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Immediate Outcomes and Long-Term Follow-Up of Percutaneous Mitral Valvuloplasty

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ABSTRACT

Background
The treatment of mitral valve stenosis has changed over the last decades. Hemodynamic results and clinical outcome of percutaneous mitral valvuloplasty (PMV) have proved to be comparable to those of surgical treatment.

Objective
The aim of this study was to evaluate the efficacy and the immediate and long-term clinical and echocardiographic outcome of PMV.

Methods
A total of 132 patients undergoing PMV were included, with a median follow-up of 48 months. Primary success was defined as mitral valve area ≥ 1.5 cm² following PMV. Mortality, need for mitral valve replacement or new PMV and mitral valve restenosis were evaluated during follow-up.

Results
Mean age was 44.6 years and 88.5% of patients (n=115) were women. Median mitral valve area before PMV was 0.90 cm² (IQR 25-75: 0.81-1.00), systolic pulmonary artery pressure was 44 mm Hg (IQR 25-75: 35-52) and the echocardiographic score was 7 (25-75 % IQR: 6-9). Primary success was achieved in 104 patients (78.8%).
After 4-year follow-up, 86.5% of patients (n=109) were free of symptoms. Three patients (2.2%) died during hospitalization and three (2.2%) during follow-up. A new PMV was performed in 10 patients and four patients underwent mitral valve replacement.
At follow-up, an echocardiographic score >8 (p=0.04) and mitral valve area following PMV <1.8 cm² (p=0.02) were associated with restenosis. After performing multivariate analysis, mitral valve area <1.8 cm² was the only predictor of restenosis after PMV (OR: 2.6; 95% CI: 1.08-6.25).

Conclusions
Percutaneous mitral valvuloplasty is a safe and efficient method with long-term efficacy. The best outcomes are achieved in patients with low echocardiographic score and in sinus rhythm and those with larger mitral valve area after PMV have lower restenosis during follow-up.

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Key words > Balloon Dilatation - Mitral Valve Stenosis - Hemodynamics - Prognosis - Balloon Valvuloplasty

Abbreviations >

EMB	**MVA**	Mitral valve area	**ES**	Echocardiographic score
CF	Functional class		**PASP**	Pulmonary artery systolic pressure
MVS	Mitral valve stenosis		**RS**	Restenosis
AF	Atrial fibrillation		**MVR**	Mitral valve replacement
MR	Mitral regurgitation		**PMV**	Percutaneous mitral valvuloplasty

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BACKGROUND

As the mitral valve is very frequently affected by rheumatic disease, (1-4) mitral valve stenosis (MVS) of rheumatic origin is still a common entity in Argentina and in underdeveloped countries. MVS treatment has changed in recent decades; and several studies have shown that percutaneous mitral valvuloplasty (PMV) has equivalent hemodynamic results and similar outcome compared to surgery, being the first treatment of choice in patients with symptomatic MVS and favorable valve morphology. (5-8) The purpose of this study was to evaluate the immediate and long-term effectiveness of PMV in our center, as well as the clinical and echocardiographic long term outcome.

METHODS

Patients

One hundred and thirty two patients undergoing PMV in our center between 1991 until 2009 were analyzed. All included cases had moderate to severe MVS and were selected according to the following criteria: a) New York Heart Association (NYHA) functional class (FC) II or higher despite optimal medical treatment, b) favorable anatomy by echocardiography [when unfavorable echocardiographic score (ES) was encountered, individual cases were evaluated based on risk/benefit considerations], c) absence of contraindications for transeptal catheterism, d) absence of grade II severe mitral regurgitation in Sellers' classification (9) and e) absence of any other valve disease supplementary to surgical treatment.

This analysis included patients with > 12-month clinical follow-up, independently of the result of the procedure.

Procedure

A transthoracic echocardiography, assessing valve anatomy according to Wilkins at al's score was performed before PMV. (10) Mitral valve area (MVA) was assessed with the pressure half-time method described by Hatle et al. (11) and in patients with atrial fibrillation (AF) five beats were averaged. Pulmonary artery systolic pressure (PASP) and left atrial diameter were assessed by usual methods. A transesophageal echocardiogram was perfomed 72 hours prior to PMV to rule out presence of thrombi in the left atrium. Percutaneous mitral valvuloplasty was contraindicated in patients with severe mitral regurgitation (MR). Oral anticoagulation was prescribed during 3 months in patients with left atrial thrombus, and if left atrial thrombus persisted after this period, the procedure was contraindicated.

