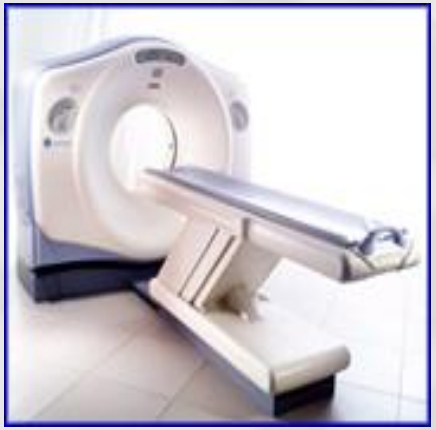
VALUTAZIONE MORFO-FUNZIONALE DELLE CAMERE CARDIACHE

Gianluca Pontone, MD

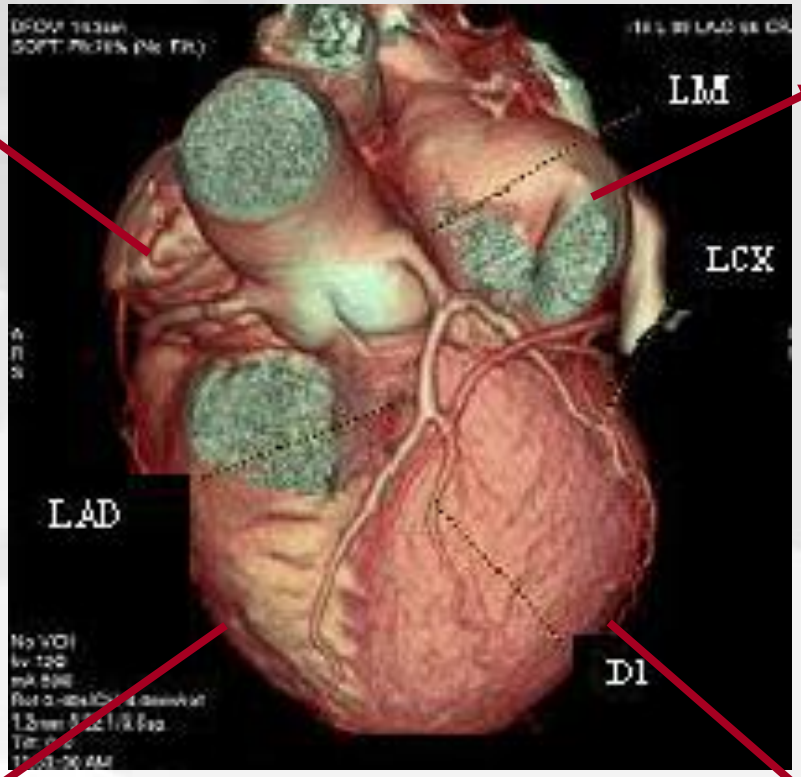
II° CONGRESSO NAZIONALE DI ECOCARDIOCHIRUGIA

Milano, 27 – 29 Ottobre 2008



SUMMARY

Right Atrium and Cardiac Veins

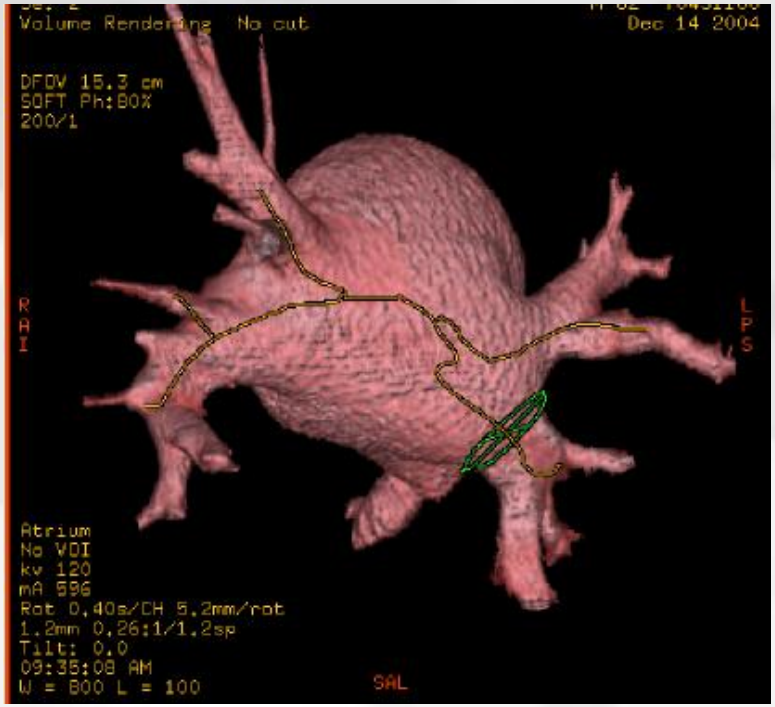


Left Atrium and Pulmonary Veins

Right Ventricle

Left Ventricle and Aortic root

LEFT ATRIUM – PULMONARY VEINS



Pre – RFCA characterization of LA

LEFT ATRIUM – PULMONARY VEINS

The electrophysiologist need to know four things from mapping before ablation…

1. **Is there normal anatomy?**
2. **What is the ostial diameter of PV and the length to the first order branch?**
3. **Is there an extra-pulmonary vein such as a right middle vein?**
4. **Are there major anomalies such as a common ostium or an anomalous pulmonary venosu return?**
5. **Is there a left atrial appendage thrombus?**

LEFT ATRIUM – PULMONARY VEINS

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Characterization of Left Atrium and Distal Pulmonary Vein Morphology Using Multidimensional Computed Tomc

David Schwartzman, MD, FACC,* Joan Lacomis, MD,† W
Pittsburgh, Pennsylvania

The International Journal of Cardiovascular Imaging (2005) 21: 133–139
DOI 10.1007/s10554-004-5347-5

CT evaluation of left atrial pulmonary venous anatomy

William Stanford[1] & Jerome F. Breen[2]
[1]*University of Iowa Hospitals and Clinics, Iowa City, Iowa, USA;* [2]*St. Mary's Hospital, Rochester, MN, USA*

Received 06 October 2004; accepted in revised form 26 October 2004

AJR:183, September 2004

Review

ıgraphy, left atrial pulmonary, venous anatomy

MDCT of the Left Atrium and Pulmonary Veins in Planning Radiofrequency Ablation for Atrial

Paul Cronin[1], Michael B. Sneider[1], Ella A. Kazerooni[1]

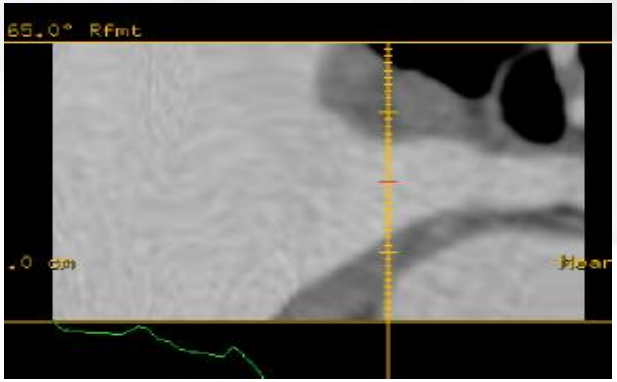
RUOLO DELLA TC MULTIDETETTORE NELLA VALUTAZIONE DELL'ANATOMIA DELL'ATRIO SINISTRO IN PAZIENTI AFFETTI DA FIBRILLAZIONE ATRIALE PAROSSISTICA.

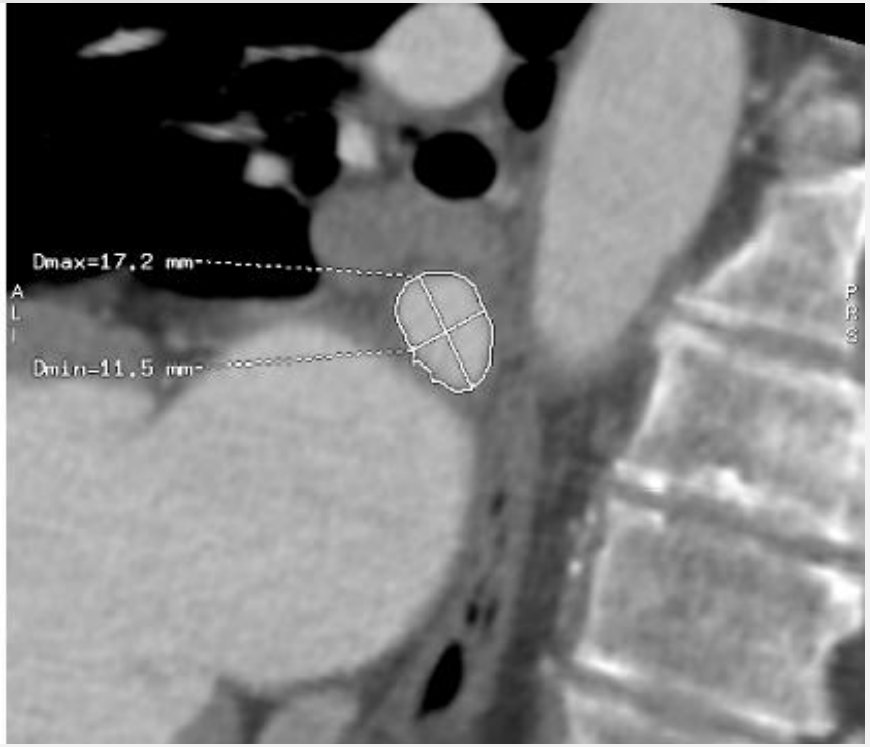
G. Pontone, D. Andreini, A. Annoni, A. Formenti, E. Bertella, G. Ballerini, E. Nobili, G. Maccabelli, P. Della Bella, M. Pepi

SIC 2007

LEFT ATRIUM – PULMONARY VEINS

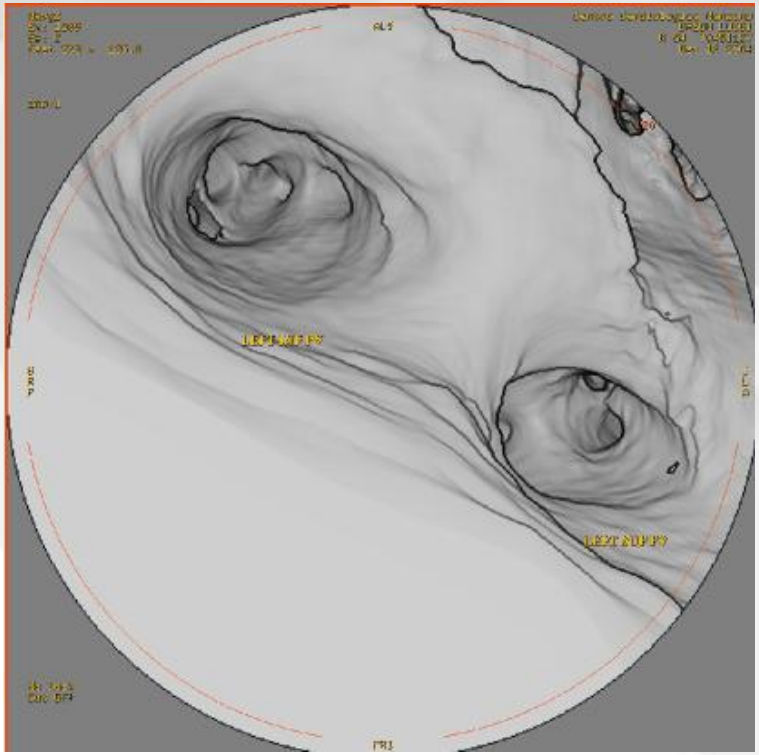
VR and MPR of Superior Left PV

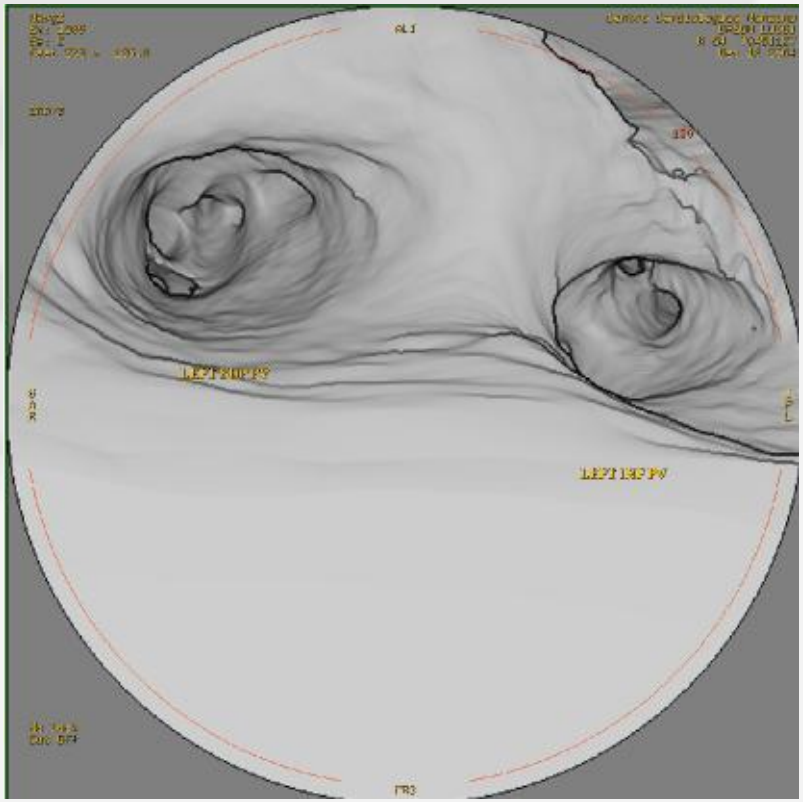




LEFT ATRIUM – PULMONARY VEINS

Intra – atrial view of PV ostium





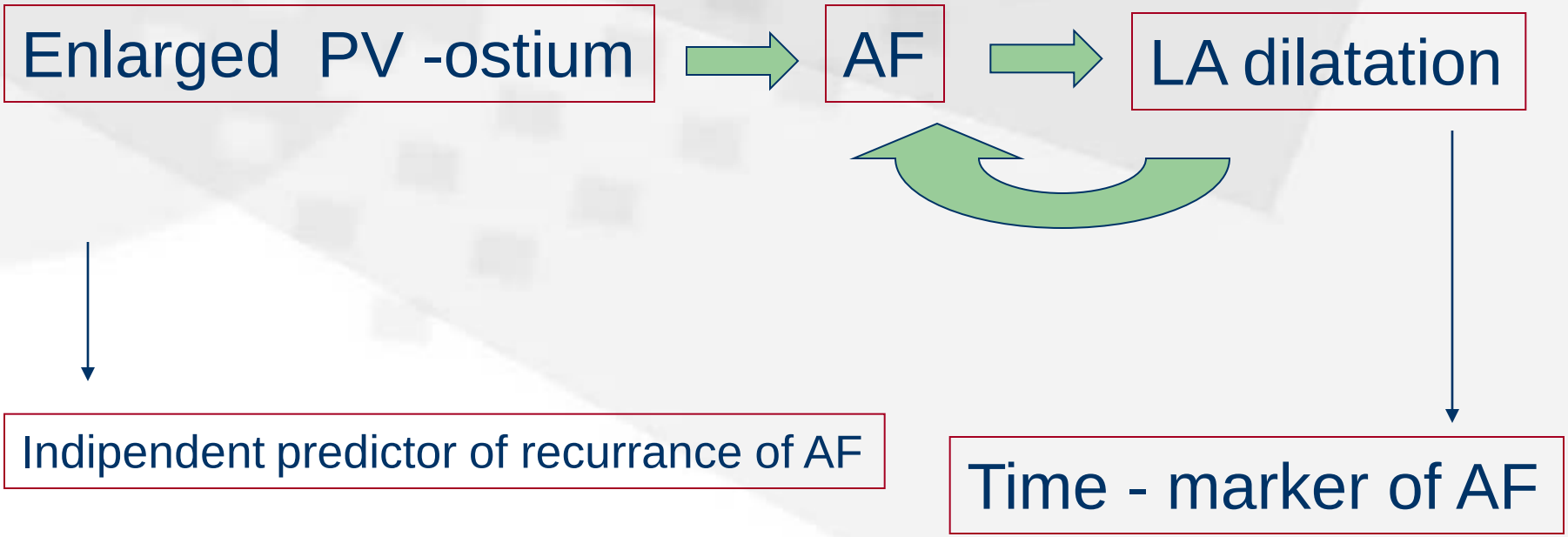
LEFT ATRIUM – PULMONARY VEINS

Moderate correlation between Echo – LA_D vs CT - LA_V (r: 0.51)

Good correlation between Echo – LA_A vs CT - LA_V (r: 0.72)

CT - LA_V and PV-ostial dimensions were signifcantly greater in the AF patients

…but overall the ostium size presents a poor correlation with CT – LA_V…



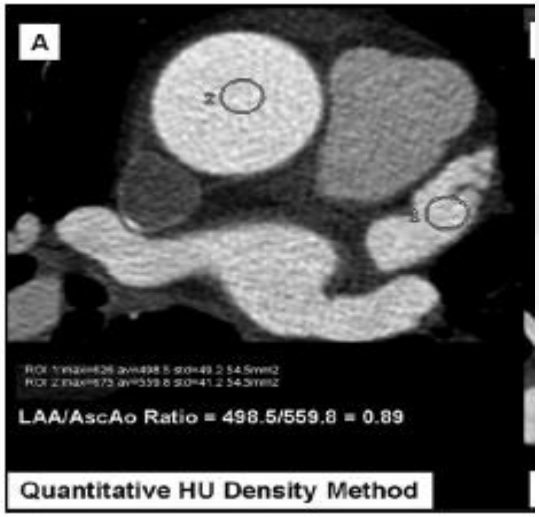
LEFT ATRIUM – PULMONARY VEINS

MDCT and LA appendage Thrombus: quantitative evaluation

Multidetector row computed tomography for identification of left atrial appendage filling defects in patients undergoing pulmonary vein isolation for treatment of atrial fibrillation: Comparison with transesophageal echocardiography

