

# Endovascular AV Access Repair: Preserving Function in Hemodialysis Vascular Access

## Introduction

Arteriovenous (AV) access, including AV fistulas and grafts, is the lifeline for patients undergoing long-term hemodialysis. Over time, these accesses are prone to dysfunction due to stenosis, thrombosis, and structural abnormalities that can compromise dialysis adequacy and access longevity. Endovascular AV access repair has become the preferred first-line approach for managing many of these complications, offering minimally invasive solutions that restore function while avoiding open surgery. Advances in imaging and interventional techniques have significantly improved outcomes and expanded the role of endovascular therapy in dialysis access care [1,2].

## Discussion

Endovascular AV access repair encompasses a variety of catheter-based interventions performed under fluoroscopic and ultrasound guidance. The most common indication is access stenosis, typically occurring at the venous outflow, anastomotic site, or within the graft. Percutaneous transluminal angioplasty is the cornerstone of treatment, effectively dilating narrowed segments and restoring adequate blood flow. For recurrent or resistant lesions, adjunctive tools such as high-pressure balloons, cutting balloons, or stent grafts may be employed to improve patency [3,4].

Thrombosed AV accesses represent another major indication for endovascular repair and require prompt intervention to prevent permanent access loss. Pharmacomechanical thrombectomy techniques combine thrombolytic agents with mechanical clot disruption or aspiration to rapidly re-establish flow. Successful thrombectomy is usually followed by angioplasty of the underlying stenosis to reduce the risk of re-thrombosis. These minimally invasive approaches allow many accesses to be salvaged on an outpatient basis [5].

Endovascular techniques are also used to address other access-related problems, including aneurysms, pseudoaneurysms, and central venous stenosis. Covered stents and embolization techniques can help manage complex lesions while preserving access function. Compared with surgical revision, endovascular repair offers shorter recovery times, reduced procedural morbidity, and the ability to repeat interventions as needed over the lifespan of the access.

## Conclusion

Endovascular AV access repair plays a critical role in maintaining functional hemodialysis access and improving patient outcomes. By effectively treating stenosis, thrombosis, and other structural complications, these minimally invasive techniques help extend access longevity and reduce reliance on central venous catheters. Early detection of access dysfunction, timely intervention, and coordinated multidisciplinary care are essential for success. As endovascular technologies continue to advance, their role in AV access maintenance will further expand, reinforcing endovascular repair as a cornerstone of modern dialysis access management.

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