

## Transcatheter Repair in Secondary Mitral Regurgitation

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### Commentary

Secondary mitral regurgitation (MR) is common in patients with idiopathic or post-ischemic dilated cardiomyopathy and is associated with a poor prognosis when treated conservatively [1,2]. Secondary MR is the result of left ventricular remodelling, and the presence and severity of secondary MR reflect the extent of underlying left ventricular dilation and dysfunction [3]. This might create a vicious cycle where secondary MR begets more secondary MR. Because of the complexity of the diseased left ventricle that caused secondary MR, it is not clear whether correction of the valve defect might significantly affect long-term survival and symptoms [4-6]. In particular, in symptomatic patients with severe secondary MR and severely depressed systolic left ventricular function, who cannot be revascularized or who present with cardiomyopathy, the decision to operate remains ambiguous.

So far, the role of surgery in secondary MR has not been well established because prospective randomized trials to compare survivals of patients treated with surgery or optimal medical therapy have never been conducted. Thus, the current guidelines recommend consideration for mitral valve surgery for secondary MR only in patients who remain symptomatic after implementation of guidelines-directed medical therapy or those with severe MR undergoing coronary artery bypass surgery [4,5]. However, a large number of patients with symptomatic functional MR are not referred for surgery, and many other patients are rejected because of a high surgical risk due to the presence of several co-morbidities [7].

Over the last decade, the introduction of transcatheter mitral valve repair with the MitraClip device offers new perspectives for the treatment of patients with severe MR at very high surgical risk. The efficacy and safety of endovascular repair with the MitraClip device have been evaluated in the EVEREST I trial and compared with surgery in the randomized trials EVEREST II [8,9]. Although patients treated with percutaneous repair more commonly required surgery for residual MR during the first year after treatment, the final 5-year results of the EVEREST II trial clearly supported the long-term safety of the MitraClip and the durability of MR reduction after percutaneous repair [10].

The MitraClip technique was originally designed for degenerative MR, however it has been recognised that in the real world practice patients treated with transcatheter valve repair are mainly affected by secondary MR [11]. Several studies suggest that even in patients with secondary MR and advanced heart failure this procedure is associated with high procedural success rate, low procedural mortality and significant early functional improvement [11-15]. What remains unknown is whether the MitraClip therapy improves survival in patients with secondary MR who are still symptomatic despite optimal medical therapy. Recently, Swaans, et al. evaluated outcomes among transcatheter valve repair, mitral valve surgery and conservative

treatment in high surgical risk patients symptomatic with severe MR demonstrating better survival benefits of mitral valve intervention compared with medical therapy [16]. Despite these encouraging results, this study presents several limitations because it included a wide spectrum of high-risk patients with both functional and degenerative MR. Moreover, the conservatively treated group had important baseline demographic differences compared with the other groups as showed by a higher surgical risk score due to higher incidence of severe comorbidities.

Due to this paucity of data comparing outcomes of patients with secondary MR treated with mitral valve repair and those treated medically, decision making for transcatheter valve repair in patients with congestive heart failure and severely depressed left ventricular function remains complicated. Therefore, we recently compared outcomes of 60 patients with high surgical risk and symptomatic secondary MR treated conservatively to a propensity-matched cohort of 60 patients who underwent MitraClip therapy [17]. Our results demonstrated that transcatheter mitral valve repair offers a safe and less invasive option in patients with severe secondary MR and advanced heart failure demonstrating excellent procedural results and encouraging long-term clinical outcomes. Otherwise, patients who remained on conservative therapy showed a remarkable worse mortality and a higher incidence of rehospitalisation for heart failure. In particular, after propensity analysis, we proved that transcatheter mitral valve repair was superior to conservative treatment in terms of overall survival ( $p=0.007$ ), cardiovascular survival ( $p=0.002$ ) and cardiac rehospitalisation ( $p=0.04$ ). Furthermore, baseline characteristics of our entire cohort, offer a precious picture of the current population of patients treated with MitraClip therapy in "real world". The mean age of patients was  $75 \pm 8$  years and median logistic EuroSCORE and EuroSCORE II were 17% (11 to 28) and 6% (4 to 12), respectively.

In line with our findings, Velazquez, et al. compared 30-day and 1-year survival among high-risk MR patients treated with the MitraClip with matched non-surgically treated patients from the Duke Echocardiography Laboratory Database [18]. This matched comparison of severe MR patients at high surgical risk supported the safety of the MitraClip relative to medical therapy at 30 days and a survival benefit at 1 year. However, our study further extends these results due to the longer follow-up period (up to 3 years) and because all patients included in our report were all affected by secondary MR.

In conclusion our data support the hypothesis that MitraClip therapy in patients with moderate or severe secondary MR who remain symptomatic despite optimal medical therapy would provide a numerically and statistically significant mortality benefit compared with medical therapy alone.

However, to confirm whether transcatheter valve repair has superior survival benefit over conservative therapy in patients with high surgical risk and secondary MR we need randomized clinical trials?

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