Apoor Patel, MD, Eric Au, MD, Kerry Donegan, MD, Robert J. Kim, MD, Fay Y. Lin, MD, Kenneth M. Stein, MD, Steven M. Markowitz, MD, Sei Iwai, MD, Jonathan W. Weinsaft, MD, James K. Min, MD, Bruce B. Lerman, MD, FHRS

(Heart Rhythm 2008;5:253–260)

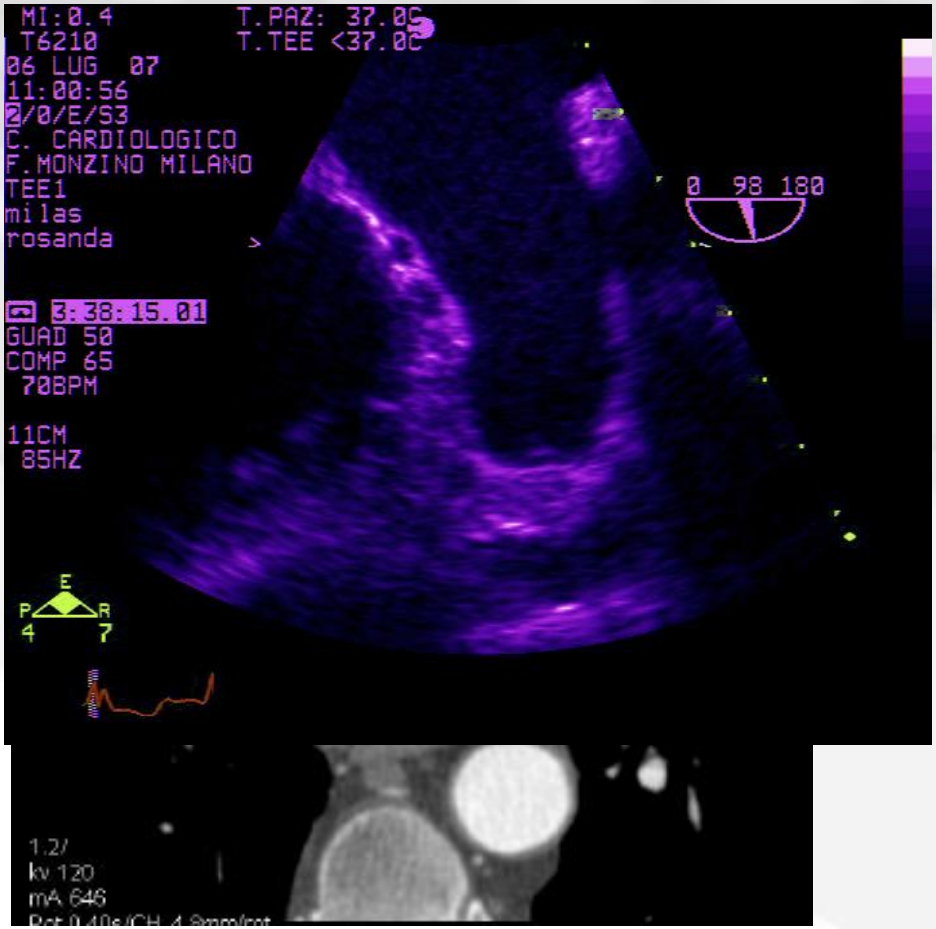


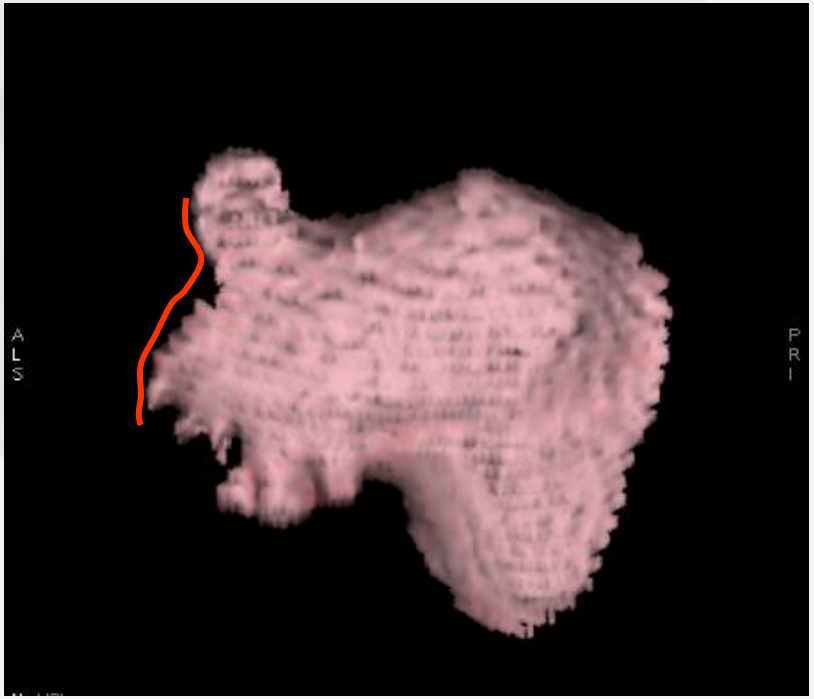
LAA/Asc Ao HU≥ 75% vs TEE and Pulsed Doppler

CONCLUSION Current-generation MDCT successfully identifies LAA thrombus and dense nonclearing SEC with high sensitivity and moderate specificity. Importantly, LAA/AscAo HU ratios >0.75 demonstrate 100% negative predictive value for exclusion of LAA thrombus or dense nonclearing SEC. These results suggest that in patients undergoing pulmonary vein isolation procedures, MDCT examinations that demonstrate LAA/AscAo HU ratios >0.75 may preclude the need for preprocedural TEE.

LEFT ATRIUM – PULMONARY VEINS

LA appendage Thrombus: False Negative TEE

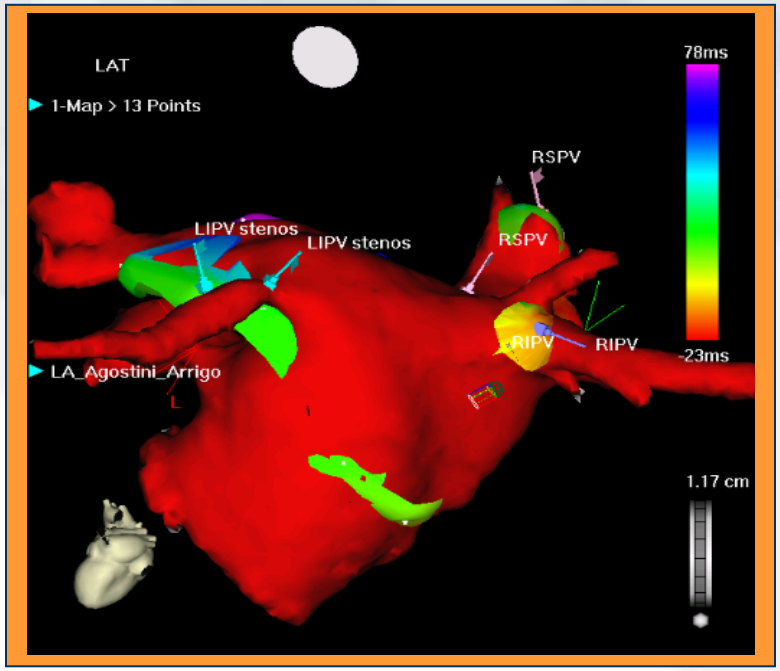


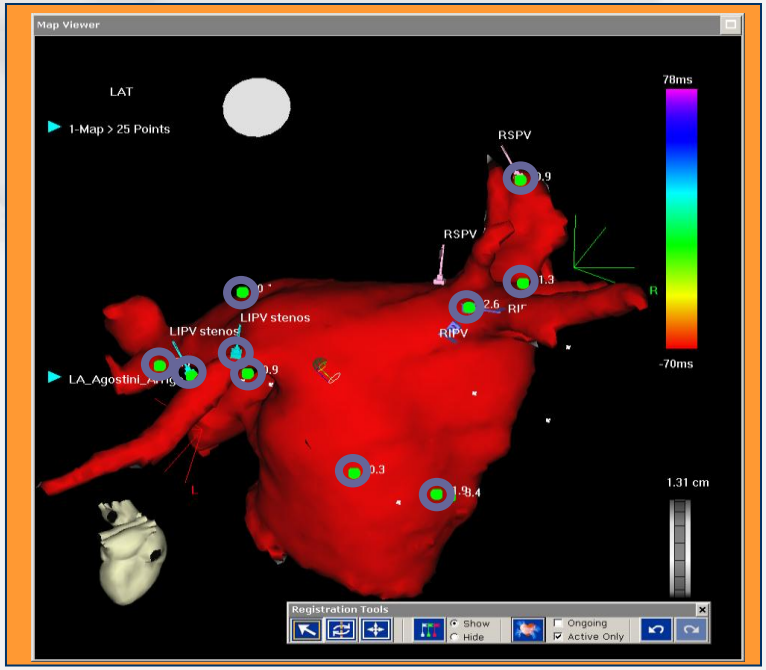


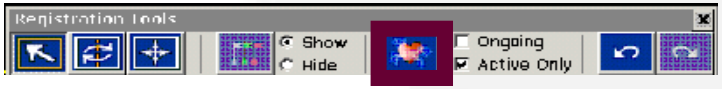
LEFT ATRIUM – PULMONARY VEINS

CARTO-MERGE: real time navigation in a 3D anatomical model of LA during RFCA procedure

Point to Surface Registration







LEFT ATRIUM – PULMONARY VEINS

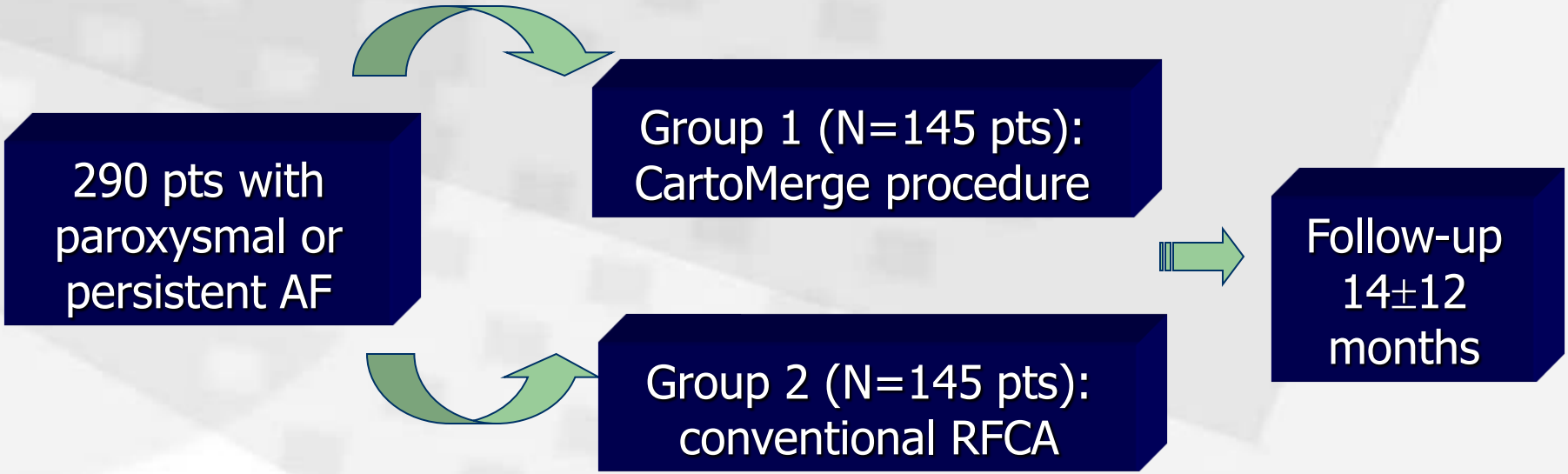
Image integration-guided catheter ablation of atrial fibrillation: a prospective randomized study

Paolo Della Bella[1], Gaetano Fassini[1], Manuela Cireddu[1], Stefania Riva[1], Corrado Carbucicchio[1], Francesco Giraldi[1], Giuseppe Maccabelli[1], Nicola Trevisi[1], Massimo Moltrasio[1], Mauro Pepi[1], Claudia Galli[1], Daniele Andreini[1], Giovanni Ballerini[1], Gianluca Pontone[1]

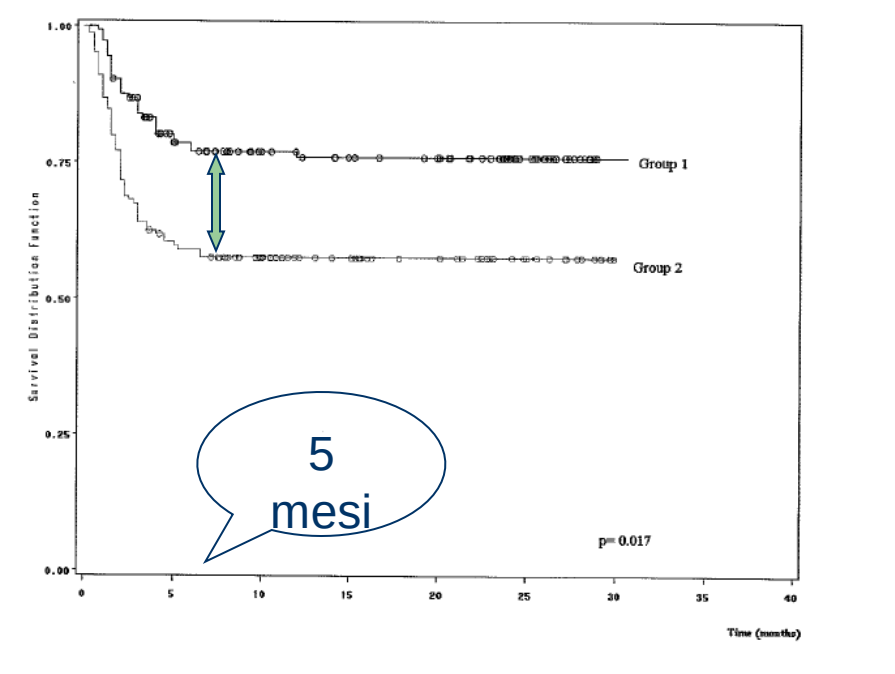
[1]Centro Cardiologico Monzino, IRCCS, Milan, Italy

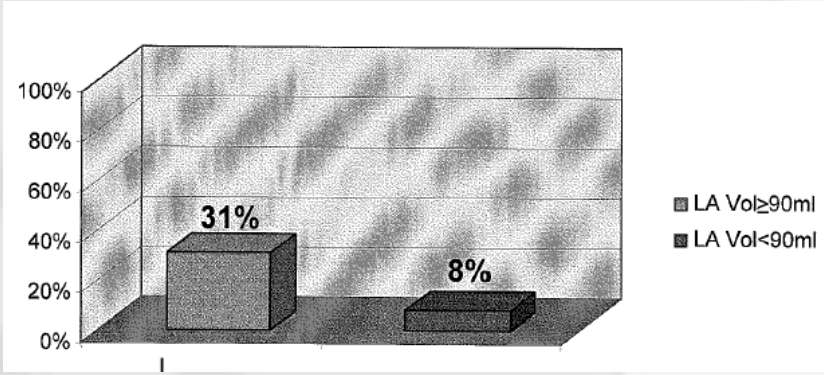
J Cardiovac Electrophysiol, in press

LEFT ATRIUM – PULMONARY VEINS



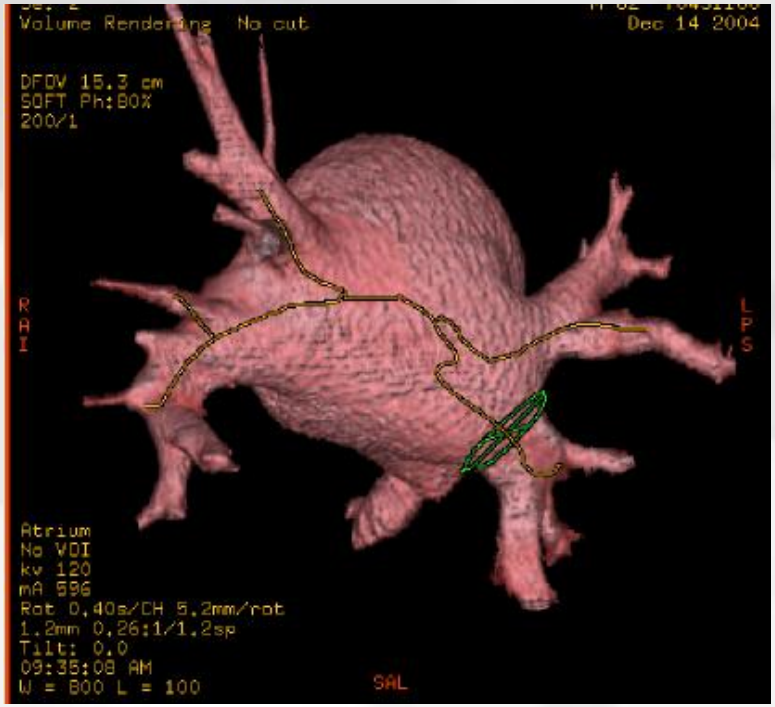
LEFT ATRIUM – PULMONARY VEINS





Group 1: AF-free survival rate 81%
Group 2: AF-free survival rate 64%*
*:p=0.017

LEFT ATRIUM – PULMONARY VEINS



Pre – RFCA characterization of LA

Post – RFCA characterization of LA

LEFT ATRIUM – PULMONARY VEINS

Post – RFCA complications

Pulmonary Veins

PV Stenosis (1.5% – 42%)
PV Thrombosis
PV Dissection

Intrathoracic

Pleural Effusion (3%-4.8%)
Pericardial Effusion (3%-4.8%)
Cardiac Perforation

Other

Catheter Site Ematoma (13%)
Arteriovenosu Fistula (1%)
Systemic Emboli (1.4% – 2.6%)

LEFT ATRIUM – PULMONARY VEINS

Post – RFCA complications: PV stenosis

Imaging and Diagnostic Testing

Detection of pulmonary vein stenosis by transesophageal echocardiography: Comparison with multidetector computed tomography

Gardar Sigurdsson, MD,[a] Richard W. Troughton, MB, ChB, PhD,[a] Xiao-Fang Xu, MD,[a] Holger P. Salazar, MD, FACC,[a] Oussama M. Wazni, MD,[a] Richard A. Grimm, DO, FACC,[a] Richard D. White, MD, FACC,[a,b] Andrea Natale, MD, FACC,[a] and Allan L. Klein, MD, FACC[a] *Cleveland, OH*

Table II. Number of stenosis (% diameter loss) detected by MDCT in 36 subjects

	Visualized, n (%)	<29%	30%-49%	50%-69%	≥70%
LUPV	36 (100%)	29	3	3	1
LLPV	36 (100%)	28	6	2	0
RUPV	36 (100%)	31	4	1	0
RLPV	36 (100%)	33	3	0	0

LUPV, Left upper pulmonary vein; *LLPV*, left lower pulmonary vein; *RUPV*, right upper pulmonary vein; *RLPV*, right lower upper pulmonary vein.

