

Indications for Aortic Valve Interventions in Pediatric Patients with Bicuspid Aortic Valve

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Introduction: Bicuspid Aortic Valve (BAV) is one of the most common causes of aortic valve (AV) intervention in pediatric patients. There is limited data available regarding the indications used by cardiologists and surgeons for deciding mode of intervention in pediatric patients with BAV.

Methods: Mayo Clinic Echocardiography Database was retrospectively reviewed to identify 1010 patients (<22 years) diagnosed with BAV from 1990-2015. Indications for aortic valve interventions were interpreted from the clinical and surgical notes.

Results: Out of 1010 patients with BAV, 109 (10.7%) young patients underwent interventions of the AV. In patients with BAV, critical aortic stenosis (CAS) (100%) and left ventricular hypertrophy (LVH) (43%) were the most common indications for balloon valvuloplasty. Similarly, CAS was the primary indication for surgical valvotomy, but in slightly older patients (mean age 4.7 years). Surgical repair/valvuloplasty was performed mainly for aortic regurgitation (AR) (69%), in yet older patients (mean age 10 years). AV replacement (AVR) was a fourth modality utilized, and was performed mainly for AR (72%), at a mean age of 17 years. AVR was the intervention most likely to take into account clinical presentation (38%). Echocardiographic data is mentioned in the table.

Conclusions: 10.7% young patients with BAV had severe enough disease that warranted aortic valve intervention. Type of valvular dysfunction, as well as age, were important factors in decision-making. Symptomatic presentation was considered more important for AVR.

	Balloon Valvuloplasty	Surgical Valvotomy	Surgical Repair	Aortic Valve Replacement
Total No.	51	29	18	39
Right-left fusion	29(57%)	16(55%)	12(67%)	18(46%)
Right-non fusion	22(43%)	13(45%)	6(33%)	21(54%)
Mean Age (years)	2.7	4.7	10	17
Male/Female				
Symptomatic	35%	38%	40%	64%
Factors in Deciding Mode of Intervention				
Aortic Stenosis	100%	100%	37%	48%
Aortic Regurgitation	0%	0%	69%	72%
CAVD	0%	0%	6%	21%
LVH	43%	24%	12%	3%
Clinical Presentation	18%	14%	19%	38%
Imaging Data				
AS gradient (mmHg)	62 _± 22	49 _± 22	42 _± 35	35 _± 26
AR grade	1	2	4	4
LV Mass Index (g/m²)	82 _± 38	103 _± 28	119 _± 36	129 _± 45
PWT (z-score)	1.6 _± 2	1.6 _± 1.4	2.2 _± 1.9	1.1 _± 1.5

CAVD, combined aortic valve disease; LVH, left ventricular hypertrophy; PWT, posterior wall thickness; AS, aortic stenosis; AR, aortic regurgitation.