture.

Under general anesthesia, re-median sternotomy was performed. After systemic heparinization, cardiopulmonary bypass was established by cannulating the right femoral artery and vein. The ascending aortic graft was clamped and the proximal anastomosis was repaired using a new prosthetic graft. The pump off was smooth and hemostasis was completed.

We stripped off the intra-abdominal esophagus by laparoscopy. A total of five ports were installed and the esophagus was resected from the adjacent tissue at the level of the trachea bifurcation.

We made a supraclavicular incision, placed the sternocleidomastoid muscle outside, and secured the
esophagus. We did not remove the left sternoclavicular joint; instead, we shaved the posterior region of the left clavicular head. Through the incision, we then resected the peri-esophageal tissue and made a connection to the earlier released layer from the abdominal esophagus. After creating an upper abdominal medial incision, the connection of the esophagus and stomach was released using EndoGIA (Medtronic plc. Dublin, Ireland). The esophagus was then removed in an inverted position through the supraclavicular incision.

The reason we selected simultaneous reconstruction was an omental flap was necessary to prevent infection in this case. Esophageal reconstruction via the left intra-thoracic route was possible when median sternotomy was performed simultaneously because the left internal mammary artery had to be dissected and the lung had to be stripped from the chest wall from the medial side. Also, omental fixation around the ascending aortic prosthesis through left thoracotomy is extremely difficult after median sternotomy was closed.

After mobilizing the left internal mammary artery toward the lateral side, the gastric tube was routed to the left thoracic ventral space, which represented the posterior of the left ribs and where the internal mammary artery was located. (central picture, figure1 B, figure 2) Then, the proximal site of the gastric tube was placed in the left supraclavicular space, and end-to-end anastomosis to cervical esophagus was accomplished using an EEA™ Circular Stapler with Tri-Staple™ Technology. The sternum was then closed without injuring the gastric tube.

The patient’s clinical condition improved after surgery, and she was discharged 1 month
postoperatively. Follow-up 2 years postoperatively was unremarkable.

Discussion

To the best of our knowledge, there are no reports regarding aorto-esophageal fistula treatment with ascending aortic repair, the left intra-thoracic esophagus reconstruction and omentopexy through median sternotomy. Three common reconstructions are performed using a gastric tube after esophagectomy: ante sternal, retro sternal and posterior mediastinal. Most procedures involve the retro sternal and posterior mediastinal reconstruction routes due to a shorter gastric conduit length and fewer cosmetic changes after esophagectomy [1] [2].

Most cases of aorto-esophageal fistulas occur between the thoracic esophagus and descending aorta. In this situation, the ante sternal or retro sternal route is selected to prevent severe adhesion between artificial graft of the descending aorta and esophagogastric anastomosis. Meanwhile, the posterior mediastinal route is used to attach the omentum around the graft [3].

In our case, the patient underwent ascending aortic graft replacement via median re-sternotomy; therefore, we performed esophagogastric reconstruction through the left intra-thoracic route and fixation of the omental flap in situ. This procedure also prevented gastric tube injury during sternal closure and prepared for re-sternotomy in the future.

Esophageal exclusion may be invasive, but it eliminates the risk of dehiscence due to primary esophageal repair and prevents re-infection of the new aortic prosthetic graft. An omental flap is a
valid surgical treatment option for aorto-esophageal fistulas and infected grafts, and it can prevent infections because of its high vascularity and potential for neo-vascularization [3] [4] [5]. We completed simultaneous reconstruction because we believed that omentopexy was crucial for prevention of prosthetic graft infection. Therefore, our operative procedure can be useful in such cases.

Conclusion

Left anterior intra-thoracic reconstruction of the esophagus with median sternotomy is a feasible technique for the fixation of the omentum to ascending aorta.
References


Figure Legends

Figure 1A: Preoperative computed tomography. Blue star showed pseudoaneurysm at proximal anastomosis, esophageal abscess was also showed as blue arrow.

Figure 1B: Postoperative computed tomography. *showed primary gastric conduit.

Figure 2: Postoperative computed tomography, gastric conduit (blue colored), there was in left thoracic space.
Central Picture
Figure 1
Figure 2