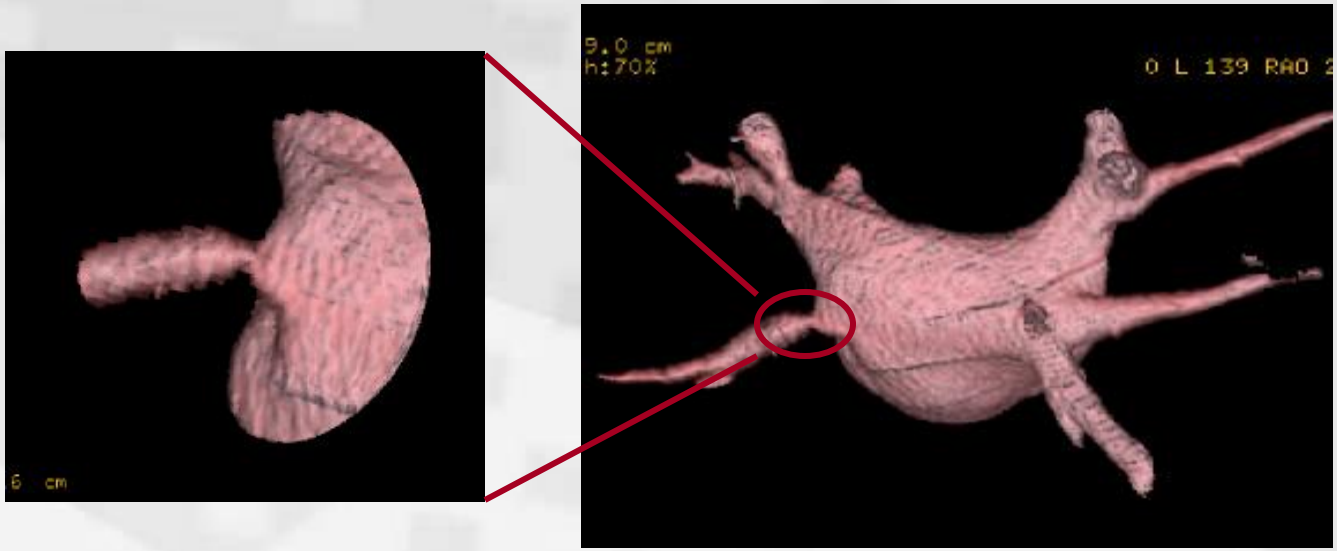
Table III. Transesophageal echocardiography results for peak velocity, both systolic and diastolic

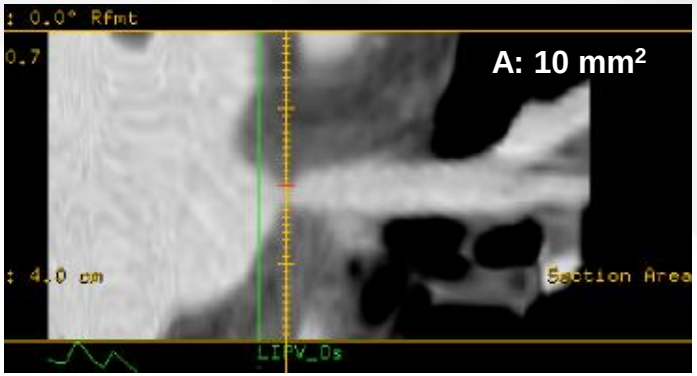
Mean ± SD	Visualized, n (%)	Peak velocity systolic (cm/s)	Peak velocity diastolic (cm/s)
LUPV	36 (100%)	66 ± 43	61 ± 34
LLPV	32 (89%)	56 ± 40	51 ± 30*
RUPV	36 (100%)	62 ± 33	67 ± 27
RLPV	34 (94%)	51 ± 22*	56 ± 26*

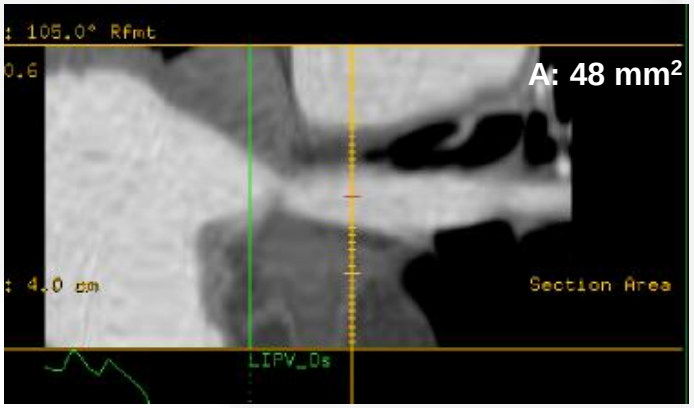
*$P < .05$ between upper and lower pulmonary vein.

LEFT ATRIUM – PULMONARY VEINS

Post – RFCA complications: PV stenosis

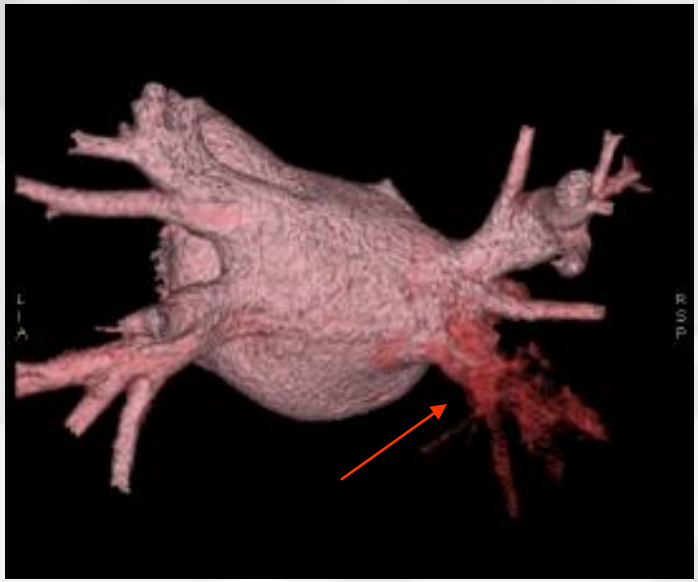




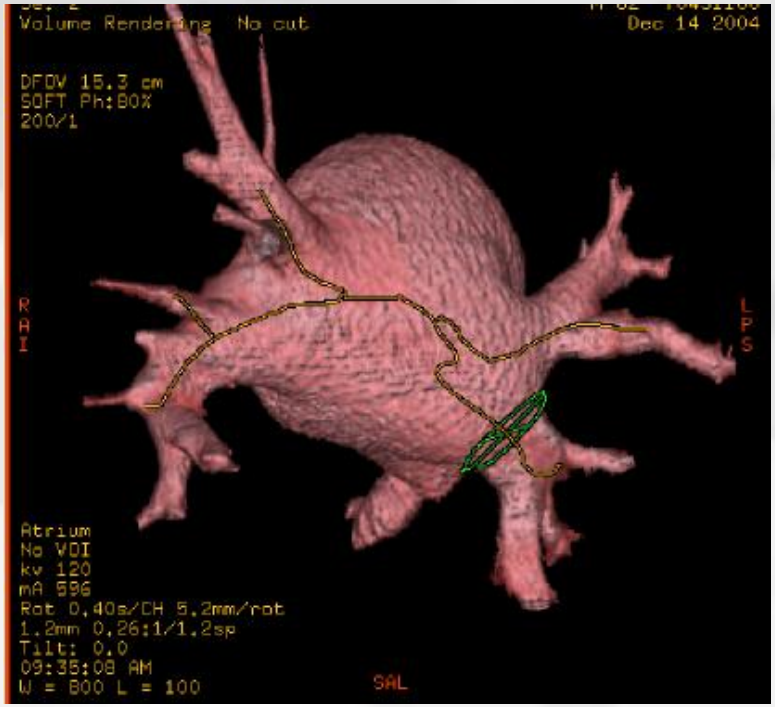


LEFT ATRIUM – PULMONARY VEINS

Post – RFCA complications: PV thrombosis



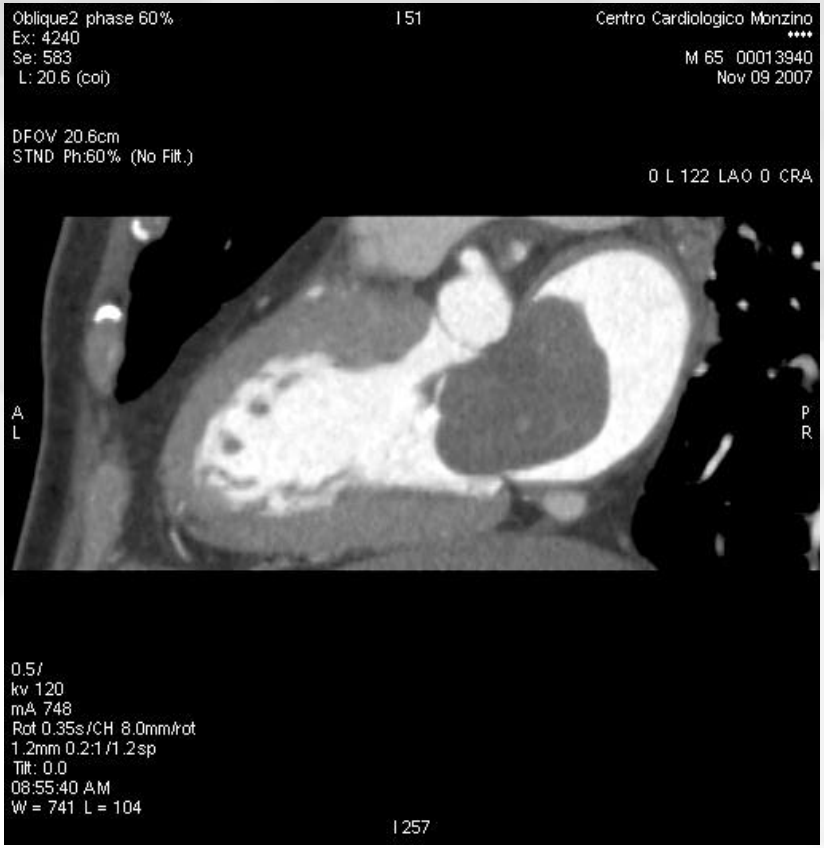
LEFT ATRIUM – PULMONARY VEINS

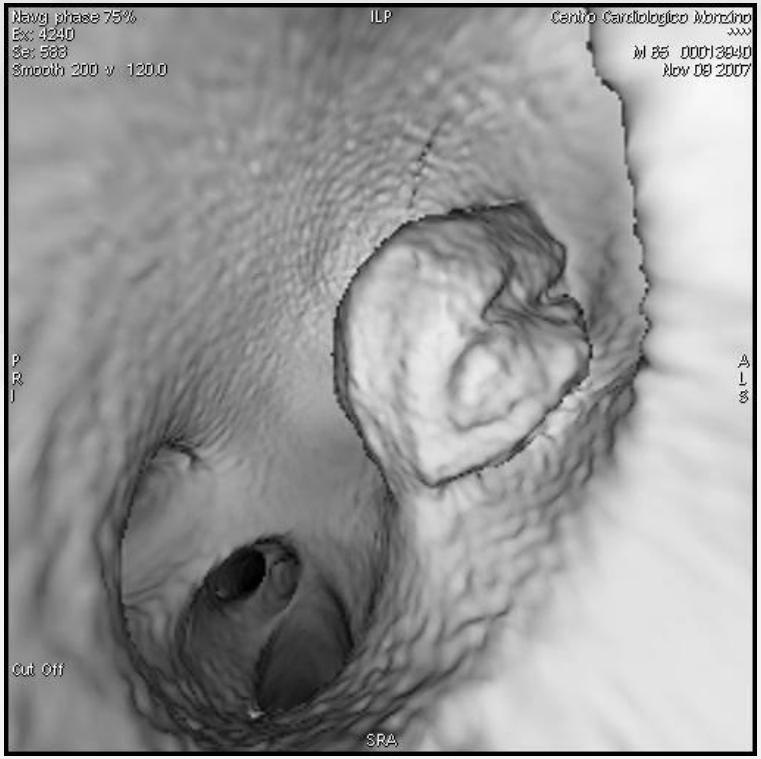


- Pre – RFCA characterization of LA
- Post – RFCA characterization of LA
- LA disease

