



Outcomes Following Septal Myectomy in Pediatric and Young Patients with Obstructive Hypertrophic Cardiomyopathy

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Introduction:

- In hypertrophic cardiomyopathy (HCM), 50-70% of patients develop left ventricular outflow tract (LVOT) obstruction, which can be associated with more severe symptoms, heart failure, and increased mortality.
- Septal myectomy (SM) has been regarded as the gold standard therapy for patients with symptomatic obstructive HCM (oHCM) who are refractory to medical management.
- Cardiac myosin inhibitors (CMIs) have been studied and evaluated in adults (≥18 years) and are currently guidelines-recommended second-line therapy.
- Mavacamten is the only commercially available CMI, which is only approved for patients ≥18 years of age.
- SM remains a primary therapeutic option in young patients and those who are unable to use CMIs (planned pregnancy, prior systolic dysfunction on low doses of mavacamten, age<18 years).
- While SM outcomes are well characterized in adults, data in younger patients remain limited to small, single-center studies.
- Younger patients typically have fewer comorbidities but distinct anatomical and electrophysiologic challenges, understanding how age impacts procedural and long-term outcomes is critical.
- Our goal was to evaluate short- and long-term outcomes following SM in patients aged ≤30 years compared to older adults.

Methods:

- We used de-identified data from the Symphony Health Integrated Dataverse (January 2015–February 2025), a nationally representative, claims database containing longitudinal medical data across all payer types.
- Patients with hypertrophic cardiomyopathy (HCM) were identified by ICD-9 or ICD-10 codes. Septal myectomy (SM) procedures were identified using CPT and ICD-10-PCS codes. The first SM claim was considered the index procedure; repeat procedures were excluded, as well as syndromic HCM (through diagnoses review).
- Baseline comorbidities were assessed prior to SM (90 days for medications, obesity, and hyperlipidemia). Acute complications were defined as new events within 30 days post-SM; long-term outcomes were those occurring beyond 30 days through the end of follow-up.

Results:

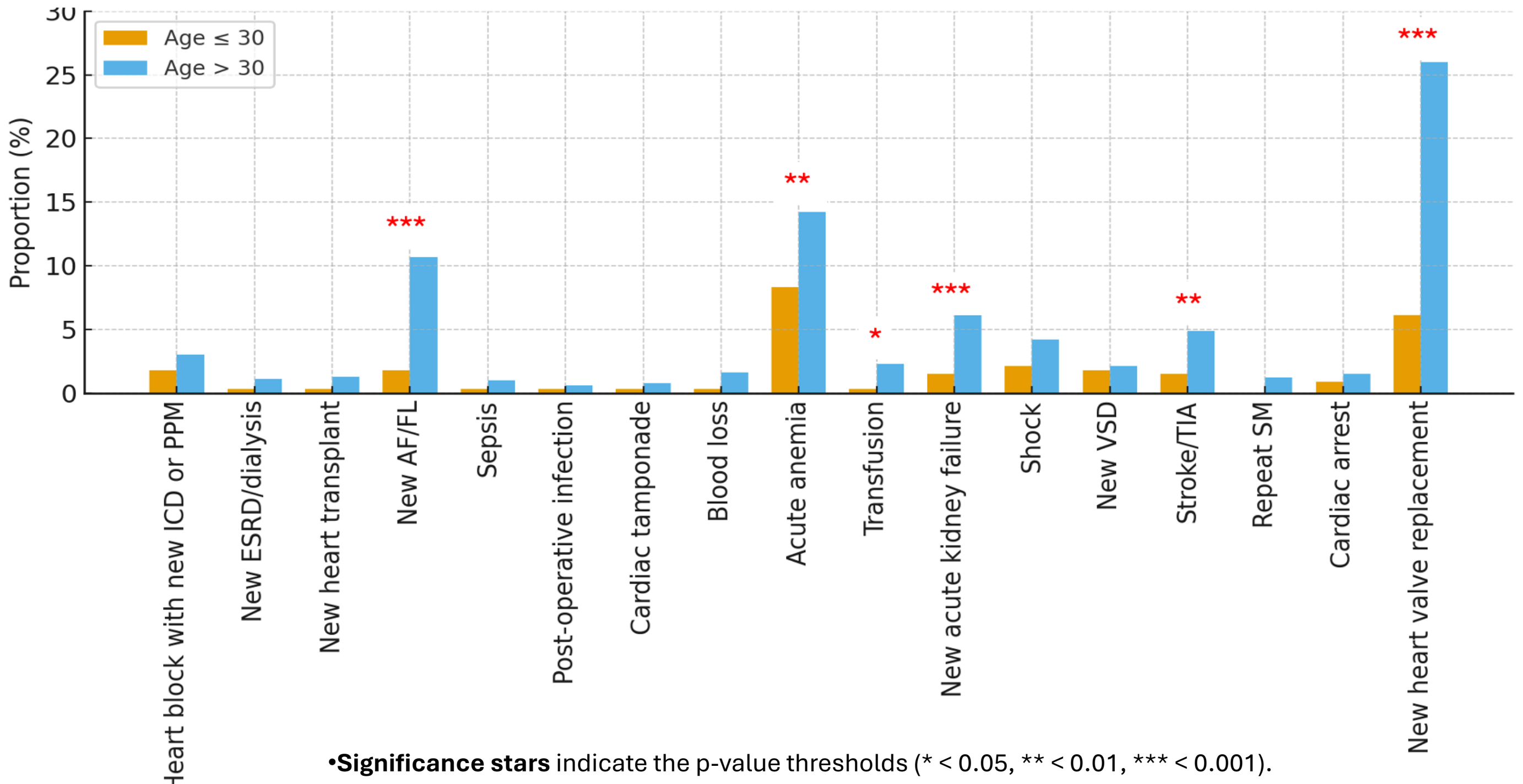
- Of the 9,085 unique individuals with HCM who underwent SM during the study period, the final cohort included 7,720 patients, of whom 327 (4.2%) were ≤30 years old and 7,393 (95.8%) were >30 years old at the time of SM.

