La diagnosi e le varie forme di Cardiomiopatia Ipertrofica

Prof. Franco Cecchi, MD

Università degli Studi di Firenze

Come diagnosticare la Cardiomiopatia Ipertrofica

"VS ipertrofico (aumentato spessore di parete), in assenza di altre malattie cardiache o condizioni di carico anormale responsabili dell'ipertrofia"

Spessore di parete in qualsiasi segmento del VS

Adulti ≥ 15 mm

Bambini ≥ 2 SD

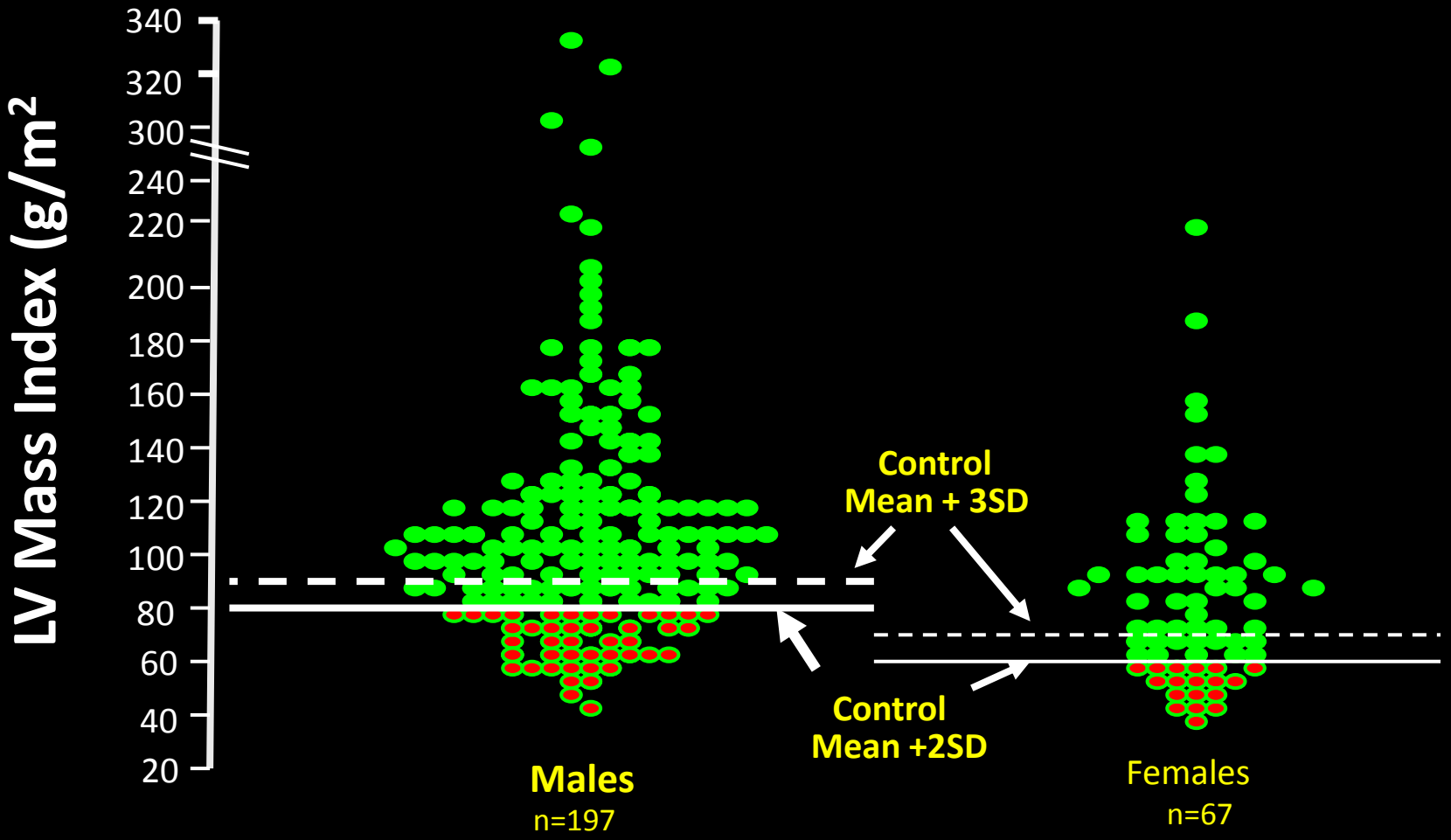
(Kampmann , Heart 2000)

nei familiari ≥ 13 mm

Prevalenza nella Popolazione Generale **1:500** **(2 per mille)**

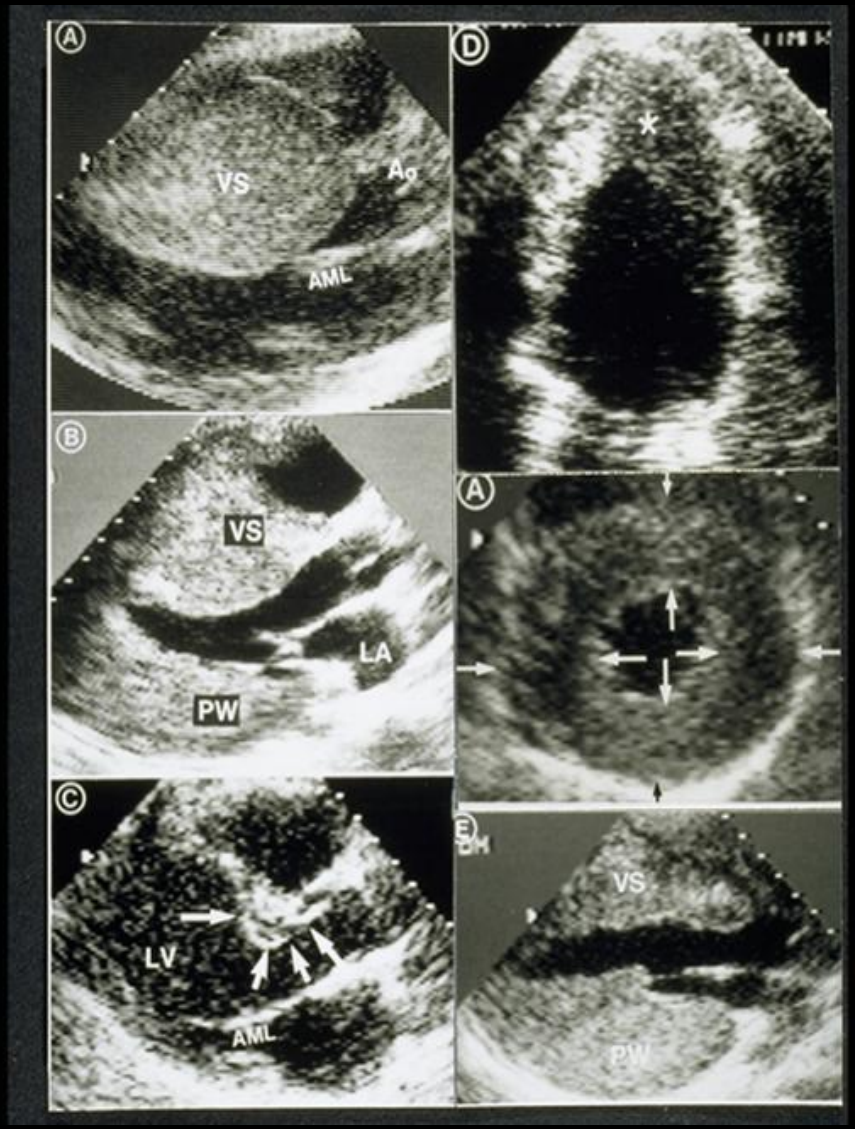
Prevalenza nella Popolazione Generale **> 2 per mille**

CMI : la massa VS non è necessariamente aumentata



Olivotto, I. et al., JACC 2008

CMI: il fenotipo è molto variabile



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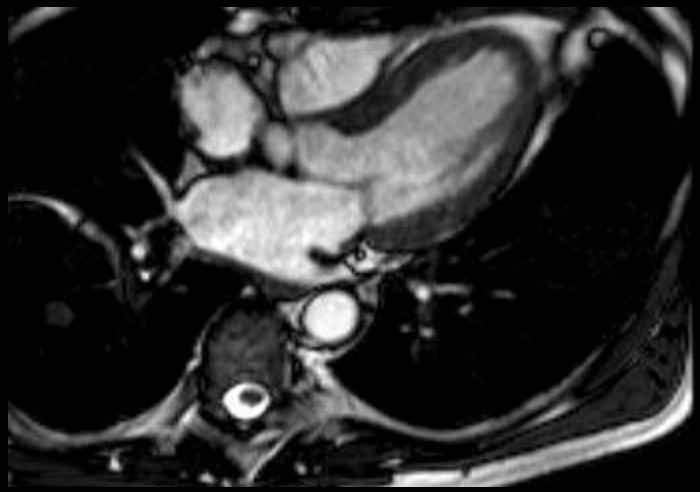
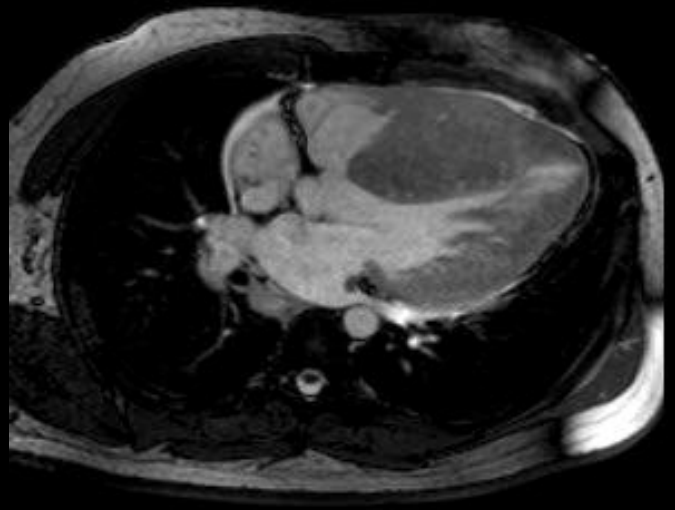
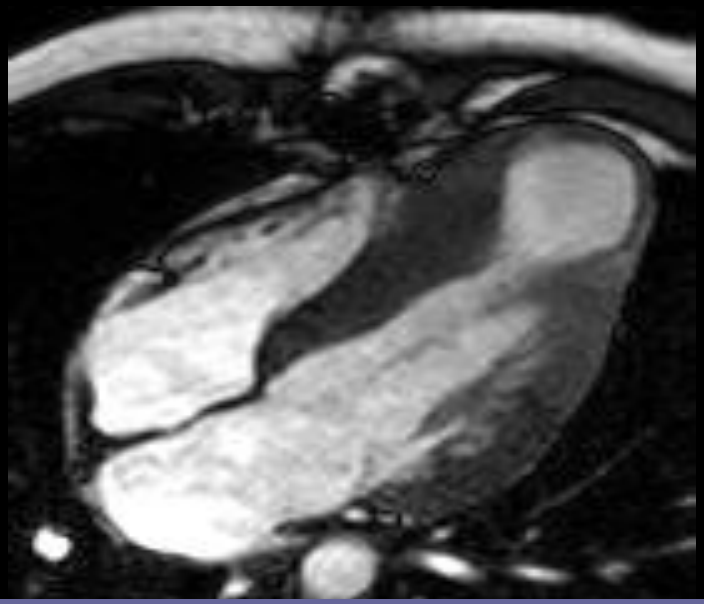
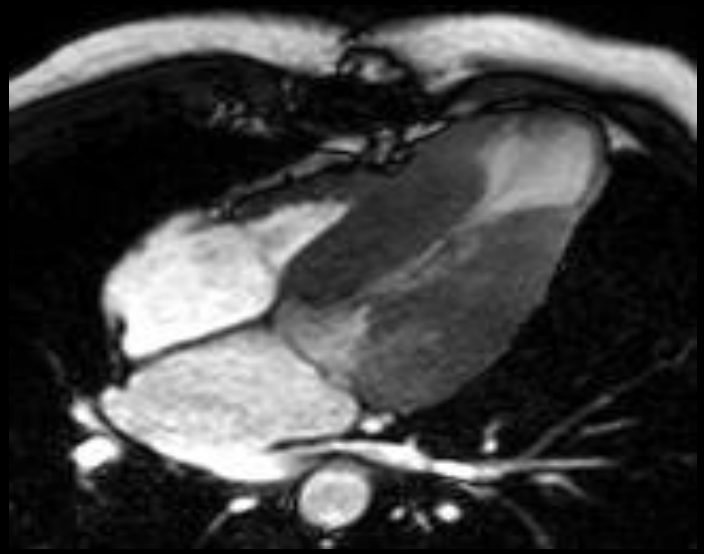
CMI: il fenotipo è molto variabile









