Editorial

Percutaneous Treatment of Functional Mitral Regurgitation in Heart Failure

Guilherme F. Attizzani[1] and Pedro A. Lemos[2]

Harrington Heart and Vascular Institute - University Hospitals Case Medical Center[1], Cleveland, OH - USA; Instituto do Coração - Hospital das Clínicas - Faculdade de Medicina - Universidade de São Paulo[2], São Paulo - Brazil

Congestive heart failure (HF) remains one of the most important and challenging clinical problems in cardiovascular medicine in Brazil and worldwide. Evidence suggests that mortality in this setting has decreased in Brazil over recent years[1], which may be related, at least partially, to a more intense and widespread use of neurohormonal blockade (with angiotensin-converting-enzyme inhibitors and beta-blockers) in patients with advanced HF[2]. To better evaluate the characteristics of end-stage heart disease in Brazil, the ongoing I Brazilian Registry of Heart Failure (BREATHE registry) will evaluate the profile of 1,200 patients admitted with decompensated HF to 60 hospitals representative of the different Brazilian regions[3]. Final results of the BREATHE registry are expected to be available within the next months. In spite of recent improvements in medical therapy, advanced HF continues to impose an ominous prognosis; in some subsets, mortality rates can reach up to 30% to 50% in the first year of disease, according to contemporary series of Brazilian centers[4]. In this context, therapeutic alternatives have been intensively investigated in an attempt to improve the outcomes of patients with HF.

Mitral regurgitation (MR) is a frequent finding among individuals with end-stage HF[5,6]. Indeed, observational studies revealed that most patients with HF and severe (≥ 3+) MR have functional (74%), rather than degenerative (21%), MR[7]. While surgery is the gold-standard therapy in patients with organic (i.e., degenerative) mitral valve disease associated with symptoms or evidence of left ventricle dysfunction[8], its benefit to patients with MR secondary to underlying ventricular dysfunction (i.e., functional MR) remains unclear[9]. Therefore, individuals with functional MR are frequently referred to isolated clinical management, carrying poor long-term prognosis[7].

Percutaneous mitral valve transcatheter therapies, such as direct and indirect annuloplasty, leaflet repairing devices, and valve replacement, have recently emerged as potential alternatives for patients with MR. Percutaneous edge-to-edge mitral valve repair with the MitraClip system (Abbott Vascular, Abbott Park, Illinois) exhibits the largest body of data available among transcatheter therapies for MR[10]. The procedure has consistently demonstrated to be safe, coupled with efficacious MR reduction, left ventricle reverse remodeling, and improvement in congestive HF symptoms and in the quality of life of patients with either functional or degenerative MR[11,12]. In fact, MitraClip implantation has been approved for commercial use for many years in Europe, but, in the United States, the approval has been recently given. In Brazil, the system has been just approved by the Brazilian Health Surveillance Agency (Anvisa) and is expected to be available in the near future.

The only prospective, randomized, controlled trial comparing MitraClip therapy and conventional surgery mostly for patients with organic MR (i.e., EVEREST II trial) has shown that the percutaneous procedure had superior safety and similar improvement in clinical outcomes, although the latter led to more effective reduction in the magnitude of MR[10]. It is currently under intense investigation whether catheter-based therapies could be offered as a minimally invasive strategy also for patients with severe MR secondary to left ventricular dysfunction. Recently, non-randomized studies including high-risk patients with functional MR have confirmed excellent safety and efficacy profiles of MitraClip implantation in more complex clinical scenarios, thus contributing to refine the understanding on the role of this novel therapy in patients with different MR etiologies[13,14].

Minimally invasive catheter-based therapies aimed at correcting (or minimizing) functional MR represent a whole new and promising therapeutic strategy for patients with advanced HF[15]. Notwithstanding its potential, the novel treatment must be scrutinized in the context of studies specifically designed to evaluate its clinical value in improving short- and long-term clinical outcomes.

Keywords

Heart Failure/mortality; Mitral Valve Insufficiency/physiopathology; Ventricular Remodeling; Cardiac Catheterization/instrumentation.

Mailing Address: Pedro A. Lemos •
Avenida Doutor Enéas de Carvalho Aguiar, 255, Cerqueira César.
Postal Code 05403-000, São Paulo, SP – Brazil
E-mail: pedro.lemos@incor.usp.br

DOI: 10.5935/abc.20140143

References

1. Gaui EN, Oliveira GM, Klein CH. Mortality by heart failure and ischemic heart disease in Brazil from 1996 to 2011. Arq Bras Cardiol. 2014;102(6):557-65.
2. Carlo CH, Cardoso JN, Ochia ME, Oliveira MT Jr, Ramires JA, Pereira-Barretto AC. Temporal variation in the prognosis and treatment of advanced heart failure - before and after 2000. Arq Bras Cardiol. 2014;102(5):495-504.
3. BREATHE investigators. Rationale and design: BREATHE registry--I Brazilian Registry of Heart Failure. Arq Bras Cardiol. 2013;100(5):390-4.
4. Pereira-Barretto AC, Carlo CH, Cardoso JN, Ochiai ME, Lima MV, Curiati MC, et al. Role of BNP levels on the prognosis of decompensated advanced heart failure. Arq Bras Cardiol. 2013;100(3):281-7.
5. Mancuso FJ, Moises VA, Almeida DR, Oliveira WA, Poyares D, Brito FS, et al. Criteria for mitral regurgitation classification were inadequate for dilated cardiomyopathy. Arq Bras Cardiol. 2013;101(5):457-65.
6. Mornos C, Petrescu L, Cozma D, Ionac A. A new tissue Doppler index to predict cardiac death in patients with heart failure. Arq Bras Cardiol. 2014;102(1):19-29.
7. 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.
8. Joint Task Force on the Management of Valvular Heart Disease of the European Society of Cardiology (ESC)1; European Association for Cardio-Thoracic Surgery (EACTS), Vahanian A, Alfieri O, Andreotti F, Antunes MJ, Barón-Esquivias G, Baumgartner H,et al. Guidelines on the management of valvular heart disease (version 2012). Eur Heart J. 2012;33(19):2451-96.
9. 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.
10. 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.
11. Attizzani GF, Ohno Y, Capodanno D. Extended use of percutaneous edge-to-edge mitral valve repair beyond EVEREST Criteria: thirty-day and twelve-month clinical and echocardiographic outcomes from the GRASP Registry. J Am Coll Cardiol Interv. [In Press]
12. Glower DD, Kar S, Trento A, Lim DS, Bajwa T, Quesada R, et al. Percutaneous mitral valve repair for mitral regurgitation in high-risk patients: results of the EVEREST II Study. J Am Coll Cardiol. 2014;64(2):172-81.
13. 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.
14. Taramasso M, Denti P, Buzzatti N, De Bonis M, La Canna G, Colombo A, et al. Mitraclip therapy and surgical mitral repair in patients with moderate to severe left ventricular failure causing functional mitral regurgitation: a single-centre experience. Eur J Cardiothorac Surg. 2012;42(6):920-6.
15. Franzen O, van der Heyden J, Baldus S, Schlüter M, Schillinger W, Butter C, et al. MitraClip(R) therapy in patients with end-stage systolic heart failure. Eur J Heart Fail. 2011;13(5):569-76