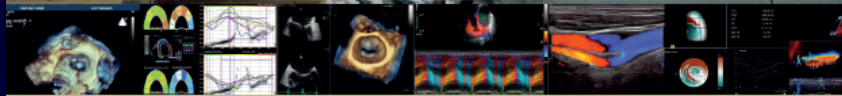




Società Italiana di Ecografia Cardiovascolare

WWW.SIEC.IT



ECOCARDIOGRAFIA 2015
XVII Congresso Nazionale SIEC

Hotel Royal Continental

Napoli, 16-18 Aprile 2015

**3D echo: una nuova
finestra su endocarditi,
trombi e auricola**

Paolo Colonna, MD FESC
*Cardiologia Ospedaliera,
Policlinico di Bari*
Presidente eletto nazionale SIEC



VENERDÌ, 17 APRILE 2015

■ 14.00-15.00

AUDITORIUM

**EVOLUZIONI NEL 3D E NELLO SPECKLE TRACKING:
SEMPRE UNA PROMESSA O UNA MATURA REALTÀ DIAGNOSTICA?**

EVENTO SCIENTIFICO NON AVENTE DIRITTO AI CREDITI ECM

organizzato con il supporto di Philips

Moderatori: **M. Marzilli** (Pisa), **F. Romeo** (Roma)

- 14.00 Anatomical Intelligent e Big Data: le nuove soluzioni per rendere l'ecocardiografia avanzata fruibile nell'attività quotidiana
R. Francavilla (Roma)
- 14.10 Novità nel campo transtoracico tridimensionale sul prollasso mitralico
M. Pepi (Milano)
- 14.22 3D echo: una nuova finestra su endocarditi, trombi e auricola
P. Colonna (Bari)
- 14.34 Meriti dell'eco 3D nel trattamento delle cardiopatie strutturali
G. La Canna (Milano)
- 14.46 La profonda rivisitazione nella valutazione della funzione cardiaca con modalità speckle tracking
V. Di Bello (Pisa)

VENERDÌ 17 APRILE

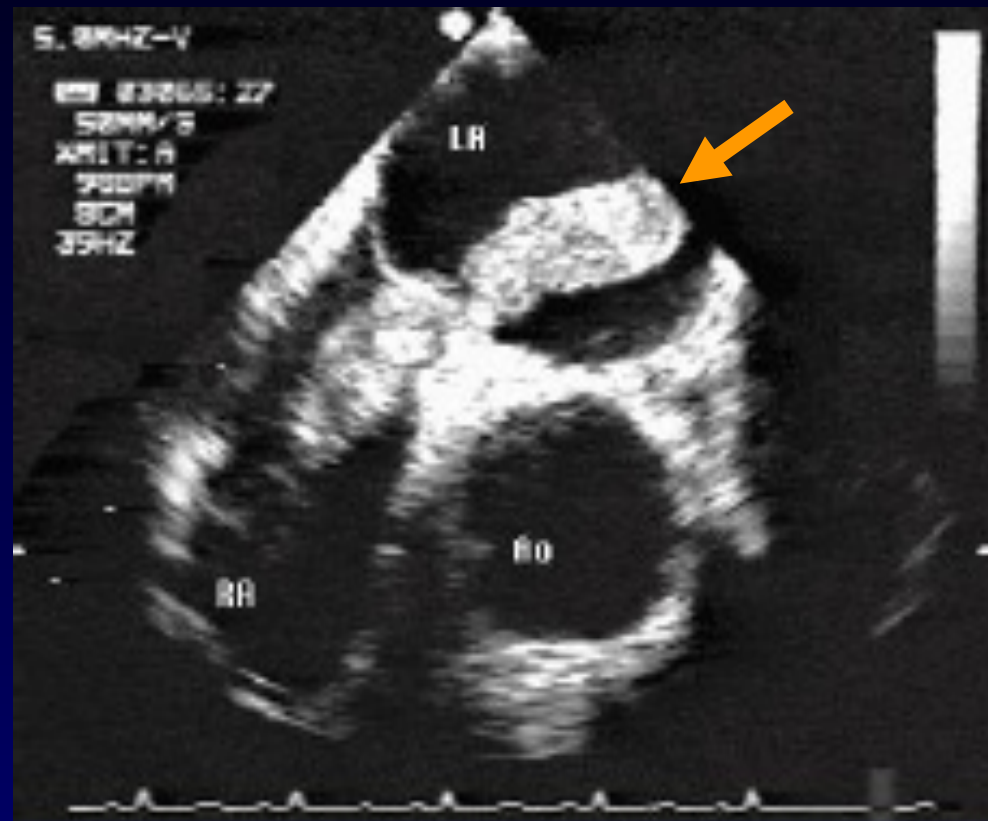


Actual Source	Echocardiographic Findings
LV thrombus	Apical aneurysm, presence of thrombus, dilated CM, <i>hypertrabeculation / noncompaction</i>
LA thrombus	3 Thrombus in LAA , spontaneous echo contrast, LAA emptying velocity, mitral stenosis, interatrial septal low aneurysm
Pelvic veins or LL thrombus	ASD, atrial septal aneurysm, PFO 1
Native valves	Vegetation , tumor, MVP, mitral annular calcification, sclerotic aortic valve 4
Prosthetic valves	Thrombus, vegetation
Cardiac tumor	LA myxoma, papillary fibroelastoma
a	Complex aortic plaque , atheroma 2



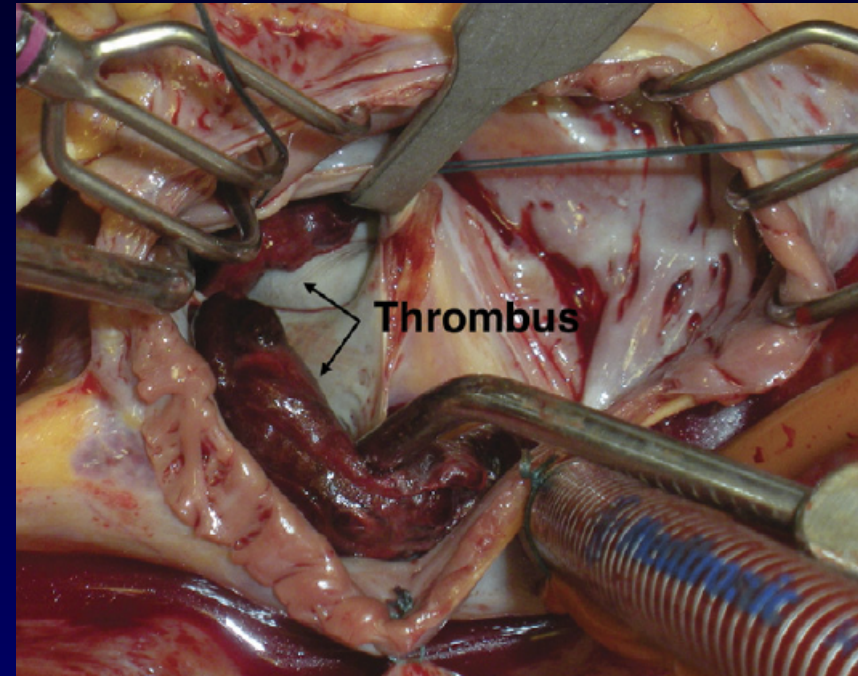
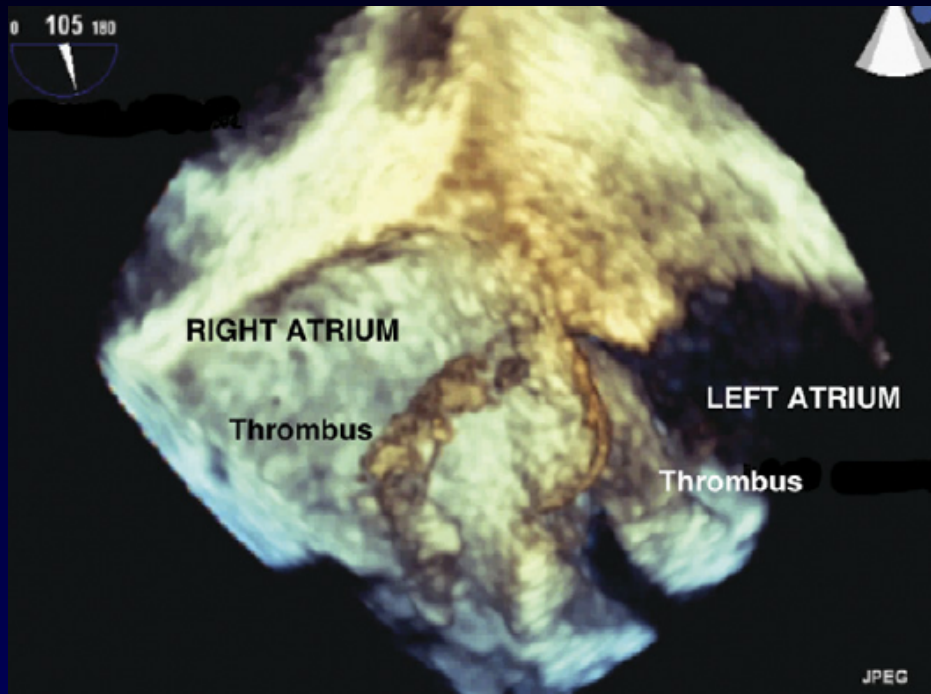
Multiplane TEE to detect effectiveness of selective pulmonary rt-PA thrombolysis in pulmonary embolism and PFO

