

# The Mitral Valve in Patients with Hypertrophic Cardiomyopathy

**Iacopo Olivotto, MD**

*Referral Center for Cardiomyopathies*

*Careggi University Hospital*

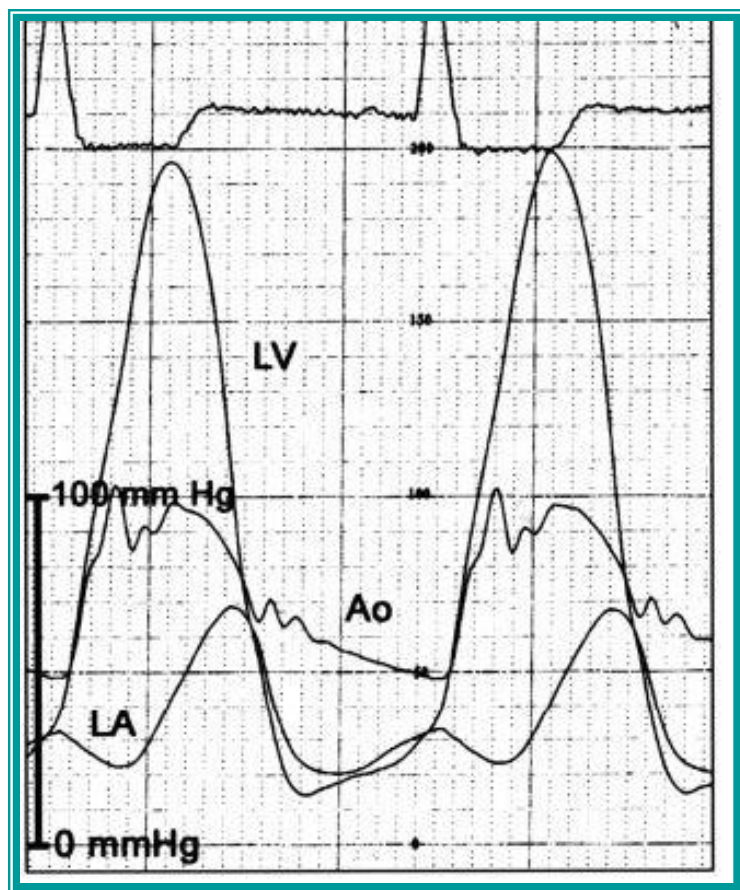
*Florence, Italy*

*[olivottoi@aou-careggi.toscana.it](mailto:olivottoi@aou-careggi.toscana.it)*

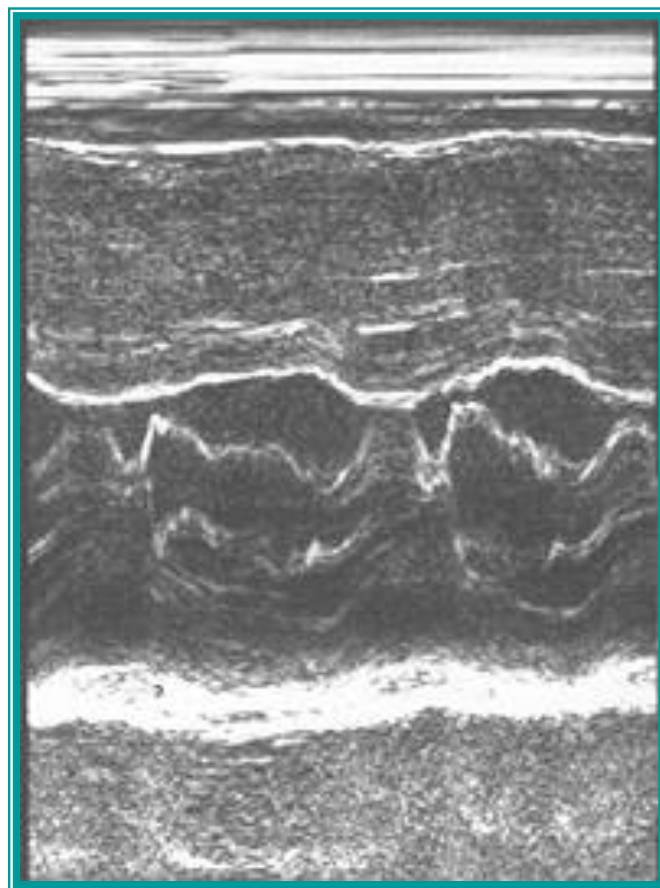


# DYNAMIC LV OUTFLOW OBSTRUCTION IN HCM

1958



1969



# Eugene Braunwald, MD and the Early Years of Hypertrophic Cardiomyopathy: A Conversation With Dr. Barry J. Maron

*Am J Cardiol, in press*

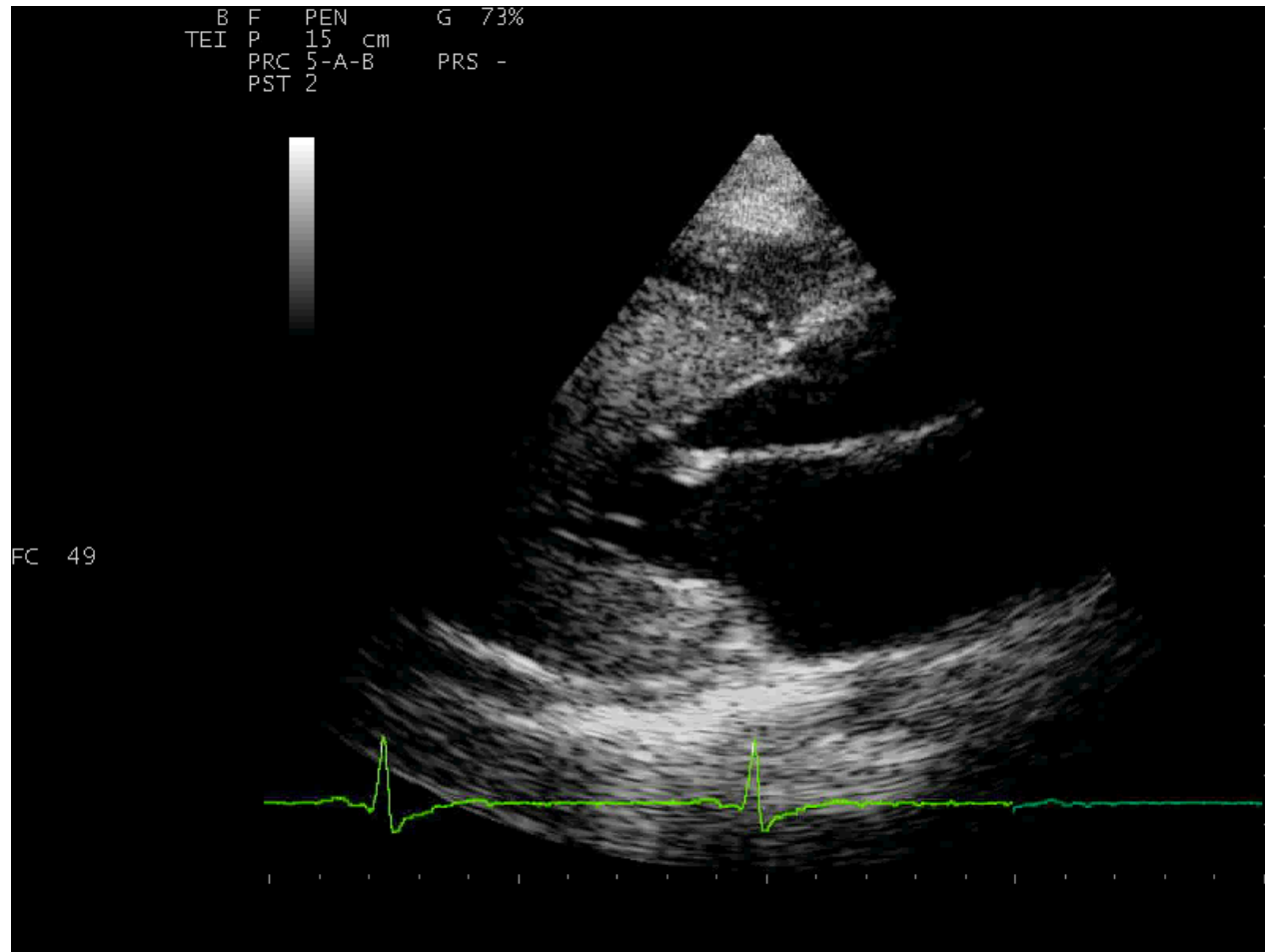


Figure 1. Eugene Braunwald, 1963.



