

Percutaneous Mitral Valvoplasty: 30 Years of Experience

Marco V. Wainstein^{1,2,3} e Rodrigo V. Wainstein^{1,2,4}

Hospital de Clínicas de Porto Alegre¹; Universidade Federal do Rio Grande do Sul²; Hospital Moinhos de Vento³, Porto Alegre, RS, Brasil; Toronto General Hospital⁴, Toronto, Canadá

In 1982, Kanjii Inoue, a Japanese cardiac surgeon, developed the concept that a thickened and deteriorated mitral valve could be widened as a synthetic balloon. This concept was similar to the one used in the surgical closed mitral commissurotomy¹. Subsequently, the double-balloon technique was introduced in Saudi Arabia as an alternative method to the valvoplasty with Inoue balloon². Nowadays, the Inoue technique became the most used method for the accomplishment of percutaneous mitral valvoplasty. In comparison to the double-balloon technique, it has similar efficacy with the additional benefit of presenting lower peri-procedures risks³. If contrasted with the surgical mitral commissurotomy, mitral valvoplasty with balloon shows similar or superior success rates^{4,5}, with equivalent restenosis averages⁵. Randomized studies, which compared the mitral valvoplasty with balloon to the surgical closed commissurotomy, have demonstrated that the percutaneous technique overpasses surgery for its results in a larger valve area with a superior duration at long term⁶.

In this edition of the Archives, Cardoso et al⁷ present the immediate and the latest results of the percutaneous mitral valvoplasty in patients with mitral stenosis, in a series of 330 consecutive patients that were followed during 47±36 months, evaluating the factors related to the procedure success, restenosis and the latest adverse clinical events⁷. The authors have concluded that mitral valvoplasty with balloon is an effective procedure, since more than 60% of the patients were free of events at the end of the follow-up. The echocardiographic score below 8 points was the only variable with independent predictive value for immediate success. The multivariate analysis also showed that the pre-procedure mitral valve area and the presence of accentuated mitral calcification were the only independent predictors of post-procedure restenosis. With regard to the occurrence of adverse cardiovascular events, more advanced age; less pre-procedure mitral valve area; and major value of medium transvalve mitral gradient in the immediate post-procedure were considered as independent indicators. It is a highly laudable, observational study because it portrays the results

of mitral valvoplasty in an essential number of patients, who were followed during a notable long period. If the procedure's efficacy had already been established through the randomized studies, its effectiveness in the so called "real world" is now unequivocally documented.

It should be noted that the echocardiographic score performs a central role for the initial and long term success prediction of applicants to the percutaneous mitral valvoplasty⁸. Directly, through the aforesaid score, or individually, by means of one of its components, such as the presence of calcification, the appropriate selection of patients goes through the echocardiographic evaluation of the mitral valve. However, other factors can be determinant for the clinical success, at long term, of patients submitted to percutaneous mitral valvoplasty. The presence of atrial fibrillation, for example, in other studies, appeared to be a marker of adverse clinical outcomes, especially the cerebrovascular in these patients. In conformity, studies prove that the percutaneous mitral valvoplasty with balloon can reduce the occurrence of embolic ischemic cerebral vascular accident in patients with severe mitral stenosis and sinus rhythm⁹.

Although the mitral valve morphology is the most important factor that determines the outcome after the procedure, the percutaneous mitral valvoplasty can be a choice for selected cases in which the anatomical factors are not ideal and that; however, there is a surgical high risk¹⁰. Asymptomatic patients with severe mitral stenosis can also benefit from mitral valvoplasty, when the valvar anatomy is favorable and presents pulmonary hypertension and/or high risk of thromboembolic events associated with the atrial fibrillation¹⁰.

It has been 30 years since the description of the technique and publication of the first results of patients submitted to percutaneous mitral valvoplasty. In this period, small technique variations were incorporated, but the method remains essentially unmodified. Percutaneous mitral valvoplasty was shown to be equal or even superior in clinical results when compared to the surgical commissurotomy. The correct preoperative evaluation, by echocardiographic score, is fundamental to the identification of subjects who will present a higher immediate and long term benefit. The results herein presented, which are from the lengthened follow-up of patients with severe mitral stenosis and submitted to the percutaneous mitral valvoplasty, show that this, following the example from other procedures of the Interventionist Cardiology, is a less invasive alternative than the conventional surgery; however, it is really effective for the handling of this disease. Fortunately, the technical advance has allowed medicine to choose for minimally invasive options, with preservation or improvement of the results.

Key words

Mitral Valve; Balloon Dilatation / history.

Mailing address: Marco V. Wainstein •

Rua Carvalho Monteiro, 68 / 501 - 90470-100 - Porto Alegre, RS - Brazil
E-mail: mwainstein@cardiol.br, mwainstein@uol.com.br
Manuscript received March 06, 2009; revised manuscript received March 06, 2009; accepted May 06, 2009.

References

1. Inoue K, Owaki T, Nakamura T, Kitamura F, Miyamoto N. Clinical application of transvenous mitral commissurotomy by a new balloon catheter. *J Thorac Cardiovasc Surg.* 1984; 87: 394-402.
2. Al Zaiibag M, Ribeiro PA, Al Kasab S, Al Fagih MR. Percutaneous double-balloon mitral valvotomy for rheumatic mitral-valve stenosis. *Lancet.* 1986; 1: 757-61.
3. Rihal CS, Holmes DR Jr. Percutaneous balloon mitral valvuloplasty: issues involved in comparing techniques. *Cathet Cardiovasc Diagn.* 1994; (Suppl 2): 35-41.
4. Turi ZG, Reyes VP, Raju BS, Raju AR, Kumar DN, Rajagopal P, et al. Percutaneous balloon versus surgical closed commissurotomy for mitral stenosis: a prospective, randomized trial. *Circulation.* 1991; 83: 1179-85.
5. Arora R, Nair M, Kalra GS, Nigam M, Khalilullah M. Immediate and long-term results of balloon and surgical closed mitral valvotomy: a randomized comparative study. *Am Heart J.* 1993; 125: 1091-4.
6. Dean LS. Percutaneous transvenous mitral commissurotomy: a comparison to the closed and open surgical techniques. *Cathet Cardiovasc Diagn.* 1994; (Suppl 2): 76-81.
7. Cardoso LF, Ayres CV, Bento AM, Tarasoutchi F, Vieira ML, Grinberg M. Resultados imediatos e tardios da valvoplastia mitral percutânea em pacientes com estenose mitral. *Arq Bras Cardiol* 2010; 94(3):406-413.
8. Wilkins GT, Weyman AE, Abascal VM, Block PC, Palacios IF. Percutaneous balloon dilatation of the mitral valve: an analysis of echocardiographic variables related to outcome and the mechanism of dilatation. *Br Heart J.* 1988; 60: 299-308.
9. Liu TJ, Lai HC, Lee WL, Wang KY, Wei HJ, Ting CT, et al. Percutaneous balloon commissurotomy reduces incidence of ischemic cerebral stroke in patients with symptomatic rheumatic mitral stenosis. *Int J Cardiol.* 2008; 123: 189-90.
10. Bonow RO, Carabello BA, Kanu C, de Leon AC Jr, Faxon DP, Freed MD, et al. ACC/AHA 2006 guidelines for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (writing committee to revise the 1998 Guidelines for the Management of Patients With Valvular Heart Disease): developed in collaboration with the Society of Cardiovascular Anesthesiologists. *Circulation.* 2006; 114: e84-e231.