

Totally Thoracoscopic Transmitral Septal Myectomy for Hypertrophic Obstructive Cardiomyopathy: A Propensity Score–Matched Comparative Study

Abstract:

BACKGROUND: This study aimed to evaluate the safety and efficacy of totally thoracoscopic transmitral septal myectomy in patients with hypertrophic obstructive cardiomyopathy (HOCM).

METHODS: A retrospective, single-center observational study was conducted involving patients who underwent either totally thoracoscopic transmitral (n = 74) or conventional transaortic myectomy (n = 446) between 2021 and 2023. Propensity score matching (1:1) yielded 45 matched pairs. Postoperative outcomes were compared at discharge and at 6-month follow-up.

RESULTS: There were no operative deaths in either group. In the thoracoscopic group, two patients required permanent pacemaker implantation, and one patient underwent reoperation due to infective endocarditis. Compared with the transaortic group, the transmitral group had a significantly shorter postoperative ICU stay [21.55 (20.53–22.50) vs. 22.33 (21.33–46.62) hours; p = 0.020]. Both approaches significantly reduced the left ventricular outflow tract gradient (LVOTG) [13.00 (8.50–18.00) mmHg vs. 9.00 (7.00–14.00) mmHg] and midventricular pressure gradient (MVPg) [10.00 (8.00–14.50) mmHg vs. 10.00 (8.00–12.50) mmHg], with complete resolution of systolic anterior motion (SAM) and improvements in mitral regurgitation. At follow-up, the transmitral group exhibited a further reduction in LVOTG [10.00 (7.00–14.00) mmHg].

CONCLUSIONS: The totally thoracoscopic transmitral approach is a safe and effective alternative to the transaortic route for septal myectomy. It provides enhanced visualization of the mid-to-apical septum and facilitates concomitant mitral valve intervention. Further validation in large-scale randomized controlled trials is warranted.

