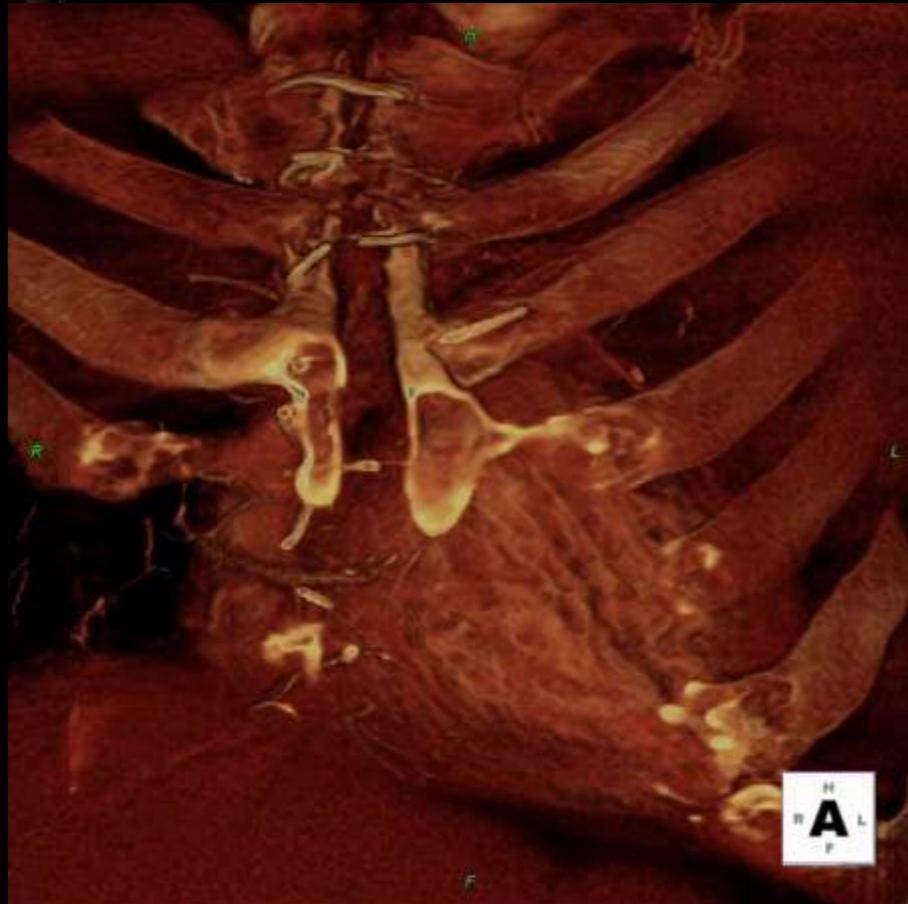




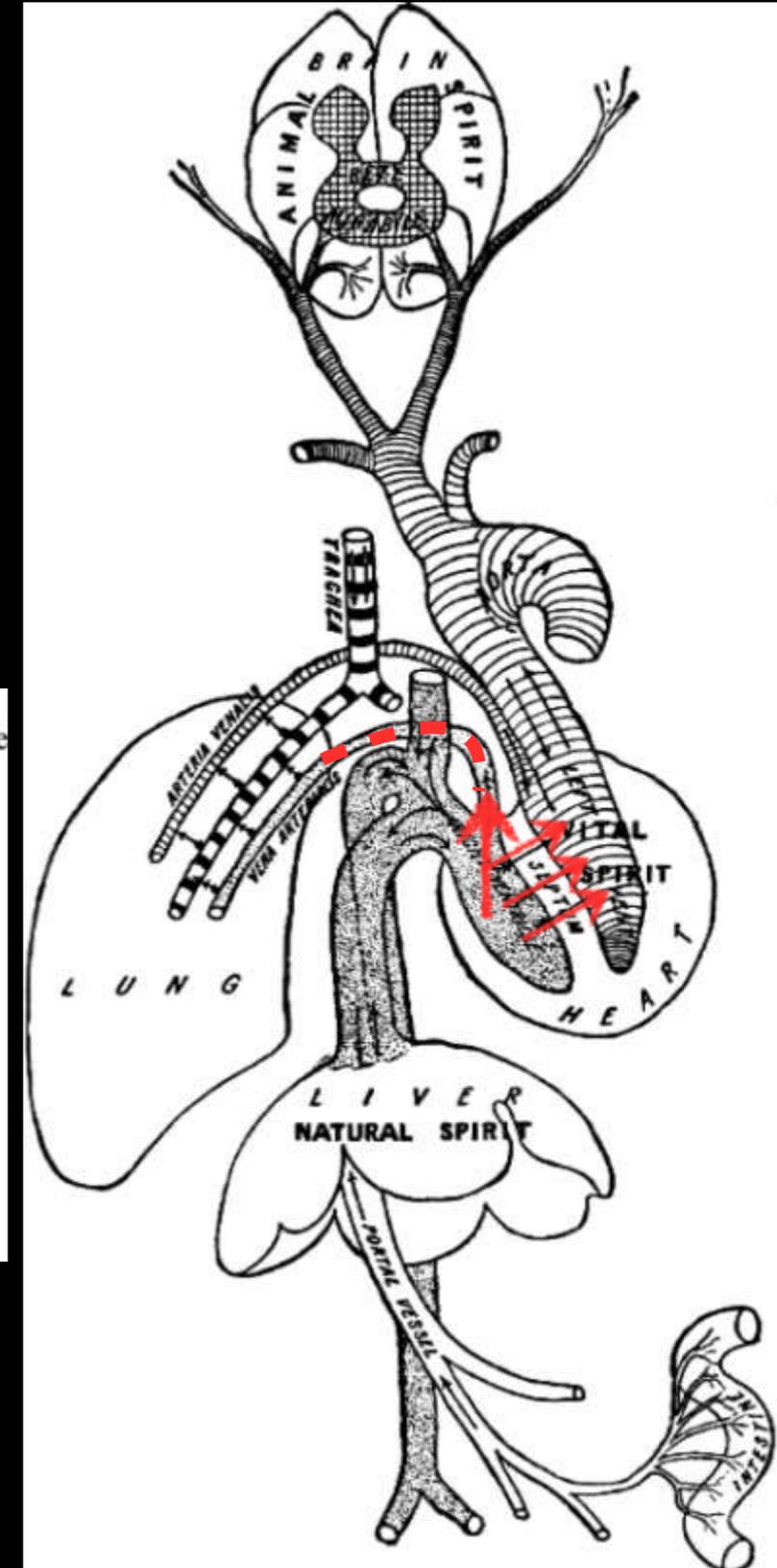
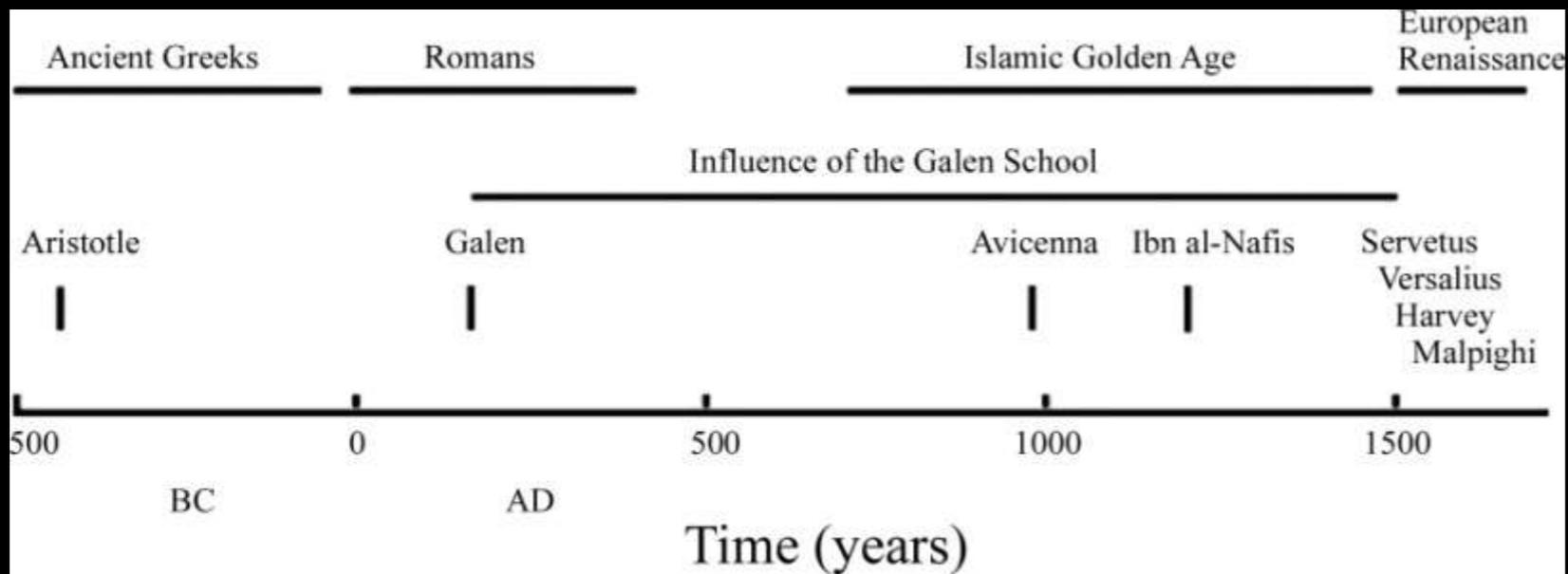
# Paper de les tècniques d'imatge en la valoració del ventricle dret



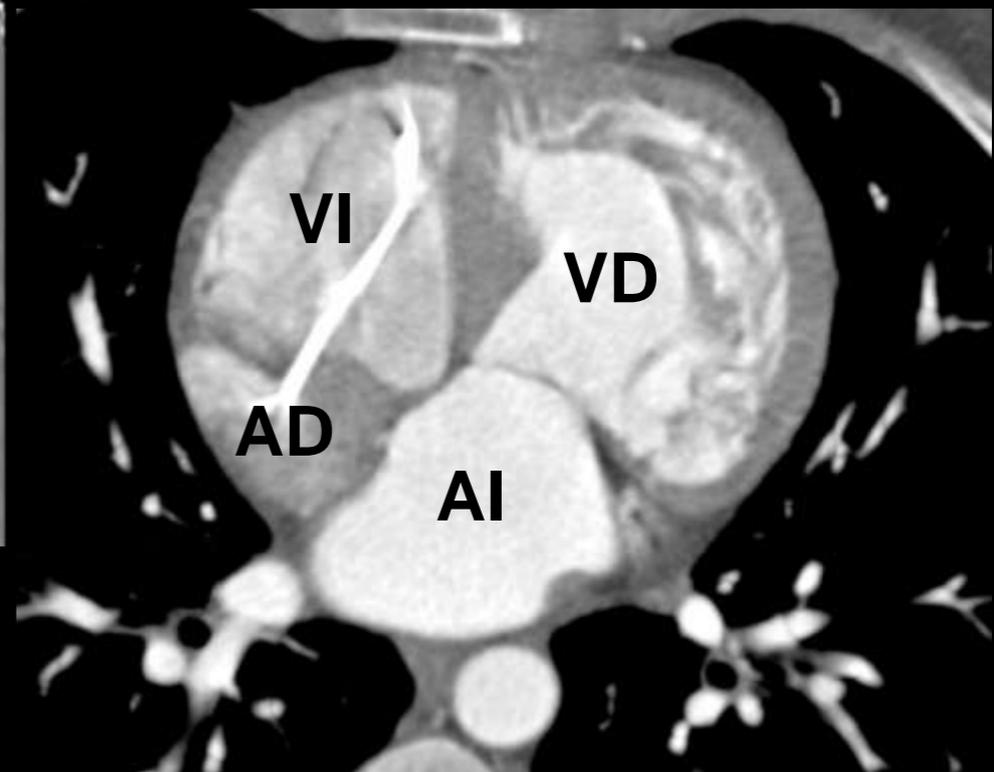
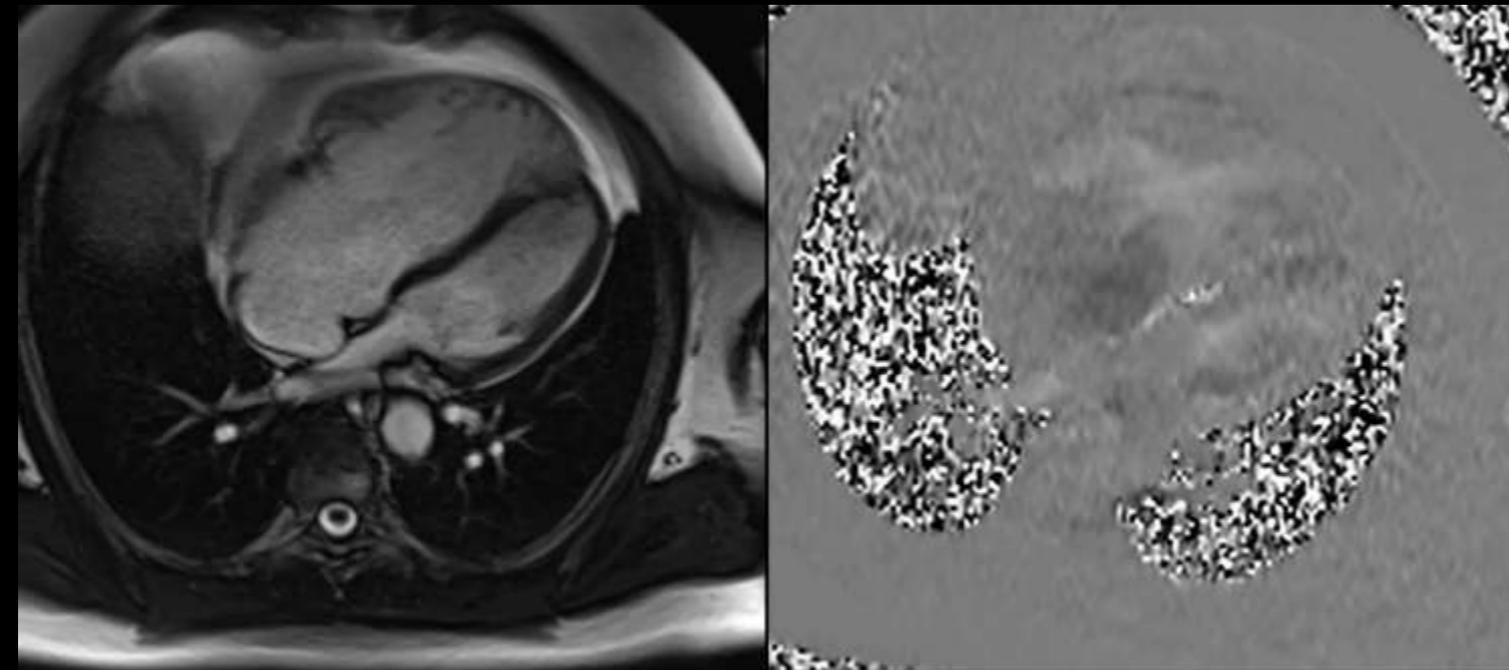
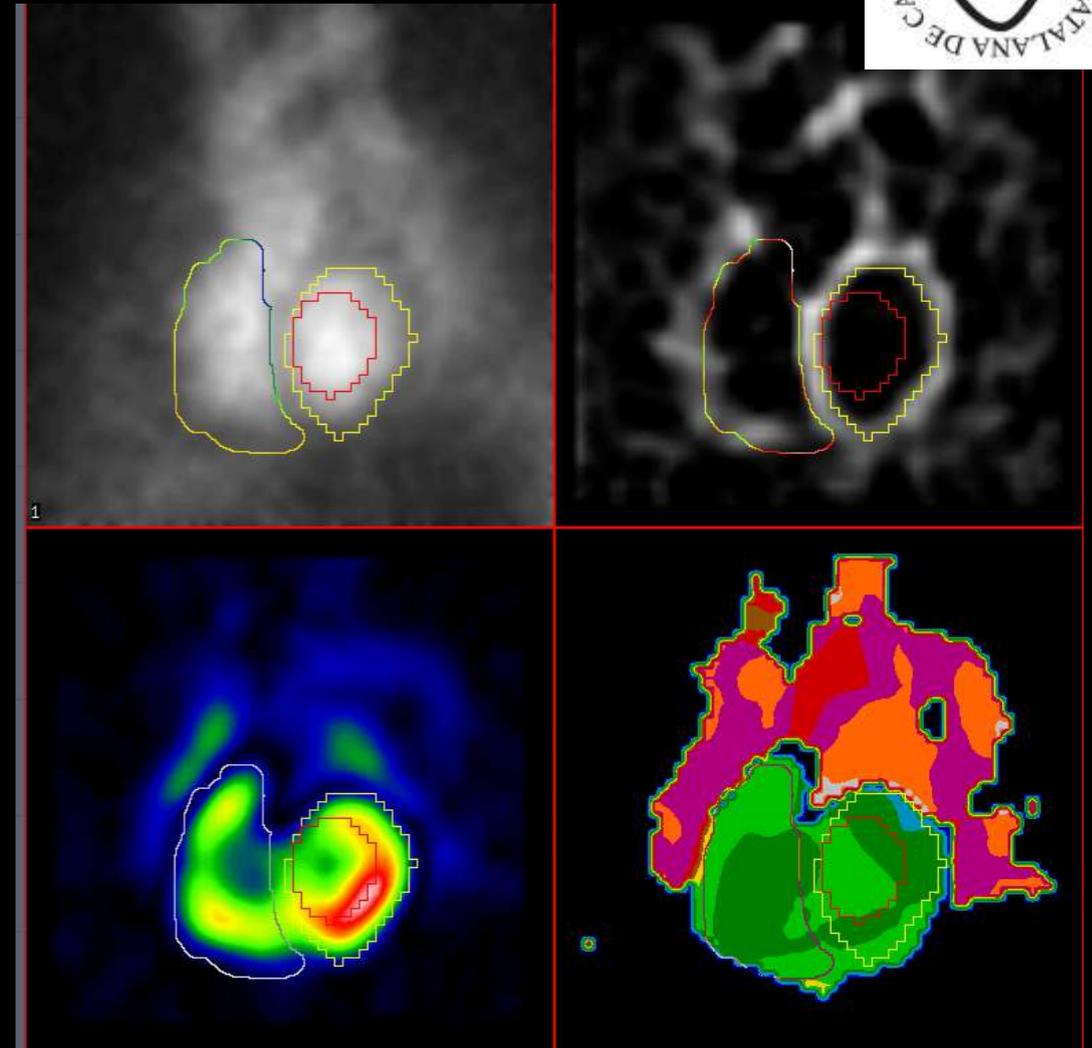
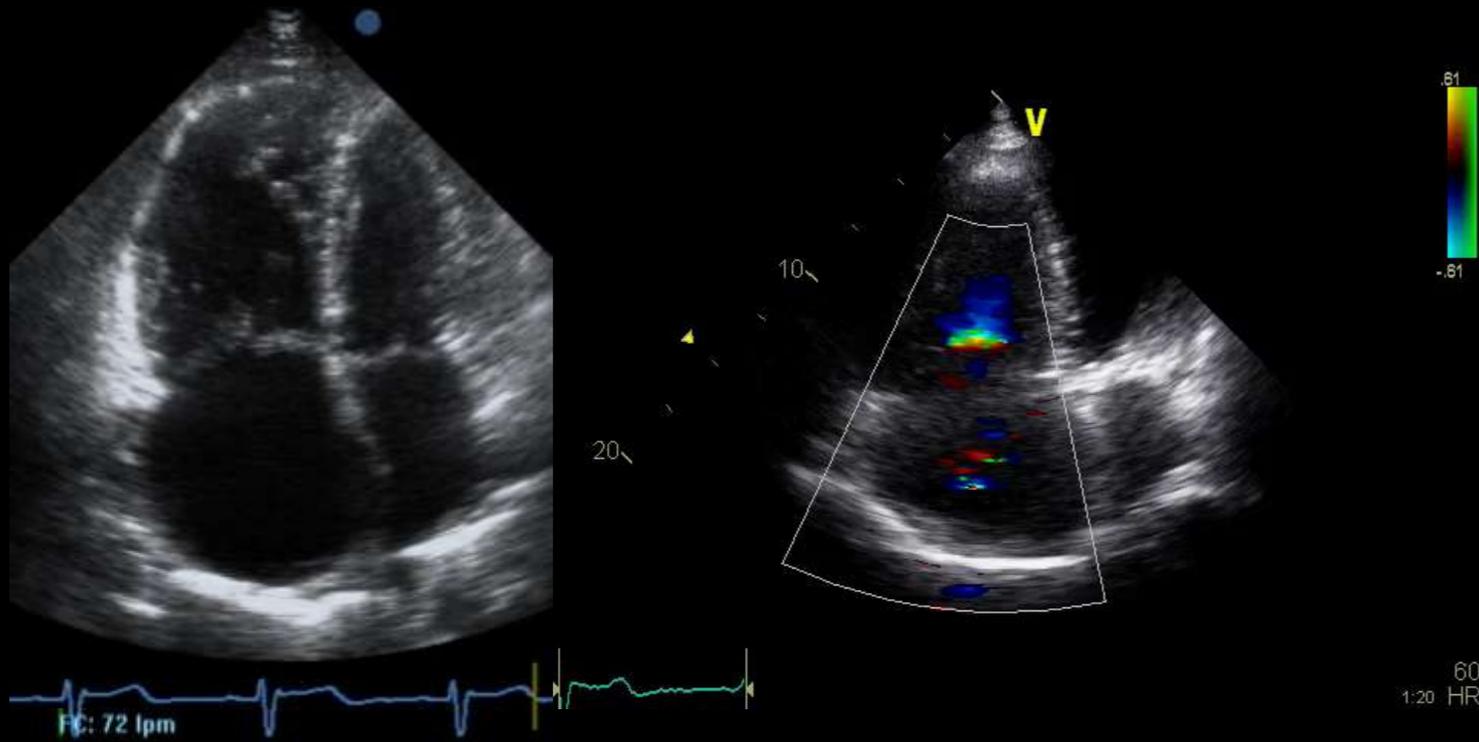
Dr. Martín Descalzo

Hospital Universitari Sagrat Cor  
Clínica Creu Blanca  
Barcelona

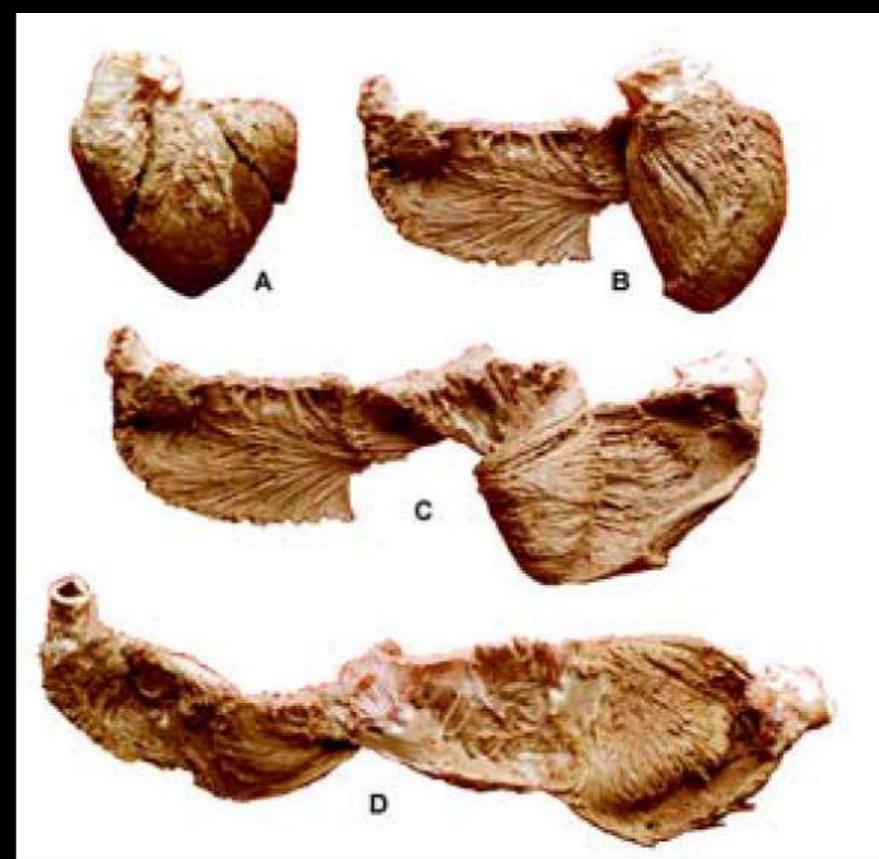
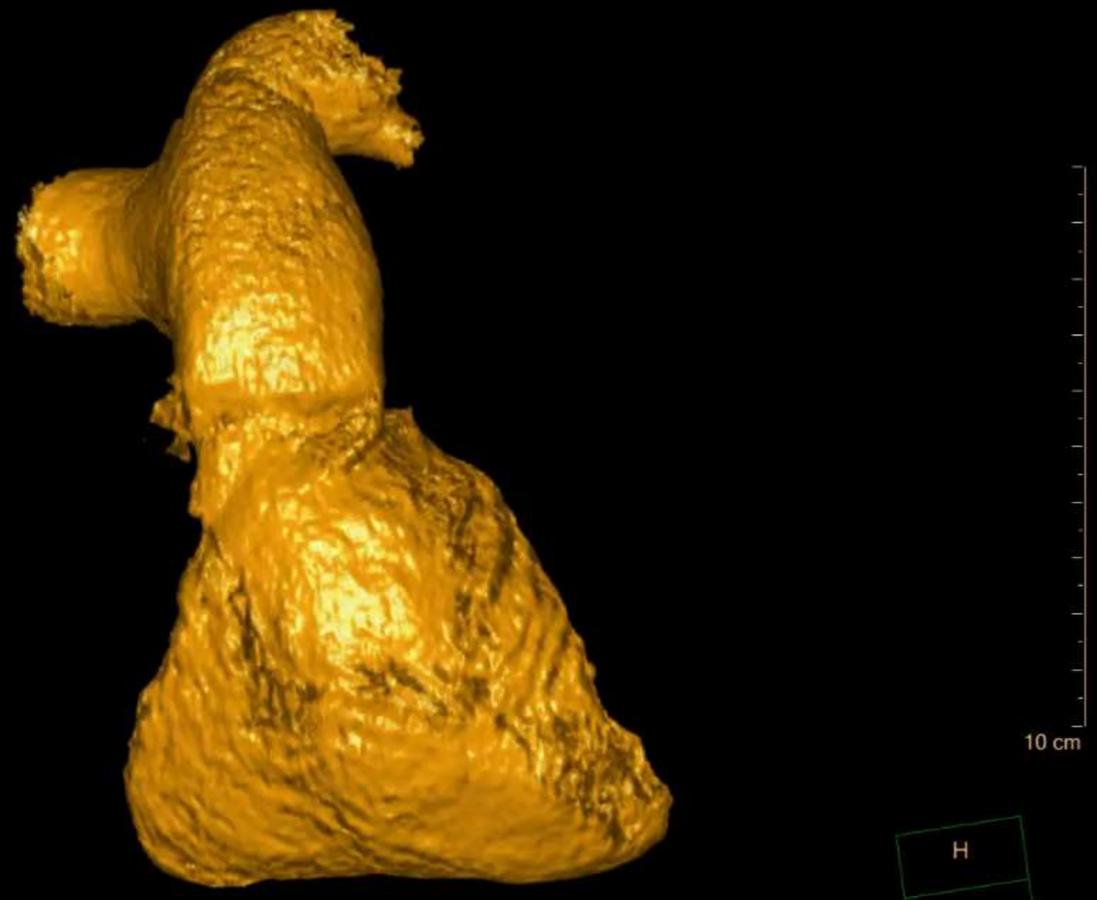
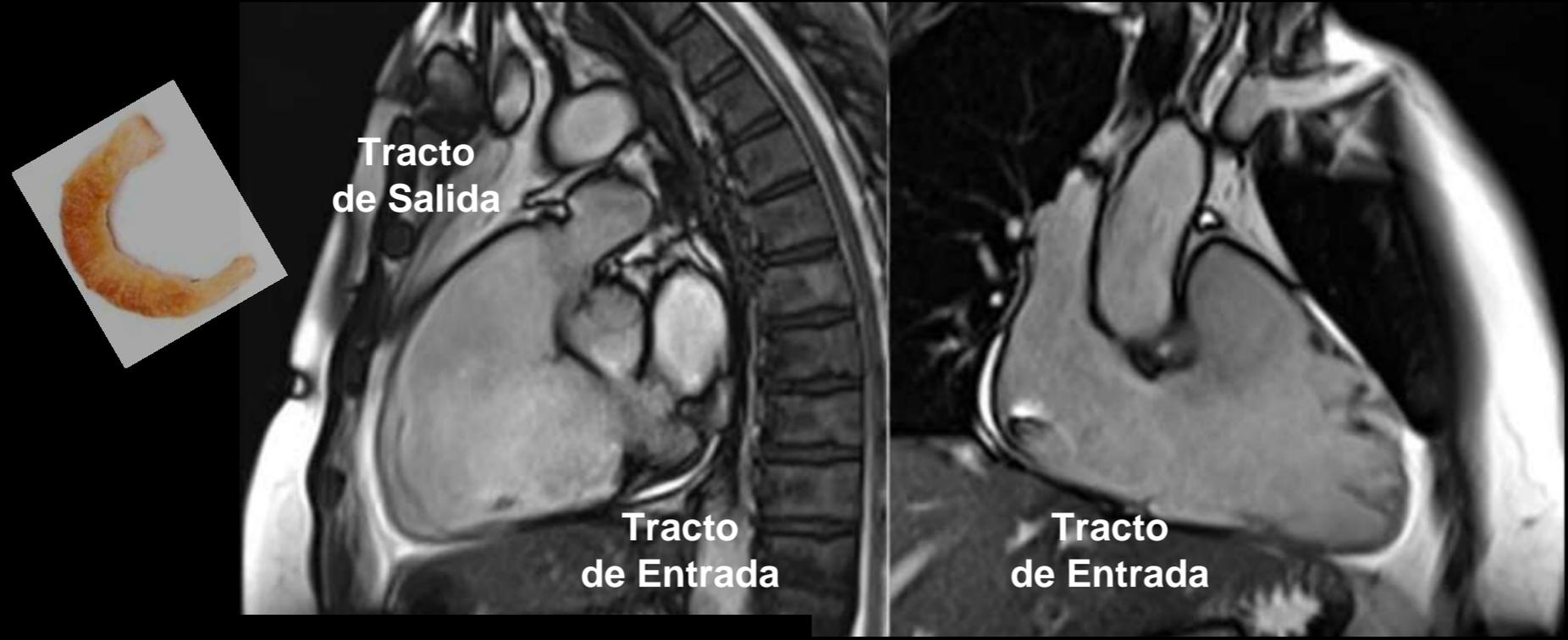
# Teoría de Galen: Circulación en paralelo



