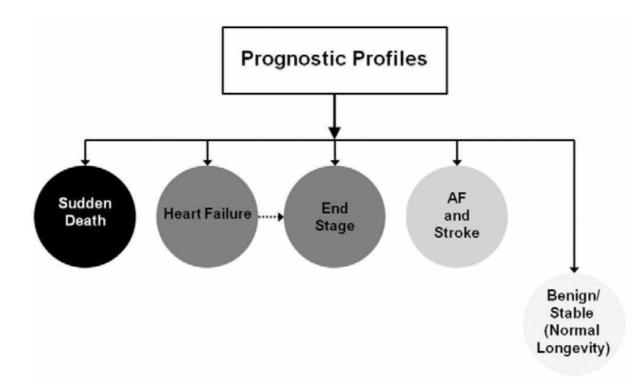
Impact of ICD Therapy on Mortality in HCMP

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1. Risk of sudden cardiac death





Epidemiology of SCD

- 20,000 / yr in South Korea
 - even only out of hospital
 - 41 / 100,000 person
 - 1 / 30 minutes

- 250,000 ~ 300,000 / yr in US
 - 53 / 100,000 person

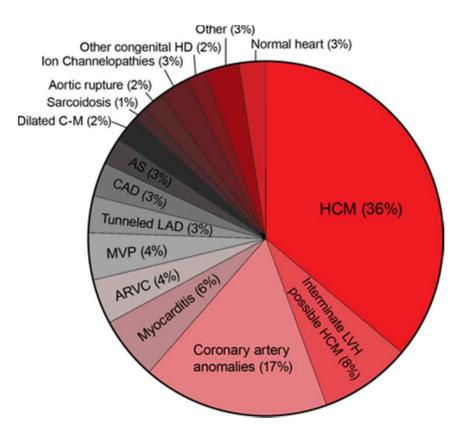


Associated conditions

- Structural heart disease (= ventricular substrate)
 - ICMP, DCMP, HCMP, ARVD, sarcoidosis, surgical scar...
- Inherited primary arrhythymia syndrome
 - Long/Short QT syndrome, Brugada syndrome, Early repolarization syndrome, Catecholaminergic
 polymorphic VT, Idiopathic ventricular fibrillation



Sudden death in young athletes







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Hypertrophic cardiomyopathy

1/500 in general population, family history in more than half

Most common cause of SCD in young (esp. athlete)



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ICD indication for primary prevention

AHA/ACC 2017 Class Ila

- Syncope within 6m
- Family history of SCD
- LV wall thickness ≥ 30mm
- NS VT or BP drop during exercise
 - < 30yr, Scar on MR, LVOT
 obstruction, syncope > 5yr, LV
 aneurysm, EF < 50%

20%											
HCM Risk-SCD Calculator											
	Age	30 Years	Age at evaluation								
EUROPEAN	Maximum LV wall thickness	18 mm	Transthoracic Echocardiographic measurement								
SOCIETY OF CARDIOLOGY®	Left atrial size	45 mm	Left atrial diameter determined by M-Mode or 2D echocardiography in the parasternal long axis plane at time of evaluation								
	Max LVOT gradient	25 mmHg	The maximum LV outflow gradient determined at rest and with Valsalva provocation (irrespective of concurrent medical freatment) using pulsed and continuous wave Doppler from the apical three and five chamber views. Peak outflow tracit gradients should be determined using the modified Bernouilli equation: Gradient= 4V ² , where V is the peak aortic outflow velocity								
	Family History of SCD	🖲 No 🗋 Yes	History of sudden cardiac death in 1 or more first degree relatives under 40 years of age or SCD in a first degree relative with confirmed HCM at any age (post or ante-mortem diagnosis).								
	Non-sustained VT	• No O Yes	3 consecutive ventricular beats at a rate of 120 beats per minute and <30s in duration on Holter monitoring (minimum duration 24 hours) at or prior to evaluation.								
	Unexplained syncope	No O Yes	History of unexplained syncope at or prior to evaluation.								
		ESC recommenda	tion: ICD generally not indicated at								
		ESC recommenda	Risk-SCD Calculator								
\bigcirc	Age										
EUROPEAN	Age Maximum LV wall thickness	HCM F 30 Years	Risk-SCD Calculator								
EUROPEAN SOCIETY OF CARDIOLOGY®	Maximum LV	HCM F 30 Years	Risk-SCD Calculator								
SOCIETY OF	Maximum LV wall thickness	HCM F 30 Years 18 mm 45 mm	Risk-SCD Calculator Age at evaluation Transthoracic Echocardiographic measurement Left atrial diameter determined by M-Mode or 2D echocardiography in								
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ESC 2015 Class IIa