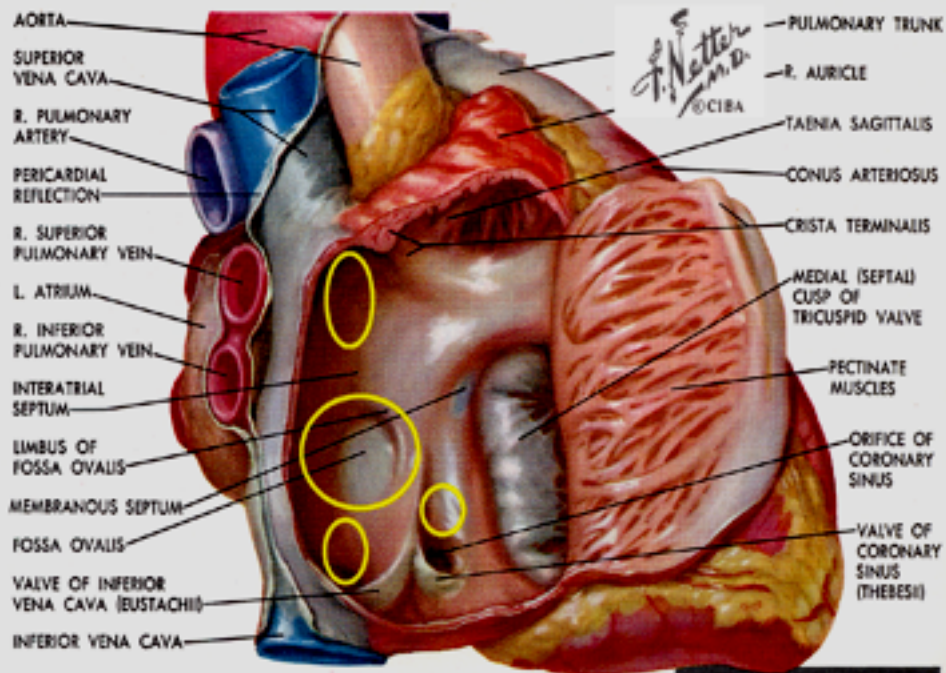
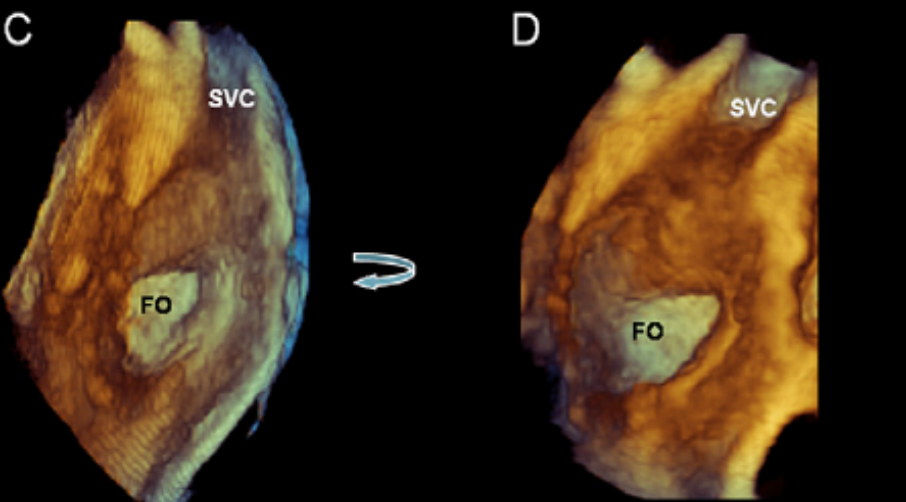
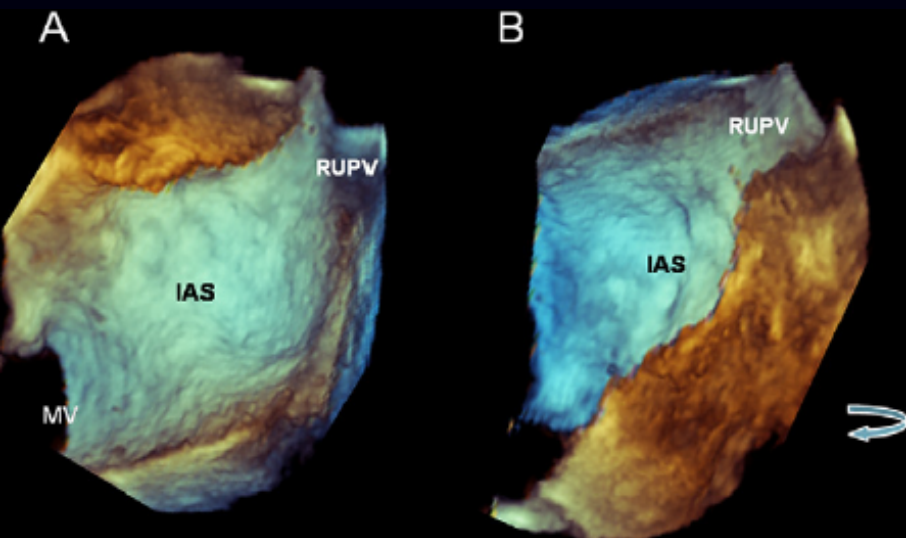
Colonna, JASE 1997



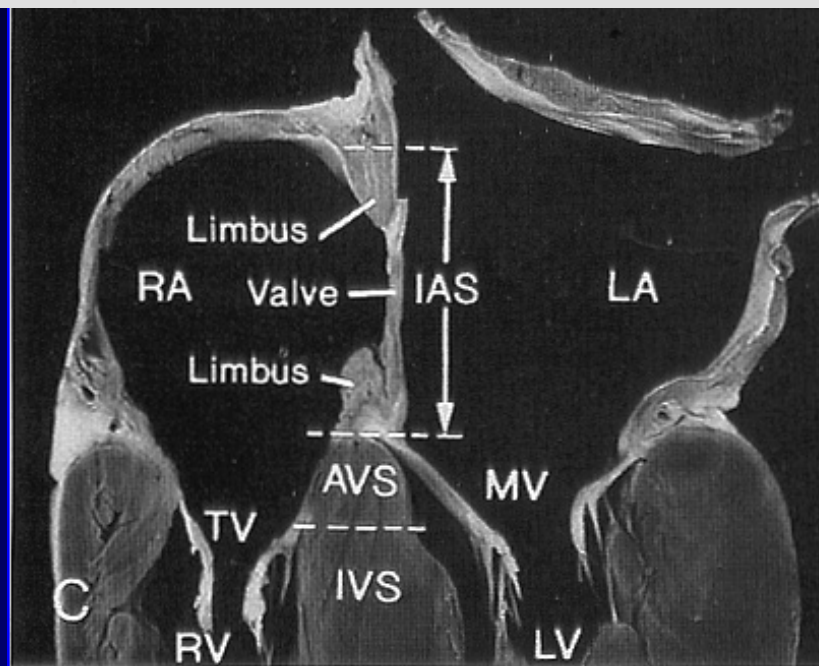
3D TEE of a thrombus entrapped by a patent foramen ovale

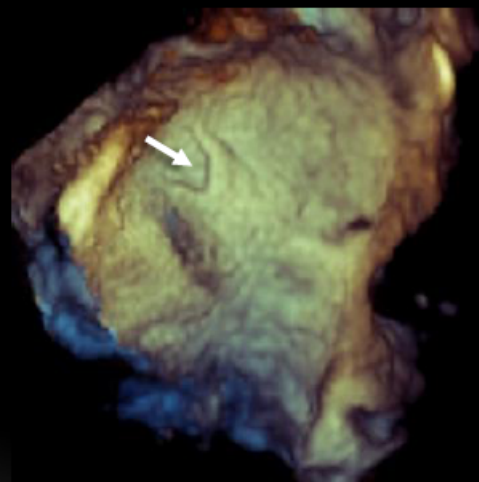
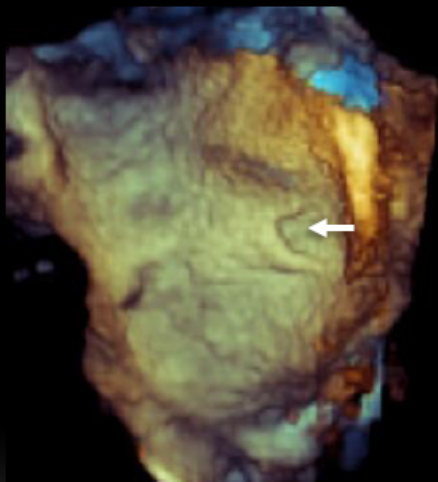
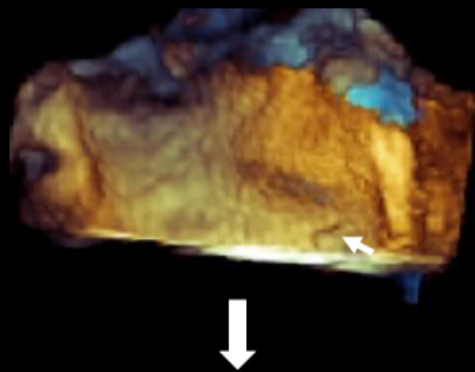
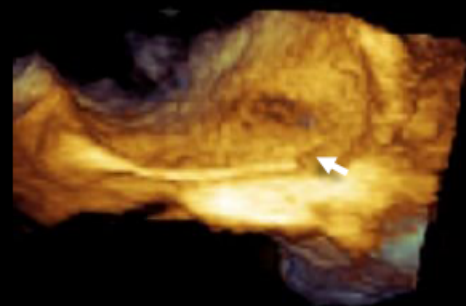
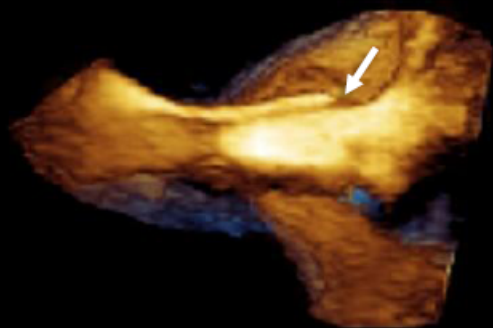
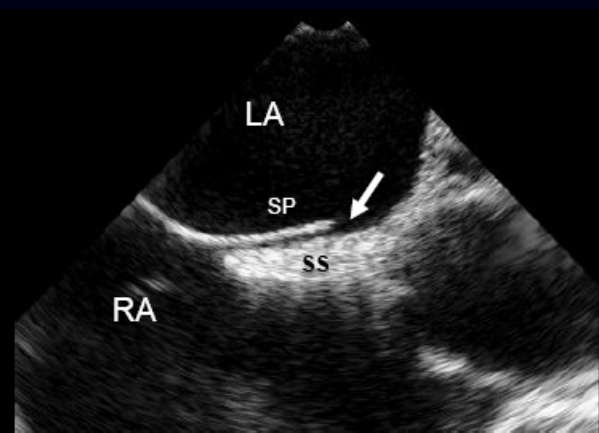
Sattiraju, Ann Thorac Surg 2012

