SHORT REPORT

Aortoceliac Artery Bypass Using an Anastomosis Device with a Saphenous Vein Graft from the Supraceliac Aorta

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We describe the clinical experience of application of an aortic anastomotic device for aortoceliac artery bypass with a saphenous vein graft from the supraceliac aorta.

A 53-year-old female with celiac artery occlusion and multiple superior pancreaticoduodenal artery aneurysms had an aortoceliac artery bypass surgery using the aortic anastomosis device. Coil embolization of the aneurysms was performed via the superior mesenteric artery. The postoperative angiogram revealed good graft patency and complete aneurysm embolization. This device can be considered for application in various anastomotic situations.

Keywords: Aortoceliac bypass; Aortic anastomosis device.

Introduction

Recently, an aortic anastomosis device has been employed for aortosaphenous vein anastomosis during off-pump coronary artery bypass grafting (CABG).1 This sutureless system can be applied in other anastomotic situations without aortic clamping.2 In this report, we describe the clinical experience of the application of a new aortic anastomosis devise (the PAS-Port system®, Cardina Inc., Menlo Park, CA, USA) in the vascular surgery of a patient who required aortoceliac artery bypass.

Case Report

A 53-year-old female was suffering from continuous, mild pain in the abdomen. Computed tomography and an aortogram revealed total occlusion of the celiac artery and three aneurysms of the inferior pancreaticoduodenal and gastroduodenal arteries. Blood was supplied to the liver and spleen via the pancreaticoduodenal artery from the superior mesenteric artery (SMA) (Fig. 1). Coil embolization was planned for these aneurysms because the largest aneurysm was situated under the pancreas. Aortoceliac artery bypass was planned prior to the coil embolization to provide blood supply to the liver and spleen.

A 10 cm saphenous vein with a 6 mm diameter was harvested from the left leg and midline laparotomy was performed. The harvested saphenous vein was loaded on the PAS-Port system® (Fig. 2(a)), in which veins with a diameter of 4–6 mm can be attached, and the anastomosis was performed at the celiac aorta without aortic clamping. Distal anastomosis of the vein graft was performed to the celiac artery in an end-to-side fashion (Fig. 2(b)). Following the bypass surgery, coil embolization was successfully performed via the SMA and via the new aorto-celiac bypass. We used a total of 88 coils comprising of 51TruFill DCS Detachable coils and 37 TruFill COMPLEX coils (Cordis Co., a Johnson & Johnson Co., Miami Lakes, FL, USA) for the embolization of all three aneurysms. Total procedure time was 265 min. Blood loss was 180 g and a blood transfusion was not performed. The patient was discharged 10 days postoperatively. No complications were noted. One month later,
the angiogram revealed good patency of the graft and complete embolization of the aneurysms (Fig. 2(c) and (d)). Six months later, the follow-up ultrasound examination also indicated good graft patency.

Discussion

Manual suturing remains the gold standard for vascular anastomoses. However, anastomosis that does not require ascending aortic clamping in off-pump CABG is an important innovation. Although it can only be used in cases of an aorta without calcification or mural thrombus. These devices reduce aortic manipulation and potentially decrease the risk of distal emboli and local injury of the aortic wall. Furthermore, the extensive use of minimally invasive anastomosis devices suggested a possibility of the applicability of this technique to other vascular anastomoses. It has been reported that this device had been used successfully for an aortomesenteric bypass in a patient with a heavily diseased aorta that was unsuitable for clamping.

In this case, the celiac artery was completely occluded, and the SMA with multiple aneurysms was an important collateral artery. Coil embolization was planned for these aneurysms because the largest aneurysm was hidden under the pancreas, and surgical resection was deemed difficult. Prior to coil embolization, an aortoceliac artery bypass was planned to provide blood supply to the liver and spleen. The reasons for selecting the celiac aorta as the proximal anastomotic site were that it provides the shortest bypass route and that this anatomical route was also considered optimal for insertion of a catheter for coil embolization. Furthermore, the accidental

Fig. 1. Preoperative selective celiac artery angiogram shows collateralization from SMA to the celiac artery by the inferior pancreaticoduodenal artery. Arrows indicate aneurysms.

Fig. 2. (a) PAS-Port system. (b) Intraoperative findings reveal excellent anastomosis was performed using PAS-Port system. The bypass is indicated by a white arrow. (c) and (d) Postoperative angiogram showed good patency of the graft (white arrow: c) and the SMA (d) and complete embolization of the aneurysms (black arrows: c and d).
SMA occlusion could be fatal in this procedure. In preparation for these complications, the coil embolization was performed after the bypass with the abdomen closed down to only the abdominal muscles.

In this case, a new anastomosis device; PAS-Port system® was used. The St Jude Medical symmetry aortic connector system® (St Jude Medical, Inc., St Paul, Minn, USA), an earlier version of the device, is reported several early complications and a poor medium-term graft patency and there is a tendency to avoid its use.4,5 One of the differences between the PAS-Port system and the symmetry aortic connector system relates to the amount of metal exposure in the blood stream.3 Minimum metal exposure of this PAS-Port system appears to facilitate the prevention of possible graft failure. Of course, a careful observation of patients is required following the application of this anastomotic device.

In conclusion, the aortic anastomosis device does not require manipulation of the aorta and may reduce the potential risks involved in vascular surgery. This sutureless system can be considered for application in various anastomotic situations.

References


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