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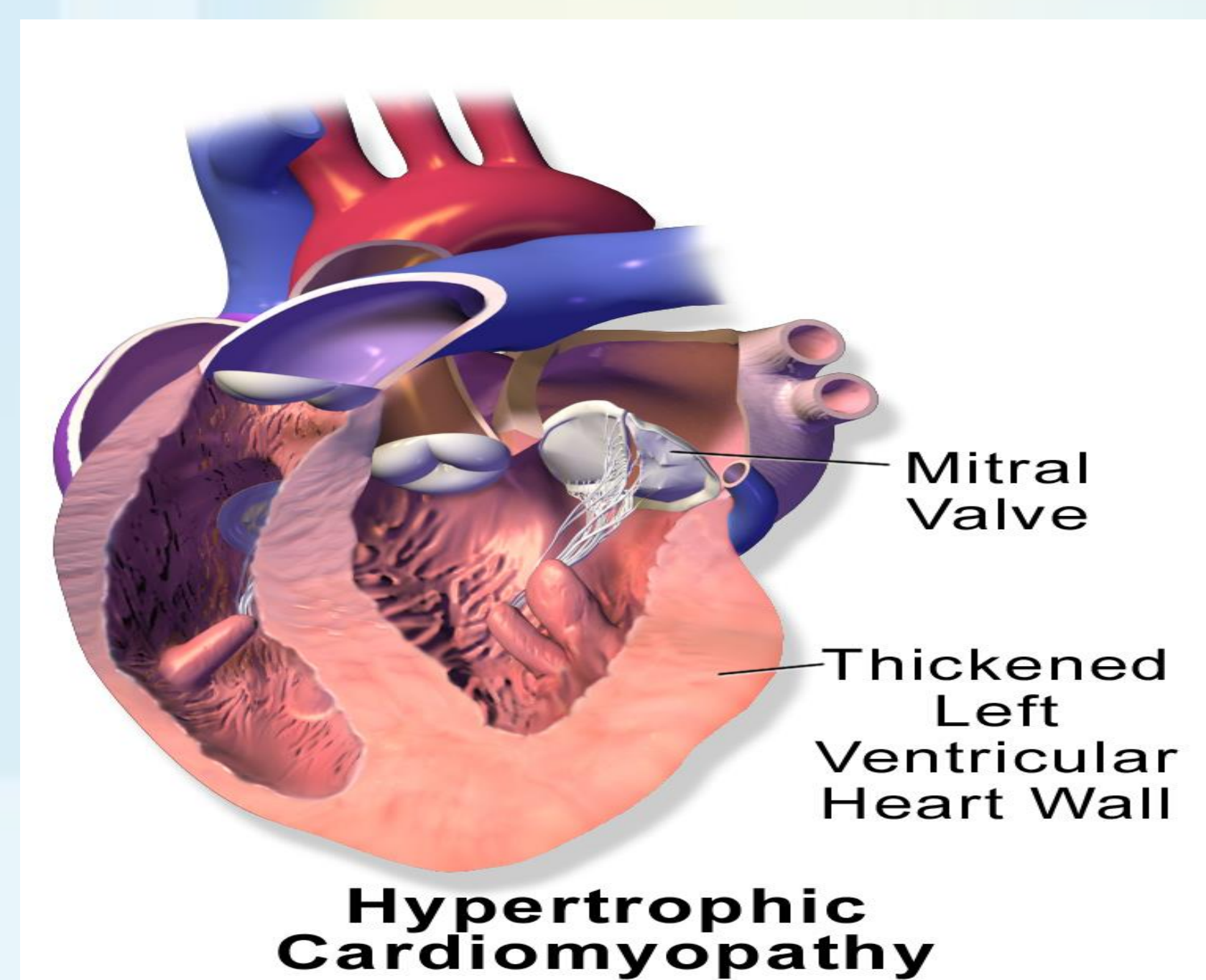
Retrospective Study on the Effects of Septal Myectomy Surgery on the Mitral-aortic Valve Angle

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OVERVIEW

- The septal myectomy procedure is performed as a result of Hypertrophic Cardiomyopathy (HCM).¹
- HCM is a genetic disease defined by an increased left ventricular wall thickness due to a mutation in cardiac sarcomere protein genes.¹
- It can cause mitral valve regurgitation which is a result of the thickened muscle creating a smaller space for blood to flow increasing the force of the blood through the mitral valve.¹ This can cause the valve to not close properly allowing blood to flow back through the valve.¹