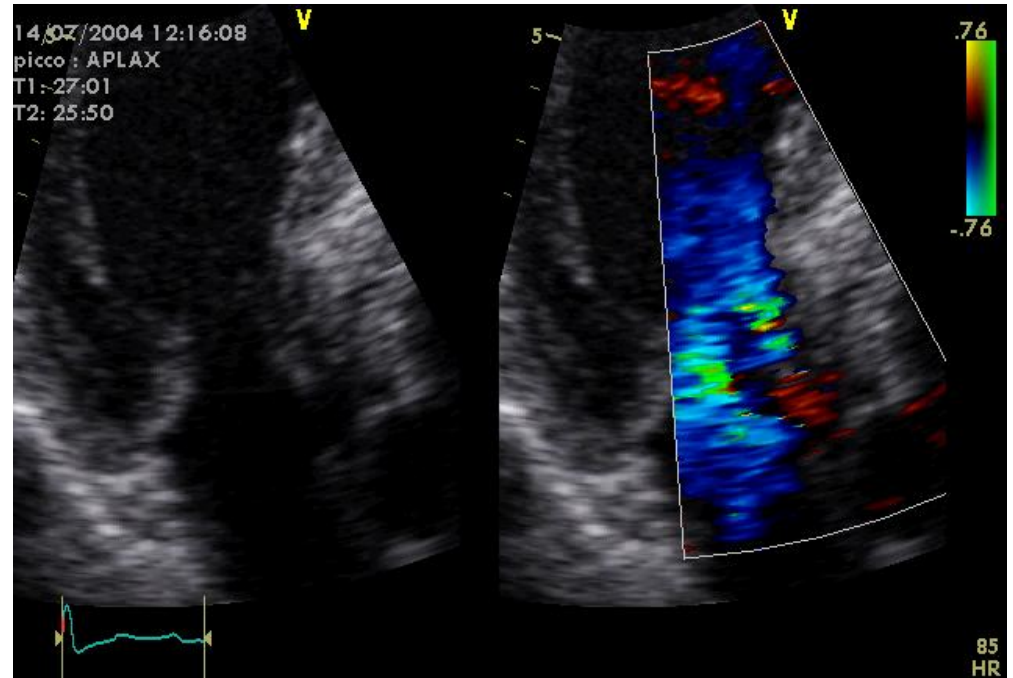
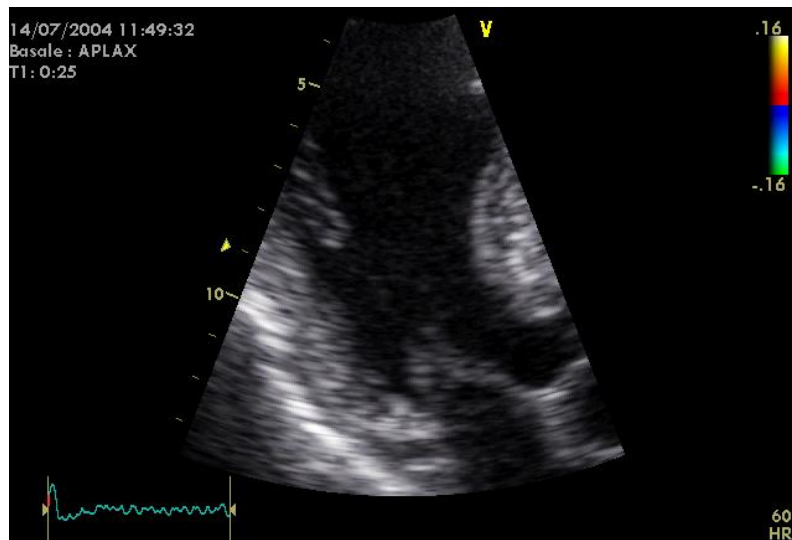
Figure 2. Andrew Glenn Morrow, 1963.