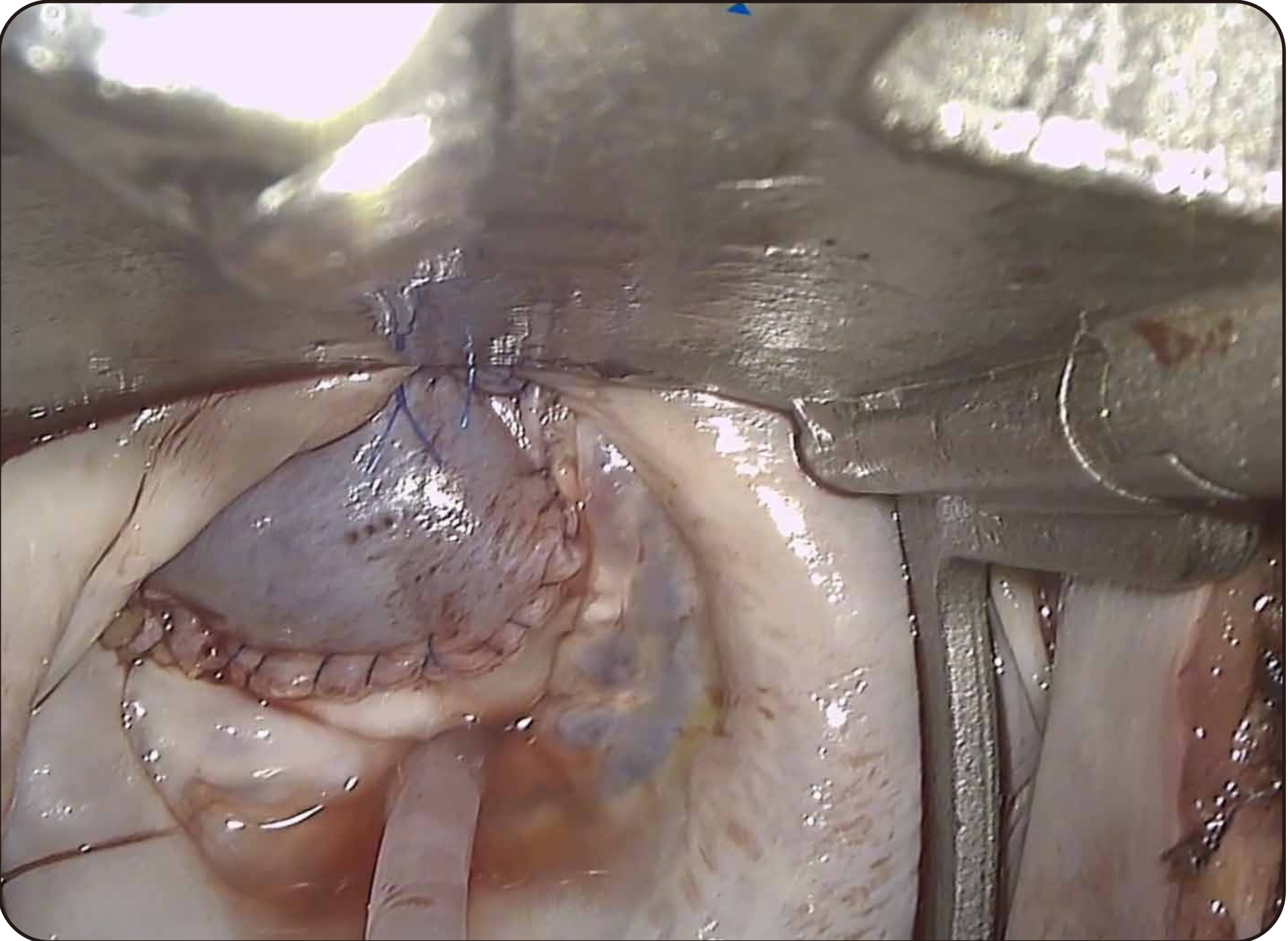
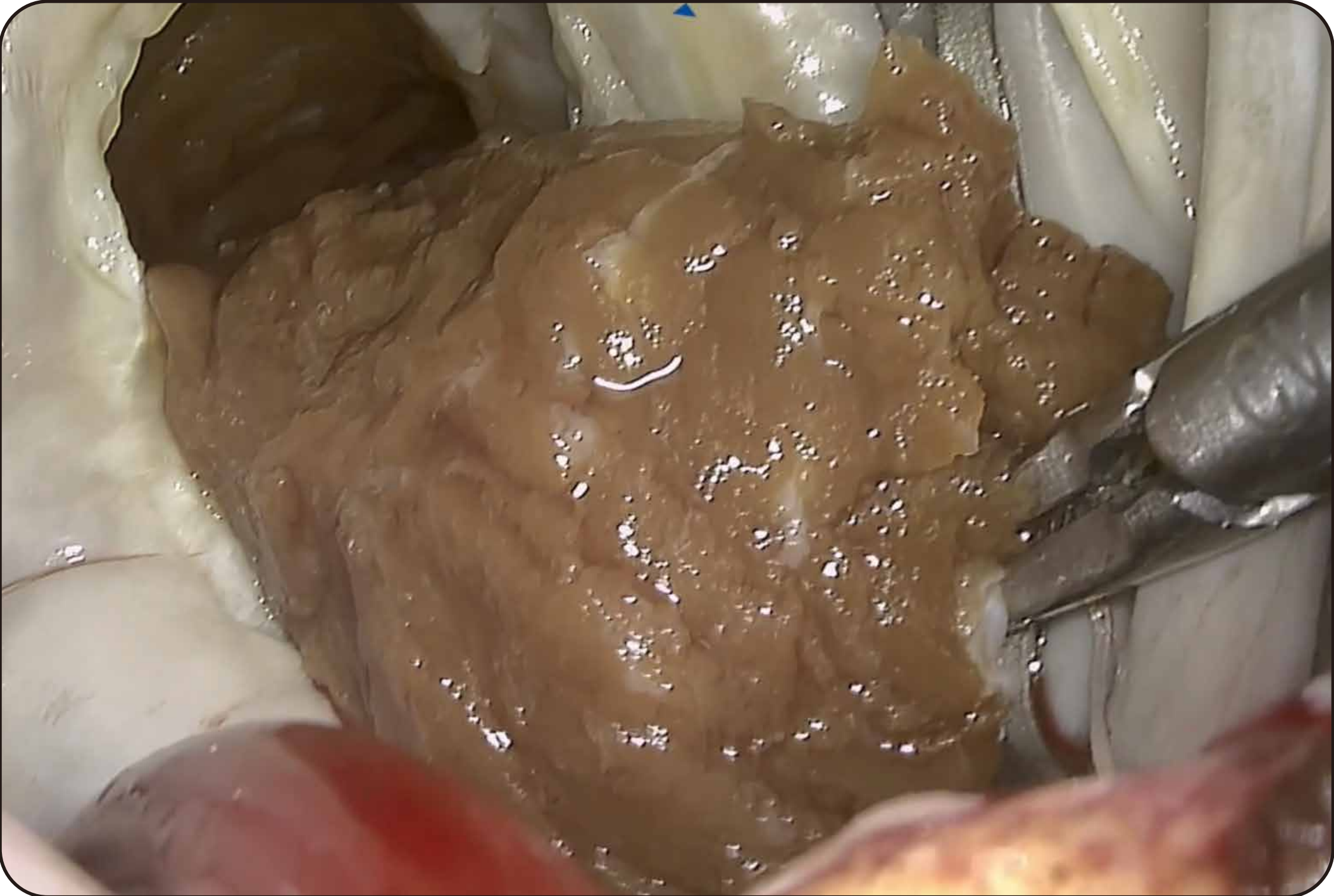