Percutaneous mitral valvuloplasty was performed in 127 patients according to Inoue's technique and with double balloon technique in five patients. When Inoue's technique was used, maximum balloon diameter was selected according to the manufacturer's criteria based on the height of the patient: 24 mm if it was ≤ 147 cm, 26 mm if it was > 147 cm, 28 mm for height > 160 cm y 30 mm for height > 180 cm. Roth et al.'s table was followed for balloon selection in the two-balloon technique. (13) Right chamber pressures and oximetry were analyzed in the Hemodynamics Lab. Mitral valve area was determined according to Gorlin's formula. (14) A left ventriculogram was performed after PMV to establish presence and degree of MR. The procedure was carried out under control transthoracic echocardiography in the Hemodynamics Lab. In all cases, the balloon was progressively inflated controlling the result and degree of MR.

The procedure was considered to be successful when MVA ≥ 1.5 cm^2 was obtained without major complications (death, MR > 2 according to Seller´s classification, systemic embolism or cardiac tamponade). Mitral valve area was assessed in the Hemodynamics Lab using Gorlin´s method and analyzed 72 hours post- PMV by Doppler echocardiography. Functional recuperation was considered when patients improved by one stage their initial functional class. Major complications were: death, need of mitral valve replacement (MVR), need of new PMV or functional class worsening to stage III or IV. Restenosis (RS) was defined in echocardiographic follow-up as MVA reduction < 1.5 cm^2 and 50% loss of MVA increase following a successful PMV (15)

Follow-up

Staff physicians from the Department of Cardiology, Hospital Argerich, trained in treating this kind of patients were in charge of clinical and echocardiographic follow-up during hospitalization, at one month, 6 and 12 month post-procedure and subsequently once a year. Median follow-up was 48 months (IQR: 24-84 months).

Statistical analysis

Demographic, clinical echocardiographic and hemodynamic variables were analyzed, as well as MVA < 1.8 cm^2 after PMV, given its association with RS and events during follow-up in different studies.

Categorical variables were expressed as frequency and percentage and analyzed using the chi-square test. Numerical variables were expressed as mean ± standard deviation (SD) or median and interquartile range (IQR 25-75) and were analyzed with Student´s t test or Kruskal-Wallis test, as appropriate. The relationship between different demographic, clinical and hemodynamic variables and immediate and at follow-up PMV success was evaluated by multivariate analysis, following which a logistic regression multivariate model was used to determine independent predictors of immediate success. The same method was employed to establish independent predictors of events and RS during evolution. In all cases, variables with $p < 0.10$ in the multivariate analysis were included. Statistix 7.0 software was used to analyze the data and $p < 0.05$ was considered statistically significant.

RESULTS

Population

One hundred and thirty two patients were included in the study from May 1991 to August 2009, 126 of which completed the procedure. Mean age was 44.2 ± 13.3 years (20-81 years) and 87.1% (n = 115) were women. Eighty three patients (62.8%) were in FC II and 34.1% (n = 45) in FC III.

Forty cases (30.3%) presented AF rhythm. Median MVA prior to the procedure was 0.90 cm^2 (IQR 25-75: 0.87-1.00 cm^2), PASP was 44 mm Hg (IQR 25-75: 35-52 mm Hg) and pulmonary capillary pressure was 23 mm Hg. Median ES was 7 and 28.3% of patients had ES > 8 (Table 1). Eighty five patients (64.9%) presented MR, mild in 63.2% (n = 83) of cases and severe in 1.7% (n = 2). In 52 patients (39.4%) PASP was > 50 mm Hg (median: 56 mm Hg) (Table 1).

Immediate results

The procedure was considered to be successful in 104

patients (78.8%), with a significant MVA increase from 0.90 cm² to 1.71 cm².