# DYNAMIC LV OUTFLOW OBSTRUCTION IN HCM





# Provokable Obstruction During Physiologic Exercise

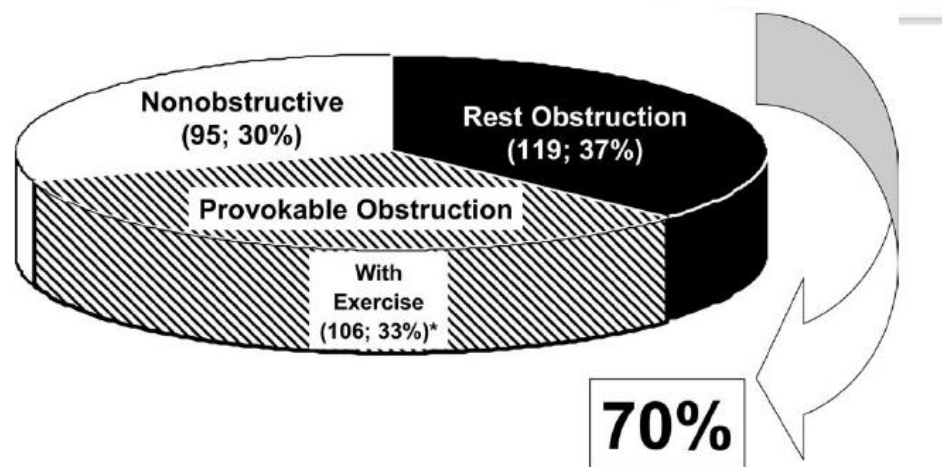


Courtesy of Dr. Stefano Nistri

# Hypertrophic Cardiomyopathy Is Predominantly a Disease of Left Ventricular Outflow Tract Obstruction

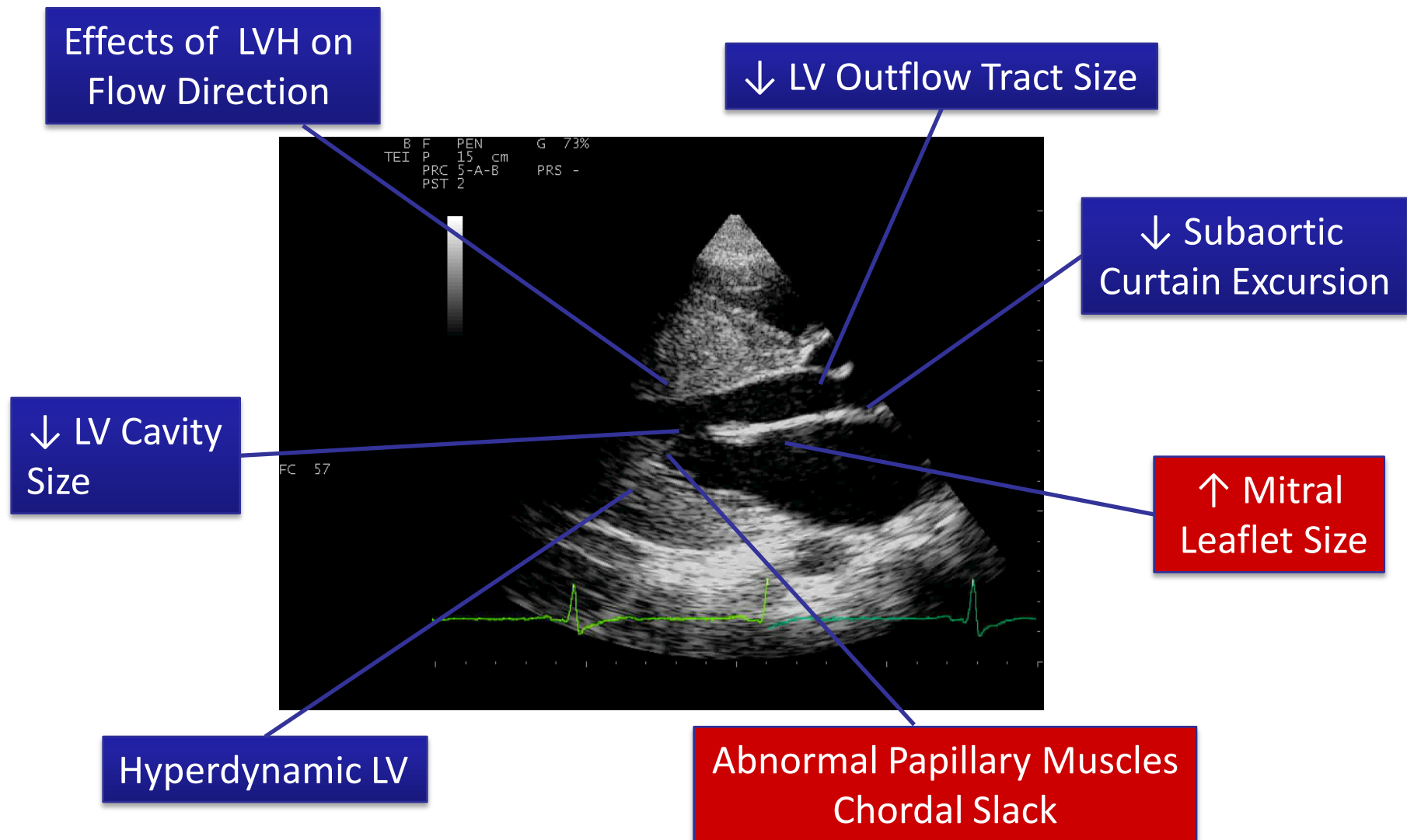
Martin S. Maron, MD; Iacopo Olivotto, MD; Andrey G. Zenovich, MSc; Mark S. Link, MD;  
Natesa G. Pandian, MD; Jeffery T. Kuvin, MD; Stefano Nistri, MD; Franco Cecchi, MD;  
James E. Udelson, MD; Barry J. Maron, MD

Circulation, 2006;114:2232



**Figure 3.** Prevalence of LV outflow tract obstruction in the overall study group of 320 HCM patients. \*Includes 30 patients with modest exercise gradients of 30 to 49 mm Hg and 76 patients with gradients  $\geq 50$  mm Hg.