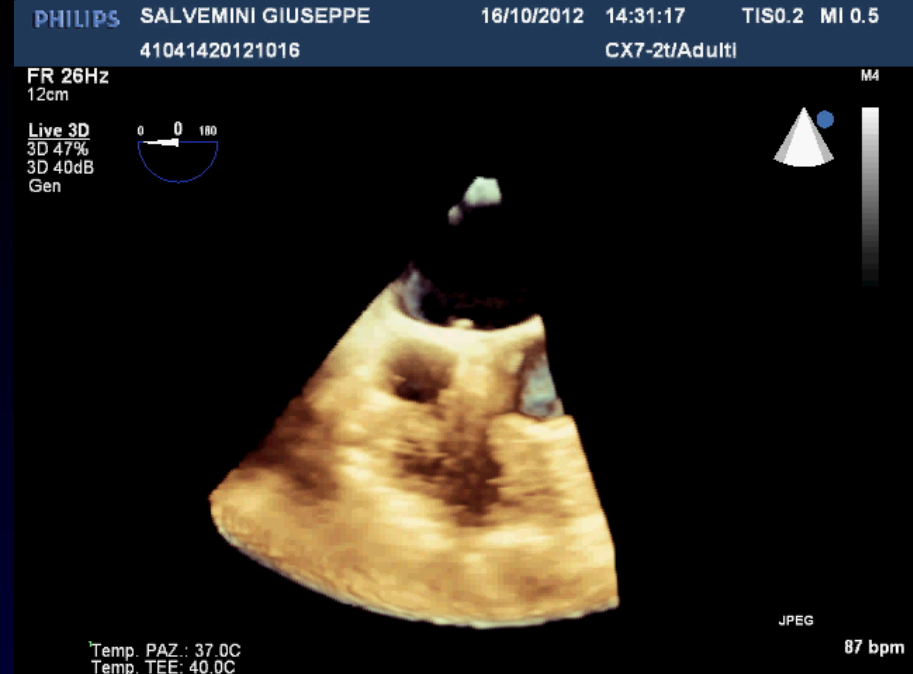
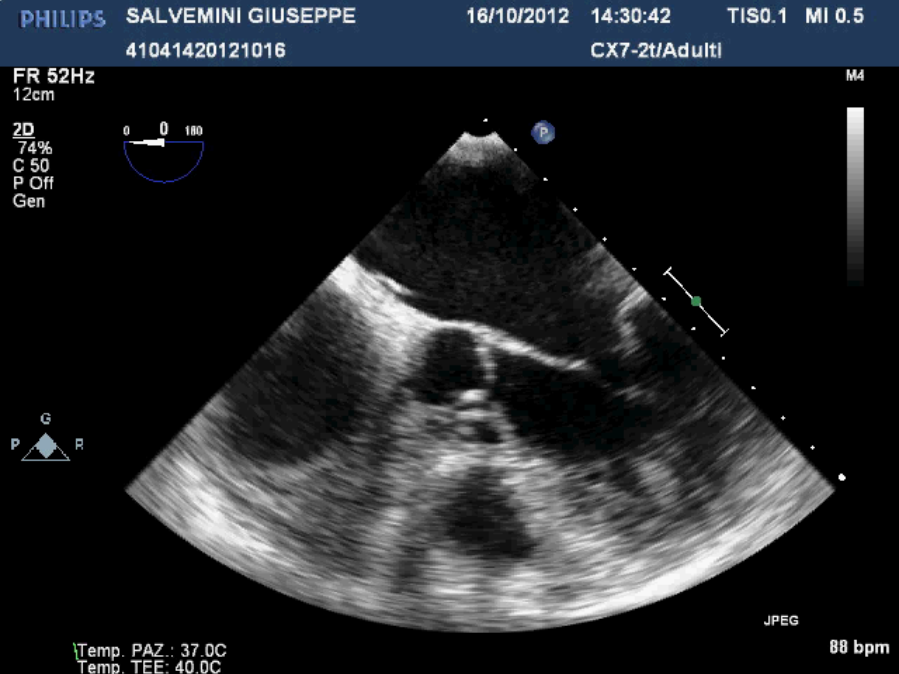




RIGHT ATRIUM OPENED AND VIEWED FROM THE RIGHT SIDE



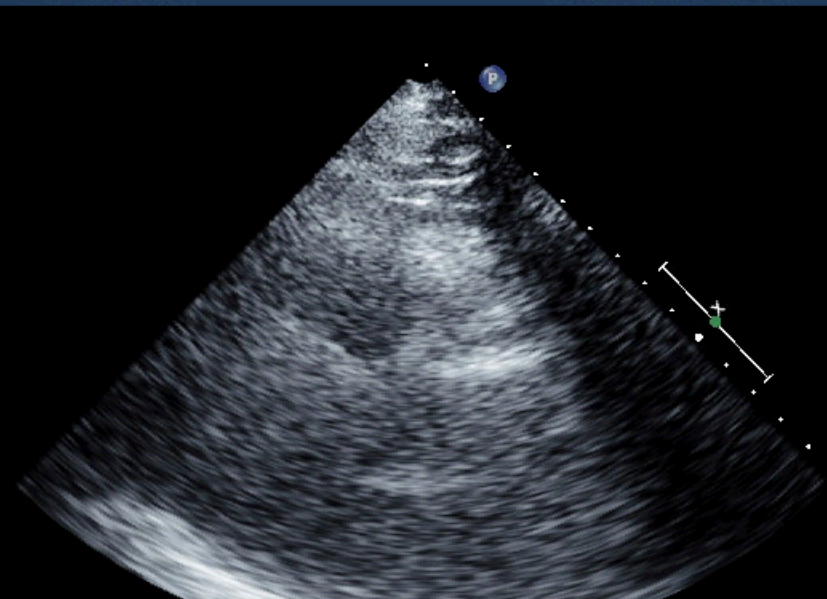




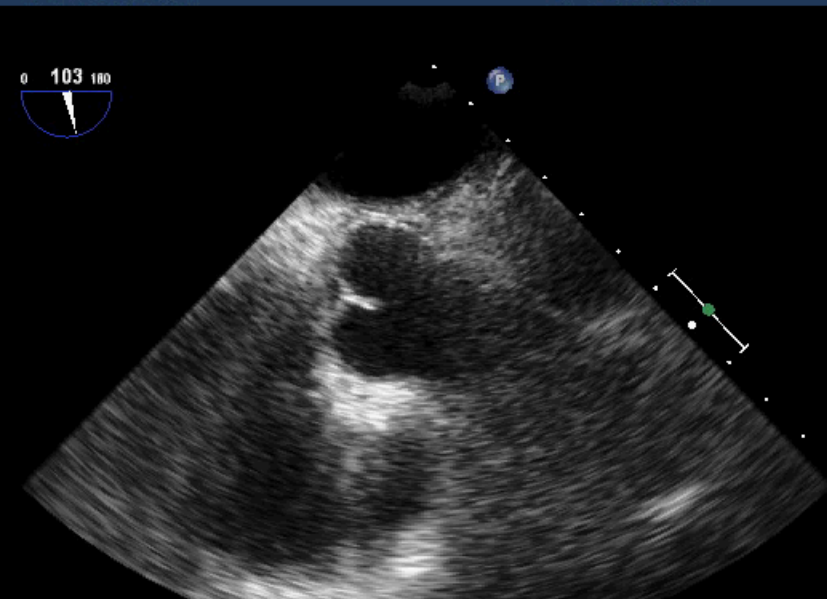
<i>Actual Source</i>	<i>Echocardiographic Findings</i>
LV thrombus	Apical aneurysm, presence of thrombus , dilated CM, <i>hypertrabeculation / noncompaction</i>
LA thrombus	Thrombus in LAA , spontaneous echo contrast, LAA emptying velocity, mitral stenosis, interatrial septal low aneurysm
Pelvic veins or LL thrombus	ASD, atrial septal aneurysm, PFO
Native valves	Vegetation, tumor, MVP, mitral annular calcification, sclerotic aortic valve
Prosthetic valves	Thrombus, vegetation
Cardiac tumor	LA myxoma, papillary fibroelastoma
Aorta	Complex aortic plaque , atheroma 2