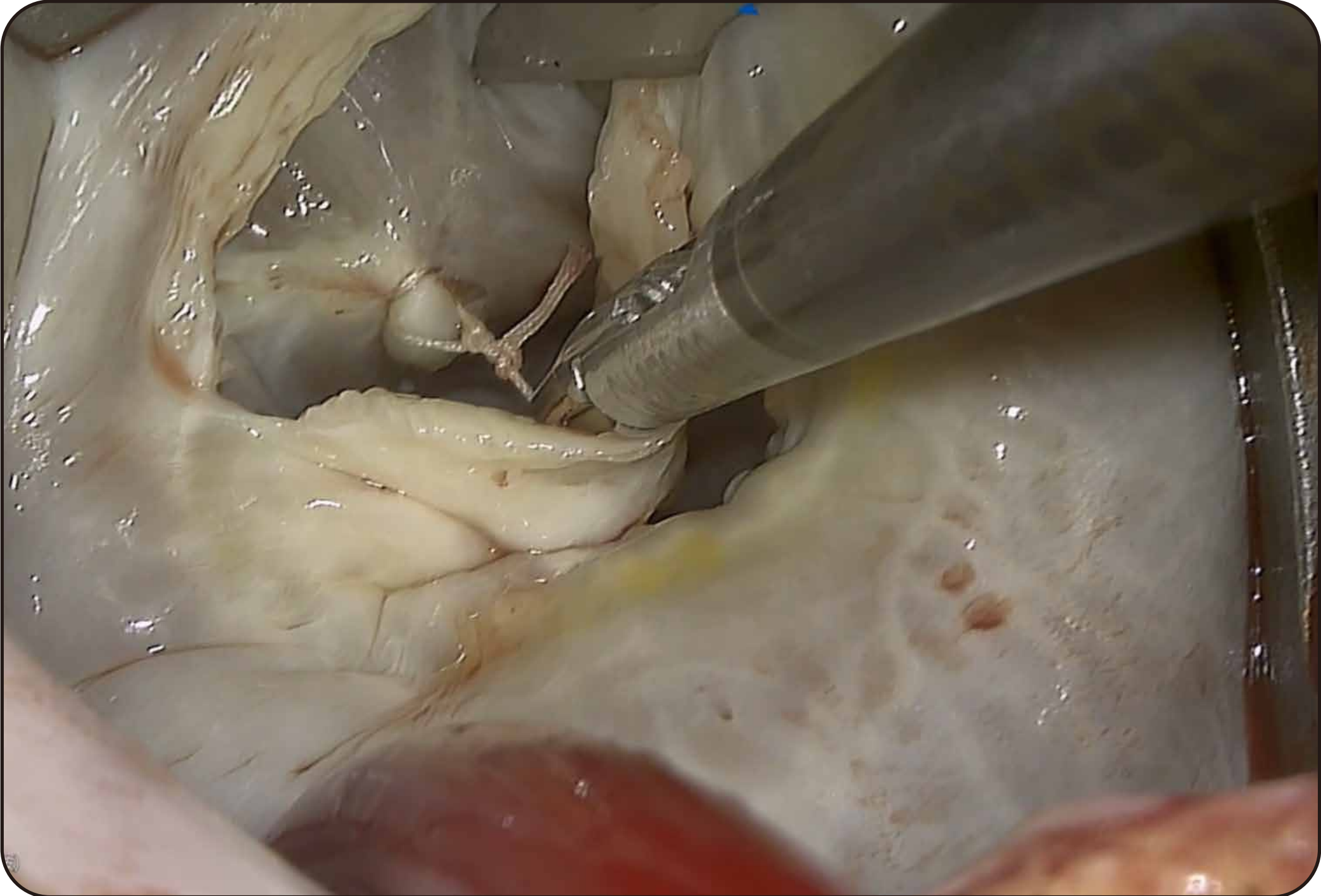