Echocardiographic and hemodynamic variables as a result of the procedure are summarized in Table 2 and basal, echocardiographic and hemodynamic characteristics according to the result of the procedure are detailed in Table 3. Median MVA after PMV was 1.71 cm² in the overall population (Table 2), while in patients with unsuccessful results (n = 28) MVA was 1.26 cm² (IQR 25-75: 1.13-1.30). A decrease in PASP from 44 to 30 mm Hg and in pulmonary capillary pressure from 23 to 15.5 mm Hg (Table 2) was observed, without significant differences independently of the result of the procedure. Patients with a successful outcome presented lower ES prior to PMV (median 7 vs. 8.5; p = 0.002) and a lower percentage of AF (24.5% vs. 50%; p = 0.02) than patients with unsuccessful outcome (Table 3). No significant differences were found in the rate of success in patients with PASP < or > 50 mmHg.

After multivariate analysis, both presence of AF (OR: 0.22; 95% CI: 0.07-0.63) and Wilkins ES > 8 (OR: 0.31; 95% CI: 0.11-0.87) were independently associated with lower procedural success rate.

Table 1. Basal clinical, echocardiographic and hemodynamic characteristics of the included population

Clinical characteristics	n	%
Age, mean ± SD	45.1 ± 12.8 years	
	n	%
Female gender	115	87.1
MVS ethiology		
Previous commissurotomy	10	7.5
ECG sinus rhythm	92	69.7
Atrial fibrillation	42	31.8
Functional class (NYHA)		
I	0	-
II	83	62.8
III	45	34.1
IV	4	3.1
Pulmonary hypertension > 50 mm Hg	52	39.4
Pregnancy	3	2.3
Echocardiographic characteristics	**Median (IQR)**	
LVSD, mm	49.0 (45-52)	
LVDD, mm	30.0 (26-32)	
SF, %	39 (33-44)	
LA, mm	53 (49-58)	
MVA, cm2	0.90 (0.87-1.00)	
Mean gradient, mm Hg	11.0 (9.0-16.0)	
PASP, mm Hg	44 (35-52)	
Wilkins score	7 (6-9)	
	n	%
Wilkins score > 8	40	30.3
Mitral regurgitation	85	64.9
Mild	83	63.2
Moderate	2	1.7
Hemodynamic characteristics		
MVA, cm2 (Gorlin)	0.88 (0.75-1.00)	
Mean gradient (mm Hg)	15.0 (11.0-19.2)	
PASP, mm Hg	44.0 (31.2-58.7)	
Pulmonary capillary pressure, mm Hg	23 (17-30)	
Cardiac output, L/min	4.2 (3.6-5.0)	

SD: Standard deviation. MVS: Mitral stenosis. ECG: Electrocardiogram. NYHA: New York Heart Association. IQR: Interquartile range. LVDD: Left ventricular diastolic diameter. LVSD: Left ventricular systolic diameter. SF: Shortening fraction. LA: Left atrium. MVA: Mitral valve area. PASP: Pulmonary artery systolic pressure.

Procedure-associated complications

Twenty seven patients developed or increased MR following PMV; hence 112 (85%) of patients presented some degree of MR post-PMV. In most cases, post-procedural MR was mild [n = 94 (83.9%)], moderate in 17 patients and severe in one patient (0.76). Twenty-eight patients (21.1%) presented interatrial communication, all mild and with spontaneous closure during follow-up.

Pericardial effusion was observed in two patients (1.5%), in whom percutaneous drainage was performed without surgery.

Three in-hospital deaths (1.5%) were registered. A female patient died because of infective endocarditis three weeks after the procedure. In another case, death was caused by disseminated intravascular coagulation due to retroperitoneal hematoma and the third death was produced by sepsis from a urinary source in an immunosuppressed female patient with systemic lupus erythematosus.

Follow-up

Median follow-up was 48 months (IQR 25-75: 24-84 months). There was a gradual decrease in MVA along time: 1.61 cm² (IQR 25-75: 1.34-1.89), 1.60 cm² (IQR 25-25: 1.33-1.89), 1.59 cm² (IQR 25-25: 1.40-1.90) and 1.56 cm² (IQR 25-25: 1.32-1.84) at 12, 24, 36 and 48-months follow-up, respectively (Figure 1 A). Median PASP was 33.5 mm Hg (IQR 25-75: 30-38), 32 mm Hg (IQR 25-75: 30-40), 32 mm Hg (IQR 25-75: 28.5-37.5) and 31 mm Hg (IQR 25-75: 30-40) at 12, 24, 36 and 48-months of follow-up, respectively (Figure 1 B).

