Ann Vasc Surg. 2011 Jan;25(1):108-19.
doi: 10.1016/j.avsg.2010.11.002.

Surgical management of hemodialysis-related central venous occlusive disease: a treatment algorithm

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- PMID: 21172586 DOI: 10.1016/j.avsg.2010.11.002

Abstract

Background: Creation and preservation of dialysis access in patients with central venous occlusive disease (CVOD) is a complex problem. The surgical approach and decision-making process remains poorly defined. We evaluated our experience in the surgical management of hemodialysis-related CVOD. Surgical technique, demographics, complications, reinterventions, access function rates, and factors influencing morbidity and mortality were examined.

Methods: From January 2006 to May 2010, we performed a total of 1,703 dialysis access-related procedures, 1,021 arteriovenous fistulas (AVFs), 335 arteriovenous grafts (AVGs), and 314 access revisions including endovascular salvage procedures. Seventeen patients (10 women [58%] with a mean age of 44 ± 27 years) with CVOD who were not suitable for peritoneal dialysis or kidney transplant underwent 20 complex vascular access procedures. The indications were need for access creation in 14 cases (70%) and preservation in the remaining 6 (30%). Polytetrafluoroethylene (PTFE) was used for all surgical bypass grafts (BPG). All patients had previously undergone multiple access surgeries and had failed percutaneous interventions for CVOD.

Results: The surgical planning centered on finding venous outflow for an arteriovenous (AV) access; central venous reconstructions were necessary in 10 (50%) cases (seven [35%] in the thoracic central venous system and three [15%] in infradiaphragmatic vessels) and extracavitary venous BPG in two (10%) cases. Non-venous access options included axillary arterial-arterial chest wall BPG in five (25%) cases and brachial artery to right atrium BPG in three (15%). Technical success was achieved in all cases (100%).

Mean follow-up was 14.1 months, both BPG and AV access patency rates were 66% at 6 months and overall average AV access function time was 9.2 months. Of these, 85% of patients were discharged home and following 19 (95%) cases they returned or improved their baseline functional status. One death occurred from multiorgan failure during the 30-day postoperative period. Four additional patients died within 3 years of the procedure secondary to nonsurgical-related comorbidities.

Conclusion: The need for complex vascular accesses will continue as the number of patients with end-stage renal disease increases. CVOD is an access surgical challenge and with this article we propose a decision-making algorithm.