

UC Davis

UC Davis Previously Published Works

Title

Pieces of a Puzzle: Anatomy and Parallel Grafts

Permalink

<https://escholarship.org/uc/item/32w1c6h3>

Authors

Maximus, Steven
Milner, Ross

Publication Date

2019

DOI

10.1016/j.ejvsr.2019.03.004

Peer reviewed

Pieces of a Puzzle: Anatomy and Parallel Grafts

Steven Maximus, Ross Milner *

University of Chicago, Section of Vascular Surgery and Endovascular Therapy, Chicago, IL, USA

In this issue of the *European Journal of Vascular and Endovascular Surgery*, Dr. Castro-Ferreira and colleagues describe the use of the parallel grafting technique (PGT) in a patient with a complex aneurysm involving the thoracic and juxtarenal aorta, and common iliac arteries.¹ Their original operative plan consisted of accessing the renal and hypogastric arteries from a transaxillary approach in order to place stents for bilateral chimney grafts. During the procedure, they were unable to selectively catheterise the left renal artery from this approach because of unfavourable anatomy. Instead of abandoning the procedure, they were able to access the left renal artery from a femoral approach, and placed a periscope for the left renal artery and a chimney for the right renal artery. The patient did well post-operatively, and later had some sac growth with a type 2 endoleak, but after 40 months of follow up had no additional sac growth.

Despite modification from their original plan of bilateral renal chimney placement, they were able to adjust and accomplish sealing of this complex aneurysm with good technical success. It is in these moments of challenge and uncertainty that the intrigue and allure of endovascular surgery makes itself apparent. Every surgeon hopes for a smooth case that goes according to the original plan; but it is a surgeon's ability to make quick intra-operative decisions and adjust the operative plan based on intra-operative difficulties that separates a surgeon from a technician. Like a complex puzzle that has no single right answer, an operative plan that needs to be adjusted on the fly is a challenge that can test even the most experienced and skilled vascular surgeon. However, it is in overcoming these intra-operative challenges and achieving technical success despite deviation from the original plan that valuable experience is gained. This experience leads to more innovation, and innovation leads to new ideas that will continue

to improve upon the already rapidly expanding endovascular technology and its application to complex techniques.

The original description of the chimney technique in 2003 by Greenberg et al.² in endovascular aneurysm repair (EVAR) was seen as an alternative for patients with inadequate neck length for infrarenal aneurysm repair, and was described as a bailout technique in order to maintain renal patency during EVAR deployment. The collective experience of surgeons performing this technique over the years has led to improvement and innovation, which has expanded the use of endovascular devices in hostile necks, pararenal, paravisceral, and thoraco-abdominal aneurysms that previously were not amenable to endovascular repair. Despite the introduction of fenestrated and branched devices, PGT has continued because of the manufacturing and availability limitations of these devices.³ Furthermore, the ability to adjust for difficult anatomy is something that is unique to the parallel grafting technique. This case report highlights the importance of both PGT and the necessity for the operating surgeon to be able to adjust to the patient's anatomical challenges.

REFERENCES

- 1 Castro-Fierrez R, Dias PG, Sampaio SM, Teixeira JF, Lobado A. Parallel grafts technique in a complex aortic aneurysm – the value of intraoperative flexibility from the original operative plan. *Eur J Vasc Endovasc Surg* 2019;**43**:37–40.
- 2 Greenberg RK, Clair D, Srivastava S, Bhandari G, Turc A, Hampton J, et al. Should patients with challenging anatomy be offered endovascular aneurysm repair? *J Vasc Surg* 2003;**38**: 990–6. 172.
- 3 Ullery BW, Tran K, Itoga NK, Dalman RL, Lee JT. Natural history of gutter-related type Ia endoleaks after snorkel/chimney endovascular aneurysm repair. *J Vasc Surg* 2017;**65**:981–90.

* Corresponding author. University of Chicago, Chicago, IL, USA.

E-mail address: rmilner@surgery.bsdc.uchicago.edu (Ross Milner).

2405-6553/© 2019 Published by Elsevier Ltd on behalf of European Society for Vascular Surgery. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.ejvssr.2019.03.004>