In the 4-year follow-up, 86.5% of the population (n = 109) was asymptomatic; 6.3% (n = 8) presented class II of higher dyspnea and 3.1% (n = 4) had palpitations. In patients with PASP > 50 mm Hg prior to the procedure, there was a similar decrease of PASP and clinical and VMA behavior comparable that of

Echocardiographic characteristics	Pre-PMV (median, IQR)		Post-PMV (median, IQR)	
LVDD, mm	49.0 (45-52)		49.0 (45-52)	
LVSD, mm	30.0 (26-32)		30.0 (26-32)	
SF, %	39 (33-44)		39.5 (44.2-35.0)	
LA, mm	53 (49- 58)		50 (47-54)	
MVA, cm2	0.90 (0.87-1.00)		1.71 (1.5-2.0)	
Mean gradient, mm Hg	11.0 (9.0-16.0)		5.0 (3.0-6.25)	
PASP, mm Hg	44 (35-52)		30 (27-40)	
	n	%	n	%
Mitral regurgitation	85	64.9	112	85
Mild	83	63.2	94	71.2
Moderate	2	1.7	18	13.8
Mild IAC			28	21.1
Echocardiographic characteristics				
MVA, cm2	0.88 (0.75-1.00)		1.70 (1.5- 2.0)	
Mean gradient, mm Hg	15.0 (11.0-19.2)		6.5 (4.2-8.57)	
PASP, mm Hg	44.0 (31.2-58.7)		24.5 (18-30)	
Pulmonary capillary pressure, mm Hg	23 (17-30)		15.5 (11.2-17)	
Cardiac output, L/min	4.2 (3.6-5.0)		4.5 (3.62-5.5)	

PMV: Percutaneous mitral valvuloplasty. IQR: Interquartile range. LVDD: Left ventricular diastolic diameter. LVSD: Left ventricular systolic diameter. SF: Shortening fraction. LA: Left atrium. MVA: Mitral valve area. PASP: Pulmonary artery systolic pressure. IAC: Interatrial communication.

Table 2. Change in echocardiographic and hemodynamic parameters with percutaneous mitral valvuloplasty

Variables	Successful PMV (n = 104)	Unsuccessful PMV (n = 28)	p
Age, years	43.5 ± 12.8	46.2 ± 14	0.80
Female gender	88 (83.1%)	23 (88.7%)	0.75
FC III-IV	35 (33%)	14 (53.8%)	0.11
Atrial fibrillation	27 (24.5%)	13 (50%)	0.02
Pre-PMV MVA, cm2	0.88 (0.75-1.02)	0.90 (0.75-0.97)	0.69
Wilkins ES	7.0 (5.2-8.7)	8.5 (7.7-10.0)	0.002
Wilkins ES > 8	26 (24.5%)	14 (53.8%)	0.008
Pre-PMV PASP, mm Hg	42.5 (34-52)	38 (34-64)	0.43
Pre-PMV severe PH	27 (25.4%)	8 (30.7%)	0.78
N° of balloons	28	28	0.96
N° of inflations	3 (2-4)	4 (3-5)	0.06

PMV: Percutaneous mitral valvuloplasty. FC: Functional class. MVA: Mitral valve area. ES: Echocardiographic score. PASP: Pulmonary artery systolic pressure. PH: Pulmonary hypertension.

Table 3. Univariate analysis of percutaneous mitral valvuloplasty success predictors

patients with PASP < 50 mm Hg

At the end of follow-up, mitral surgery had been indicated in four cases. Median time between PMV and MVR in these patients was 60 months (IQR 25-75: 33-69). Patients requiring MVR had a mean age of 47 ± 18 years, with basal Wilkins ES of 10 (IQR 25-75: 7-11).

A new PMV was carried out in 10 patients. Median time to the new procedure was 72 months (IQR 25.75: 52-132 months). The age of these patients was 43 ± 13 years and median ES was 8 (IQR 25-75: 6-9.5), with ES > 8 in 40% of patients. Nine patients presented sinus rhythm and one AF rhythm. Mitral valve area prior to the second procedure was 0.88 cm^2 (IQR 25-75: 0.77-0.91) and after the procedure it was 1.86 cm^2 (IQR 25-75: 1.57-2.11), with 100% success rate.

