OPEN ACCESS Freely available online

ISSN: 2329-6925
Journal of Vascular Medicine & Surgery

Short Communication

Abdominal Aortic Aneurysm Management: Balancing Innovation with Evidence

Sophie Blaise*

Department of Medical Physics, Grenoble Alpes University, Grenoble, France

DESCRIPTION

The management of Abdominal Aortic Aneurysms (AAAs) has undergone remarkable evolution over the past three decades, transitioning from exclusively open surgical repair to an era where Endovascular Aneurysm Repair (EVAR) has become the predominant approach in most vascular centers worldwide. This transformation reflects technological innovation, changing patient demographics, and evolving healthcare priorities. However, recent long-term data have prompted renewed debate about optimal management strategies, particularly for younger patients with longer life expectancy [1].

The initial enthusiasm for EVAR was driven by compelling early outcomes, with multiple randomized controlled trials demonstrating significant reductions in perioperative mortality and morbidity compared to open repair. The EVAR-1, DREAM, OVER, and ACE trials consistently showed 30-day mortality reductions of 50-70% with endovascular techniques. These benefits, combined with shorter hospital stays and reduced recovery time, rapidly accelerated EVAR adoption across vascular practices globally [2].

However, the durability of these early advantages has been challenged by long-term follow-up data. The 15-year results from the EVAR-1 trial revealed an eventual convergence in survival curves, with higher rates of aneurysm-related mortality and reintervention in the EVAR group compared to open repair after 8 years. Similarly, the DREAM trial's 12-year outcomes demonstrated higher reintervention rates and aneurysm-related complications in the endovascular cohort. These findings have raised important questions about the late failure modes of endovascular repair and appropriate patient selection [3,4].

The phenomenon of late endograft failure manifests through various mechanisms: endoleak development, sac enlargement despite prior successful exclusion, component separation, and material fatigue. Type II endoleaks, once considered relatively benign, are now recognized as potential contributors to adverse outcomes when associated with aneurysm expansion. The natural history of these complications remains incompletely understood, particularly in younger patients with decades of life expectancy following intervention [5,6].

The surveillance burden following EVAR represents another significant consideration. Current guidelines recommend lifelong imaging follow-up, typically with CT angiography or duplex ultrasound, imposing substantial resource utilization and radiation exposure. This contrasts with the relatively limited surveillance needs following successful open repair. The psychological impact of indefinite surveillance requirements on patients' quality of life is an underexplored aspect that warrants further attention [7,8].

Recent years have also witnessed a renewed interest in non-interventional management strategies for smaller aneurysms. The PIVOTAL and CAESAR trials demonstrated the safety of surveillance for aneurysms between 4.0-5.5 cm in diameter, with low rupture rates during follow-up. Pharmacological approaches to limit aneurysm growth, including statins, tetracyclines, and antihypertensive agents, have shown promise in experimental models but remain unproven in clinical practice. The identification of biomarkers predictive of rapid expansion or rupture risk continues to be an active area of investigation [9].

Perhaps most significantly, our conceptualization of AAA has evolved from viewing it merely as a focal mechanical problem to recognizing it as a manifestation of systemic cardiovascular disease. This paradigm shift has important implications for management, emphasizing the importance of comprehensive cardiovascular risk factor modification alongside aneurysm-specific interventions. Optimal medical therapy, smoking cessation, and management of comorbidities may be as crucial to long-term outcomes as the technical aspects of repair [10].

The decision-making process for AAA intervention has consequently become more nuanced and individualized. Factors including aneurysm morphology, growth rate, patient age and life expectancy, comorbidities, and personal preferences must be carefully weighed. The concept of shared decision-making has

Correspondence to: Sophie Blaise, Department of Medical Physics, Grenoble Alpes University, Grenoble, France, E-mail: sblaise22@chu-grenoble.fr

Received: 28-Feb-2025, Manuscript No. JVMS-25-28759; **Editor assigned:** 03-Mar-2025, Pre QC No. JVMS-25-28759 (PQ); **Reviewed:** 17-Mar-2025, QC No. JVMS-25-28759; **Revised:** 24-Mar-2025, Manuscript No. JVMS-25-28759 (R); **Published:** 31-Mar-2025, DOI: 10.35248/2329-6925.25.13.586.

Citation: Blaise S (2025). Abdominal Aortic Aneurysm Management: Balancing Innovation with Evidence. J Vasc Surg. 13:586.

gained prominence, with patients increasingly involved in navigating the trade-offs between different management strategies.

CONCLUSION

The economics of AAA management also merit consideration in an era of increasing healthcare cost scrutiny. The higher initial costs of endovascular devices may be offset by reduced hospital stays and complications, but long-term surveillance and reintervention needs complicate the calculation. Cost-effectiveness analyses suggest that EVAR may be economically advantageous for older patients with limited life expectancy, while open repair remains more cost-effective for younger patients who would otherwise require decades of surveillance. The management of abdominal aortic aneurysms continues to evolve as we gain longer-term experience with endovascular techniques and develop more sophisticated approaches to patient selection. The initial dichotomous question of "EVAR versus open repair" has given way to more nuanced consideration of which patients benefit most from each approach. Future advances will likely focus on improving the durability of endovascular repair, developing less intensive surveillance protocols, and identifying pharmacological strategies to modify disease progression. By integrating technological innovation with evidence-based practice and patient-centered decision-making, we can continue to improve outcomes for this common and potentially devastating condition.

REFERENCES

1. Raju S, Neglen P. Clinical practice. Chronic venous insufficiency and varicose veins. N Engl J Med. 2009;360(22):2319-2327.
2. Sharif MA, Soong CV, Lau LL, Corvan R, Lee B, Hannon RJ, et al. Endovenous laser treatment for long saphenous vein incompetence. Br J Surg. 2006;93(7):831-835.
3. Wichers IM, Di Nisio M, Buller HR, Middeldorp S. Treatment of superficial vein thrombosis to prevent deep vein thrombosis and pulmonary embolism: a systematic review. Haematologica. 2005;90(5):672-677.
4. Chengelis DL, Bendick PJ, Glover JL, Brown OW, Ranval TJ. Progression of superficial venous thrombosis to deep vein thrombosis. J Vasc Surg. 1996 ;24(5):745-779.
5. Carugo D, Ankrett DN, Zhao X, Zhang X, Hill M, Byrne VO, et al. Benefits of polidocanol endovenous microfoam (Varithena®) compared with physician-compounded foams. Phlebology. 2016 ; 31(4):283-295.
6. Kulkarni SR, Messenger DE, Slim FJ, Emerson LG, Bulbulia RA, Whyman MR, et al. The incidence and characterization of deep vein thrombosis following ultrasound-guided foam sclerotherapy in 1000 legs with superficial venous reflux. J Vasc Surg Venous Lymphat Disord. 2013;1(3):231-238.
7. Stubbs MJ, Mouyis M, Thomas M. Deep vein thrombosis. BMJ. 2018;360.
8. Wenger N, Sebastian T, Engelberger RP, Kucher N, Spirk D. Pulmonary embolism and deep vein thrombosis: similar but different. Thromb Res. 2021;206:88-98.
9. Alomari AI. Simple system for perivenous tumescent infusion for endovenous laser ablation. Phlebology. 2012 ;27(5):242-244.
10. Kruger PC, Eikelboom JW, Douketis JD, Hankey GJ. Deep vein thrombosis: update on diagnosis and management. Med J Aust. 2019;210(11):516-524.