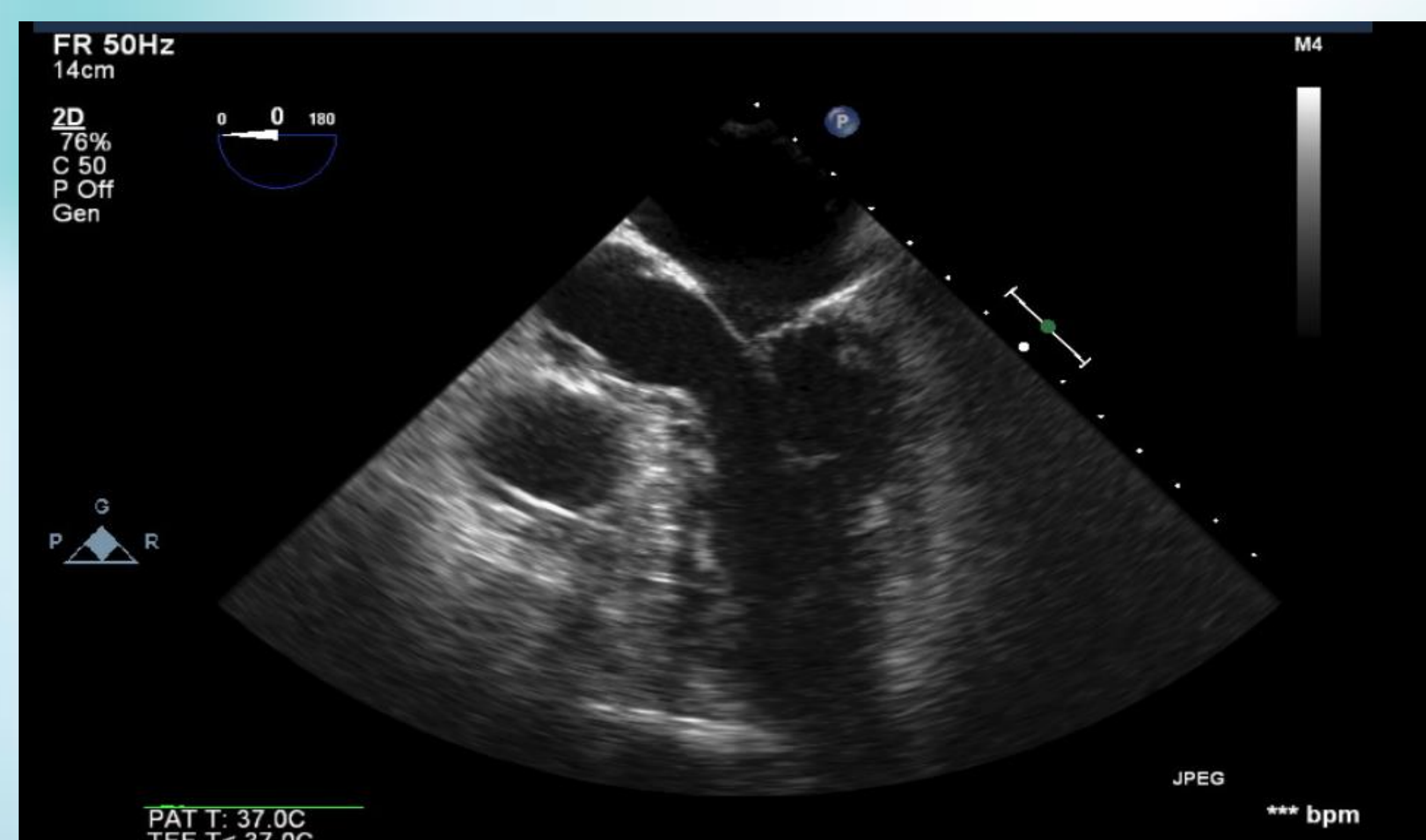
Figure 1: Illustration of an enlarged ventricular septum



METHODS

- This was a retrospective study focusing on 22 patients within a group of 88 patients, all who underwent a septal myectomy procedure for HCM.
- The OR transesophageal (TEE) echo were examined before and after the procedure. A method to measure the patient echo by hand using a protractor was developed for this experiment and several measurements were taken.