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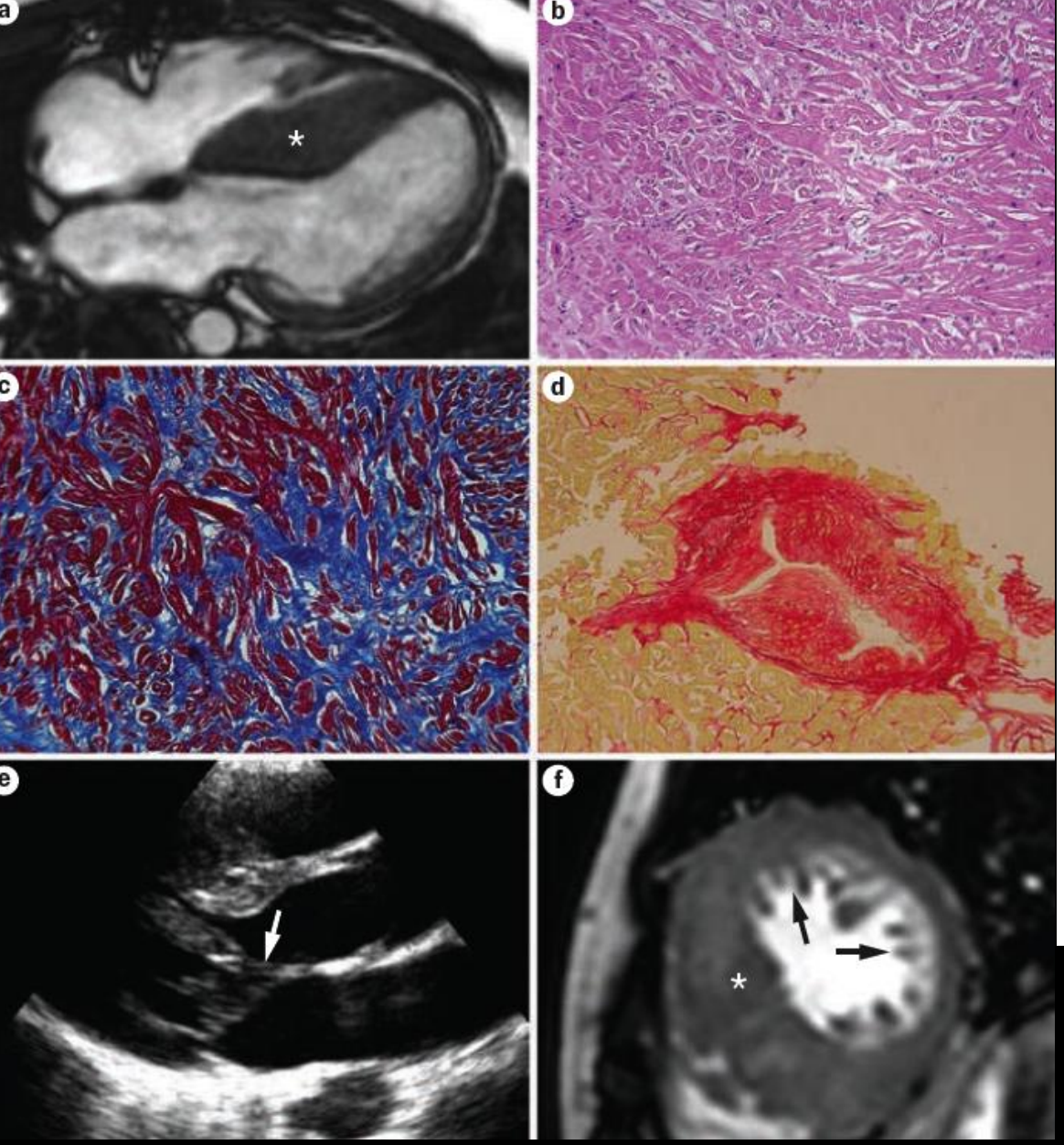


CMI FENOTIPO

a.IPERTROFIA

b.DISARRAY

c.FIBROSI

d.DISFUNZIONE DEL MICROCIRCOLO

e. ANOMALIE APPARATO VALVOLARE MITRALICO

f. NON COMPATTAZIONE

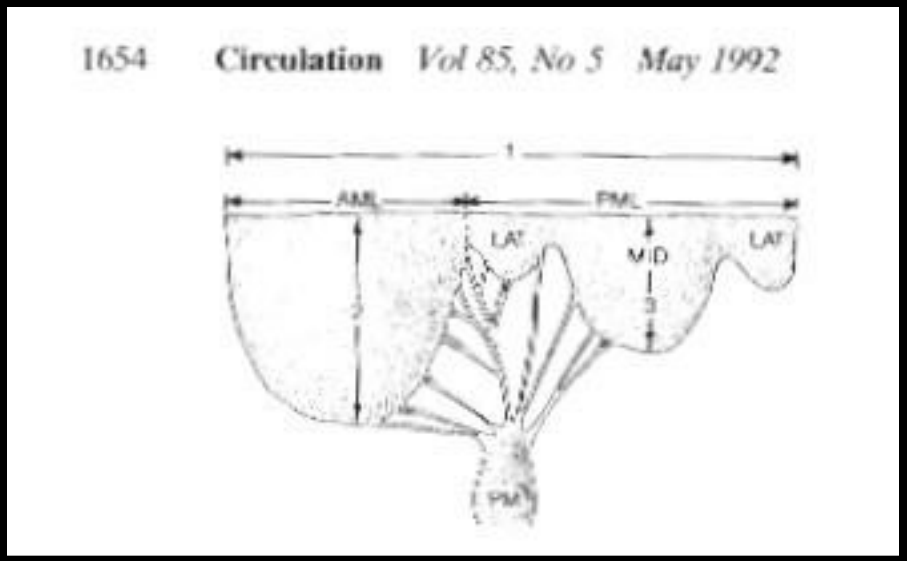
OPINION

Developmental origins of hypertrophic cardiomyopathy phenotypes: a unifying hypothesis *Nat. Rev. Cardiol.* 6, 317–321 (2009)

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

Valvola mitrale ridondante nella CMI ostruttiva

Lembi mitralici ridondanti nel
64% dei pz (92) con CMIO (NIH)



↑ AML
+
↑ PML

↑ AML

↑ PML

NORMAL

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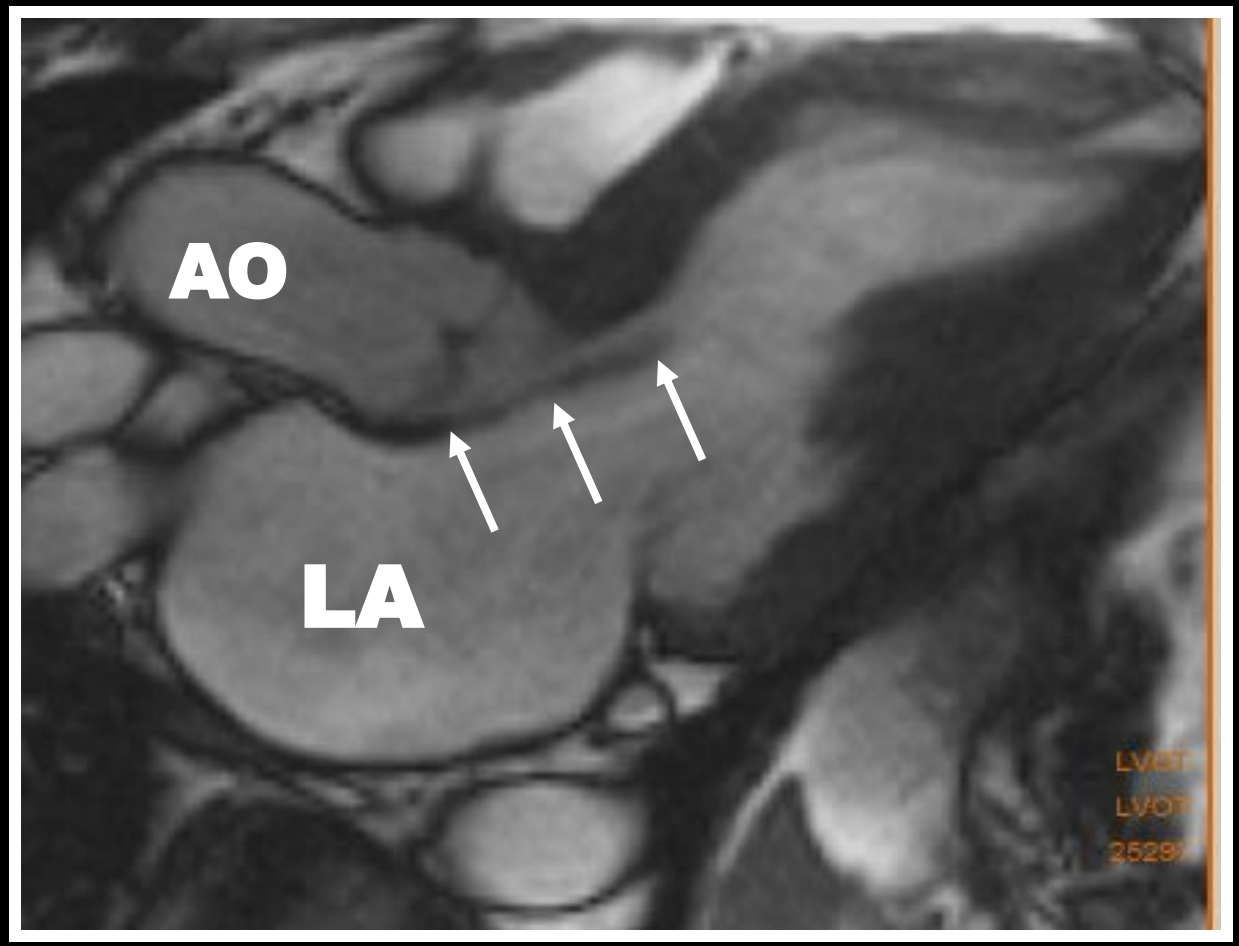
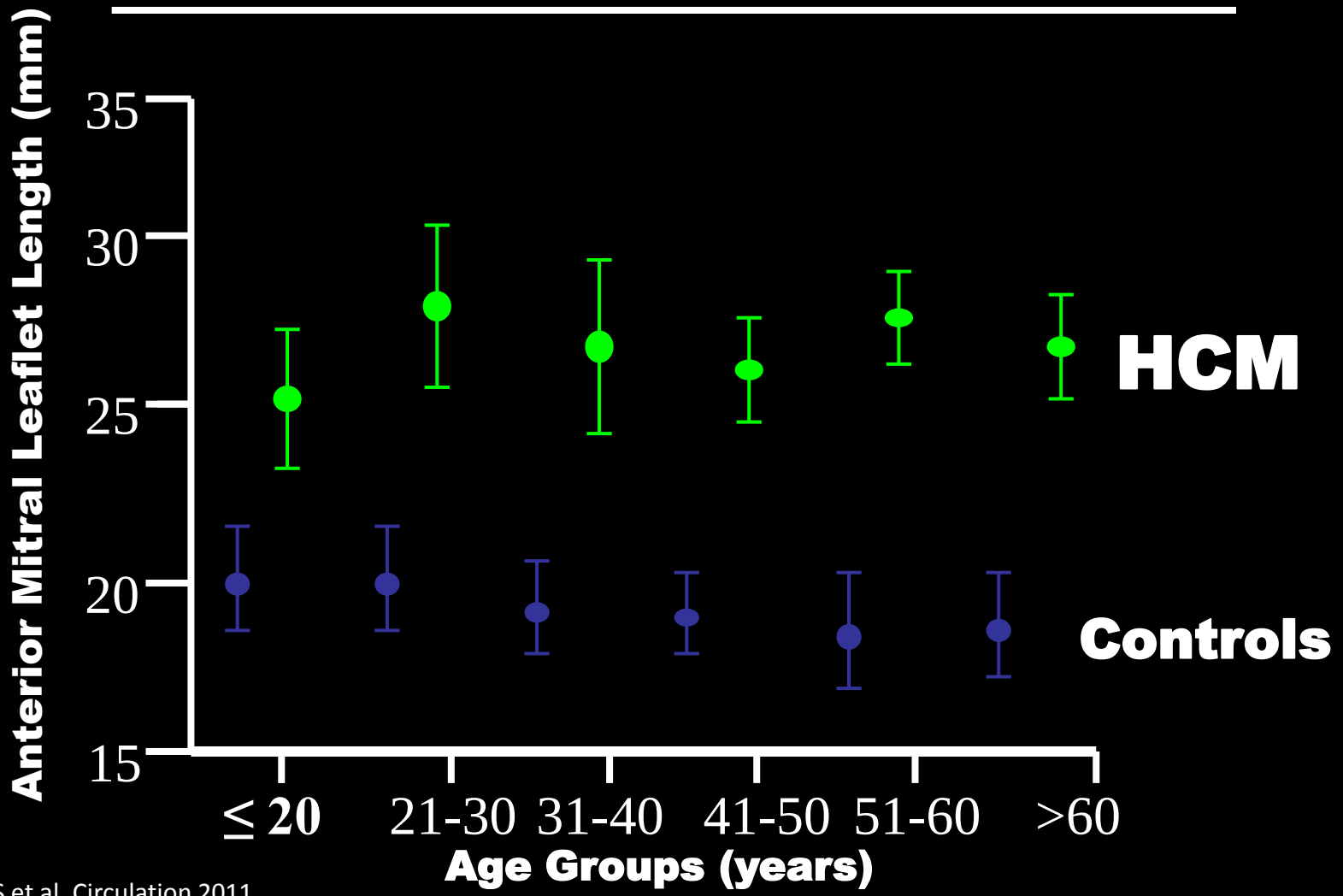
Valvola mitrale ridondante nella CMI ostruttiva



