ORIGINAL ARTICLE

Aortic Valve Replacement in Octogenarian Patients. Perioperative Results and Mid-term Follow-up

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ABSTRACT

Introduction
Over the last decades the number of elderly patients requiring cardiac surgery due to degenerative aortic stenosis has consistently increased. The aim of this study is to communicate the experience of a center on aortic valve replacement in this octogenarian population and their mid-term follow-up.

Methods
From January 2005 to December 2010, 96 patients older than 80 years with degenerative severe aortic stenosis, underwent aortic valve replacement surgery combined or not with coronary artery bypass grafting at the Hospital Universitario Fundación Favaloro. Retrospective morbidity and mortality data were compared between both populations. Follow-up to analyse quality of life was made through personal and telephone interviews.

Results
Mean age of the population was 82±2 years and 54% were men. Exercise-induced dyspnea was the most common symptom present in 84% of the study population. Eighty-four patients (77%) presented with some degree of previous renal dysfunction. According to the additive EuroSCORE, 78.1% of patients were at high and 17.7% at very high surgical risk. Isolated aortic valve replacement was performed in 55 patients (group I) and combined with coronary artery bypass grafting in the remaining 41 (group II). Overall 30-day mortality was 7.3%, 3.6 % in group I and 12.2% in group II (NS). Taking into account elective surgeries, these percentages were reduced to 5.3%, 4.3% and 6.9%, respectively (NS). During the 6-month follow-up, cumulative mortality was 14%, 94% of patients are in FC I-II of the NYHA classification and 88% were not re-admitted for a cardiovascular cause.

Conclusions
Aortic valve replacement in octogenarian patients combined or not with coronary artery bypass grafting is a procedure with good short and mid-term outcome when performed electively in an experienced center. Therefore, it should not be contraindicated considering only age or cardiac operative risk scores.

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Key words > Aortic valve stenosis, Cardiovascular surgical procedures, Geriatrics, Follow-up studies

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Abbreviations

AVR	Aortic valve replacement	**PH**	Pulmonary hypertension
CABG	Coronary artery bypass grafting	**CVA**	Stroke
CRF	Chronic renal failure	**PAMI**	Perioperative acute myocardial infarction
ECC	Extracorporeal circulation	**CAB**	Complete atrioventricular block
HTN	Hypertension	**CrCl**	Creatinine clearance
NYHA	New York Heart Association		

INTRODUCTION

In recent decades, life expectancy has increased considerably due to advances of modern medicine. In Argentina, according to the 2010 National Census, people older than 80 years exceed a million inhabitants, representing 2.5% of the total population (1). This increases the incidence of pathologies related to the elderly, aortic stenosis being one of the most common. (2) Once the patient with severe aortic stenosis develops symptoms, survival without surgical correction is less than 3 years, in addition to an increased risk of sudden death. (3, 4) Numerous foreign publications of the last 20 years confirm that the risk-benefit balance of octogenarian patients increases with aortic valve replacement when they become symptomatic. (5.6) Yet, surgery is still contraindicated in a large number of patients due to their advanced age. (7)

To assess whether surgery remains a valid option for this age group in our country, it is necessary to balance the risks and benefits knowing not only the surgical results but the complications and the perceived quality of life gained by the patients, data which are scarce in Argentine publications. The main purpose of this study was thus to analyze short and mid-term outcome of aortic valve replacement (AVR) combined or not with coronary artery bypass grafting (CABG) in octogenarian patients, in a high complexity surgical center of the Argentina Republic.

METHODS

Patients

From January 2005 to December 2010, 96 patients older than 80 years with degenerative severe aortic stenosis, underwent aortic valve replacement surgery combined or not with coronary artery bypass grafting at the Hospital Universitario Fundación Favaloro. A retrospective analysis was performed using clinical history data. The population was divided into two groups: 55 patients underwent isolated AVR (Group I), and 41 patients underwent AVR combined with CABG (Group II).

