Perspective

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AV Fistula Salvage Techniques: Preserving Lifelines for Hemodialysis Patients

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Introduction

Arteriovenous (AV) fistulas are considered the preferred vascular access for hemodialysis due to their superior longevity, lower infection rates, and improved patient outcomes compared with grafts and catheters. Despite these advantages, AV fistulas are prone to complications such as stenosis, thrombosis, and poor maturation, which can compromise dialysis adequacy and threaten access survival. AV fistula salvage techniques have therefore become an essential component of dialysis access management, aiming to restore function, prolong access life, and reduce the need for new access creation [1,2].

Discussion

AV fistula salvage encompasses a range of surgical and endovascular interventions tailored to the underlying cause of access dysfunction. Stenosis, most commonly occurring at the juxta-anastomotic segment or venous outflow, is the leading cause of fistula failure. Percutaneous transluminal angioplasty is the first-line treatment for most stenotic lesions and can effectively restore adequate blood flow [3,4]. In cases of recurrent or resistant stenosis, cutting balloons or stent placement may be considered to improve long-term patency.

Thrombosed AV fistulas represent a more urgent clinical scenario requiring prompt intervention to prevent access loss. Endovascular thrombectomy techniques, including pharmacomechanical thrombolysis and aspiration thrombectomy, are widely used to remove clot burden and re-establish flow. These procedures are often combined with angioplasty of the underlying stenotic lesion to prevent re-thrombosis. Surgical thrombectomy and revision remain important options when endovascular methods are unsuccessful or unavailable.

Non-maturing fistulas also benefit from salvage strategies. Early identification through clinical examination and ultrasound surveillance allows timely intervention. Balloon-assisted maturation, accessory vein embolization, and surgical ligation of competing veins are commonly employed to enhance fistula development. Additionally, aneurysm formation and high-flow fistulas may require flow reduction procedures or surgical reconstruction to prevent complications such as rupture or cardiac overload [5].

Successful AV fistula salvage depends on multidisciplinary collaboration involving nephrologists, vascular surgeons, and interventional specialists. Regular surveillance and early intervention are critical to maintaining access patency and minimizing patient morbidity.

Conclusion

AV fistula salvage techniques play a vital role in preserving functional hemodialysis access and improving patient outcomes. Through a combination of endovascular and surgical approaches, many dysfunctional fistulas can be successfully restored, reducing reliance on central venous catheters and repeated access creation. Early detection of access

dysfunction, appropriate technique selection, and coordinated care are essential for long-term success. As technology and expertise continue to evolve, AV fistula salvage will remain a cornerstone of comprehensive dialysis access management.

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