>6% by Rick_SCD calculator





2. Apical vs. Asymmetric





2011 ACCF/AHA Guideline for the Diagnosis and Treatment of Hypertrophic Cardiomyopathy: Executive Summary : A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines

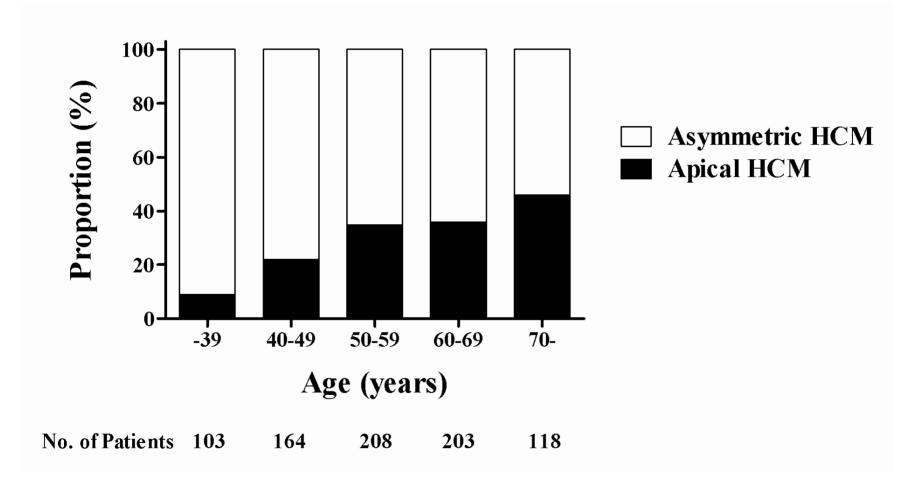
 Writing Committee Members, Bernard J. Gersh, Barry J. Maron, Robert O. Bonow, Joseph A. Dearani, Michael A. Fifer, Mark S. Link, Srihari S. Naidu, Rick A.
 Nishimura, Steve R. Ommen, Harry Rakowski, Christine E. Seidman, Jeffrey A. Towbin, James E. Udelson and Clyde W. Yancy

• HCMP guideline (31 pages) 중, apical HCMP 가 언급된 부분은 ?

- 4. TTE combined with the injection of an intravenous contrast agent is reasonable if the diagnosis of apical HCM or apical infarction or severity of hypertrophy is in doubt, particularly when other
 - 1. CMR imaging is reasonable in patients with HCM to define apical hypertrophy and/or aneurysm if echocardiography is inconclusive.^{73,75} (Level of Evidence: B)