Maron MS et al. Circulation 2011

Lunghezza del lembo anteriore mitralico per età

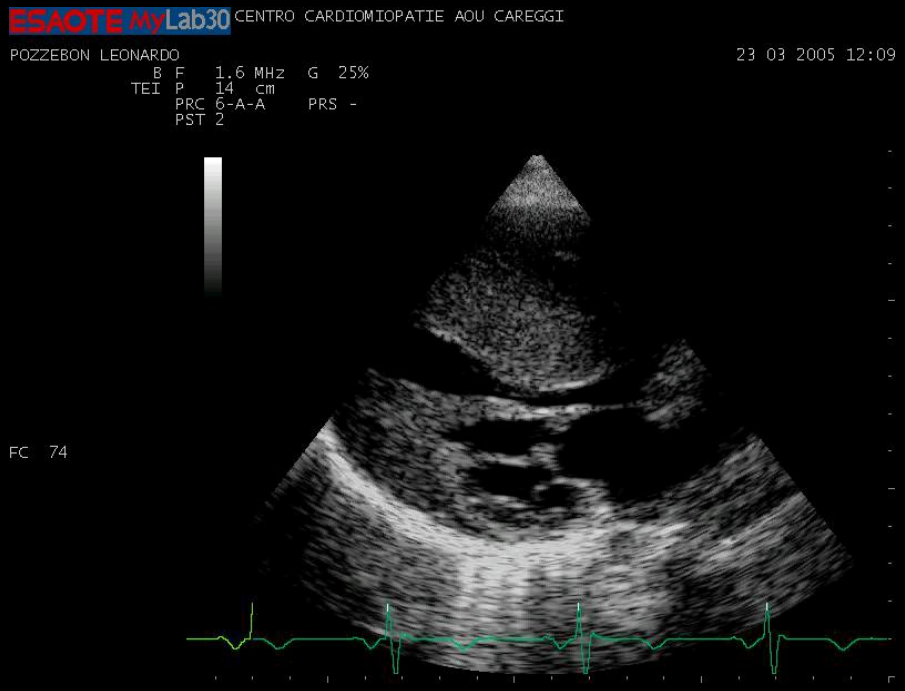


Maron MS et al. Circulation 2011

Valvola mitrale e muscoli papillari anomali

Inserzione diretta del muscolo papillare sul LAM

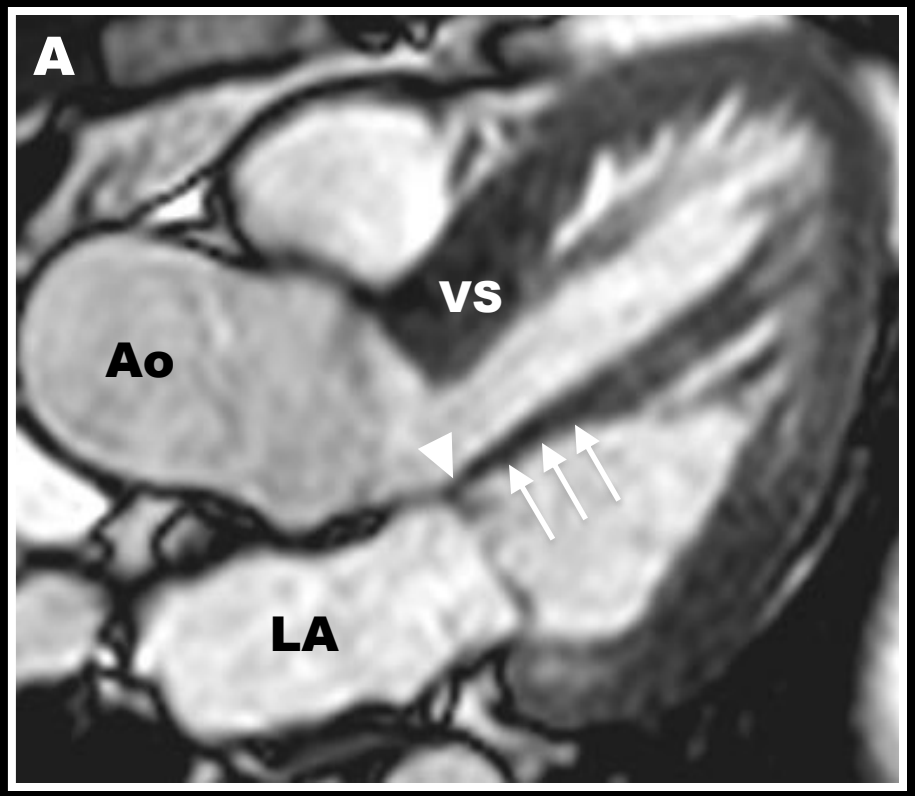
nel 13% dei pz (78) con CMIO



Klues H , et al Circulation 1991

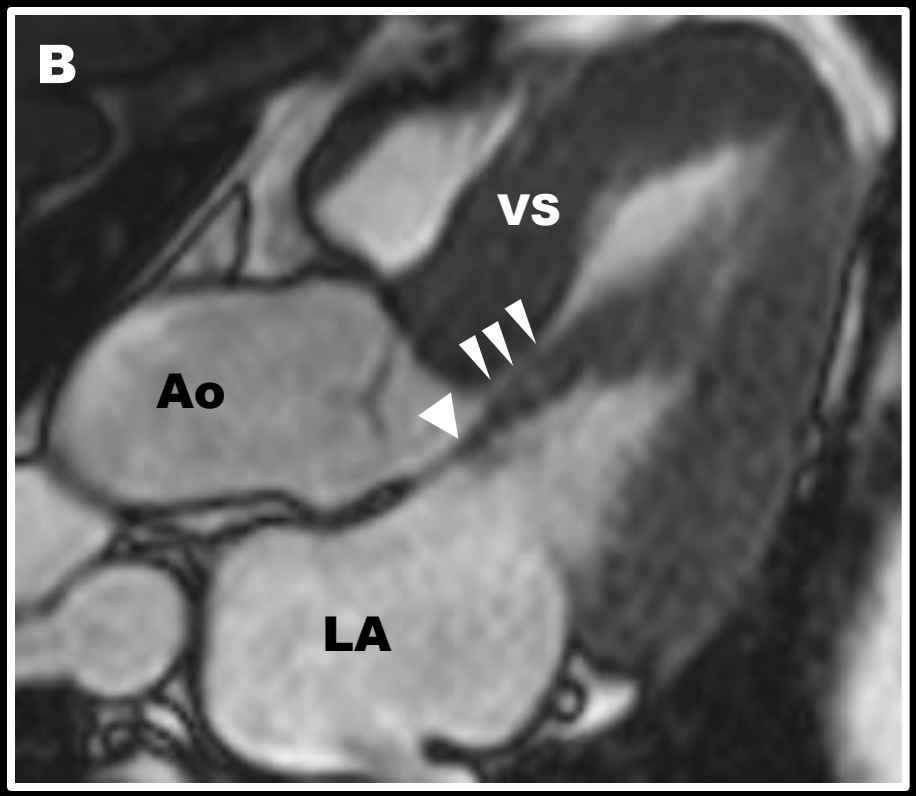
Prof. Franco Cecchi, MD

CMI Inserzione diretta del muscolo papillare sul LAM



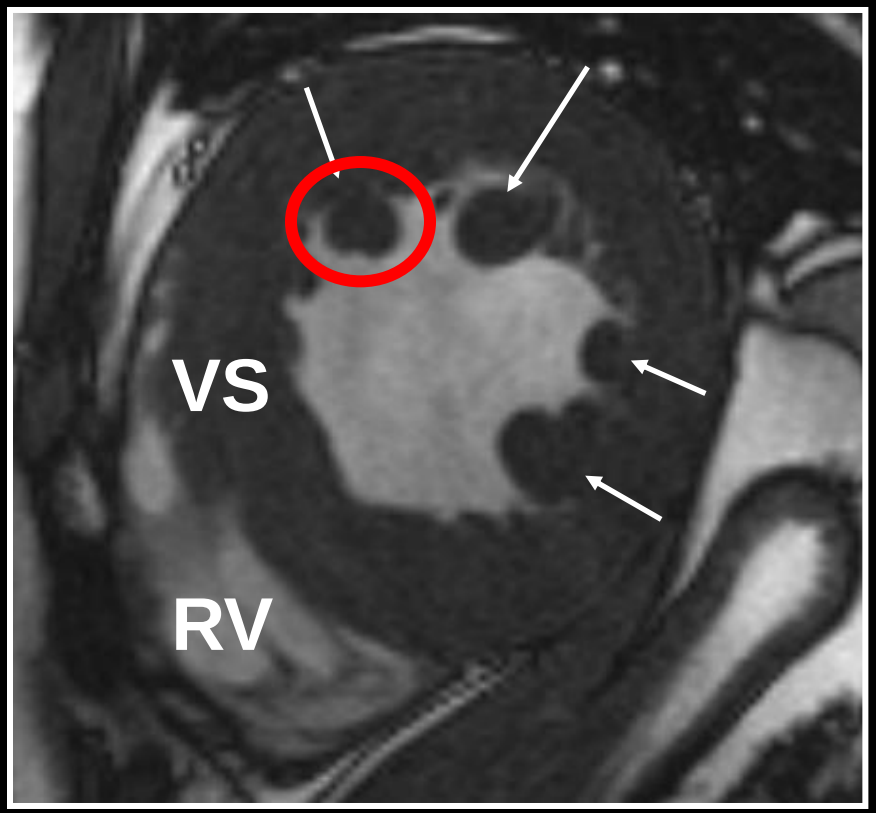
Rowin E et al *AJC* 2013

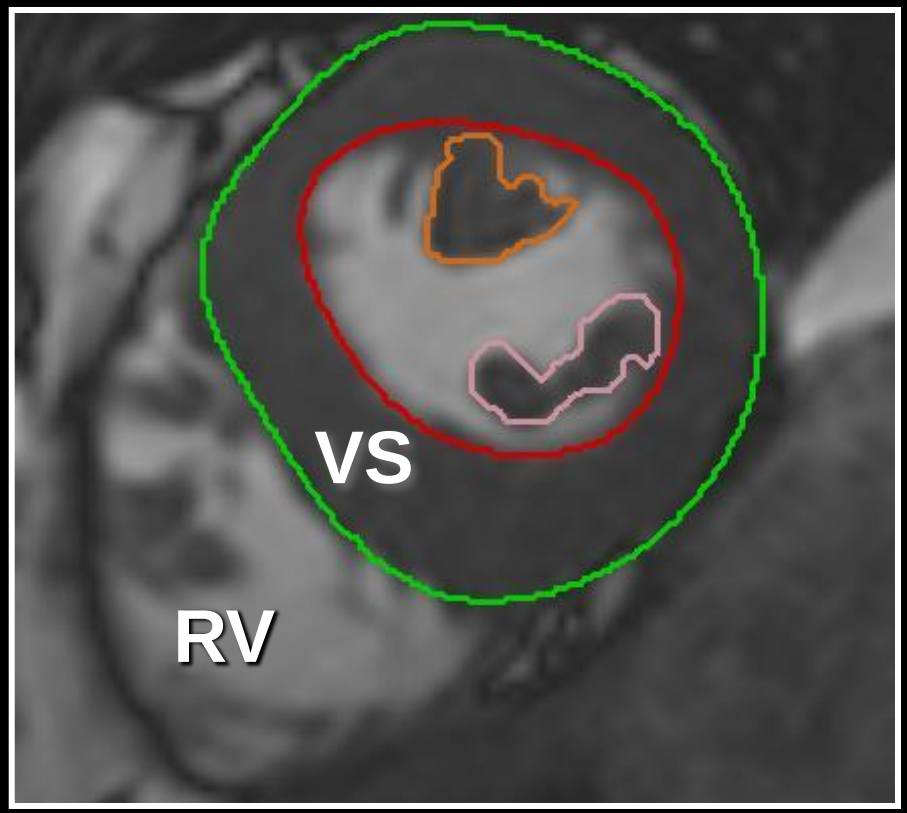
End-Diastolic



Mid-Systolic

CMI Anomalia dei m. papillari





Harrigan, C. et al. *AJC* 2008

CMI Tralci fibromuscolari accessori

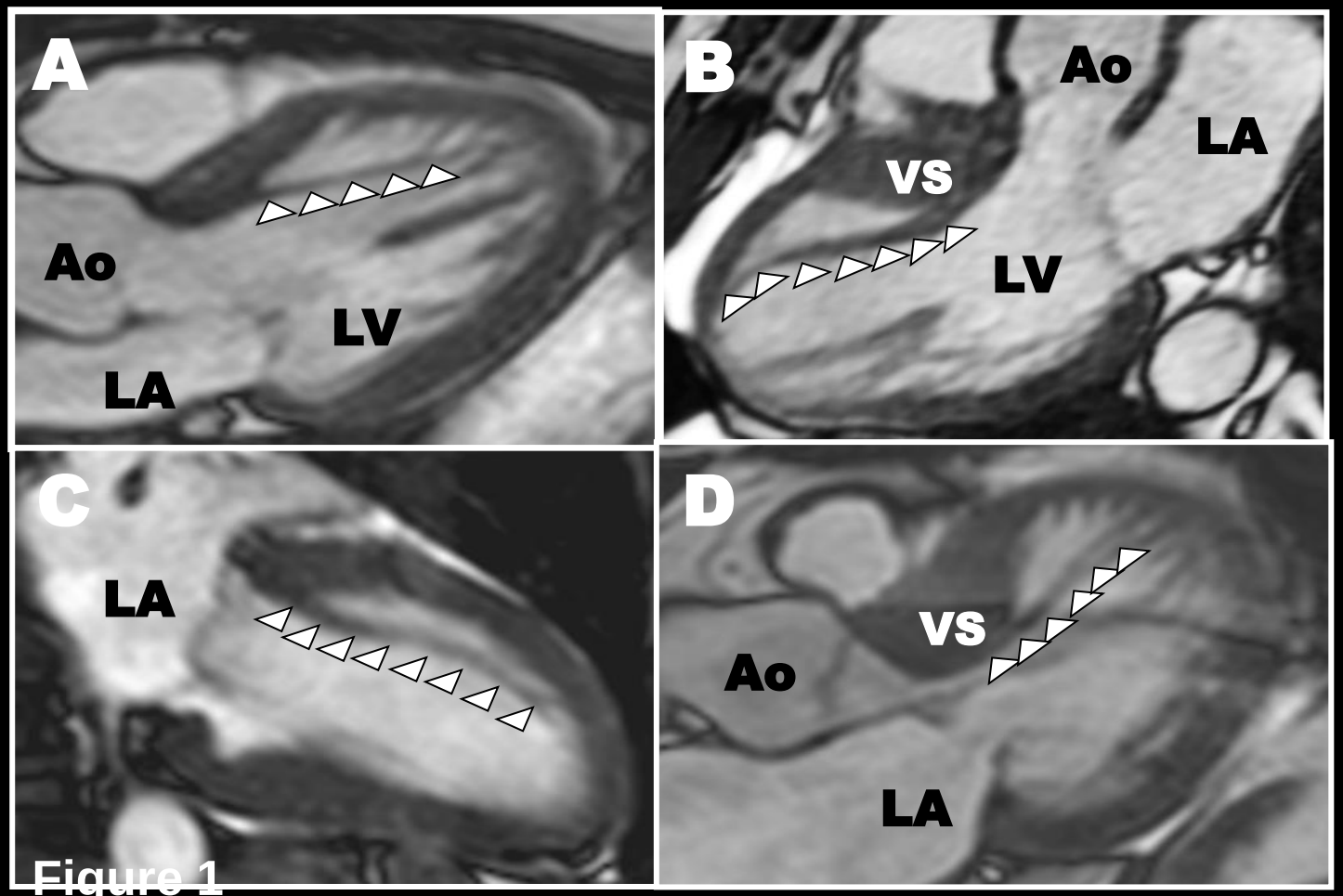


Figure 1

CARDIOMIOPATIA IPERTROFICA

1. DIAGNOSI

2. DIAGNOSI DIFFERENZIALE (es. Amiloidosi, Fabry, Sindromi, etc)

3. VALUTAZIONE DEL RISCHIO
   (es. aritmie, scompenso, progressione di malattia, etc)

4. TERAPIA OTTIMALE
   (riduzione dei sintomi, miglioramento della prognosi)

5. PREVENZIONE MORTE IMPROVVISA

HYPERTROPHIC CARDIOMYOPATHY

High genetic heterogeneity

Classification of the cardiomyopathies: a position statement from the european society of cardiology working group on myocardial and pericardial diseases