FR 45Hz
15cm

2D
46%
C 50
P Bassa
APen



M3

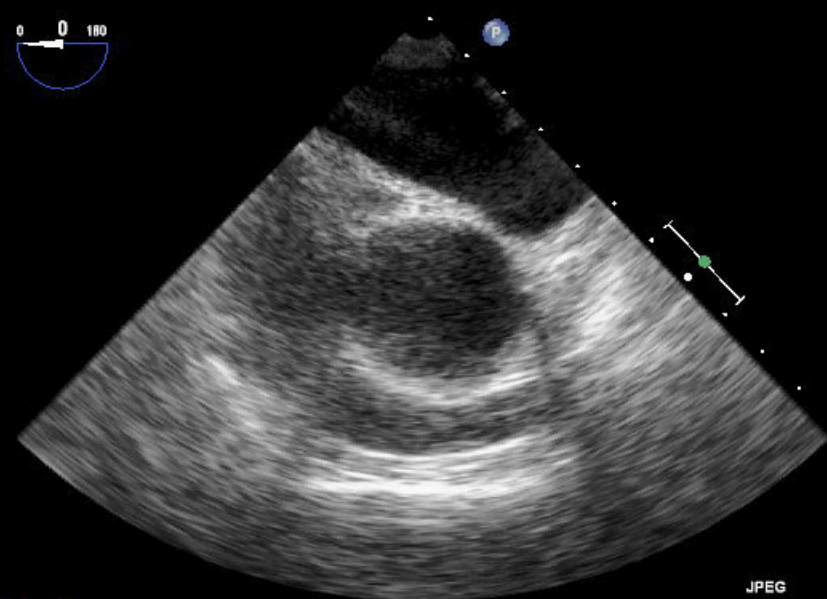


M4

PHILIPS Cardiology Hosp Policlinico Bari 17/09/2012 15:12:04 TIS0.1 MI 0.5 26211020120917 CX7-2t/AdultI

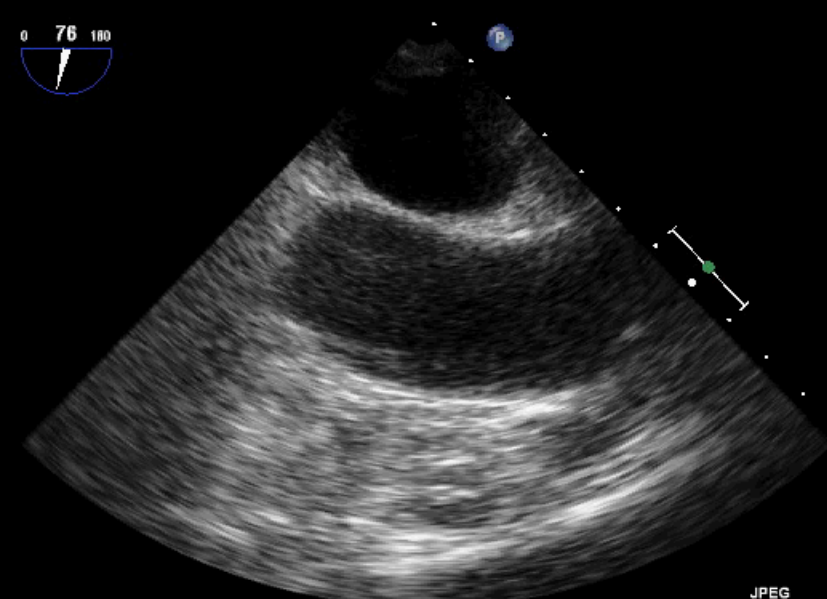
FR 52Hz
11cm

2D
66%
C 50
P Off
Gen



M4

Cardiology Hosp Policlinico Bari 17/09/2012 15:11:41 TIS0.1 MI 0.5 26211020120917 CX7-2t/AdultI



M4

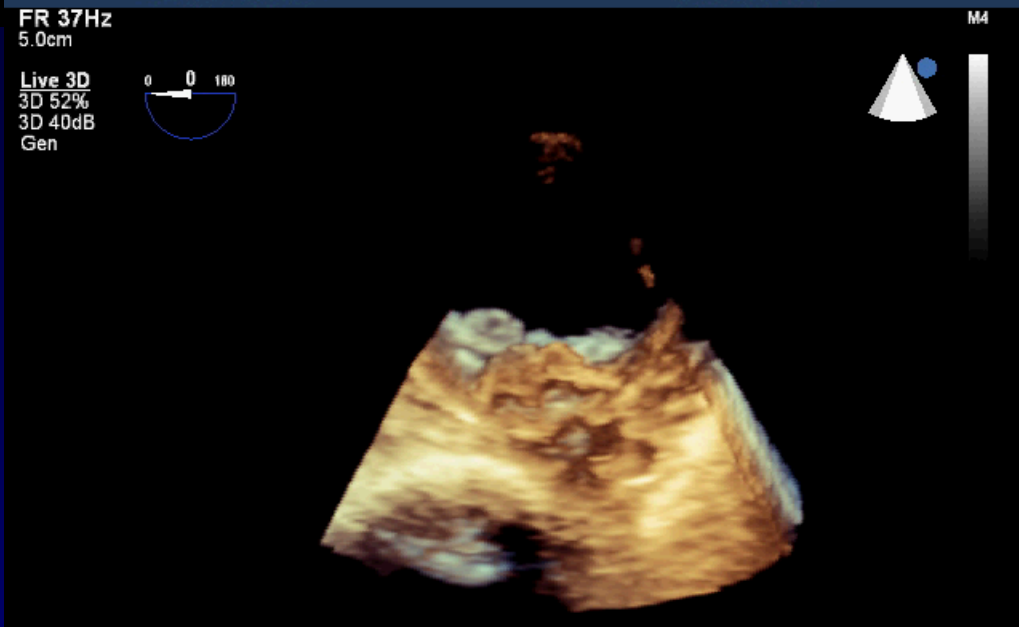
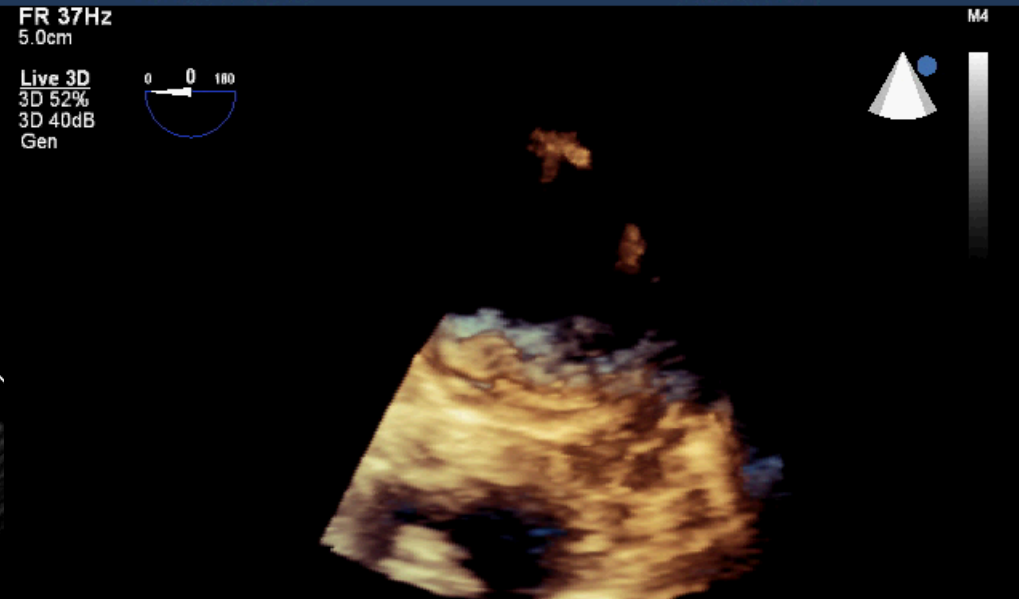
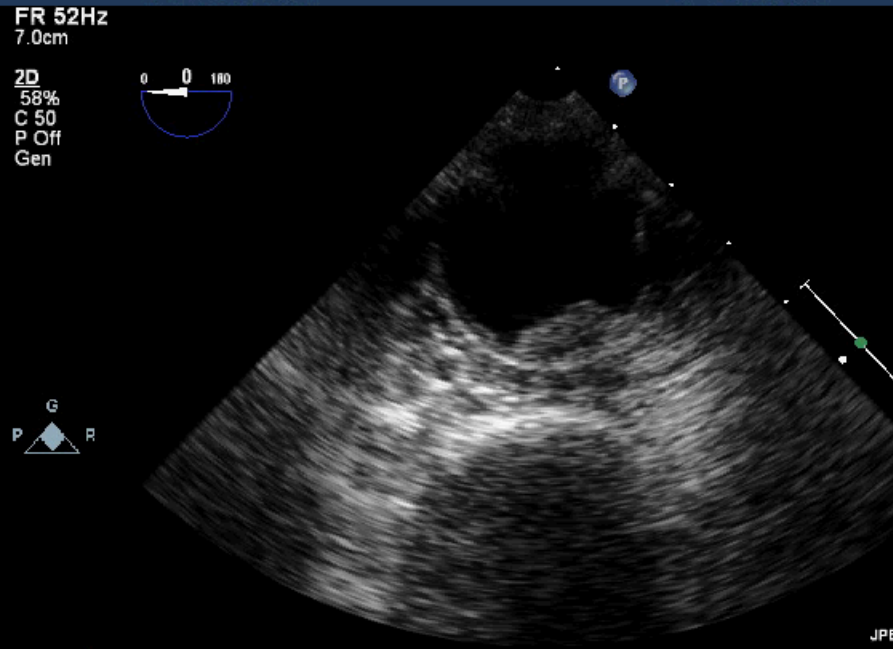
Temp. PAZ.: 37.0C
Temp. TEE: 39.1C

