Durability of Homografts Used to Treat Complex Aortic Valve Endocarditis

Willem Flameng, MD, PhD, Willem Daenen, MD, Ramadan Jashari, MD, Paul Herijgers, MD, PhD, and Bart Meuris, MD, PhD

Department of Cardiac Surgery, KU Leuven, University Hospitals Leuven, Leuven, and European Homograft Bank, Brussels, Belgium

Background. **Acute bacterial endocarditis may be extremely destructive for cardiac valves and their periannular structures. It has been suggested that complex reconstruction procedures require the use of homografts because of their versatility and potency to resist repeated infection.**

Methods. **We studied the long-term results of 69 patients with complex endocarditis who received homografts in the aortic position.**

Results. **The results after a mean follow-up of 8.1 ± 5.1 years (median, 8.0 years) showed that the recurrence of endocarditis even in these complex cases is low (7%), but the incidence of structural valve degeneration (SVD) is high. Freedom from SVD at 10 years is only 60.0%. When aortic homografts degenerate, they predominantly calcify.**

Conclusions. **The use of homografts to reconstruct endocarditis-related aortic valve destruction is associated with a low recurrence of endocarditis but a high incidence of SVD in the long run.**

(Ann Thorac Surg 2015;99:1234–8)
© 2015 by The Society of Thoracic Surgeons

In the literature, the use of a homograft as treatment for acute aortic endocarditis has been associated with a lower incidence of recurrence of endocarditis than has the use of a prosthetic valve [1]. Therefore the homograft has been advocated as the first choice to replace an infected valve [2]. In contrast, from long-term studies in nonendocarditis valve pathologic conditions, we have learned that homografts are prone to structural valve degeneration (SVD), mainly in younger patients [3, 4]. Even in elderly patients, significantly more valve degeneration and a higher need for reoperation has been reported after aortic root replacement with a homograft than after the use of a Freestyle bioprosthesis (Medtronic Inc, Minneapolis, MN) [5].

Specifically in the setting of acute bacterial endocarditis, long-term durability of homografts has never been systematically studied. Also, whenever the durability of homografts implanted for endocarditis has occasionally been reported, it was regarding the need for reoperation and not based on echocardiographic criteria of valve function. It can be shown in previous reports that the reoperation rate significantly underestimates the rate of SVD [6].

In the present study, we describe the long-term results of 69 patients undergoing aortic valve replacement for acute complex bacterial endocarditis. Besides mortality, reoperation rates, and recurrence of endocarditis, the development of SVD based on serial echocardiography is reported.

Accepted for publication Nov 3, 2014.

Address correspondence to Dr Meuris, Department of Cardiac Surgery, UZ Gasthuisberg, Herestraat 49, B-3000 Leuven, Belgium; e-mail: bart.meuris@uzleuven.be.

Material and Methods

The study was approved by the Ethical Committee of the University Hospitals Leuven (Belgium), and the need for individual patient consent was waived.

Homografts

Cryopreserved homografts were provided by the European Homograft Bank and processed as described previously [7]. Sixty-six aortic and 3 pulmonary homografts were used. In most cases, aortic root homografts had the anterior mitral valve leaflet preserved during graft procurement. This allowed the closure of subannular defects in extensive aortic root destruction as well as simultaneous replacement of the entire recipient anterior mitral leaflet together with aortic root replacement (surgical details are described further on).

Patient Population and Valve Pathologic Processes

A total of 69 patients were operated on for congestive heart failure caused by severe valve insufficiency eventually combined with septic systemic embolization. All characteristics are listed in Table 1. The patients received a homograft in the aortic position because of acute complex endocarditis. Thirty-one (43%) patients had undergone previous cardiac operations: aortic valve replacement (n = 19), aortic valve replacement combined with coronary artery bypass grafting (CABG) (n = 6), Bentall procedures (n = 2), Bentall procedures combined with CABG (n = 2), and atrial septal defect closure (n = 2).