# Corazón derecho: Rol de las técnicas de imagen



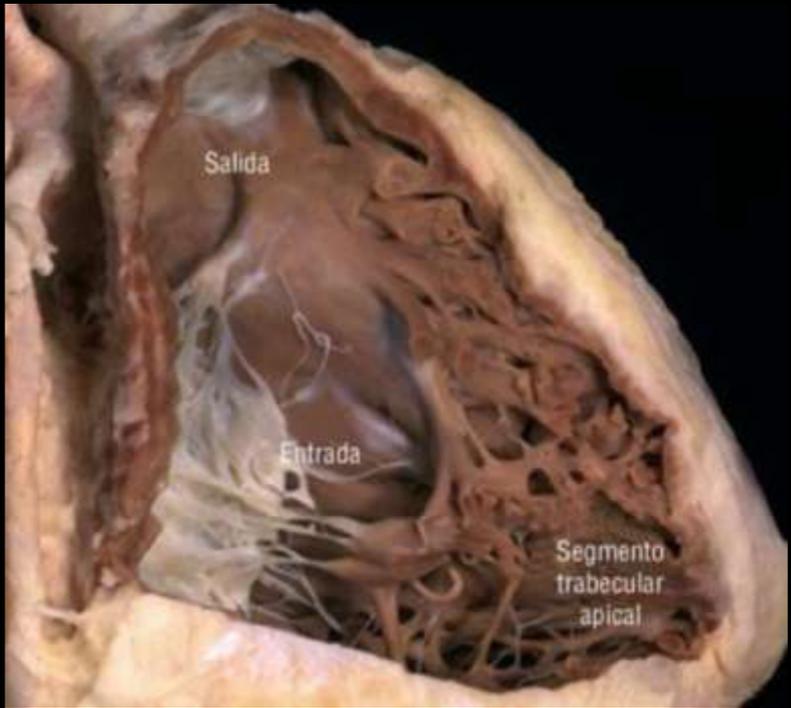
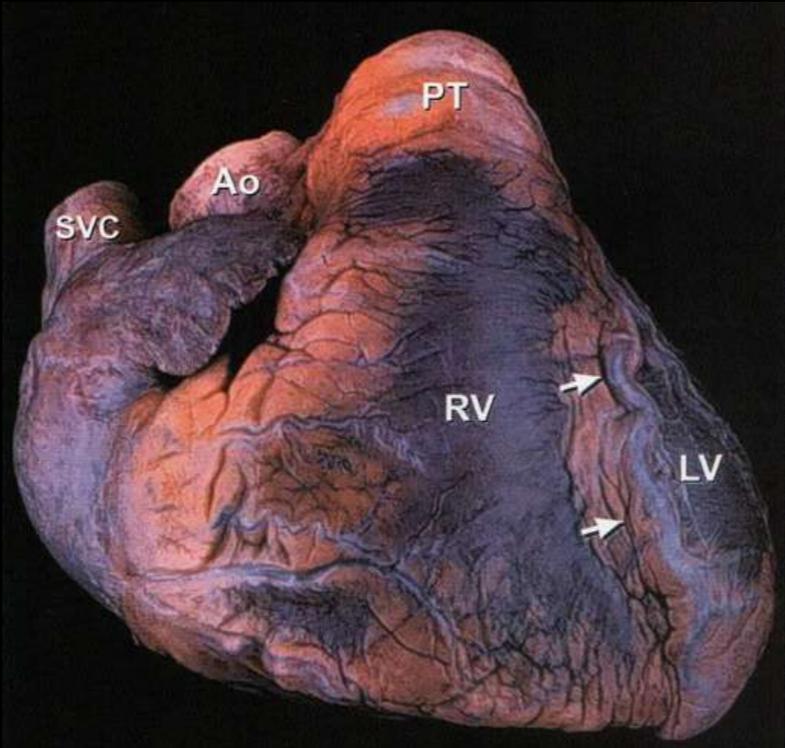
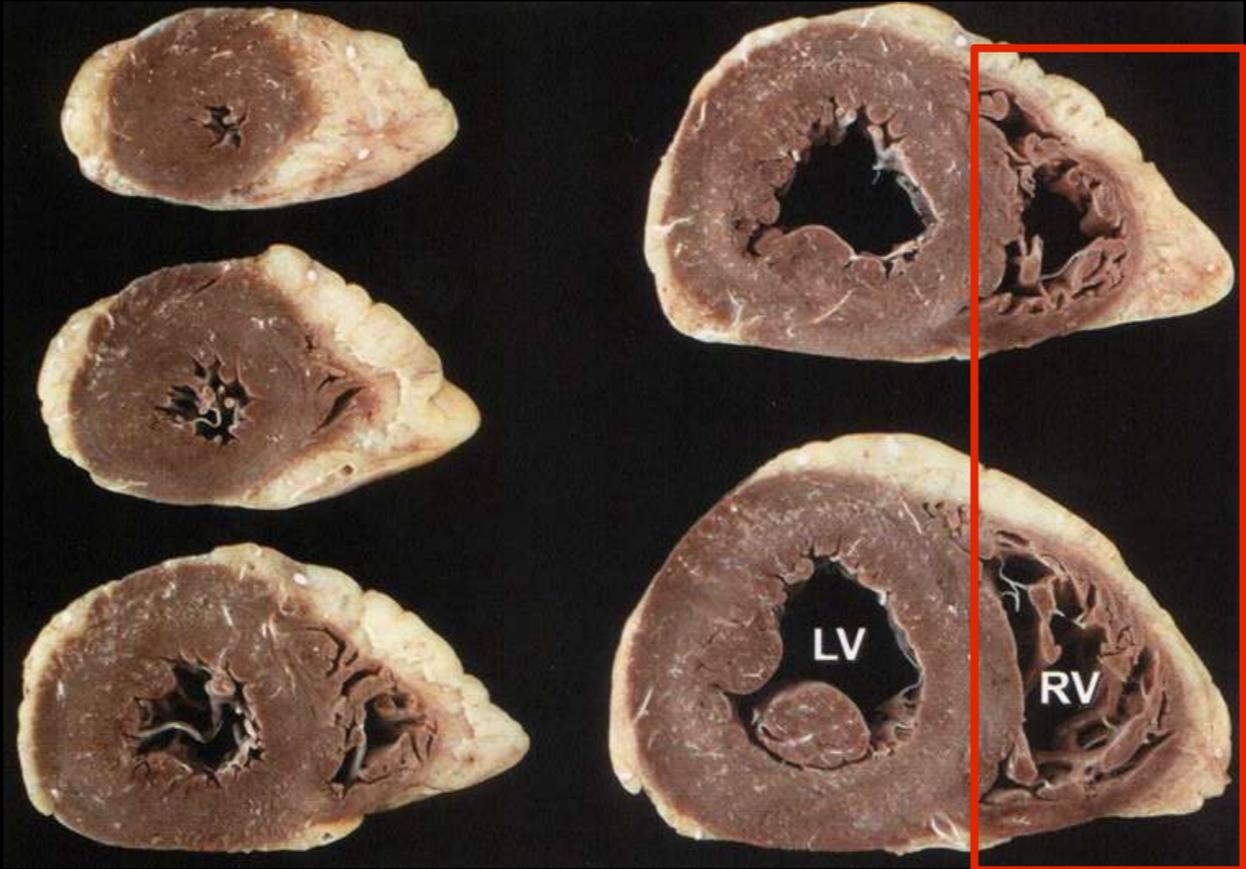
# Corazón derecho: Estructura y función



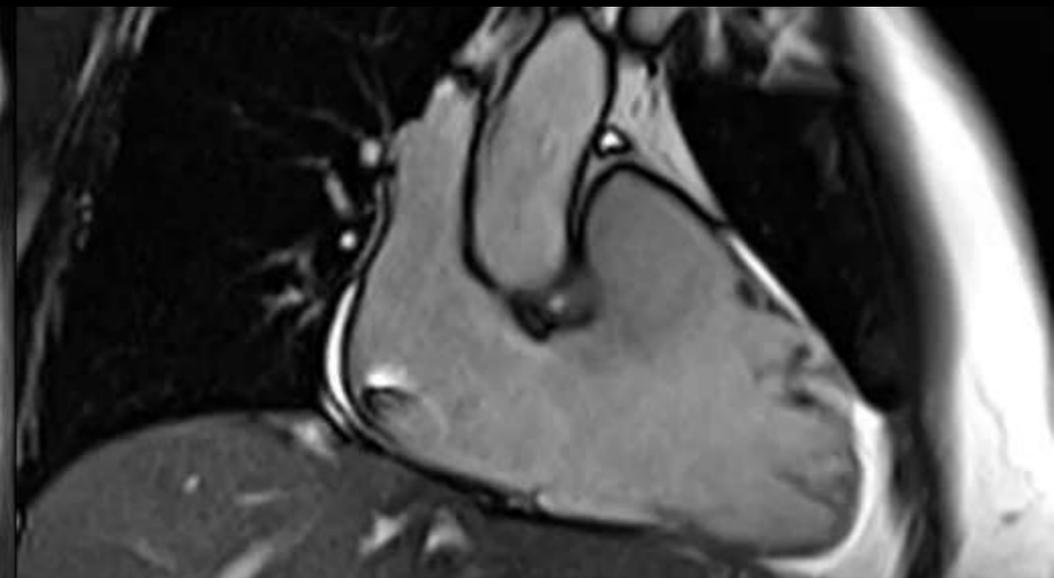
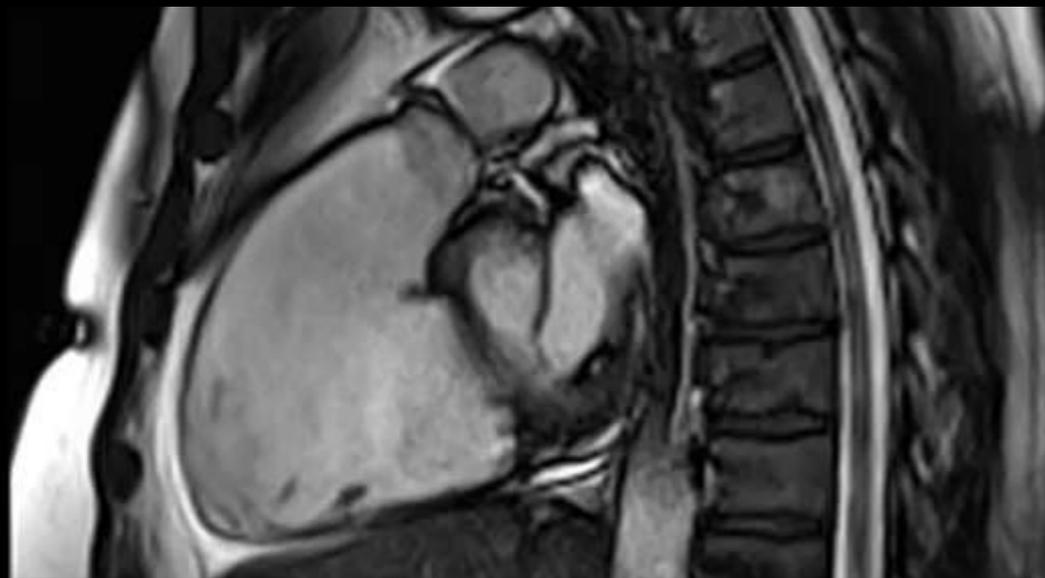
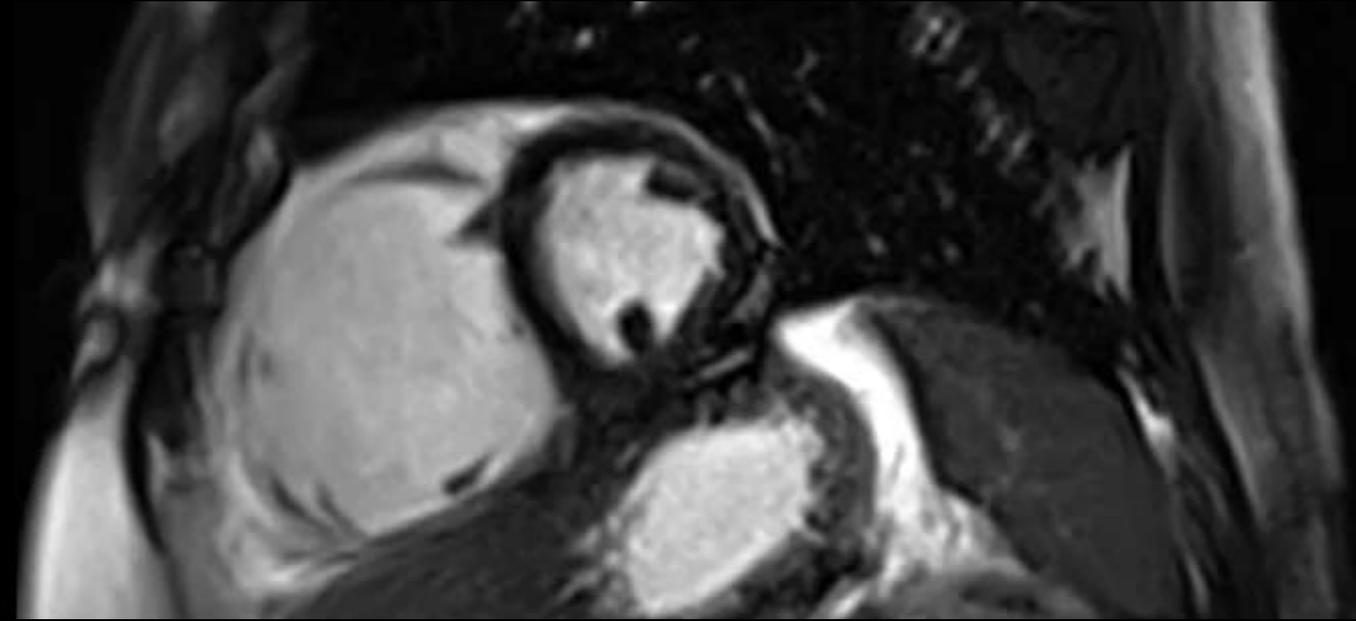
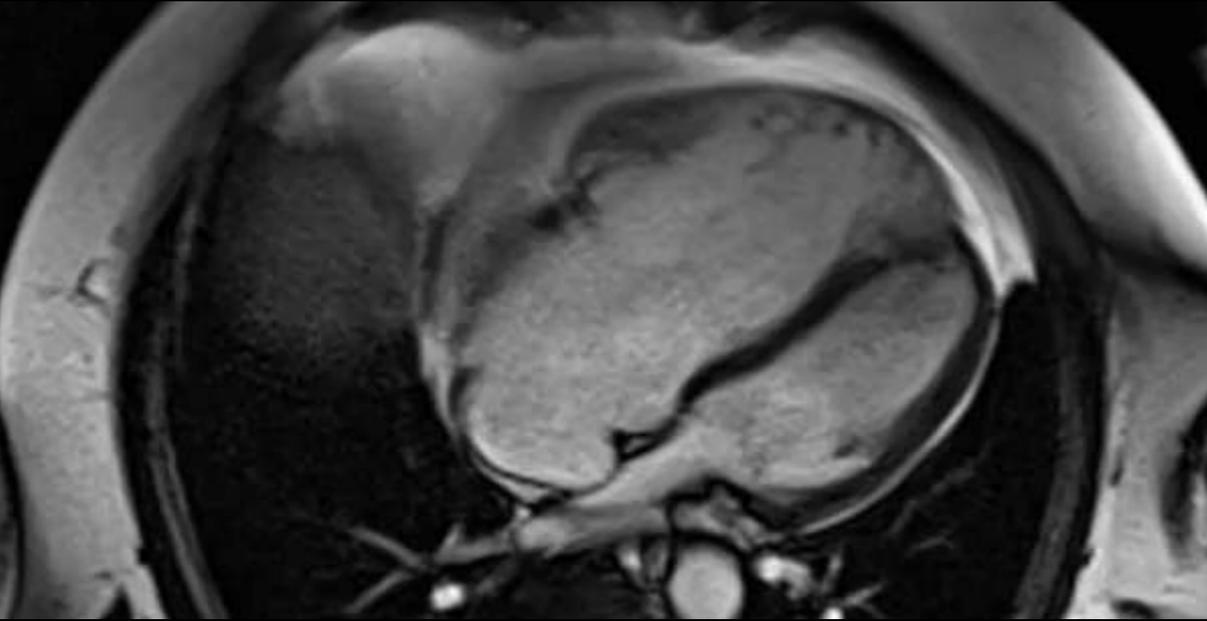
Banda miocárdica.



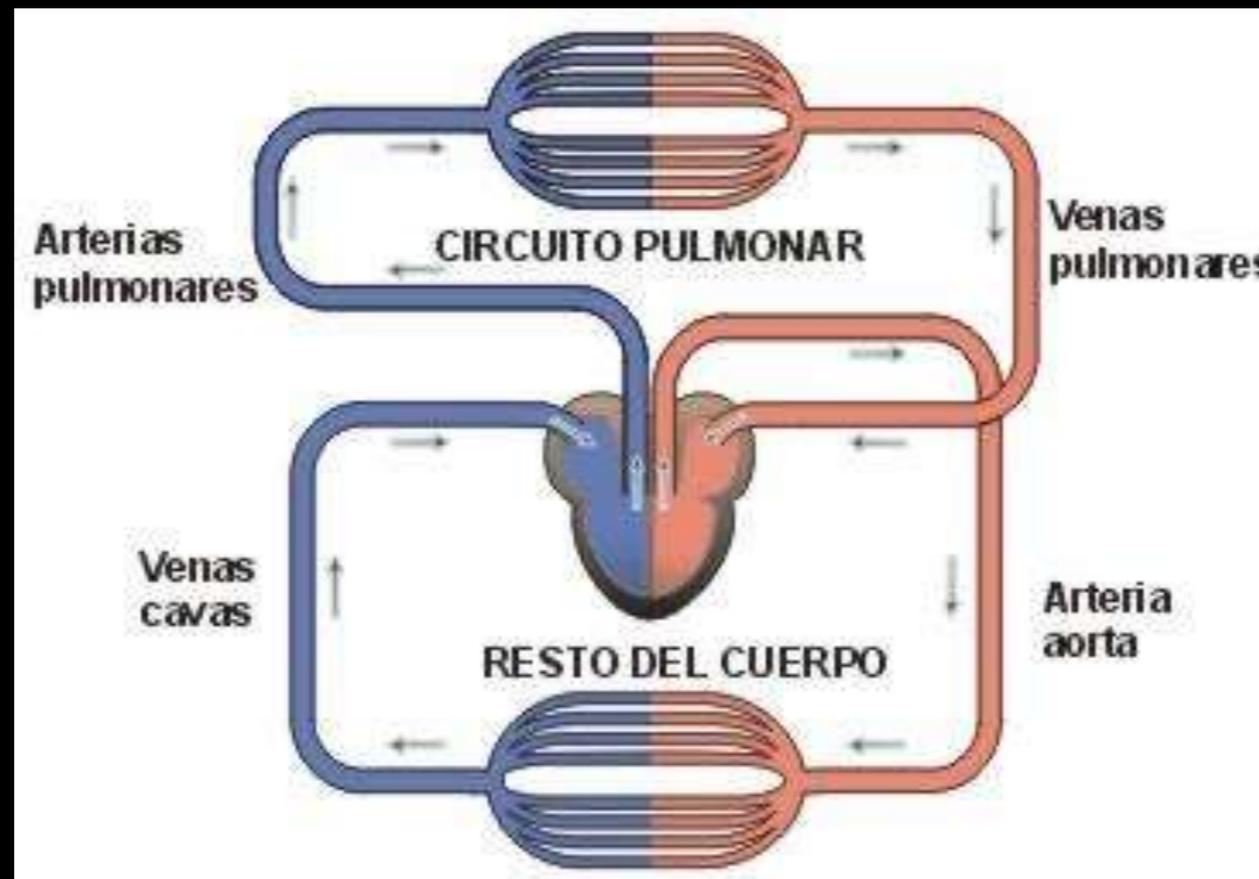
# Corazón derecho: Estructura y función



# Corazón derecho: Estructura y función



# Circulación en serie (acoplamiento ventriculo-arterial)



- Interacción indirecta en serie
- Interacción directa inter - ventricular

# Corazón derecho: Rol pronóstico



## Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION



American  
Heart  
Association®

### The Prevalence and Prognostic Significance of Right Ventricular Systolic Dysfunction in Nonischemic Dilated Cardiomyopathy

Ankur Gulati. Tevfik F. Ismail. Andrew Jabbour. Francisco Alendurada. Kaushik Guha. Nizar

### Right Ventricular Ejection Fraction Is an Independent Predictor of Survival in Patients With Moderate Heart Failure

PASCAL DE GROOTE, MD, ALAIN MILLAIRE, MD, PhD, CLAUDE FOUCHER-HOSSEIN, MD,\*

OLIVIER

JEAN-MA

Lille, France

#### STATE-OF-THE-ART PAPERS

## Adult Congenital Heart Disease

### Importance of the Right Ventricle

Carole  
Rocheste

### Evaluation of Suspected Right Ventricular Pathology in the Athlete

Jonathan D.S. Sniderman<sup>a,b</sup>, Daniel M. Sado<sup>a</sup>, Allan D. Sniderman<sup>c</sup>, William J. McKenna<sup>a,\*</sup>

<sup>a</sup>Institute of Cardiovascular Science, University College London, and The Heart Hospital, University College London Hospitals Trust, London, UK

<sup>b</sup>Great Ormond Street Hospital for Sick Children, London, UK

<sup>c</sup>Mike Rosenbloom Laboratory for Cardiovascular Research, McGill University Health Centre, Montreal, Canada



# CHEST

Recent Advances in Chest Medicine

## The Right Ventricle Under Pressure\*

Cellular and Molecular Mechanisms of Right-Heart Failure in Pulmonary Hypertension\*

(CHEST 2009; 135:794-804)

# Corazón derecho:

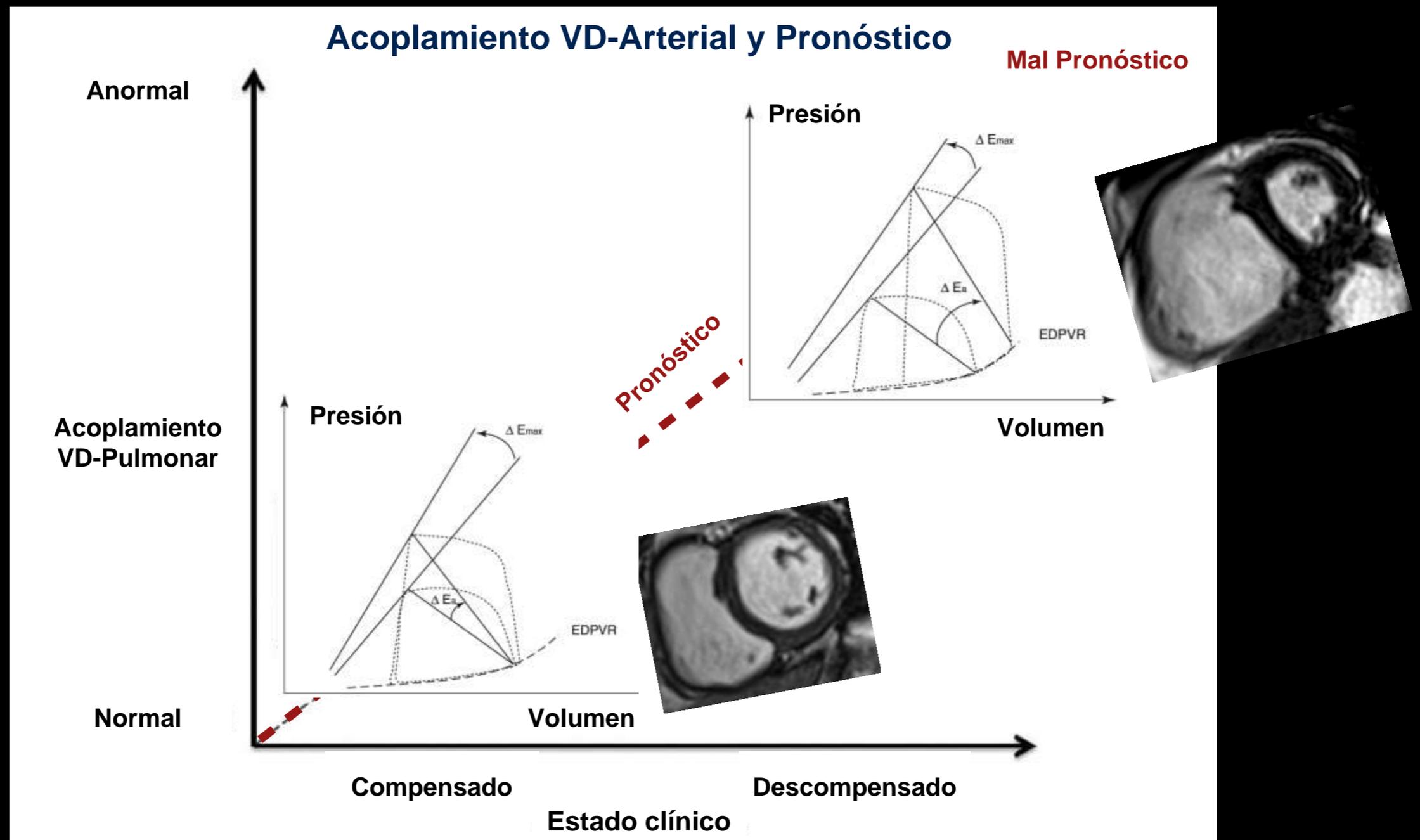
## Rol de la imagen y escenarios clínicos

- Hipertensión arterial pulmonar
  - HTP 1<sup>ria</sup>
  - TEP.
  - TEP crónico recurrente
  - Afectación del VD 2<sup>rio</sup> a disfunción del VI.
  
- Enf Congénitas
  - Tetralogía de Fallot.
  - CIA, CIV.
  - Ebstein.
  - TGV
  - IP, IT
  - CoAo
  
- Cardiopatía arritmogénica.

# Corazón derecho: HAP



- La sintomatología y pronóstico de los pacientes con HAP está estrechamente ligada al grado de disfunción ventricular derecha.
- En etapas precoces el VD tiende a adaptarse a la post carga impuesta con mínima o sin dilatación ventricular.... si la resistencia pulmonar se incrementa gradualmente.



