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SHORT REPORT

A Fatal Complication Following Hybrid Total Arch Replacement with Supra-aortic Artery Translocation and Endovascular Stenting

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This case highlights the successful management of acute Type B dissection complicated by visceral malperfusion. Even though the procedure of hybrid supra-aortic translocation and endovascular stenting corrected the malperfusion, it is important for vigilant CT scan surveillance for the post operative complications which can occur with this procedure.

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Keywords: Type B Dissection; Malperfusion; Hybrid procedure; Total arch replacement; Supra-aortic artery translocation; Endovascular stenting.

Purpose

This case highlights the successful management of acute Type B dissection complicated by visceral malperfusion. Even though the procedure of hybrid supra-aortic translocation and endovascular stenting corrected the malperfusion, it is important for vigilant CT scan surveillance for the post operative complications which can occur with this procedure.

Case Report

A 56 year old female was admitted with history of sudden onset chest pain. Acute coronary syndrome was suspected but angiography revealed a type B dissection confirmed on CT scanning (Fig. 1). Medical management was initiated but on day 9 post-event she complained of further back pain and was noted to have deteriorating renal and liver function and haematuria. A repeat CT scan demonstrated partial right renal and liver ischaemia due to malperfusion (Fig. 2A). The type B dissection arose immediately adjacent to the left subclavian artery and the supra-aortic vessels arose in close proximity (Fig. 1).

Endovascular stent grafting¹ was considered but stent deployment could only satisfactorily occur in Zone 0² because of the supra-aortic anatomy and arch curvature. A hybrid operation was performed comprising total supra-aortic vessel translocation using the three side-arms of a Gelweave Vascutek Plexus (Vascutek Ltd, Renfrewshire, UK) aortic arch graft with the patch anastomosed to the proximal ascending aorta using a side-biting clamp without utilising

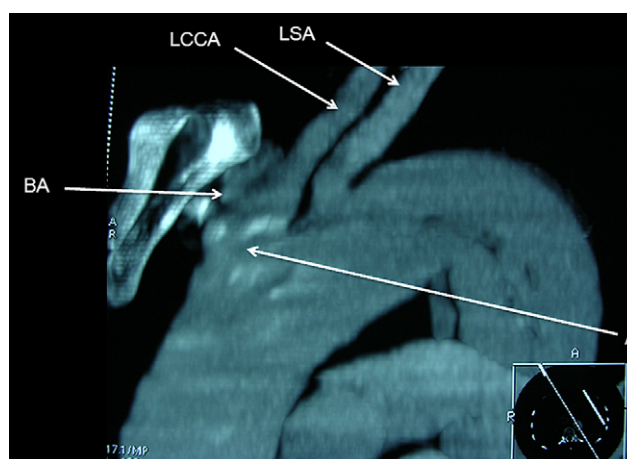


Fig. 1. Preoperative sagittal CT scan demonstrating Type B dissection (A) extending to the left common carotid (LCCA) and necessitating overstenting of all supra-aortic vessels. BA- Brachiocephalic artery, LSA- Left subclavian artery.

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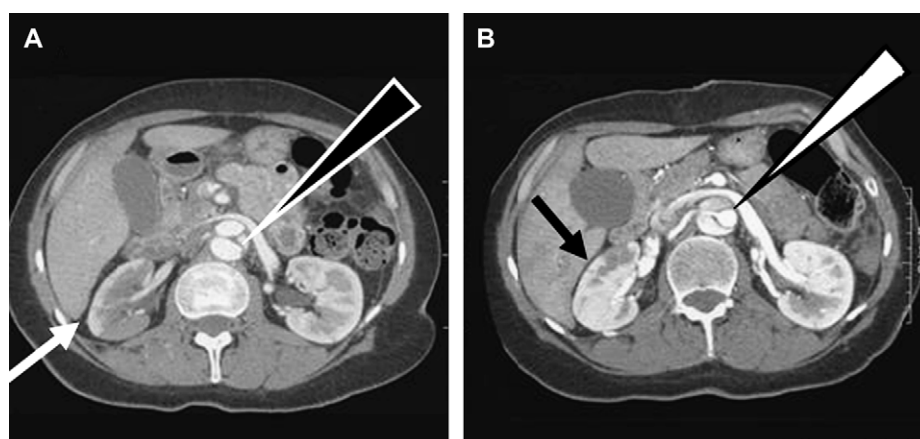