Age at the diagnosis

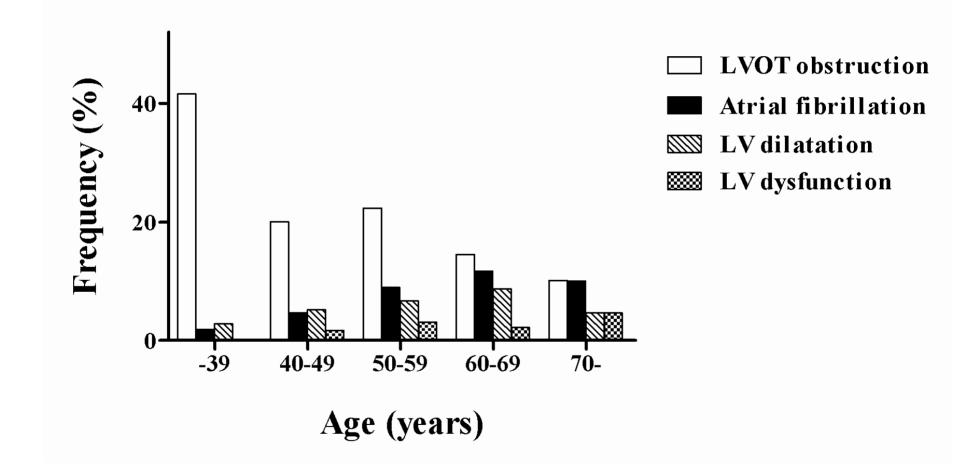


Kim et al. Int Heart J. 2013



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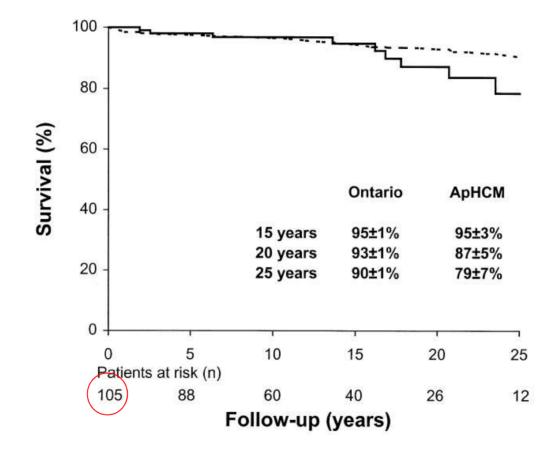
LV chamber and AF

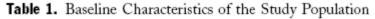


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Is Apical HCM benign?



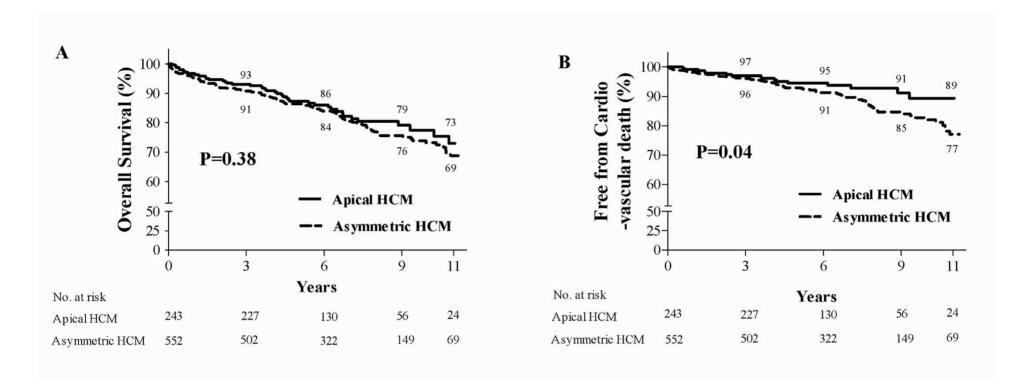


Men/women	78/27
Age at presentation (yrs)	41.4 ± 14.5

Eriksson et al. JACC 2002



Unadjusted Survival Rates



All-cause death

CV death

Kim et al. Int Heart J. 2013



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Adjusted hazard ratios, vs. apical HCM

	All-cause death				Cardiovascular death			
Analysis	Hazard	95% CI		Dualua	Hazard	95% CI		Dualua
	ratio	Lower	Upper	P value	ratio	Lower	Upper	- P value
Univariate Cox Model	1.17	0.82	1.66	0.38	1.76	1.02	3.03	0.04
Multivariate Cox Model	1.73	1.21	2.47	0.003	2.54	1.45	4.45	0.001
Inverse-probability-of -treatment weighting	1.44	0.99	2.09	0.05	1.92	1.08	3.42	0.03
Propensity Score Matching	1.57	1.00	2.46	0.05	2.04	1.08	3.89	0.03

Kim et al. Int Heart J. 2013



