Commentary

Vol. 8, No. 3; 2024; pp 90–91
DOI: https://doi.org/10.26676/jevtm.33220

Stent Graft Treatment of Traumatic Arteriovenous Fistula in a 35-Year-Old: What is the 10-Year Outcome?

Per Skoog

Department of Vascular Surgery and Institute of Medicine, Department of Molecular and Clinical Medicine, Sahlgrenska University Hospital and Academy, Gothenburg, Sweden

Received: 30 October 2024; Accepted: 30 October 2024

In a detailed case report, Patel et al. examine the management of a traumatic arteriovenous fistula (AVF) in the popliteal segment of a 35-year-old male. This patient presented with a painful swelling at the back of his left knee following arthroscopic cruciate ligament repair after a knee injury. The authors conducted thorough diagnostic investigations, identifying a post-traumatic AVF, and subsequently performed endovascular treatment using two balloon-expandable stent grafts.

A review of the literature on traumatic AVF treatments reveals only about 20 publications addressing a handful of cases, and notably, no long-term follow-up data. This highlights the limited scientific foundation for treating post-traumatic AVFs.

Broader investigations into popliteal injuries, including treatment of popliteal injuries in general, yield more information. Studies by Potter et al. [1] and Abdou et al. [2] analyzed outcomes from the American National Trauma Data Bank (NTDB), examining 2,873 and 3,698 patients, respectively, although only a small fraction underwent endovascular treatment (5.7% and 5.3%). Recent reviews by Vaidya et al. [3] and Qi et al. [4] in 2024 include meta-analyses comparing open and endovascular treatments for popliteal injuries. However, the quality of data in these studies is limited due to the studies included. Qi et al.'s meta-analysis primarily relies on NTDB data, which only tracks in-hospital outcomes, failing to provide insights into long-term vascular reconstruction performance. Vaidya et al.'s review involves 864 patients, but 3 out of 8 studies on endovascular treatment lacked follow-up, and the other studies (56 patients) had a mean follow-up of just 33 months.

Overall, these studies indicate minimal differences between open and endovascular techniques for popliteal injuries in the short perspective. However, the significant issue of long-term patency with endovascular methods remains largely unaddressed. It is therefore concerning that many authors still describe the endovascular approach as "promising."

A notable study by Jiang et al. in 2020 [5] evaluated 46 patients with popliteal injuries treated with 41 stent grafts, reporting a primary patency rate of 75.3% at 12 months, 61.9% at 24 months, and 55.7% at 48 months, with an assisted patency rate of 85.2% at 48 months. These long-term results are strikingly similar to those for other popliteal stent graft treatments. In line with Jiang et al.'s result, Saxon et al. [6] reported a primary patency of only 55% after four years for stent grafts used in popliteal artery aneurysm treatments, while Cervin et al. [7] found a 44% occlusion rate after stent grafting compared to 17.6% for open bypass surgery at three years.

Given these findings, I express concerns about using a stent graft in a young, healthy patient. In cases of popliteal AVF presenting electively, my concerns intensify. If endovascular treatment is considered, a self-expanding stent graft—exclusively used in the studies cited—should be the choice.

Open surgical repair of a traumatic AVF in the popliteal segment is typically straightforward, raising the question of why a young patient should face the risks of stent graft occlusion. Reporting only in-hospital or six-month results seems inadequate, especially for a 35-year-old man whose long-term function is at stake.

I strongly believe that stent grafts in highly mobile arteries, such as the popliteal artery, should be reserved for young patients facing immediate life-threatening conditions or, rather, used temporarily, with plans for open reconstruction. Additionally, I urge the authors

Corresponding author:

Per Skoog, Department of Vascular Surgery and Institute of Medicine, Department of Molecular and Clinical Medicine, Sahlgrenska University Hospital and Academy, Gothenburg, Sweden.

Email: peraskoog@yahoo.se

to ensure that their patient undergoes long-term ultrasound monitoring to facilitate timely management of the stent graft occlusion.

Ethics Statement

(1) All the authors mentioned in the manuscript have agreed to authorship, read and approved the manuscript, and given consent for submission and subsequent publication of the manuscript.
(2) The authors declare that they have read and abided by the JEVTM statement of ethical standards including rules of informed consent and ethical committee approval as stated in the article.

REFERENCES

[1] Potter HA, Alfson DB, Rowe VL, et al. Endovascular versus open repair of isolated superficial femoral and popliteal artery injuries. J Vasc Surg. 2021;74(3):814.e1–822.e1.
[2] Abdou H, Edwards J, Stonko D, et al. The role of endovascular repair of popliteal arterial injuries in the acute setting. Ann Vasc Surg. 2022;87:522–28.
[3] Vaidya A, Rilo N, Steigerwald S, Rajani RR. Outcomes of endovascular and open surgical therapy for popliteal artery injury. Ann Vasc Surg. 2024;104:282–95.
[4] Qi Y, Wang J, Yuan D, Duan P, Hou L, Wang T. Systematic review and meta-analysis of endovascular therapy versus open surgical repair for the traumatic lower extremity arterial injury. World J Emerg Surg. 2024;19(1):16.
[5] Jiang C, Chen Z, Zhao Y, Zhang WW, Zeng Q, Li F. Four-year outcomes following endovascular repair in patients with traumatic isolated popliteal artery injuries. J Vasc Surg. 2021;73(6):2064–70.
[6] Saxon RR, Coffman JM, Gooding JM, Ponec DJ. Long-term patency and clinical outcome of the Viabahn stent-graft for femoropopliteal artery obstructions. J Vasc Interv Radiol. 2007;18(11):1341–49; quiz 1350.
[7] Cervin A, Acosta S, Hultgren R, Grip O, Björck M, Falkenberg M. Results after open and endovascular repair of popliteal aneurysm: a matched comparison within a population based cohort. Eur J Vasc Endovasc Surg. 2021;61(6):988–97.