



Urgent Endovascular Repair with an Off the Shelf Multibranched Thoraco-abdominal Endograft to Fix Late Chimney Failure

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INTRODUCTION

Chimney endovascular aneurysm repair (ChEVAR) technique, with < 2 parallel grafts and > 2 cm of neck, is a viable option for urgent complex abdominal aortic aneurysms, because multicentre experiences have reporting favourable early and midterm outcomes.¹

Gutter endoleaks remain the Achilles heels of this technique, occurring in up to 12% of cases and requiring re-interventions.² Endovascular solutions include gutter coiling,³ proximal extension with additional chimneys, or custom made fenestrated and branched devices. Although custom made devices offer an effective solution, their manufacture time limits their use in urgent settings.⁴ Commercially available off the shelf thoraco-abdominal branched devices as E-nside (Artivion, Kennasaw, GA, USA); TAMBE (W.L. Gore, Flagstaff, AZ, USA); t-Branch (Cook Medical, Bloomington, IN, USA) may be valuable alternatives for these situations. The authors report the possibility of fixing late urgent ChEVAR failures with the t-Branch.

MATERIALS AND METHODS

The authors report a paravisceral aortic rupture (Fig. 1A) caused by persistent gutter endoleaks in a patient with previous ChEVAR involving renal arteries and coeliac trunk obstruction (Supplementary Video).

The t-Branch was advanced from the left femoral access after initial iliac endograft angioplasty with a high pressure balloon (12 × 60 mm) and navigability test by hydrophilic dilators. The endograft was positioned with the renal cuffs 2 cm above the lowest target artery (TA) (right renal chimney).

The t-Branch was rotated 90° laterally to guarantee the cannulation of both renal chimneys located at the 6.30 and 11 o'clock positions and released by the partial deployment technique.⁵ The cuff for the superior mesenteric artery was exposed (9 o'clock), the vessel was wired, catheterised and stented (Gore VBX 8 × 79 + 9 × 39 mm). The graft

unsheathing was continued as far as renal cuffs, the previous parallel grafts were cannulated and relined by new covered stents (Gore VBX 7 × 79 mm). The t-Branch deployment was completed and the coeliac trunk cuff was occluded by a vascular plug (16 mm). Due to the short distance between renal cuffs and the previous graft's flow divider, a Gore C3 device (23 mm) was implanted to obtain complete aortobi-iliac relining. The post-operative course was uneventful with no neurological, renal, or cardiopulmonary complications. This technique was successfully adopted in two cases with available imaging follow up at 12 and 48 months, respectively (Fig. 1B).

Several technical considerations should be considered. Firstly, TA origins and orientations are altered and more cranial due to previous parallel graft configurations. It requires a high t-Branch deployment, careful endograft alignment and challenging TA cannulations. Secondly, the paravisceral aortic diameter is often narrow, making parallel graft cannulation unpredictable. The partial deployment technique may facilitate this manoeuvre.⁵ Thirdly, the earlier aortobi-iliac endograft may limit t-Branch introduction and rotation. Angioplasty of the iliac limb with a high pressure non-compliant balloon, use of hydrophilic dilators (16 – 22 Fr) and a brachial femoral through and through technique facilitate graft manoeuvrability. Finally, the limited distance between the lowest TA and the previous graft's flow divider requires adjunctive strategies to achieve bifurcated reconstruction. If necessary, the shortest Cook Unibody (length 81 mm) can be replaced by a standard Gore abdominal device (length 70 mm) to avoid a more cranial t-Branch deployment and guarantee the total relining of the previous bifurcated endograft.

Conclusion

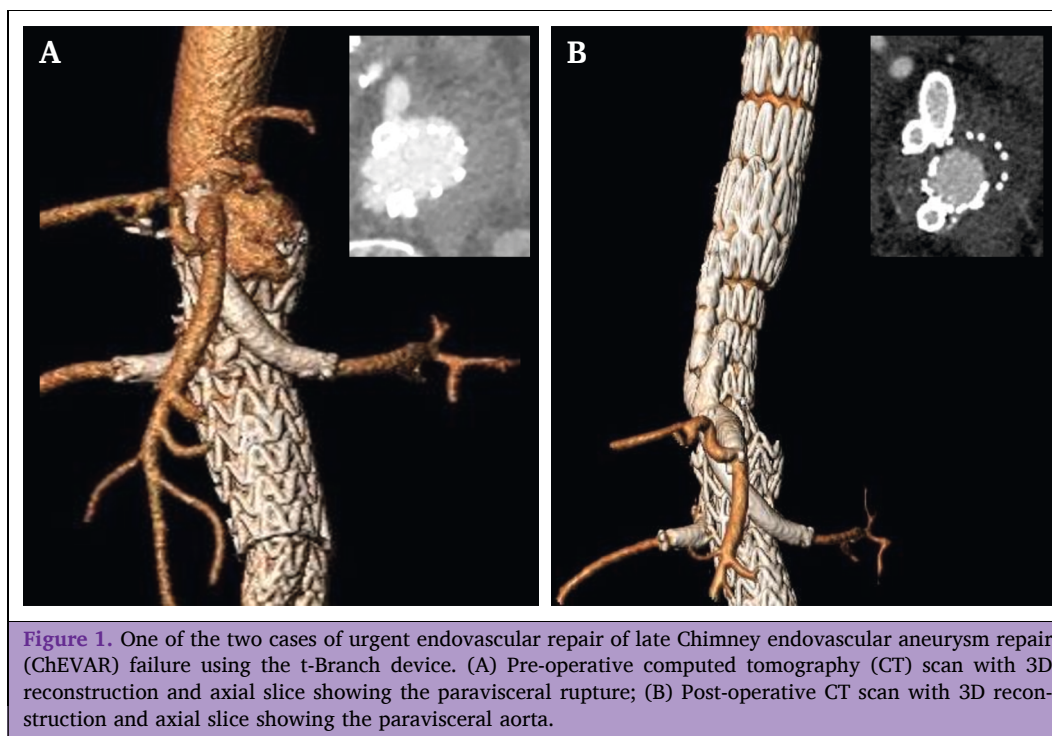
In anatomically selected urgent cases, t-Branch may be a safe and effective option to manage late ChEVAR failures. This solution is technically demanding, and it should be performed in dedicated centres.

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CONFLICTS OF INTEREST AND FUNDING

E.G., G.F., and M.G. are clinical proctors for fenestrated and branched endografts for Cook Medical and receive speaking fees and travel grant. A.C. declares that he has no competing interests. No funding was received for preparing this manuscript.

APPENDIX A. SUPPLEMENTARY DATA

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ejvs.2025.12.003>.

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