# Searching for markers of the right heart-pulmonary circulation unit function: a continuing challenge

Eduardo Bossone<sup>1,2\*</sup>, Lawrence G. Rudski<sup>3</sup>, and Ekkehard Grünig<sup>4</sup>

European Heart Journal – Cardiovascular Imaging  
doi:10.1093/ehjci/jeu151



- Necesidad de encontrar parámetros de disfunción precoces.
- Rol relevante de la imagen.
  - En el diagnóstico inicial.
  - Seguimiento y pronóstico.

## Table 1 Prognostic parameters in pulmonary hypertension

### Clinical

Rate of progression of symptoms/evidence of RV failure  
Syncope  
World Health Organization Functional Class  
Six minutes walking distance

### Echocardiography

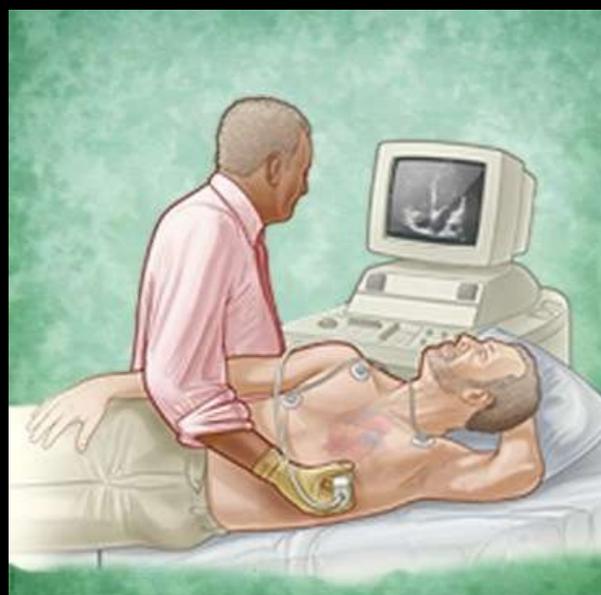
Pericardial effusion  
Right atrial area  
Abnormal end-diastolic septal curve  
Tricuspid annular plane systolic excursion  
Tei index  
RV free wall strain  
RV contractile reserve  
Magnetic resonance imaging  
Stroke volume index  
RV mass  
RV end-diastolic volume index  
RV ejection fraction

### Biomarkers

BNP/NT proBNP  
Creatinine clearance  
Serum urate  
Troponin T

### Haemodynamics

Cardiac output  
Cardiac index at rest and during exercise  
Right atrial pressure  
Pulmonary vascular resistance



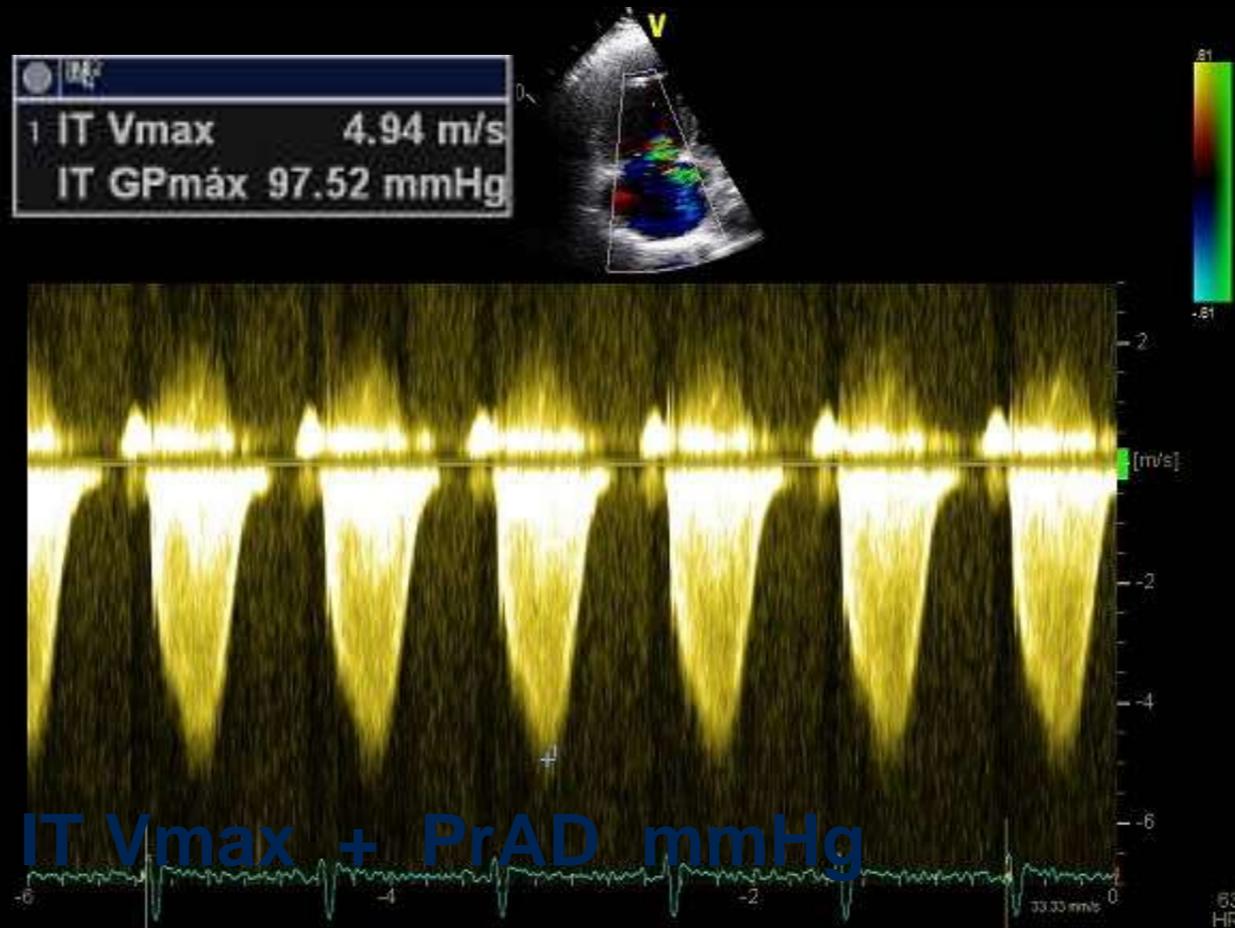
# Ecocardiograma

Diagnóstico y  
Pronóstico

PRONOSTICO

## Echocardiography in Pulmonary Arterial Hypertension: from Diagnosis to Prognosis

Eduardo Bossone, MD, PhD, Antonello D'Andrea, MD, PhD, Michele D'Alto, MD, Rodolfo Citro, MD, Paola Argiento, MD, PhD, Francesco Ferrara, MD, Antonio Cittadini, MD, PhD, Melvyn Rubenfire, MD, and Robert Naeije, MD, PhD, *Milan, Salerno, and Naples, Italy; Ann Arbor, Michigan; Brussels, Belgium*



**PAP sistólica :  $4 \times IT V_{max} + PrAD$  mmHg**

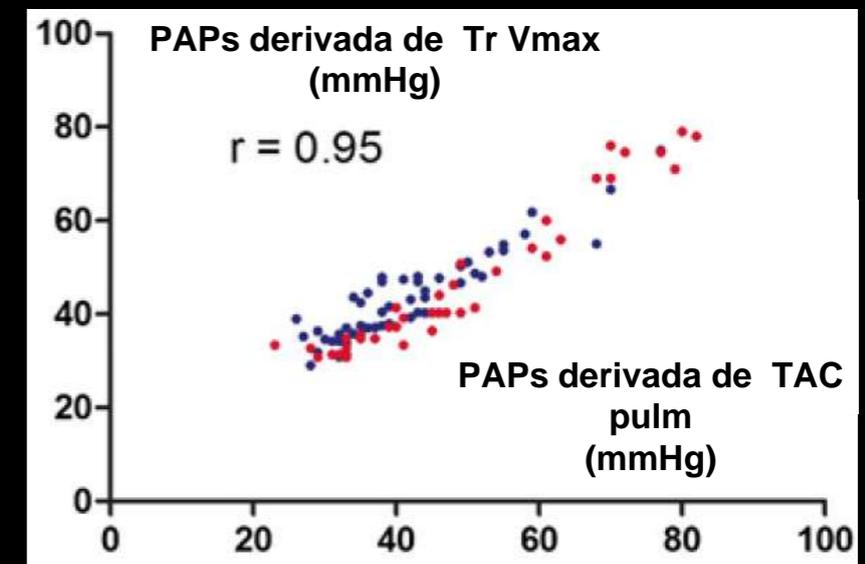
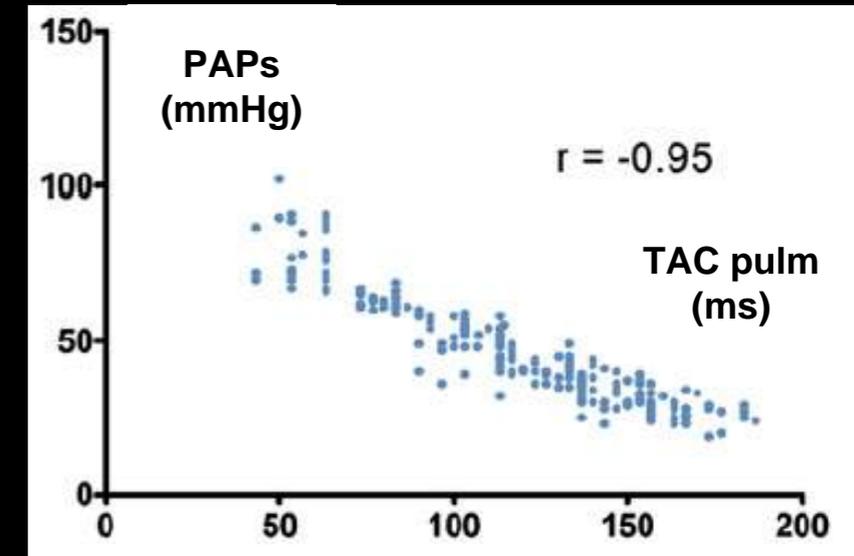
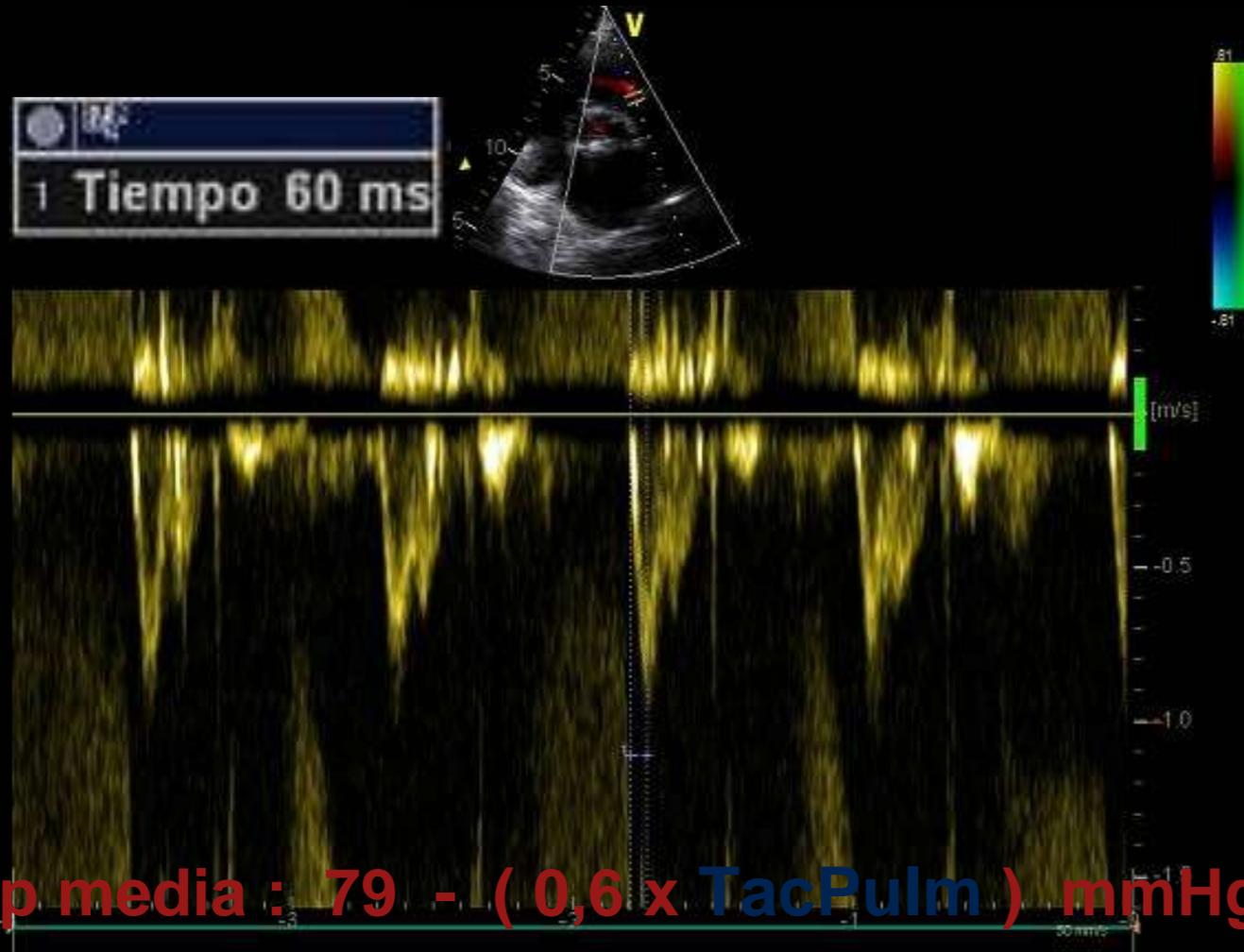
**PAP media :  $0,6 \times PAPs + 2$  mmHg**

# Ecocardiio y HAP Diagnostico



## Accuracy of Doppler Echocardiography in the Hemodynamic Assessment of Pulmonary Hypertension

Micah R. Fisher<sup>1\*</sup>, Paul R. Forfia<sup>2†</sup>, Elzbieta Chamera<sup>2</sup>, Traci Houston-Harris<sup>1</sup>, Hunter C. Champion<sup>2</sup>, Reda E. Girgis<sup>1</sup>, Mary C. Corretti<sup>2</sup>, and Paul M. Hassoun<sup>1</sup>



Am J Respir Crit Care Med Vol 179. pp 615–621, 2009  
(J Am Soc Echocardiogr 2011;24:687-92.)  
(J Am Soc Echocardiogr 2013;26:1-14.)

# Ecocardiio 2D y HAP: Pronóstico



## DIÁMETROS:

- 1 Distance= 4.39 cm
- 2 Distance= 4.57 cm
- 3 Distance= 8.27 cm

Ratio NI:  
0,5-0,7

- 4 L 1.62 cm / 3.4 MHz
- 3 L 1.99 cm
- 2 L 3.00 cm
- 1 L 2.60 cm

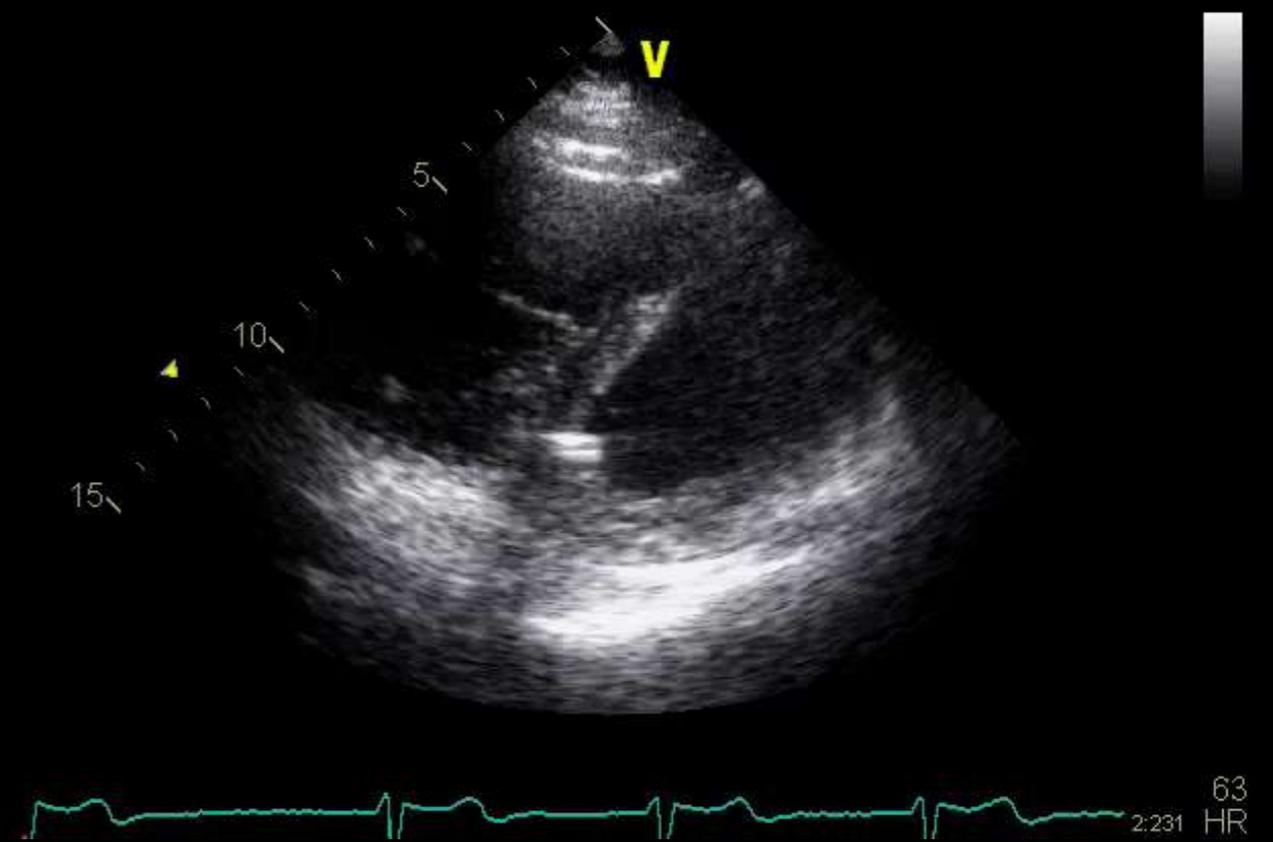
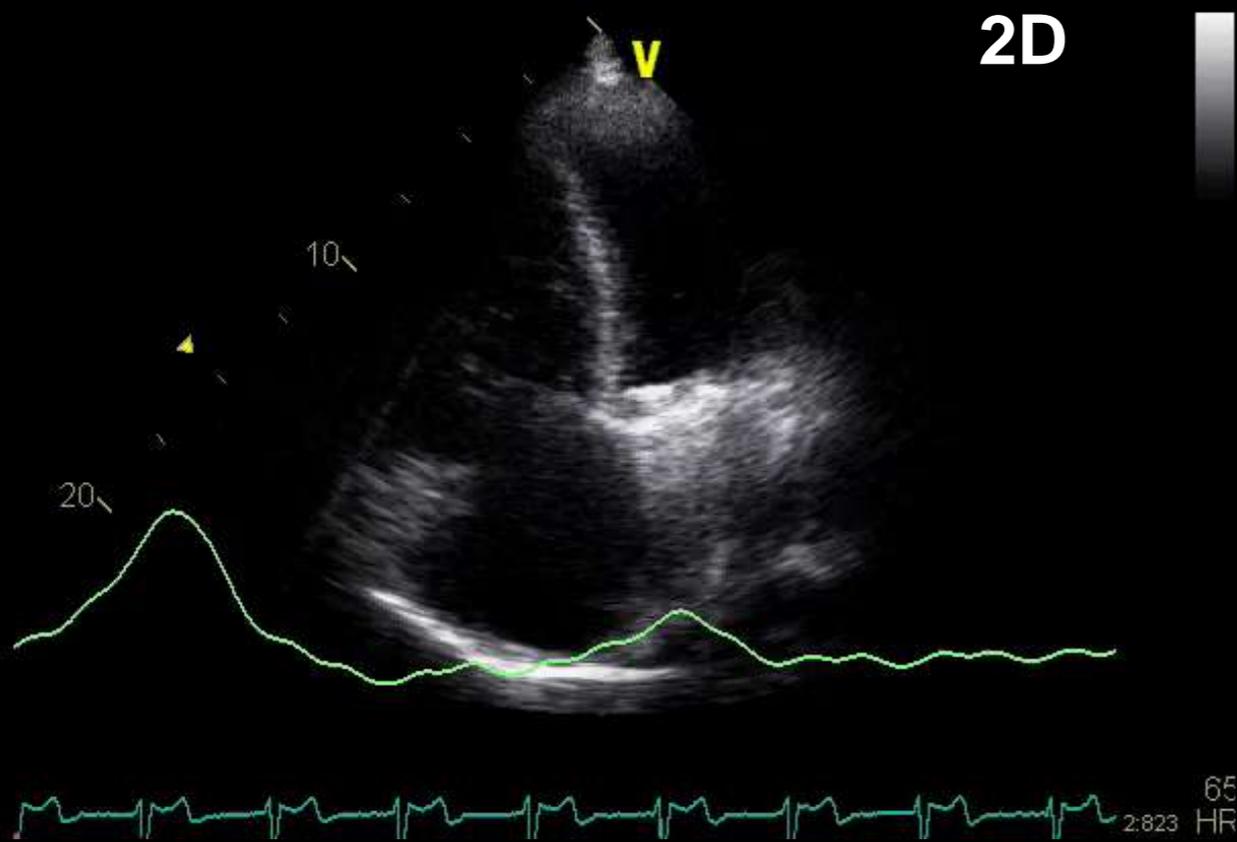
- 1 Volume MOD= 46.96 cm<sup>3</sup>  
Volume A-L = 49.93 cm<sup>3</sup>  
Area = 18.18 cm<sup>2</sup>  
Length = 5.62 cm
- 2 Volume MOD= 98.46 cm<sup>3</sup>  
Volume A-L = 104.4 cm<sup>3</sup>  
Area = 27.55 cm<sup>2</sup>  
Length = 6.17 cm

Indice de Excentricidad

# Ecocardiio 2D y HAP: Pronóstico



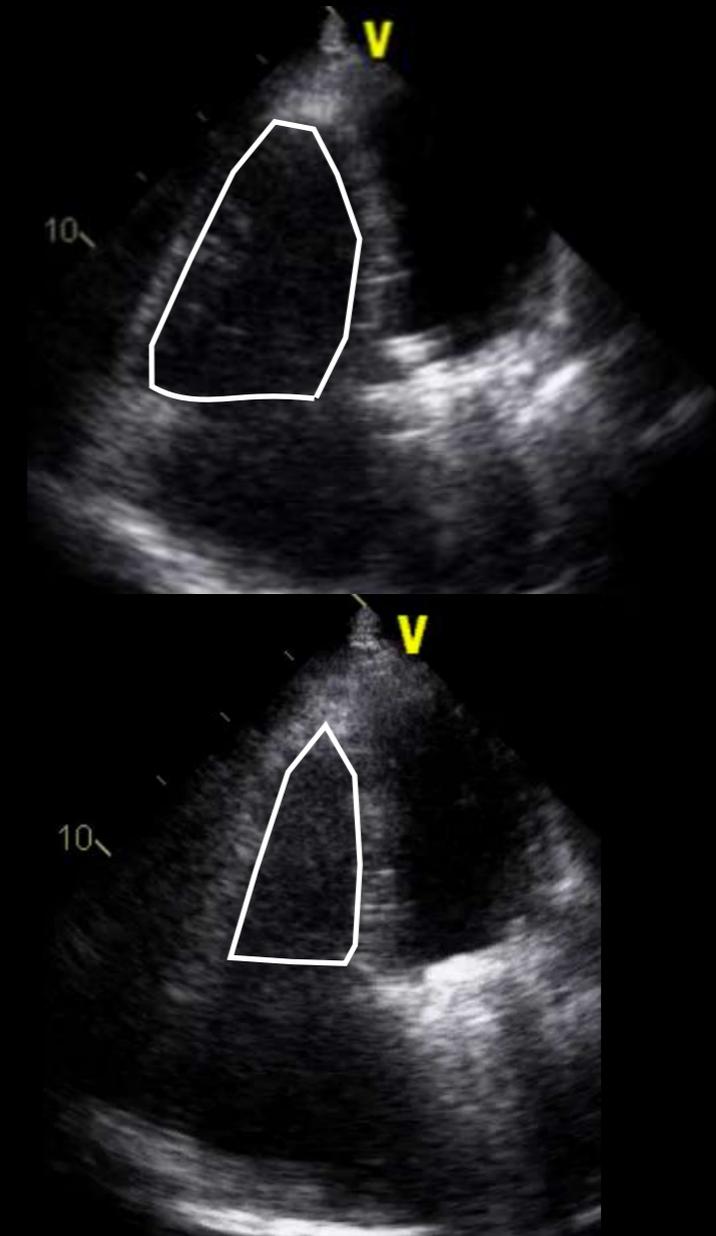
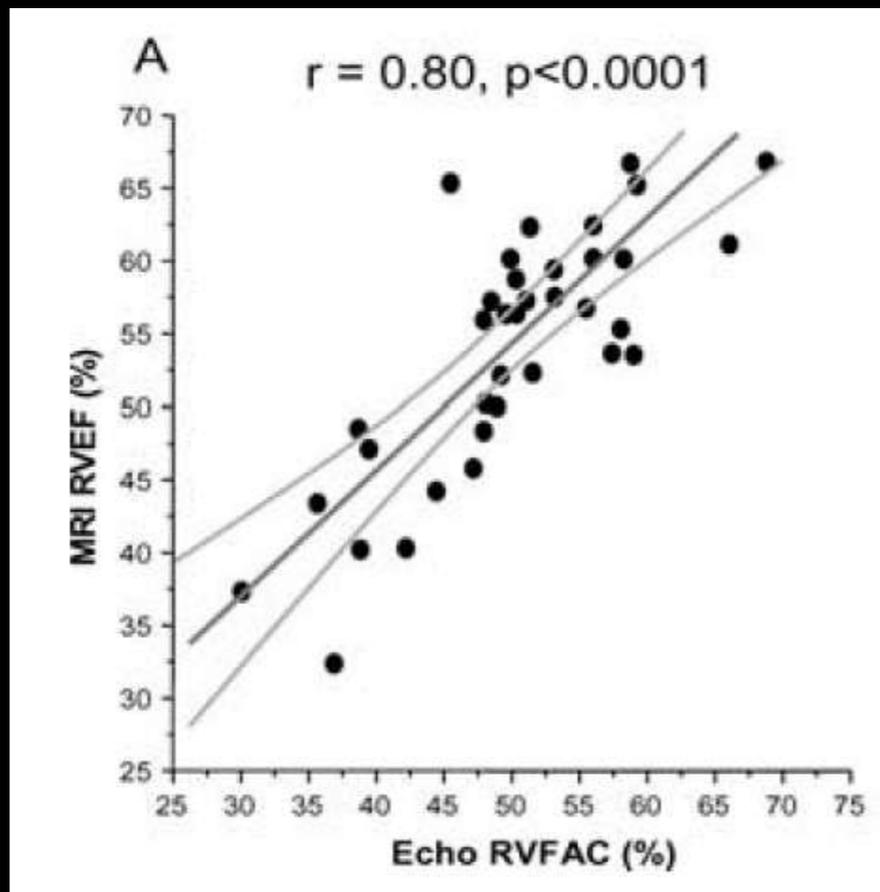
## FUNCIÓN SISTÓLICA Y VOLÚMENES



## FUNCIÓN SISTÓLICA

### Two-Dimensional Assessment of Right Ventricular Function: An Echocardiographic-MRI Correlative Study

Nagesh S. Anavekar, M.D.,\* David Gerson, M.D.,† Hicham Skali, M.D. M.S.,† Raymond Y. Kwong, M.D.,† E. Kent Yucel, M.D.,‡ and Scott D. Solomon, M.D.†