Perry Elliott, Bert Andersson, Eloisa Arbustini, Zofia Bilinska, Franco Cecchi, Philippe Charron, Olivier Dubourg, Uwe Kühl, Bernhard Maisch, William J. McKenna, Lorenzo Monserrat, Sabine Pankuweit, Claudio Rapezzi, Petar Seferovic, Luigi Tavazzi, and Andre Keren*

European Heart Journal (2008) **29**, 270–276

FAMILIAL Unknown gene

Sarcomeric protein disease ß myosin heavy chain, Cardiac myosin binding protein C Cardiac troponin I , T and C, a-tropomyosin, Essential myosin light chain Regulatory myosin light chain, Cardiac actin, a- myosin heavy chain , Titin

Glycogen storage diseases (e.g. GSD II (Pompe's disease); GSD III (Forbes' disease), AMP kinase (WPW, HCM, conduction disease)

Lysosomal storage diseases (e.g. Anderson-Fabry disease, Hurler's syndrome)

Disorders of Fatty Acid Metabolism Carnitine , Phosphorylase B kinase deficiency

Mitochondrial cytopathies (e.g. MELAS, MERFF, LHON)

Syndromic HCM Noonan's syndrome, LEOPARD syndrome, Friedreich's ataxia, Beckwith-Wiedermann syndrome; Swyer's syndrome (pure gonadal dysgenesis)

Other: Muscle LIM protein Phospholamban promoter Familial Amyloid

NON-FAMILIAL Obesity; Infants of diabetic mothers;

Athletic training; Amyloid (AL / prealbumin)