Follow-up

Follow-up was conducted in clinical cardiology outpatient visits in patients assessed at our institution, or by telephone interview in those who continued their follow-up at other centers. Between July-August 2011, all patients answered a structured survey on their health status, hospital readmissions (type and number), functional capacity, quality of life improvement, medical follow-up and satisfaction with the surgery.

Definitions

Non-elective surgery: It was surgery performed prior to hospital discharge in patients with severe aortic stenosis admitted to the hospital for syncope, sudden death, acute coronary syndrome or heart failure.

Revascularizable coronary disease: The decision to associate coronary bypass was based on the angiographic detection of epicardial coronary lesions > 70% and/or according to the treating surgeon

Preoperative risk score according to the additive EuroSCORE: Very high risk > 10 points; high risk: 6 – 9 points; moderate risk: 3 – 5 points; and low risk: 0 – 2 points. (8)

Pulmonary hypertension (PH): It was defined by transthoracic echocardiography according to the criteria used in the 2009 Pulmonary Hypertension European guidelines.

Stroke (CVA): It was a clinically compatible neurological impairment of > 24-hour duration, diagnosed by the Neurology service.

Functional class (FC): It was classified according to the New York Heart Association scale in FC I, II, III and IV

Prolonged mechanical respiratory assistance (MRA): It was MRA lasting more than 24 hours.

Surgical procedure

The surgical procedure was performed following a standard technique. Median sternotomy was used as access in all patients. Aortic (distal ascending aorta and or aortic arch) and single vena cava cannulation were done. Moderate hypothermia (28 to 32 °C) and antegrade and intermittent retrograde cold blood cardioplegia were used.

Statistical analysis

Dichotomous variables were expressed as integers and percentages, and compared at the univariate analysis using the chi-square test (with Yates' correction or Fisher's exact test as appropriate). Continuous variables were expressed as mean ± standard deviation, or median and interquartile range, and compared using the Wilcoxon sum rank test. The survival curve was built using the Kaplan-Meier method.

RESULTS

Population

Population age was 82 ± 2 years and 54% were men. In the group undergoing AVR associated with CABG there was a greater percentage of men (73% vs. 40%, p = 0.002), as well as more patients with history of acute myocardial infarction (14% vs. 0%, p = 0.005), stroke (9% vs. 0%, p = 0.03), and presence of peripheral vascular disease (12% vs. 0%, p = 0.012) compared with those undergoing isolated AVR, while the valve area was lower in this last group (0.58 ± 0.15 vs. 0.67 ± 0.20, p = 0.02). Table 1 shows that there were no differences between both groups in the rest of baseline characteristics nor in the echocardiographic parameters.

The most common symptom was exercise dyspnea, present in 84% of patients, followed by angina (31%) and syncope (14%). Only 3 asymptomatic patients

were operated-on because at follow-up they presented a pathological exercise test.

Among the total population, 10 patients (10%) had an ejection fraction (EF) < 40%, and 12 patients (12%) presented PH. Eighty-four patients (77%) had evidence of some degree of previous renal dysfunction: 64% had a CrCl of 40-60 ml/min, 12% a CrCl of 20-40 ml/min and there were no patients with CrCl < 20 ml/min or in chronic hemodialysis.

Mean valve area was 0.62 ± 0.18 cm2. Peak and mean gradients were 86 ± 27 mmHg and 54 ± 17 mmHg, respectively. Elective surgery was performed in 75 patients (78%) and non-elective surgery in 21 (22%).

According to the additive EuroSCORE, 3.1% of patients were moderate risk, 78.1% high risk and 17% very high risk patients, with similar values between groups, except for the Parsonnet score which was significantly higher in patients with combined surgery (13.3 ± 2.4 vs. 11.2 ± 2.2, p < 0.001).

The implanted valve was biological with stent in 100% of cases: 86 patients received a bovine pericardium valve and the remaining 28 a porcine valve, with an average size of 23 ±1.6 mm2. Extracorporeal circulation and cross-clamp times were respectively 92 ± 20 min and 71 ± 14 min for group I and 132 ± 28 min and 108 ± 24 min for group II (p ≤ 0.001).