Área Fraccional

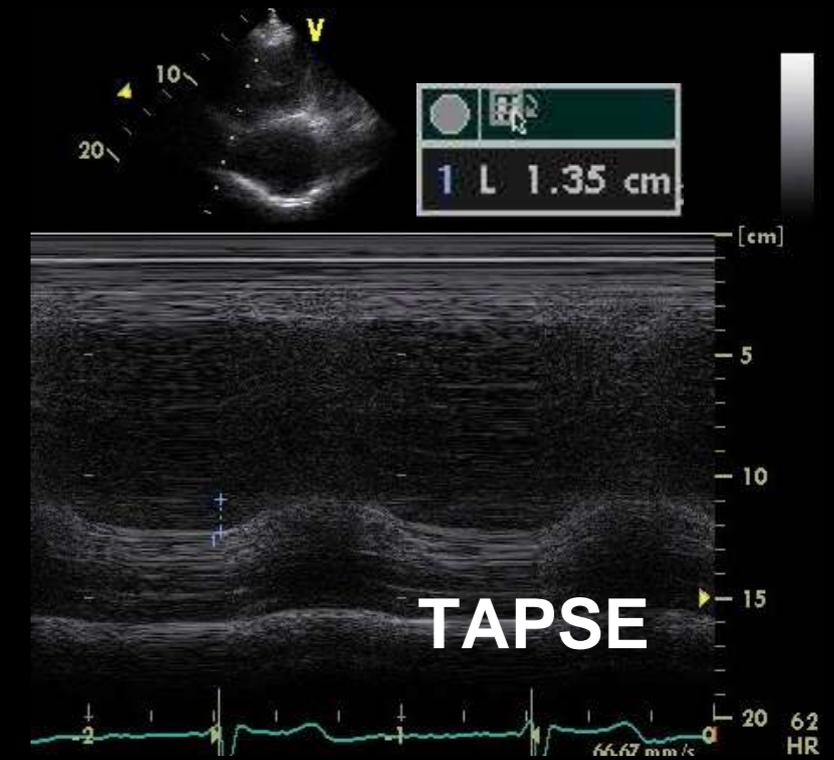
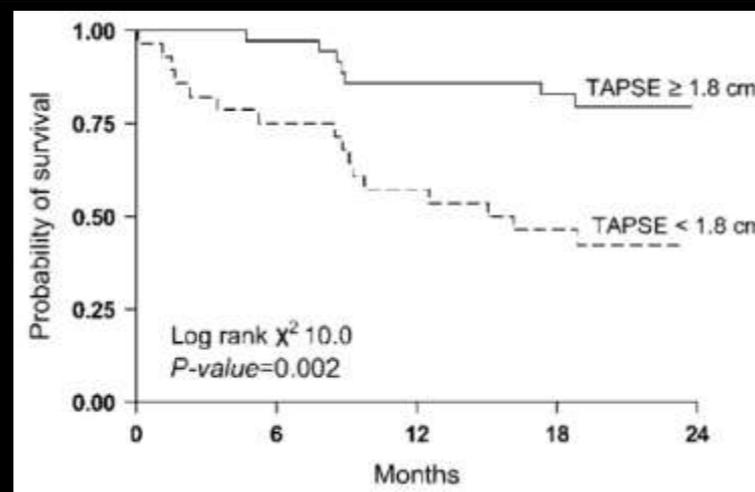
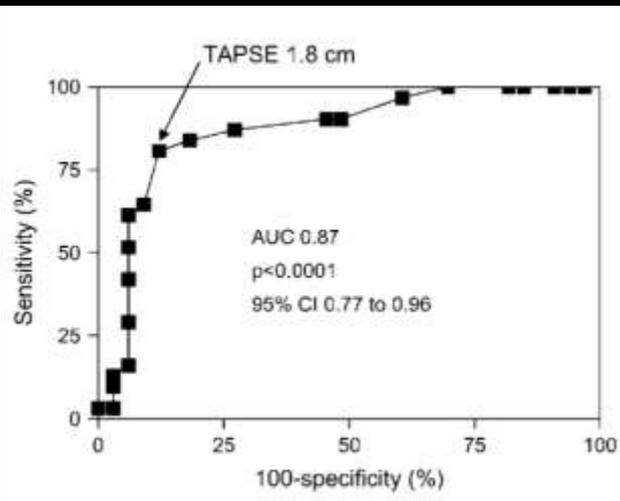
# Ecocardio 2D y HAP: Pronóstico



Am J Respir Crit Care Med Vol 174. pp 1034–1041, 2006

## Tricuspid Annular Displacement Predicts Survival in Pulmonary Hypertension

Paul R. Forfia, Micah R. Fisher, Stephen C. Mathai, Traci Houston-Harris, Anna R. Hemnes, Barry A. Borlaug, Elzbieta Chamera, Mary C. Corretti, Hunter C. Champion, Theodore P. Abraham, Reda E. Girgis, and Paul M. Hassoun



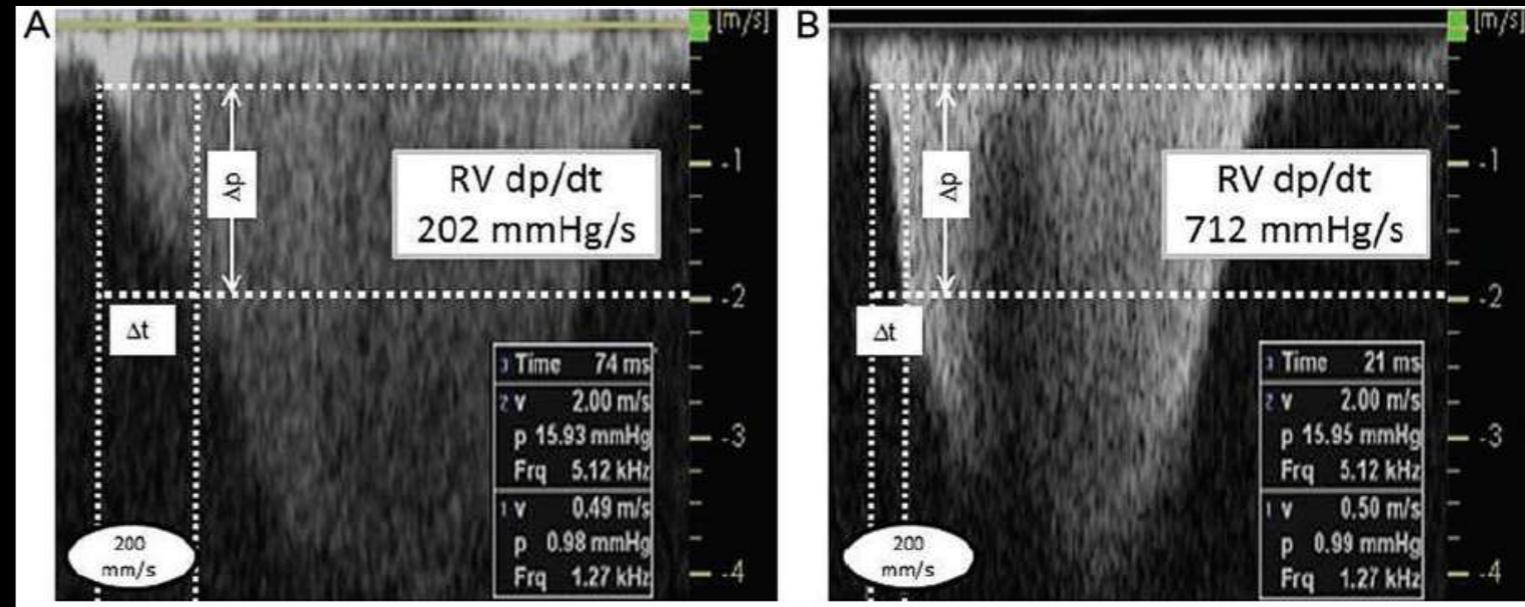
# Clinical value of echocardiographic Doppler-derived right ventricular dp/dt in patients with pulmonary arterial hypertension



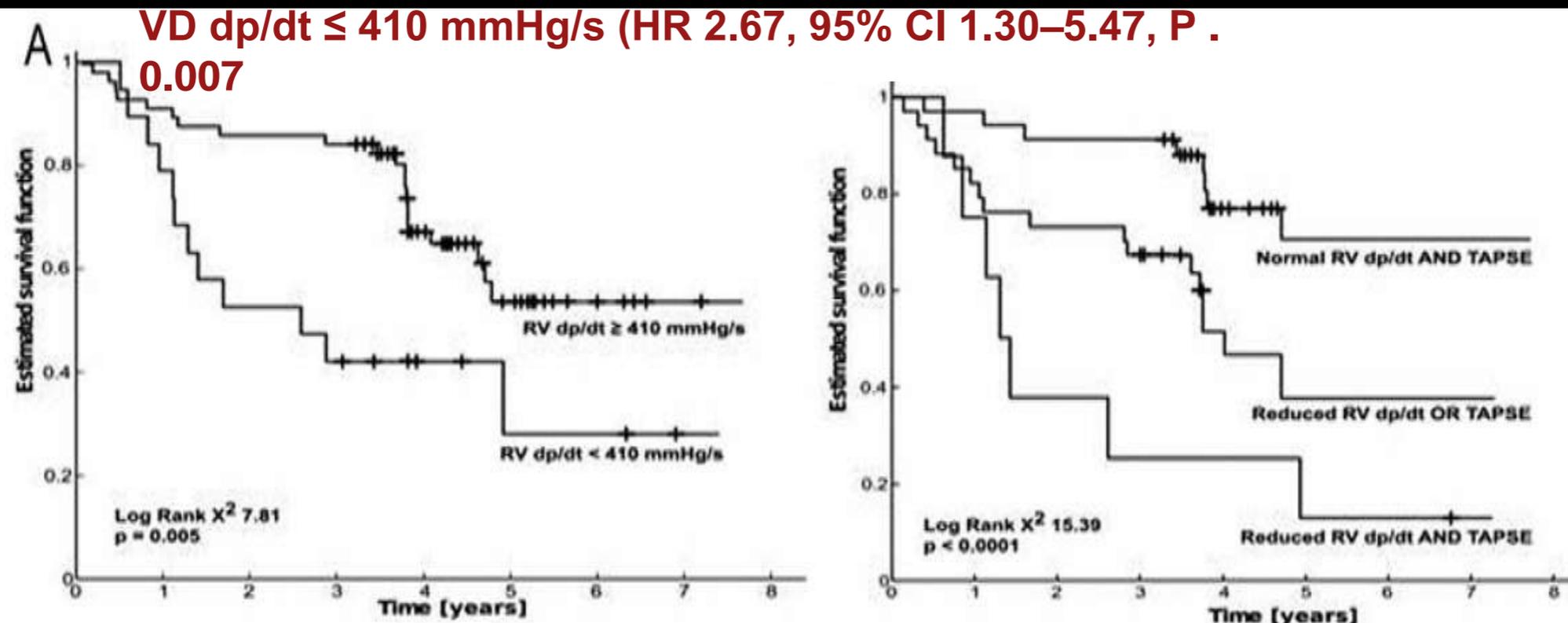
Koen Ameloot<sup>1\*</sup>, Pieter-Jan Palmers<sup>1</sup>, Alexander Vande Bruaene<sup>1</sup>, Annelies Gerits<sup>1</sup>, Werner Budts<sup>1</sup>, Jens-Uwe Voigt<sup>1†</sup>, and Marion Delcroix<sup>2†</sup>

European Heart Journal – Cardiovascular Imaging  
doi:10.1093/ehjci/jeu134 Epub ahead of print

- 78 pts
- Dg reciente de HAP no tratada



RV dp/dt  $\leq$  410 mmHg/s (HR 2.67, 95% CI 1.30–5.47, P = 0.007)



# Ecocardio 2D y HAP: Pronóstico



## FUNCIÓN SISTÓLICA: Speckle tracking.

Imaging

### Imaging the right heart: the use of integrated multimodality imaging



Emanuela R. Valsangiacomo Buechel<sup>1\*</sup> and Luc L. Mertens<sup>2</sup>

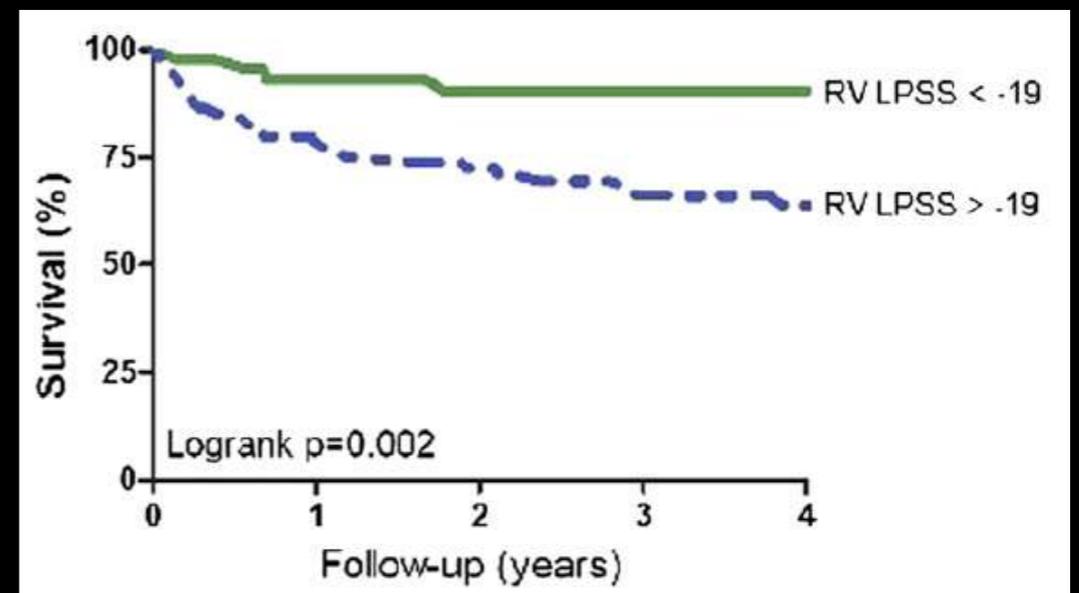
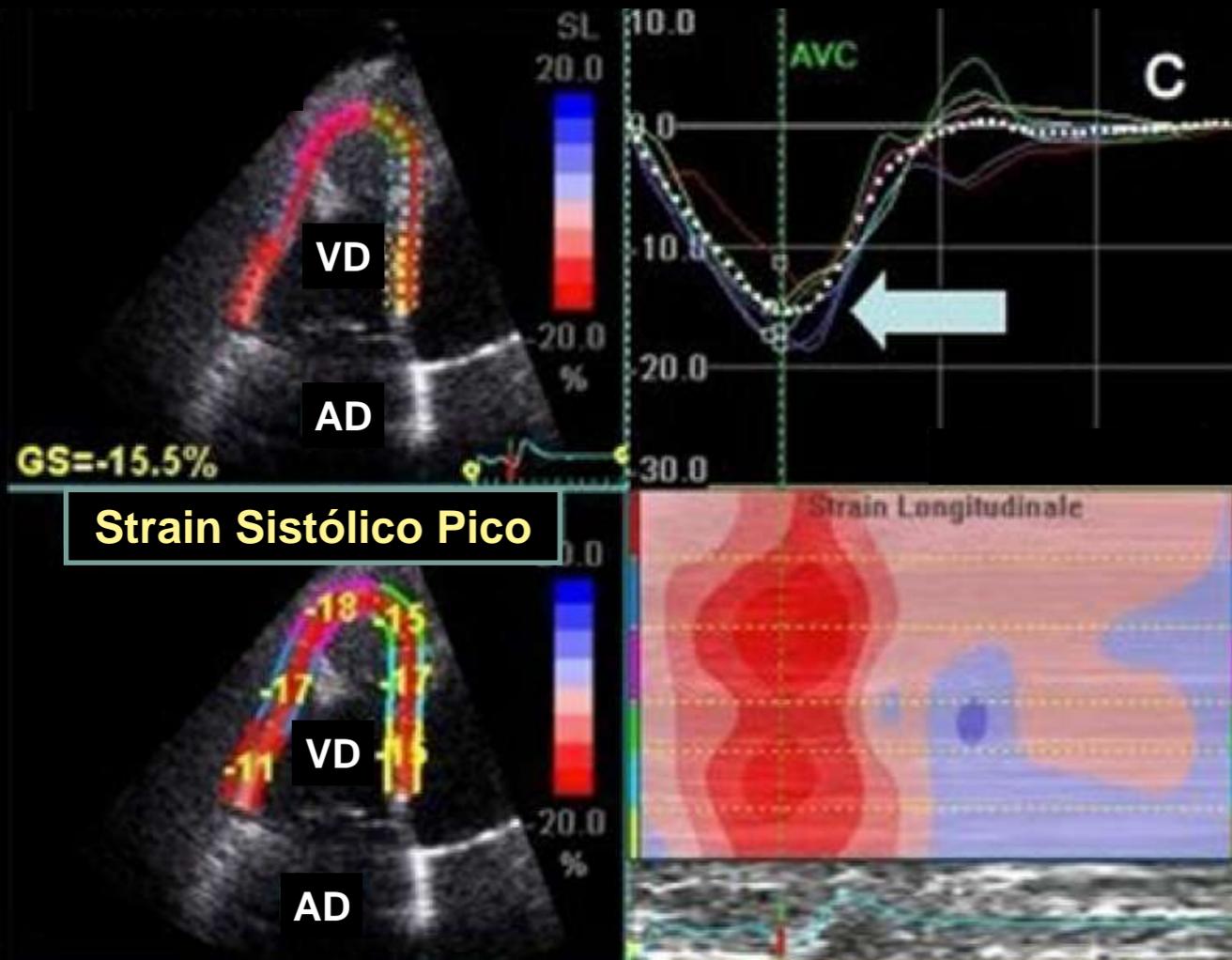
European Heart Journal (2012) 33, 949–960

Circ Cardiovasc Imaging (2012);5:628-636;

**Circulation**  
Cardiovascular Imaging

### Prognostic Value of Right Ventricular Longitudinal Peak Systolic Strain in Patients With Pulmonary Hypertension

Marlieke L.A. Haeck, Roderick W.C. Scherptong, Nina Ajmone Marsan, Eduard R. Holman, Martin J. Schalij, Jeroen J. Bax, Hubert W. Vliegen and Victoria Delgado

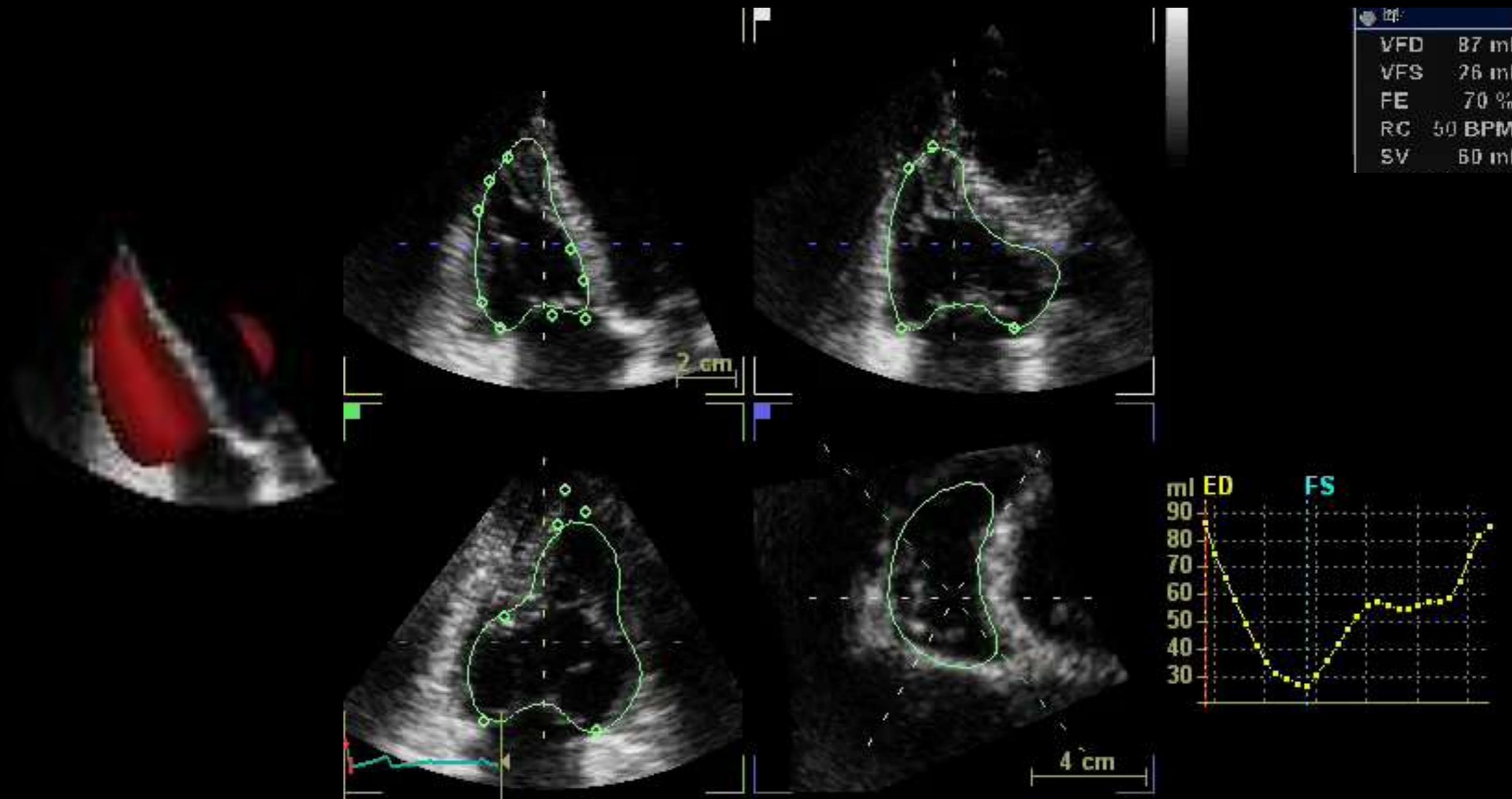


Heart 2010;96:281–288.

Circulation 2010; 121:259–266.

Eur J Echocardiogr 2010;11:341–345.

## FUNCIÓN SISTÓLICA Y VOLÚMENES 3D



# Quantitative Assessment of Right Ventricular Volumes and Ejection Fraction in Patients with Left Ventricular Systolic Dysfunction by Real Time Three-Dimensional Echocardiography versus Cardiac Magnetic Resonance Imaging

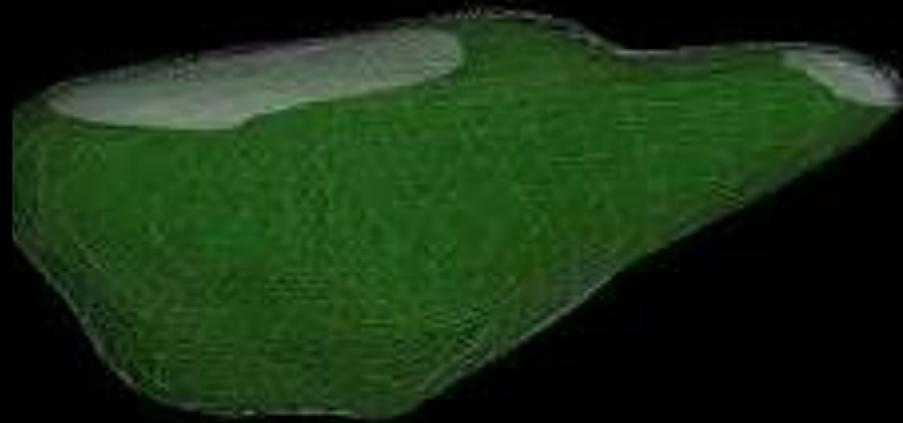
(Echocardiography 2014;00:1– 8)

Jiwon Kim, M.D.,\* Scott B. Cohen, M.D., M.P.H.,† Michael K. Atalay, M.D., Ph.D.,‡ Andrew D. Maslow, M.D.,§ and Athena Poppas, M.D.¶

27 pts

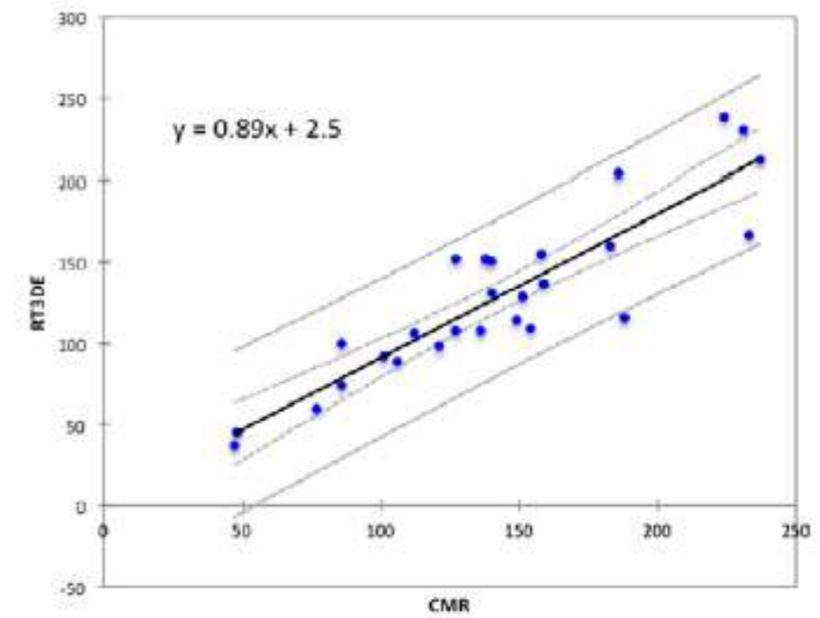
Todos con Disfunción del VI

FEVI media 36%

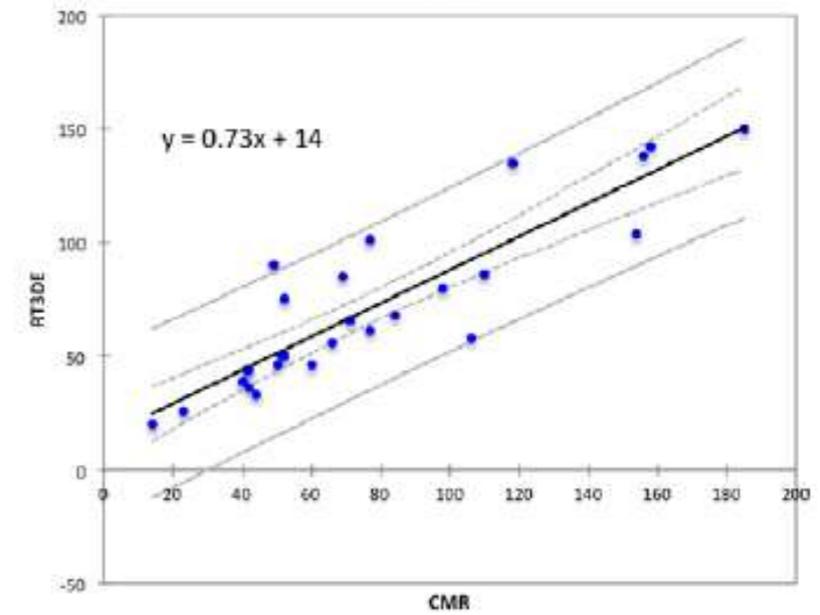


RVEDV = 200.5 ml  
RVESV = 116.0 ml  
RVSV = 84.5 ml  
RVEF = 42.1 %

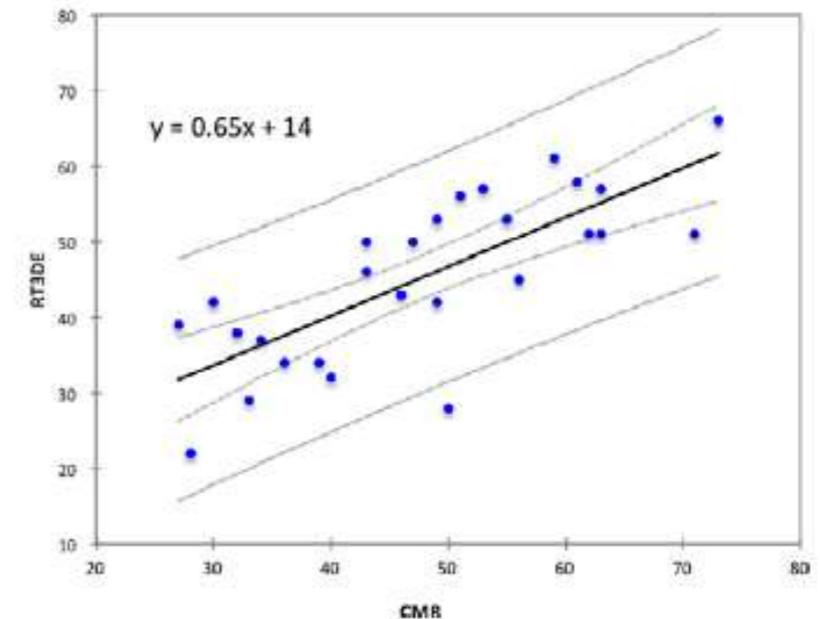
EDV



ESV



EF



# Real Time Three-Dimensional Echocardiography for Quantification of Ventricular Volumes, Mass, and Function in Children with Congenital and Acquired Heart Diseases