Figure 2: Echocardiogram depicting the angle measured



OUTCOMES

Table 1: Pre-op and Post-op data for 22 patients

Patients	MidVentricular Thickness (cm)	Valve Angle (systole)		Valve Angle (diastole)		Leaflet Angle		Length A. Mitral Leaflet (cm)
		Pre-op	Post-op	Pre-op	Post-op	Pre-op	Post-op	
1	3	125	115	95	100	85	75	4
2	3.5	125	105	120	115	100	100	4
3	2.5	130	130	135	135	100	90	3
4	2.5	105	110	110	105	90	85	3
5	2.5	110	130	120	130	75	100	3
6	2.5	110	120	130	110	90	85	2.5
7	2.5	125	125	120	130	80	100	3
8	3.5	135	110	130	120	105	90	3.5
9	2	140	125	130	130	90	100	3.5
10	2	95	105	100	115	75	95	5
11	3	115	105	125	120	95	95	3.5
12	2.5	110	150	115	140	85	110	3
13	2.5	100	100	105	105	90	90	4
14	3	100	110	115	115	90	90	4
15	3	115	130	120	130	95	105	3.5
16	4	115	135	130	140	95	105	2
17	3.5	105	115	110	105	85	95	2.5
18	3.5	110	100	115	110	90	85	3
19	3	105	125	125	140	90	100	3
20	2	110	110	115	115	95	95	3.5
21	2	110	115	125	120	95	90	2.5
22	3.5	110	125	110	125	85	95	4