LEFT ATRIUM – PULMONARY VEINS

Left Atrium Mixoma

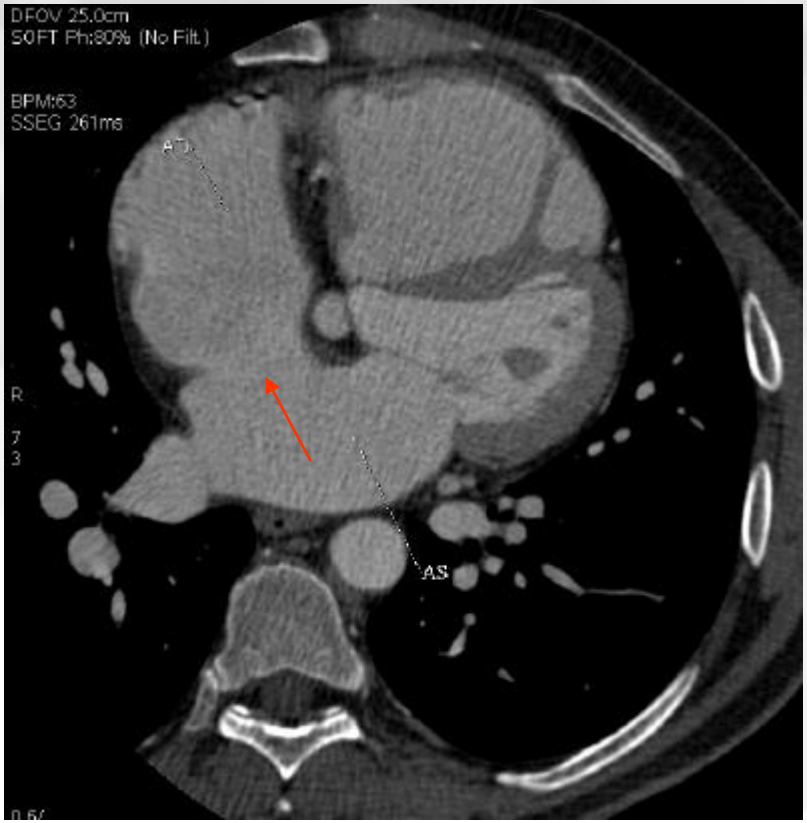




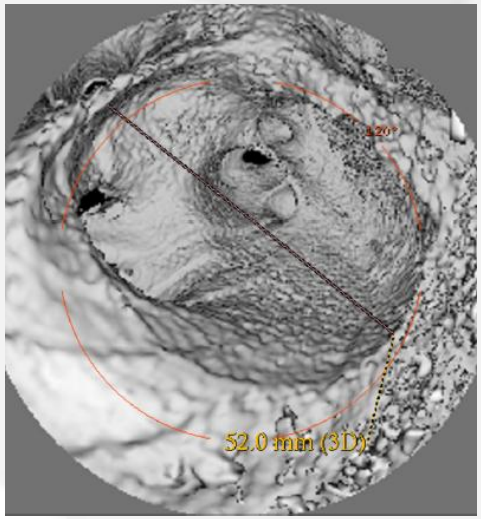
LEFT ATRIUM – PULMONARY VEINS

ASD Type II

Axial Plan



Sagital Plan

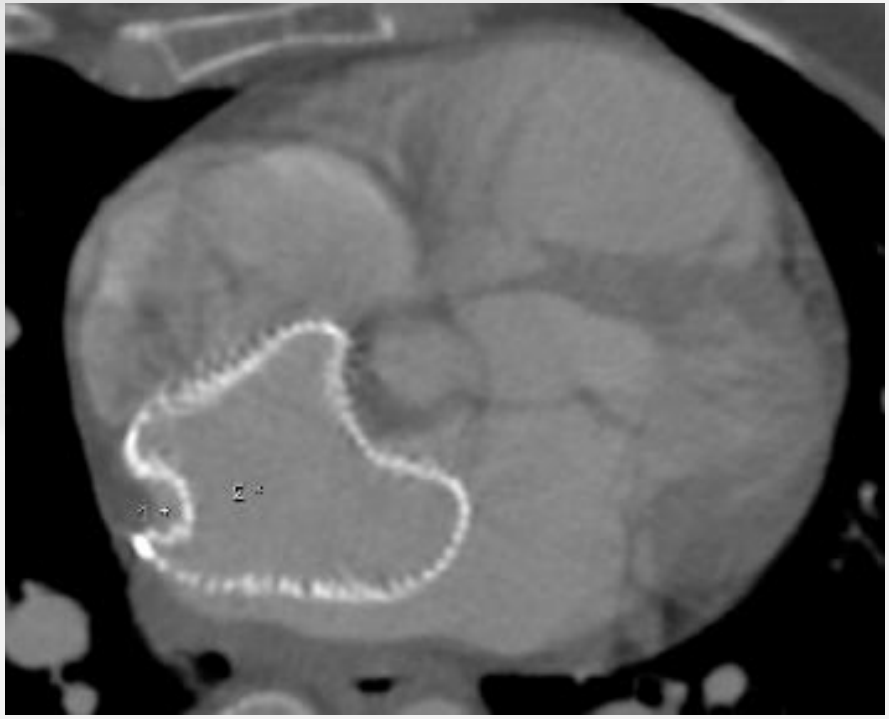


Navigator

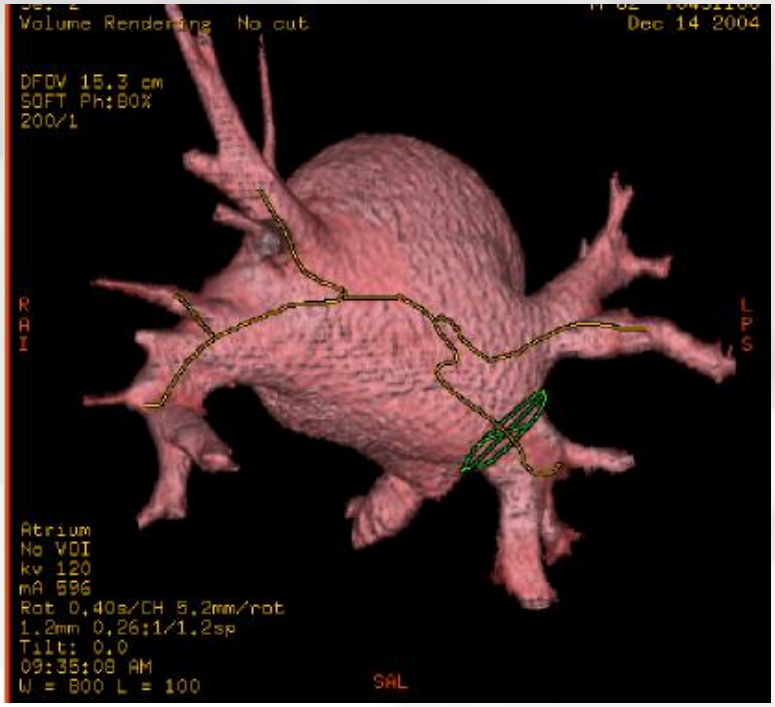
LEFT ATRIUM – PULMONARY VEINS

Correct AD positioning

Non-correct AD positioning



LEFT ATRIUM: conclusions



Pre – RFCA characterization of LA

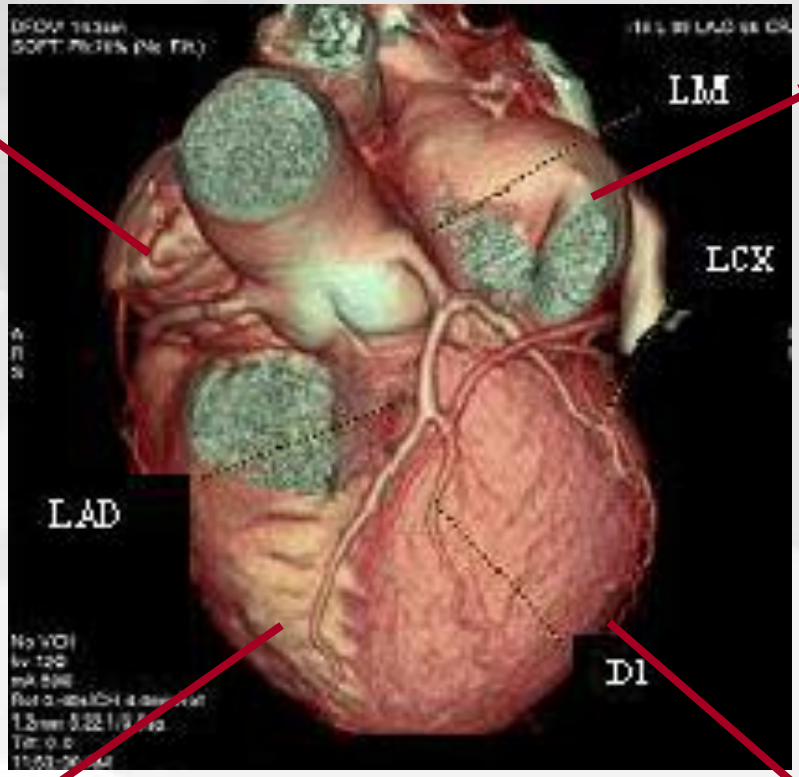
Post – RFCA characterization of LA

LA disease

- Road-map for RFCA
- Predict the non-responsive pts to RFCA
- Follow-up of RFCA-complications
- LA anatomical - disease

SUMMARY

Right Atrium and Cardiac Veins

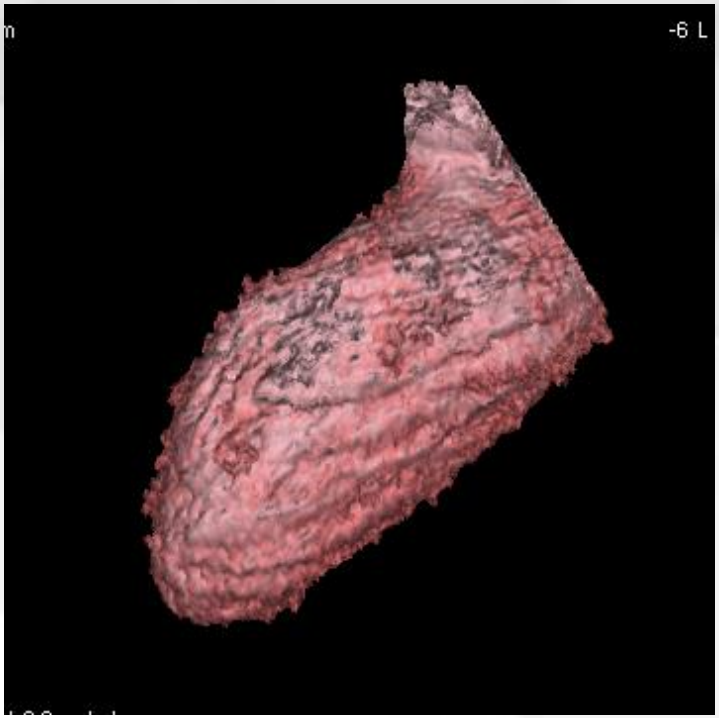


Left Atrium and Pulmonary Veins

Right Ventricle

Left Ventricle and Aortic root

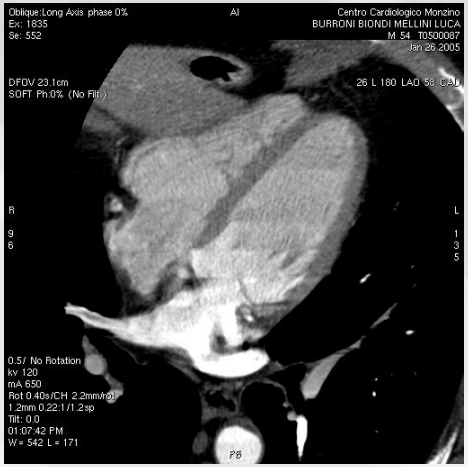
LEFT VENTRICLE

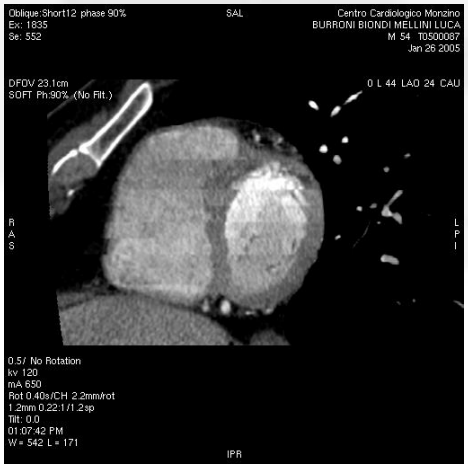


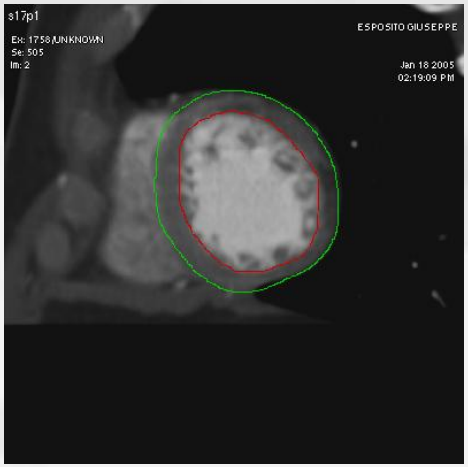
Global Left Ventricular Function

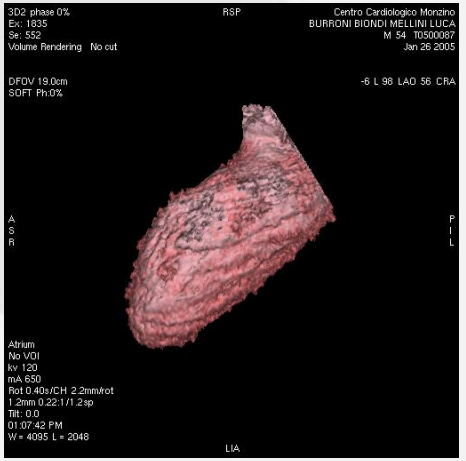
LEFT VENTRICLE

Global Left Ventricular Function: methodology









LEFT VENTRICLE

ADVANCES IN NONNUCLEAR IMAGING TECHNOLOGIES

Comprehensive cardiac CT study: Evaluation of coronary arteries, left ventricular function, and myocardial perfusion—Is it possible?

(J Nucl Cardiol 2007;14:229-43.)

Ricardo C. Cury, MD,[a,b] Koen Nieman, MD,[c] Michael D. Shapiro, MD,[a,b]
Khurram Nasir, MD,[a,b] Roberto C. Cury, MD,[d] and Thomas J. Brady, MD[a,b]

Table 3. Correlation of EF and ventricular volumes (ESV and EDV) between MDCT and cine ventriculography, 2-dimensional echocardiography, SPECT, and cardiac MRI

Author	MDCT	Correlation coefficient			Absolute difference in EF (%)
		ESV	EDV	EF	
Two-dimensional echocardiography					
Dirksen et al (2002)[82]	4 Slice	—	—	—	−1.3 ± 4.5
Schuijf et al (2005)[105]	16 Slice	—	—	0.96	−0.02 ± 3.9
Schuijf et al (2006)[106]	16 Slice	0.98	0.97	0.91	1.7 ± −4.9
SPECT					
Schepis et al (2006)[80]	64 Slice	0.96	0.92	0.82	−1.1 ± 1.7

LEFT VENTRICLE

Global Left Ventricular Function: MDCT vs MRI

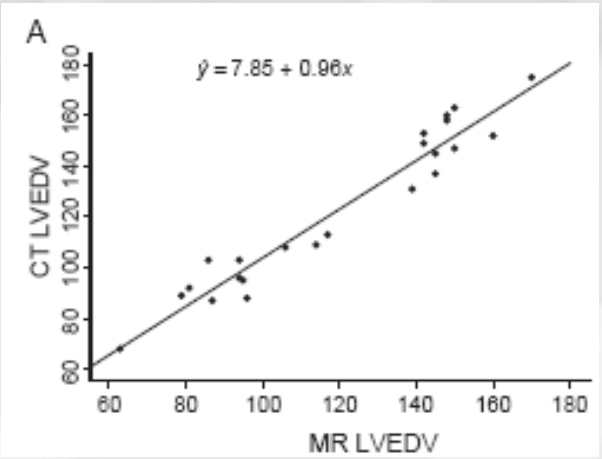
Multi-detector row cardiac computed tomography accurately quantifies right and left ventricular size and function compared with cardiac magnetic resonance

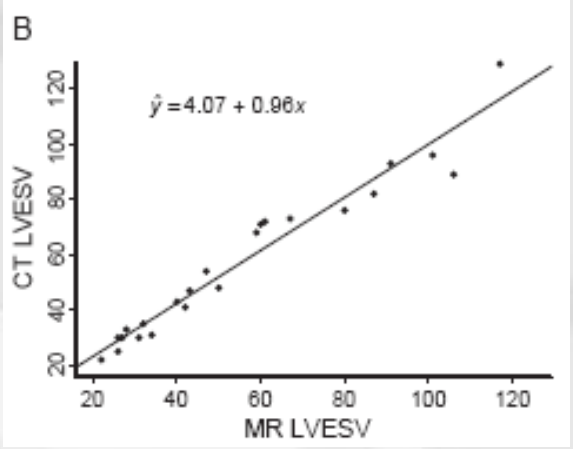
Subha V. Raman, MD, MSEE, Mona Shah, MD, Beth McCarthy, BSRT, Anne Garcia, BSRT, and Amy K. Ferketich, PhD *Columbus, OH*

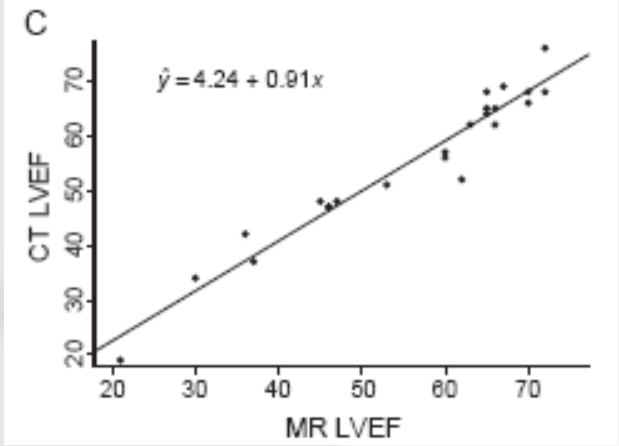
(Am Heart J 2006;151:736-44.)

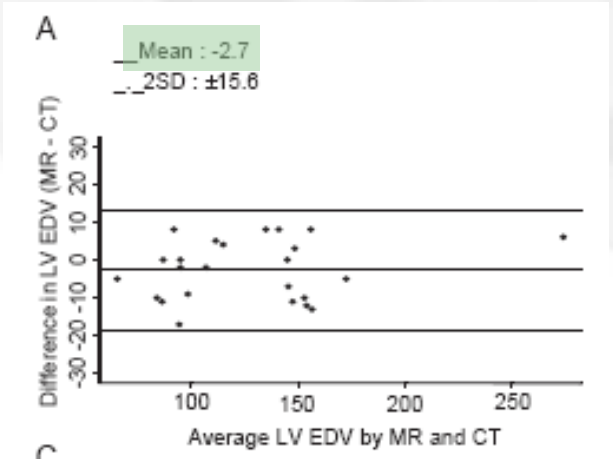
LEFT VENTRICLE

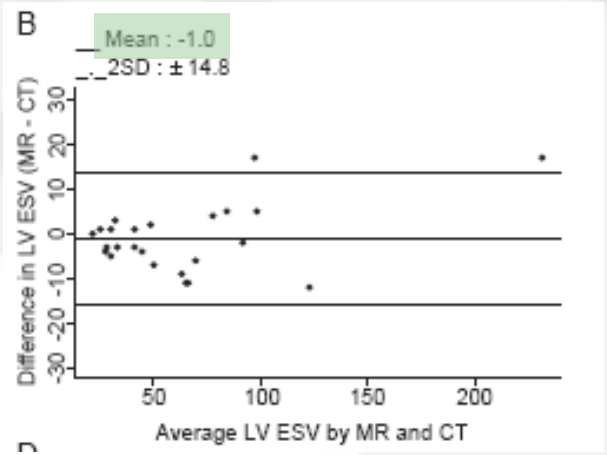
Global Left Ventricular Function: MDCT vs MRI

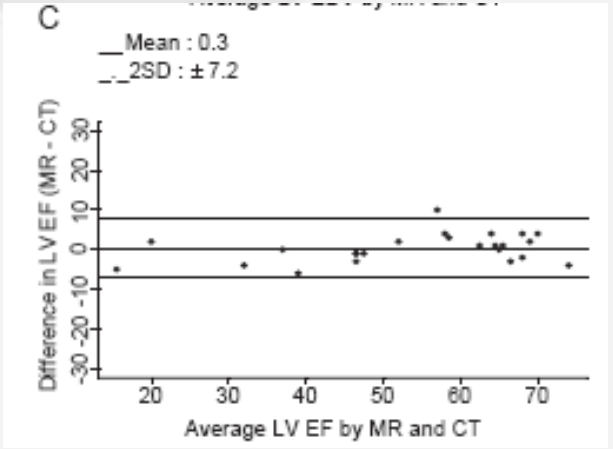




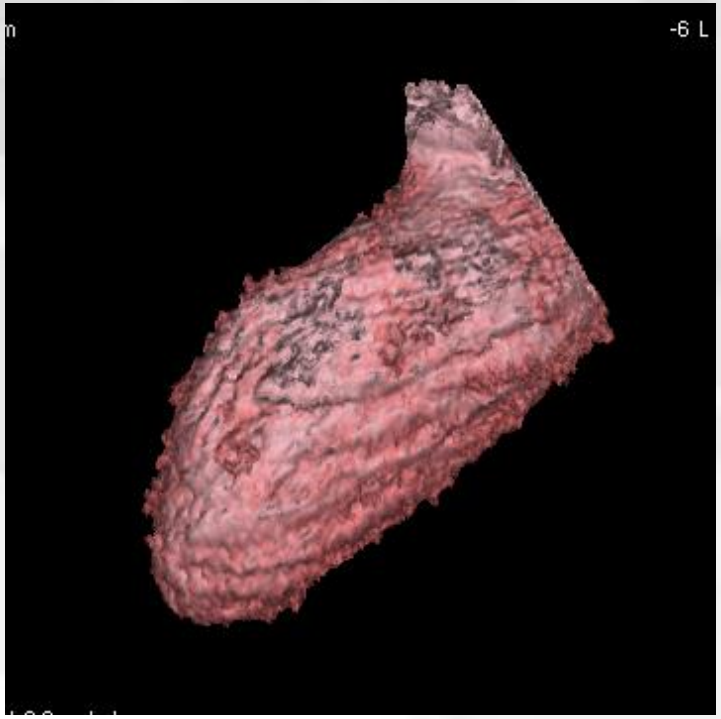








LEFT VENTRICLE



- Global Left Ventricular Function
- Regional Left Ventricular Function

LEFT VENTRICLE

Regional Left Ventricular Function: MDCT vs Echo

(Am J Cardiol 2005;96:1011–1015)

Comparison of Multidetector Computed Tomography Versus Echocardiography for Assessing Regional Left Ventricular Function

Jonathan Lessick, MD, DSc[a,*], Diab Mutlak, MD[a], Shmuel Rispler, MD, DSc[a], Eduard Ghersin, MD[b], Robert Dragu, MD[a], Diana Litmanovich, MD[b], Ahuva Engel, MD[b], Shimon A. Reisner, MD[a], and Yoram Agmon, MD[a]

Table 4
MDCT assessment of segmental function versus echocardiography as the gold stan

Segment	No. of Segments	Sensitivity	Specific
16-segment approach	616	66% (103/155)	96% (443/

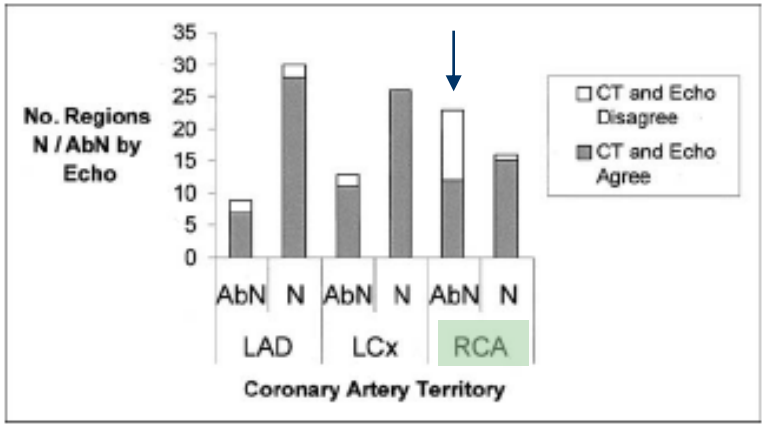


Figure 2. Agreement between MDCT and echocardiography (echo) per coronary artery territory for normal (N) and abnormal (AbN) regions as scored by echocardiography. CT = computed tomography; LAD = left anterior descending artery LCx = left circumflex artery; RCA = right coronary artery.