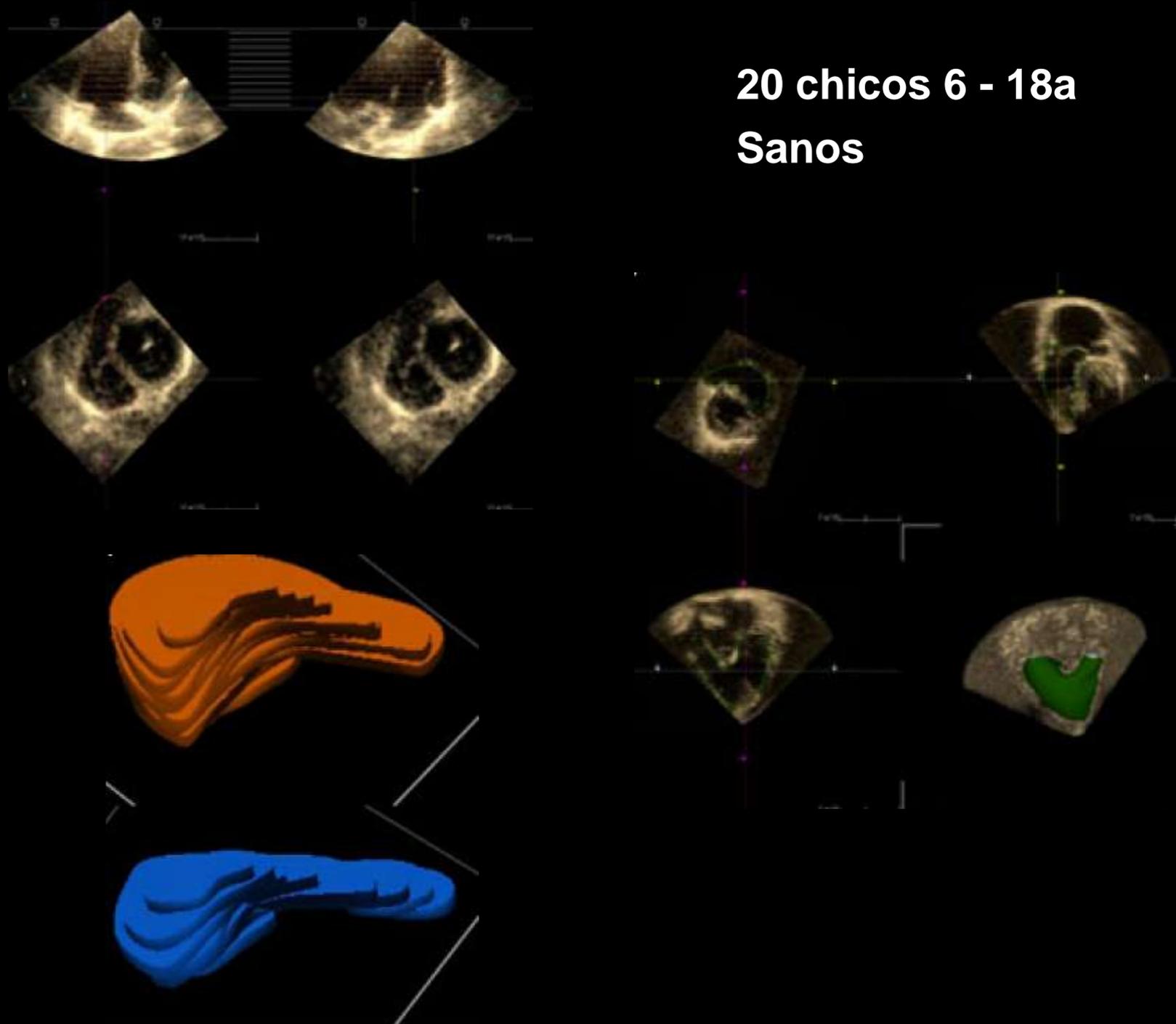
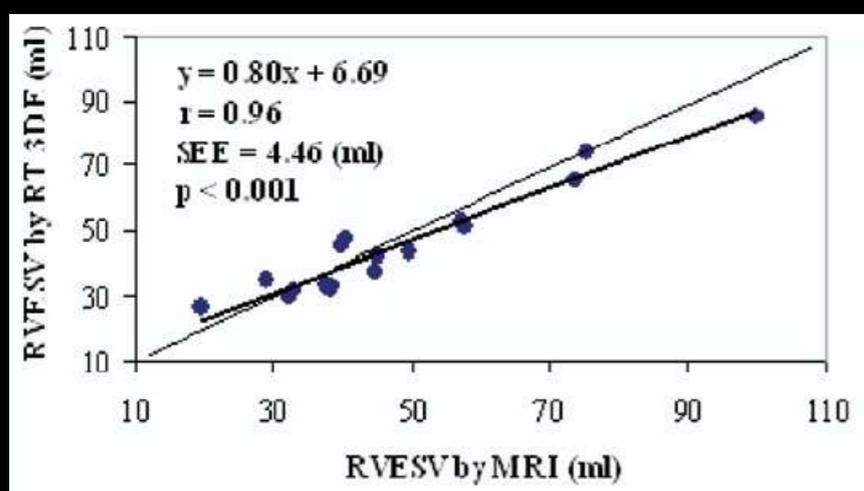
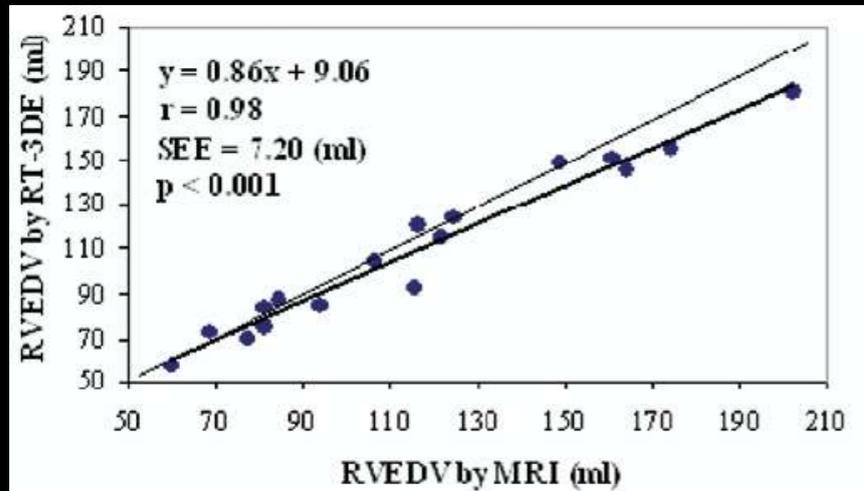
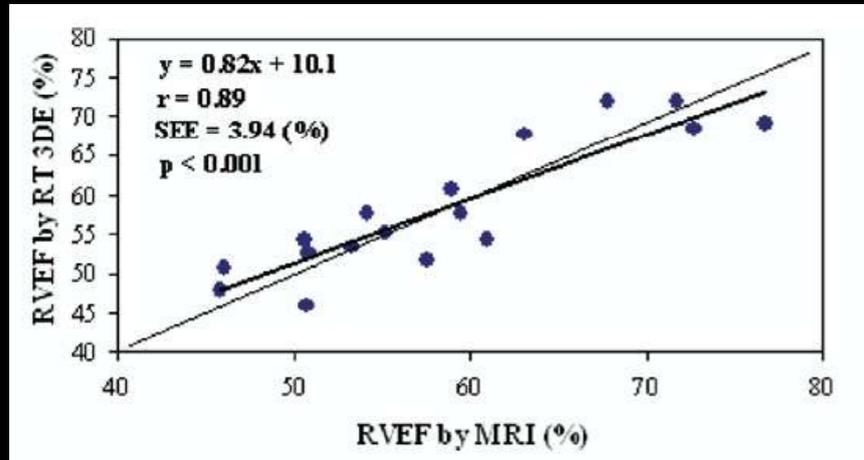
(Echocardiography 2013;30:472-482)

Rula Balluz, M.D., M.P.H.,\* Liwen Liu, M.D., Ph.D.,† Xiaodong Zhou, M.D., Ph.D.,† and Shuping Ge, M.D.\*

# Accuracy and Reproducibility of Real-Time Three-Dimensional Echocardiography for Assessment of Right Ventricular Volumes and Ejection Fraction in Children

J Am Soc Echocardiogr 2008;21: 84-89

Xiuzhang Lu, Vyacheslav Nadvoretzkiy, Liping Bu, Alan Stolpen, Nancy Ayres, Ricardo H. Pignatelli, John P. Kovalchin, Michelle Grenier, Berthold Klas, and Shuping Ge, MD, *Houston, Texas; Iowa City, Iowa; and Munich, Germany*



**20 chicos 6 - 18a  
Sanos**

# Accuracy of Right Ventricular Volumes and Function Determined by Three-Dimensional Echocardiography in Comparison with Magnetic Resonance Imaging: A Meta-Analysis Study

Yuichi J. Shimada, MD, Maiko Shiota, MD, Robert J. Siegel, MD, and Takahiro Shiota, MD, PhD, FACC, FASE, FAHA, *New York, New York; Los Angeles and Palo Alto, California*

23 estudios

807 adultos y niños

**Results:** Twenty-three studies including 807 subjects revealed underestimation of RV volumes ( $P < .00001$ ) and EF ( $P = .03$ ). Larger volumes and EF were associated with more underestimation. Older patient age was associated with overestimation of volumes and underestimation of EF.

**Conclusions:** This meta-analysis found underestimation of RV volumes and EF by 3DE and factors affecting the bias. These data provide a more detailed basis for improving the accuracy of 3DE for further clinical application. (J Am Soc Echocardiogr 2010;23:943-53.)

# Ecocardio 2D y HAP: Pronóstico



## RESERVA CONTRÁCTIL DEL VD: ECO EJERCICIO

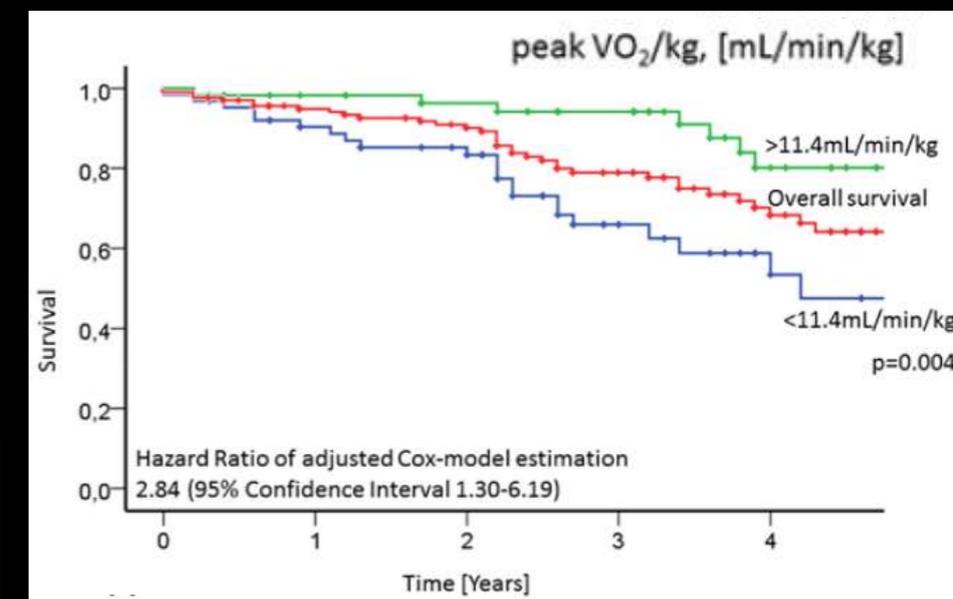
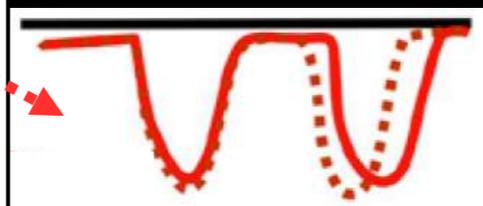
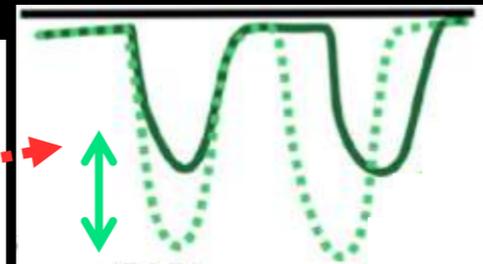
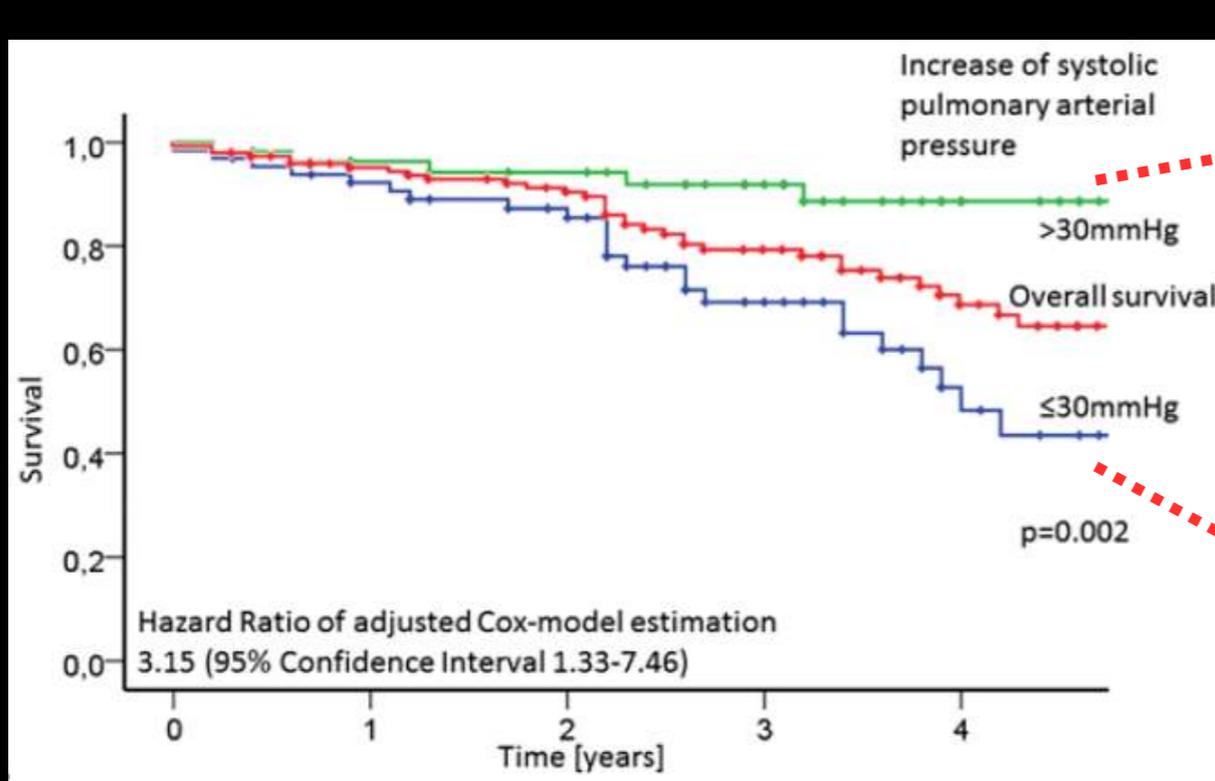


### Assessment and Prognostic Relevance of Right Ventricular Contractile Reserve in Patients With Severe Pulmonary Hypertension

Ekkehard Grünig, Henning Tiede, Esi Otuwa Enyimayew, Nicola Ehlken, Hans-Jürgen Seyfarth, Eduardo Bossone, Antonello D'Andrea, Robert Naeije, Horst Olschewski, Silvia Ulrich, Christian Nagel, Michael Halank and Christine Fischer



- 127 pts HTP y/o TEP crónico no operable
- En tto con medicación optimizada.

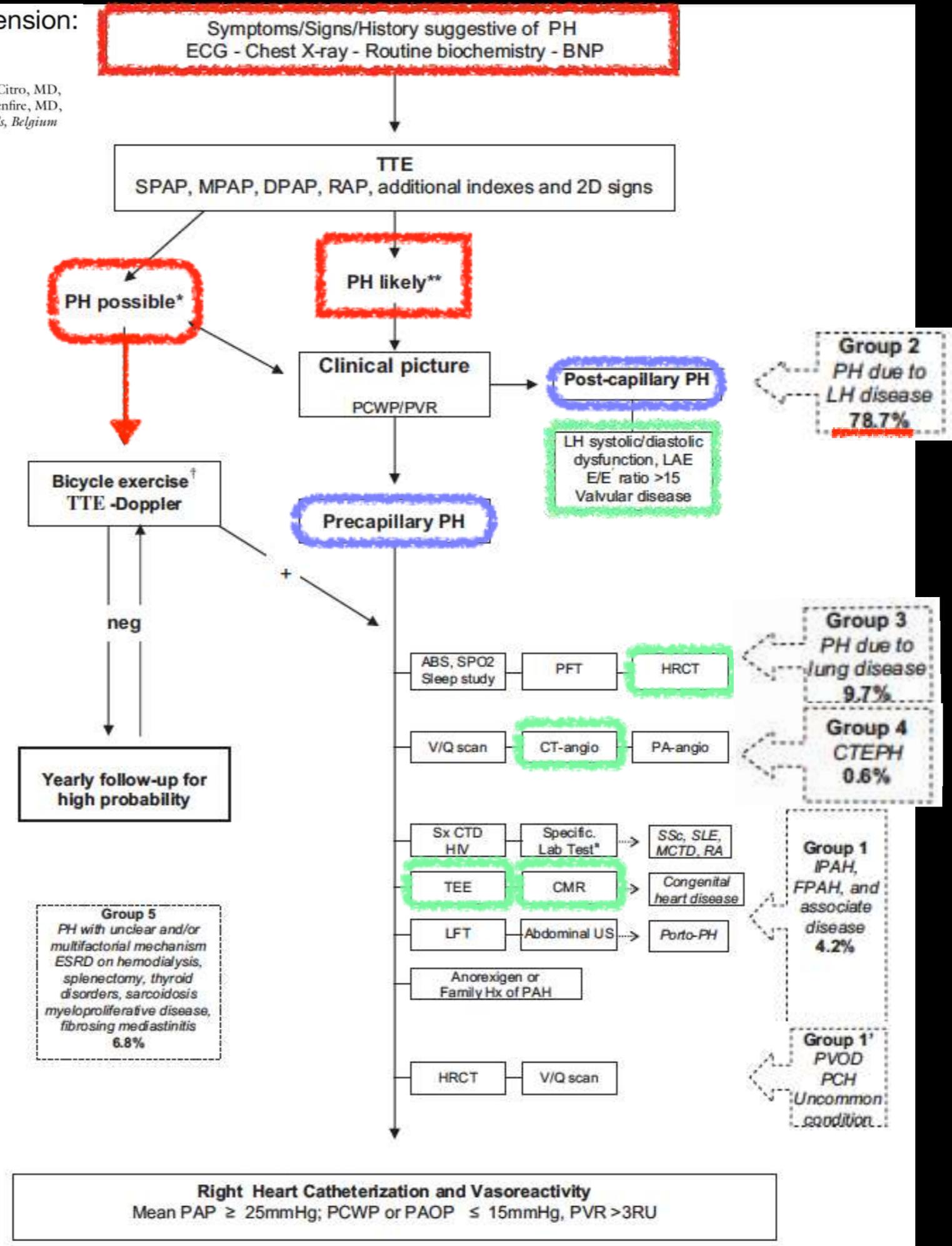


# Echocardiography in Pulmonary Arterial Hypertension: from Diagnosis to Prognosis



Eduardo Bossone, MD, PhD, Antonello D'Andrea, MD, PhD, Michele D'Alto, MD, Rodolfo Citro, MD, Paola Argiento, MD, PhD, Francesco Ferrara, MD, Antonio Cittadini, MD, PhD, Melvyn Rubenfire, MD, and Robert Naeije, MD, PhD, *Milan, Salerno, and Naples, Italy; Ann Arbor, Michigan; Brussels, Belgium*

(J Am Soc Echocardiogr 2013;26:1-14.)



**Group 5**  
PH with unclear and/or multifactorial mechanism  
ESRD on hemodialysis,  
splenectomy, thyroid disorders, sarcoidosis  
myeloproliferative disease,  
fibrosing mediastinitis  
6.8%

**Right Heart Catheterization and Vasoreactivity**  
Mean PAP ≥ 25mmHg; PCWP or PAOP ≤ 15mmHg, PVR >3RU



# Cardio RM o Cardio TC

(¿ anatomía o fisiología ?)

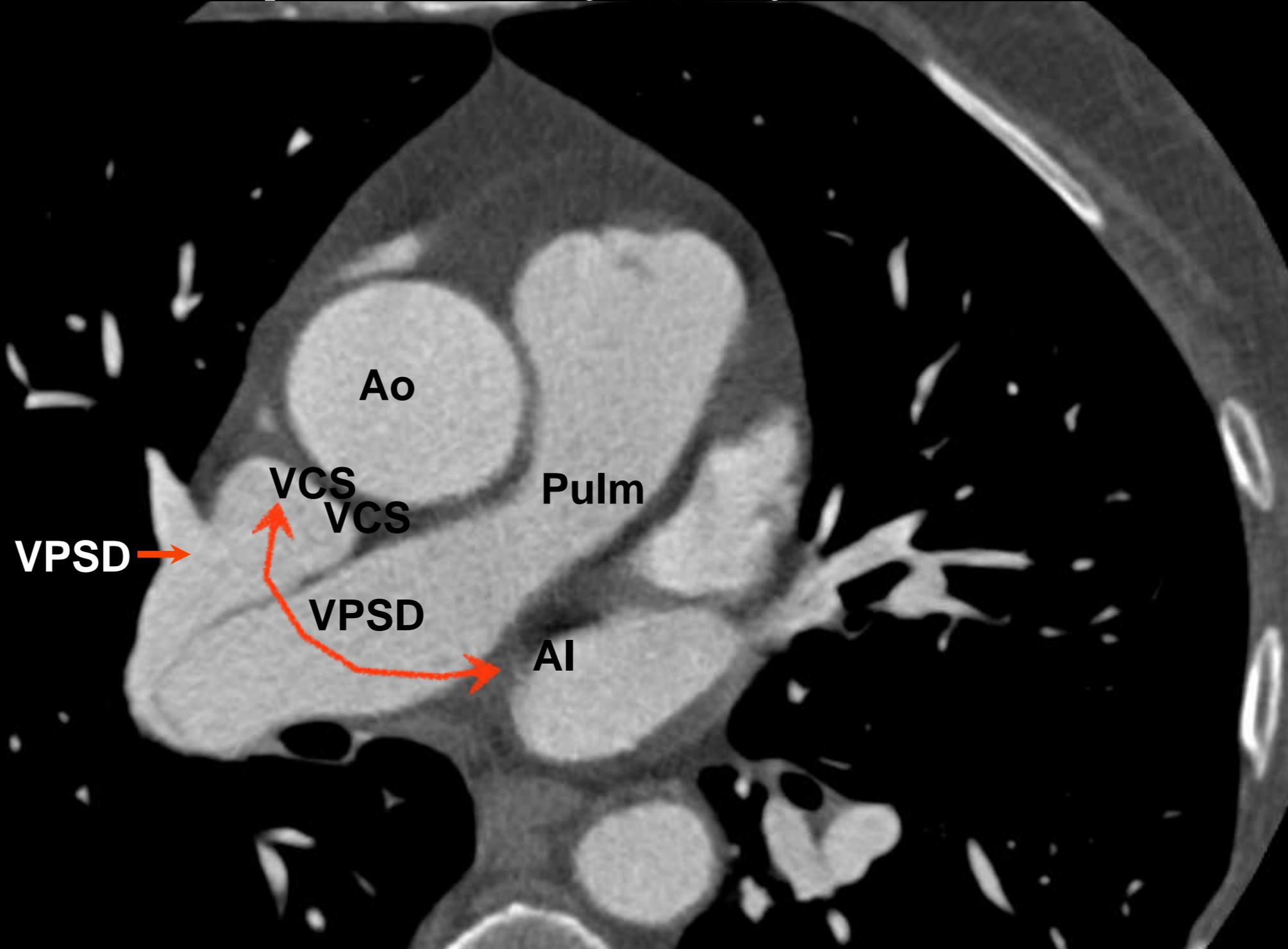
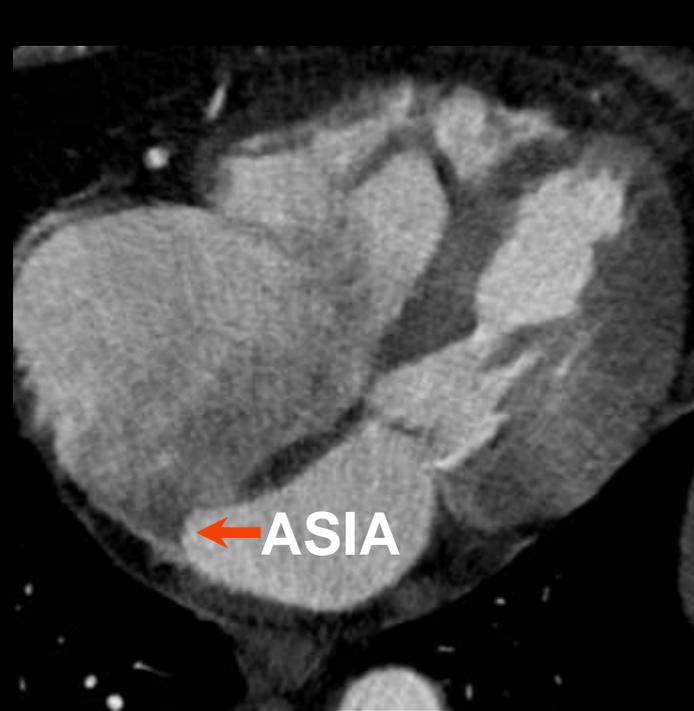
(¿ anatomía o fisiología ?)



