

Renal Artery Stenting: Current Perspectives and Clinical Significance

Introduction

Renal artery stenosis (RAS) is a common vascular disorder characterized by narrowing of the renal arteries, most frequently caused by atherosclerosis and, less commonly, fibromuscular dysplasia. This condition can lead to renovascular hypertension, ischemic nephropathy, and increased cardiovascular morbidity. Early recognition and appropriate management are essential to prevent irreversible renal damage. Renal artery stenting has developed as a minimally invasive endovascular technique designed to restore renal blood flow and improve clinical outcomes in selected patients [1,2]. Although its role has evolved over time, renal artery stenting remains an important therapeutic option in specific clinical scenarios.

Discussion

Renal artery stenting is usually performed following percutaneous transluminal renal angioplasty, with placement of a metallic stent to prevent elastic recoil and restenosis. The procedure is guided by fluoroscopy and often performed under local anesthesia, making it suitable for high-risk patients who may not tolerate surgical intervention. Technical success rates are high, and immediate improvement in vessel patency is commonly achieved [3,4].

The primary indications for renal artery stenting include resistant hypertension despite optimal medical therapy, progressive deterioration of renal function attributed to significant RAS, and recurrent episodes of flash pulmonary edema. However, the widespread use of this procedure has been challenged by large randomized trials, which demonstrated limited benefit of routine stenting over aggressive medical therapy alone in unselected patient populations. As a result, contemporary practice emphasizes careful patient selection.

Imaging plays a crucial role in diagnosis and procedural planning. Duplex ultrasonography, computed tomography angiography, and magnetic resonance angiography are commonly used to assess the severity and hemodynamic significance of stenosis. Invasive angiography remains the gold standard when intervention is considered [5]. Despite its benefits, renal artery stenting carries potential risks, including contrast-induced nephropathy, cholesterol embolization, arterial dissection, and in-stent restenosis. Advances in stent technology and procedural techniques have helped reduce complication rates, but long-term surveillance remains necessary.

Conclusion

Renal artery stenting is a valuable intervention when applied to carefully selected patients with clinically significant renal artery stenosis. While routine use in all cases of RAS is not supported by current evidence, the procedure can offer meaningful benefits in blood pressure control, preservation of renal function, and reduction of acute cardiovascular complications in specific high-risk groups. An individualized approach, integrating clinical presentation, imaging findings, and response to medical therapy, is essential to optimize

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outcomes. Renal artery stenting should therefore be viewed as a complementary component of comprehensive renovascular disease management rather than a universal solution.

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