
PERSONAL EXPERIENCE

History of PTMC at National Institute of Cardiovascular Diseases Karachi.

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Abstract

Rheumatic mitral stenosis (MS) incidence and severity rates have decreased in the developed world, but the condition is still very common in many nations. Since its invention, percutaneous mitral balloon valvuloplasty has transformed the therapy of mitral stenosis, shown promising short- and long-term outcomes, and taken the role of surgical mitral commissurotomy as the preferred method of managing rheumatic mitral stenosis in suitable patients. The morphologic characteristics of the valve leaflets and sub valvular structures can be used to predict the possibility of hemodynamic benefit and the danger of complications with balloon valvuloplasty. The results will be less than ideal if the valves are hard, thickened, and extensively calcified. We presented the retrospective data of approximately 500 patients from March 2001 to June 2006 in this paper.

Keywords

Percutaneous Transvenous Mitral Commissurotomy, History, Hospital.

Introduction

I joined NICVD as Assistant Professor in 1992, after completing postgraduate training in Cardiology in United Kingdom. Those were the days when there was one cardiac Cath lab, where only diagnostic Rt & Lt heart catheterization was carried out routinely. Multipurpose catheter was easily available, as the name suggest it was used for all various cardiac diagnostic procedures, however if one gets stuck, selective catheters were available in stock too as a backup.

Rheumatic mitral stenosis (MS) occurrence and intensity rates have decreased in the developed world, but the condition is still very common in many nations. The chosen treatment for individuals with severe mitral stenosis prior to 1984, when Inoue et al. first documented the clinical application of percutaneous mitral valvotomy [PMV], was surgical mitral commissurotomy (MS). Since its invention, percutaneous mitral balloon valvuloplasty has transformed the treatment of mitral stenosis, produced positive immediate and lasting outcomes, and, in suitable patients, has displaced surgical mitral commissurotomy as the preferred method of treating rheumatic MS.

The morphologic characteristics of the valve leaflets and sub valvular structures can be used to predict the possibility of hemodynamic benefit and the threat of consequences with balloon valvuloplasty. The results will be less than ideal if the valves are hard, bulging, and extensively calcified. To predict the likely consequences of PMBV, Wilkins et al echocardiographic scoring system is used.

Percutaneous mitral balloon valvuloplasty (PMBV) techniques that are retrograde (trans arterial) and

antegrade (transvenous) have been established. The antegrade method utilising transeptal catheterization is more popular right now. The method used most frequently today was first characterized as the Inoue balloon technique in 1984. In most cases, the femoral vein is used.

I was keen to start PTMC, however the Inoue Balloon¹ was expensive and moreover facility for close commissurotomy was available at nominal cost, thus administration could not afford balloon worth of around Rs 120,000/. Since RHD affect non-affording masses to a large extent, thus PTMC was not cost effective in developing countries, unless the balloon is reused various times after resterilisation. I learned from an experience of various developing countries including Egypt, Malaysia and neighboring India where they made this procedure cost effective by using the balloon repeatedly after sterilization. Obviously, patients were screened for carrier viruses first.

I initiated PTMC in year 1993, thanks to a philanthropist who promised to donate balloons on regular basis. I was careful in case selection in order to establish this new intervention. A thorough explanation of the procedure to the team, likely complications and availability of all rescue measures were ensured.

Balloon was thoroughly prepared before the procedure and cleaned, washed and reserialized after the procedure on each occasion. Repeat ECHO remained mandatory and TOE was performed in all patients with severe MS and AF, in order to exclude LAA thrombus. I continued performing the PTMC with the financial assistance of the private donor for more than three years. Latter hospital started buying the balloon itself.

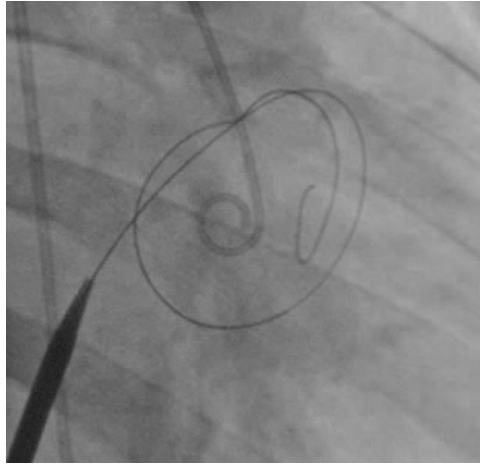


Figure 1: Inoue Technique Septal dilation.



Figure 2: Inoue Technique Balloon Dilation.

Cribier et al^{2,3} In the 1990s, the metallic commissurotomy was first offered. This operation is equally effective as balloon commissurotomy, but it is more difficult for the surgeon to do than the Inoue method, and it seems to have a larger risk of hemopericardium since a rigid guide wire is present in the left ventricle. The procedure may be advantageous due to the dilator's reusability and substantial cost.

Dr Alain Cribier visited NICVD in December 1998 and introduced Metallic Device, similar to Tubbs Mitral valve dilator, used for close commissurotomy. Here the procedure is more or less similar, except that the septal dilator was of 18 French, while the metallic device can be deesterilized and can be used repeatedly. Controlling the opening of the metallic device according to the desired range regulates dilation of the valve. We performed several procedures together. I was comfortable to use it.

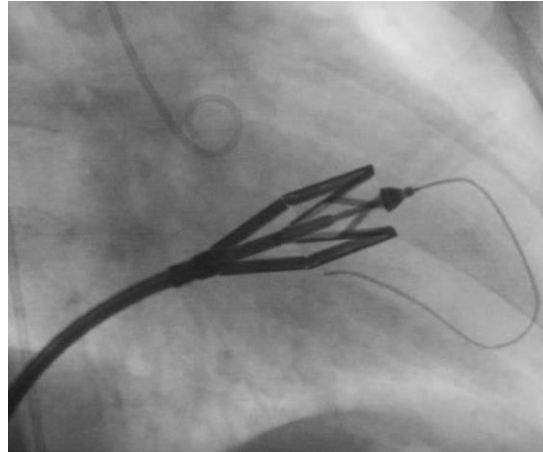


Figure3: Cribier Technique Partial inflation.