JPEG

93 bpm
p. PAZ.: 37.0C
p. TEE: 39.1C

JPEG

93 bpm



26211020120917

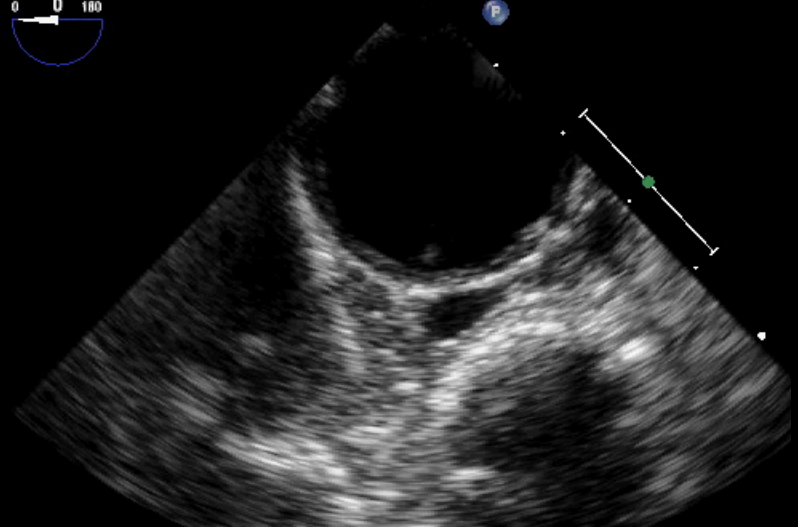
CX7-2t/AdultI

26211020120917

CX7-2t/AdultI

FR 52Hz
6.0cm

D
55%
: 50
Off
Gen



G
R

FR 37Hz
6.0cm

Live 3D
3D 52%
3D 40dB
Gen



PHILIPS Cardiology Hosp Policlinico Bari 17/09/2012 15:19:32 TIS0.1
26211020120917 CX7-2t/AdultI

FR 37Hz
5.0cm

Live 3D
3D 45%
3D 40dB
Gen



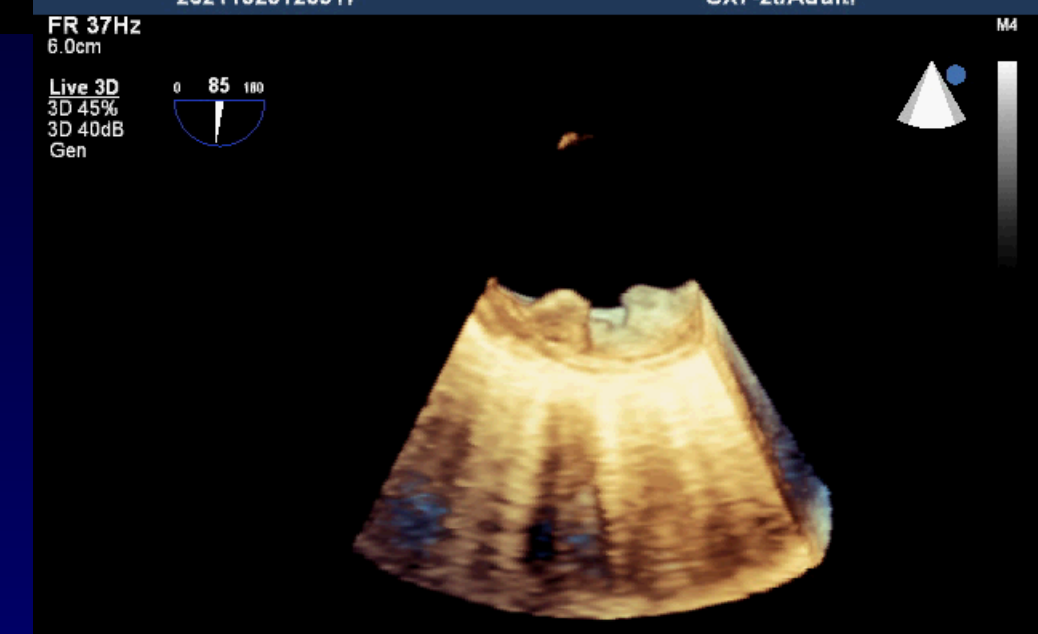
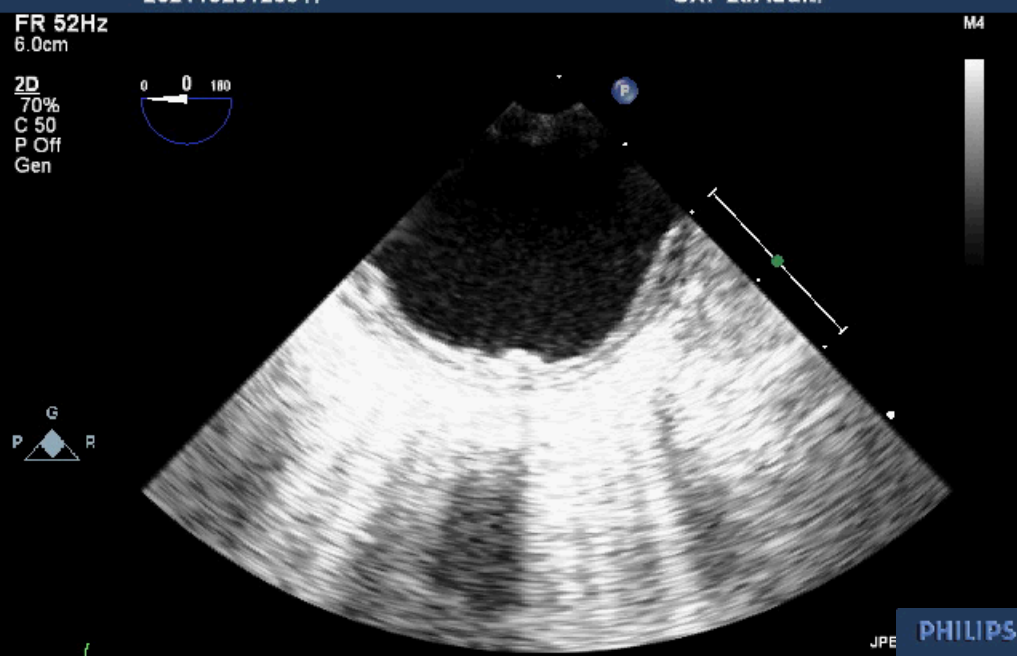
Temp. PAZ.: 37.0C
Temp. TEE: 39.1C

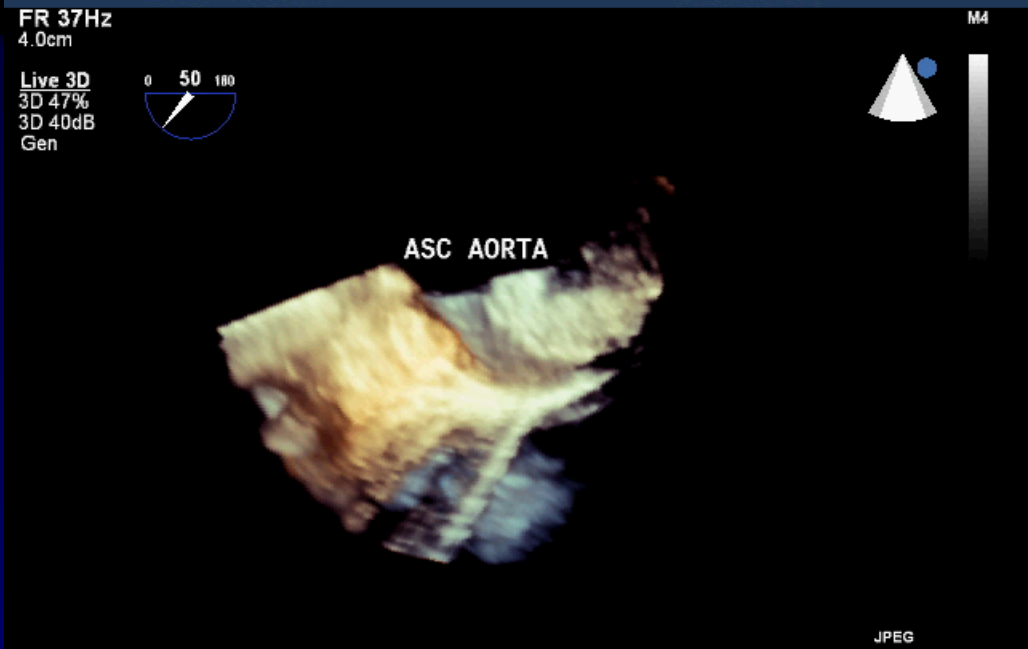
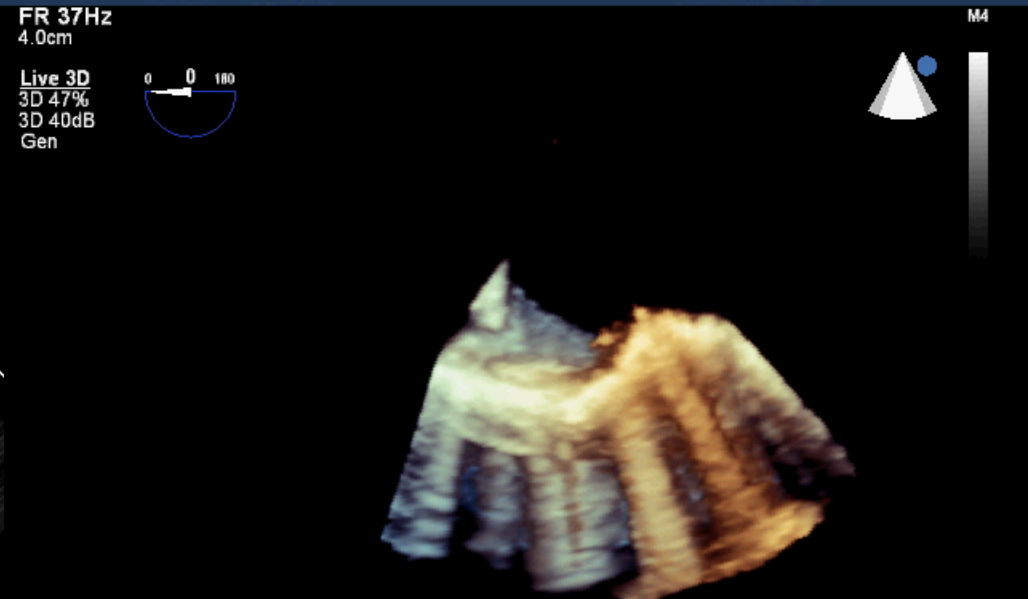
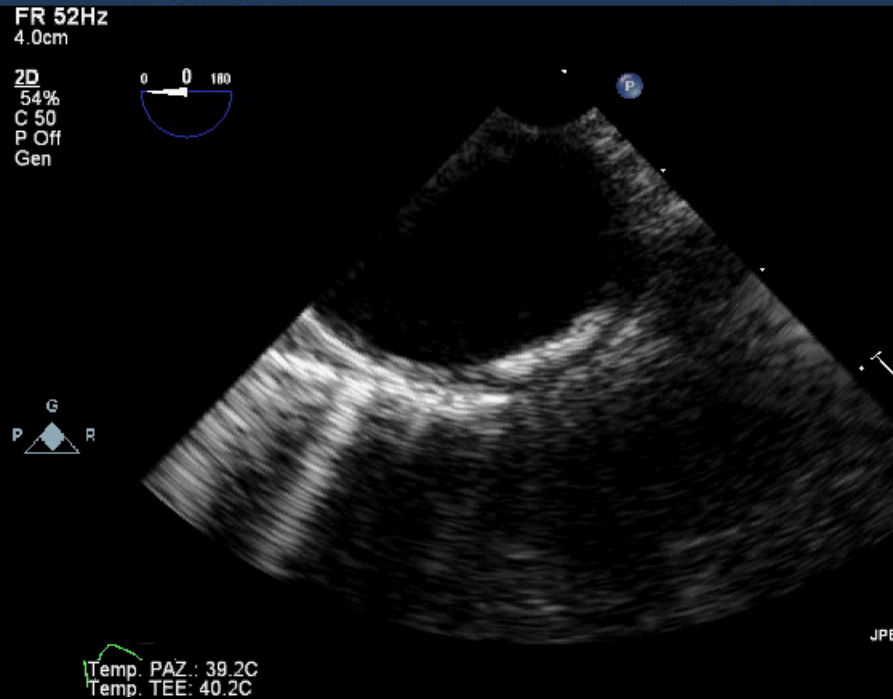
JPEG
91 bpm