# LVOT Obstruction in HCM: a Pathophysiologic Conspiracy

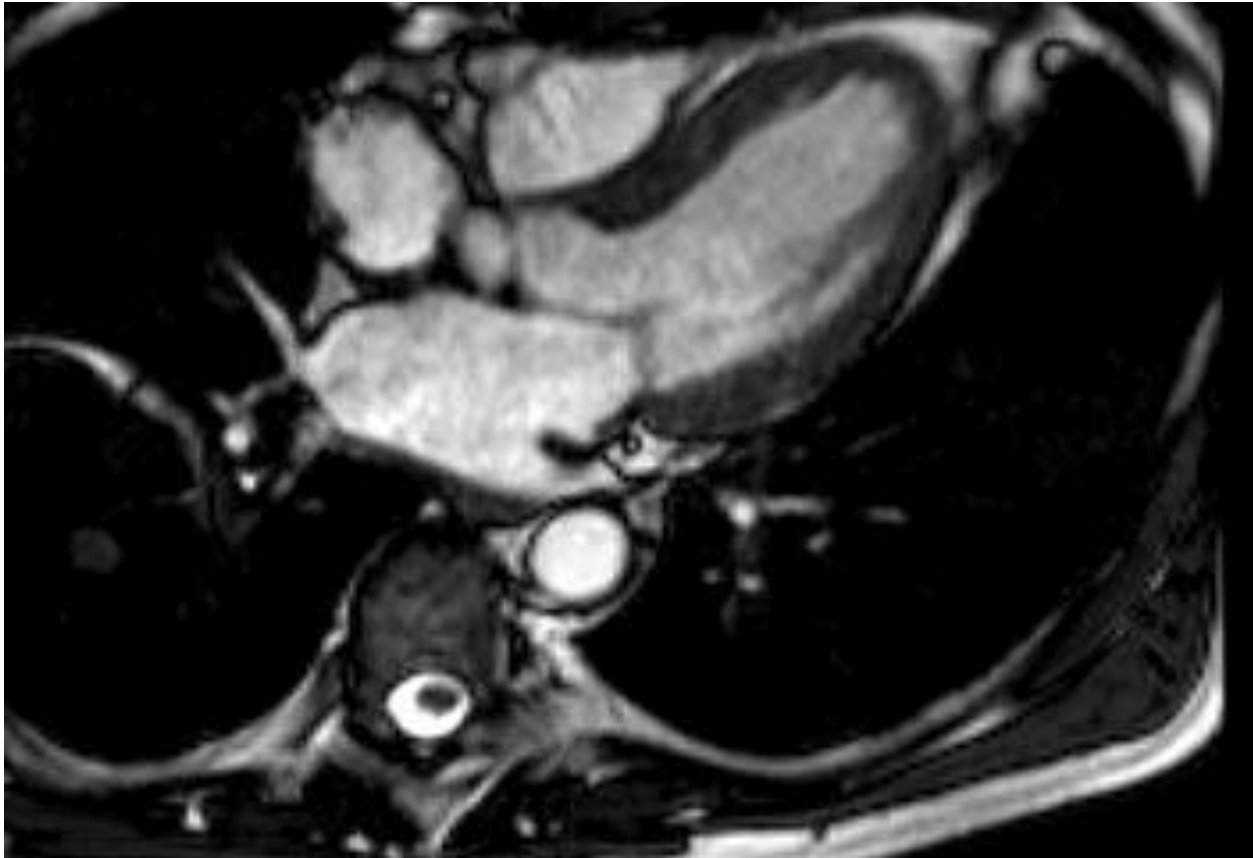


# DYNAMIC LV OUTFLOW OBSTRUCTION IN HCM

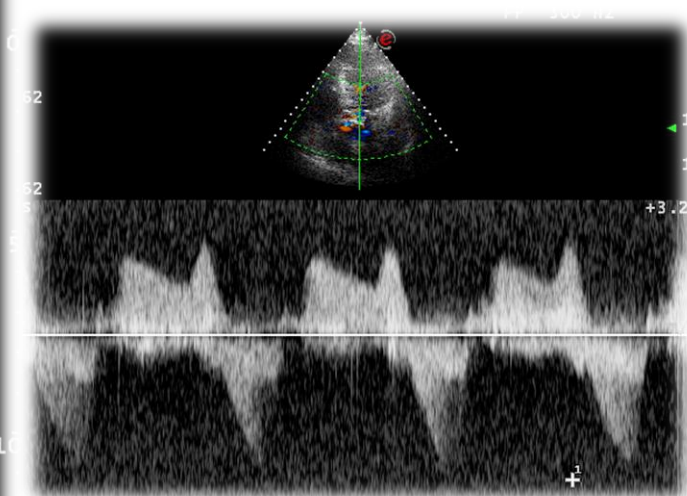
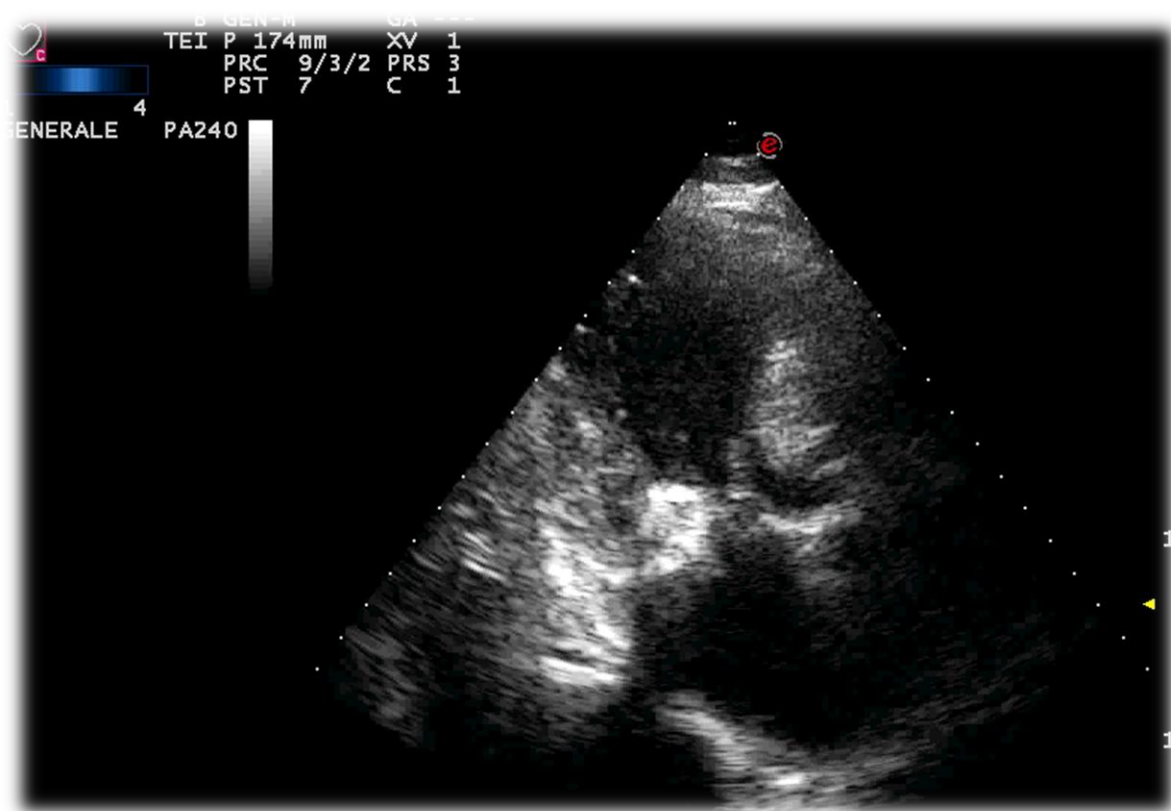