Table 1. Baseline population characteristics

	Group I n=55	Group II n=41	p	Overall n=96
Male gender, n (%)	22(40)	30(73)	0.002	52(54)
Age, years	81.6±2	81.9±2	0.380	81.7±2
Body surface area, m2	1.82±0.24	1.87±0.18	0.033	1.84±0.2
Functional class:				
Functional class FC II, n (%)	25(45)	26(63)	0.485	51(53)
Functional class FC III, n (%)	19(34)	10(27.1)	0.473	29(30)
Asymptomatic, n (%)	2(3)	1(2)	0.962	3(3)
Symptoms:				
Dyspnea, n (%)	47(85)	34(83)	0.783	81(84)
Angina, n (%)	14(25)	17(41)	0.123	31(32)
Syncope, n (%)	7(13)	7(17)	0.572	14(15)
Hypertension, n (%)	48(87)	38(97)	0.517	86(90)
Dyslipidemia, n (%)	26(47)	20(49)	0.521	46(48)
Current smoker / ex smoker, n (%)	19(35)	18(44)	0.236	37(38)
Diabetes, n (%)	4(7)	6(15)	0.315	10 (10)
Chronic obstructive pulmonary disease	3(5)	1(2)	0.212	4(4)
(moderate-severe), n (%)				
Chronic atrial fibrillation, n (%)	4(7)	3(5)	0.641	7(7)
Chronic renal failure				
CrCl 41-60 ml/min, n (%)	34(62)	28(68)	0.686	62(64)
CrCl 20-40 ml/min, n (%)	8(14)	4(10)	0.706	12(12)
CrCl < 20 ml/min, n (%)	0	0	-	0
History:				
Unstable angina, n (%)	5(9)	8(19)	0.227	13(13)
Acute myocardial infarction, n (%)	0	6(14)	0.005	6(6)
Stroke n (%)	0	4(9)	0.030	4(4)
Heart failure, n (%)	15(27)	8(20)	0.478	23(24)
Peripheral vascular disease, n (%)	0	5(12)	0.012	5(5)
Coronary angioplasty, n (%)	2(3)	2(5)	0.164	4(4)
Pacemaker implantation n (%)	0	0	-	0
Previous surgery:				
Carotid endarterectomy, n (%)	0	3(7)	0.051	3(3)
Myocardial revascularization, n (%)	1(1)	0	0.082	1(1)
Left ventricular dysfunction, mod-sev, n (%)	5(9)	5(12)	0.967	10(10)
Pulmonary hypertension, n (%)	10(18)	2(5)	0.108	12(12)
Mitral regurgitation, mod, n (%)	11(20)	4(10)	0.342	15(16)
Peak aortic gradient, mmHg	86.1±28.3	87.4±26	0.900	86±27
Mean aortic gradient, mmHg	55.4±17.6	53.1±16.7	0.596	54±17
Valve area, cm2	0.58±0.15	0.67±0.20	0.021	0.62±0.18
Logarithmic Euroscore, %	9.7±4.7	10.6±5.1	0.411	10.1±4.9
Parsonnet, points	11.2±2.2	13.3±2.4	<0.001	12.1±2.5

CrCl: creatinine clearance

Postoperative complications

The incidence of postoperative complete atrioventricular block (CAB) was similar between the isolated AVR group and that with associated CABG: 16.4% vs. 12.2%, though without statistically significant differences for higher mortality. Among the 14 patients presenting with this complication, 1 required definitive pacemaker implantation, 11 recovered normal conduction and 2 died postoperatively.

