

Editorial

Transcatheter treatment of severe mitral regurgitation in Brazil: a new kid on the block

Tratamento transcater da insuficiência mitral grave no Brasil: uma novidade na área

While moderate-to-severe and severe mitral regurgitation (MR) lead to high rates of morbidity and mortality if no intervention is performed, a considerable number of patients are exclusively medically managed due to their high surgical risk;¹ indeed, adverse event rates among high-risk patients whom undergo mitral valve surgery are relevant.² Therefore, there is a large unmet need for transcatheter therapies in this setting.¹ In this edition of *Revista Brasileira de Cardiologia Invasiva*, Brito Jr. et al.³ describe the first two percutaneous edge-to-edge mitral valve repairs utilizing the MitraClip™ (Abbott Vascular, Abbott Park, USA) device performed in Brazil. We would like to congratulate the authors for their pioneering work in this important field.

While the only randomized trial published to date comparing MitraClip™ implantation with mitral valve surgery included mostly (~70%) patients with primary (*i.e.*, degenerative) MR, the scenario in which mitral valve surgery delivers excellent results,⁴ large real world registries, such as ACCESS-EU,⁵ GRASP,⁶ and TRAMI,⁷ included mostly patients with secondary (*i.e.*, functional) MR, reflecting the potential of also utilizing MitraClip™ in the setting in which mitral valve surgery delivers worse results, such as lack of survival benefit and high rates of recurrence coupled with high morbidity and mortality.² Randomized trials comparing MitraClip™ implantation with mitral valve surgery for patients with severe functional MR, such as the ongoing COAPT (Clinical Outcomes Assessment of the MitraClip™ Percutaneous Therapy for High Surgical Risk Patients; NCT01626079) study, will certainly shed more light on the ideal approach for this particular subset of patients. We believe, however, that the approval of MitraClip™ for both primary and secondary MR in Brazil was extremely mature and important as it relied not only on randomized data, which could restrict its indications for primary MR, but also on large real-world experiences that included thousands of patients with functional MR (*i.e.*, those with the higher likelihood of receiving no surgical intervention)¹ whom were successfully treated, mostly demonstrating sustained long-term results.

Increasing experience has enabled the expansion of MitraClip™ indications, which were initially limited by the strict echocardiographic criteria proposed in the EVEREST II study.⁵ In fact, while our group was a pioneer in the implantation of this novel device in Italy back in 2008, we also recently demonstrated the potential for expanding the indications to more complex anatomical scenarios, while maintaining favorable outcomes.^{6,8} While predictors of acutely unsuccessful MitraClip™ procedure

have been demonstrated by Lubos et al.,⁹ we identified long-term predictors of unfavorable clinical outcomes after MitraClip™ implantation,¹⁰ which ultimately enabled a more refined understanding of this intervention. Importantly, however, the learning curve associated with MitraClip™ may be relatively steep; therefore, following the echocardiographic criteria initially proposed by the EVEREST II study⁴ may be the best way to start a new program while progressively transitioning to more complex scenarios.

MitraClip™ implantation is associated with hemodynamic improvement, left ventricle reverse remodeling, and improvement in quality of life. When reduction of MR to $\leq 2+$ is achieved, the procedure can be considered successful, just as demonstrated in the two cases described by Brito Jr. et al.³ Importantly, one should not expect that MR will be completely abolished with MitraClip™; in fact, improvement in quality of life was comparable in patients with 1+ and 2+ MR post-procedure in a recent analysis of the EVEREST II study.¹¹

Similarly to transcatheter aortic valve implantation, structural heart intervention centers that include MitraClip™ in their armamentarium will certainly observe an increase in the overall rates of referrals for mitral valve dysfunction evaluation; therefore, not only transcatheter but also surgical mitral valve interventions will likely increase (*i.e.*, "halo effect"). This may become even more important when reimbursement for the MitraClip™ procedure is an issue. For example, while expected for the second semester of 2015, to date in the United States there is no full coverage for MitraClip™ implantation. Nonetheless, this fact has not stopped centers of excellence from adopting this novel technique, thereby offering a broader spectrum of structural heart disease interventions to their patients.

While MitraClip™ is the only Food and Drug Administration-approved transcatheter procedure to treat severe MR, transcatheter balloon expandable aortic valves have been implanted in the mitral position to treat dysfunctional surgical bioprostheses and annuloplasty rings¹² with promising results; in addition, native mitral valves with important annular calcification have also been treated in a similar fashion.¹³ While these interventions probably represent the only therapeutic option for prohibitive surgical risk patients, the ultimate goal in this field is the possibility of implanting dedicated transcatheter heart valves in the mitral position. Several different devices are currently being tested, but the initial human experience is still in its infancy.

