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Transthoracic Echocardiographic Measurement of the Ascending Aorta in Bicuspid Aortic Valve Patients: A Simple Standardized Method

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TABLES & FIGURES

Table 1. Clinical and Echocardiographic Characteristics of Patients With Bicuspid and Tricuspid Aortic Valves

	BAV (n=45)	Control (n=45)	p
Age, y	47.5 ± 12.6	47.6 ± 12.6	
Men, %	60	60	
Height, cm	172 ± 11	173 ± 12	
Weight, kg	83 ± 23	88 ± 20	
Body surface area, m^2	1.98 ± 0.27	2.01 ± 0.26	
Heart Rate	70 ± 10	77 ± 12	
SBP, mm Hg	121 ± 14	119 ± 8	
DBP, mm Hg	75 ± 10	76 ± 10	
Ejection Fraction, %	63 ± 8	63 ± 4	
Mild AS	19 (42%)	0	
Moderate AS	2 (4%)	0	
Severe AS	0	0	
Mild AR	16 (36%)	5 (11%)	
Moderate AR	12 (27%)	0	
Severe AR	0	0	

Table 2. Aortic Dimensions at Various Locations and in Different Phases of the Cardiac Cycle in Patients with Bicuspid and Tricuspid Aortic Valves

	BAV (n=45)	Control (n=45)	p
End-diastole			
1cm	3.50 ± 0.49	2.92 ± 0.38	
2cm	3.75 ± 0.54	3.01 ± 0.37	
3cm	3.84 ± 0.58	3.05 ± 0.38	
End-systole			
1cm	3.59 ± 0.48	3.00 ± 0.35	
2cm	3.84 ± 0.54	3.10 ± 0.35	
3cm	3.95 ± 0.58	3.15 ± 0.36	
Mid-systole			
1cm	3.69 ± 0.49	3.05 ± 0.35	
2cm	3.96 ± 0.54	3.16 ± 0.35	
3cm	4.06 ± 0.58	3.22 ± 0.36	

Table 3. Percentage of Dilated Aortas Detected In Patients With Bicuspid Valves Using Control Criteria Applied Under Various Measurement Methodologies

	Control + 2SD (n=45)	Dilated BAV (n=45)	p
End-diastole			
1cm	3.67	16 (36%)	
2cm	3.75	24 (53%)	
3cm	3.81	25 (56%)	
End-systole			
1cm	3.70	19 (42%)	
2cm	3.81	24 (53%)	
3cm	3.88	25 (56%)	
Mid-systole			
1cm	3.74	21 (47%)	
2cm	3.87	28 (62%)	
3cm	3.94	28 (62%)	

Table 4. Mean Differences In Aortic Diameter Between Different Phases of the Cardiac Cycle In BAV Patients and Controls

	BAV (n=45)	Control (n=45)	p
1cm			
ES-ED	0.10 ± 0.11	0.08 ± 0.09	
MS-ES	0.09 ± 0.10	0.05 ± 0.06	
MS-ED	0.19 ± 0.13	0.13 ± 0.09	
2cm			
ES-ED	0.09 ± 0.15	0.10 ± 0.06	
MS-ES	0.12 ± 0.08	0.06 ± 0.04	
MS-ED	0.21 ± 0.13	0.16 ± 0.09	
3cm			
ES-ED	0.11 ± 0.13	0.10 ± 0.08	
MS-ES	0.10 ± 0.09	0.06 ± 0.05	
MS-ED	0.22 ± 0.13	0.17 ± 0.09	

Table 5. Percentage of Dilated Aortas Detected In Patients With Bicuspid Valves Using Control Criteria Applied Under Various Measurement Methodologies

	Control + 2SD (n=45)	Dilated BAV (n=45)	p
End-diastole			
1cm	3.67	16 (36%)	
2cm	3.75	24 (53%)	
3cm	3.81	25 (56%)	
End-systole			
1cm	3.70	19 (42%)	
2cm	3.81	24 (53%)	
3cm	3.88	25 (56%)	
Mid-systole			
1cm	3.74	21 (47%)	
2cm	3.87	28 (62%)	
3cm	3.94	28 (62%)	