Figure 3: Systolic angle before and after surgery

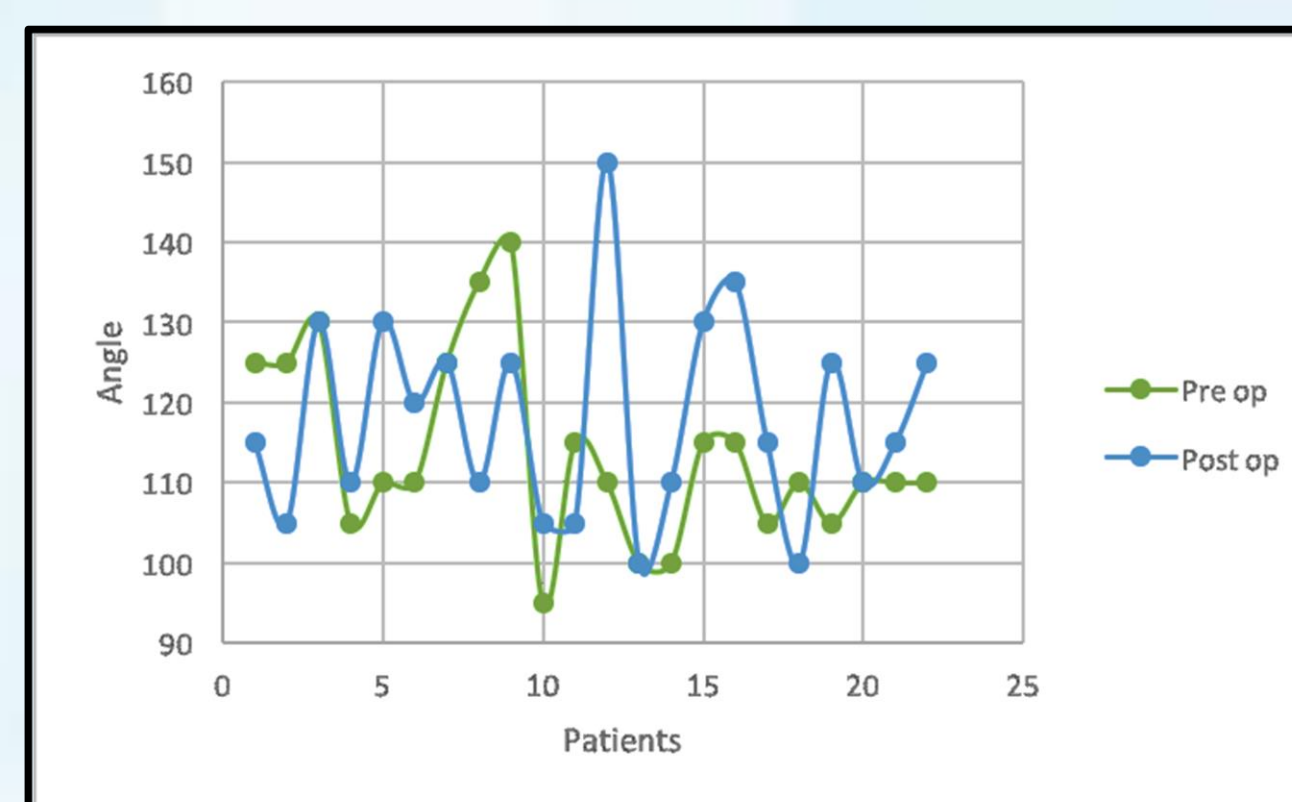


Figure 4: Diastolic angle before and after surgery

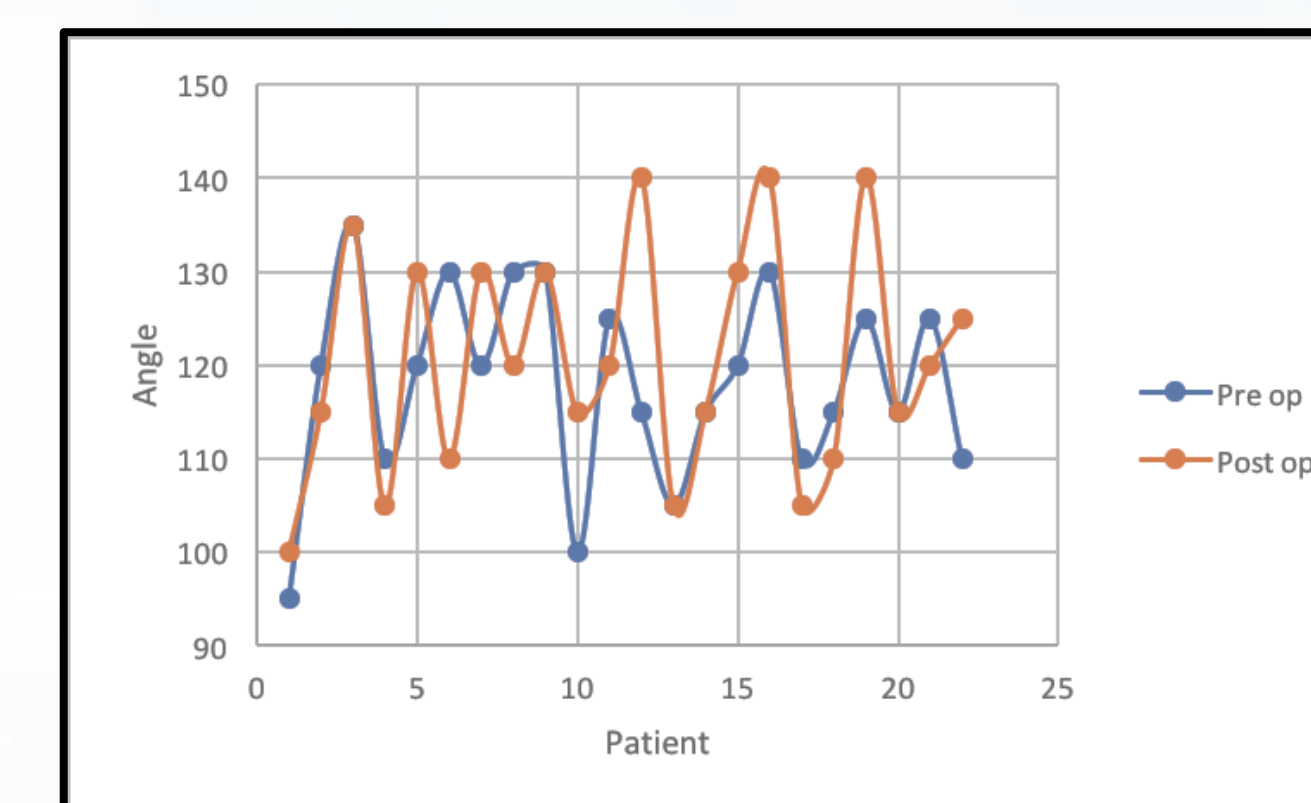
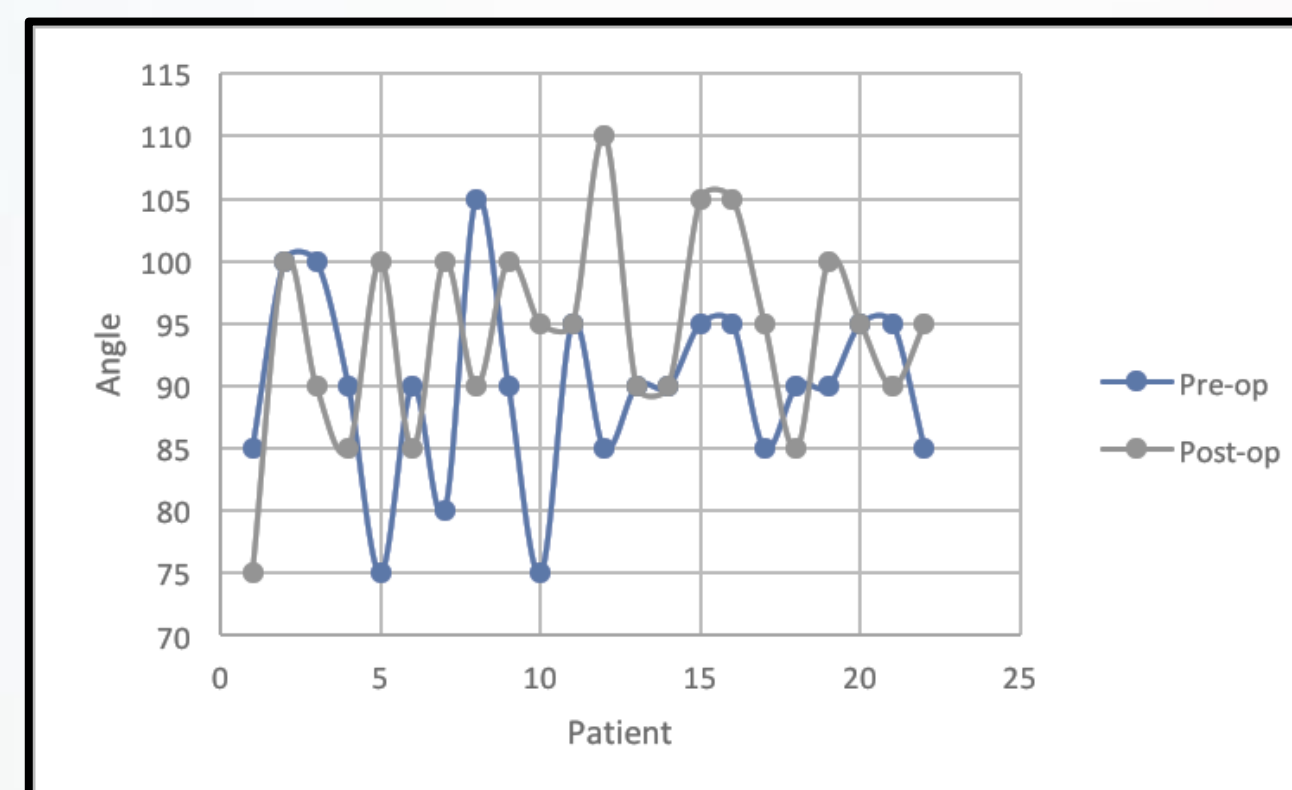


