

Introduction

Since 1992, the preferred technique in our Department for aortic valve replacement (AVR) with homografts (HG) has been root replacement - which poses a surgical challenge when a redo procedure becomes necessary: Due to implantation technique and calcification, the redo procedure might pose a higher risk in comparison to other prostheses. The aim of the present study was to evaluate the outcome after homograft redo surgery based on data from the biggest patient cohort in Germany for this procedure.

Methods

Between May 1992 and August 2009, 363 adult patients underwent valve replacement with homografts in our Department of cardiac surgery. All patients underwent prospective follow-up on an annual basis including medical history, clinical examination and echocardiography. Ninety out of the 363 patients (24,8%) had an indication for homograft replacement due to degenerative or infective alterations and were analysed in this study.

PRIMARY OPERATIVE TECHNIQUE

	Aortic HG	Pulmonary HG	
Subcoronary technique	n = 47	n = 22	n = 69
Root replacement technique	n = 268	n = 26	n = 294
	n = 315	n = 48	n = 363

TECHNIQUE OF THE REDO OPERATION

1. The homograft was dissected and removed 'enbloc' sparing the coronary buttons
→ total replacement of the aortic root in Bentall-DeBono technique
2. In case of a flexible homograft wall, only the leaflets were excised
→ aortic valve prosthesis (mechanical/biological) was implanted into the annulus
3. In case of severely calcified aortic annulus and wall, but thin and friable leaflets
→ transapical HG replacement with an Edwards-Sapien®-Transcatheter-valve (TAV)

Table I

	Aortic HG	Pulmonary HG	
Subcoronary technique	13	12	25
Miniroot technique	56	9	65

Table I shows the different implantation techniques distributed between the two utilised graft types at the time of the redo procedure.

Results

PATIENTS

Seventy three of the 90 patients were male (81%) and 17 female (19%). Mean age at redo operation was 55.15 ± 12.09 years. Mean time between HG implantation and redo operation was 7.63 ± 3.55 years (longest time until redo: 15.54 years). The mean follow-up time after HG replacement was 3.85 years (up to 14.55 years).

INDICATIONS FOR HOMOGRAFT REPLACEMENT

Table II

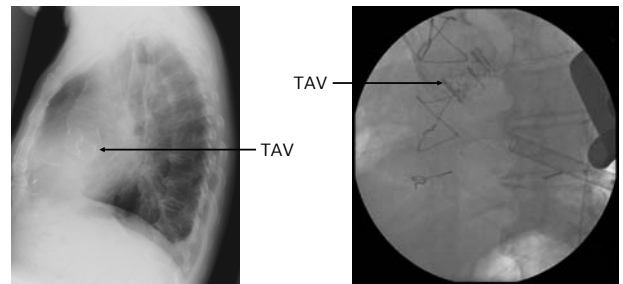
Indications for operation	n	
Aortic valve regurgitation	57	63 %
Aortic valve stenosis	19	21 %
Acute homograft endocarditis	14	16 %
Overall replaced homografts	90	

REDO OPERATION

Classical Bentall or valve in valve procedure (with mechanical/biological prosthesis) was done in 86 cases, classical transapical homograft replacement with an Edwards-Sapien®-Transcatheter-valve (TAV) in 4 patients.

COPROCEDURES

Nine patients had coronary bypasses as coprocedures, in 4 patients additional mitral valve reconstruction was necessary. One patient underwent a reconstruction of the tricuspid valve and 1 patient had a replacement of the ascending aorta.



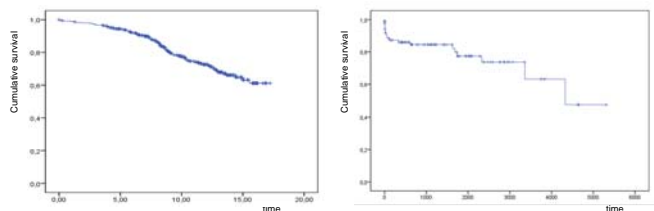
Transapical homograft replacement with an Edwards-Sapien®-Transcatheter-valve (TAV)

SURVIVAL

Overall 30 day mortality after redo operation was 8.9% (n=8, all of these patients were suffering from severe homograft endocarditis), survival rates after 1 and 5 years were 86.0% and 77.4 %.

Figure I

Kaplan-Meier graphs depicting actuarial patient survival of the overall homograft cohort (n=363) and after redo operation (n=90).



Survival after homograft implantation

Survival after redo operation

Conclusions

The risk for a redo procedure after homograft aortic valve replacement seems to be comparable to other prostheses. Mortality was, however, elevated in patients with a homograft infection.

Based on our limited experience, transapical procedures are safe and feasible - they might be our preferred technique for the future. Yet valve infections remain a contraindication for transapical procedures.