Abstract

Objectives: The present study is aimed at evaluating the long-term outcomes (up to 12 years of follow-up) of patients undergoing aortic valve replacement using bovine pericardial prostheses.

Method: From March 1992 to January 2003, 287 patients underwent aortic valve replacement as a single procedure, using bovine pericardial prostheses. Of these, 189 (65.9%) were males. Ages ranged from 15 to 82 years with a mean and standard deviation of 53.6 ± 15.1 years and median of 56 years. The diameters of the bioprostheses ranged from 21 to 29 mm, of which 23 mm (105 cases, 36.6%) and 25 mm (105 cases, 36.6%) were the most prevalent sizes. Only in 1 patient was a 29-mm prosthesis implanted. The assessed variables were late overall survival, comparative survival of patients < 70 years and ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥geist

Results: The overall actuarial survival at the end of 12 years was 91.7 ± 2.2%. Separate analysis of patients < 70 years (Group A= 252 patients) and ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥≥ ≥≥≥≥geist

Conclusions: The use of bovine pericardial prostheses in patients with aortic valve disease provides an excellent survival rate over 12 years of follow-up. Patients with 70 years and over had a significantly lower survival, but dysfunctions were only observed in the younger group of patients.

Descriptors: Bioprosthesis, Aortic valve, Survival, Clinical Evolution.
INTRODUCTION

In the last decades, in an attempt to find a valvular prosthesis with the closest possible hemodynamic performance to native valves, new alternatives emerged aiming at reducing primary failures related to prostheses, to diminish the left ventricular mass and increase the survival rate [1-4].

Knowledge that the aortic valve could be replaced originated in 1952, when Charles Hufnagel implanted a ball-valve prosthesis in the ascending aorta of a patient suffering from severe aortic failure [5]. From then on a great number of valve prostheses have been widely used with several new over-70-year-old patients and the re-intervention free survival rate was 94.7 ± 1.7%, whereas in group B it was 58.1 ± 17.2% (Logrank test p-value = 0.0005; Hazard ratio 0.20 CI 95% 0.01 a 0.29). A taxa livre de reintervenções por causa primária da bioprótese foi de 96.1±2.0%, ao final de 12 anos. Os quatro pacientes que apresentaram disfunção pertenciam ao grupo A, com média de idade de 49,7 anos.

Conclusão: O uso da bioprótese de pericárdio bovino em portador de doença valvular aórtica proporciona excelente taxa de sobrevivência após 12 anos de seguimento. Pacientes com idade igual ou superior a 70 anos apresentaram sobrevivência significativamente menor, mas as disfunções ocorreram exclusivamente no grupo de menor idade.

The re-intervention free rate for any cause related to primary bioprosthetic dysfunction was 96.1 ± 2.0 at the end of 12 years (Figure 3). The four patients who presented with dysfunction belonged to Group A, with an average age of 49.7 years.

**DISCUSSION**

The improved techniques for the production of prostheses, the trans-operative period with a better control of myocardial protection and cardiopulmonary bypass and the post-operative period with better drugs and more sophisticated propedeutic methods have all enabled a longer life and a better quality of life for patients. However, there is still a challenge to produce an ‘ideal prosthesis’. The complications inherent to the presence of prostheses are real and depend on specific aspects of each individual patient.

Evidence points to the long-term advantages of bioprostheses [19,20]. In respect to bioprostheses, two basic aspects should be considered: the type of material utilized and the use of stented or stentless prostheses. Several publications have been produced approaching the hemodynamic behavior of prostheses in respect to these aspects [21,22]. Bovine pericardial prostheses possess excellent hemodynamic function [23], however the structural deterrioration is a weak point, thus putting its durability into question.

We believe that the resistance and the survival rate of patients are highly relevant results dependent on the hemodynamic performance of the prostheses. GLOWER et al. in 1994, published an evaluation of 960 patients who underwent aortic valve replacement using porcine bioprostheses and confirmed that 76% ± 3% of the patients were free of reoperations after 10 post-operative years [24]. One year after, COSGROVE et al. [25](1995) published their results with bovine pericardial prostheses with low structural deterioration over ten years of follow-up. Recently, VITALE et al (2003) demonstrated reduced mortality and morbidity rates with Perimount bovine pericardial bioprostheses over a 12-year period [26].

Cohen et al. in 2002, demonstrated there was no hemodynamic advantage using stentless in comparison to stented prostheses in 12 months of follow-up [15]. This instigated our study.

The BIOPRO bioprosthesis utilized to replace the aortic valve gave excellent results over up to 12 years of follow up, similar to the results on the Perimount bovine pericardial prostheses that is considered the gold standard. The survival rates and primary dysfunctions related to the bioprostheses certainly demonstrate advantages for the patient.

**CONCLUSION**

The use of BIOPRO bovine pericardial bioprostheses in aortic valve disease patients gives an excellent survival rate over a 12-year follow-up period. Patients with ages greater than or equal to 70 years present with a significantly lower survival rate, but dysfunctions exclusively occurred in patients in the lower age range.
BIBLIOGRAPHIC REFERENCES