# Cardio TC: Escenarios clínicos



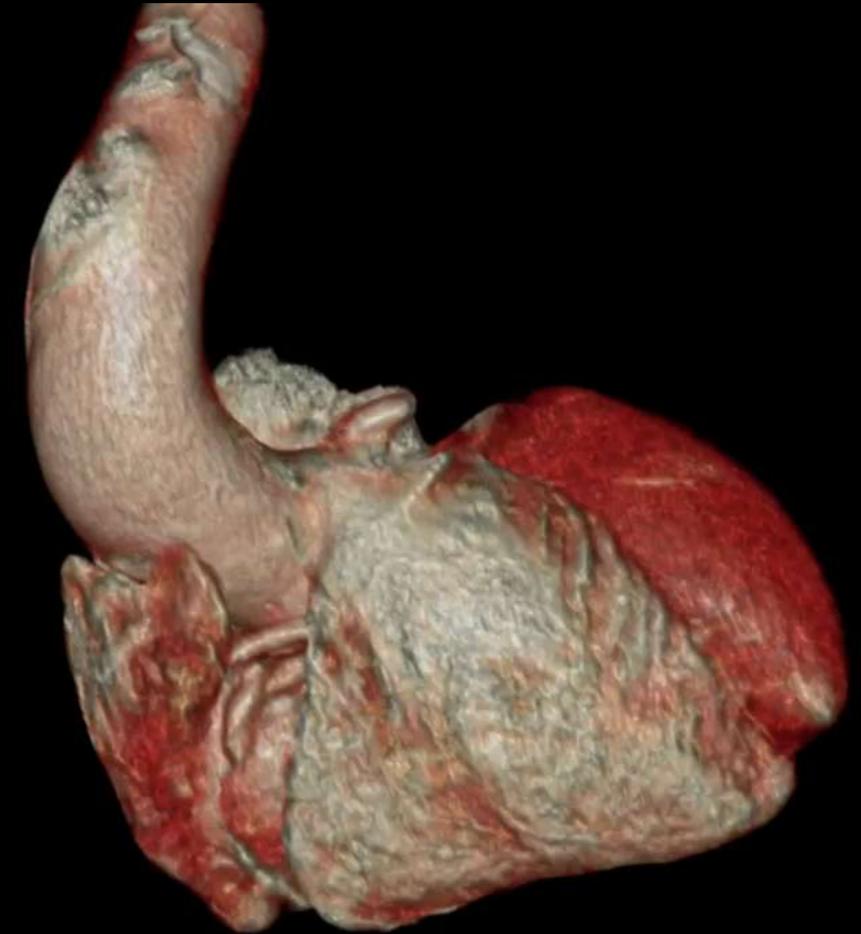
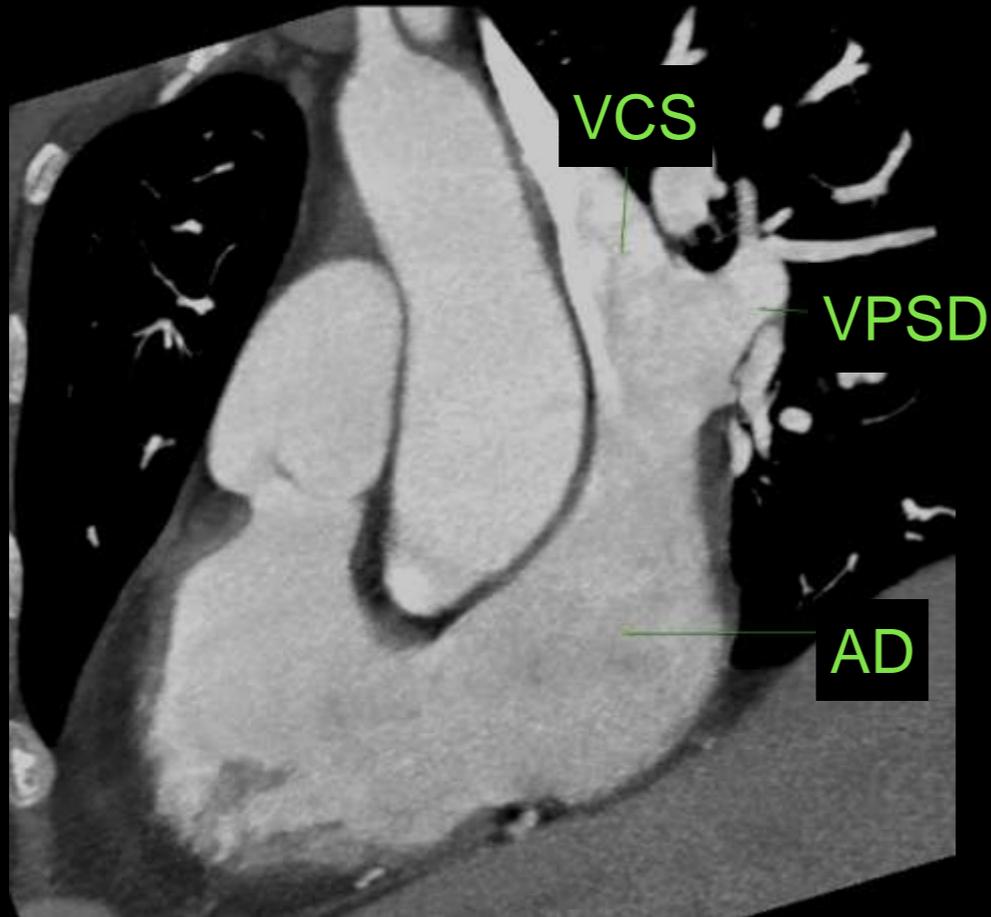
- 66 años. Disnea actual CF II
- Ant de TEP.
- Eco: - VD moderadamente dilatado y disfuncionante con HAPs 48mmHg.  
- Existe ASIA con foramen oval permeable (?). Pasaje de burbujas ++



# Cardio TC: Escenarios clínicos



## Anomalia parcial del retorno venoso pulmonar sup derecho



-VTD del VD: 227 ml (n: 127-223) ; 125 ml/m<sup>2</sup> (n: 67-108)

-VTS del VD: 111 ml (n: 53-111) ; 61 ml/m<sup>2</sup> (n: 20-48)

-VS: 116 ml

-FEVD: 51 %

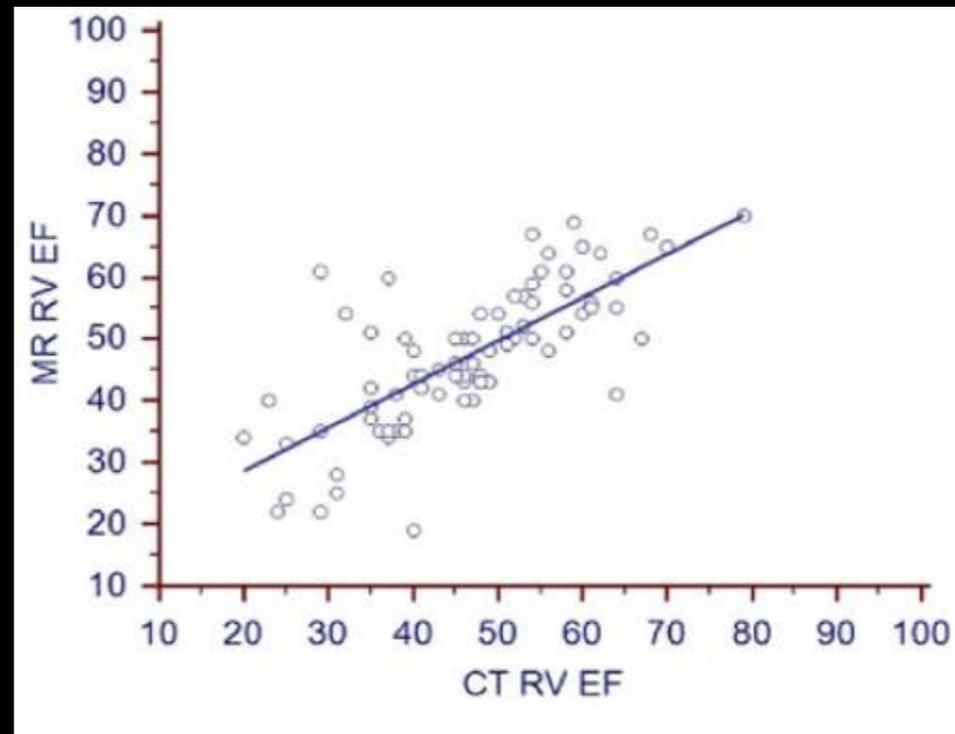
# Cardio TC: Función VD



## Left and right ventricle assessment with Cardiac CT: validation study vs. Cardiac MR

Erica Maffei • Giancarlo Messalli • Chiara Martini •  
Koen Nieman • Onofrio Catalano • Alexia Rossi •  
Sara Seitun • Andrea I Guaricci • Carlo Tedeschi •  
Nico R. Mollet • Filippo Cademartiri

**Conclusions:** Cardiac CT provides accurate and reproducible LV and RV volume parameters



# Cardio RM: (Estudio integral multi paramétrico)

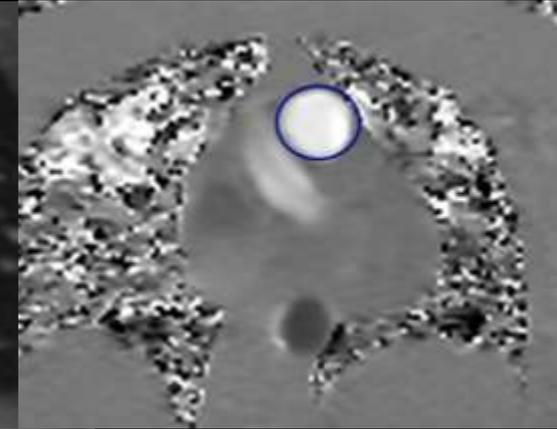
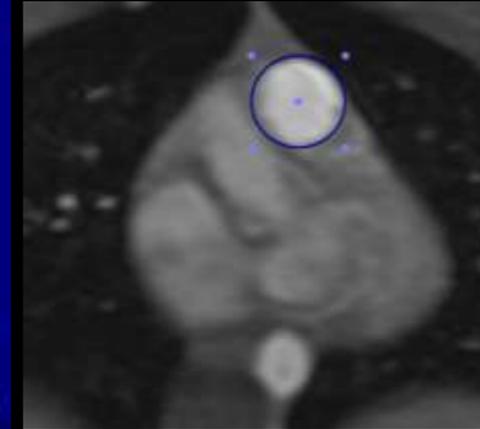
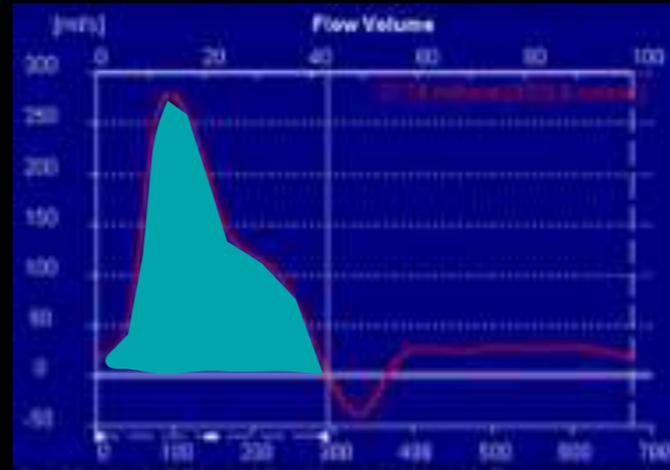


- Es sin duda la prueba de 2da línea luego del Ecocardiograma para el estudio integral del corazón derecho.
  - *Considerado el estudio de referencia para:*
    - Medición de volúmenes y FE.
    - Cuantificación de flujos y shunts.
- Circulation 2009; 120:992-1007.
- *Además permite obtener*
    - Información 3D de la estructura de las arterias y venas pulmonares, aorta y conexiones venosas sistémicas.
    - Caracterización tisular de patologías que afectan el VD (C. arritmogénica del VD, MCP por depósito, tumores de cavidades derechas).

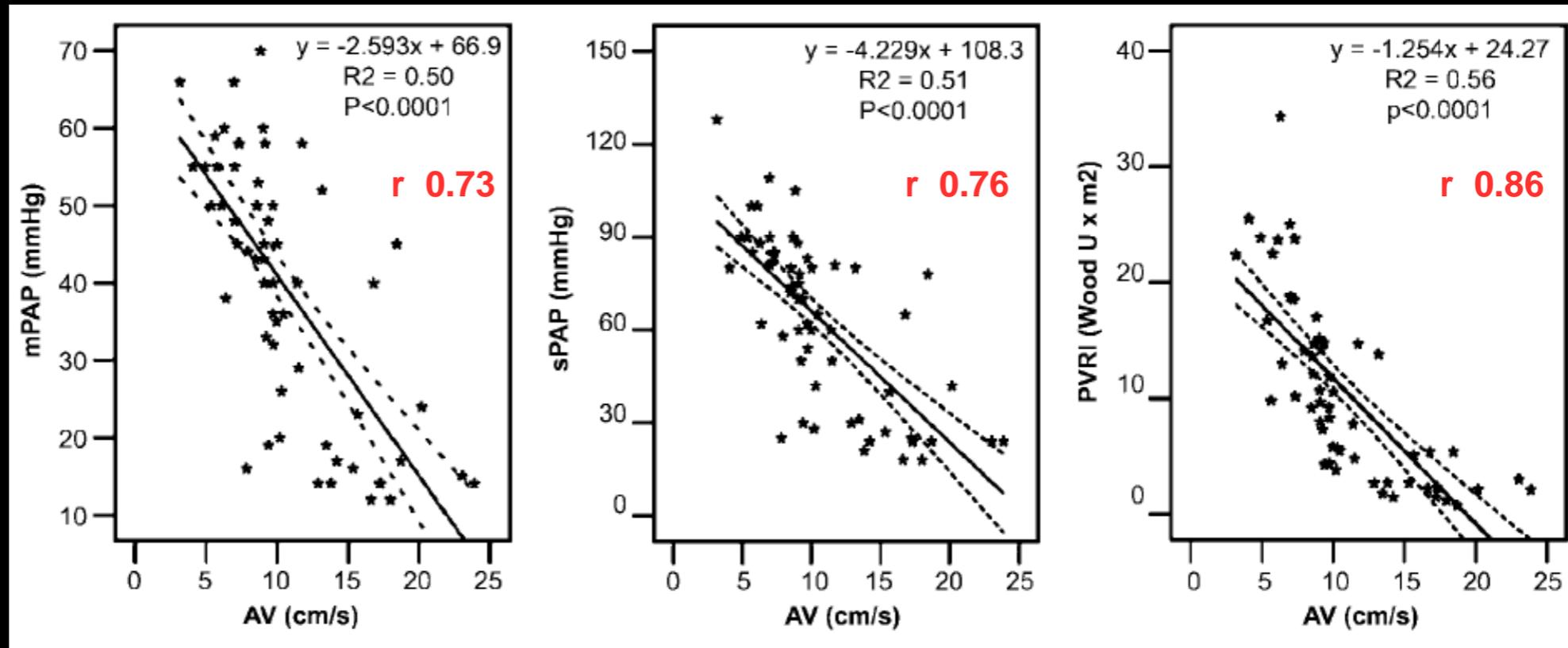
# Cardio RM: HTP

## Pulmonary Arterial Hypertension: Noninvasive Detection with Phase-Contrast MR Imaging<sup>1</sup>

Radiology 2007; 243: 70-79.



- 59 pts con HTP
- Veloc Pulm media (AV) y correlación con PAP media, PAP sistólica y RVP.
- Punto de corte 11,7 cm/seg ( dg. de HTP con S 92,9% y E 82,4% )



# Cardio RM: HTP



## Role of Cardiac Magnetic Resonance Imaging in the Management of Patients With Pulmonary Arterial Hypertension



(J Am Coll Cardiol 2008;52:1683–92)

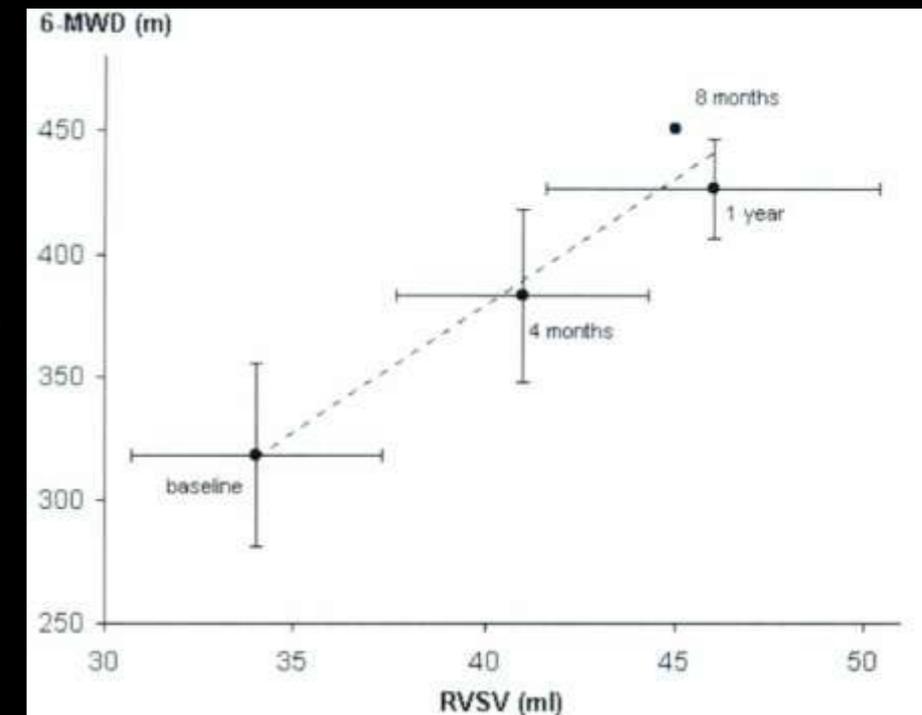
Raymond Benza, MD,\* Robert Biederman, MD,\* Srinivas Murali, MD,\* Himanshu Gupta, MD†  
*Pittsburgh, Pennsylvania; and Birmingham, Alabama*

## Diagnosis and Management of Pulmonary Arterial Hypertension using MR Imaging

Tae IWASAWA

Magn Reson Med Sci, Vol. 12, No. 1, pp. 1-9, 2013

- ptes con HTP en tto con Epoprostenol
- Un incremento significativo del VS del VD y caída de las RVP.
- Predominante en los 1ros 4 meses.
- Con adecuada correlación con el test de caminata de 6 min



# Cardio RM: Congenitas

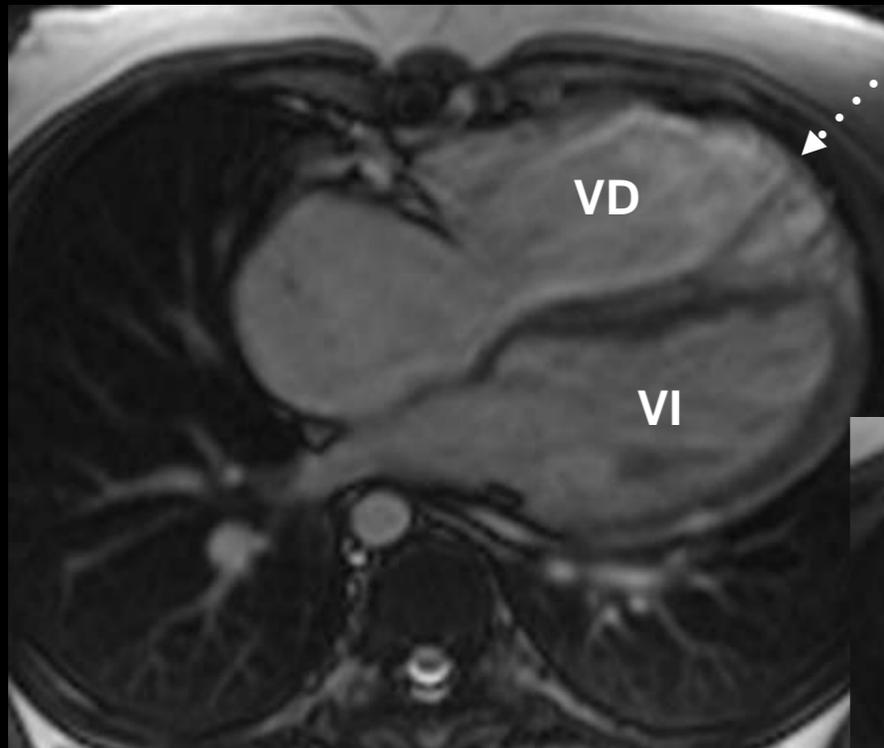


## FALLOT OPERADO

Varón de 12a

Intervenido de Tetralogía de Fallot.

Disnea importante al ejercicio.



Banda moderadora

VD

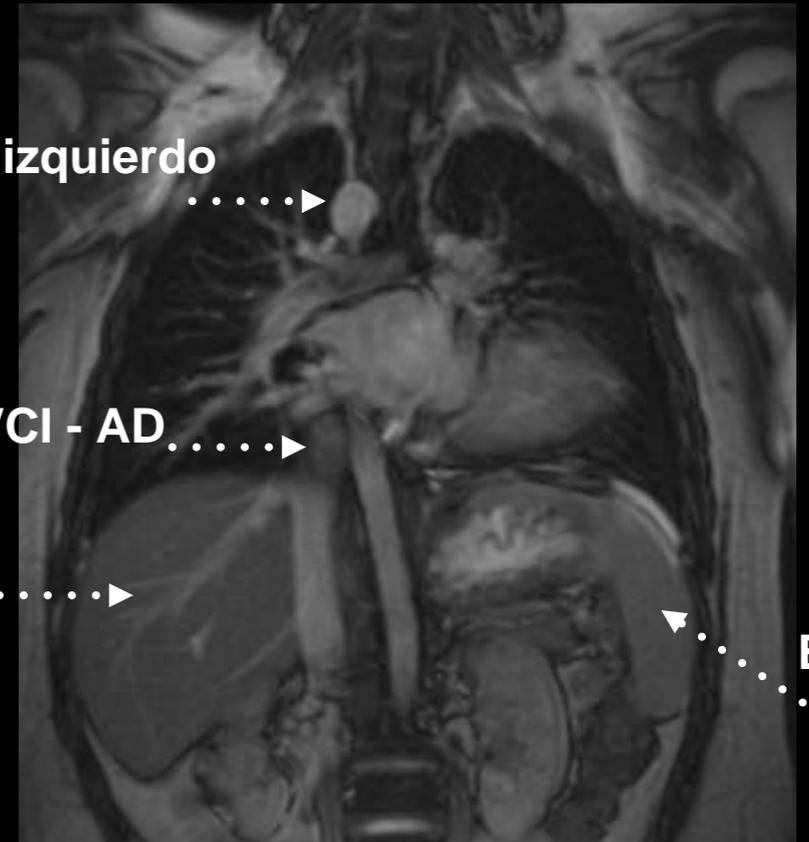
VI

Arco Ao izquierdo

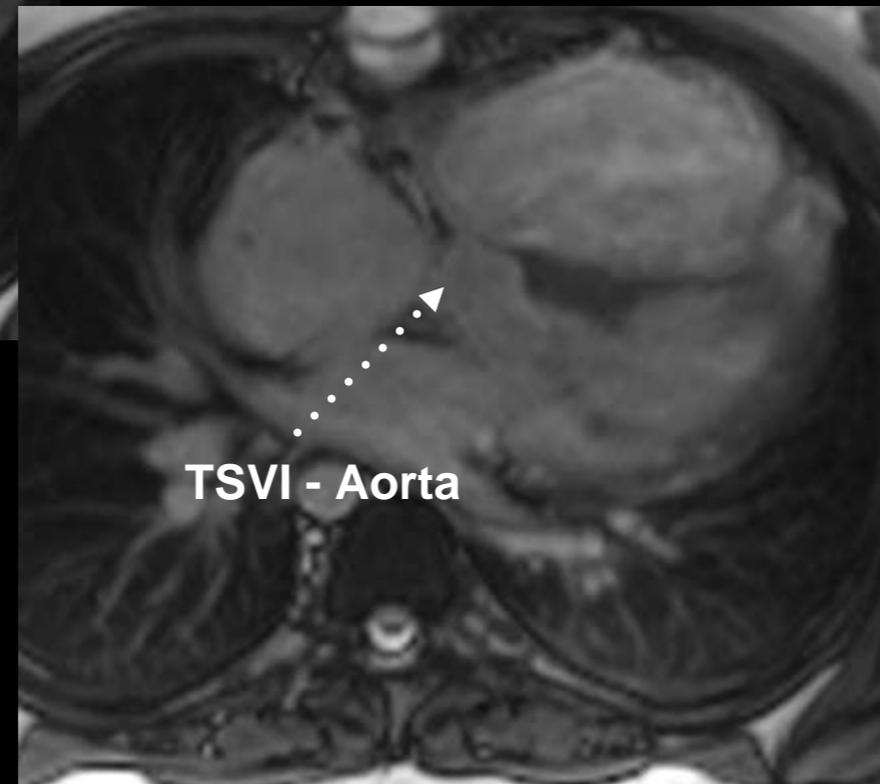
VCI - AD

Higado

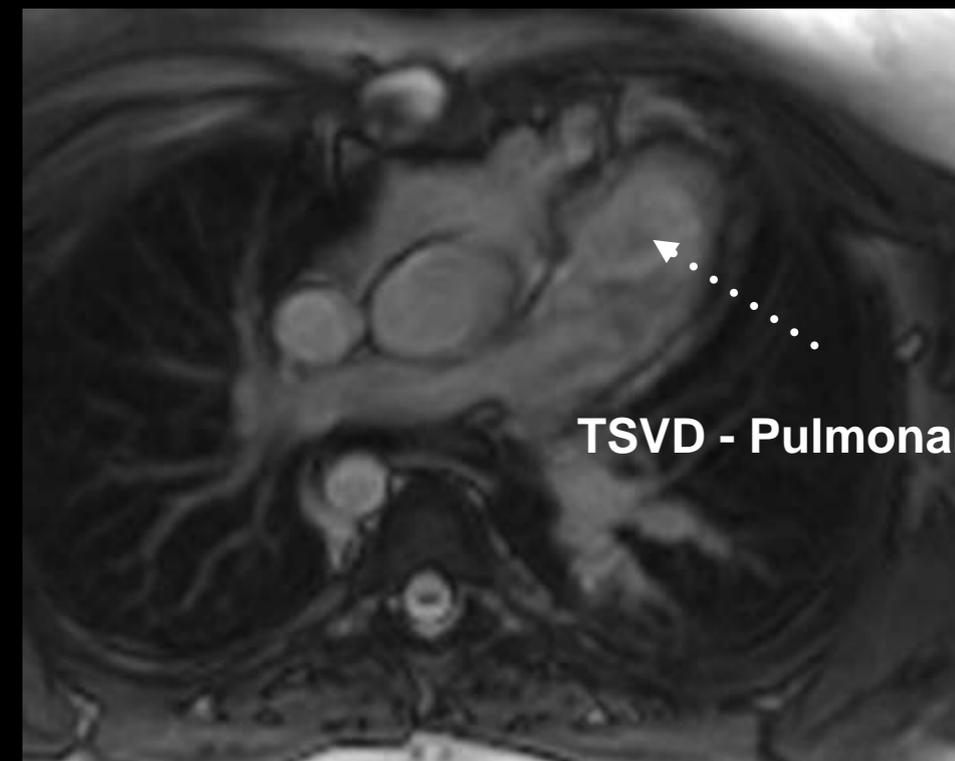
Bazo



- Situs solitus
- Concordancia A-V y V-A



TSVI - Aorta



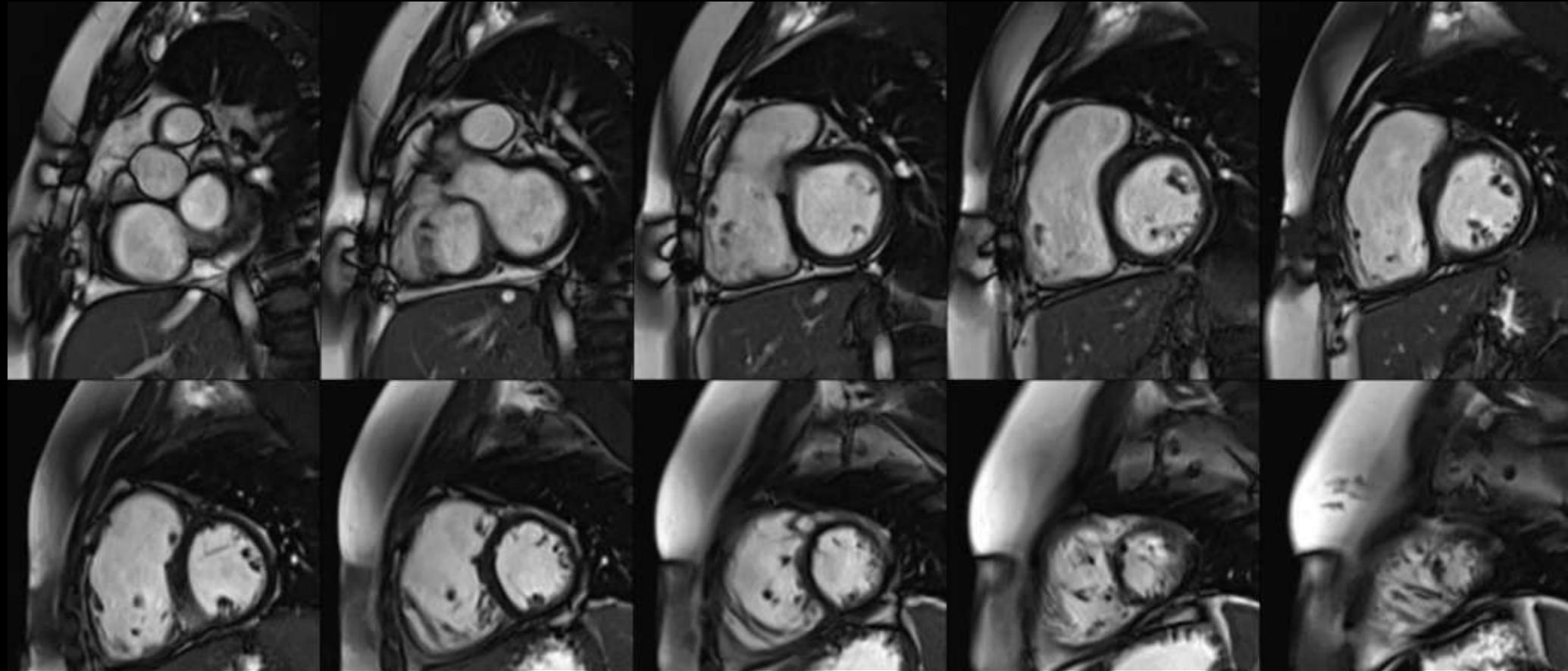
TSVD - Pulmonar

# Cardio RM: Congenitas



## FALLOT OPERADO

### Multicine ejes cortos



#### Ventrículo izquierdo

Volumen telediastólico del VI (ml):	148
Indice de volumen telediastólico del VI (ml/m <sup>2</sup> ):	85 (82 +/- 15 ml/m <sup>2</sup> )
Volumen telesistólico del VI (ml):	60
Indice de volumen telesistólico del VI (ml/m <sup>2</sup> ):	34
FEVI (%):	59
Masa VI (g):	98
Indice de masa VI (g/m <sup>2</sup> ):	56 (75 +/- 12 g/m <sup>2</sup> )