Table 1. Characteristics of the cohort at septal myectomy by age group

Characteristic	Age ≤30 (n = 327)	Age >30 (n = 7393)
Age, years, median (Interquartile Range)	23.0 (16.0, 27.0)	64.0 (55.0, 70.0)
Female	109 (33.3)	3,911 (52.9)
Obesity	28 (8.6)	1,209 (16.4)
Hypertension	52 (15.9)	5,406 (73.1)
Hyperlipidemia	6 (1.8)	2,931 (39.6)
Diabetes	7 (2.1)	1,651 (22.3)
Atrial Fibrillation/Flutter	53 (16.2)	2,366 (32.0)
Chronic Kidney Disease	10 (3.1)	1,040 (14.1)
Chronic Obstructive Pulmonary Disease.	14 (4.3)	1,406 (19.0)
Stroke/Transient Ischemic Attack	4 (1.2)	689 (9.3)
Myocardial infarction	18 (5.5)	885 (12.0)
Implantable Cardioverter-Defibrillator	94 (28.7)	888 (12.0)
Pacemaker	34 (10.4)	520 (7.0)
ACE-inhibitor	3 (0.9)	777 (10.5)
Angiotensin II Receptor Blocker	4 (1.2)	723 (9.8)
Beta Blocker	165 (50.5)	3,583 (48.5)
Calcium Channel Blocker	1 (0.3)	595 (8.0)
Loop Diuretic	10 (3.1)	880 (11.9)
Oral Anticoagulant	13 (4.0)	845 (11.4)

- Younger patients undergoing septal myectomy had substantially fewer comorbidities and were prescribed fewer cardiovascular medications compared with older patients. However, ICD use was notably higher in the younger group.

Table 2. Acute complications in the 30 days post-procedure in HCM patients undergoing septal myectomy by age group



- Younger patients experienced fewer acute complications within 30 days of septal myectomy compared with older adults. Overall acute care encounters were nearly identical (~70%) (Data not shown).

Table 3. Outcomes after 30 days post-procedure in HCM patients undergoing septal myectomy by age group. (IR per 100 person-years)

Outcome	Ages ≤30		Ages >30		P-value
	Events	IR (95% CI)	Events	IR ^a (95% CI)	
Recurrent acute CV event	118	7.21 (5.96, 8.63)	4678	12.85 (12.48, 13.22)	<0.001
New AF/FL	17	1.09 (0.63, 1.74)	1276	4.18 (3.95, 4.41)	<0.001
New HF	54	3.75 (2.81, 4.89)	1659	5.47 (5.21, 5.74)	0.005
Recurrent VT/VF	168	10.26 (8.77, 11.93)	2188	6.01 (5.76, 6.27)	<0.001
Recurrent Stroke/TIA	21	1.28 (0.79, 1.96)	2194	6.03 (5.78, 6.28)	<0.001
New Heart Transplant	8	0.50 (0.22, 0.98)	311	0.88 (0.79, 0.98)	0.124
New ICD	45	3.15 (2.30, 4.21)	779	2.32 (2.16, 2.49)	0.064
Heart Block with New ICD or PPM	8	0.50 (0.21, 0.98)	157	0.44 (0.37, 0.51)	0.839
New Loop Diuretic	42	2.89 (2.08, 3.91)	2363	8.85 (8.50, 9.22)	<0.001
New Beta Blocker	79	6.01 (4.76, 7.49)	2161	7.98 (7.65, 8.33)	0.012
New DHP CCB	17	1.06 (0.62, 1.70)	1336	4.26 (4.03, 4.49)	<0.001
New Sotalol	8	0.50 (0.22, 0.99)	280	0.79 (0.70, 0.89)	0.248
New Amiodarone	13	0.82 (0.44, 1.41)	1279	4.16 (3.94, 4.40)	<0.001
New Disopyramide	3	0.18 (0.04, 0.54)	63	0.17 (0.13, 0.22)	>0.999
New Dofetilide	4	0.25 (0.07, 0.63)	76	0.21 (0.17, 0.26)	0.908
New OAC	49	3.33 (2.46, 4.40)	2386	9.10 (8.74, 9.48)	<0.001

- Younger patients had substantially fewer long-term cardiovascular complications after septal myectomy compared with older adults. However, recurrent ventricular tachycardia/fibrillation occurred more frequently in younger patients, and they still suffered complications of HCM. Incidences of heart transplant, new ICD implantation, and heart block were similar between groups.

Conclusion:

- Younger patients undergoing septal myectomy experience significantly fewer perioperative and long-term complications than older adults.
- Despite overall favorable surgical outcomes, younger patients continued to suffer with HCM complications, such as recurrent ventricular arrhythmias (VT/VF) and new heart failure, highlighting the need for continued rhythm surveillance and individualized post-myectomy management in this population.

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