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CARDIOMIOPATIA IPERTROFICA

1. DIAGNOSI

2. DIAGNOSI DIFFERENZIALE (es. Amiloidosi, Fabry, Sindromi, etc)

3. VALUTAZIONE DEL RISCHIO
   (es. aritmie, scompenso, progressione di malattia, etc)

4. TERAPIA OTTIMALE
   (riduzione dei sintomi, miglioramento della prognosi)

5. PREVENZIONE MORTE IMPROVVISA

L'ostruzione all'efflusso VS è un Fattore di rischio

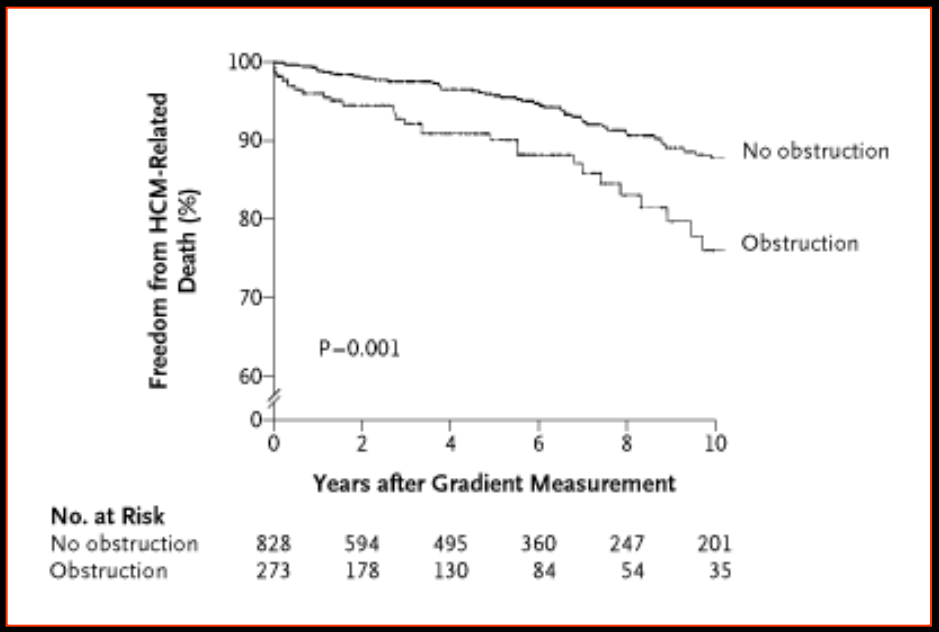

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Effect of Left Ventricular Outflow Tract Obstruction on Clinical Outcome in Hypertrophic Cardiomyopathy

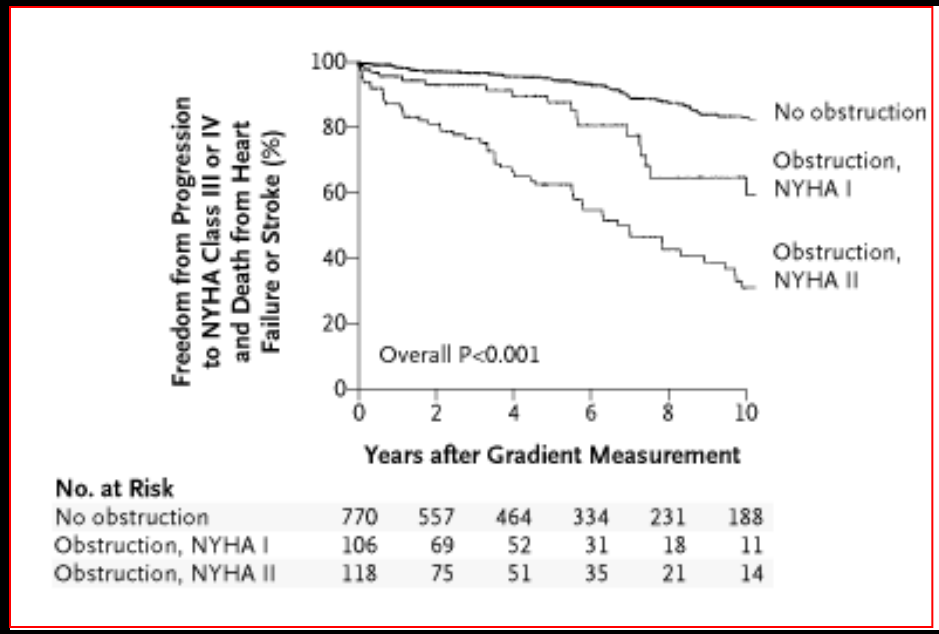
Martin S. Maron, M.D., Iacopo Olivotto, M.D., Sandro Betocchi, M.D., Susan A. Casey, R.N., John R. Lesser, M.D., Maria A. Losi, M.D., Franco Cecchi, M.D., and Barry J. Maron, M.D.

Mortalità correlata alla CMI
in pz con e senza Ostruzione basale



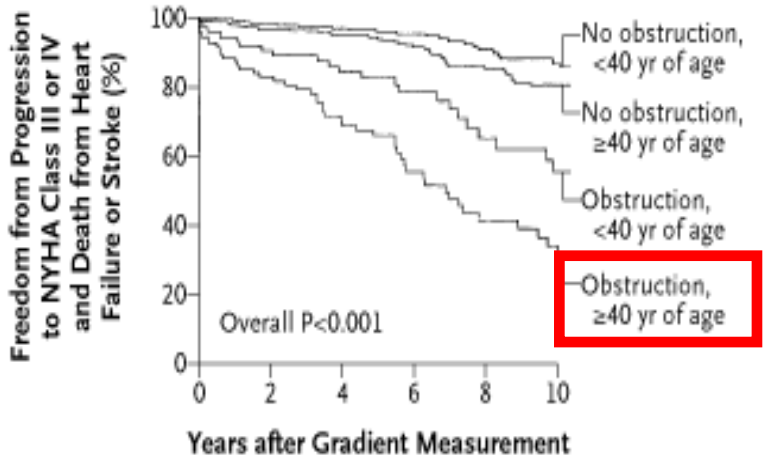
No. at Risk						
No obstruction	828	594	495	360	247	201
Obstruction	273	178	130	84	54	35

Probabilità di Progressione a
Severa limitazione funzionale (CFIII-IV)
o Morte per Sompenso o Stroke
in pz con e senza Ostruzione (CF I-II)

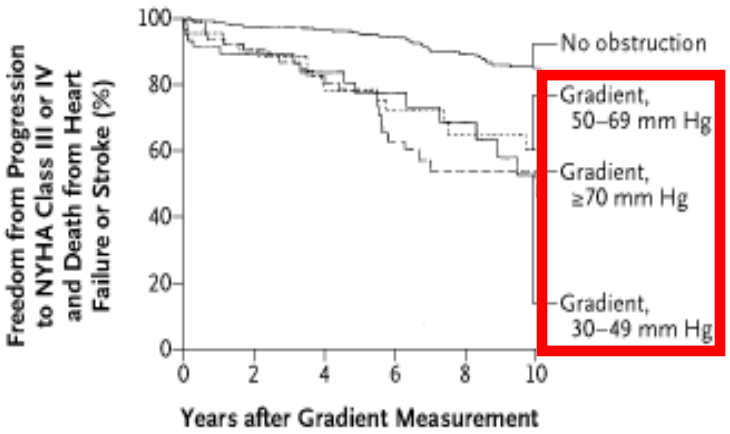


No. at Risk						
No obstruction	770	557	464	334	231	188
Obstruction, NYHA I	106	69	52	31	18	11
Obstruction, NYHA II	118	75	51	35	21	14

Il rischio è maggiore dopo i 40 anni ed è indipendente dall'entità del gradiente



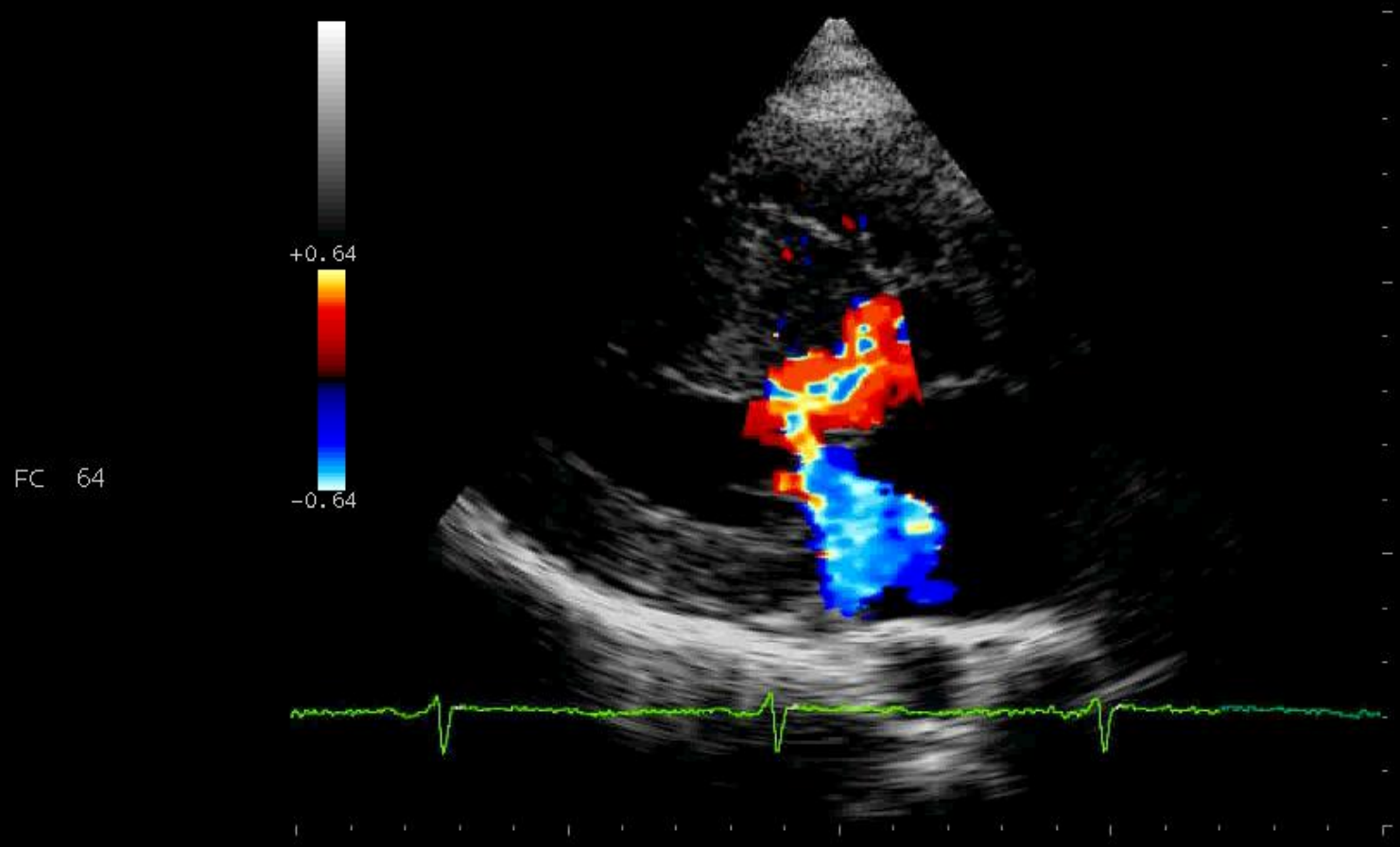
No. at Risk						
No obstruction, <40 yr of age	349	251	206	146	103	80
No obstruction, ≥40 yr of age	421	306	258	188	128	108
Obstruction, <40 yr of age	106	70	52	37	21	15
Obstruction, ≥40 yr of age	118	74	51	29	18	10



No. at Risk						
No obstruction,	770	557	464	334	231	188
Gradient, 30–49 mm Hg	62	38	28	18	12	8
Gradient, 50–69 mm Hg	73	50	37	24	16	10
Gradient, ≥70 mm Hg	89	56	38	24	11	7