Three patients died during follow-up. One died at 24 months due to heart failure, with unsuccessful procedure and in planned MVR. Another patient died at 36 months from pulmonary neoplasia and the third died at 120-month follow-up from a lymphoproliferative disorder.

Restenosis was found in 20.4%, 20.7%, 27.4%, 25%, and 28.2% of patients at 6, 12, 24, 36 and 48-months of follow-up, respectively. Following multivariate analysis, variables associated with RS during follow-up were ES > 8 (p = 0.04) and post-PMV MVA < 1.8 cm² (p = 0.02). The latter was the only independent predictor of RS (OR: 2.6; 95% CI: 1.08-6.25) in the multivariate analysis (Table 4).

DISCUSSION

Since 1984, PMV has become the treatment of choice for pure rheumatic MVS or with minimal MR having favorable anatomical features. The best results are obtained in young patients with flexible, non-calcified valves and sinus rhythm. Our work included a population with severe symptomatic mitral disease, with 28.3% of patients presenting ES > 8 and 30.3% AF rhythm.

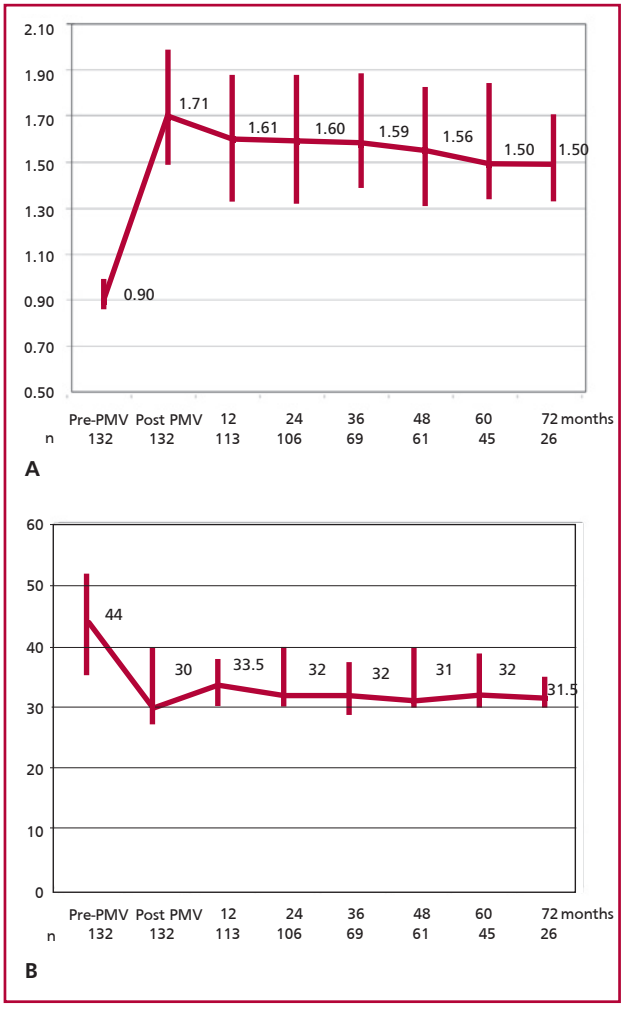

Fig. 1. **A.** Mitral valve area (cm²) evolution after mitral valvuloplasty and at long-term follow-up. **B.** Pulmonary artery systolic pressure (mm Hg) evolution after mitral valvuloplasty and at long-term follow-up.

Immediate results

The success rate was 78.8%, comparable to that reported in the literature ranging between 73% and 99%. (15-22) Palacios et al. observed 71.7% success rate in 879 patients, (18) while Iung et al. report a primary success rate of 89%, with an incidence of 3.4% severe MR. (19)

In our series, the rate of MR after PMV is lower than that of other authors. (15-19) In 27 patients (20.4%) there was manifestation or increase of MR, although in most cases the increase was mild (1 + or 2 +) and the incidence of severe MR was almost nil (0.79%). It is possible that with larger diameter balloons a greater success could have been obtained. However, as indicated by Inoue, balloons were selected according to the patient's size, and by controlling MR outcome and degree the selected diameter or a larger one was reached. This could justify the obtained MVA and the somewhat lower success rate than that of other series, but also the lower MR rate compared to other authors.

