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Commentary

The Role of Percutaneous Procedures in Modern Heart Valve Care

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DESCRIPTION

Valvular Heart Disease (VHD) poses a significant burden on global health, affecting millions of individuals worldwide. Traditionally, the management of VHD has relied heavily on surgical interventions, such as valve repair or replacement. However, percutaneous approaches to valve repair and replacement have emerged as less invasive alternatives, offering new hope to patients who may not be suitable candidates for traditional surgery. This article provides an overview of percutaneous valve repair and replacement techniques in the management of VHD, highlighting their benefits, indications, and outcomes.

Percutaneous valve repair techniques

Percutaneous valve repair techniques aim to restore valvular function without the need for open-heart surgery. One such technique is transcatheter mitral valve repair, commonly performed using devices such as the MitraClip. The MitraClip system allows for the percutaneous placement of a clip on the mitral valve leaflets, reducing mitral regurgitation by bringing the leaflets closer together. Clinical trials have demonstrated the safety and efficacy of MitraClip in reducing symptoms and improving outcomes in patients with severe mitral regurgitation who are at high surgical risk. Another percutaneous valve repair technique is balloon valvuloplasty, primarily used in the management of mitral and aortic stenosis. During balloon valvuloplasty, a catheter with an inflatable balloon at its tip is advanced to the stenotic valve, where the balloon is inflated to dilate the narrowed valve opening. This procedure can provide symptomatic relief in patients with severe valvular stenosis, particularly in cases where surgical intervention is deemed high-risk or not feasible.

Percutaneous valve replacement techniques

Percutaneous valve replacement techniques offer a minimally invasive alternative to surgical valve replacement for patients with severe valvular dysfunction. Transcatheter Aortic Valve Replacement (TAVR) has revolutionized the treatment of aortic stenosis, allowing for the percutaneous placement of a prosthetic valve within the native aortic valve via a catheter-based approach. TAVR has been shown to be non-inferior to surgical aortic valve replacement in terms of mortality and morbidity outcomes in both high and intermediate surgical risk patients, and it is now considered the standard of care for eligible patients with severe aortic stenosis.

Similarly, Transcatheter Pulmonary Valve Replacement (TPVR) has emerged as a less invasive option for patients with dysfunctional pulmonary valve prostheses or native pulmonary valve disease. TPVR involves the percutaneous placement of a transcatheter valve within the dysfunctional pulmonary valve using a variety of devices, including balloon-expandable and self-expanding valves. This approach offers advantages such as shorter recovery times, reduced hospital stays, and avoidance of sternotomy or cardiopulmonary bypass.

Indications and Patient selection

The selection of patients for percutaneous valve repair or replacement depends on various factors, including the type and severity of valvular dysfunction, overall cardiac function, comorbidities, and surgical risk. In general, percutaneous approaches may be considered in patients who are deemed high-risk or ineligible for surgical intervention due to advanced age, significant comorbidities, or anatomical factors that increase surgical risk.

However, it is essential to carefully evaluate each patient's individual characteristics and preferences to determine the most appropriate treatment approach. Multidisciplinary heart teams, comprising cardiologists, cardiac surgeons, imaging specialists, and other healthcare professionals, play a important role in patient selection and treatment planning, ensuring that each patient receives personalized care tailored to their unique needs. Overall, percutaneous valve repair and replacement techniques have demonstrated favorable outcomes in terms of procedural success, symptom relief, and improvement in quality of life. These approaches offer the potential for significant clinical benefits with lower procedural risks, shorter recovery times, and reduced healthcare resource utilization compared to surgical interventions. However, like any medical procedure, percutaneous valve repair and replacement are associated with potential complications, including vascular injury, bleeding, stroke, device malposition, and

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paravalvular leak. Close post-procedural monitoring and long-term follow-up are essential to detect and manage these complications promptly, ensuring optimal outcomes for patients undergoing percutaneous valve interventions.

CONCLUSION

Percutaneous valve repair and replacement techniques have revolutionized the management of valvular heart disease, offering less invasive alternatives to traditional surgical interventions. These approaches provide new hope to patients who may not be suitable candidates for surgery and have expanded the treatment options available to individuals with severe valvular dysfunction. With ongoing advancements in technology, patient selection, and procedural techniques, percutaneous valve interventions are poised to play an increasingly prominent role in the management of VHD, ultimately improving outcomes and quality of life for patients worldwide.