Conflicts of interest

The authors declare no conflicts of interest.

References

- Goel SS, Bajaj N, Aggarwal B, Gupta S, Poddar KL, Ige M, et al. Prevalence and outcomes of unoperated patients with severe symptomatic mitral regurgitation and heart failure: comprehensive analysis to determine the potential role of MitraClip for this unmet need. *J Am Coll Cardiol*. 2014;63(2):185-6.
- Mihaljevic T, Lam BK, Rajeswaran J, Takagaki M, Lauer MS, Gillinov AM, et al. Impact of mitral valve annuloplasty combined with revascularization in patients with functional ischemic mitral regurgitation. *J Am Coll Cardiol*. 2007;49(22):2191-201.
- Brito Jr. FS, Siciliano A, Fischer CH, Vieira ML, Rabischoffski A, Papa F, et al. Tratamento percutâneo da insuficiência mitral por MitraClip®: relato dos dois primeiros procedimentos no Brasil. *Rev Bras Cardiol Inv*. 2015;23(2):156-60.
- Feldman T, Foster E, Glower DD, Kar S, Rinaldi MJ, Fail PS, et al.; EVEREST II Investigators. Percutaneous repair or surgery for mitral regurgitation. *N Engl J Med*. 2011;364(15):1395-406. Erratum in: *N Engl J Med*. 2011;365(2):189. Glower, Donald G [corrected to Glower, Donald D].
- Maisano F, Franzen O, Baldus S, Schäfer U, Hausleiter J, Butter C, et al. Percutaneous mitral valve interventions in the real world: early and 1-year results from the ACCESS- EU, a prospective, multicenter, nonrandomized post-approval study of the MitraClip therapy in Europe. *J Am Coll Cardiol*. 2013;62(12):1052-61.
- Attizzani GF, Ohno Y, Capodanno, Cannata S, Dipasqua F, Immè S, et al. Extended use of percutaneous edge-to-edge mitral valve repair beyond EVEREST (Endovascular Valve Edge-to-Edge Repair) criteria - 30-day and 12-month clinical and echocardiographic outcomes from the GRASP (Getting Reduction of Mitral Insufficiency by Percutaneous Clip Implantation) registry. *J Am Coll Cardiol Interv*. 2015;8(1 Pt A):74-82.
- Schillinger W, Hünlich M, Baldus S, Ouarrak T, Boekstegers P, Hink U, et al. Acute outcomes after MitraClip therapy in highly aged patients: results from the German Transcatheter Mitral Valve Interventions (TRAMI) Registry. *EuroIntervention*. 2013;9(1):84-90.
- Grasso C, Ohno Y, Attizzani GF, Cannata S, Immè S, Barbanti M, et al. Percutaneous mitral valve repair with the MitraClip system for severe mitral regurgitation in patients with surgical mitral valve repair failure. *J Am Coll Cardiol*. 2014;63(8):836-8.
- Lubos E, Schluter M, Vettorazzi E, Goldmann B, Lubs D, Schirmer J, et al. MitraClip therapy in surgical high-risk patients: identification of echocardiographic variables affecting acute procedural outcome. *J Am Coll Cardiol Interv*. 2014;7(4):394-402.
- Capodanno D, Adamo M, Barbanti M, Giannini C, Laudisa ML, Cannata S, et al.; GRASP-IT Investigators. Predictors of clinical outcomes after edge-to-edge percutaneous mitral valve repair. *Am Heart J*. 2015;170(1):187-95.
- Lim DS, Reynolds MR, Feldman T, Kar S, Herrmann HC, Wang A, et al. Improved functional status and quality of life in prohibitive surgical risk patients with degenerative mitral regurgitation after transcatheter mitral valve repair. *J Am Coll Cardiol*. 2014;64(2):182-92.
- Attizzani GF, Tam CC, Markowitz A. Transcatheter mitral valve-in-ring implantation in prohibitive surgical risk patients: single center initial experience in the United States. *Catheter Cardiovasc Interv*. 2015. In Press.
- Attizzani GF, Fares A, Tam CC, Padaliya B, Mazzurco S, Popovich K, et al. Transapical mitral valve implantation for the treatment of severe native mitral valve stenosis in a prohibitive surgical risk patient - importance of comprehensive cardiac computed tomography procedural planning. *J Am Coll Cardiol Interv*. 2015. In Press.

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