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Invited Commentary

From the Neck to the Heel

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The less invasive endovascular aneurysm repair (EVAR) is regarded as a less effective procedure for the treatment of abdominal aortic aneurysm (AAA) since it is associated with frequent re-interventions and failures in the midterm mainly related to aneurysm neck problems. Open surgical conversion is often required after EVAR failure. Open repair of AAA is associated with fewer aortic-related re-interventions and remains the gold standard. However, about one-third of open surgery survivors have been reported to undergo at least one vascular intervention after 15 years.¹ Failure may lie in unrecognised disease or vulnerable aorta with recurrent aneurysmal development especially at the neck, which is the 'Achilles heel' of any aortic repair.

In this perspective, open repair may postpone the time of aortic failure when compared with EVAR, but the aorta remains at risk to fail.

The perception of durability attributed to open repair may be due to the lack of standardised imaging follow-up after surgery. In this article of *EJVES*, data from a randomised trial comparing EVAR with open repair for AAA treatment clearly showed that as, in the EVAR era, the implementation of rigorous imaging follow-up after aortic repair has led to the perception that also open aneurysm surgery may not be a definite therapy for AAA.² de Bruin et al. re-measured the length of the residual infrarenal aortic neck after repair in 156 aneurysms treated with open surgery and 160 assigned to EVAR in the Dutch Randomized Endovascular Aneurysm Management (DREAM) trial. The distance from the caudal artery to the proximal graft anastomosis was significantly shorter in the EVAR group ranging from 0 to 6 mm, while the average infrarenal neck length in the open repair group was 24 mm (ranging from 16 to 30 mm). The shorter neck length after EVAR was understandably related to device instructions for use and required to ensure adequate sealing for a nonsutured prosthesis. Nevertheless, the almost 2.5 cm of remaining neck after open surgery might be a reason for concern, also because this persisting neck was not intentionally achieved by most surgeons. The DREAM authors indeed specifically queried surgeons about the neck length they left after surgery and found that only 6% were accurate in this respect with many surgeons (54%), indicating the proximal anastomosis within 10 mm of the caudal

renal artery (while actually only 10/156 open repairs showed this length and 146 had a neck longer than 11 mm at re-measurement).²

Since failure after open surgery often occurs later than 10 years but the DREAM trial did not provide data longer than 6 years and at this time point open surgery still showed to be more durable than EVAR (freedom from secondary interventions was 81.9% for open repair and 70.4% for endovascular repair; difference, 11.5 percentage points; 95% CI, 2.0–21.0; $P = 0.03$), the consequence of persisting aortic neck after open surgery may be uncertain.³ Nevertheless, the persisting neck length and the nearly 20% re-intervention rate reported at 6 years after open surgery in the DREAM patients raise the question as to whether aneurysm repair even with open surgery is palliative or curative.

In this context, EVAR may become a game changer, altering what we usually think about the treatment of AAA, that is, open surgery as a reparative definitive solution after EVAR failure. Availability of fenestrated and branched stent grafts has expanded the application of the endovascular approach also to more complex aortic aneurysm configurations, such as those with pararenal/paravisceral involvement for recurrent aneurysmal disease after previous open surgery failure. Since patients referred for late failure after open aortic repair are 10 years older, the aortic disease is more extensive, and a higher rate of comorbidities is present; EVAR may become the treatment of choice as a rescue procedure to treat open repair failure. Whether and to what extent this rescue endovascular therapy after failed aortic open surgery will be durable remains undetermined.

Infrarenal aortic neck is the main critical issue of any aortic repair due to the need to preserve renal perfusion and, at the same time, allow total aneurysm exclusion. Deeper knowledge on aortic aneurysm pathophysiology and development is needed to clarify whether the neck-to-(Achilles) heel behaviour of aortic aneurysms can be reversed.

References

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