There was a high incidence of postoperative atrial fibrillation (51%), which was expected in this age group and type of surgery (10), without differences between group I and group II (50.9% vs. 51.2%). Due to this complication, 25% of patients were anticoagulated at discharge. There were also no differences in the incidence of stroke (3.6% vs. 4.9%) and reoperations due to increased bleeding (12.7% vs. 12.2%), with a trend of presenting higher PAMI incidence in the group associated with CABG (9.8% vs. 1.8%, p = 0.083). Only one patient, belonging to group II, required hemodialysis, and the rate of intra-aortic balloon pump (IABP) was 6.2% (5.5% vs. 7.3%).

There were no differences in the median of hospital stay between both groups: 7 days (CI: 6-10) vs. 7 days (CI: 6-9). However, ICU stay (2 days (CI: 2-3) vs. 3 days (CI: 2-4); p = 0.024) and need for prolonged MRA (9.3% vs. 26.3%, p = 0.023) were higher in the AVR associated with CABG group.

Mortality

Overall 30-day mortality was 7.3% (7 patients). A non-significant trend towards higher mortality was found in the group combining AVR with CABG (2/55 patients, 3.6% vs. 5/41 patients, 12.2%; p = 0.089).

A very similar finding was observed in patients undergoing elective vs. non-elective surgery (4/7 patients, 5.3% vs. 3/2 patients, 14.3%; p = 0.095). Notably, all deaths in the non-elective group were combined surgeries. Thirty-day mortality in the subgroup of elective surgery patients was 4.3% in the case of isolated AVR, and 6.9% in AVR surgery combined with CABG.

Taking into account the additive EuroSCORE, 30-day mortality was 17% for high risk (17 patients), 5.2% for moderate risk (76 patients) and 0% for low risk (3 patients) subjects.

From the 7 patients who died within 30 postoperative days, 3 occurred in the context of cardiogenic shock, 2 due to multiple organ dysfunction and 2 for neurological complications (1 patient in the context of ischemic stroke and the rest with convulsive status epilepticus).

Chronic renal failure was the only one preoperative variable significantly associated with increased mortality in the univariate analysis: 25% (3/12 patients) vs. 4.9% (4/82 patients) mortality in patients with CrCl > 40 ml/min. As already described, there was also a trend towards higher mortality in non-elective surgeries and in those combined with CABG. In accordance with the latter, pump time was the intraoperative variable significantly associated with higher mortality (138 ± 19 minutes vs. 106 ± 30 minutes).

It is worth pointing out that both the Parsonnet score (12.1±2.5 vs. 12.3±3.1; p=0.87) as the Euroscore (9.9±4.6 vs.13.4±6.8; p=0.22) were not significantly associated with higher mortality. The area under the ROC curves for death at 30 days was 0.66 for the EuroSCORE and 0.58 for the Parsonnet score.

Follow-up- Quality of life

Mean follow-up was 3 years (IQ range: 1.4-4.6 years) and cumulative follow-up was 259 years-patient. Cumulative mortality was 14% (11 patients) during follow-up. The series mortality at 6 years was 19.7% (19 patients).

Out of the 77 patients who remained alive at the end of follow-up, 70 (91%) were interviewed. No complications, such as valve thrombosis, endocarditis or reoperation for valve dysfunction were reported during follow-up.

Ninety-one percent of patients clearly improved their quality of life after surgery. Among these, 96% believe it was a good decision to undergo surgery while the remaining 4% do not know whether this was a helpful choice.

Ninety-four percent of patients are in NYHA FV I-II and 6% in NYHA FC III. At the time of the interview, none of the patients was in tertiary level centers or with home care.

Seventy percent of patients are under medical surveillance at least every 6 months, 24% at least once a year and 6% only sporadically. There was no cause

	Group I n=55	Group II n=41	p	Overall n=96
Elective status, n (%)	46(83)	29(70)	0.130	75(78)
Non-elective status, n (%)	9(16)	12(29)	0.130	21(22)
By-pass number				
One, n (%)	-	17(41)	-	19(20)
Two, n (%)	-	11(27)	-	13(13)
Three, n (%)	-	12(29)	-	14(14)
Pump time, min	92±20	132.6±27.8	<0.001	109±31
Aortic clamping time, min	70.8±14	108.4±24.1	<0.001	86±26

Table 2. Surgical variables.

