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Ten years follow-up of Bicuspid Aortic Valve (BAV) Repair according to morphology, functional classification and surgical techniques.

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BAV is frequently associated with aortic insufficiency (AI) due to cusp disease and/or aortic root dilation. Based on valve morphology and functional classification of AI, a systematic approach was used for aortic valve repair (AVR). **METHODS:** 125 consecutive BAV patients (54 ± 12 years) underwent between February 2003 and December 2012 non-emergent AVR for AI with or without aortic root surgery. Functional Type I lesions were detected in 30 patients (24%), Type II in 75 (60%) and Type III in 20 (16%). Cusp pathology was treated with central plication (n: 42), free edge reinforcement (n: 32), triangular resection (n: 17), pericardial patch (n: 11) and the "chordae technique" (n: 38). Root dilation was corrected with valve sparing reimplantation (n: 55). Mean follow-up was 68 ± 36 months. **RESULTS:** There were 6 late cardiac deaths, with an overall late survival of 91.2%. Freedom from recurrent AI (≥ 2) was 92.8%. Freedom from re-operation (9 patients) was significantly different in functional type I and II vs type III (p<0.01) and in plication and chordae technique vs free margin reinforcement (p<0.01). Patients undergoing combined repair and stabilization of the functional aortic annulus (reimplantation technique) have a significantly lower recurrence of AI compared with those undergoing AVR alone (p=0.02). **CONCLUSIONS:** BAV Type I and II can be reproducibly repaired and are associated with a lower incidence of recurrent AI. Free edge reinforcement with Gore-Tex had worse long term results. Valve sparing reimplantation had better outcomes compared with isolated repair. Functional aortic annulus stabilization should be considered as a protective factor against recurrent AI.

Bicuspid valve		
Type 0:	26 (20.8%)	
Type 1:	78 (62.4%)	
Type 2:	21 (16.8%)	
NYHA Class		
II	84 (67.2%)	
III	32 (25.6%)	
IV	9 (7.2%)	
Ascending Aortic Pathology:		
Atherosclerotic Aneurysm	30 (24%)	
Degenerative	86 (68.8%)	
Marfan	9 (7.2%)	
Type of valve dysfunction:		
Type I	30 (24%)	
Type II	75 (60%)	
Type III	20 (16%)	
Grade of AI:		
Moderate-to-severe	59 (47.2%)	
Severe	66 (52.8%)	
Aortic root diameter:		
<40 mm	36 (28.8%)	
40-45 mm	31 (24.8%)	
>45 mm	58 (46.4%)	

Cusp repair:		
Plication	42 (33.6%)	
Free edge reinforcement	32 (25.6%)	
Chordae technique	38 (30.4%)	
Triangular resection of raphe + re-suture	17 (13.6%)	
Pericardial patch	11 (8.8%)	
Procedures on functional aortic annulus		
Aortic root reimplantation	55 (44%)	
Supracommissural aortic replacement	31 (24.8%)	
Subcommissural plasty	29 (23.2%)	
Associated surgical procedures:		
CABG	21 (16.8%)	
Mitral valve repair	14 (11.2%)	
Intraoperative		
CPB time (min)	107±40	
Cross-clamp time (min)	98±33	

Variables	p value	HR	95% CI
Bicuspid type 2	0.0003	10	6.6-92
Isolated BAV repair	0.001	7.0	1.9-50
Free edge reinforcement with Gore-Tex	0.01	4	1.7-15