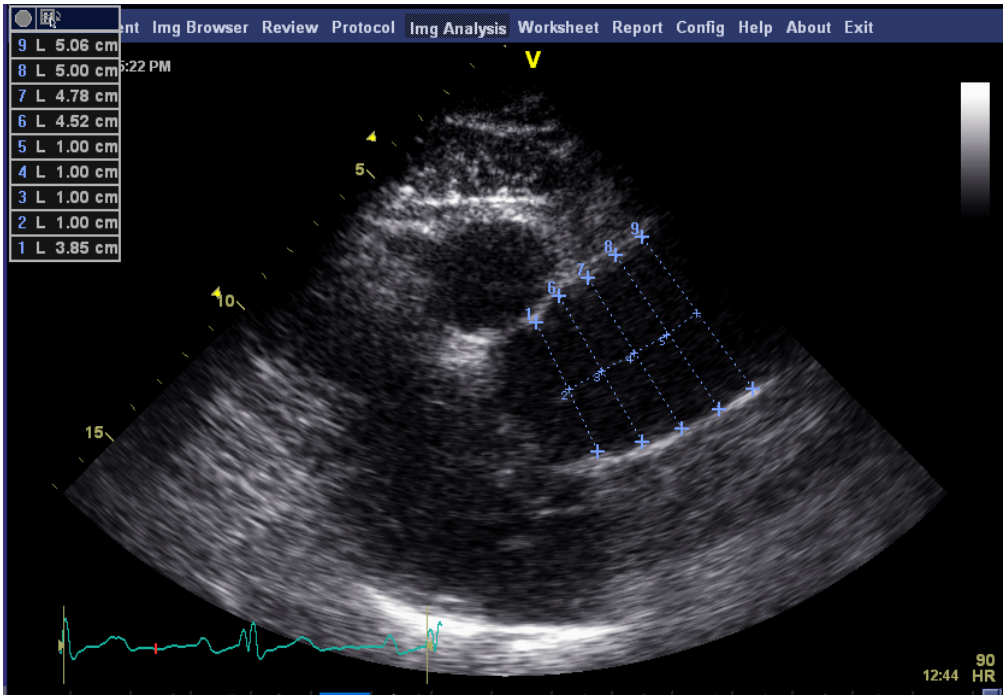

Figure 1. Measurement of aortic diameter in a BAV patient at 1cm, 2cm, 3cm, and 4cm from the STJ in end-systole using EchoPac software.