Table 3. Postsurgical complications.

	Group I n=55	Group II n=41	p	Overall n=96
Death at 30 days	2 (3.6)	5 (12.2)	0.089	7 (7.3)
Death at 30 days, elective surgery	2/46 (4.3)	2/29 (6.9)	0.105	4/75 (5.3)
Death at 30 days, non-elective surgery	0/9 (0)	3/12 (25)	0.105	3/21 (14.3)
Reoperation, n (%)	7(13)	5(12)	0.595	12(11)
Atrial fibrillation, n (%)	28(51)	21(51)	0.691	49(51)
Cardiac tamponade, n (%)	0	2(5)	0.183	2(2)
Intra-aortic ballon counterpulsation, n (%)	3(5)	3(7)	0.397	6(6)
Respiratory distress, n (%)	2(4)	4(10)	0.104	6(6)
Perioperative infarction, n (%)	1	4(10)	0.190	5(5)
Complete atrioventricular block, n (%)	9(16)	5(12)	0.826	14(14)
Mediastinitis, n (%)	0	1	0.412	1(1)
Hemodialysis, n (%)	0	1	0.631	1(1)
Stroke, n (%)	2(4)	2(5)	0.482	4(4)
Sepsis, n (%)	2(4)	4(10)	0.362	6(6)
Mechanical ventilation				
Not prolonged, n (%)	54(98)	28(68)	0.071	81(80)
Prolonged, n (%)	5(9)	10(24)	0.340	15(15)
Heart failure, n (%)	5(9)	8(19)	0.596	13(13)
New complete left bundle branch block, n (%)	3(5)	2(5)	0.567	5(5)
Definitive pacemaker implantation, n (%)	1(1)	0	0.657	1(1)
Tranfusions				
Red blood cells, International units	3.1±2.6	4±3.6	0.270	3.2±3
Plateletes, International units	3±6.1	4.4±8.5	0.281	2.9±5
Plasma, International units	1.4±2.1	2.4±3	0.146	1.6±2.1
Anticoagulation at discharge, n (%)	13(23)	12(29)	0.410	25(25)

for readmission in 70% of patients during follow-up. Among the remaining patients, 12% were readmitted due to cardiovascular causes and 18% for other reasons.

Survival

Survival at one year was 88%, at 2 years 85% and at 6 years 69% (Figure 3). Discharged patients presented 1-year, 2-year and 6-year survival of 97%, 94% and 76%, respectively.

DISCUSSION

In the present study we have observed that AVR surgery in octogenarian patients performed in a high complexity center is more than acceptable, with an overall 30-day mortality of 7.3%. This is even lower if we exclude patients who underwent non-elective surgeries, since 30-day mortality in elective surgery was 4.3% in isolated AVR and 6.9% when combined with CABG. These data are very important, since the natural history of symptomatic severe aortic stenosis without resolution is ominous, and is associated with a progressive deterioration of quality of life and high costs for the healthcare system (3). In Argentina, Piccinini et al. reported 30-day mortality of 10.3 % in 87 octogenarian patients undergoing isolated AVR, and of 9.5% in those with elective surgery (11). Considering these data from high volume and high complexity centers of our country, we notice that the results are within those described in different foreign series reporting a hospital mortality of 6-13 % for isolated AVR, reaching 12-24 % when combined with CABG. (12, 13, 14, 15, 16, 17).

Survival in our series, at 1 year, 2 years and 6 years was 88 %, 85 % and 69 % respectively. Our results are comparable with those reported by other studies and show good mid-term survival, especially if adjusted to patients' age and comorbidities (14, 16, 17, 18).