Fig. 2. Coronal CT images (A) demonstrating right renal malperfusion (white arrow) and compressed true lumen (black filled triangle) preoperatively. Scan (B) shows the post-stent scan demonstrating improved right renal perfusion (black arrow) and dominant flow in a somewhat larger true lumen (white filled triangle). Note the post-stent hypoenhancement in the false lumen.

cardiopulmonary bypass (Fig. 3). A 38 mm Medtronic Valient stent graft (Medtronic Limited, Hertfordshire, UK) was then satisfactorily deployed via the femoral artery from zone 0 to zone 3. The initial recovery was uneventful with resolution of pain, normalisation of renal function and improved kidney perfusion on check CT scanning done immediately postop (Fig. 2B). On post-operative day 14, the patient collapsed with an electromechanical cardiac arrest from which she could not be resuscitated. Post-mortem examination demonstrated a type A dissection with intra-pericardial rupture. A review of the check CT

scan revealed an intimal tear in the proximal ascending aorta (Fig. 3 A, B); this was initially perceived to be related to the patch graft insertion.

Conclusion

Endovascular stent grafting is rapidly becoming a treatment of choice³ for complicated type B dissection.⁴ Supra-aortic vessel translocation to allow secure stent deployment is sometimes necessary. However, the non-dissected aorta may also be abnormal in

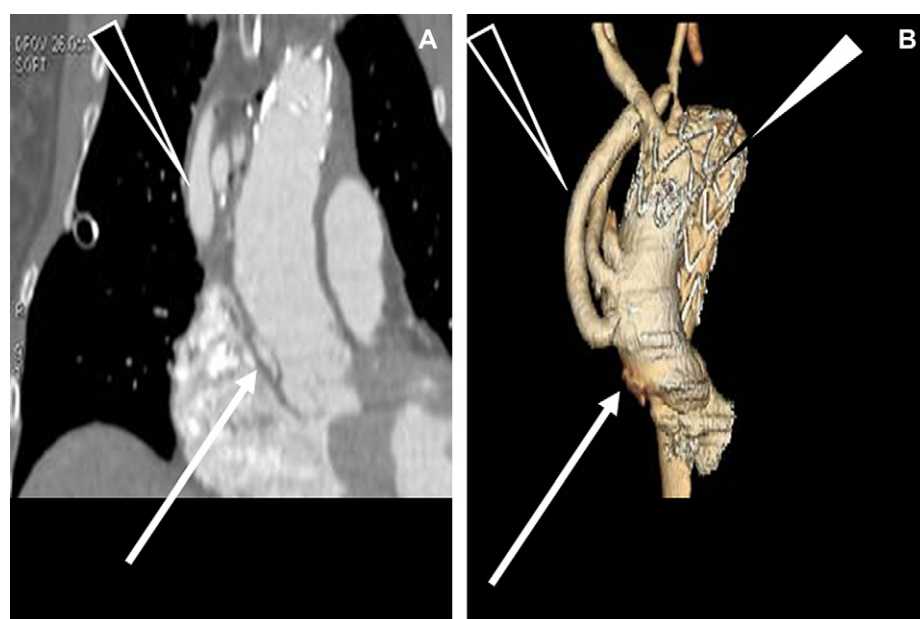


Fig. 3. Saggital (A) and 3-D reconstructed (B) CT images following EVAR. The trifurcating supra-aortic bypass is shown (black filled triangle) together with the stent deployed into zone 0-1 (white triangle). The white arrows demonstrate a proximal aortic dissection initially attributed to the patch implantation of the trifurcating patch graft.

such patients and this case illustrates the need for great caution and vigilance in post-operative CT scan assessment to ensure that iatrogenic aortic injury is prevented or detected.

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