There were three in-hospital deaths (2.2%). In general, mortality in large studies ranges from 0% to 1.3% and, in these series most deaths were due to ventricular perforation, which is much more frequent with the use of double-balloon. (10, 17, 23) In our study, although in-hospital mortality was higher, both cardiovascular deaths as those occurring for other reasons were included. Two cases of pericardial effusion, but without cardiac tamponade were reported, in which percutaneous drainage was performed without complications.

Regarding predictors of immediate success, an inverse relationship between the ES and the obtained result has been described. A study by Palacios et al. observed that the best immediate results were obtained in young patients with ES <8, larger pre-PMV MVA, a lesser degree of MR, male gender and absence of prior commissurotomy. (18) In our study, both ES > 8 as presence of AF were associated with a lower immediate success rate of the procedure.

Long-term results

During follow-up, three deaths (2.27%) occurred. This result is slightly higher than that reported by Fawzy et al. (0.81%), (24) similar to that reported by Hernández

Table 4. Multivariate analysis of restenosis predictors at 60 month follow-up

	Odds ratio (95% VI)	%
Post PMV MVA < 1.8 cm2	2.63 (1.08-6.25)	0.04
Wilkins ES > 8	2.30 (0.,82-6.44)	0.46
Atrial fibrillation rhythm	2.22 (0.29-4.34)	0.32
PASP >50 mm Hg	1.63 (0.60-4.34)	0.49

CI: Confidence interval. MVA: Mitral valve area. PMV: Percutaneous mitral valvuloplasty. ES: Echocardiographic score. PASP: Pulmonary artery systolic pressure.

(3.3%) and Song (3.4%), (25, 26) and lower than that published by Palacios, who reported 12.5% of deaths during a mean follow-up of 50 months, although cardiac mortality was 9.67% in an elderly population (55 ± 15 years) and with a high percentage of patients with AF rhythm (49.3%) and ES > 8 (31.6%).

No patient in our series required surgery before hospital discharge, while 14 patients (10.6%) required reoperation, both MVR as new PMV, during follow-up. Four patients (3.03%) underwent MVR surgery, most of which were cases with unfavorable valve anatomy that evolved with poor clinical tolerance. This result is similar to that reported by Fawzy et al. and lower than that found in other studies. (24) Moreover, in Palacios et al.´s records, 26.6% of patients underwent MVR during follow-up. (18)

A new PMV was performed in 10 patients (7.57%). This was successful in all cases, a finding consistent with that reported in the study by Fawzy et al., in which 9.73% of the population was reoperated, 6.08% for a new PMV and 3.65% for MVR. (24) However, this higher percentage of patients submitted to a new PMV compared to MVR (7.57% vs. 3.03%) reported in our registry contrasts with other investigations. In the study of Palacios et al., 6.14% of patients underwent new PMV and 26.6% required MVR. (18) Hernandez et al. report that 9.8% of patients received MVR during follow-up, while 1% underwent new PMV. (25) Among the possible reasons for this difference is the higher rate of MR in the studies of Palacios and Hernandez, favoring surgical resolution.

Mitral valve area showed a gradual decrease over time. A subclinical rheumatic process and turbulent blood flow generated in a valve with altered anatomical features are among the explanations attributed for the decrease of MVA. Both mechanisms contribute to commissural fusion, thickening and calcification observed at valvular and subvalvular levels. (27) Most records show 0.12 to 0.20 cm^2. MVA decrease in the 5-year follow-up. This decrease is associated with an increased rate of RS. Restenosis incidence varies according to the studied series between 3% and 70% at 1 and 3-year follow-up. (15-19, 22-26, 28) This wide range in the incidence of RS is explained, firstly, by the different definitions of RS and, secondly, by the different access routes and follow-up periods. Restenosis rate in our series at 48-month follow-up was 28.2%, similar to that reported by Hernández et al., who at 7-year follow-up observed a RS rate of 39% in patients with mean age of 53 years. In the univariate analysis, both ES > 8 as well as post-PMV MVA < 1.8 cm2 were associated with RS, although after multivariate analysis, post-PMV MVA <1.8 cm^2 was the only predictor of RS during follow-up. This predictive value given by the immediate result was also observed in a study with a 39-month mean follow-up, in which post-PMV MVA <1.8 cm^2 was the only predictor of RS. (25) In a recent publication, Song et al. found that post-PMV MVA was not only a RS predictor, but also of events at long-term follow-up, and consequently determined that the most effective RS predictor cut-off point is MVA of 1.8 cm^2. (26) These findings have established that post-PMV MVA is considered a useful noninvasive parameter of long-term evolution