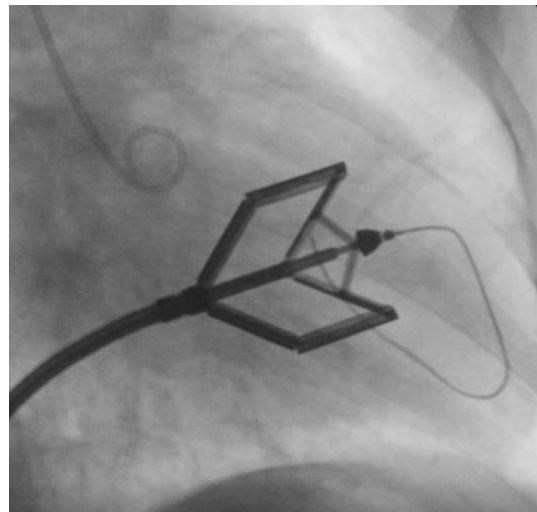


Figure 4: Cribier Technique Complete inflation.

Following his visit Institute decided to buy two pairs of these devices and Innoue remained available for young & small size patients where the use of large size dilator appears cumbersome. We performed more than five hundred cases with metallic devices over the years, besides almost double the number of cases by the Innoue technique. Various live workshops were conducted from NICVD and efficacy of metallic device was found Comparable to Innoue balloon. Perhaps with an added advantage that device can be sterilized more efficiently.

Multitrack balloon was introduced in year 2002, its very much user friendly. Bonhoeffer et al² have described the use of the multitrack system, which is a refinement of the double-balloon technique that employs a monorail system requiring only 1 guide wire. The guide wire tip being placed in LV apex or one can park it across the aortic valve down in to descending aorta, for easy tractability of the balloons. First balloon predilate and then second balloon is placed side by side across the mitral valve to achieve optimum mitral valve dilation. This technique allows easier dilation than the standard technique.

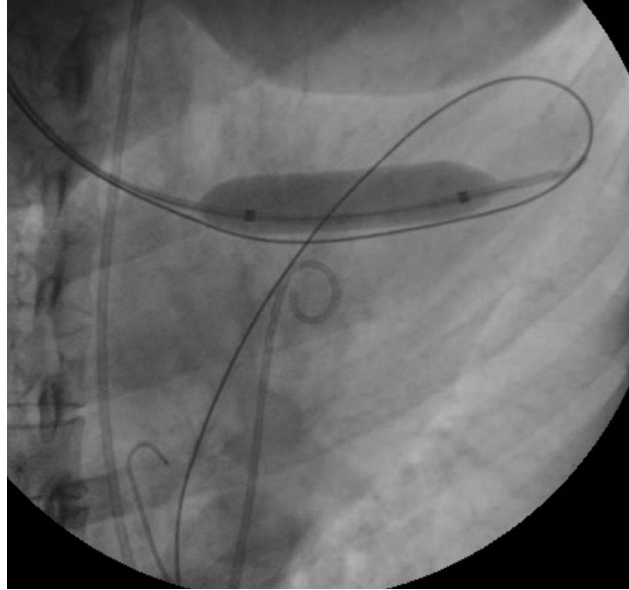


Figure 5: Bonhoeffer Technique Single balloon inflation.

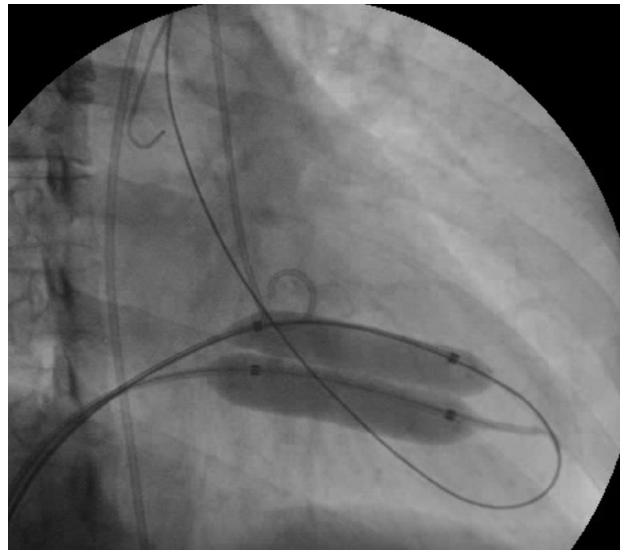


Figure 6: Bonhoeffer Technique Double balloon inflation.

Thus, NICVD had three modalities of Mitral Valve Percutaneous Commissurotomy. All of the three techniques were successfully used for number of years. Latter due to non-availability of the various parts of the Metallic Valvotomy, this technique was abandoned.

More than hundred symptomatic full term pregnant women were treated with different techniques and the percutaneous technique was found safe and successful, fluoroscopy time was

kept to minimum and necessary protective measures were used.

Efficacy of three techniques and the result have been discuss in various international meetings and a paper on the Result of PTMC in patients with severe symptomatic MS during pregnancy was presented in European Society of Cardiology Meeting, where it was highly appreciated and award was offered. Original paper comparing the efficacy of three techniques was published in

Journal of Invasive Cardiology in 2008^{5,4}. In this paper we shared the retrospective data of around 500 patients from March 2001 to June 2006.

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