

Transcatheter Mitral and Tricuspid Valve Therapies

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Mitral regurgitation (MR) affects almost 10% of individuals over 75 years of age. Open-heart surgery is the gold standard for the treatment of severe MR as excellent outcomes can be achieved in most patients, often adopting minimally invasive approaches. However, in up to 50% of patients with severe MR surgical treatment is not performed owing to increased risk related to comorbidities.

Transcatheter MV repair vs Transcatheter MV replacement

Whereas mitral valve repair is currently the most widely used approach for transcatheter interventions for MR, TMVI offers several theoretical advantages. Transcatheter mitral valve implantation is potentially applicable to a greater proportion of patients; there is a hope that TMVI could provide the concept of 'one valve fits all', MR reduction may be more predictable, and the procedure may be less technically demanding and easier to learn. However, due to procedural and design challenges to TMVI, complications may be more catastrophic and less forgiving, while transcatheter mitral valve repair (TMVRep) may be associated with a superior safety profile as it involves a less marked change in valve anatomy and physiology. Repair does not entail a heterologous tissue implant, the related supporting structure does not require anti-coagulation, and it has been a general conclusion in the surgical experience that repair has advantages over valve replacement. The major limitation of TMVRep is that MR reduction is less predictable and MR may persist or reoccur. Recurrence could be greater in FMR, due to further remodelling¹¹ or to poor patient selection. In addition, operators may need to master multiple transcatheter repair techniques to manage the wide variability of mitral disease, and the need to combine different devices in some patients to approximate a complete surgical repair. Given the advantages and disadvantages of these two approaches, a patient-specific decision-making algorithm for the

optimal device choice will likely be required.

The future of Transcatheter MV repair and Transcatheter MV replacement

At the moment, given the rapid evolution in device development, the complementary role of TMVRep and TMVI must be considered speculative. In general terms, TMVI is likely to be technically simpler and more reproducible in terms of MR reduction. However, durability, safety and disruption of adjacent cardiac structures remain important concerns. Transcatheter mitral valve repair is more complex and likely carries a steeper learning curve, and individual device may be applicable only in selected patients with less predictable MR reduction. Of note, the safety profile of TMVRep is generally excellent, and durability is likely to be robust in most patients when acute procedural success is achieved and the impact of TMVRep on physiology is minimal. Therefore, TMVRep may in the future aspire to an early treatment option, aiming at a prognostic approach, if randomized trials can demonstrate equipoise in long-term outcomes when compared with minimally invasive mitral valve repair.

In patients with severe FMR, the role of surgery is less well established in patients who are not candidates for CABG, and most patients are treated medically. Transcatheter mitral valve repair may be a safe, palliative approach for such patients, and several large-scale randomized ongoing trials investigate the effectiveness of the MitraClip in this scenario. Transcatheter mitral valve implantation may potentially be a therapeutic option for patients with more advanced disease and severe anatomical and functional abnormalities, who are not eligible for valve repair.

Transcatheter Tricuspid valve therapies

Patients currently undergoing transcatheter tricuspid valve therapy are mostly high risk, with a functional etiology and very severe central regurgitation, and do not have severely impaired RV function. Initial results suggest that transcatheter tricuspid valve therapy is feasible with different techniques, but clinical efficacy requires further investigation.

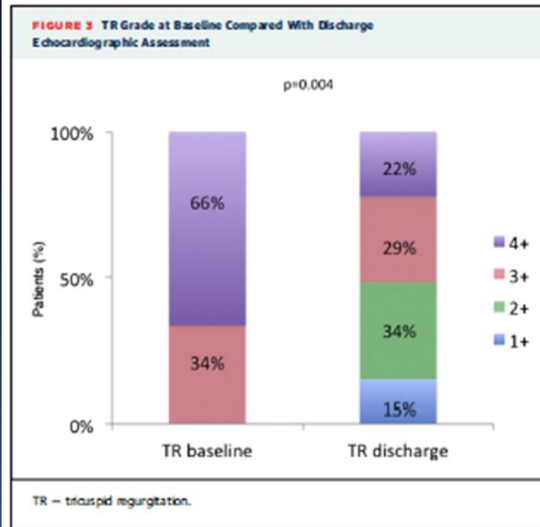
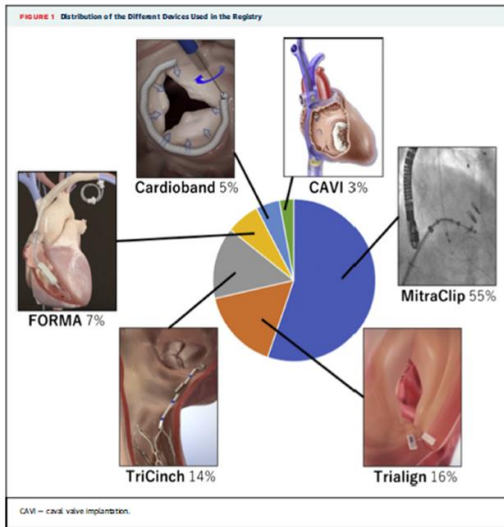


Figure 1. The current available transcatheter TV therapies