#### Ventrículo derecho

Volumen telediastólico del VD (ml):	294
Indice de volumen telediastólico del VD (ml/m <sup>2</sup> ):	168 (86 +/-14 ml/m <sup>2</sup> )
Volumen telesistólico del VD (ml):	147
Indice de volumen telesistólico del VD (ml/m <sup>2</sup> ):	84
FEVD (%):	50

# Cardio RM: Congenitas

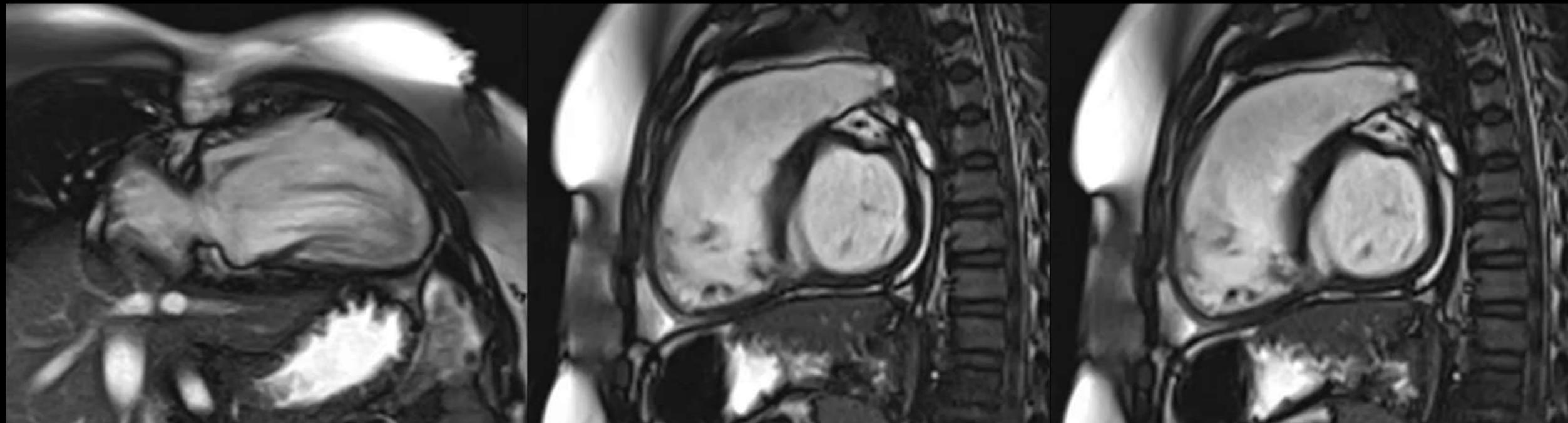


FALLOT OPERADO

Cines orientados del VD

2C

TSVD

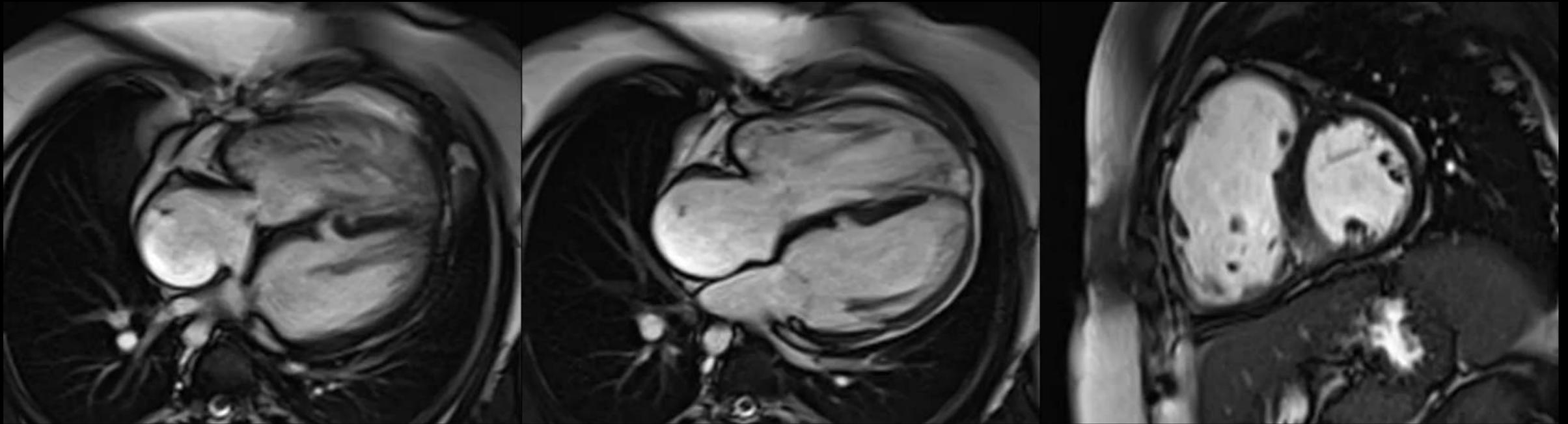


# Cardio RM: Congenitas

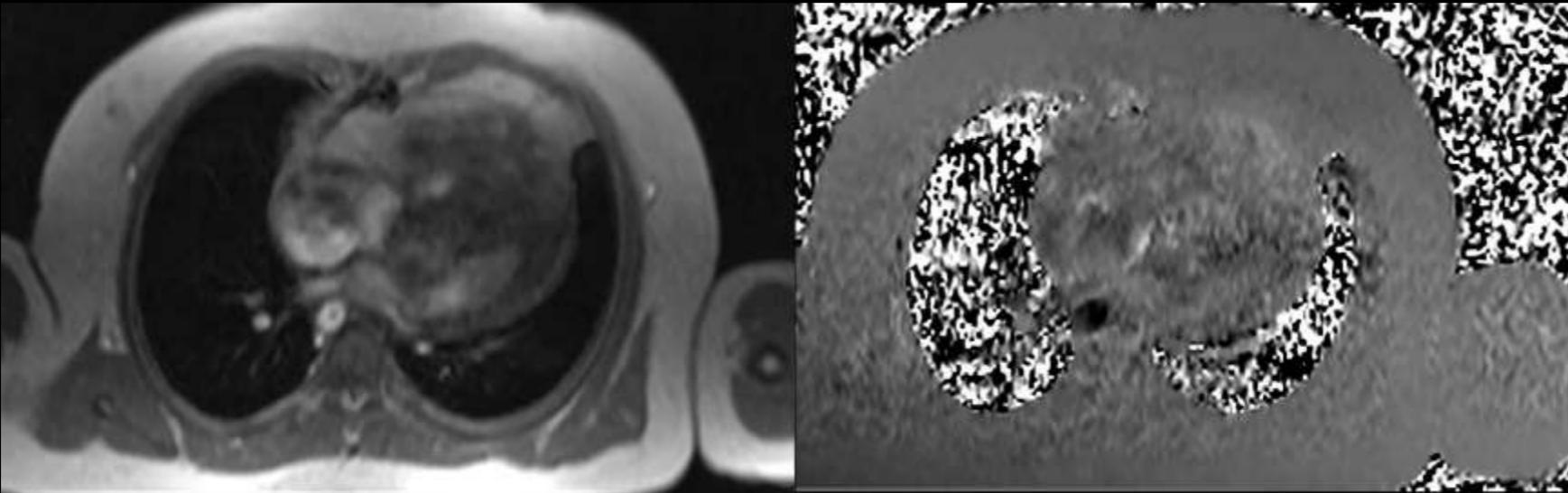


FALLOT OPERADO

Cines 4C CIV muscular



Flujo a través de CIV



# Cardio RM: Congenitas



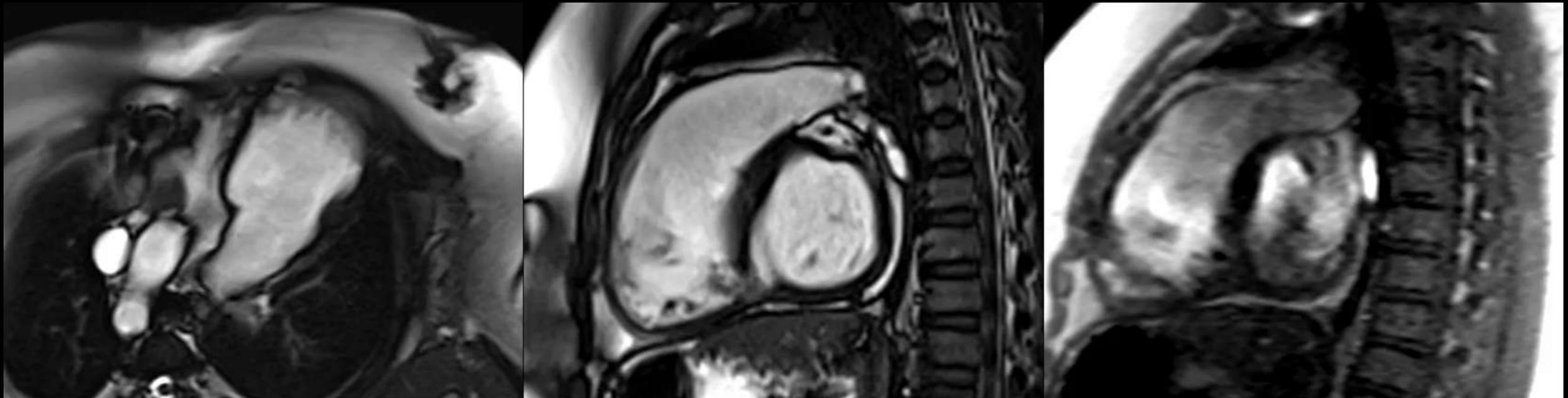
FALLOT OPERADO

Indications and Timing of Pulmonary Valve Replacement After Tetralogy of Fallot Repair

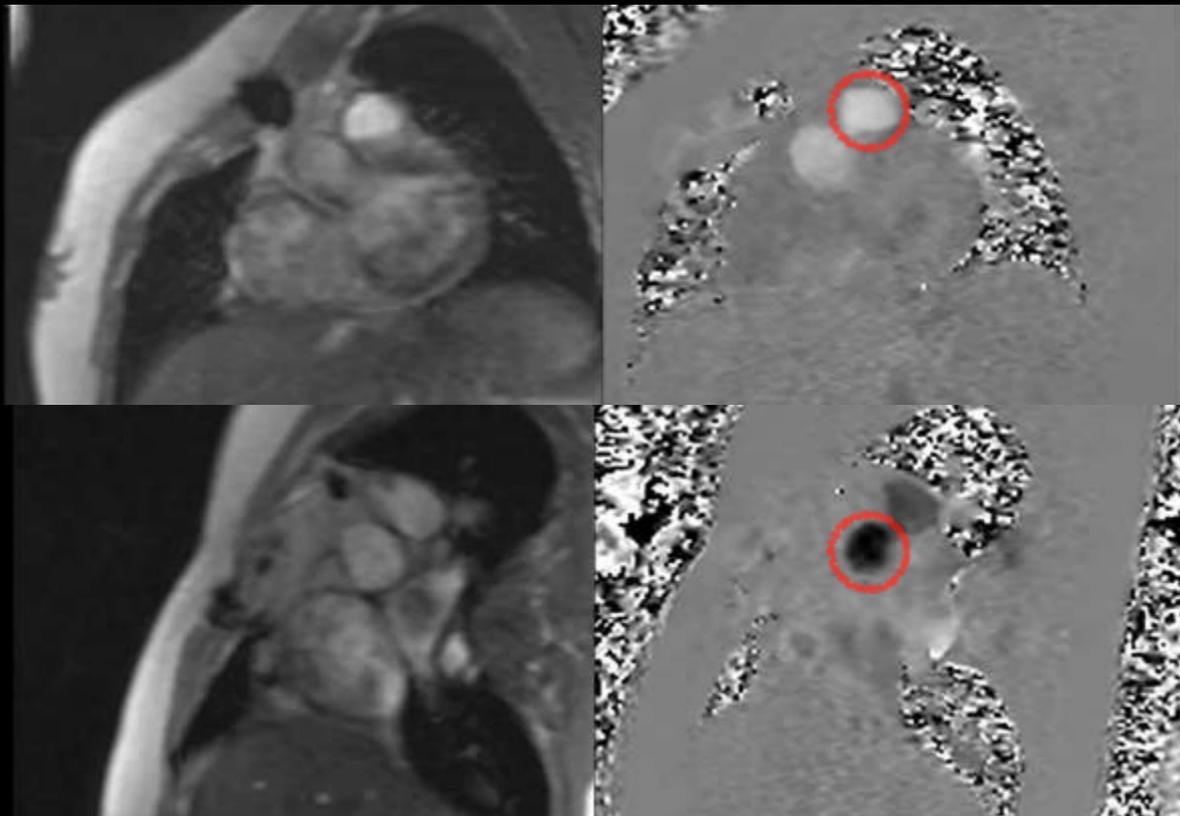
Tal Geva

Semin Thorac Cardiovasc Surg Pediatr Card Surg Ann 9:11-22

Cines TSVD IP



## Secuencias de Contraste de flujo y magnitud



### Flujo Pulmonar

- Anterógrado: 86 ml.
- Retrógrado: 26 ml.

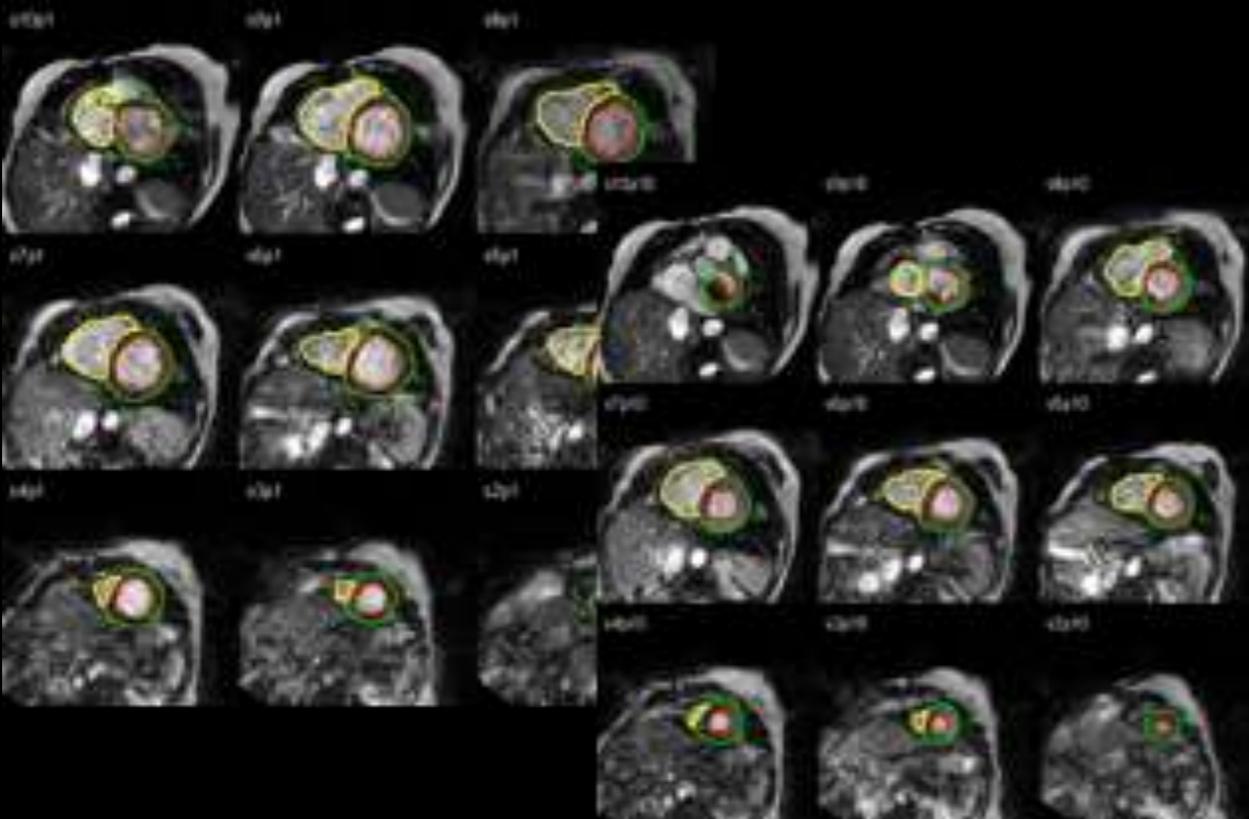
$V_{IP} = 112 \text{ ml} / ED$   
(IP: moderada a importante)

### Flujo Aortico

- Anterógrado: 68 ml.
- Retrógrado: 0 ml.

$Q_p/Q_s (86 \text{ ml} / 68 \text{ ml}) : 1.3$

## Volúmenes ventriculares



### VI

- $VTDVI - VTSVI = VS = 88 \text{ ml}$ .

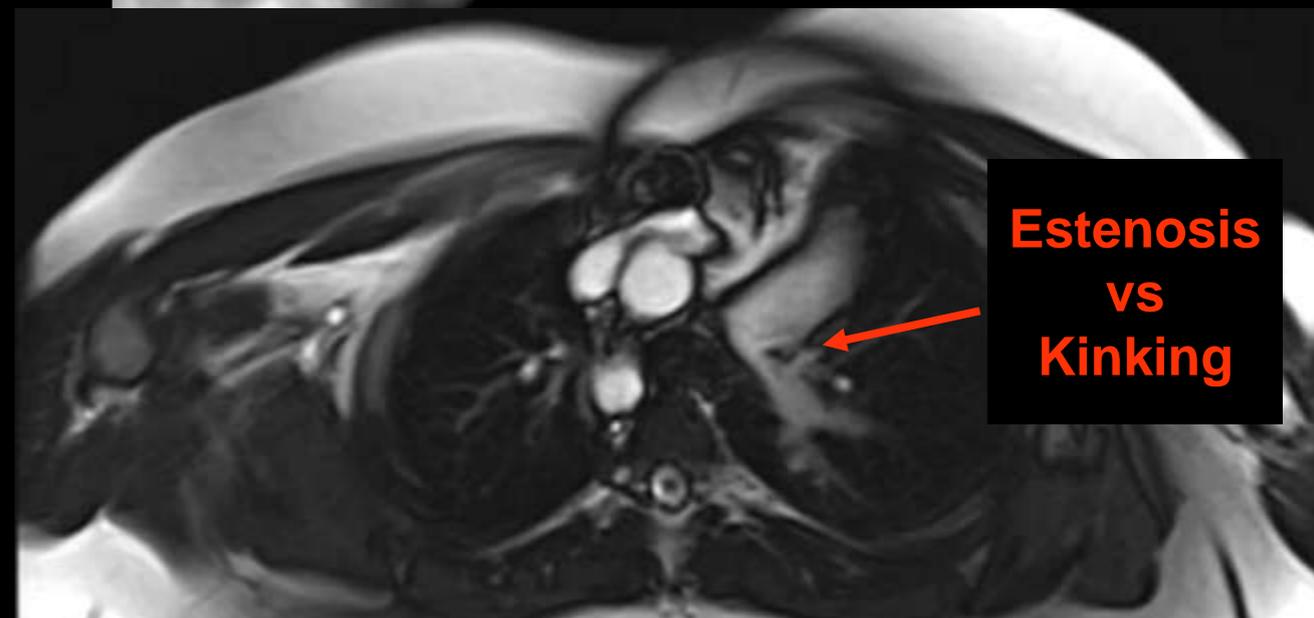
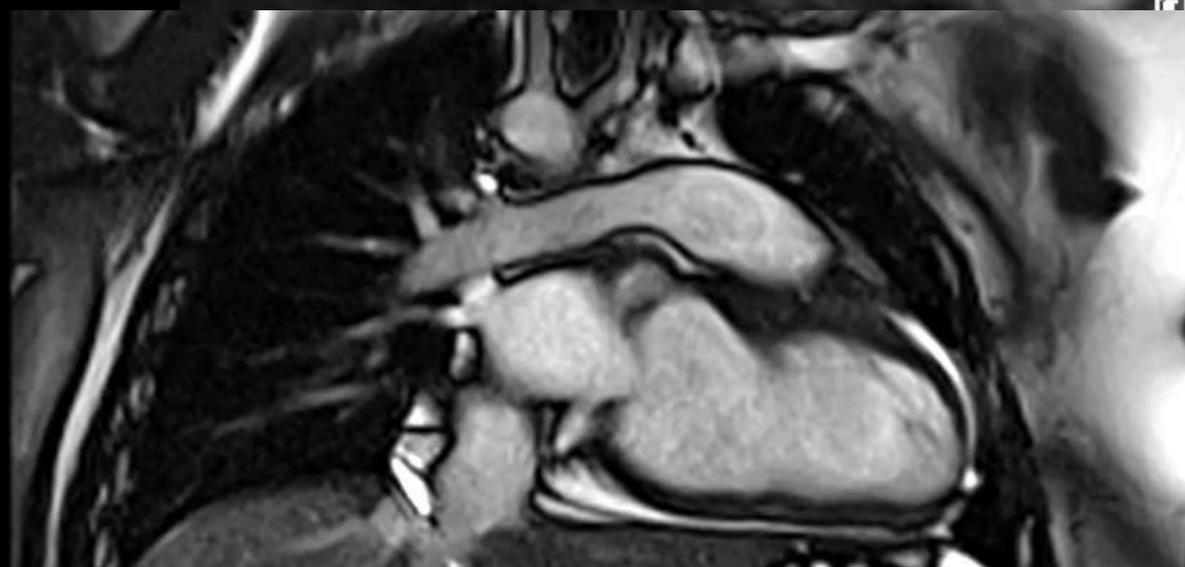
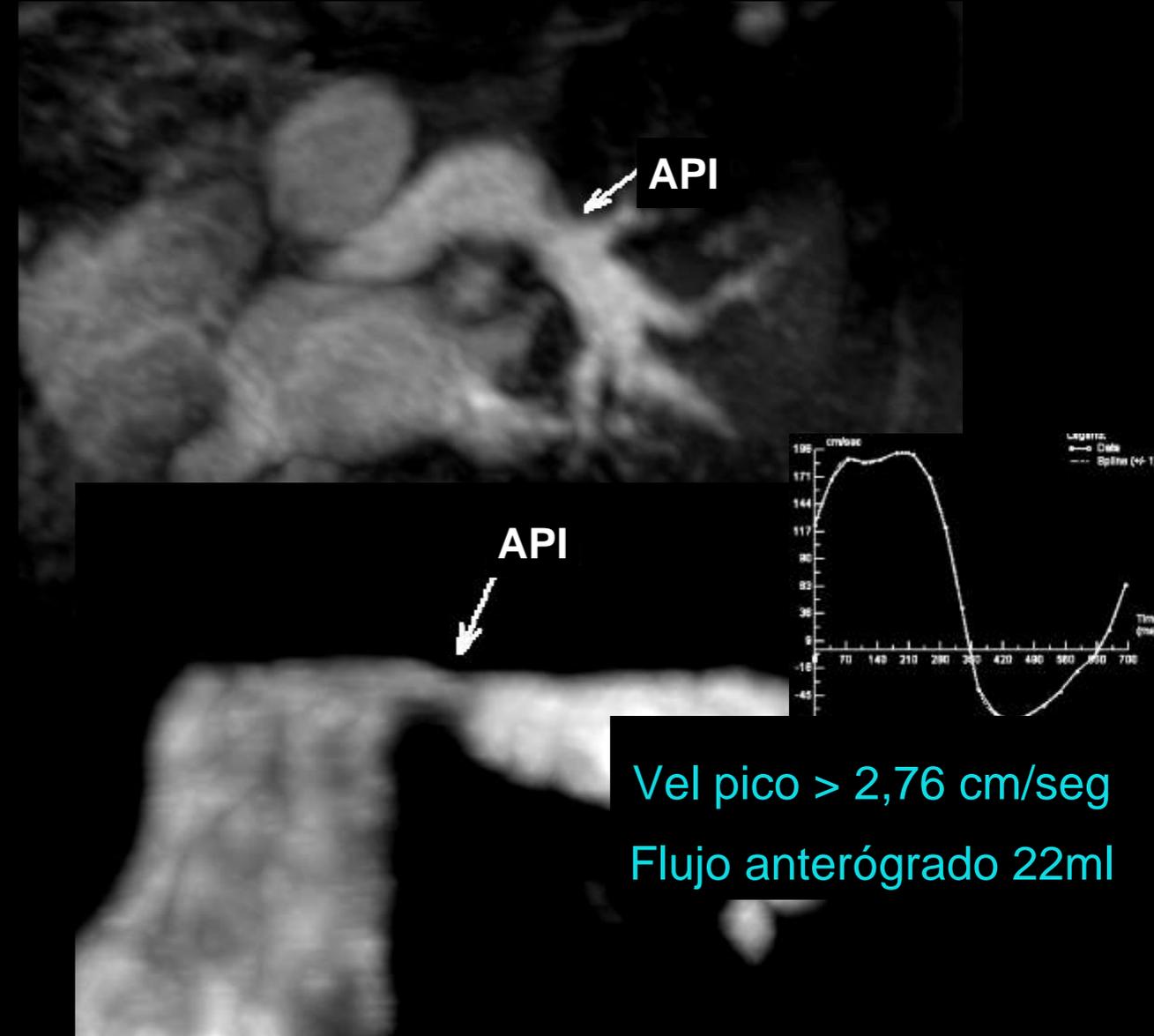
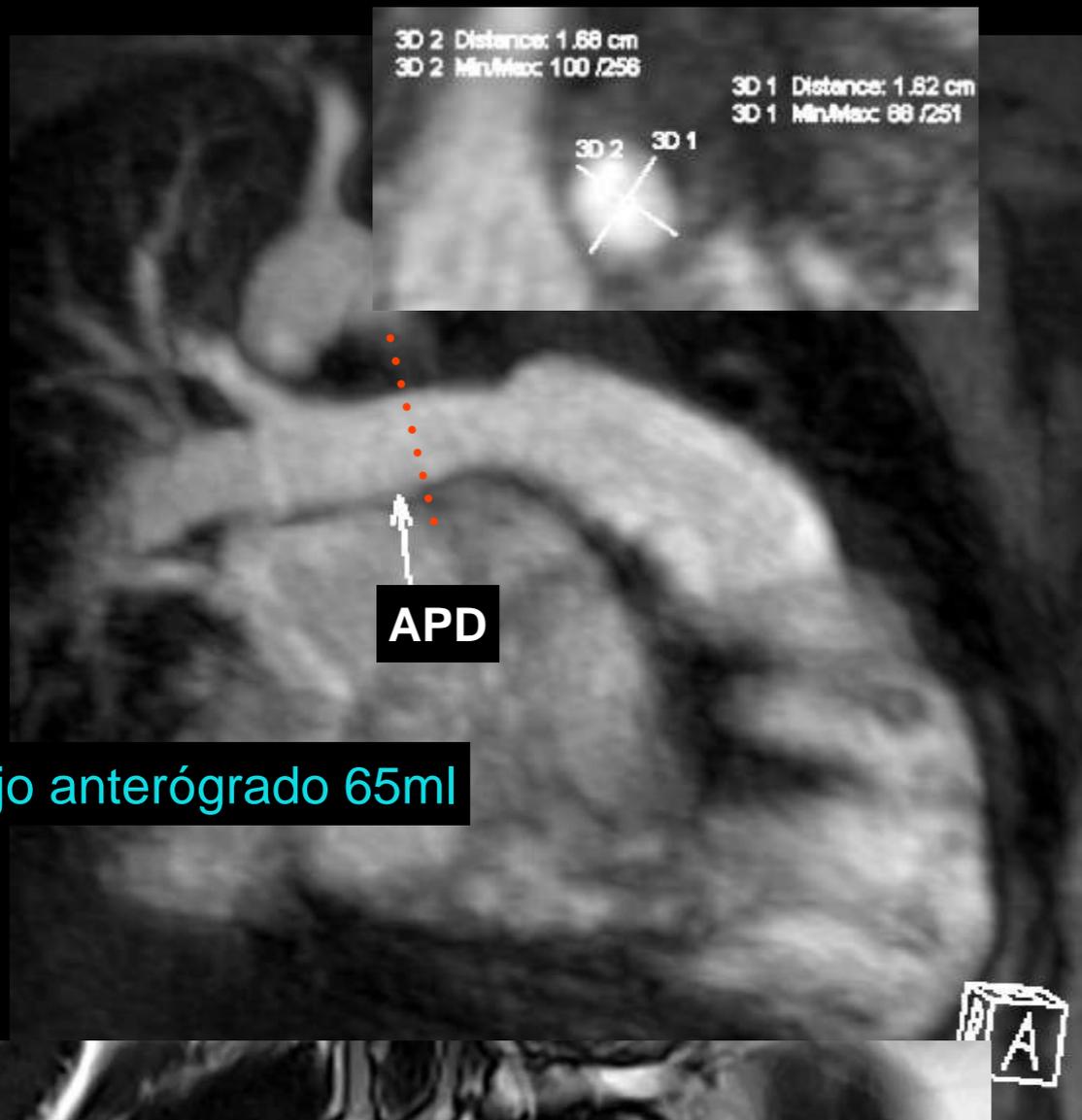
$VR \text{ mitral} : (88 \text{ ml} - 68 \text{ ml}) : 20 \text{ ml} / ED$   
(IM: moderada)

