When Collaterals Become the Outflow: A Functioning Arteriovenous Fistula Despite Brachiocephalic Vein Occlusion

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A 46-year-old man with kidney failure of undetermined etiology returned to hemodialysis following kidney allograft failure. After thrombosis of a right radiocephalic arteriovenous fistula (AVF), a tunneled right internal jugular catheter was placed in November 2024. In February 2025, a right brachiocephalic AVF was created through the median cephalic vein and successfully used for hemodialysis.

He subsequently developed marked right arm edema, raising suspicion of central venous outflow obstruction. On 24th July 2026, angiography demonstrated occlusion of the right brachiocephalic vein with extensive collateral drainage (Fig. 1), and endovascular recanalization was attempted through the AVF and right femoral vein using multiple guidewires and catheters, without success. The right internal jugular catheter was removed.

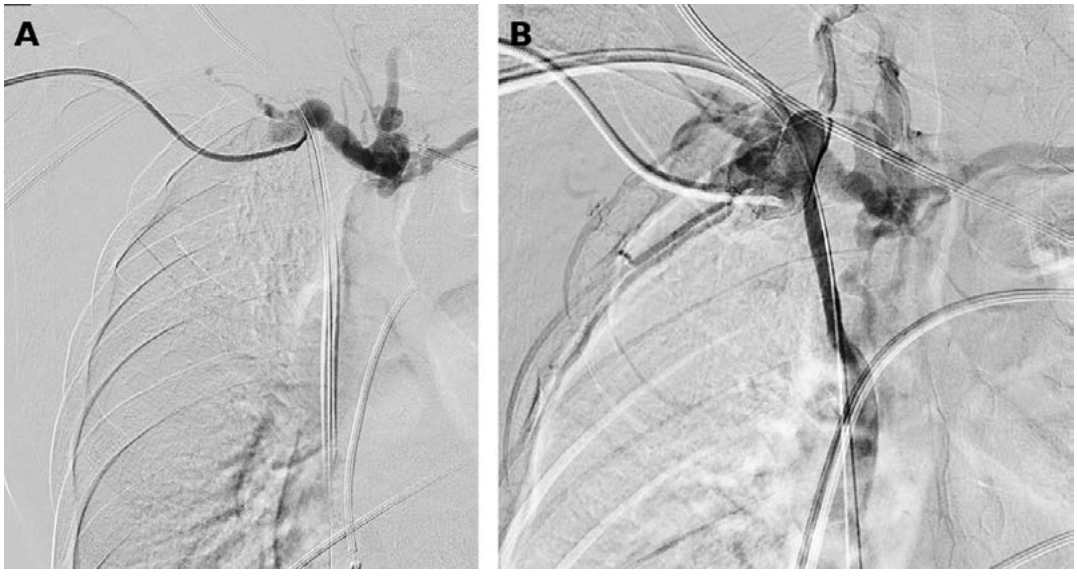


Figure 1. (A) Angiography showing occlusion of the right brachiocephalic vein, with diversion of venous flow through extensive cervicothoracic collaterals. (B) Bidirectional endovascular recanalization attempt through the arteriovenous fistula and right femoral vein, with catheters advanced toward both ends of the occlusion. The lesion could not be crossed.

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At subsequent follow-up, the arm edema had resolved. Examination revealed a dilated, pulsatile cephalic vein that did not collapse with arm elevation, a thrill palpable distally along the forearm cephalic vein, and an extensive network of superficial venous collaterals over the right shoulder and posterior thoracic wall (Fig. 2), consistent with alternative outflow pathways. The patient had no pain, skin changes, prolonged post-needle hemostasis, or increased intradialytic venous pressures. The AVF remained patent, with an access flow of 1500 mL/min, and continued to provide adequate dialysis.



Figure 2. Extensive superficial venous collateral network over the right shoulder and posterior thoracic wall at follow-up, after resolution of the initial right arm edema.

Although collateral drainage represents a suboptimal outflow pathway, it relieved venous hypertension and preserved AVF function despite persistent central occlusion and unsuccessful recanalization. For a young patient likely to require long-term kidney replacement therapy, preserving a usable native access is particularly valuable, although close surveillance remains essential.[1-3]

Ethical Disclosures

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SG: Writing – original draft, Writing – review & editing.
SP: Investigation, Writing – review & editing.
AV: Investigation, Writing – review & editing, Supervision.
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