N.L., maschio,19 a., sincope (calcio), NYHA CF III,

GRADIENTE TEVS 95 mmhg + rigurgito mitralico ; AS 54 MM

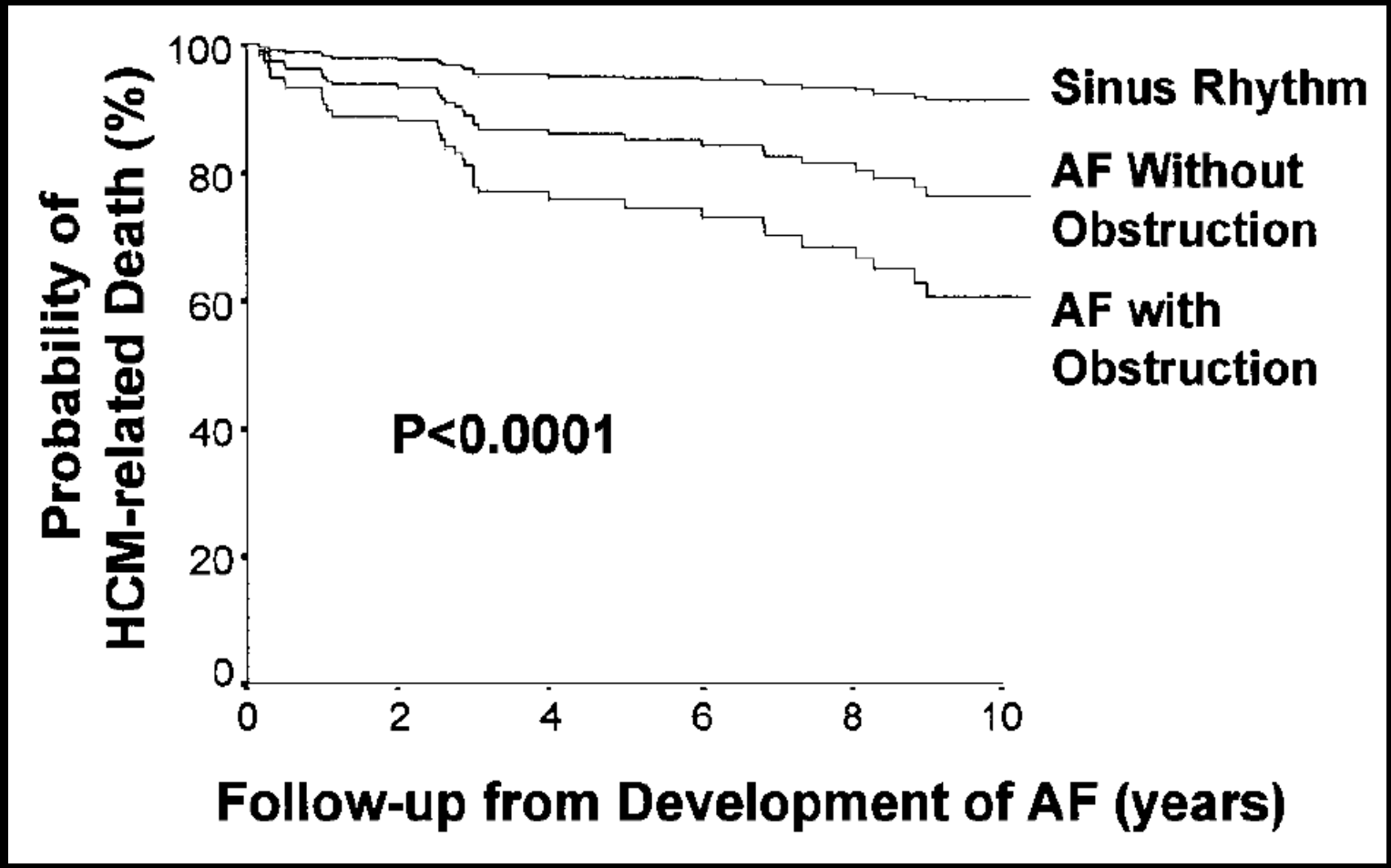


Impact of Atrial Fibrillation on the Clinical Course of Hypertrophic Cardiomyopathy

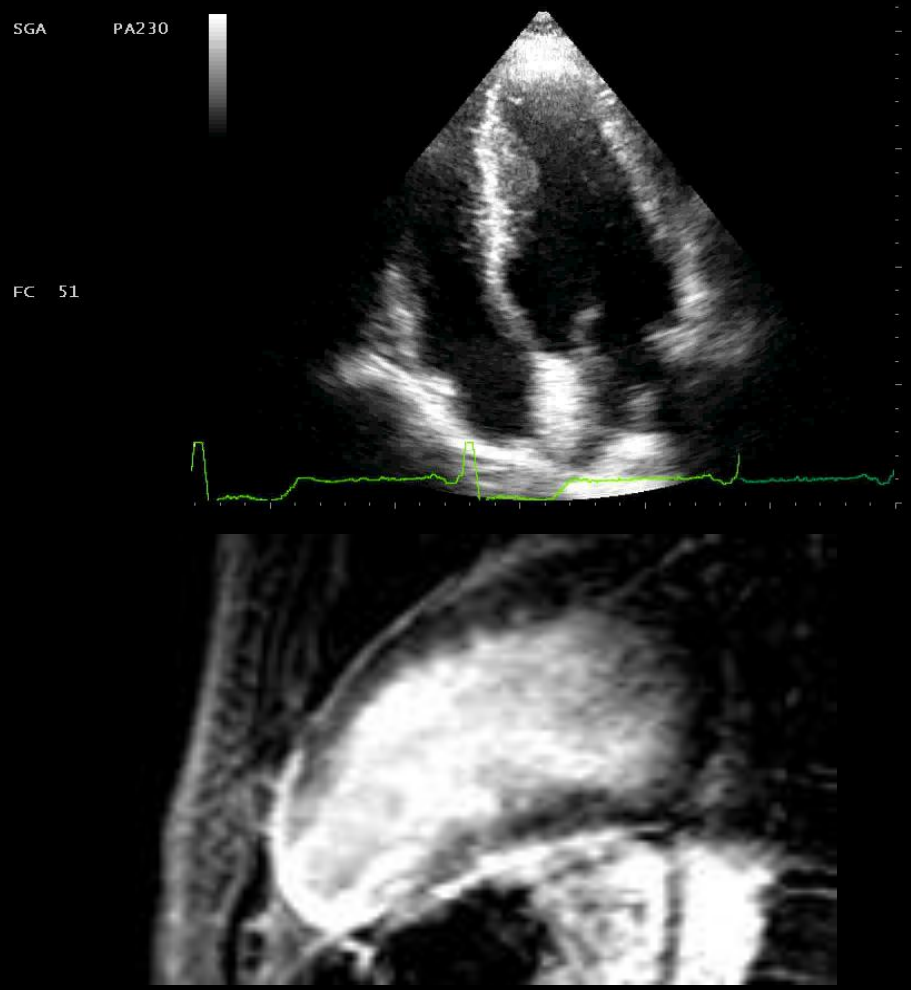
Iacopo Olivotto, MD; Franco Cecchi, MD; Susan A. Casey, RN; Alberto Dolara, MD; Jay H. Traverse, MD; Barry J. Maron, MD

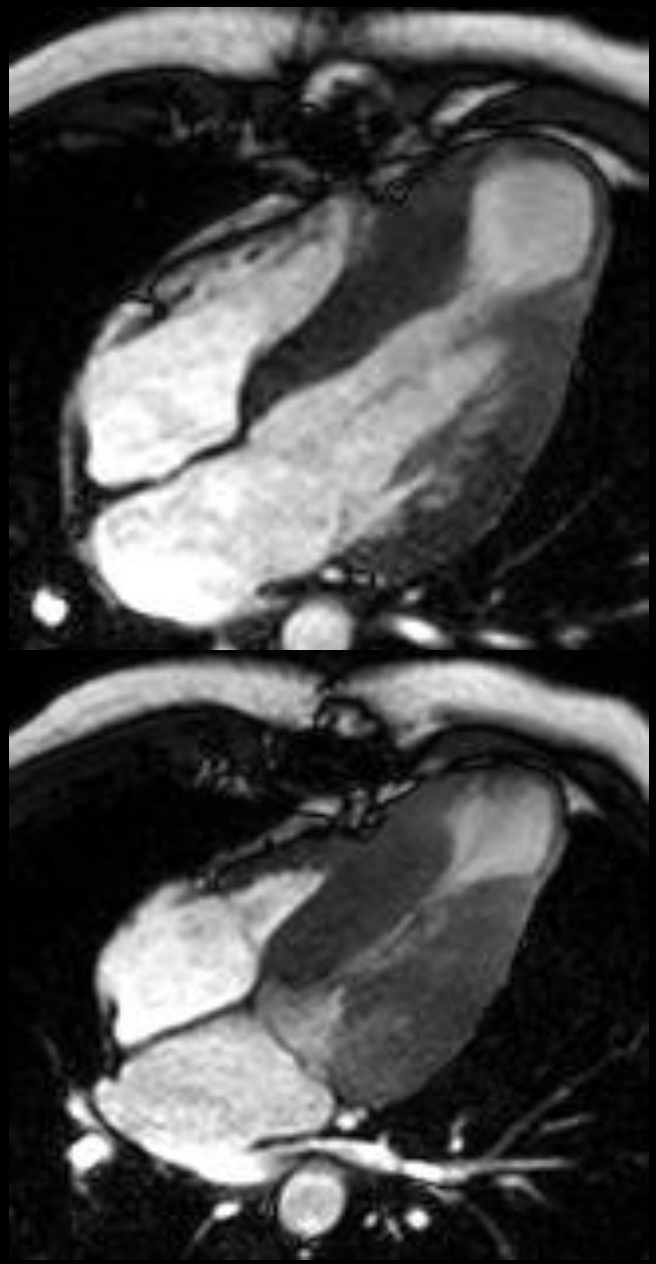
(*Circulation*. 2001;104:2517-2524.)

