Stent Graft Repair of a Ruptured Aberrant Right Subclavian Artery after Open Repair

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Abstract

An aberrant right subclavian artery arising from the proximal portion of the descending thoracic aorta is the most common congenital anomaly of the aortic arch. Open repair is typically performed for such patients; however, this procedure may be associated with a high rate of neurological complications and mortality, particularly in patients contraindicated for major open vascular reconstruction. We successfully treated a ruptured aberrant right subclavian artery using stent grafts in an 81-year-old female patient who had previously undergone open aortic arch repair. The stent graft technique is useful for patients without vascular ring symptoms who require repeat thoracotomy.

Keywords: Kommerell diverticulum; Aberrant right subclavian artery; Stent graft

Introduction

An aberrant right subclavian artery (ARSA) arising from the proximal portion of the descending thoracic aorta is the most common congenital anomaly of the aortic arch. Open repair is typically performed for such patients; however, this procedure may be associated with a high rate of neurological complications and a mortality of up to 30%, particularly in patients contraindicated for major open vascular reconstruction. In addition, open repair may be contraindicated in patients with a history of thoracotomy. Because thoracotomy and aortic clamping are the most crucial steps of open repair, a combination of aortic endografting and extra-anatomic bypass is particularly appealing for the management of this condition. We report the successful repair of a ruptured ARSA after open repair in an 81-year-old patient without vascular ring symptoms.

Case Report

An 81-year-old patient was hospitalized at our facility with anemia and a respiratory disorder. Two years back at another hospital, she had undergone total aortic arch and abdominal aortic graft replacement because of aneurysmal changes. On presentation, the patient was suspected to have digestive tract bleeding. However, a plain chest radiograph showed an abnormal increase in the cardiothoracic ratio.

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remained at the graft anastomosis site, and this led to eventual rupture. Grafts should be anastomosed to normal tissue, while an ARSA should not be anastomosed behind the esophagus, as was done in the first surgery. This is because reconstruction of a rupture at this site is very difficult. The vessel passes posterior to the esophagus, and, in rare cases, may cause dysphagia or massive hemoptyis if associated with vasculitis or an aneurysmal diverticulum of Kommerell [3-5]. Open repair may be associated with high rates of neurological complications and mortality, particularly in patients who are too unstable for open vascular reconstruction. Thoracotomy and aortic clamping are the most crucial steps of open repair, with an associated mortality of as high as 30% [6]. In addition, open repair may be contraindicated in patients with a history of thoracotomy. A combination of aortic endografting and extra-anatomic bypass surgery is particularly appealing for the management of this condition. Patients with ARSA have been recently treated by endovascular or hybrid treatment. Joseph et al. reported hybrid treatment for a ruptured diverticulum of Kommerell [7]. We would not have selected a stent graft procedure for our patient if vascular ring symptoms such as dysphagia were present. We divided the RSCA from near the origin and anastomosed the distal end of the subclavian artery to the right common carotid artery. We selected endovascular repair (EVAR) for our patient because she did not have vascular ring symptoms and required a re-thoracotomy. Because only two leg devices (Excluder and Zenith) were available as small stent graft devices for EVAR in Japan at that time, we selected the Excluder leg device because it is more flexible. We operated only one time on this patient, who required immediate improvement because of older age and the emergency situation. We deployed another Gore TAG device according to the schedule before surgery. This site on the distal aortic arch was the site of the graft and native anastomosis used previously. After stent grafting, the patient’s systemic condition improved immediately because rupture of the RSCA anastomosis influenced this case. Although we were concerned about vascular ring symptoms, they never appeared. However, this patient required careful follow-up.

In summary, we experienced a rare case of an ARSA after aortic arch graft replacement. An ARSA should not be rerouted behind the esophagus. In the present patient, residual vulnerable tissue left after the first surgery for proximal RSCA led to rupture of the graft anastomosis site. Our stent graft technique is useful for patients without vascular ring symptoms who require re-thoracotomy.

References