Various studies have shown that a significant number of patients with severe MVS have elevated PASP. Our population included 52 patients (39.4%) with PASP > 50 mm Hg (median, 56 mm Hg), similar to that reported in other studies. (29) If this population with severe pulmonary hypertension does not receive an effective treatment, it has a poor prognosis, with 3-year median survival. (30) Surgery in this group of patients has a mortality rate between 9% and 15% (31-33), whereas in our study, mortality rate was 1.51% (two of the deceased patients had PASP > 50 mm Hg). Both immediate and follow-up results were similar to those of patients without elevated PASP. Moreover, sustained normalization and decreased post-PMV PASP was observed over time, a finding consistent with that observed in other studies. (34-36)

CONCLUSIONS

Percutaneous mitral valvuloplasty is a safe and effective technique with long-term efficacy. The best immediate results are obtained in patients with low ES and sinus rhythm, while those with a larger MVA diameter after the procedure have lower RS during follow-up.

RESUMEN

Resultados inmediatos y seguimiento a largo plazo de la valvuloplastia mitral percutánea

Introducción

El tratamiento de la estenosis mitral ha cambiado en las últimas décadas. Se ha demostrado que, frente al tratamiento quirúrgico, la valvuloplastia mitral percutánea (VMP) presenta resultados hemodinámicos comparables y una evolución similar.

Objetivo

Evaluar la eficacia y la evolución clínica y ecocardiográfica inmediata y a largo plazo de la VMP.

Material y métodos

Se incluyeron 132 pacientes que habían sido sometidos a VMP, con una mediana de seguimiento de 48 meses. Se consideró éxito primario cuando se obtuvo un área pos-VMP ≥ 1,5 cm2. En el seguimiento se evaluaron: muerte, necesidad de reemplazo valvular mitral o de nueva VMP y reestenosis valvular.

Resultados

La media de edad fue de 44,6 años; el 88,5% de los pacientes (n = 115) eran de sexo femenino. La mediana del área valvular mitral pre-VMP era de 0,90 cm^2 (IIC 25-75: 0,81-1,00), la presión sistólica de la arteria pulmonar era de 44 mm Hg (IIC 25-75: 35-52) y el puntaje ecocardiográfico, de 7 (IIC 25-75: 6-9). Se obtuvo éxito primario en 104 pacientes (78,8%). En el seguimiento a 4 años, el 86,5% de los pacientes (n = 109) se encontraban asintomáticos. Se registraron tres muertes intrahospitalarias (2,2%) y tres en el seguimiento (2,2%). Se realizó una nueva VMP en 10 pacientes y reemplazo valvular mitral en cuatro.

Las variables asociadas con reestenosis en el seguimiento fueron el puntaje ecocardiográfico > 8 (p = 0,04) y el área

valvular mitral pos-VMP < 1,8 cm^2 (p = 0,02). Luego del análisis multivariado, el área valvular mitral pos-VMP < 1,8 cm^2 fue el único predictor de reestenosis (OR: 2,6; IC 95%: 1,08-6,25).

Conclusiones

La VMP es segura y eficaz, eficacia que se mantiene a largo plazo. Los mejores resultados inmediatos se obtienen en pacientes con puntaje ecocardiográfico bajo y en ritmo sinusal, mientras que aquellos con un área valvular mitral mayor pos-VMP son los que presentan menor reestenosis en el seguimiento.

Palabras clave > Dilatación con balón - Valvuloplastia con balón - Estenosis de la válvula mitral - Hemodinámica - Pronóstico

Conflicts of interest

None declared.

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