The results of the quality of life survey are interesting: 94% of patients have at least annual medical monitoring and 96 % are satisfied with the decision of having undergone the surgery. This is surely closely related to good postoperative functional class, which allows 94 % of the sample to perform daily activities asymptomatically. Another no less important fact is that 88 % of patients were not readmitted from cardiovascular causes during follow-up. Patients who died during follow-up did so mostly by diseases related to aging such as hip fracture, infections, cancer, and not for late surgery complications.

One question that arises from our study is whether the risk scores predict the actual risk in this patient's population: the EuroSCORE and Parsonnet score were poor predictors of 30-day mortality, as they were not only unrelated with increased mortality but the area under the ROC curve for predicting mortal-

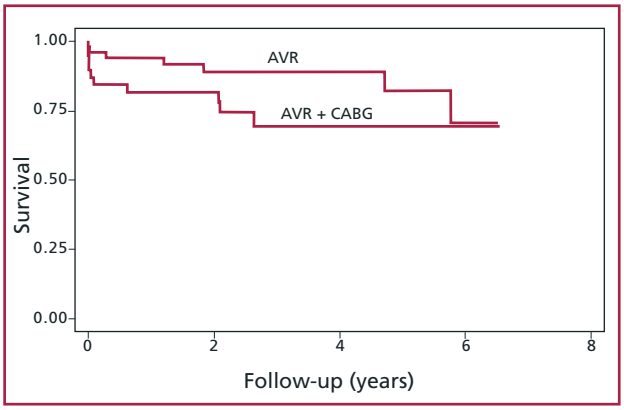

Fig. 1. Kaplan Meier Survival Curve

ity was very low, with values < 0.7 in both cases. Different publications have shown similar results, with an overestimation of up to 3 times the risk of death predicted by the EuroSCORE, both in its additive as logistic variants, with respect to the actual surgical results at 30 days in octogenarian and nonagenarian populations. (19) Currently, the most used preoperative risk scores such as the EuroSCORE and the STS SCORE are not satisfactory per se to refuse surgery to this age group because they overestimate risk: with the EuroSCORE, a patient older than 80 years without any comorbidity is categorized as of high surgical risk (20).

Although the age variable should be taken into account when making surgical decisions, because it adds risk in any of the preoperative scores used, it should not be a formal contraindication to surgery by itself, as evidenced by our results and other studies: Bakaeen et al. compared patients older and under 80 years of age with AVR, adjusting populations for risk profile, and concluded that although octogenarian patients have greater morbidity, mortality in both populations was similar. (21) Despite this, patients with surgical indication are still excluded from AVR surgery mainly because of age, or the presence of elevated preoperative risk scores. According to the 2005 Euro Heart Survey on valvular heart disease, AVR was contraindicated in 1 out of 3 patients > 75 years with symptomatic severe aortic stenosis. The main reasons claimed were old age, impaired left ventricular function and previous neurological dysfunction, with other comorbidities such as renal or pulmonary failure being barely considered (22). The latter is striking, since chronic renal failure was the preoperative variable most strongly associated with poor prognosis, accounting for 25% mortality in this subgroup. The other intraoperative variable associated with higher mortality was pump time, probably related to the greater number of non-elective or combined surgeries. It is noteworthy that despite this, when the subgroup of patients with associated CABG was analyzed, the by-pass number alone was not related to mortality, though it may increase surgical times. Despite the deterioration of left ventricular function adds risk in all preoperative scores, from the 10 patients in our series with severe left ventricular dysfunction, only 1 (10%) had a fatal postoperative outcome.

