

Percutaneous Mitral Balloon Valvuloplasty: Surviving the Test of Time

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Cardiovascular disease remains the most important disease of the western world. As such, many strides against cardiovascular disease have been made in the past decades, especially when considering coronary artery disease. Cardiologists went from an era of “watchful waiting” for a patient with an acute myocardial infarction and severe coronary disease to an era of surgical revascularization and finally evolving to the new percutaneous interventional era that culminates with drug eluting stents. Thus, the new subspecialty of interventional cardiology was born.

See page 253

Conquering the structural heart disease territory has long been an interventional cardiologist's dream. The treatment for valvular heart disease fits perfectly the interventionalist's drive. It progressed from “watchful waiting” to surgical correction to innovative and revolutionary percutaneous minimally invasive procedures. Percutaneous pulmonary balloon valvuloplasty was the first percutaneous treatment for valvular heart disease.¹ A close second, percutaneous mitral balloon valvuloplasty can certainly be considered one of the most innovative percutaneous procedures that has led the way for the birth of a new subspecialty: structural heart disease percutaneous intervention.

As with any new technological innovation, in the beginning, there was close scrutiny and opposition to change the then current “status quo”: surgical mitral commissurotomy. It is well established through several studies that have compared the immediate and early follow-up results of percutaneous mitral balloon valvuloplasty versus closed surgical commissurotomy that in optimal patients for these techniques there was either superior outcome from percutaneous mitral balloon valvuloplasty^{2,3} or no significant differences between both techniques.^{4,6} The evaluation of candidates for

percutaneous mitral balloon valvuloplasty requires a precise evaluation of both valve morphology and function for pre-procedure decision making and follow-up of patients. Patient selection is fundamental in predicting immediate outcome and follow-up results of percutaneous mitral balloon valvuloplasty. Aguiar Filho et al.⁷, in this edition of the **Revista Brasileira de Cardiologia Invasiva**, highlight this fundamental issue of patient selection as the mean Wilkins score of the current population was 7.6 and only 32 patients (16%) had a score > 8. This comes with no surprise given the known expertise and experience of this group of clinical investigators with distinct operators such as Esteves and Abizaid that have been involved with developing and perfecting percutaneous valve therapy since the early days.

It is well defined that other patient related factors such as older age, presence of atrial fibrillation and pre-procedural mitral regurgitation can negatively affect percutaneous mitral balloon valvuloplasty outcomes. Differences in age and valve morphology may account for the lower survival and event-free survival of percutaneous mitral balloon valvuloplasty series from United States and Europe. For example, in the series from the Massachusetts General Hospital, 497 patients with echocardiographic scores ≤ 8 and a mean age of 51 ± 14 years have an 85% survival and a 45% event-free survival at 8-year follow-up. In contrast, 237 patients with echocardiographic scores > 8 and a mean age of 63 ± 14 years have a 55% 8-year survival, and only 20% of them were free of combined events at 8-year follow-up. Regarding the current Brazilian series, the authors report a very long term follow-up after percutaneous mitral balloon valvuloplasty in a group of young patients (mean age of 32 years old) with the great majority in normal sinus rhythm and with mitral regurgitation present in only 13% of the patients followed. The result of 85% probability of being free from restenosis at 5 years likely reflects the characteristic of

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the patient population. However, at 10 and 20 years the probability of being free from restenosis declines to 60% and 36%, respectively; and 25 patients required a second percutaneous mitral balloon valvuloplasty with 27 patients undergoing surgery after restenosis was diagnosed. This confirms that percutaneous mitral balloon valvuloplasty should be the first line of treatment for rheumatic mitral stenosis with the understanding that in the "long run" some patients will require a second percutaneous mitral balloon valvuloplasty or mitral valve surgery.

Lastly, there is no unique technique of percutaneous mitral balloon valvuloplasty. In the current report, the great majority of the patients had the antegrade double-balloon technique. Most of the techniques of percutaneous mitral balloon valvuloplasty require transseptal left heart catheterization and use of the antegrade approach. There is controversy as to whether the double-balloon technique versus the Inoue technique of percutaneous mitral balloon valvuloplasty provides superior immediate and long-term results. Compared with the Inoue technique, the double-balloon technique results in larger mitral valve area and lesser degree of severe mitral regurgitation after percutaneous mitral balloon valvuloplasty, particularly in patients with echocardiographic scores ≤ 8 . However, despite the difference in immediate outcome between both techniques, there are no significant differences in survival, event-free survival, and restenosis at long-term clinical follow-up.

Percutaneous balloon mitral valvuloplasty has definitely survived the test of time. Aguiar Filho et al.⁷ confirm once more the success of this ground breaking structural percutaneous intervention as first line treatment for rheumatic mitral stenosis. The historical and well established success of percutaneous mitral balloon

valvuloplasty should inspire the new generation of structural heart disease interventionalists to further innovate the field and change once and for all the landscape of the treatment of valvular heart disease.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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