Temp. PAZ.: 37.0C
Temp. TEE: 39.1C

JPEG
91 bpm







Actual Source	Echocardiographic Findings
LV thrombus	Apical aneurysm, presence of thrombus , dilated CM, <i>hypertrabeculation / noncompaction</i>
LA thrombus	Thrombus in LAA , spontaneous echo contrast, LAA emptying velocity, mitral stenosis, interatrial septal low aneurysm
Pelvic veins or LL thrombus	ASD, atrial septal aneurysm, PFO
Native valves	Vegetation , tumor, MVP, mitral annular calcification, sclerotic aortic valve
Prosthetic valves	Thrombus, vegetation
Cardiac tumor	LA myxoma, papillary fibroelastoma
a	Complex aortic plaque , atheroma

3



Echocardiography in atrial fib: information for clinical decisions

EAE recommendations, EJE '10

- Thrombi
- Spontaneous echocontrast
- LA appendage velocities
- **LV function and thrombi**
- Patent foramen ovale

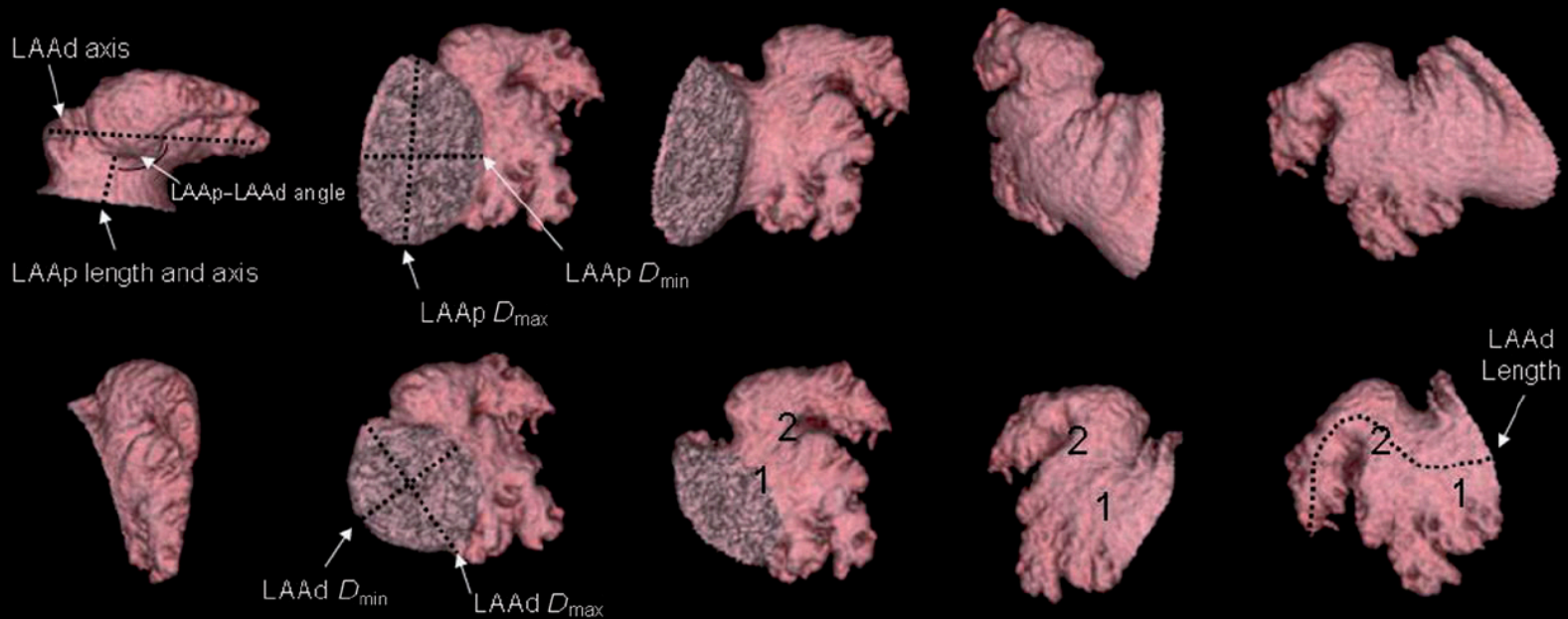
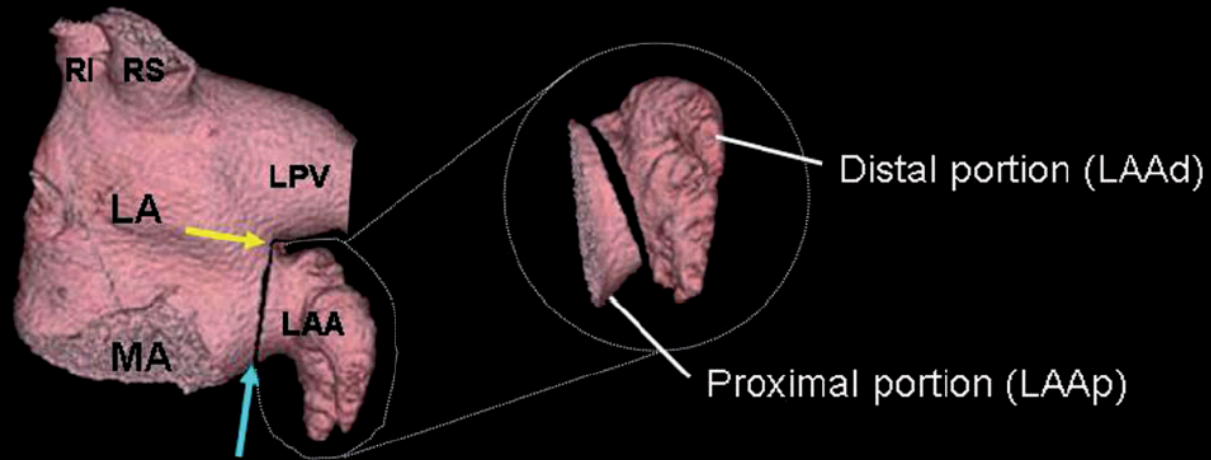
**Atrio auricular
function**