Figure 5: Leaflet angle before and after surgery



RESULTS

Table 2: Patients who had their angle increase or remain the same postoperatively

	Systolic Angle	Diastolic Angle	Leaflet Angle
Under 60	5/9 = 56%	7/9 = 78%	7/9 = 78%
Over 60	11/13 = 85%	6/13 = 46%	8/13 = 62%
Total	16/22 = 73%	13/22 = 59%	15/22 = 68%

- Excluding any patients who had a decrease in angle from preoperative to postoperative there was a statistical significance between the angle during systole and the thickness of the septum before surgery ($p = 0.005$)
- There was a statistical significance between the anterior leaflet length and the mitral-aortic angle during systole ($p = 0.009$).
- Finally, there was a statistical significance between the anterior leaflet length and the leaflet angle ($p = 0.01$).

CONCLUSIONS

- For future septal myectomy procedures these measurements should be done while in the operating room using the 3D rendering on TEE to obtain more accurate data.
- This has been implemented since the project started.
- Future studies can use the 3D data to form more accurate results to determine if the septal myectomy procedure does in fact change the mitral-aortic angle.

References

- Heart Disease and Hypertrophic Cardiomyopathy. (n.d.). Retrieved July 19, 2017, from <http://www.webmd.com/heart-disease/guide/hypertrophic-cardiomyopathy#>