Table. Echocardiographic Parameters at Baseline, Discharge, and 6-Month Follow-up

	IVST (mm)		LVOTG (mmHg)		MVGg (mmHg)		SAM, n (%)	
Timepoint	Transaortic	Transmitral	Transaortic	Transmitral	Transaortic	Transmitral	Transaortic	Transmitral
Baseline	22.78 ± 4.72	22.98 ± 4.86	84.00 (66.00, 102.00)	82.00 (67.50, 100.00)	59.91 ± 30.15	56.55 ± 20.15	35 (77.78)	38 (84.44)
Discharge	14.00 (11.00, 16.00)	14.00 (13.00, 17.00)	9.00 (7.00, 14.00)	13.00 (8.50, 18.00)	10.00 (8.00, 12.50)	10.00 (8.00, 14.50)	0 (0.00)	0 (0.00)
Followup	13.42 ± 3.64	14.33 ± 4.26	7.00 (5.00, 10.00)	10.00 (7.00, 14.00)	16.00 (8.50, 26.00)	13.00 (7.00, 16.50)	0 (0.00)	2 (4.44)
Parameters	Estimate	95% HPD	Estimate	95% HPD	Estimate	95% HPD	Estimate	95% HPD
GroupTransmitral	0.22	-1.63, 2.04	0.01	-0.18, 0.20	-0.02	-0.58, 0.54	0.14	-21.26, 18.01
TimepointDischarge	-8.18	-9.40, -6.93	-2.15	-2.31, -1.98	-1.62	-2.07, -1.15	-33.22	-128.41, -7.27
TimepointFollowup	-9.36	-10.67, -8.08	-2.31	-2.48, -2.14	-1.08	-1.53, -0.59	-5.01	-5.98, -4.16
GroupTransmitral: TimepointDischarge	-0.01	-1.81, 1.72	0.32	0.09, 0.55	0.11	-0.56, 0.77	0.39	-84.88, 91.80
GroupTransmitral: TimepointFollowup	0.70	-1.10, 2.47	0.26	0.02, 0.50	-0.47	-1.13, 0.16	0.27	-0.88, 1.46

Analysis performed using Bayesian GLMM for continuous and binary outcomes, and CLMM for ordered categorical outcomes. Statistical significance is determined when the 95% HPD interval does not contain zero.
Abbreviation: IVST, Interventricular Septal Thickness; LVOTG, Left Ventricular Outflow Tract Gradient; MVGg, Midventricular pressure gradient; SAM, Systolic Anterior Motion; MR, Mitral Regurgitation.

	MR, n (%)					
MR Severity	Baseline		Discharge		Followup	
	Transaortic	Transmitral	Transaortic	Transmitral	Transaortic	Transmitral
None	1 (2.22)	1 (2.22)	11 (24.44)	10 (22.22)	6 (13.33)	4 (8.89)
Trace	2 (4.44)	3 (6.67)	22 (48.89)	17 (37.78)	19 (42.22)	22 (48.89)
Mild	10 (22.22)	7 (15.56)	11 (24.44)	11 (24.44)	15 (33.33)	9 (20.00)
Mild-to-Moderate	5 (11.11)	6 (13.33)	1 (2.22)	7 (15.56)	3 (6.67)	8 (17.78)
Moderate	13 (28.89)	13 (28.89)	0 (0.00)	0 (0.00)	1 (2.22)	0 (0.00)
Moderate-to-Severe	11 (24.44)	10 (22.22)	0 (0.00)	0 (0.00)	1 (2.22)	1 (2.22)
Severe	3 (6.67)	5 (11.11)	0 (0.00)	0 (0.00)	0 (0.00)	1 (2.22)
Parameters	Estimate	95% HPD				
GroupTransmitral	0.43	-0.27, 1.15				
TimepointDischarge	-3.41	-4.18, -2.63				
TimepointFollowup	-2.67	-3.42, -1.95				
GroupTransmitral: TimepointDischarge	-0.15	-1.02, 0.74				
GroupTransmitral: TimepointFollowup	-0.390	-1.27, 0.48				