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Aortic Puncture Through Sewn-on Graft for TEVAR and Aortic Bypass

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INTRODUCTION

An innovative hybrid approach is described for treating a chronic aortic dissection (AD) after two failed attempts at thoracic endovascular aneurysm repair (TEVAR) because of the impossibility of catheterising the true lumen (TL). The patient was a 67 year old woman with surgical history of ascending aortic replacement for acute Type A AD, aortic arch replacement, and aorto-bi-iliac bypass for aneurysmal degeneration; of note, the bypass had been sewn onto the false lumen (FL) (Fig. 1A). Follow up computed tomography angiography indicated an increase of the descending thoracic aortic diameter (DTA) to 74 mm: the FL was enlarged, perfusing the aorto-bi-iliac graft; the TL that perfused all visceral arteries was collapsing.

SURGICAL TECHNIQUE

By means of midline laparotomy, the abdominal aorta was accessed and the TL and FL were identified at the level of the renal arteries. On the bench, a 10 mm diameter bifurcated polyethylene terephthalate graft (AlboGraft, Le Maitre Vascular, Burlington, MA, USA) was constructed; a Teflon cardiovascular patch (Bard, Billerica, MA, USA) with a 10 mm inner hole was glued (GRF, Cardial, Bard, Tempe, AZ, USA) on the outer aspect of the aorta overlying the TL for aortic reinforcement, and the bifurcated graft was then sewn onto the patch as a cul-de-sac (Fig. 1B). Through one limb of the graft, the TL was punctured and the DTA cannulated (Fig. 2A). Two C-Tag stent grafts (WL Gore, Bloomington, IN, USA) were deployed through a 24F sheath. Angiography confirmed optimal device position and entry tear exclusion.

Following sheath retrieval, the anterior aortic wall puncture point was reinforced by deploying a 12 × 38 mm balloon expandable stent graft (Lifestream, Bard) before performing end to end anastomoses to each iliac limb of the previous bi-iliac bypass (Fig. 2B). The post-operative course was uneventful and the patient was discharged on Day 9.

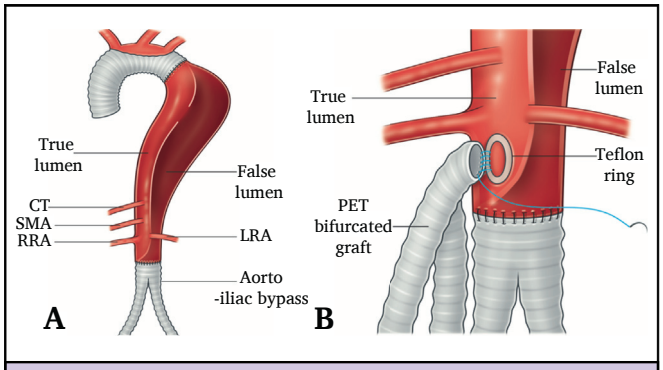

Figure 1. Panel A. Preoperative patient anatomy. Panel B. Suture of the bifurcated graft to the aorta through the glued Teflon ring. CT = celiac trunk; LRA = left renal artery; PET = Polyethylene terephthalate; RRA = right renal artery; SMA = superior mesenteric artery.

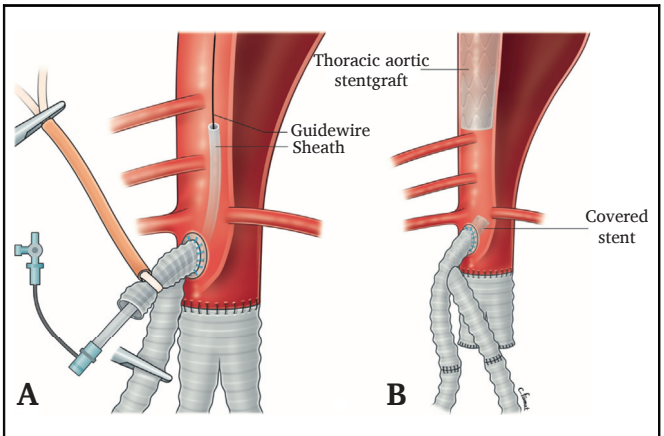

Figure 2. Panel A. True lumen cannulation through one limb of the bifurcated graft. Panel B. Postoperative patient anatomy.

CONCLUSION

Direct aortic TL puncture through a sewn-on graft allowed TEVAR and revision aorto-bi-iliac bypass without aortic clamping in a high risk patient with chronic AD.

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