# DYNAMIC LV OUTFLOW OBSTRUCTION IN HCM

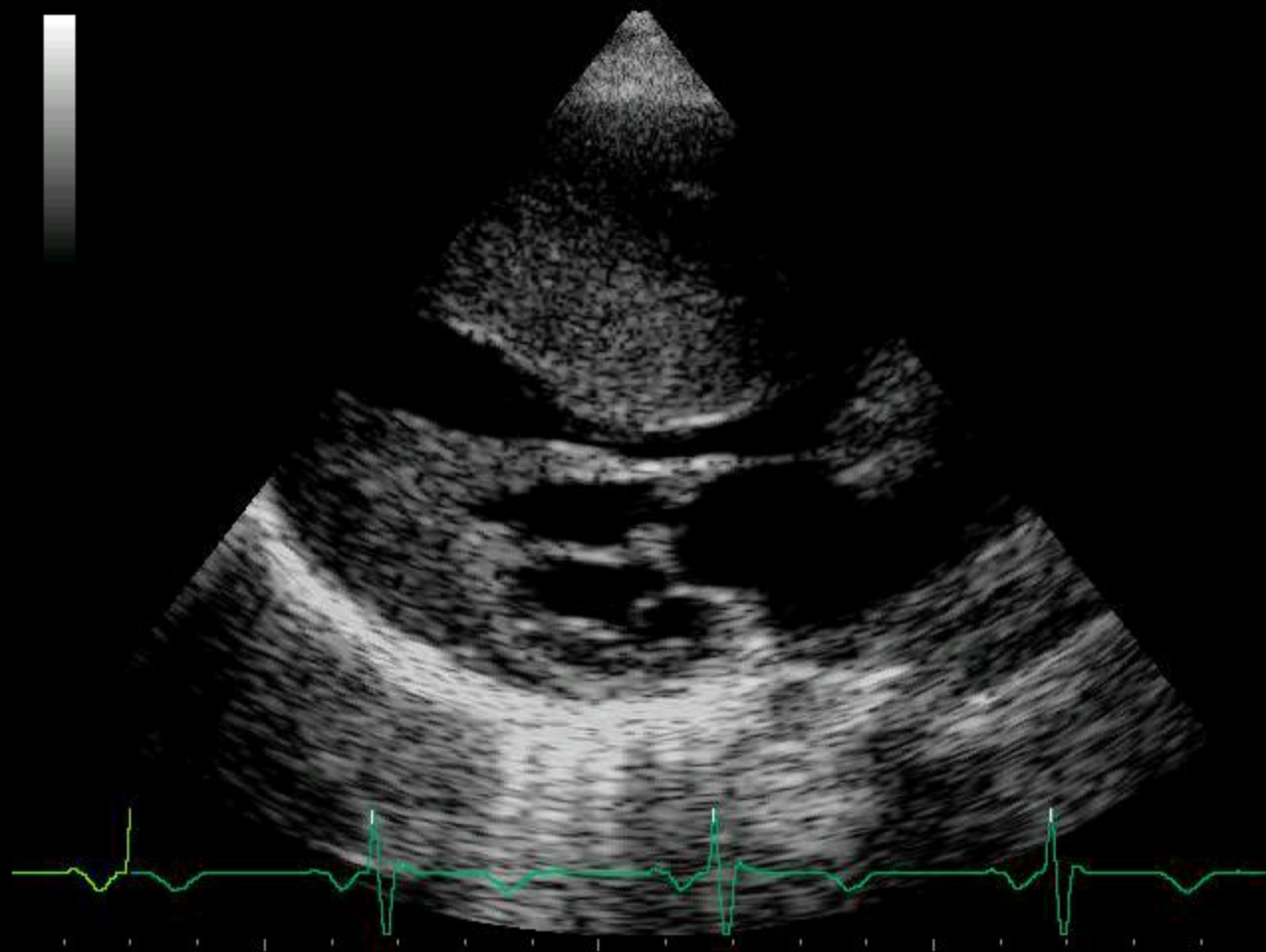


# ASSOCIATED MITRAL VALVE DISEASE



TEI P 14 cm  
PRC 6-A-A PRS -  
PST 2

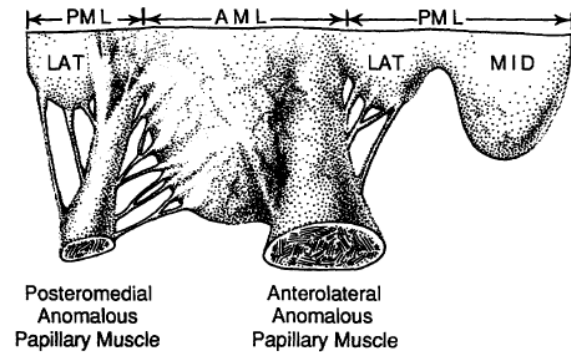
FC 74



# Anomalous Insertion of Papillary Muscle Directly Into Anterior Mitral Leaflet in Hypertrophic Cardiomyopathy

## Significance in Producing Left Ventricular Outflow Obstruction

Heinrich G. Klues, MD; William C. Roberts, MD; and Barry J. Maron, MD

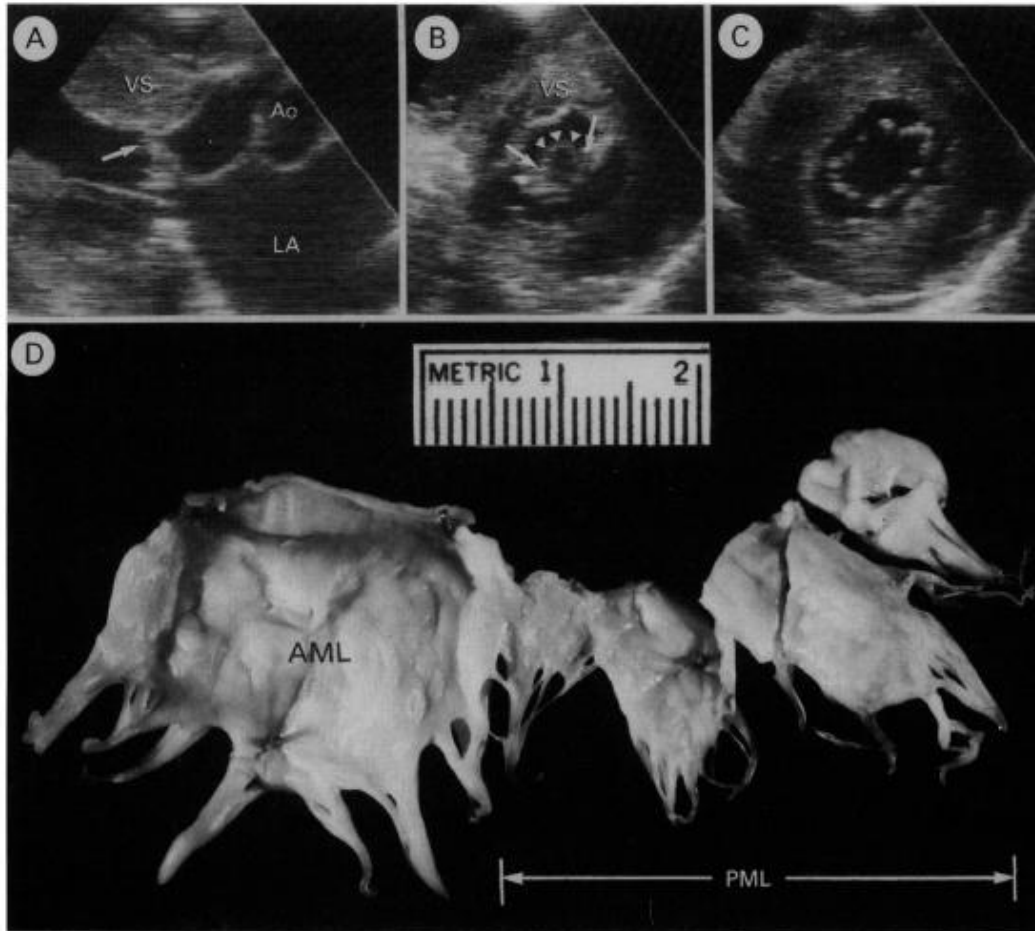


Circulation, 1991



# Morphological Determinants of Echocardiographic Patterns of Mitral Valve Systolic Anterior Motion in Obstructive Hypertrophic Cardiomyopathy

Heinrich G. Klues, MD; William C. Roberts, MD; and Barry J. Maron, MD



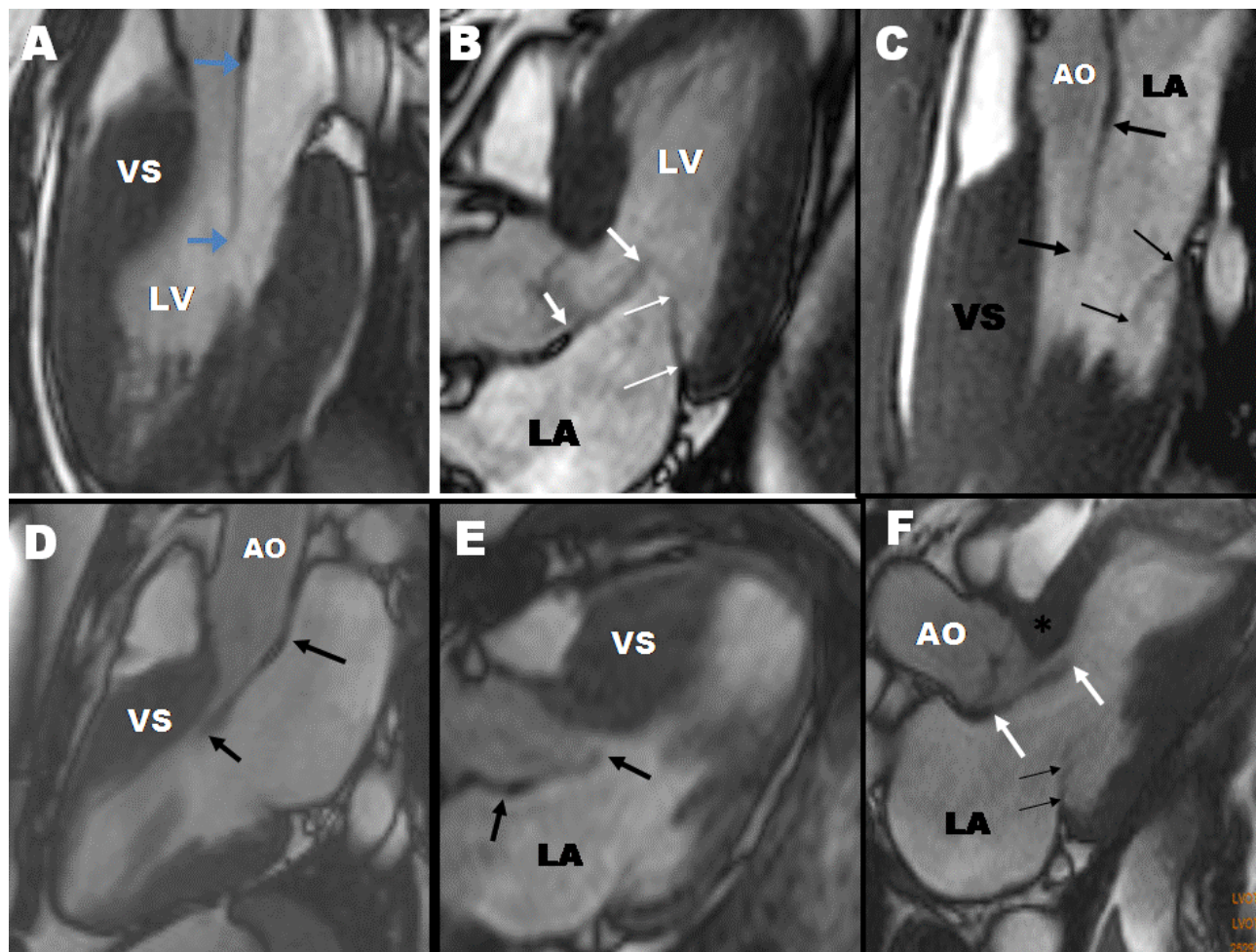
Circulation, 1993



# Mitral Valve Abnormalities Identified by Cardiovascular Magnetic Resonance Represent a Primary Phenotypic Expression of Hypertrophic Cardiomyopathy