Acute endocarditis was of bacterial (n = 68) or fungal (n = 1) origin. The following micro-organisms were found: *Staphylococcus aureus*, methicillin-resistant *S*

© 2015 by The Society of Thoracic Surgeons
Published by Elsevier

0003-4975/$36.00
http://dx.doi.org/10.1016/j.athoracsur.2014.11.002

Table 1. Patient Demographics

Variable	Aortic Homograft
Number of patients	69
Sex	19 female
Age (y), mean (range)	55 (25–50)
Smoking (% of patients)	25
Family history CAD (%)	3
Diabetes (%)	13
Obesity (%)	6
Hypercholesterolemia (%)	7
Renal failure (%)	15
Hypertension (%)	16
Pulmonary hypertension (%)	9
Stroke (%)	9
TIA (%)	6
Cardiomegaly (%)	22
COPD (%)	6
Previous AMI (%)	4
Cardiogenic shock (%)	9
Sinus rhythm (%)	77
Atrial fibrillation (%)	10
Pacemaker (%)	4
NYHA functional class (%)	
I	4
II	10
III	20
IV	53
V	13
Septic embolization (%)	12

AMI = acute myocardial infarction; CAD = coronary artery disease; COPD = chronic obstructive pulmonary disease; NYHA = New York Heart Association; TIA = transient ischemic attack.

aureus, *Streptococcus viridans*, *S milleri*, *S bovis*, *S epidermidis*, *S sanguis*, and *S mutans*, *Enterococcus faecalis*, *Pseudomonas*, and *Candida*.

Aortic valve pathologic processes were restricted to the leaflets (vegetations or perforations, or both) in 17 patients (24%). The other patients had either additional abscess formation in the aortic annulus (n = 13 [19%]) additional abscess formation in the annulus extending to the left ventricular outflow tract (LVOT) musculature causing aortoventricular discontinuity (n = 26 [38%]) or periannular abscess formation which induced intracardiac fistulas extending to the left or right ventricle (n = 11 [16%]). In 1 case, only the aortic wall was infected, with minor involvement of the aortic valve.

In 6 patients with primary infection of the aortic root, the endocarditis process extended to the anterior leaflet of the native mitral valve. In these cases, there was always destruction of the anterior part of the mitral annulus combined with abscess formation within the anterior mitral leaflet. In none of these patients did the chords showed visible involvement. In 1 patient, the posterior leaflet also showed a vegetation.

Surgical Procedures

All operations were performed between 1991 and 2003. In aortic valve endocarditis, the subcoronary implantation technique was used in 8 patients showing only leaflet involvement (11%). In all other patients, full aortic root replacement was performed. In 31 patients (45%), the proximal anastomosis was made at the annular level, and in 4 patients (6%) it was made at the level of the LVOT because of massive destruction at the annular level. In 19 patients (27%), subannular defects were closed using the anterior mitral leaflet of the aortic homograft. The average size of the aortic homograft was 20 mm (range, 19–29 mm). Concomitant operations were performed in 24 patients (35%): mitral valve replacement (n = 3), mitral valve repair (n = 3), tricuspid valve repair (n = 1), CABG (n = 9), LVOT reconstruction with a patch (n = 6), and closure of a VSD with a patch (n = 2).

In 6 patients, the anterior leaflet of the mitral valve was also involved in the infectious process and was secondary to the aortic valve endocarditis. Because the chords were never involved, the anterior leaflet of the implanted aortic homograft root could be used to replace the infected native leaflet, with preservation of the native chords in 5 of 6 cases. If necessary, polytetrafluoroethylene chords were also implanted. In 3 patients, a mitral annuloplasty ring was added. In 1 patient, a separate mitral homograft was used to replace the anterior leaflet of the mitral valve. In this patient, the mitral leaflet of the aortic homograft root had already been used to close a subannular muscle defect.

Follow-Up

Mean follow-up duration was 8.1 ± 5.1 years (409 patient-years; maximum follow-up, 22 years). Clinical follow-up was 100% complete. Serial echocardiography was performed on a yearly basis by the referring cardiologist. For the formulation of valve-related complications, standard guidelines and definitions of terms were used according to published recommendations [8]. SVD was diagnosed as being either stenosis-type SVD or regurgitation-type SVD [6].

Statistical Analysis

Kaplan-Meier curves were constructed for survival, freedom from reoperation, and freedom from SVD. For these analyses, only the hospital survivors were taken into account. STATISTICA, version 12.0 (StatSoft, Tulsa, OK) was used for analysis.

Results

Hospital Mortality

Hospital mortality was 24% (17 of 69 cases). Causes of death included septic shock (n = 8, including 1 patient who received a combined aortic and partial mitral homograft), bleeding complications or tamponade, or both (n = 8), and ventricular fibrillation (n = 1). Time of death varied between 1 day and 5 months postoperatively. In

Download English Version:

https://daneshyari.com/en/article/2874060

Download Persian Version:

https://daneshyari.com/article/2874060

Daneshyari.com