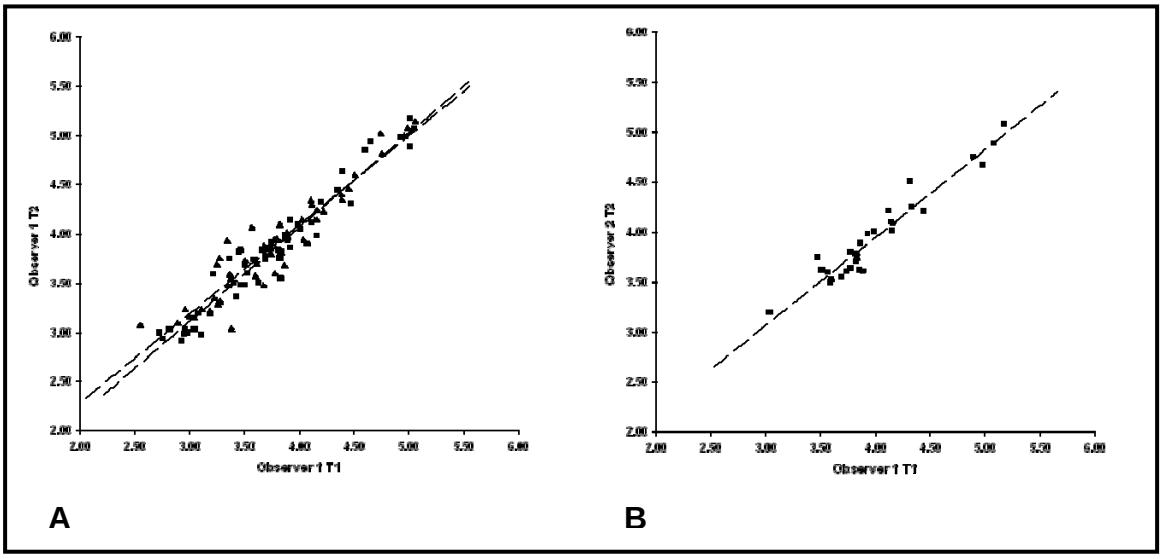

Figure 2. (A) Intraobserver variability at 2 times and (B) interobserver variability between two investigators (AA, LP) for aortic measurements 1cm, 2cm, and 3cm from the STJ in end-diastole (black squares) and end-systole (black triangles).

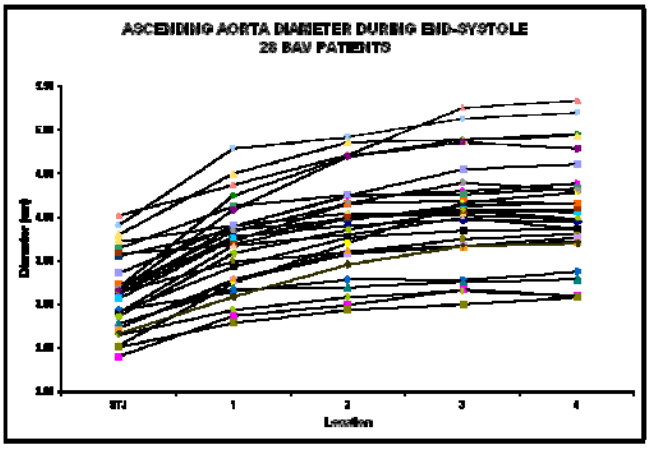

Figure 3. Aortic diameter in 28 BAV patients measured in 1cm intervals from the STJ up to 4cm.

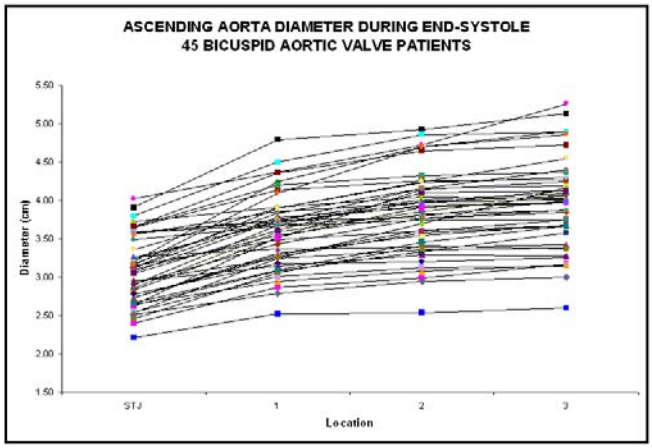

Figure 4. Ascending aorta diameter measured in end-systole for 45 BAV patients.

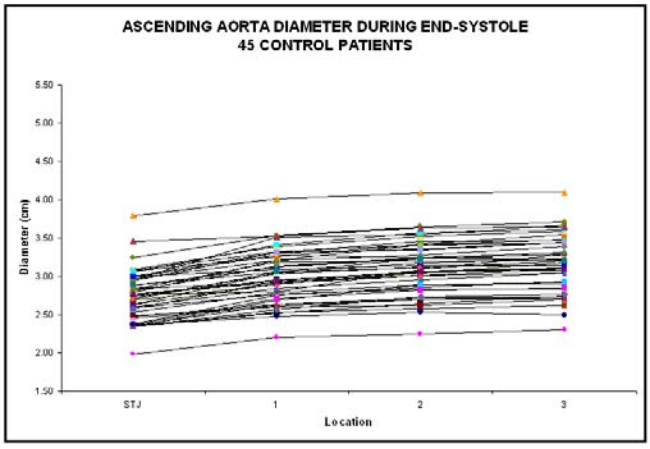

Figure 5. Ascending aorta diameter measured in end-systole for 45 control subjects with a tricuspid aortic valve.