Martin S. Maron, MD, Iacopo Olivotto, MD, Caitlin Harrigan, BA, Evan Appelbaum, MD, C. Michael Gibson, MD, John R. Lesser, MD, Tammy S. Haas, RN, James E. Udelson, MD, Warren J. Manning, MD and Barry J. Maron, MD

Circulation, 2011



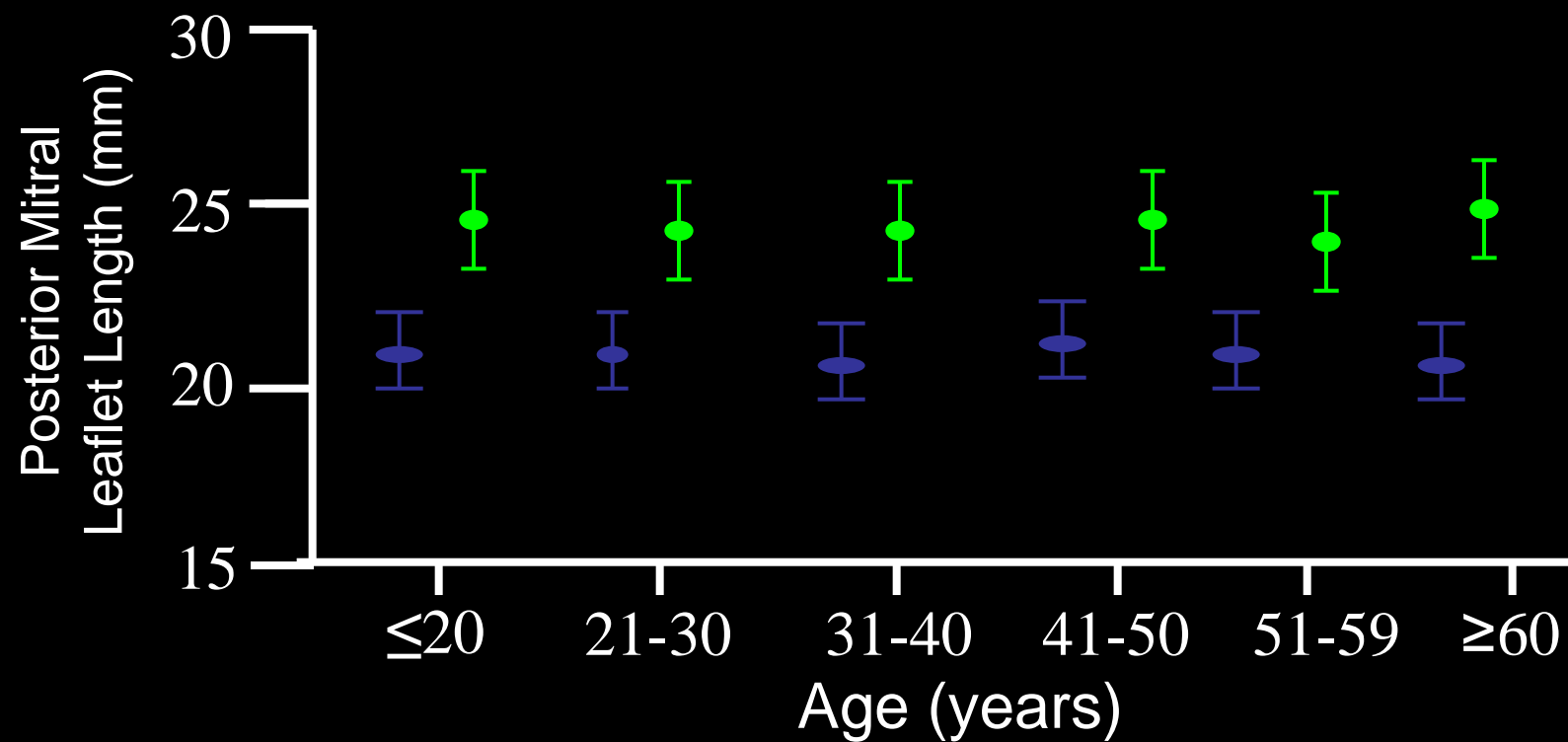
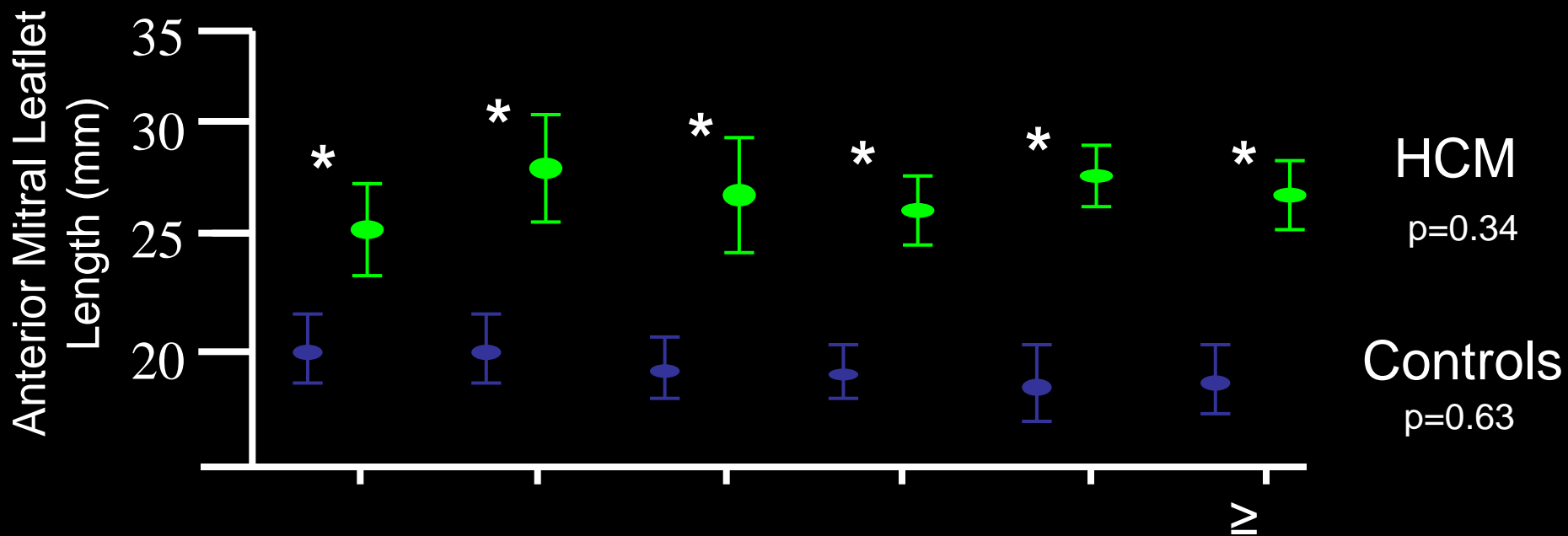
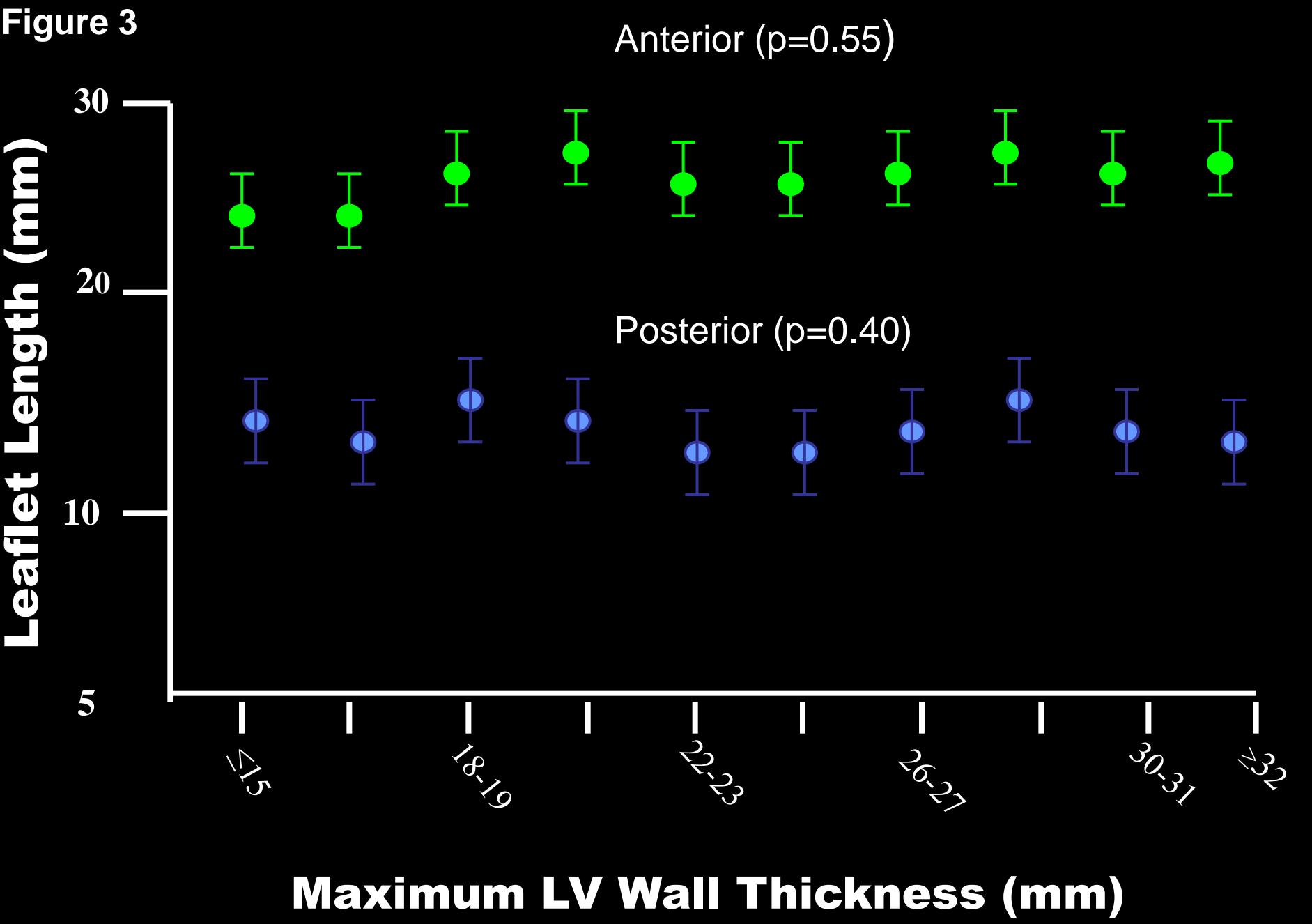