Ostruzione all'efflusso e Fibrillazione Atriale



L’ ostruzione medioventricolare e l’aneurisma apicale





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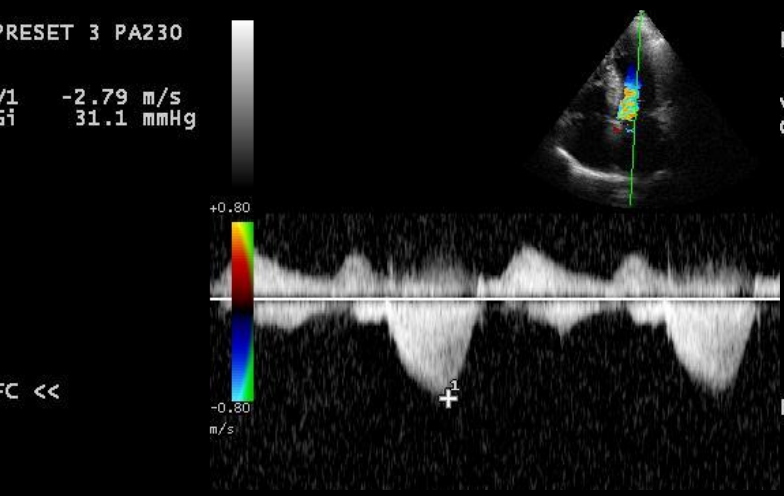
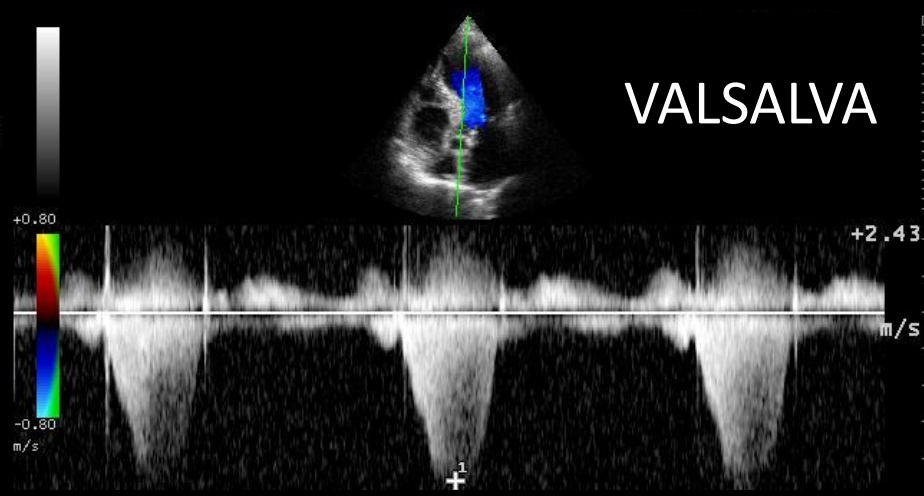
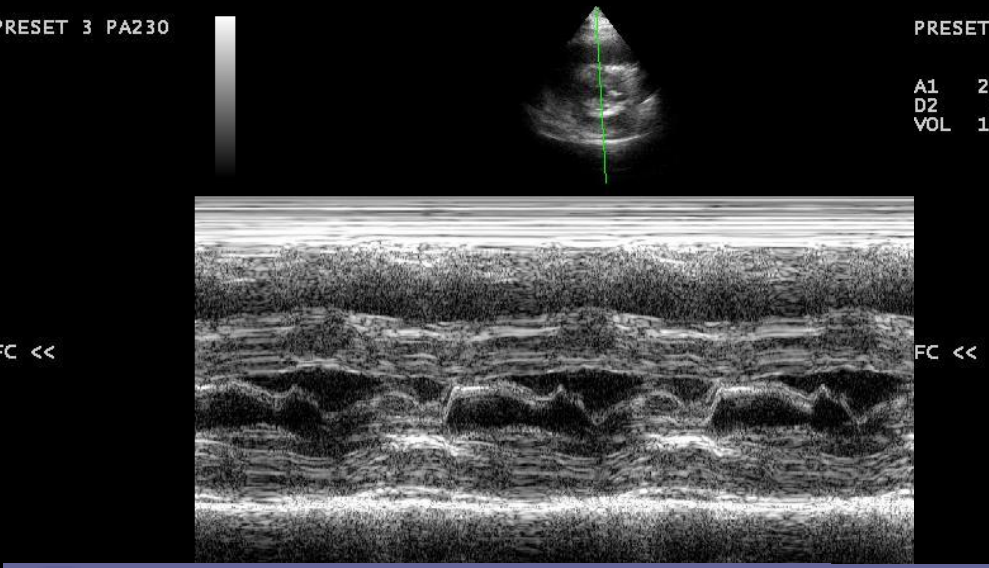
S.L., maschio, 39 a., NYHA CF II,





VALSALVA



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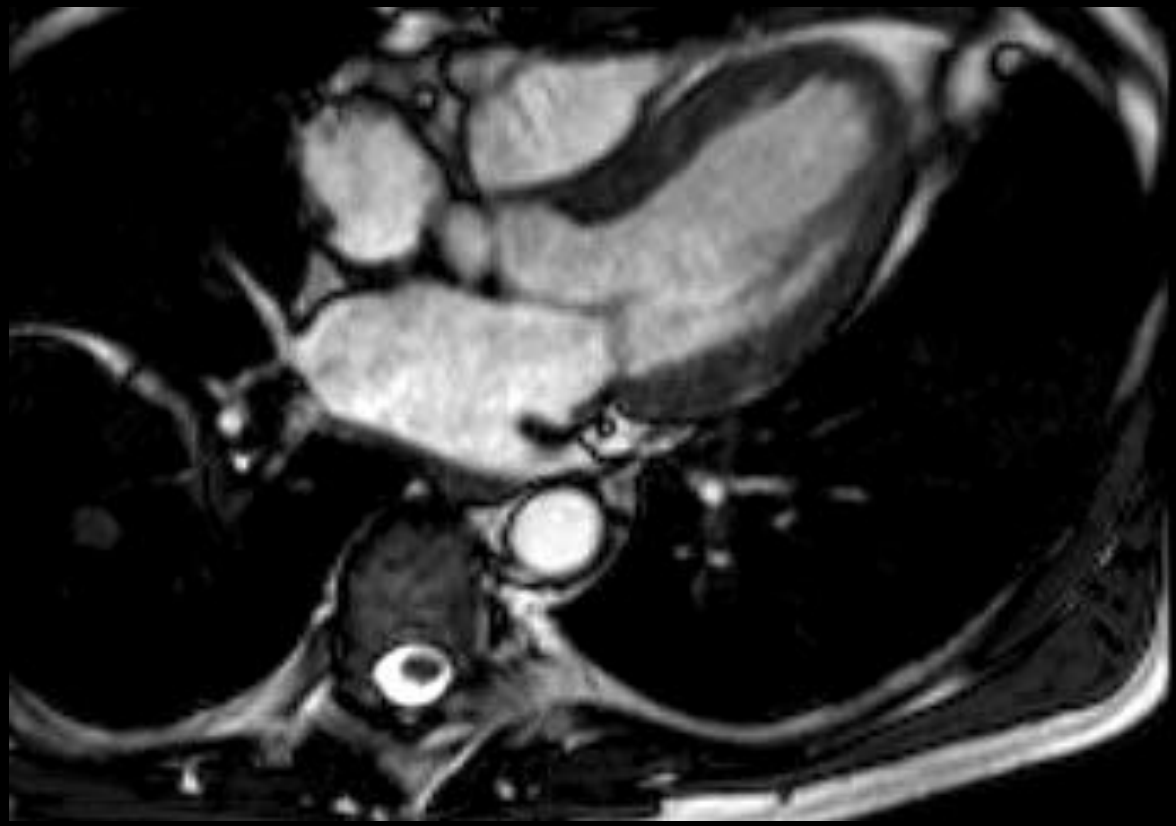
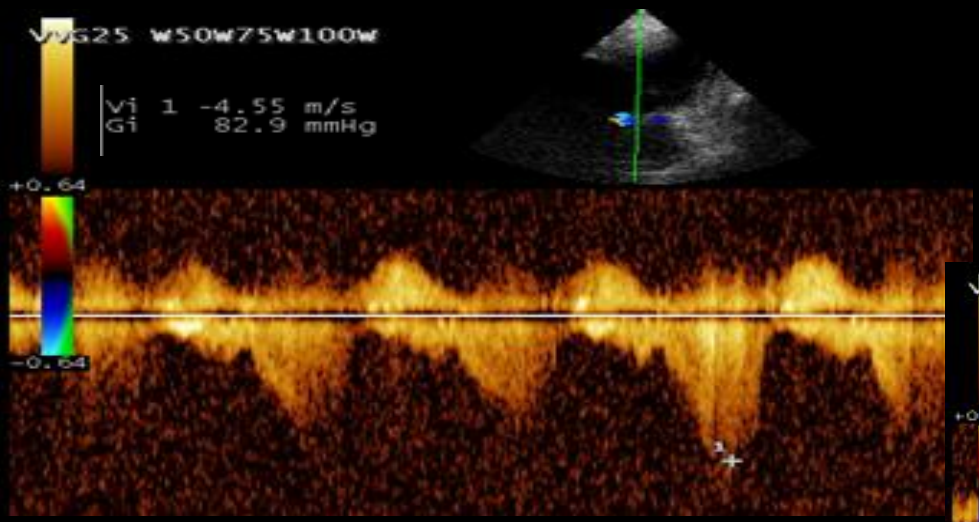
Ostruzione all'efflusso del VS provocabile

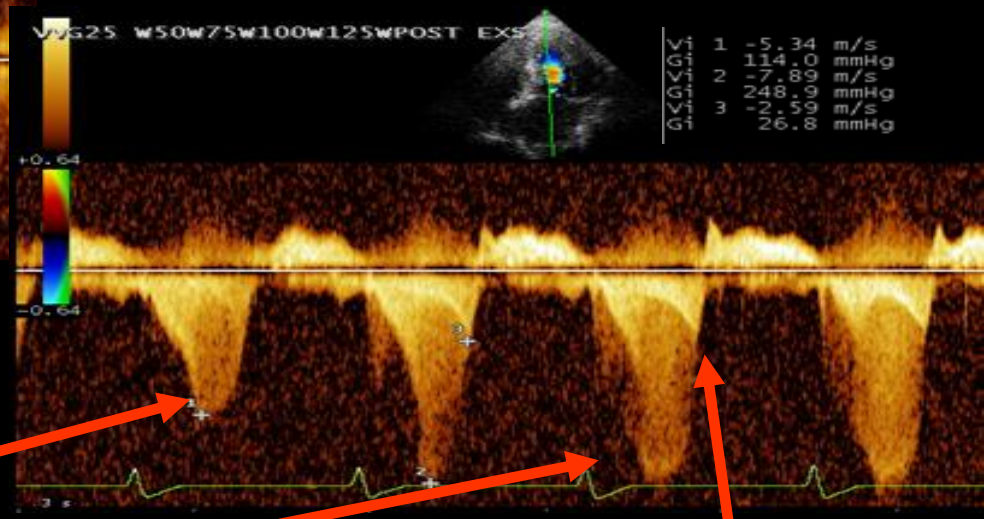
B.A., a 55, NYHA CF II Spessore max setto 16 mm; AS dilatato



Ostruzione all’efflusso del VS provocabile

Durante e dopo sforzo al cicloergometro





Gradiente all’efflusso del VS

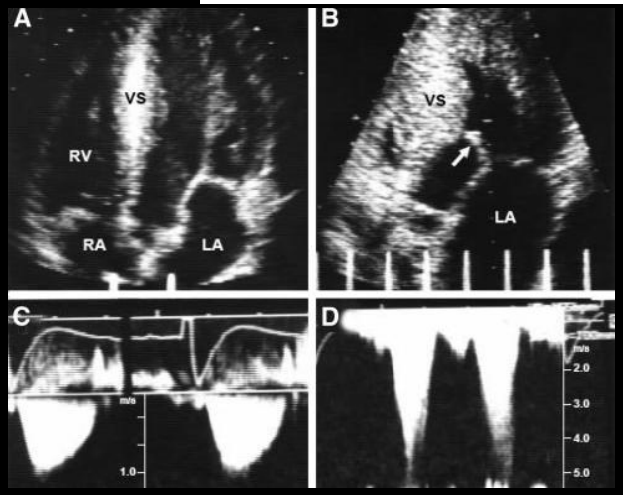
Rigurgito mitralico (VS/AS)

Gradiente medioventricolare

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;114:2232-2239.)



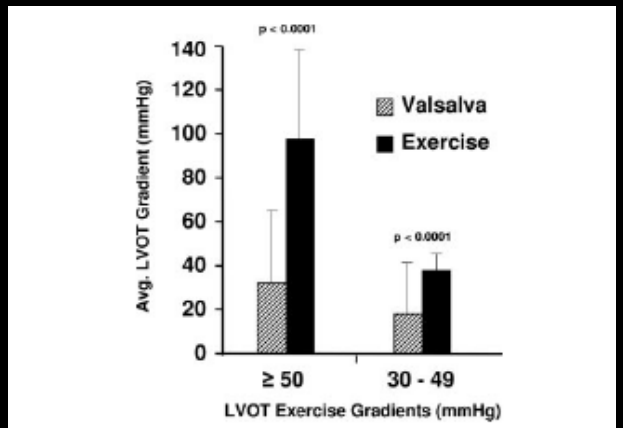


Figure 4. Comparison between LV outflow tract (LVOT) gradients (≥30 mm Hg) provoked with exercise and with Valsalva maneuver. Valsalva significantly underestimates gradients vs those provoked with exercise. Avg indicates average.