Only with TOE

Complex aortic plaques

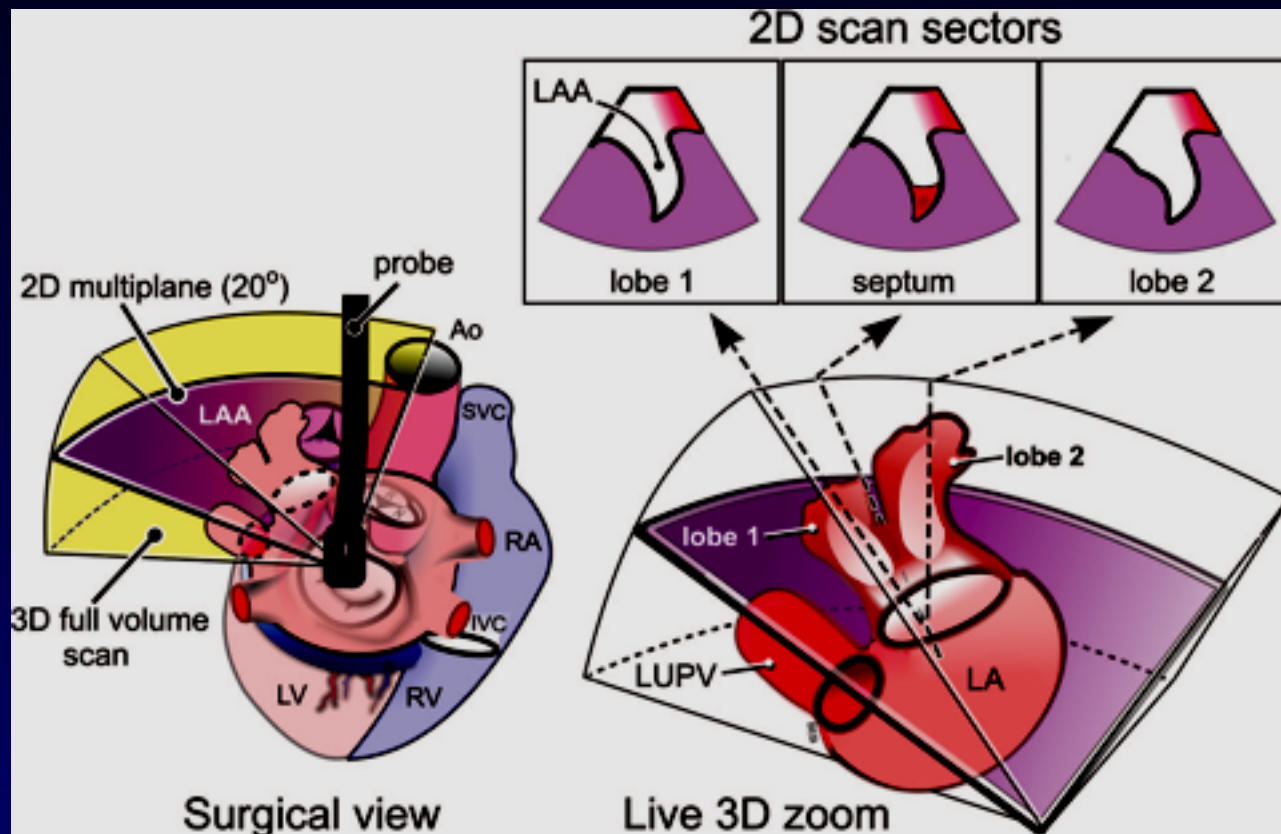


Complexity of LAA anatomy



Thrombus or bilobar left atrial appendage? Diagnosis by Real-Time 3D TEE

Mizuguchi, Anesth analg 2009



Thrombus or bilobar left atrial appendage? Diagnosis by Real-Time 3D TEE

Mizuuchi, Anesth analg 2009

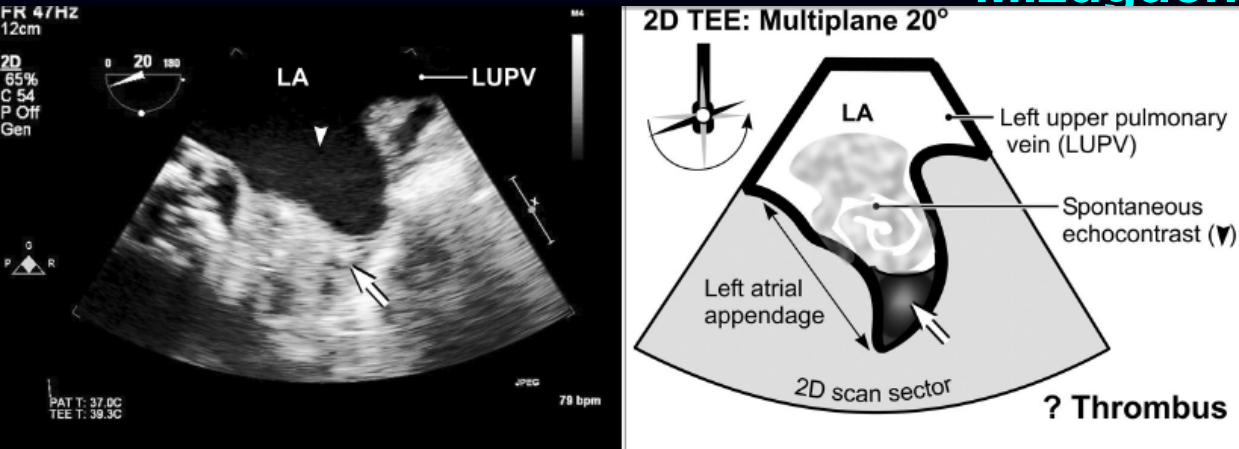
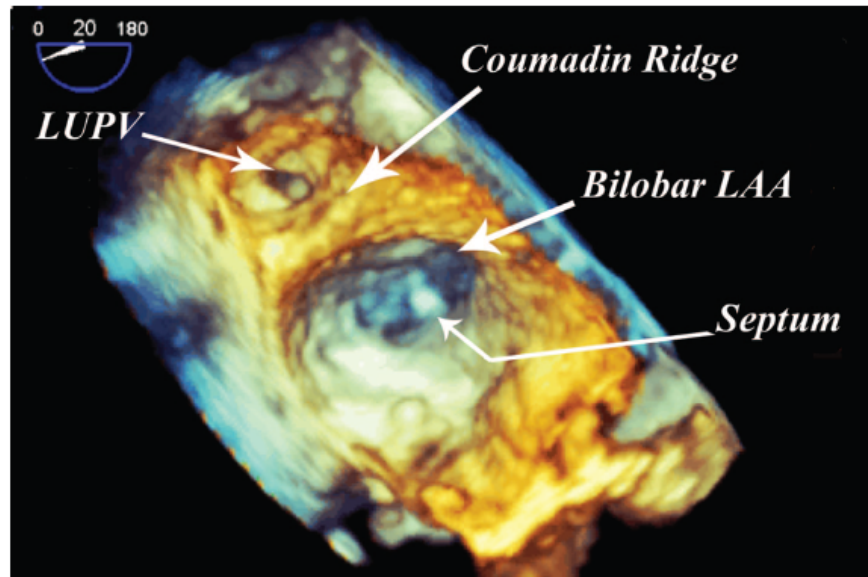


Figure 1. 2D TEE View of LAA. Mid-esophageal 20° 2D TEE view of the LAA showing spontaneous echo contrast and the questionable thrombus is noted on the left. A schematic of the view is noted on the right. The arrows in the figures point to the questionable thrombus and the arrowhead (left figure) points to the spontaneous echo contrast. 2D TEE = two-dimensional transesophageal echocardiography; LAA = left atrial appendage.



Evaluation of left atrial appendage function and thrombi in patients with AF: from transthoracic to real time 3D TEE

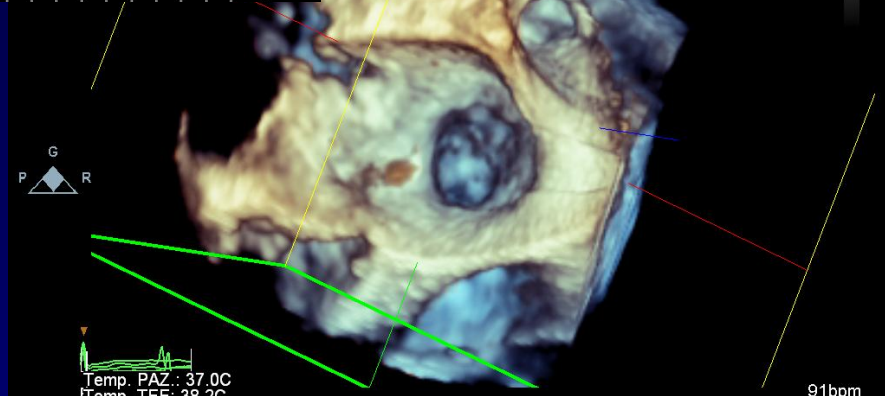
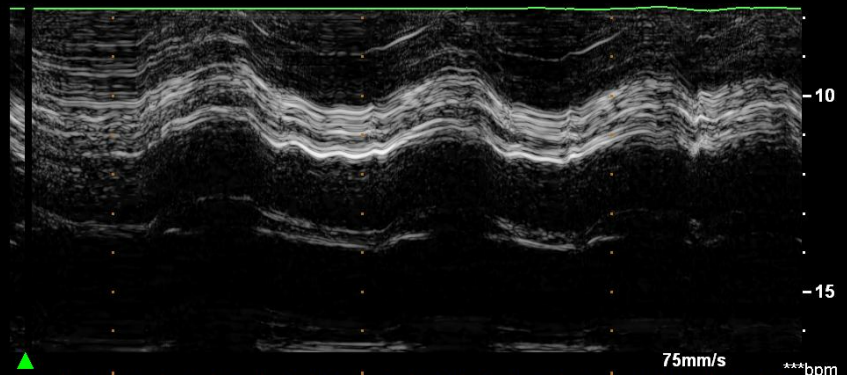
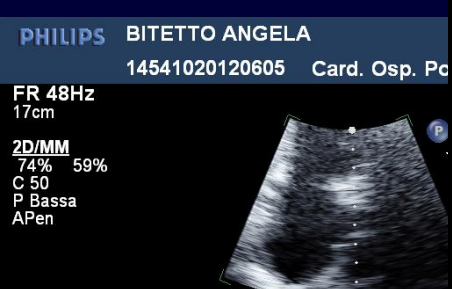
Colonna et al. Eur J CV Imag 2012 in press