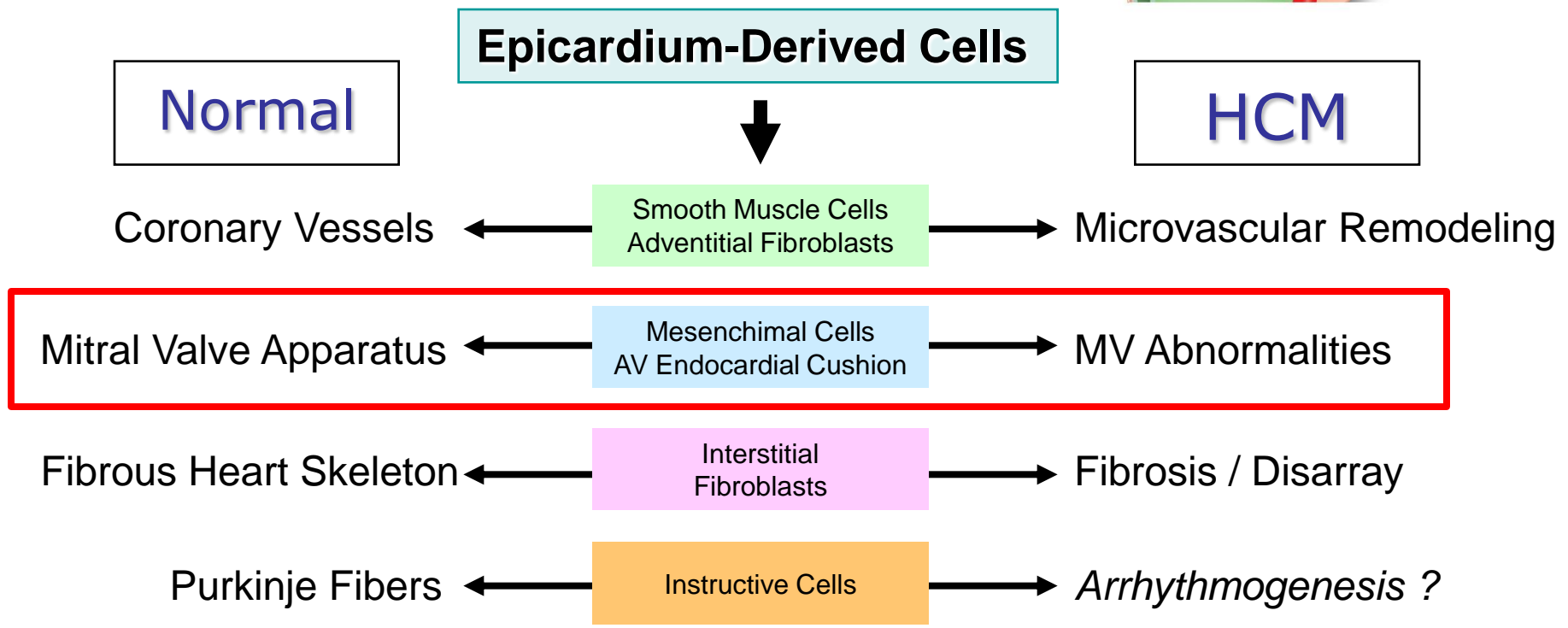
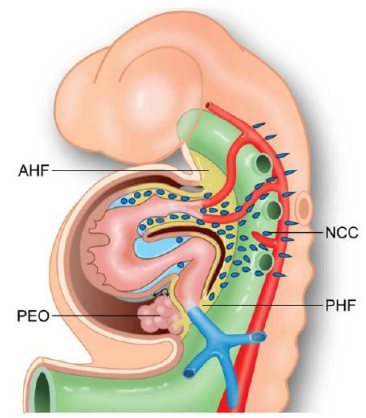
Figure 3