### VD

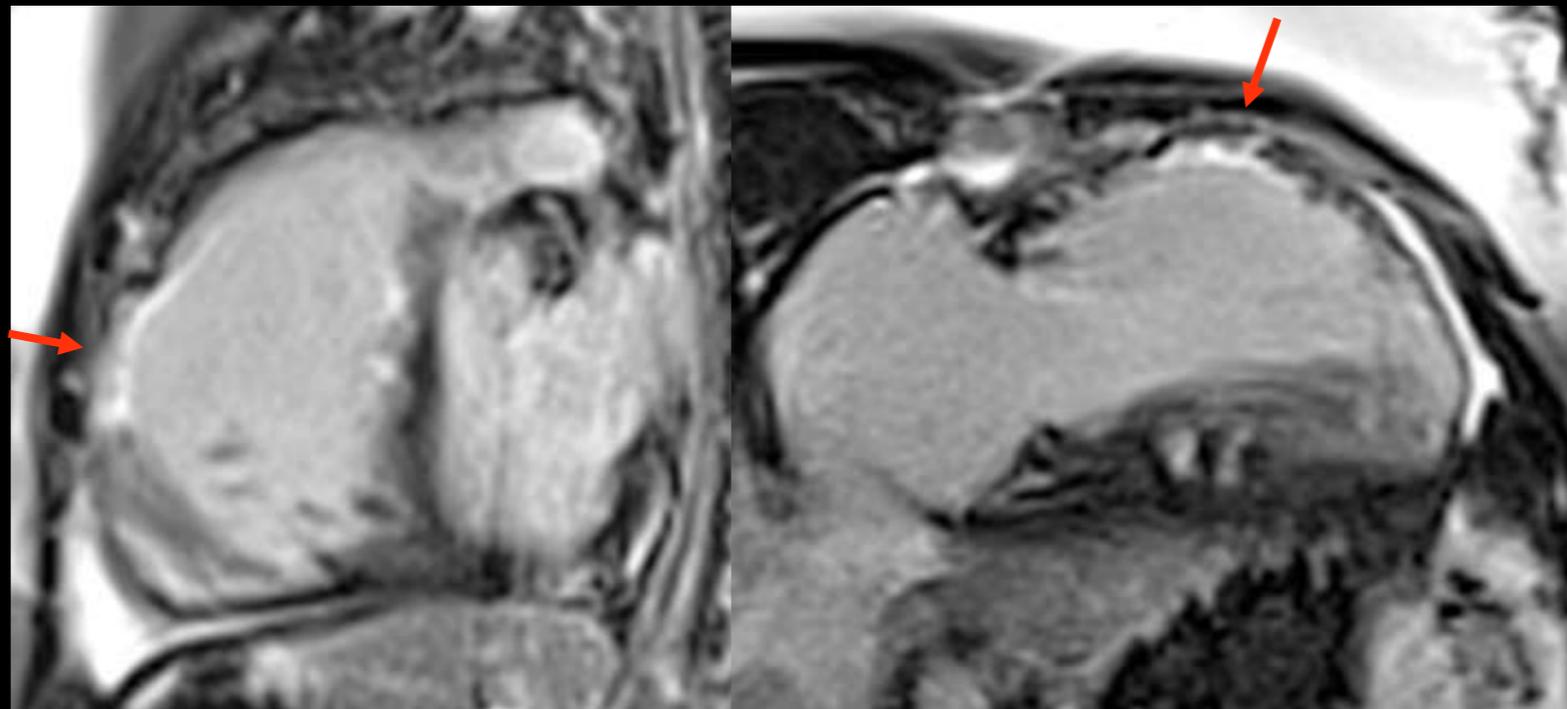
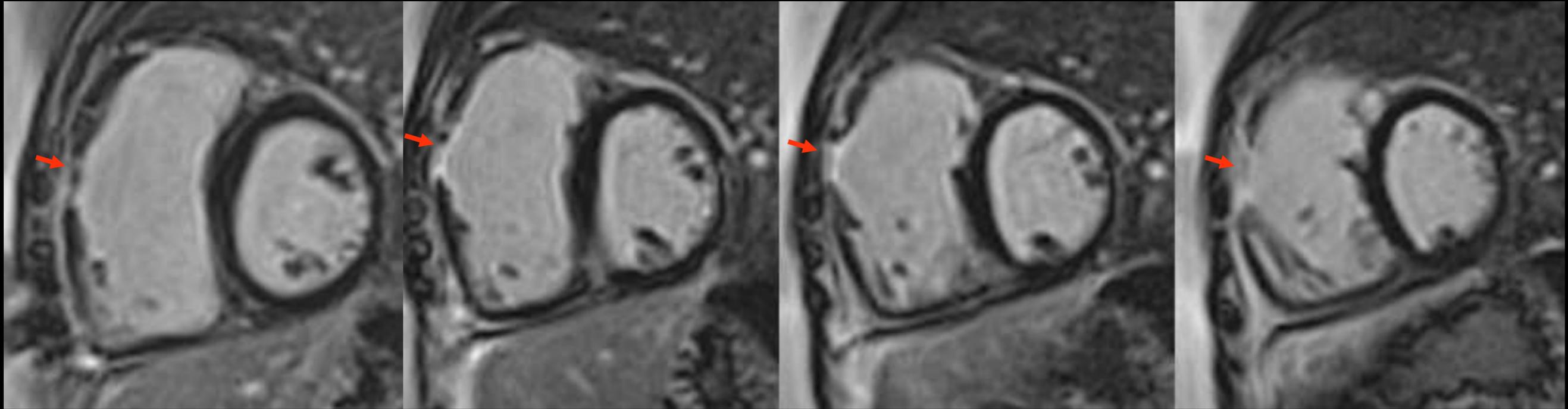
- $VTDVD - VTSVD = VS = 147 \text{ ml}$

$VR \text{ Tr} : (147 \text{ ml} - 86 \text{ ml}) : 61 \text{ ml} / ED$   
(IT: importante)

# Secuencia de Angio pulmonar y flujo dirigido a ramas pulmonares



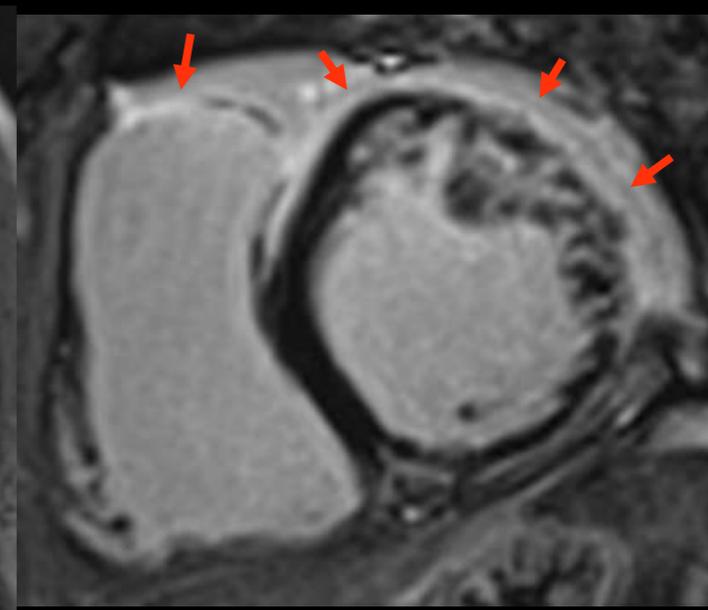
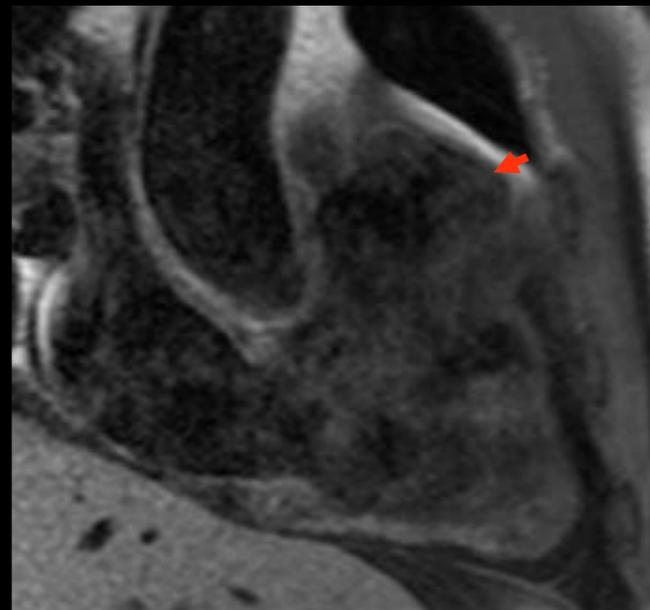
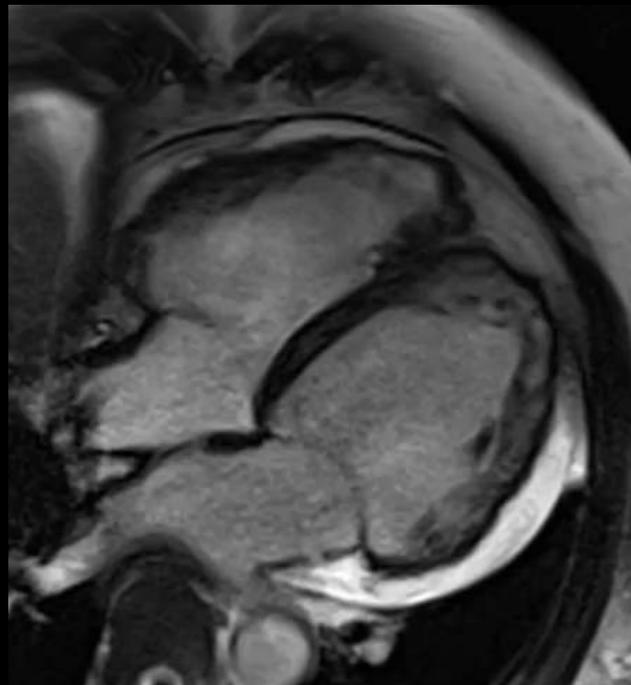
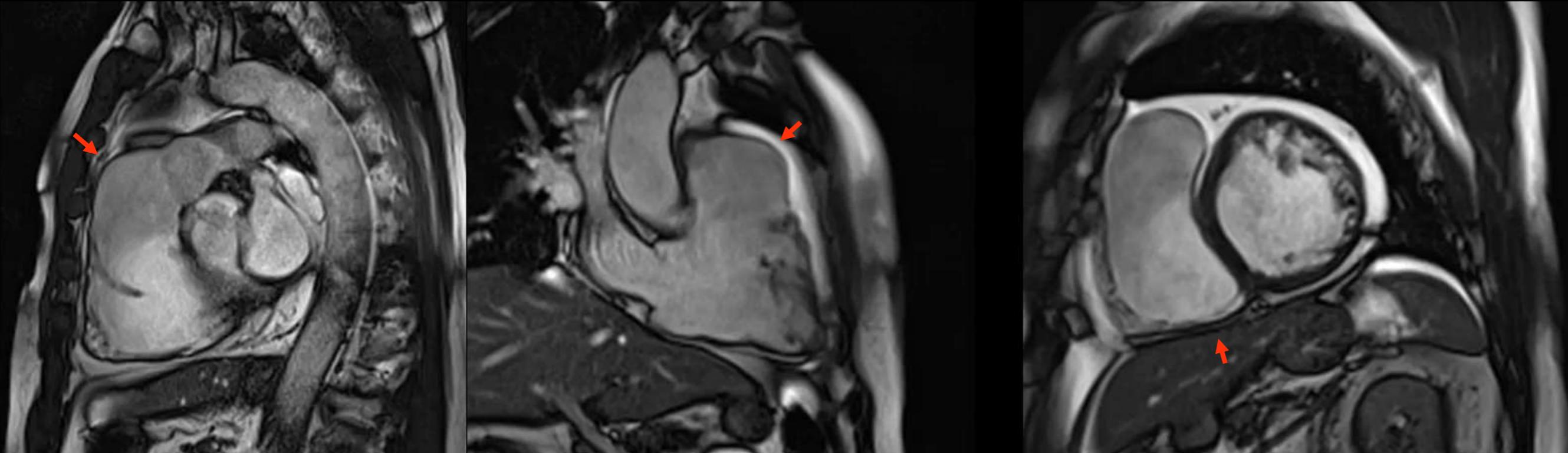
# Realce Tardío



# Cardio RM: Cardiopatía arritmogénica



Cines



T1 Saturación grasa

Realce Tardío

# Cardio RM: Cardiopatía arritmogénica



## Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC/D): A Systematic Literature Review

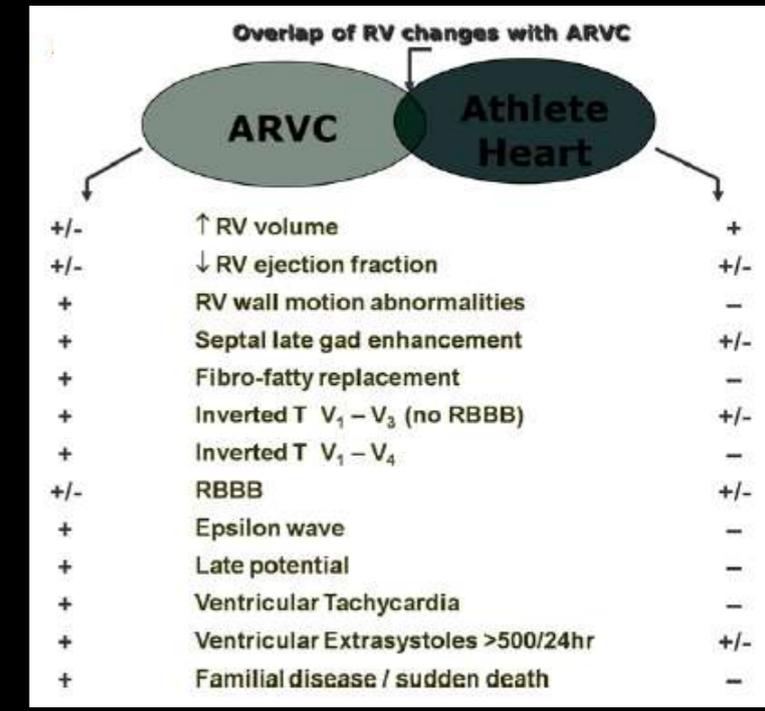
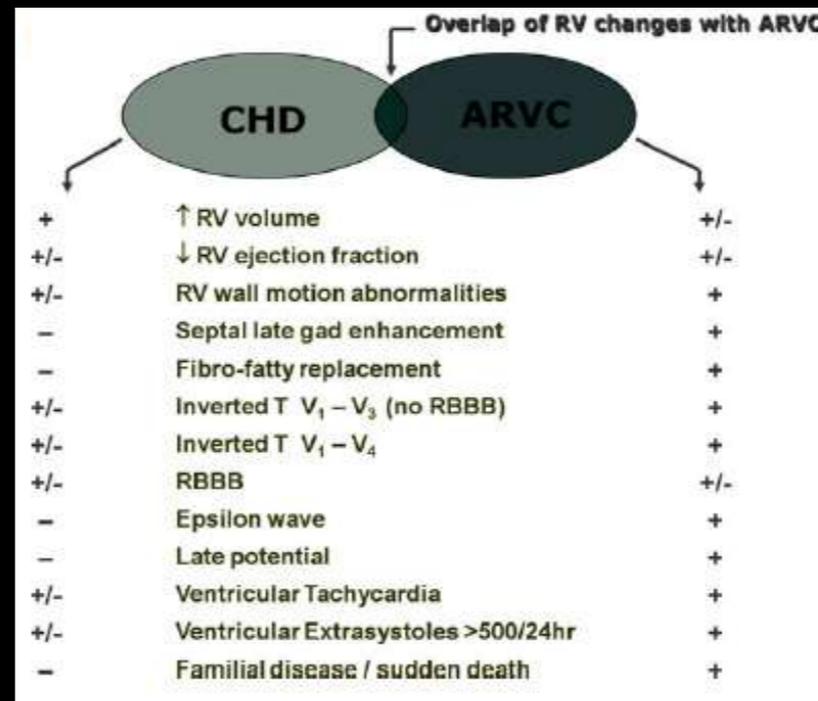
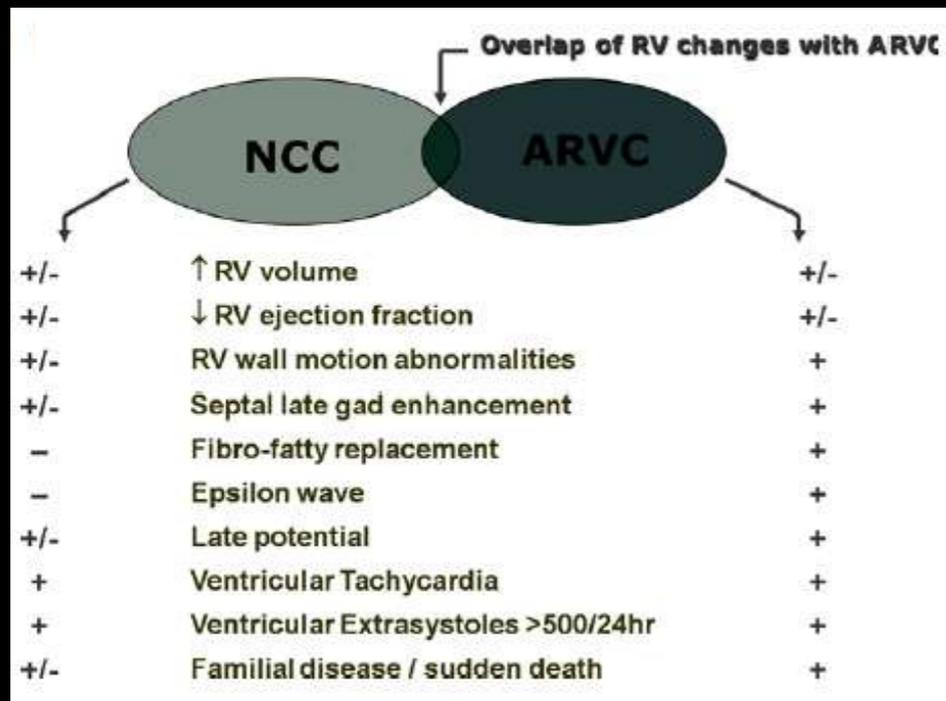
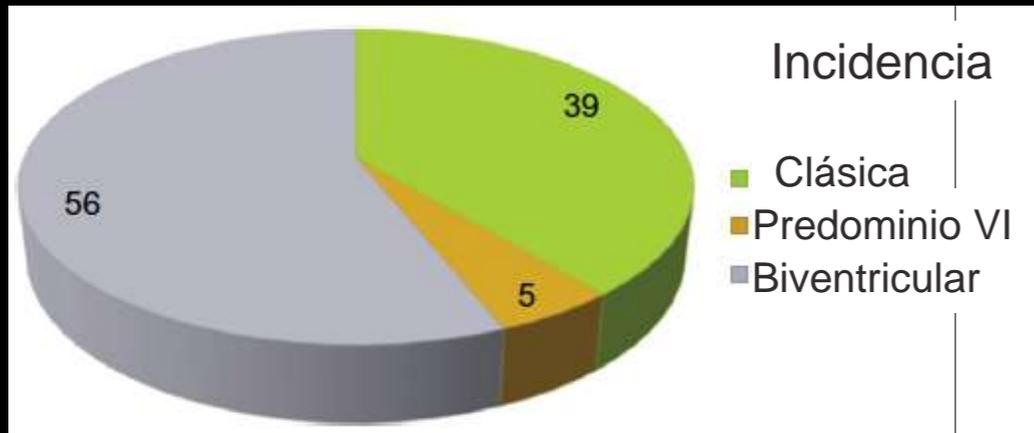
Jorge Romero<sup>1</sup>, Eliany Mejia-Lopez<sup>1</sup>, Carlos Manrique<sup>2</sup> and Richard Lucariello<sup>1</sup>

Clinical Medicine Insights: Cardiology 2013;7 97–114

## Right Ventricular Cardiomyopathies: A Multidisciplinary Approach to Diagnosis

Giuseppe Limongelli, M.D., Ph.D., F.E.S.C., F.A.H.A.,\* Alessandra Rea, M.D.,\* Daniele Masarone, M.D.,\* M. Paola Francalanci,† Aris Anastasakis, M.D., Ph.D.,‡ Raffaele Calabro', M.D.,\* Russo Maria Giovanna, M.D.,\* Eduardo Bossone, M.D., Ph.D.,§ Perry Mark Elliott, M.D.,¶ and Giuseppe Pacileo, M.D.\*

Echocardiography 2014;00:1– 20



# Cardio Nuclear y VD

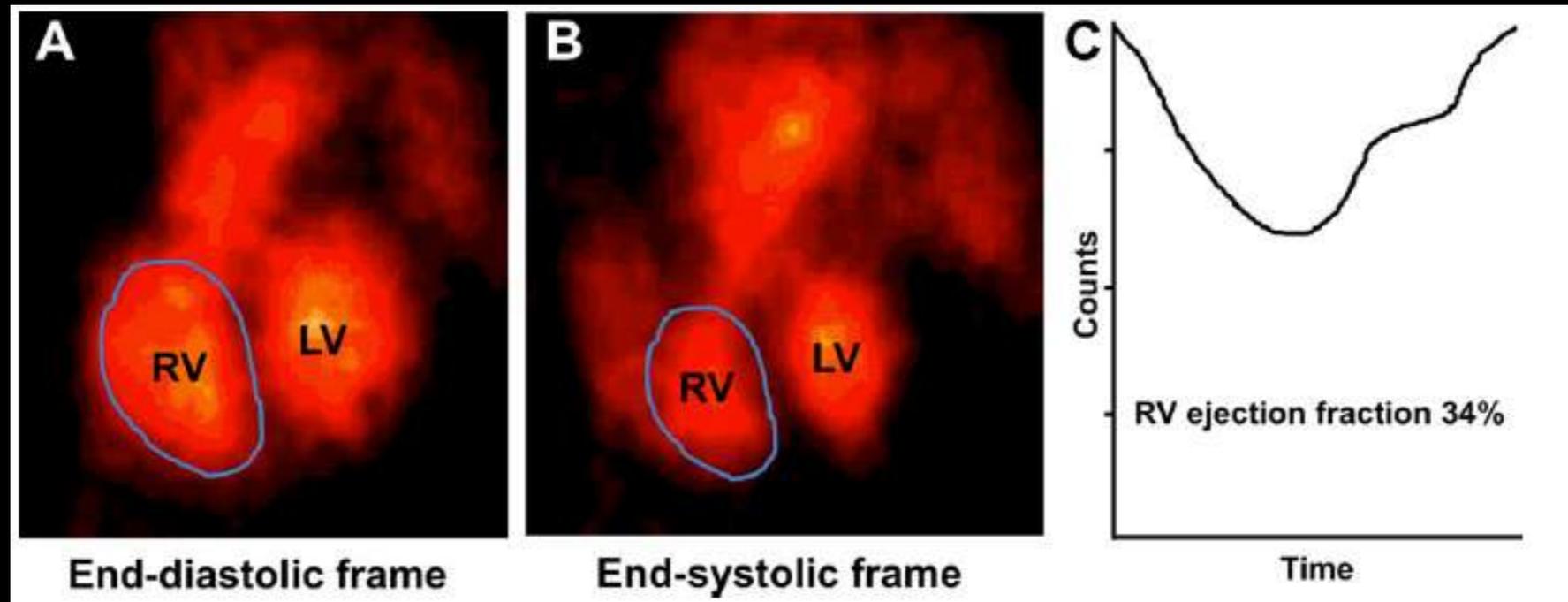


## Ventriculografía SPECT de equilibrio

### Nuclear Assessment of Right Ventricle

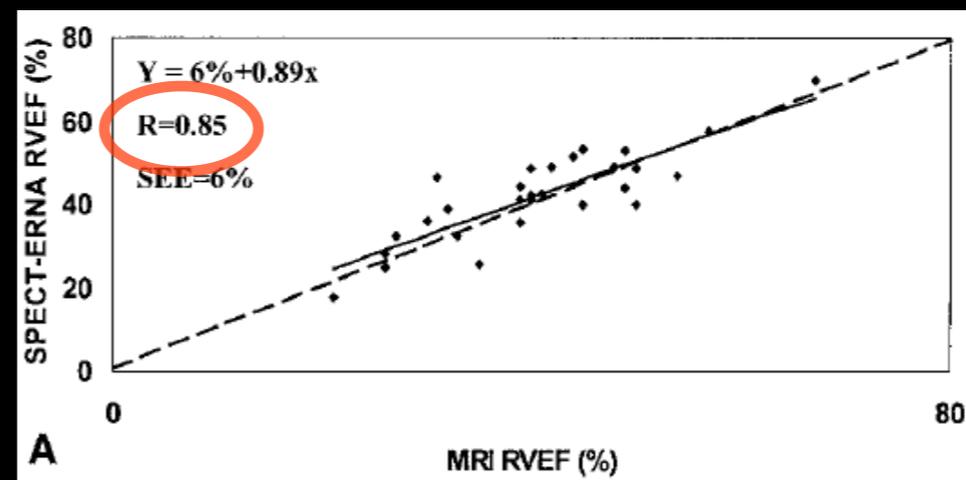
Echocardiography 2014;0:1-6

Paola Gargiulo, M.D.,\* Alberto Cuocolo, M.D.,\*† Santo Dellegrottaglie, M.D., Ph.D.,‡§ Maria Prastaro, M.D.,\* Gianluigi Savarese, M.D.,\* Roberta Assante, M.D.,¶ Emilia Zampella, M.D.,¶ Stefania Paolillo, M.D.,\* Oriana Scala, M.D.,\* Donatella Ruggiero, M.D.,\* Fabio Marsico, M.D.,\* and Pasquale Perrone Filardi, M.D., Ph.D.\*



### Validation of SPECT equilibrium radionuclide angiographic right ventricular parameters by cardiac magnetic resonance imaging

Kenneth Nichols, PhD,<sup>a</sup> Rola Saouaf, MD,<sup>b</sup> Ala'eldin A. Ababneh, MD,<sup>a</sup> Robyn J. Barst, MD,<sup>a</sup> Marlon S. Rosenbaum, MD,<sup>a</sup> Mark W. Groch, PhD,<sup>c</sup> Abu H. Shoyeb, MD,<sup>a</sup> and Steven R. Bergmann, MD, PhD<sup>a</sup>



# Conclusiones



- **La anatomía y función del VD:**

- Es compleja y esta íntimamente relacionada con la precarga, la postcarga impuesta por la RVP y al funcionamiento del VI.

- **El ecocardiograma:**

- Es el estudio de 1ra línea de la mayoría de patologías, es costo efectivo y aporta valiosa información anatómica, de flujos y pronóstica.
- Limitaciones clásicas: Mala ventana, asunción geométrica, baja reproducibilidad.

- **Cardio RM:**

- Estudio multi paramétrico con gran versatilidad diagnóstica, patrón oro par medición de FE, volúmenes y cuantificación de flujos. Muy reproducible.
- Difícil acceso y costoso.

- **Cardio TC:**

- Adecuada alternativa para valorar FE y volúmenes del VD (RM contraindicada)
- 1ra elección ante sospecha de TEP.

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