LEFT VENTRICLE

Regional Left Ventricular Function: MDCT and SPECT vs MRI

ELSEVIER

European Journal of Radiology xxx (2008) xxx–xxx

EJR

www.elsevier.com/locate/ejrad

Functional imaging in the assessment of myocardial infarction: MR imaging vs. MDCT vs. SPECT

Andreas H. Mahnken[a,b,*], Philipp Bruners[a,b], Sven Stanzel[c], Ralf Koos[d], Georg Mühlenbruch[a], Rolf W. Günther[a], Patrick Reinartz[e,f]

[a] Department of Diagnostic Radiology, RWTH Aachen University, Germany
[b] Applied Medical Engineering, Helmholtz Institute, RWTH Aachen University, Germany
[c] Institute of Medical Statistics, RWTH Aachen University, Germany
[d] Medical Clinic I, RWTH Aachen University, Germany
[e] Department of Nuclear Medicine, RWTH Aachen University, Germany
[f] Nuclear Center of Diagnostic Radiology and Nuclear Medicine, Duesseldorf, Germany

Received 4 January 2008; received in revised form 20 May 2008; accepted 4 June 2008

Table 2
Frequency tables for wall motion analysis comparing MDCT and MR imaging (A), SPECT and MDCT (B) and SPECT and MR imaging (C)

MDCT	MR imaging			
	Normal	Hypokinetic	Dyskinetic	Akinetic
Normal	77	1	0	0
Hypokinetic	1	44	5	0
Dyskinetic	0	1	2	0
Akinetic	0	5	0	17

SPECT	MDCT			
	Normal	Hypokinetic	Dyskinetic	Akinetic
Normal	68	17	0	1
Hypokinetic	10	30	3	7
Dyskinetic	0	1	0	2
Akinetic	0	2	0	12

MDCT vs MRI → K:0.86

SPECT vs MRI → K: 0.51

LEFT VENTRICLE

Left Ventricular Function: limitations

Temporal Resolution

Single Source CT: 175 msec
Dual Source CT: 85 msec
MRI, Echo < 50 msec

β-blockade

Because β-blocker is generally used in MDCT, it can alter the functional parametrs and thus limit the utility of functional analysis

Other

Radiation Exposure

LEFT VENTRICLE

Global Left Ventricular Disease

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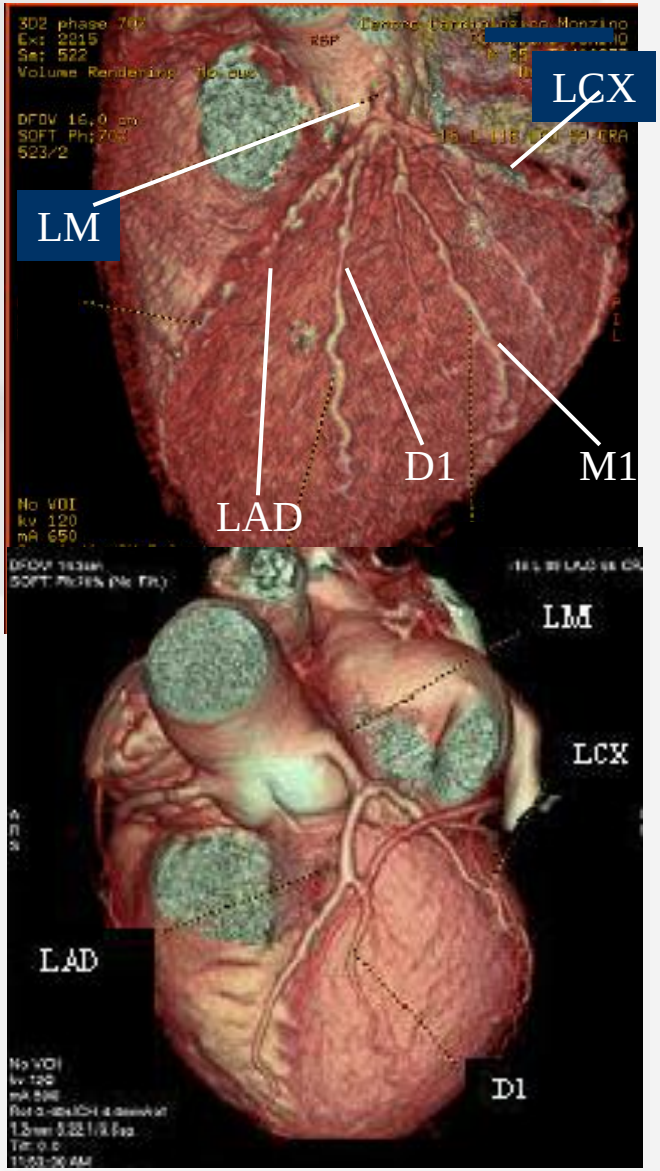
Cardiac Imaging

Diagnostic Accuracy of Multidetector Computed Tomography Coronary Angiography in Patients With Dilated Cardiomyopathy

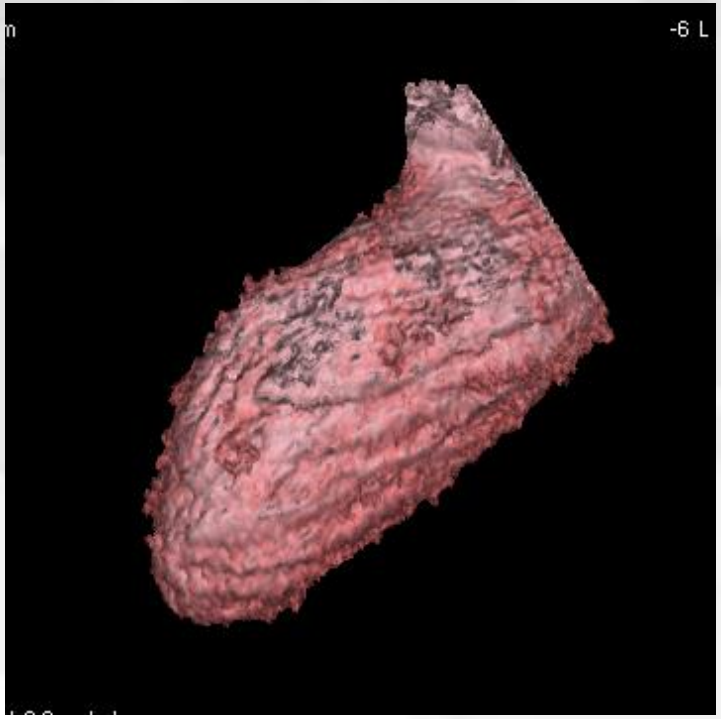
Daniele Andreini, MD, Gianluca Pontone, MD, Mauro Pepi, MD, Giovanni Ballerini, MD, Antonio L. Bartorelli, MD, FACC, Alessandra Magini, MD, Carlo Quaglia, MD, Enrica Nobili, MD, Piergiuseppe Agostoni, MD, PhD

Milan, Italy

*: p < 0,05	Group 1 (DCM)	Group 2 (Control)
Number	61	139
Feasibility	97,2%	96,1%
Sensitivity	99%	86,1%*
Specificity	96,2%	96,4%
NPV	99,85	96,4%*
PPV	81,2%	86,1%



LEFT VENTRICLE

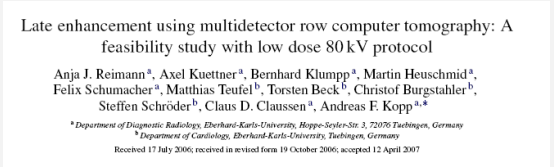


- Global Left Ventricular Function
- Regional Left Ventricular Function
- Viability

LEFT VENTRICLE

Late Enhancement with MDCT

It is known that MRI can characterize MI with both early and late contrast patterns. First-pass imaging performed immediately after contrast administration may demonstrate areas of hypoenhancement in the endocardial core of the infarct corresponding to microvascular obstruction. Delayed images acquired more than 10 minutes after contrast administration may demonstrate regional hyperenhancement, corresponding to myocardial necrosis or scar. Because iodinated contrast agents used in CT have kinetics similar to gadolinium used in MRI, as discussed later, there is a rationale to believe that DHE-MDCT would be able to identify areas of MI



Late enhancement using multidetector row computer tomography: A feasibility study with low dose 80 kV protocol

Anja J. Reimann[a], Axel Kuettner[a], Bernhard Klumpp[a], Martin Heuschmid[a], Felix Schumacher[a], Matthias Teufel[b], Torsten Beck[b], Christof Burgstahler[b], Steffen Schröder[b], Claus D. Claussen[a], Andreas F. Kopp[a,*]

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[b] Department of Cardiology, Eberhard-Karls-University, Tuebingen, Germany

Received 17 July 2006; received in revised form 19 October 2006; accepted 12 April 2007

LEFT VENTRICLE

Late Enhancement with MDCT

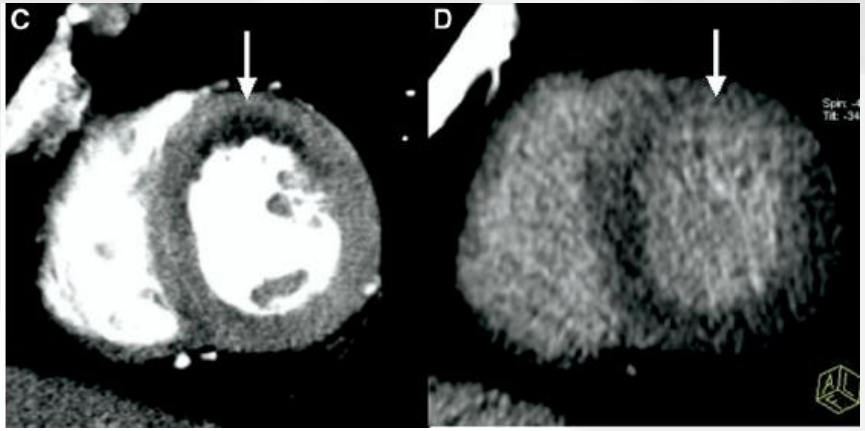
European Journal of Radiology 66 (2008) 127–133

Late enhancement using multidetector row computer tomography: A feasibility study with low dose 80 kV protocol

Anja J. Reimann[a], Axel Kuettner[a], Bernhard Klumpp[a], Martin Heuschmid[a], Felix Schumacher[a], Matthias Teufel[b], Torsten Beck[b], Christof Burgstahler[b], Steffen Schröder[b], Claus D. Claussen[a], Andreas F. Kopp[a,*]

[a] *Department of Diagnostic Radiology, Eberhard-Karls-University, Hoppe-Seyler-Str. 3, 72076 Tuebingen, Germany*
[b] *Department of Cardiology, Eberhard-Karls-University, Tuebingen, Germany*

Received 17 July 2006; received in revised form 19 October 2006; accepted 12 April 2007



- Delayed Time: 5 min
- Tube Voltage: 80 Kv
- Tube Current: 420 mA
- Collimation: 64x0.625 mm
- Gantry Rotaion time: 350 msec
- ECG-gating: modulation dose

Se	Sp	NPV	PPV
78%	100%	100%	97%

Effective Radiation Dose: 1.19 – 1.61 mSv

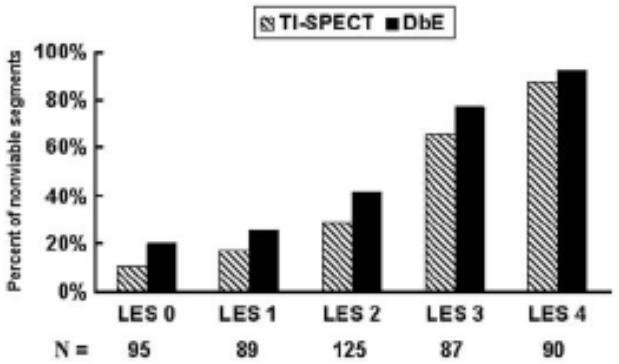
LEFT VENTRICLE

Regional Left Ventricular Disease: MDCT vs Db-Echo and Tl-SPECT

Identification and viability assessment of infarcted myocardium with late enhancement multidetector computed tomography: Comparison with thallium single photon emission computed tomography and echocardiography

Kuan-Rau Chiou, MD,[a,d] Chun-Peng Liu, MD,[a,d] Nan-Jing Peng, MD,[b,d] Wei-Chun Huang, MD,[a,d] Shih-Hung Hsiao, MD,[a,d] Yi-Luan Huang, MD,[c,d] Kuen-Huang Chen, MD,[c,d] and Ming-Ting Wu, MD[c,d] *Taiwan, Republic of China*

Figure 4

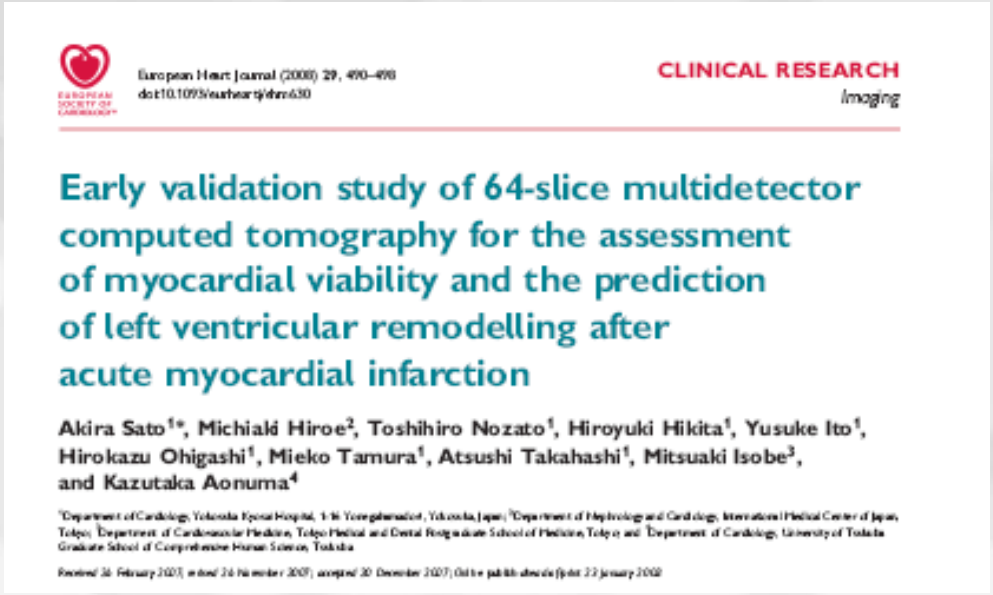


Bar graph shows comparison of Tl-SPECT and DbE nonviable segments with segmental extent of MDCT-LE. The proportion of nonviable myocardium depicted by Tl-SPECT and DbE rises in conjunction with increases in LES (both $P < .001$).

