CASE REPORTS

Extra-anatomic bypass grafting for aortoesophageal fistula: A logical operation

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Aortoesophageal fistula (AEF) is an uncommon cause of upper gastrointestinal hemorrhage. Usually, but not always, patients present with a small sentinel bleed followed by a variable interval of apparent resolution, and then they experience a massive exsanguinating hemorrhage. The variable interval of time after the sentinel bleed is the period in which most AEFs resulting from thoracic aortic aneurysm have been successfully treated. Although only a few successful cases have been reported in the literature, most describe an in situ repair. We describe treatment of a late-presenting AEF due to a thoracic aneurysm with an extra-anatomic bypass graft for the aortic repair. (J Vasc Surg 2000;32:1030-3.)

CASE REPORT

A 68-year-old man was transferred from an outlying hospital after an emergent exploratory celiotomy and gastrotomy for upper gastrointestinal hemorrhage. An intraoperative esophagoscopy showed active arterial bleeding from the mid thoracic esophagus but no exact source of the bleeding. On arrival, the patient was hemodynamically stable with a Sengstaken-Blakemore tube in place with both esophageal and gastric balloons inflated. Emergent thoracic aortogram (Fig 1) and computed tomography of the chest (Fig 2) revealed two saccular aortic aneurysms in the descending aorta without evidence of active bleeding.

The patient was taken to the operating room for emergent repair of thoracic aortic aneurysm and AEF. Through a median sternotomy, the ascending aorta was exposed. The previous midline abdominal incision was reopened; the supraceliac abdominal aorta was exposed. An extra-anatomic bypass graft was performed with a 20-mm Dacron graft from the ascending aorta to the supraceliac abdominal aorta, and only partial occlusion of the aorta was used. Heparinization was not performed. The graft was tunneled around the right lateral side of the pericardium after the right pleura and the diaphragm were opened at the pericardiophrenic angle, then between the
diaphragm and liver by mobilizing the triangular ligament of the lateral segment of the left lobe, and then directly to the abdominal aorta.

After completion of the extra-anatomic bypass graft, enteral access was established. After closure of the midline wounds, the patient was repositioned with his right side down. A saccular aneurysm on the right lateral aspect of the aorta was exposed through a standard left posterolateral thoracotomy. A second aneurysm just distal to the takeoff of the left subclavian artery was revealed. Fluid surrounding the aorta was cultured. The involved aorta was excluded by firing a TA 55 stapler with vascular staples twice distal to the most inferior aneurysm. The aorta was then controlled and transected just distal to the left subclavian artery. The stump was oversewn with 3-0 Prolene suture. On evacuation of the clot from the aneurysm, a 1.0-cm diameter communication with the esophagus was easily seen. All intervening intercostal vessels were ligated, and then the involved aorta was excised.

Because of the size of the defect in the esophagus, a temporary exclusion procedure was performed. The proximal and distal intrathoracic esophagus was excluded by #1 polydioxanone sutures. This excluded esophagus was drained with an 18 French T tube through the actual defect of the AEF. An 18 French tube was placed through the nares with the distal tip proximal to the proximal esophageal exclusion to control the patient’s oral secretions. Two 36 French thoracotomy tubes were placed to drain the pleural space.

Postoperatively, the patient was hemodynamically stable with good distal pulses and no signs of paraplegia. The results of the cultures were negative. Vancomycin, gentamycin, and Flagyl were given for perioperative antibiotics. Three weeks postoperatively, the T tube was removed after obtaining an esophagram, which revealed no extravasation of contrast at the site of the esophageal erosion. The patient had a tumultuous course with multiple episodes of sepsis and ventilator dependency. Eventually, he was weaned off ventilatory support and was able to talk. Approximately 24 weeks after presentation, the patient was discharged to a rehabilitation facility for ongoing care. Two months after transfer, the patient had sudden death due to a cardiac dysrhythmia. No post-mortem examination was performed.

DISCUSSION

There have been few successes in dealing with AEF reported in the literature. Successful repair of an AEF has been described when the primary problem was of aortic origin, but only when the diagnosis was made before massive hemorrhage. Before our report, repair of an AEF due to a thoracic aortic aneurysm had been successful only when the diagnosis was known before massive exsanguination.

For the vascular repair of an AEF, a surgeon has several options. Primary repair of the aorta has been reported, but this is usually after a limited injury that

Fig 1. Aortogram demonstrates two saccular aneurysms with no evidence of hemorrhage.
occurs from an insult such as a swallowed foreign body. This approach was first described as a staged operation; more recent reports, however, suggest that repair with either suture or Dacron patch is possible as a single-stage procedure.

When an AEF results from an aortic aneurysm, primary repair is usually not an acceptable option. In situ bypass grafting has been advocated by some as an acceptable and appropriate choice. The advantages to this repair are the decrease in total operative time and the avoidance of risks of an extra-anatomic bypass graft such as stump blowout from the native aorta. The disadvantages of this repair are the increase in total ischemic time and the potential for graft infection.

Extra-anatomic bypass grafting, however, is another option. A problem noted with an axillary femoral bypass graft was hypertension, which was attributed to the size restriction of the axillary femoral bypass graft. Instead of a 10-mm diameter unilateral axillobifemoral graft, Hageman et al suggested the use of a large caliber graft from the ascending aorta to the abdominal aorta. In 1969, Yonago et al reported successful treatment of an AEF with such an extra-anatomic bypass graft through the right chest.

We chose an extra-anatomic bypass graft approach for our patient. Because the diagnosis of AEF was made only after massive exsanguination, our patient had already experienced a major hypoperfusion insult. This extra-anatomic approach avoided additional ischemia time in a patient who already had protracted hypofusion insult, while maximizing bypass graft blood flow due to its large cross-sectional diameter. Although some suggest it is not an issue, there is the benefit of the decreased potential for graft infection by routing the graft away from infected planes. In fact, others recommend extra-anatomic bypass grafting whenever possible for other mycotic aortic aneurysms. While endoluminal repair may be an option for repair, the risk of contamination from the esophagus makes this repair less than ideal.

In AEF, there are various options for the esophageal repair from simple repair with a patch to a total esophagectomy. Although several repairs for all esophageal perforations have been advocated, intubation of a T tube has been suggested by some as well. We chose a temporary exclusion and T tube esophageal intubation because this procedure does not require either extensive time to perform or an additional operation. Again, the most expedient operation to repair the esophagus was in the best interest of our patient. The temporary exclusions allowed the esophageal perforation to heal and spontaneously close. A postoperative esophagram is helpful to ensure the closure of the perforation.

The cause of death in our patient did not seem to be directly related to the AEF. However without postmortem examination, this cannot be fully assessed.

Surgeons must be aware of all options of repair when dealing with an AEF so that they can apply any
option to whatever the situation dictates. Key principles need to be followed when operating on an unstable, hypotensive patient on the verge of irreversible shock. These principles include aggressive resuscitation, aggressive hemodynamic monitoring, expedient operation, and decrease in total ischemic time. Extraneous bypass grafting and T tube esophageal intubation are two such options that a surgeon should consider when repairing a late-presenting AEF.

REFERENCES