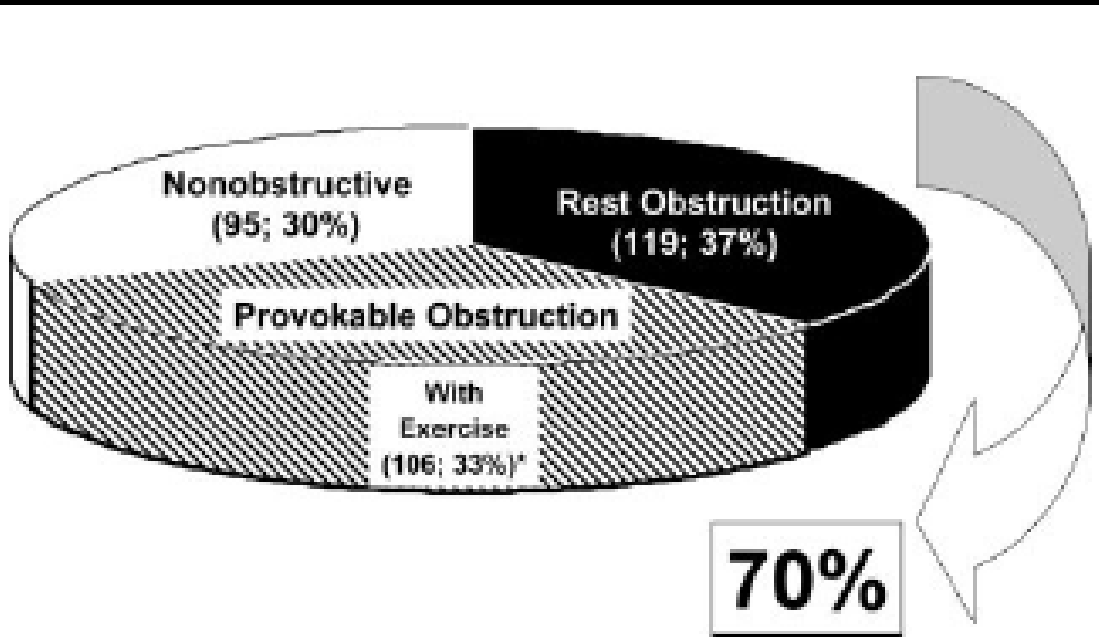
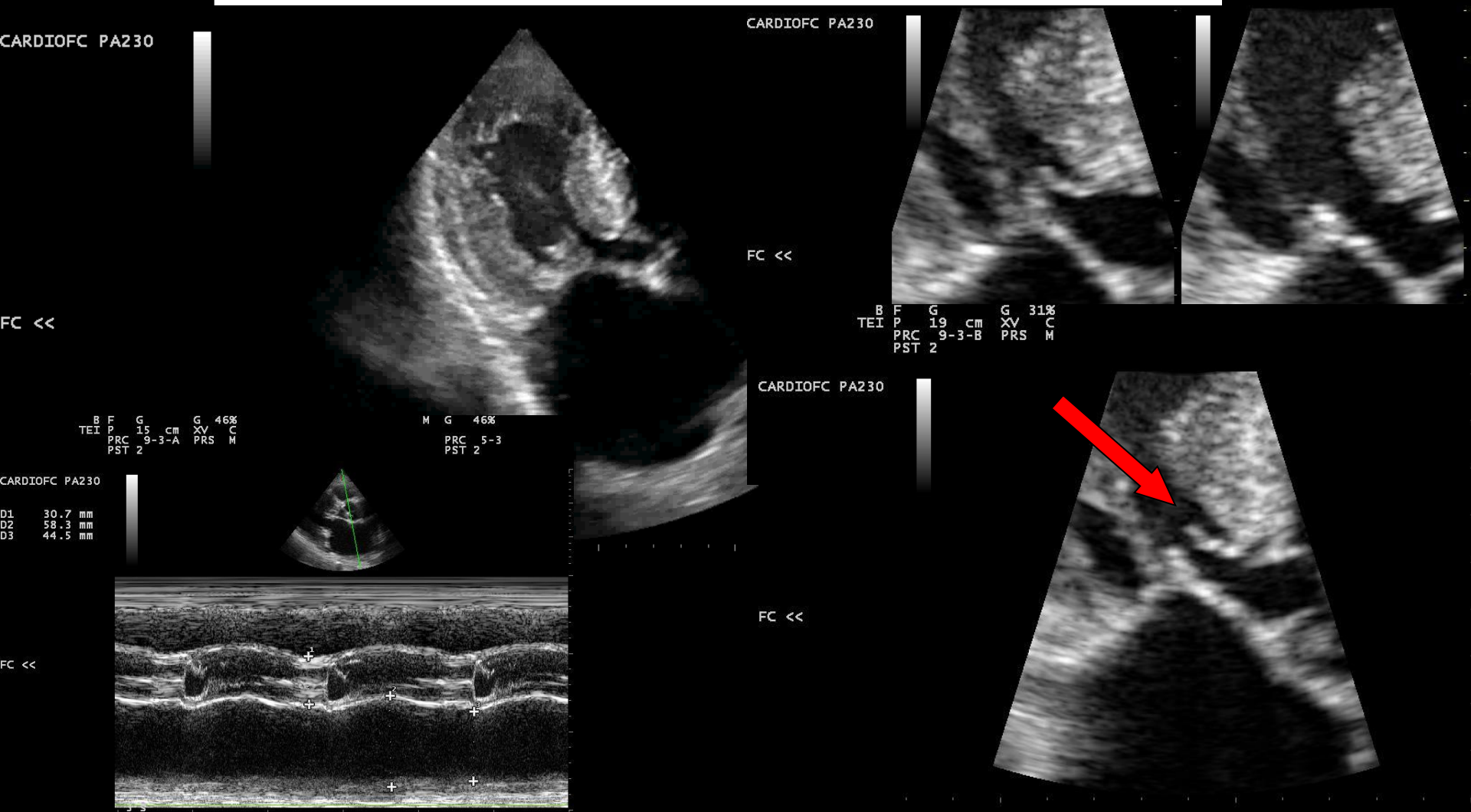


Figure 3. Prevalence of LV outflow tract obstruction in the overall study group of 320 HCM patients. *Includes 30 patients with modest exercise gradients of 30 to 49 mm Hg and 76 patients with gradients ≥50 mm Hg.

L'OSTRUZIONE ALL'EFFLUSSO : CHECK LIST

1. Diagnosi differenziale
2. Analisi dell'area d'efflusso
3. Anomalie dei lembi mitralici e dei m. papillari
4. Sede ed estensione dell'ipertrofia
5. Ostruzione (+ rigurgito mitralico) latente
6. Ostruzione funzionale (iatrogena)

L’ ostruzione subaortica a diaframma



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Indicazioni all'abolizione dell'ostruzione intraventricolare (e rimodellamento VS)

SPESSORE SETTO BASALE > 16 MM

1. CLASSE FUNZIONALE III-IV
2. CLASSE FUNZIONALE I-II +

   AS > 45 mm o 100 cc

   FA PAROSSISTICA O PERSISTENTE

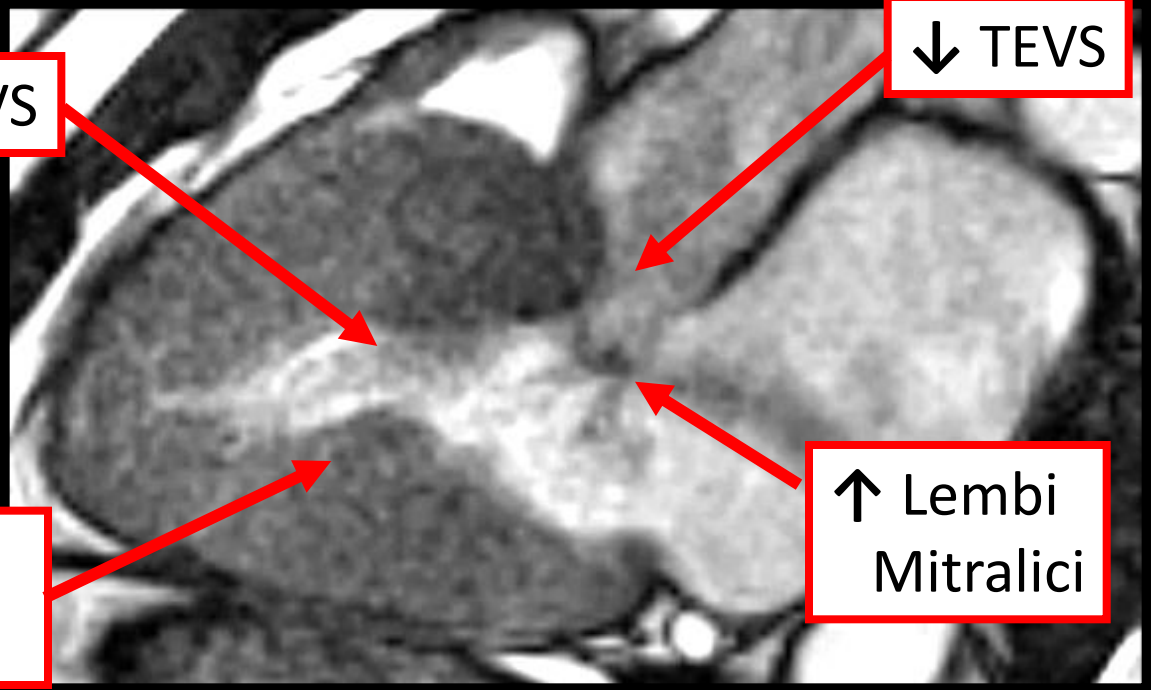
   IPOTENSIONE O SINCOPE DA SFORZO

   RIGURGITO MITRALICO

Fattori determinanti la scelta fra Alcoolizzazione e Miectomia estesa

	ALCOOLIZZAZIONE SETTALE	MIECTOMIA ESTESA
ECG	BBdx	BBS
Accettazione PM o ICD del pz	+	-
Età del paziente	> 60 a.	< 50 a.
Rigurgito mitralico	lieve	moderato-severo
Anomalie mitrale o m. papillare	-	+
Ipertrofia diffusa e severa	-	+
Ostruzione medioventricolare	-	+
Bridge (inducente ischemia)	-	+
Coronaropatia severa	-	+

CMIO: una miriade di anomalie da correggere



- ostruzione TEVD (pediatria)
- Calcificazione anello mitralico e lembi

Thanks !!

I. OLIVOTTO , B. TOMBERLI

INFERMIERE	K.Baldini, S.Fantini
GENETISTE	F. Torricelli, F. Girolami
RMN	L.Rega
PET	A. Pupi, R. Sciagrà
GENETICA	F. Torricelli, F. Girolami
ABLAZIONE	D. Antoniucci
CARDIOCHIRURGIA	M.Yacoub, PL.Stefano, G.Popoff
ISTOPATOLOGIA	G. D'Amati,
ELETTROFISIOLOGIA	L. Padeletti, P.Pieragnoli, G.Ricciardi
FISIOLOGIA	C. Poggesi, C.Ferrantini, R. Coppini
NEUROLOGIA	W.Borsini
NEFROLOGIA	L.Cirami
MALATTIE METABOLICHE	M.A. Donati, A. Morrone, E. Pasquini