Late Enhancement 0 = no LE
Late Enhancement 1: 1% - 25%
Late Enhancement 2: 26% - 50%
Late Enhancement 3: 51% - 75%
Late Enhancement 4: : >75%

LEFT VENTRICLE

Regional Left Ventricular Disease: $MDCT_{LE}$ and LV Remodelling



European Heart Journal (2008) 29, 490–498
doi:10.1093/eurheartj/ehm630

CLINICAL RESEARCH
Imaging

Early validation study of 64-slice multidetector computed tomography for the assessment of myocardial viability and the prediction of left ventricular remodelling after acute myocardial infarction

Akira Sato[1]*, Michiaki Hiroe[2], Toshihiro Nozato[1], Hiroyuki Hikita[1], Yusuke Ito[1], Hirokazu Ohigashi[1], Mieko Tamura[1], Atsushi Takahashi[1], Mitsuaki Isobe[3], and Kazutaka Aonuma[4]

[1]Department of Cardiology, Yokosuka Kyosai Hospital, 1-16 Yonegahamadori, Yokosuka, Japan; [2]Department of Nephrology and Cardiology, International Medical Center of Japan, Tokyo; [3]Department of Cardiovascular Medicine, Tokyo Medical and Dental Postgraduate School of Medicine, Tokyo; and [4]Department of Cardiology, University of Tsukuba Graduate School of Comprehensive Human Sciences, Tsukuba

Received 26 February 2007; revised 26 November 2007; accepted 30 December 2007; Online publish-ahead-of-print 23 January 2008

52 PTS with Acute MI → PTCA+Stent → CT_{LE} and TI-SPECT → 0 and 6 Month

LEFT VENTRICLE

Regional Left Ventricular Disease: $MDCT_{LE}$ and LV Remodelling

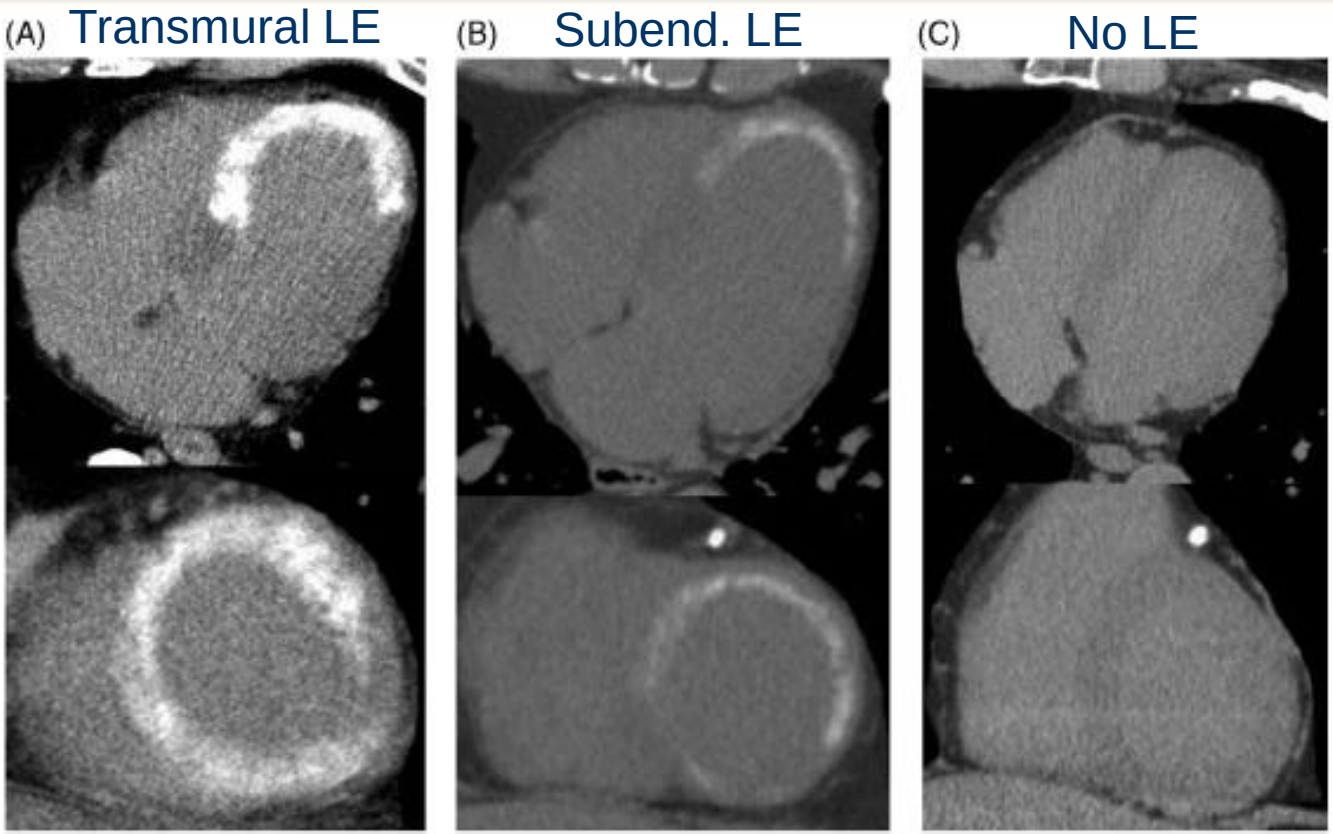


Figure 1 The myocardial contrast-delayed enhancement patterns were divided into three groups. Multidetector computed tomography images show axial (upper) and short-axis (lower) slices with (*A*) transmural contrast-delayed enhancement, (*B*) subendocardial contrast delayed enhancement, and (*C*) no contrast-delayed enhancement

LEFT VENTRICLE

Regional Left Ventricular Disease: $MDCT_{LE}$ and LV Remodelling

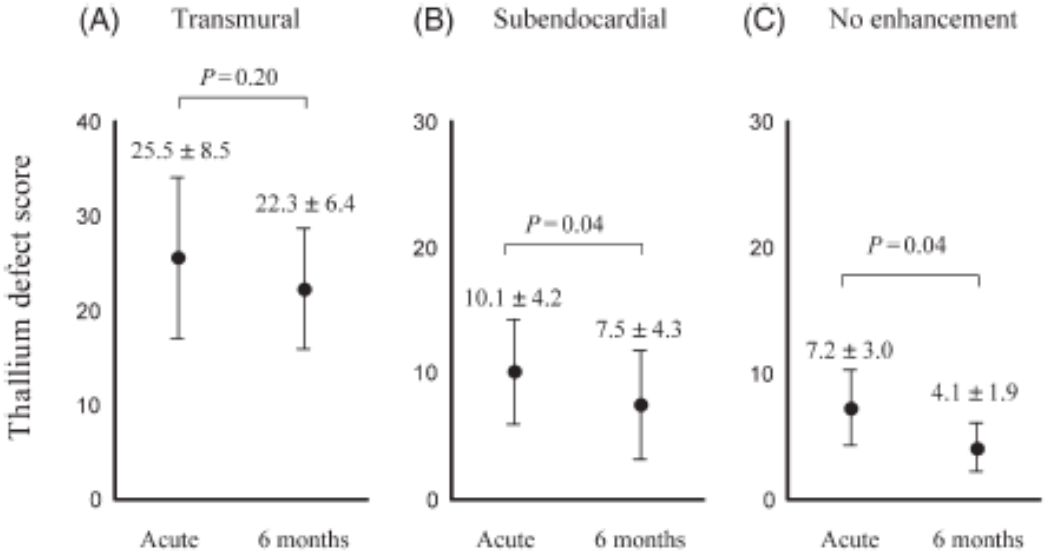


Figure 4 Comparison of the defect scores of thallium-201 between the acute phase and at 6 months according to myocardial contrast-delayed enhancement patterns. Values are expressed as mean ± SD. (*A*) transmural enhancement, (*B*) subendocardial enhancement, and (*C*) no enhancement

Significant reduction of TL-SPECT score only in subendocardial LE or in no-LE

LEFT VENTRICLE

Regional Left Ventricular Disease: $MDCT_{LE}$ and LV Remodelling

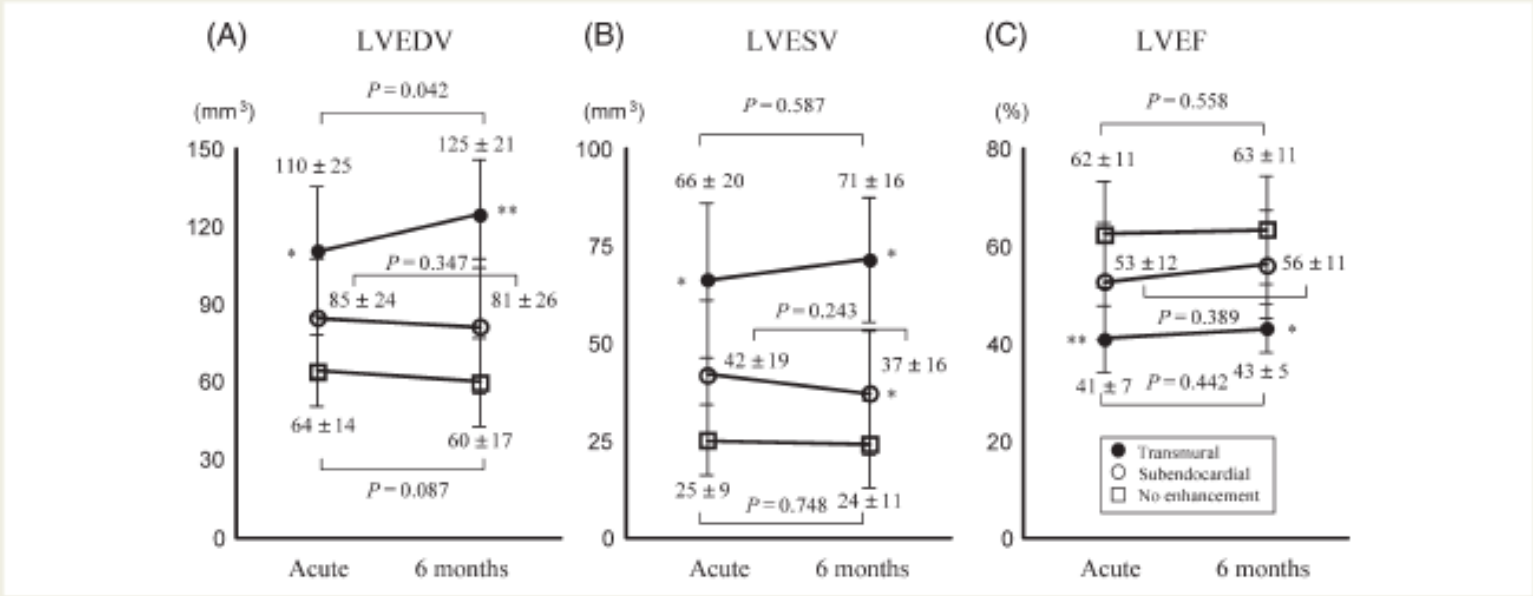


Figure 5 Changes in left ventricular functional parameters from the acute phase to those at 6 months according to myocardial contrast-delayed enhancement patterns. Values are expressed as mean ± SD. (*A*) Left ventricular end-diastolic volume, (*B*) Left ventricular end-systolic volume, and (*C*) Left ventricular ejection fraction. Solid circles indicate transmural enhancement, open circles indicate subendocardial enhancement, and open squares indicate no enhancement. Asterisks are overall significance between three groups calculated by Jonckheere–Terpstra trend test. *$P < 0.0001$, **$P < 0.0005$

Significant increase of LVEDV only in transmural LE

Greater incidence of hospitalization only in transmural LE

LEFT VENTRICLE: clinical case

ELSEVIER

European Journal of Radiology Extra 54 (2005) 51–54

EUROPEAN JOURNAL OF RADIOLOGY eEXTRA

http://intl.elsevierhealth.com/journals/ejrex

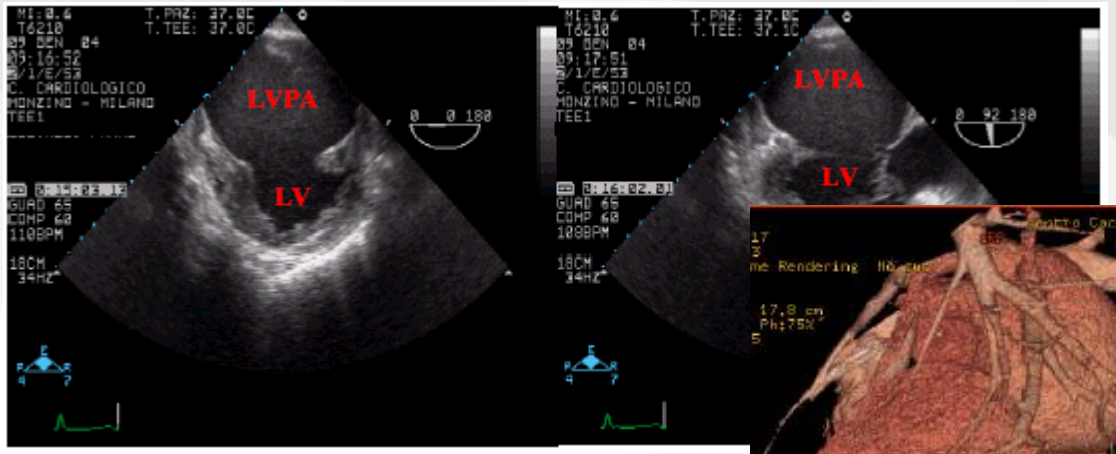
An unusual case of large left ventricular aneurysm: Complementary role of echocardiography and multidetector computed tomography in surgical planning

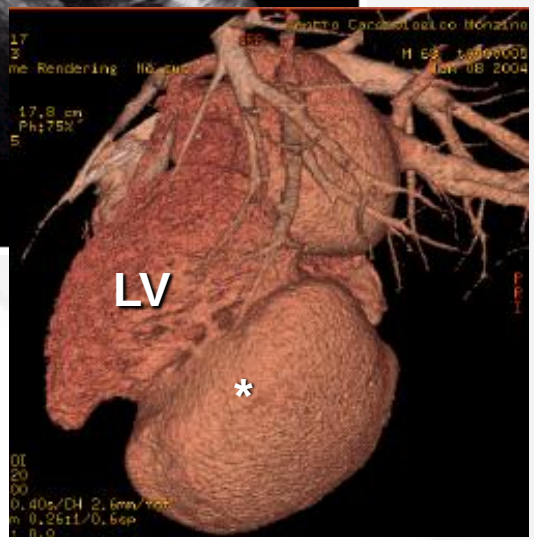
Gianluca Pontone [a,*], Daniele Andreini [a], Giovanni Ballerini [a], Giulio Pompilio [a], Francesco Alamanni [a], Enrica Nobili [a], Franco Casazza [b], Mauro Pepi [a], Paolo Biglioli [a]

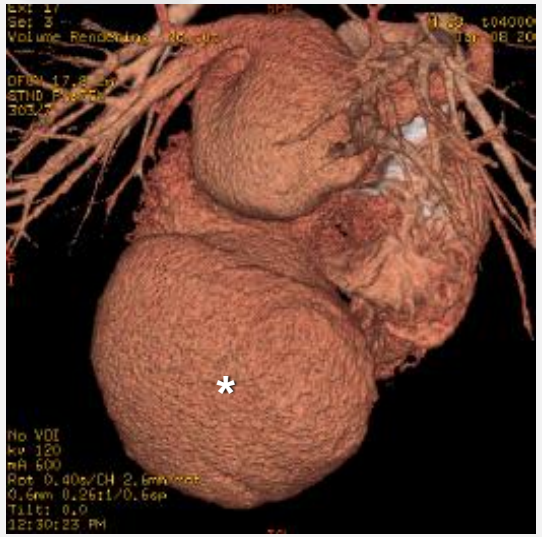
[a] Centro Cardiologico Monzino, IRCCS, Via C. Parea 4, Milan, Italy
[b] Ospedale S. Carlo, Milan, Italy

Received 21 December 2004; received in revised form 22 March 2005; accepted 24 March 2005

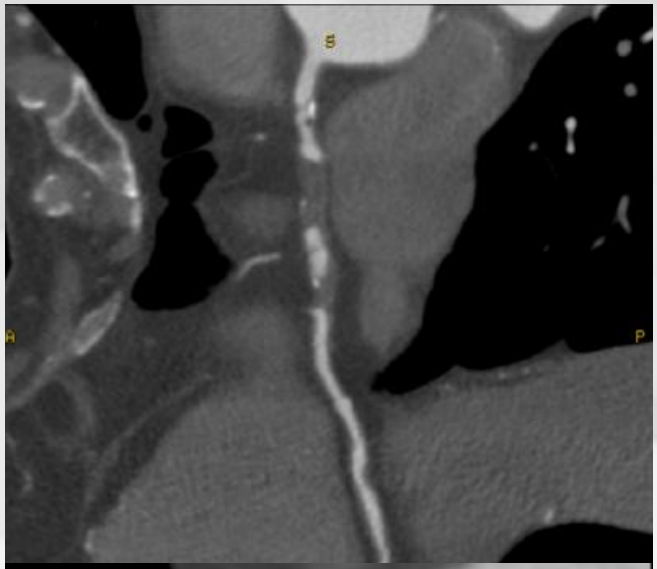
Male, 65 aa with history of myocardial infarction of inferior wall of LV