Different options such as valvuloplasty or percutaneous valve replacement have failed to show better short-term results than surgery, even in patients at high surgical risk. In- hospital mortality of 10% (23) and restenosis at 6 months in 1 out of 3 patients (24) have been reported with valvuloplasty. Furthermore, percutaneous aortic valve implantation in patients at high risk by the EuroSCORE has resulted in 30-day mortality of 12% with unknown mid-term results, although we should mention that in this case the selected patients seem to have a higher risk profile than those of our population, with a mean EuroSCORE of 20 ± 2. (25) Even though percutaneous aortic valve replacement is an attractive alternative to surgery, mainly in very high risk patients, there is still much to be established worldwide in terms of short and long-term morbidity and mortality and more so in our country, where the series published by different high complexity centers do not exceed 100 patients. With the passing of years, improved devices and operators' expertise will surely turn it into a good option for those patients at high surgical risk. In our experience, and with the intention of reducing the mortality of non-elective surgical valve replacement in octogenarian patients, every attempt must be made to compensate the patient on admission, and to schedule surgery far from the acute event, under a close clinical ambulatory surveillance. If this is not possible, the best multidisciplinary therapeutic option should be assessed

Limitations

This is a retrospective single center study, so that the results should be interpreted with caution, hindering their generalization to other centers of our country

The evaluation of quality of life and satisfaction with the procedure was conducted by telephone interview without an objective observation of the functional class. In addition these data were obtained as a cohort study irrespective of length of the postoperative evolution of each patient and without individual follow-up.

CONCLUSIONS

According to the study findings, aortic valve replacement surgery in octogenarian patients associated or not to CABG is a procedure with good short and mid-term outcome when performed electively in an experienced center. Unless there are severe concomitant comorbidities or too short life expectancy, this type of surgery should not be contraindicated only considering isolated age or preoperative risk score, as it is able to provide this age group significant improvement in terms of survival and quality of life.

RESUMEN

Cirugia de reemplazo valvular aortico en pacientes octogenarios. resultados perioperatorios y seguimiento a mediano plazo

Introducción
En las últimas décadas el número de pacientes ancianos que requieren cirugía cardíaca por estenosis aórtica degenerativa ha ido en aumento. El objetivo de nuestro trabajo es comunicar la experiencia de un centro en la cirugía de reemplazo valvular aórtico en octogenarios y su seguimiento a mediano plazo.

Material y métodos
Desde enero 2005 a diciembre 2010, 96 pacientes consecutivos mayores de 80 años de edad portadores de estenosis valvular aórtica severa degenerativa fueron sometidos a cirugía de reemplazo valvular asociada o no a revascularización miocárdica en el Hospital Universitario Fundación Favaloro. Los datos fueron obtenidos en forma restrospectiva y se compararon ambas poblaciones en términos de morbimortalidad. Se realizó un seguimiento de los pacientes para análisis de calidad de vida mediante entrevistas personales y telefónicas.

Resultados
La edad de la población fue de 82±2 años, siendo el 54% de sexo masculino. El síntoma más común fue la disnea de esfuerzo, presente en el 84% de los pacientes, En 84 pacientes (77%) se halló algún grado de disfunción renal previo. Según el EuroSCORE aditivo, 78.1% fueron pacientes de alto riesgo y un 17.7% de muy alto riesgo. Se les realizó reemplazo valvular aórtico aislado a 55 pacientes (grupo I) y asociado a revascularización miocárdica a los 41 restantes (grupo II). La mortalidad total a 30 días fue 7.3%, siendo 3.6% para el grupo I y 12.2% para el grupo II (NS). Teniendo en cuenta las cirugías electivas, estas cifras descienden a 5.3%, 4.3 % y 6.9 % respectivamente (NS). Durante el seguimiento a 6 años se registró una mortalidad acumulativa de 14%. En el seguimiento, el 94% se encuentra en NYHA CF I-II y el 88% no debió reinternarse por causa cardiovascular.

Conclusiones
La cirugía de reemplazo valvular aórtico en pacientes octogenarios, asociada o no a revascularización miocárdica, es un procedimiento con buenos resultados a corto y mediano plazo realizada en un centro con experiencia y en forma electiva por lo que no debería ser contraindicada teniendo en cuenta en forma aislada la edad o el puntaje de riesgo prequirúrgico.

Palabras clave > Estenosis de la Válvula Aórtica – Procedimientos quirúrgicos cardiovasculares-Geriatría- Estudios de Seguimiento.

Conflicts of interest
None declared.

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