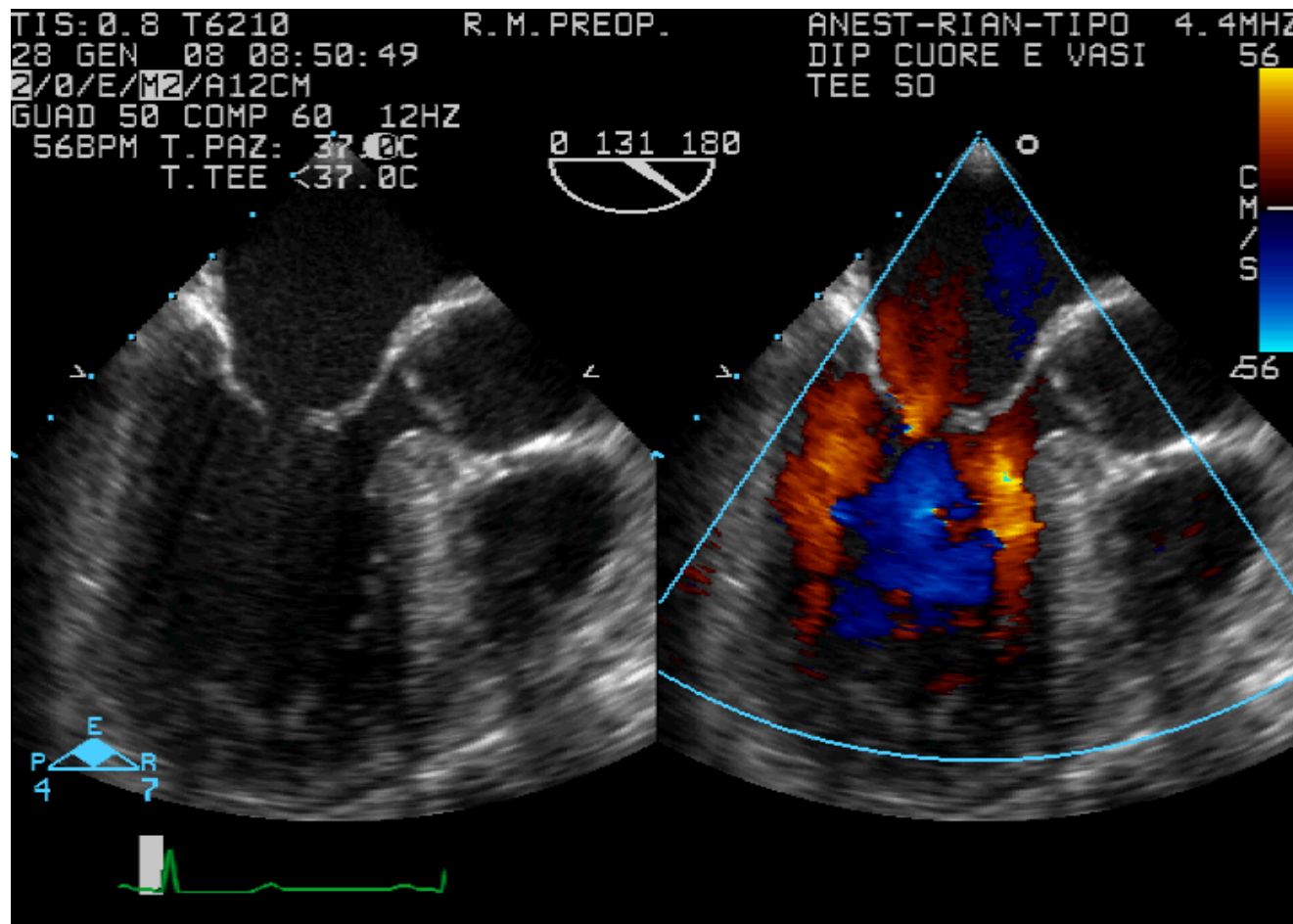
# Developmental origins of hypertrophic cardiomyopathy phenotypes: a unifying hypothesis

Iacopo Olivotto, Franco Cecchi, Corrado Poggesi and Magdi H. Yacoub

Nat. Rev. Cardiol. 6, 317–321 (2009)

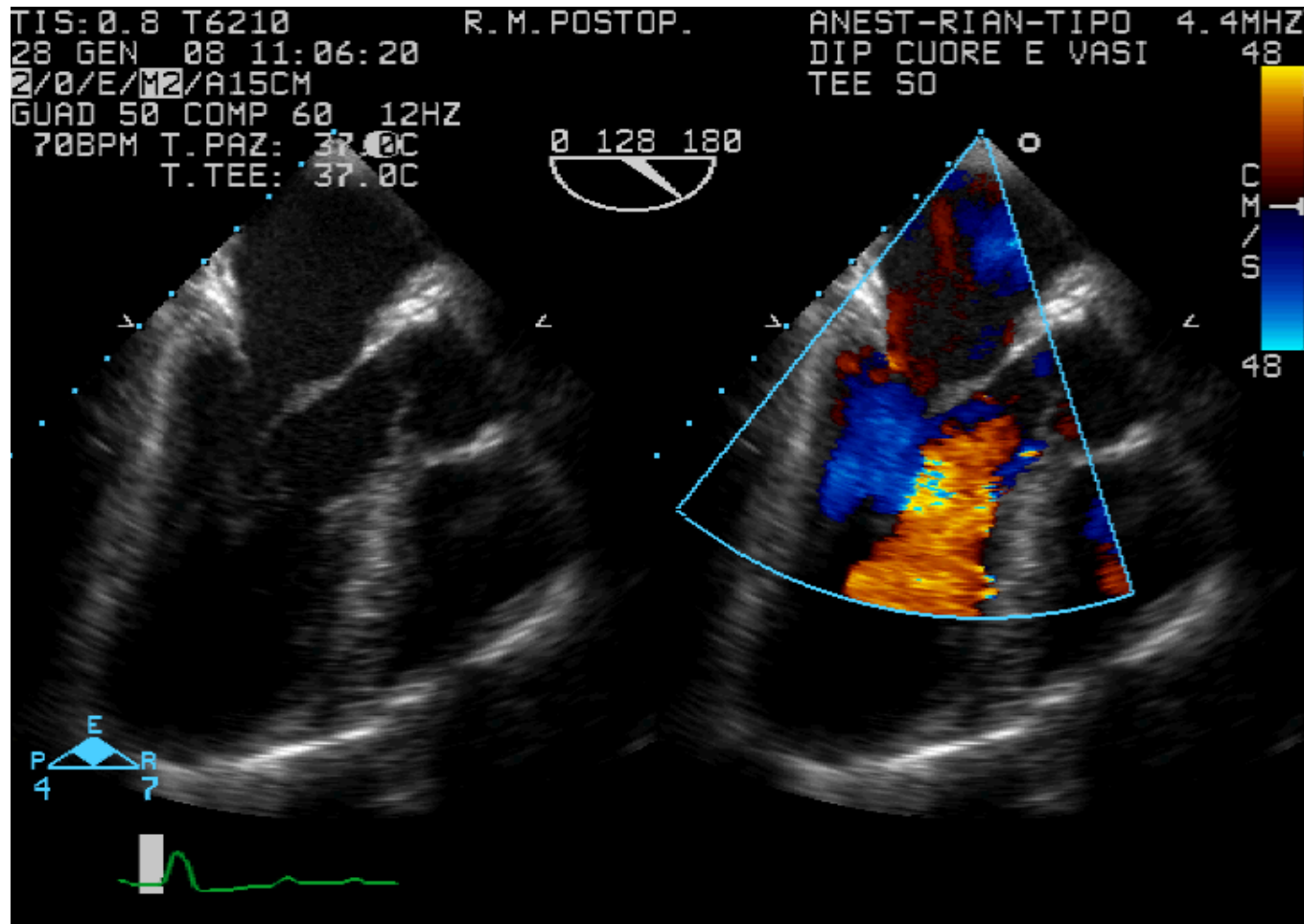


# PERI-OPERATIVE EVALUATION





# PERI-OPERATIVE EVALUATION



# CONCLUSIONS

- ✓ The mitral valve is intrinsically abnormal in HCM.
- ✓ Increased mitral leaflet dimensions are a main determinant of dynamic LV outflow obstruction, in the context of a “pathophysiological conspiracy”.
- ✓ The etiology of mitral abnormalities is unknown; a developmental origin may be hypothesized.
- ✓ Understanding mitral valve pathophysiology in HCM is crucial for clinical decision making in symptomatic patients with obstruction.

# ***II FLORENCE INTERNATIONAL SYMPOSIUM ON ADVANCES IN CARDIOMYOPATHIES***

Preliminary Program

Palazzo degli Affari - Firenze Fiera  
Florence, September 26/28 2012

Presented by:  
University of Florence  
QCRC

[www.cardiomyopathies2012.com](http://www.cardiomyopathies2012.com)



**9<sup>TH</sup> MEETING OF THE EUROPEAN MYOCARDIAL  
AND PERICARDIAL DISEASES WG OF THE ESC**