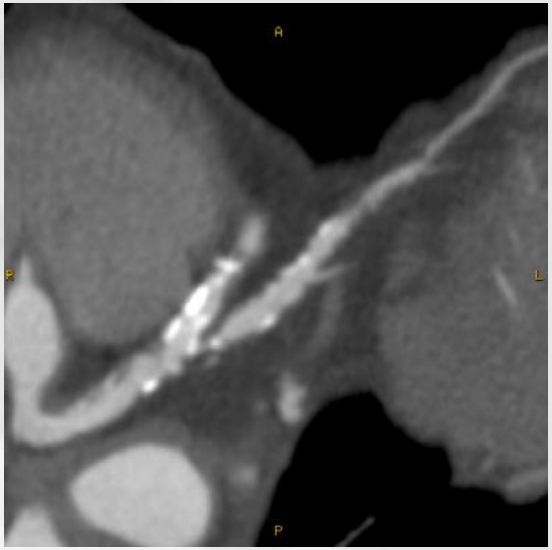


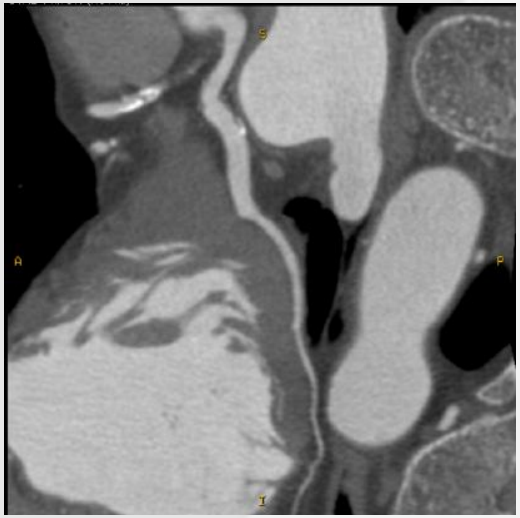


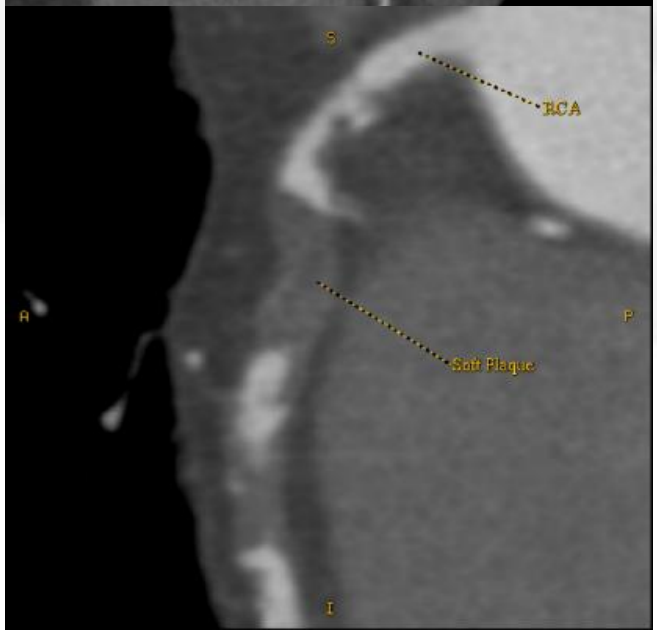


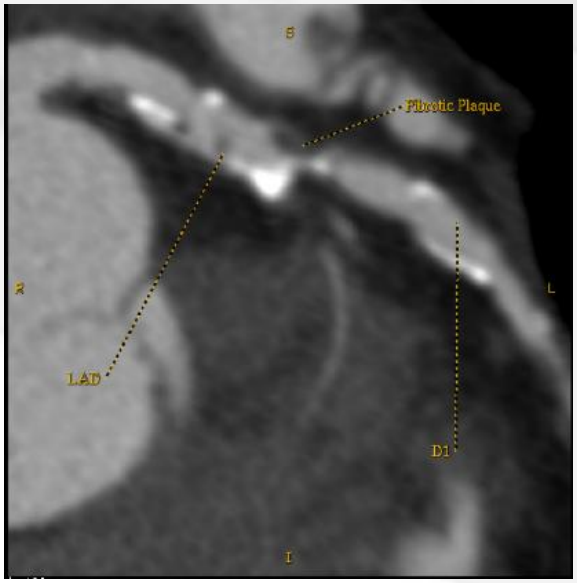
LEFT VENTRICLE: clinical case

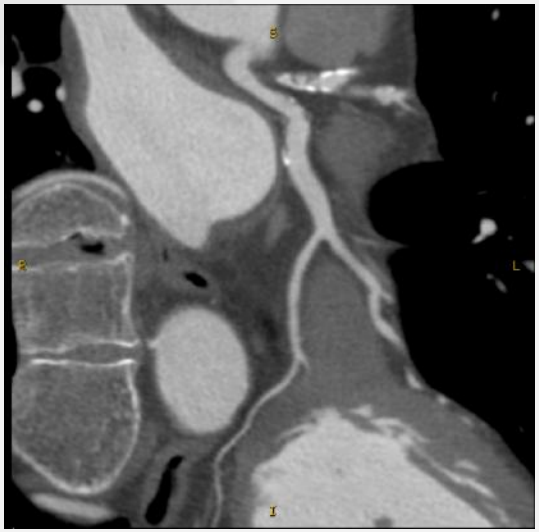






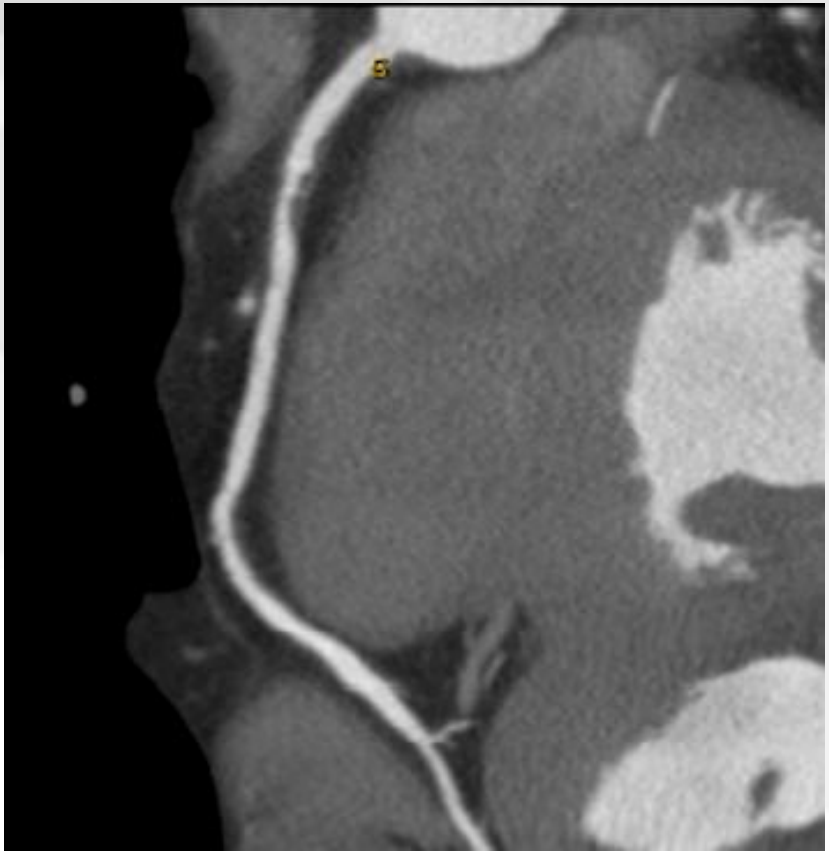


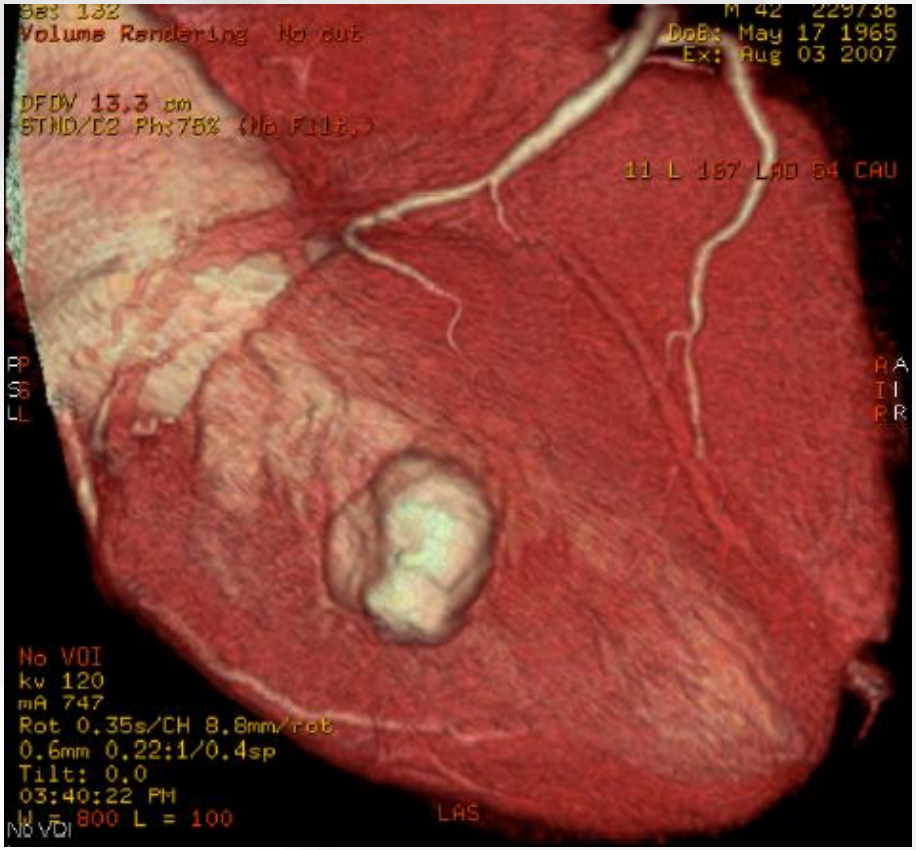




LEFT VENTRICLE: clinical case

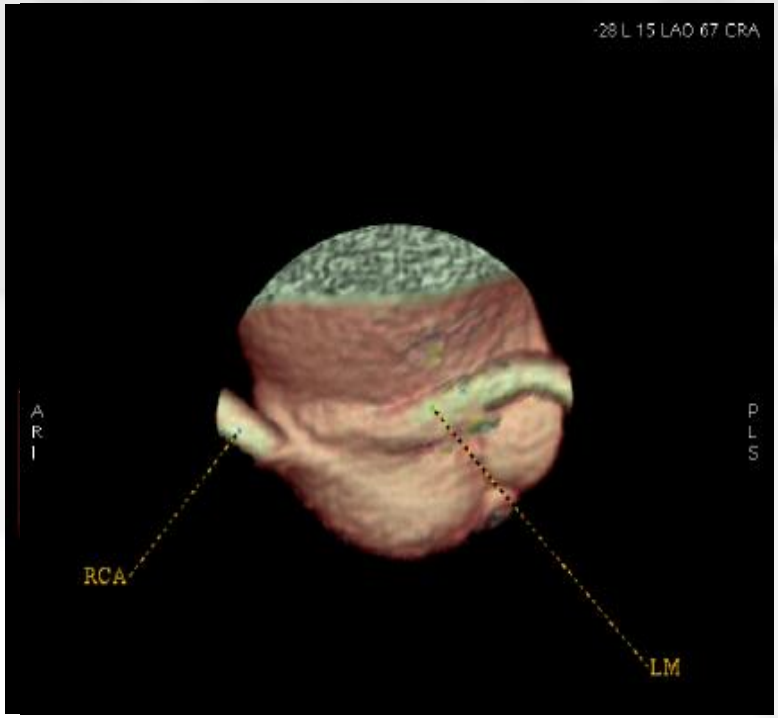
Soft plaque in the proximal RCA and posterior wall left ventricle aneurysm

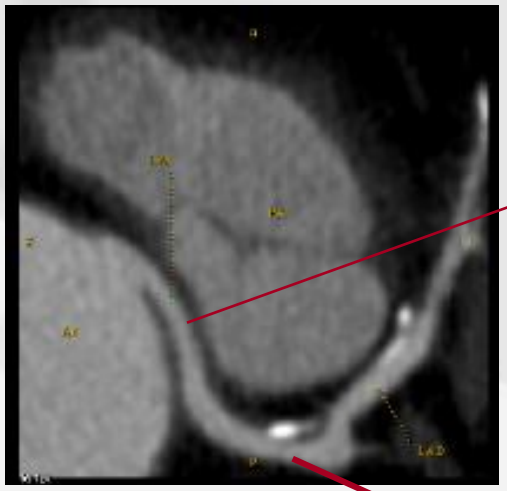


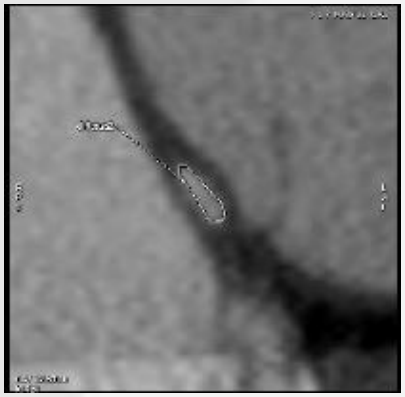


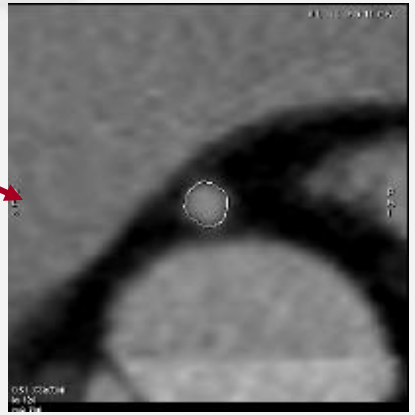
LEFT VENTRICLE: clinical case

LM origin from RCA



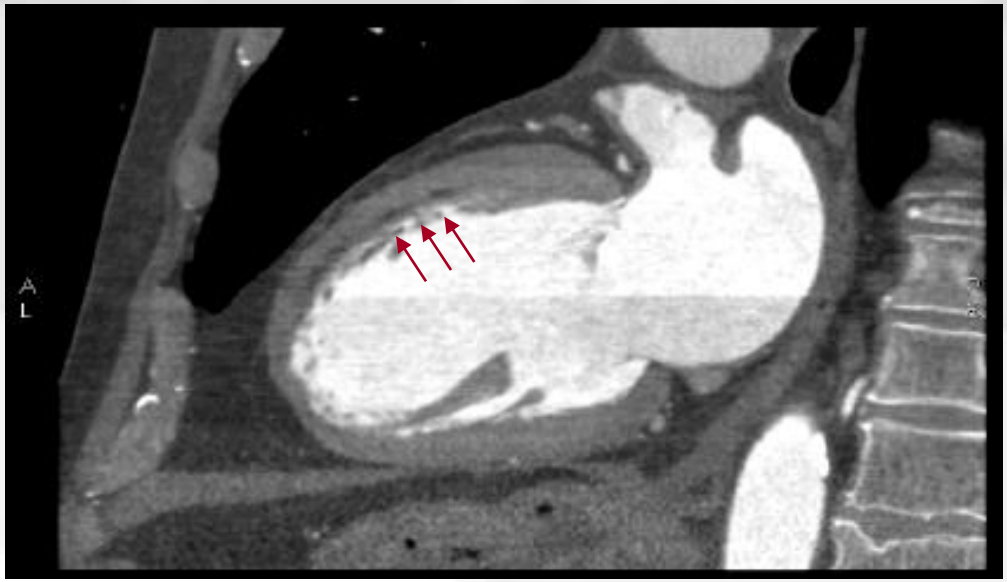


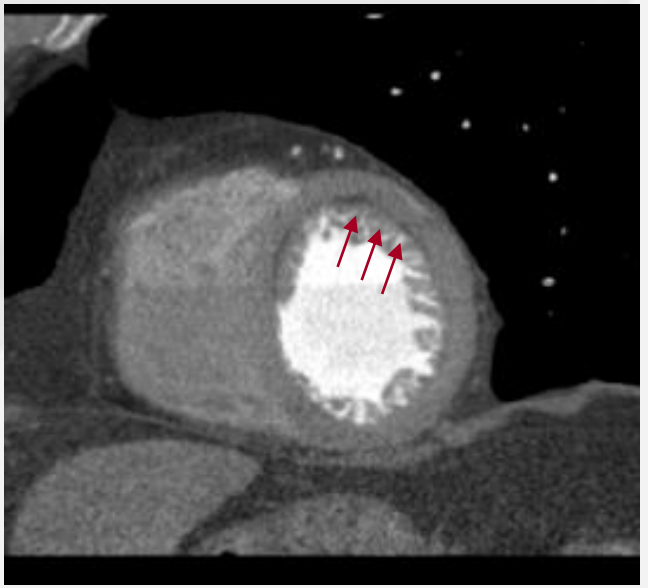




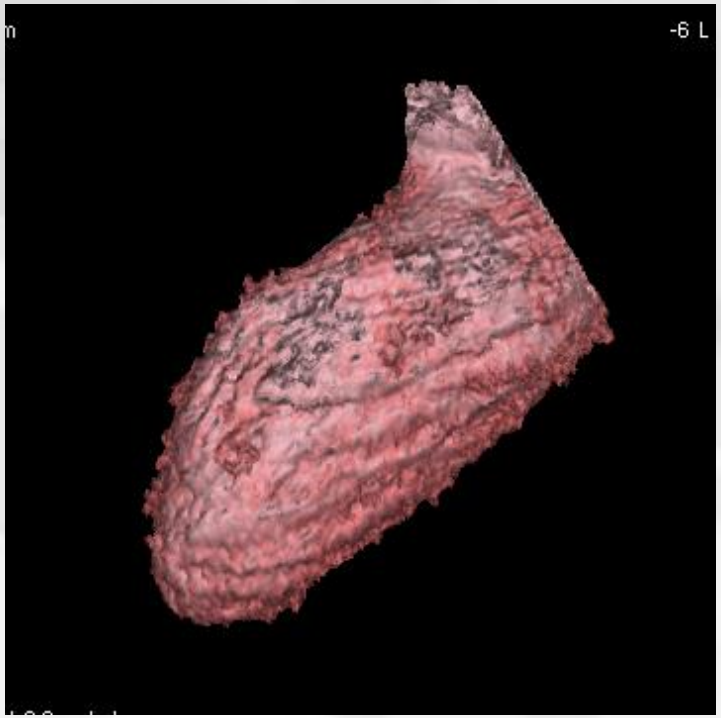
LEFT VENTRICLE: clinical case

LM origin from RCA





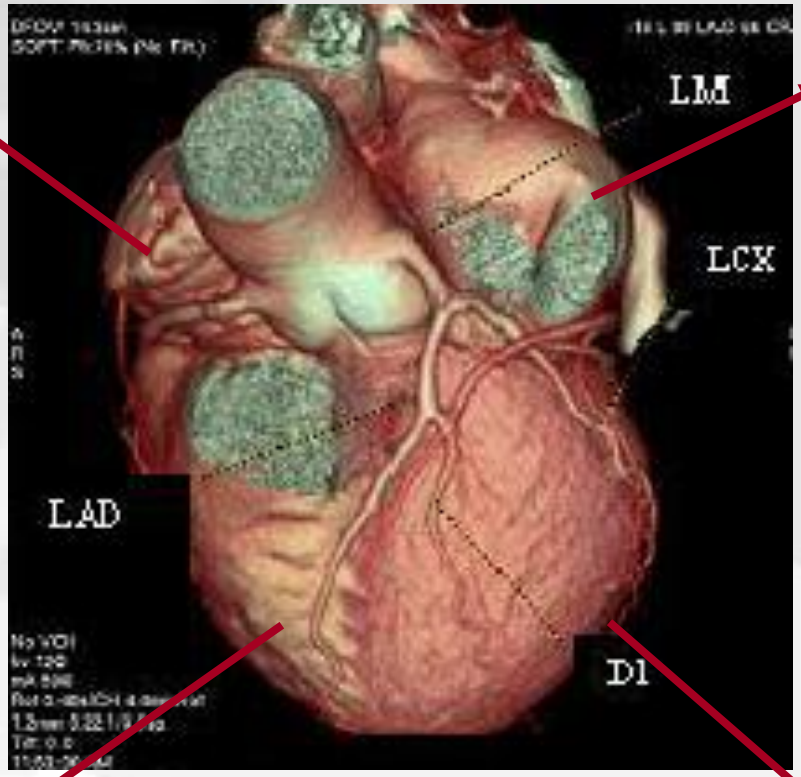
LEFT VENTRICLE: conclusions



- Global Left Ventricular Function
- Regional Left Ventricular Function
- Viability
  - LVEF
  - WMLV
  - Ethiology of LV dysfunction
  - LV viability
  - Predict LV remodelling and clinical outcome

SUMMARY

Right Atrium and Cardiac Veins



Left Atrium and Pulmonary Veins

Right Ventricle

Left Ventricle and Aortic root

Right Atrium and Cardiac Veins

The role of multidetector computer tomography in assessing the cardiac venous circulation in patients with dilated cardiomyopathy.

Gianluca Pontone MD, Daniele Andreini MD, Andrea Annoni MD, Alberto Formenti MD, Erika Bertella MD, Saima Mushtaq MD,, Enrica Nobili MD, Francesco Giraldi MD, Giovanni Ballerini MD, Paolo Della Bella MD, Piergiuseppe Agostoni PhD, Mauro Pepi MD

Centro Cardiologico Monzino, IRCCS, Milan, Italy

submitted

Right Atrium and Cardiac Veins

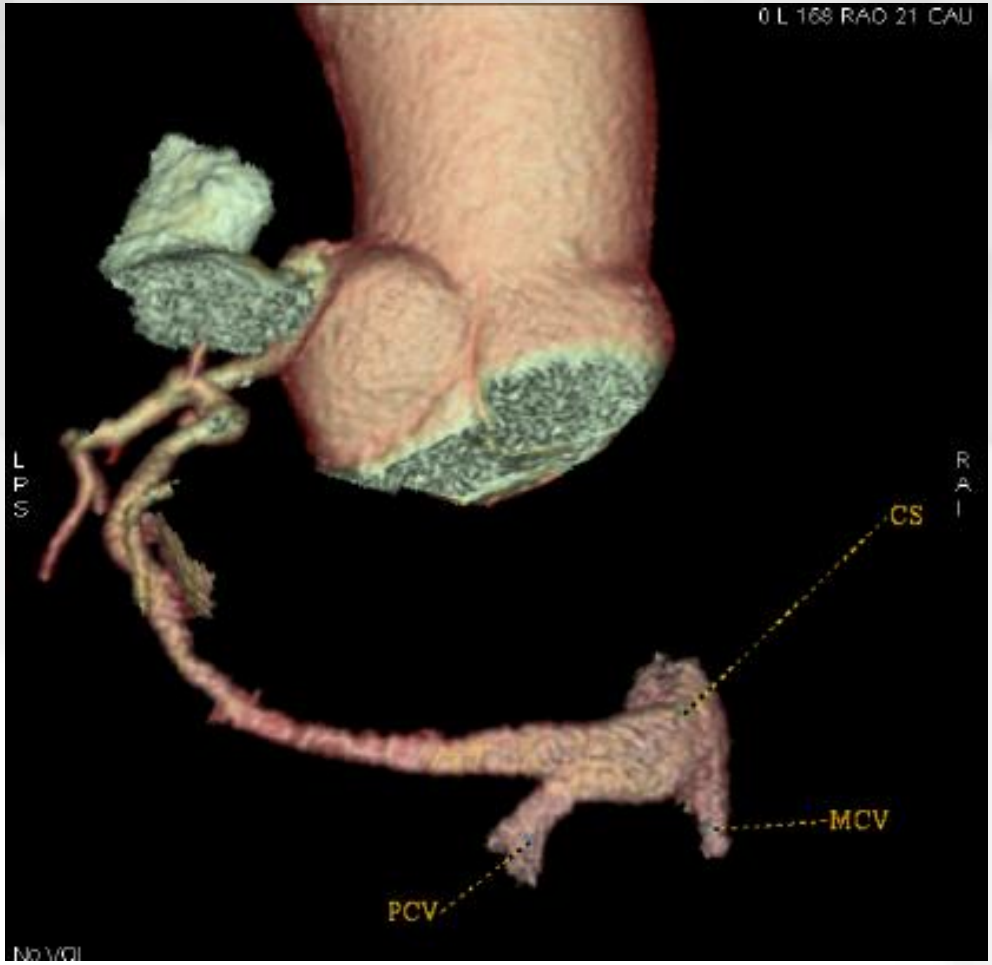
PATIENTS	CONTROLS (No-CAD)	CONTROLS (CAD)	DCM (No-CAD)	DCM (CAD)
Number of pts	64	29	72	27
Vessels, no.	320	145	360	135
Number of visualized vessels, no. (%)	278 (86%)*§&	110 (76%)#	278 (77%)£	86 (64%)

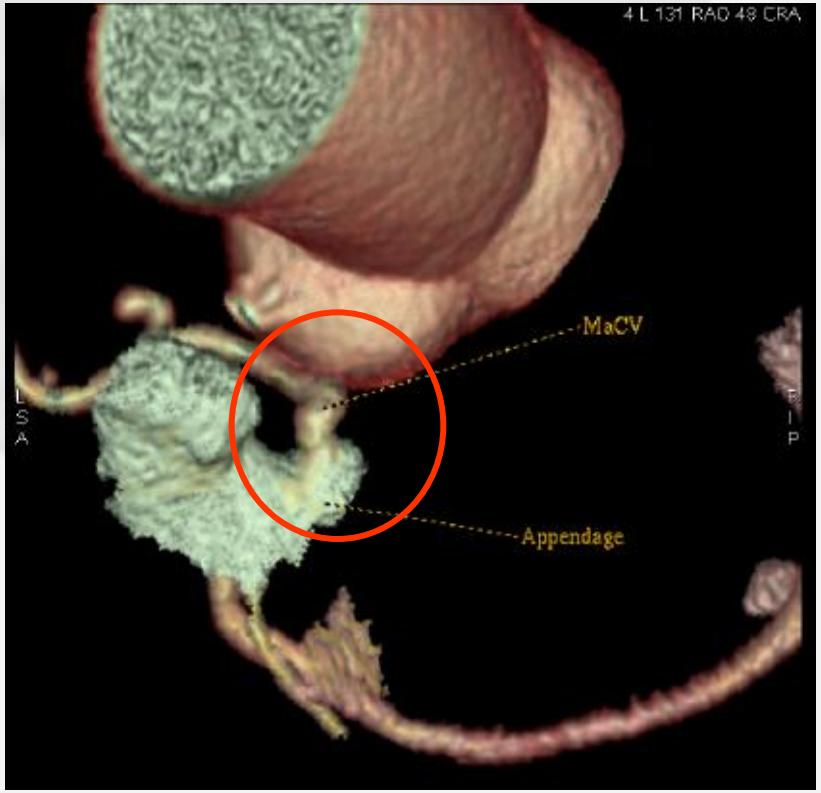
DCM: dilated cardiomyopathy; CAD: coronary artery disease.; *: $p<0.01$ Controls (No-CAD) vs Controls (CAD); §: $p<0.01$ Controls (No-CAD) vs DCM (No-CAD); &: $p<0.01$ Control (No-CAD) vs DCM (CAD); #: $p<0.05$ Controls (CAD) vs DCM (CAD); £: $p<0.01$ DCM (No-CAD) vs DCM (CAD).

Ischemic DCM patients present less cardiac veins than other group

Right Atrium and Cardiac Veins: clinical case

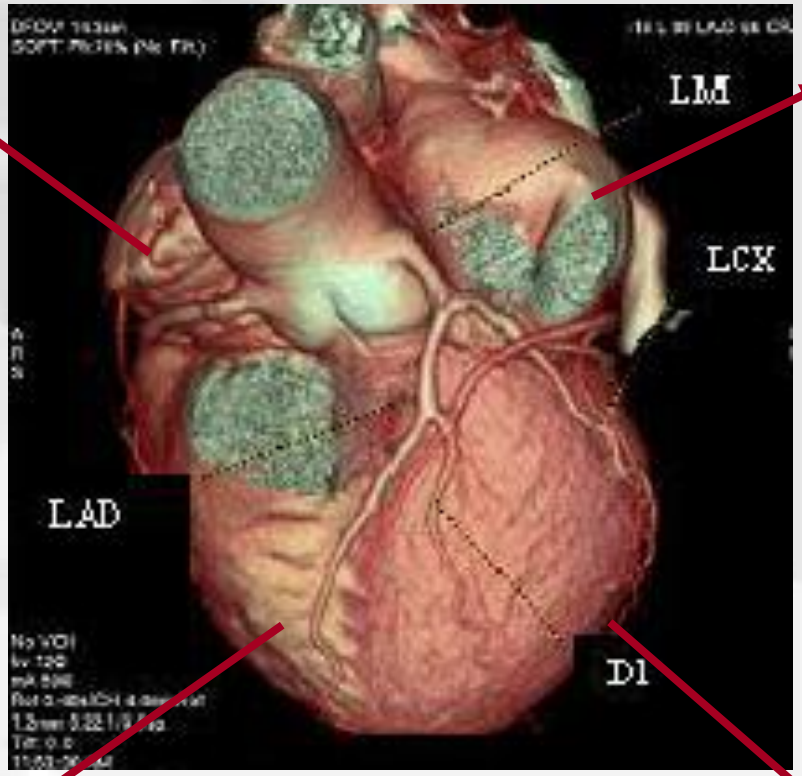
Fistula between greta cardiac vein and left atrial appendage





SUMMARY

- Right Atrium and Cardiac Veins
- Left Atrium and Pulmonary Veins



- Right Ventricle
- Left Ventricle and Aortic root

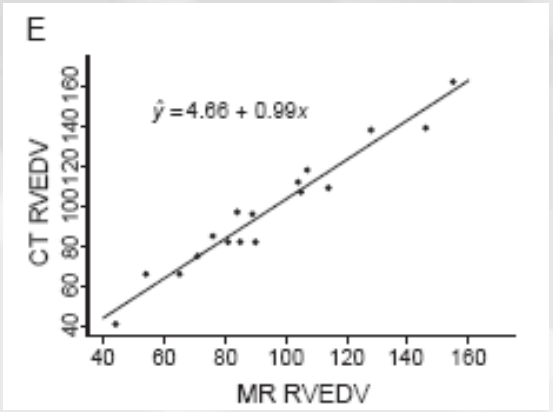
Right Ventricle

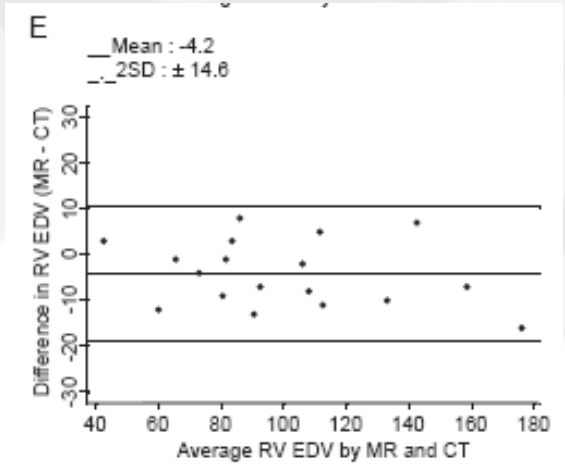
Multi-detector row cardiac computed tomography accurately quantifies right and left ventricular size and function compared with cardiac magnetic resonance

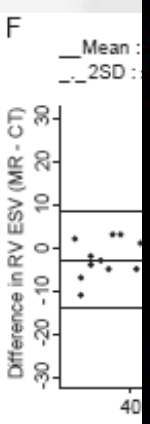
Subha V. Raman, MD, MSEE, Mona Shah, MD, Beth McCarthy, BSRT, Anne Garcia, BSRT, and Amy K. Ferketich, PhD *Columbus, OH*

(Am Heart J 2006;151:736-44.)

Right Ventricle: function

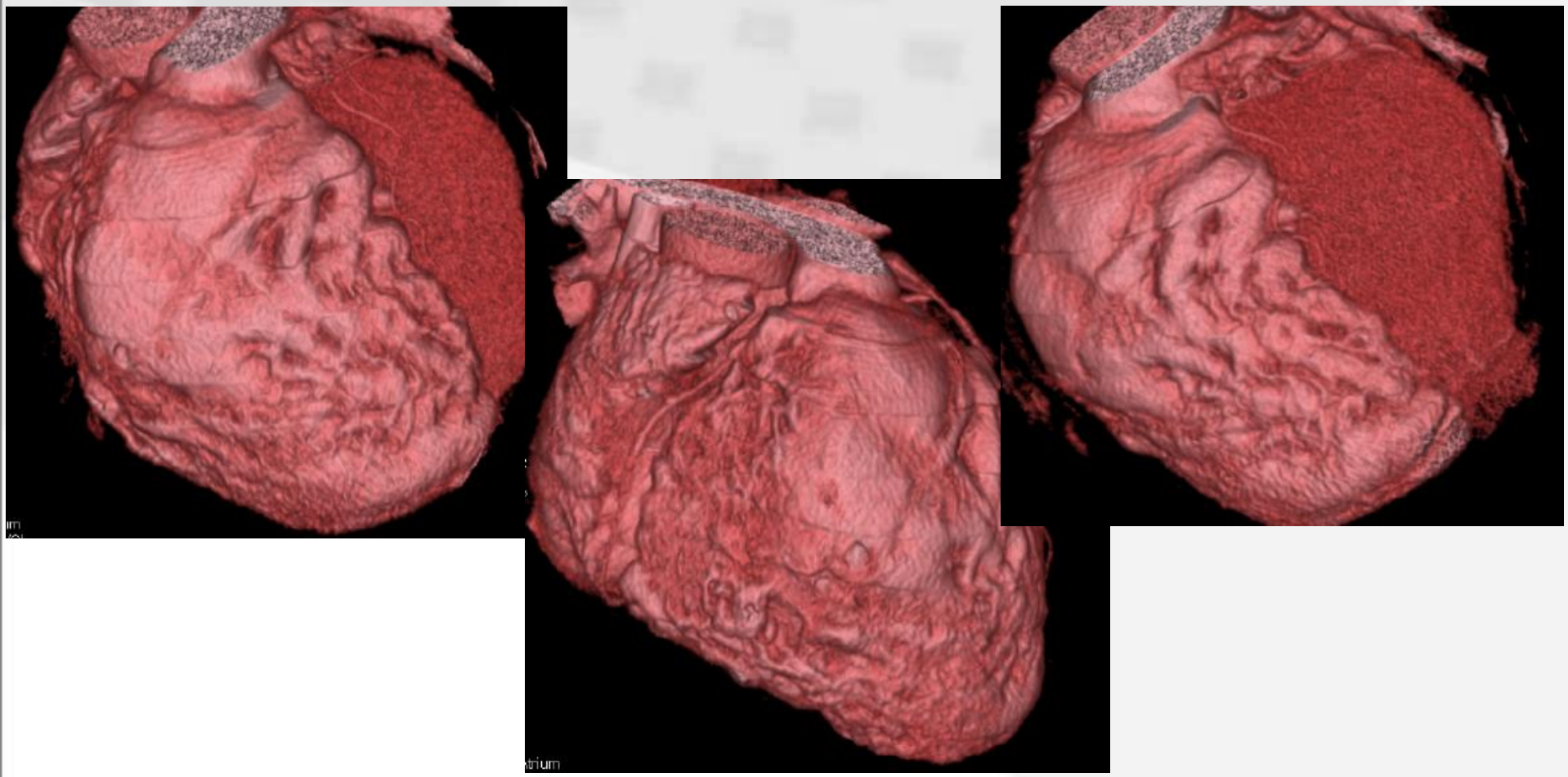






Right Ventricle: clinical case

Left ventricular involvement in arrhythmogenic right ventricular cardiomyopathy demonstrated by multidetector-row computed tomography.
Matsuo S et al. Int J Cardiol. 2007 Feb 14;115(3):e129-31.



RADIOLOGICAL RISK OF MDCT

Estimating Risk of Cancer Associated With Radiation Exposure From 64-Slice Computed Tomography Coronary Angiography

Andrew J. Einstein, MD, PhD
Milena J. Henzlova, MD, PhD
Sanjay Rajagopalan, MD

JAMA. 2007;298(3):317-323

LAR (M, 80 y): 0.075%
1 pts in 1338

LAR (F, 20 y): 0.7%
1 pts in 143

Table 1. Doses From the 8 Computed Tomography Coronary Angiography Protocols

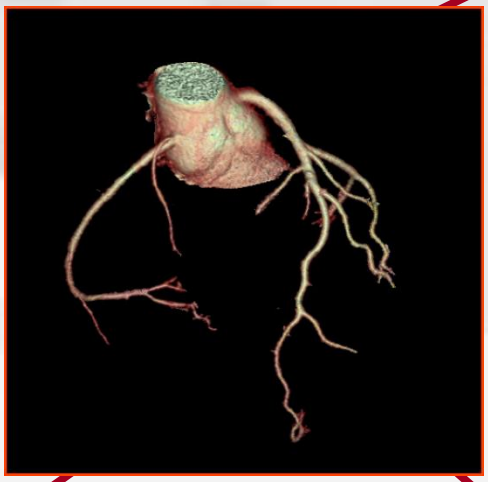
				Organ Equivalent Doses, mSv[a]									
Sex	ECTCM	Aorta	Effective Dose, mSv[b]	Thymus	Breast	Lung	Esophagus	Bone	Adrenals	Marrow	Liver	Small Intestine	Stomach
Female	No	No	21	79	77	74	47	29	15	13	12	9	8
Male	No	No	15	29		65	37	24	30	10	22	15	14
Female	Yes	No	14	52	50	48	30	19	10	8	8	6	5
Male	Yes	No	9	19		42	24	15	20	7	14	9	9
Female	No	Yes	29	114	80	91	77	47	16	21	12	9	8
Male	No	Yes	23	107		90	63	41	31	18	23	16	14
Female	Yes	Yes	19	74	52	59	50	31	10	14	8	6	6
Male	Yes	Yes	15	69		58	41	26	20	12	15	10	9

Abbreviation: ECTCM, electrocardiographically controlled tube current modulation.
[a]Organ equivalent doses reported here only for organs with a dose >10 mSv for standard male or female patient; the doses are displayed here as integers, although more significant figures were retained for calculations.
[b]Effective dose determined using International Commission on Radiological Protection Publication 60 tissue weighting factors.[13]

SUMMARY: conclsions

Right Atrium and Cardiac Veins

Left Atrium and Pulmonary Veins



Right Ventricle

Left Ventricle and Aortic root

THANKS FOR YOUR ATTENTION