Parametri ecocardiografici pre-CV, media \pm DS	
<i>2DTEE e RT3DTEE</i>	Totale 93 pazienti
Definizione della LLAeV, n (%)	93 (100)
LLAeV, cm/s (93/93)	41,3 \pm 17,3
LLAeV < 40 cm/s (LLA disfunzionante), n (%)	49 (52,7)
LLAeV \leq 20 cm/s (LLA gravemente disfunzionante), n (%)	10 (10,7)
LLArV, cm/s (67/93)	41,1 \pm 15,4
Visualizzazione della LAA, n (%)	93 (100)
Diametro diastolico massimo della LAA, mm (38/93)	17,8 \pm 7,9
Diametro sistolico minimo della LAA, mm (24/93)	10,5 \pm 6,5
Change percentuale dell'area della LAA (24/93)	0,4 \pm 0,4
Presenza certa di trombi alla 2DTEE, n (%)	8 (8,6)
Dubbio diagnostico per trombosi alla 2DTEE, n (%)	5 (5,4)
Presenza certa di trombi alla RT3DTEE, n (%)	9 (9,7)
Presenza di muscoli pettinati alla RT3DTEE, n (%)	4 (4,3)



Evaluation of left atrial appendage function and thrombi in patients with AF: from transthoracic to real time 3D TEE

Colonna et al. Eur J CV Imag 2012 in press

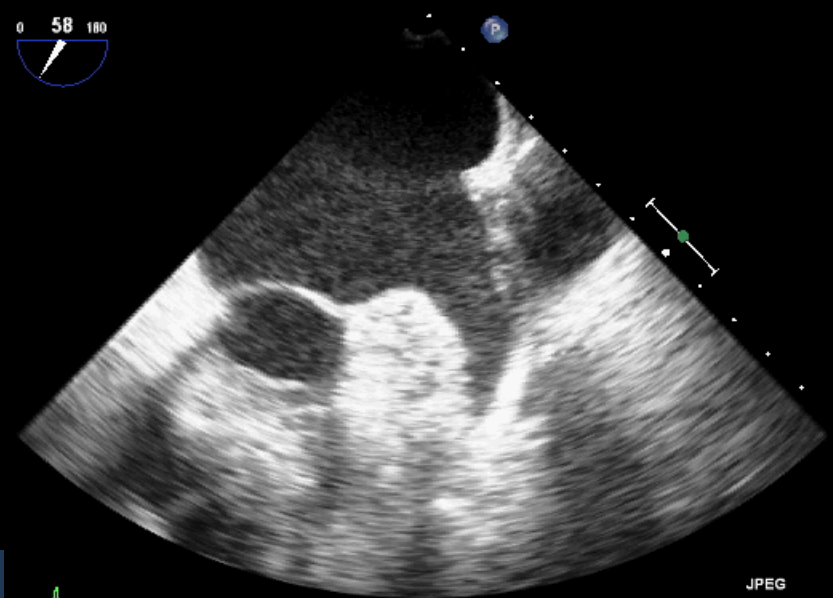


14541020120605

CX7-2t/AdultI

FR 52Hz
12cm

2D
75%
C 50
P Off
Gen



JPEG

103 bpm

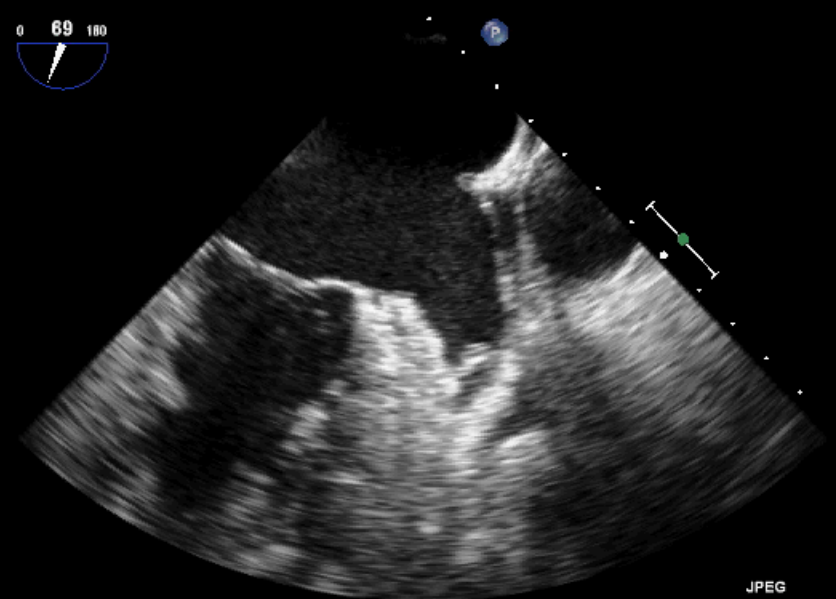
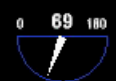
p. PAZ.: 37.0C
p. TEE: 38.3C

14541020120605

CX7-2t/AdultI

FR 52Hz
12cm

2D
66%
C 50
P Off
Gen



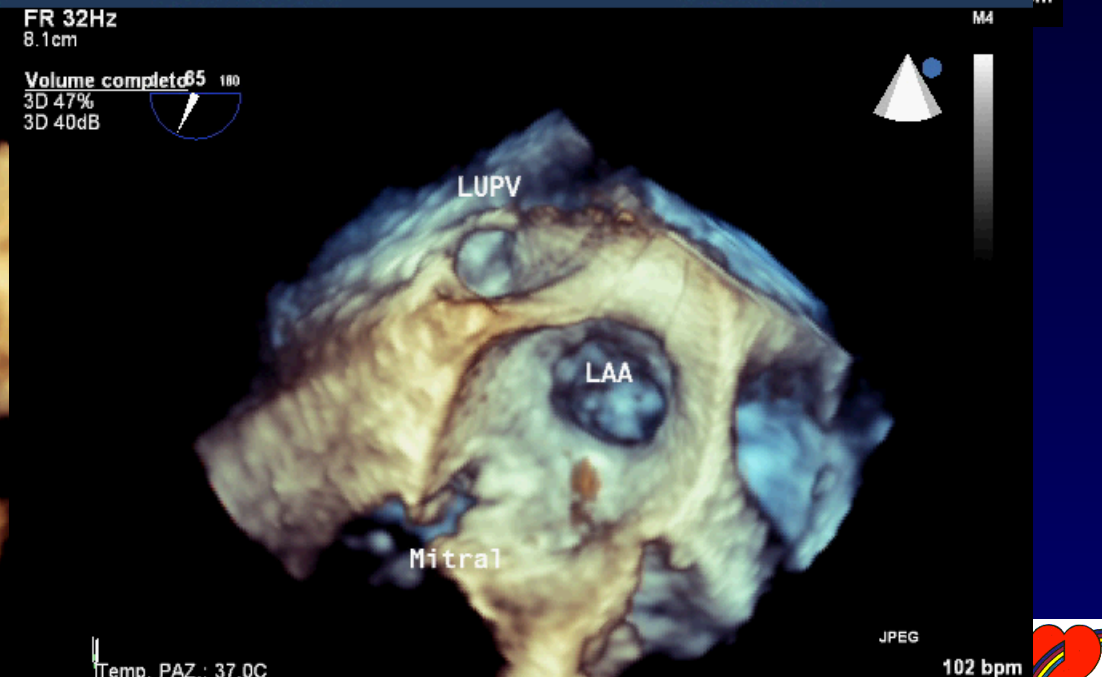
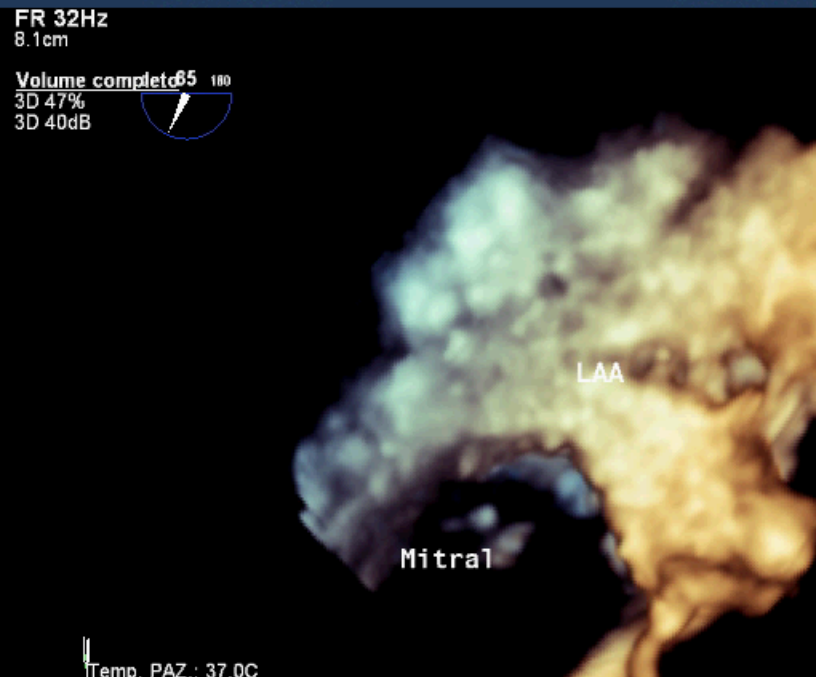
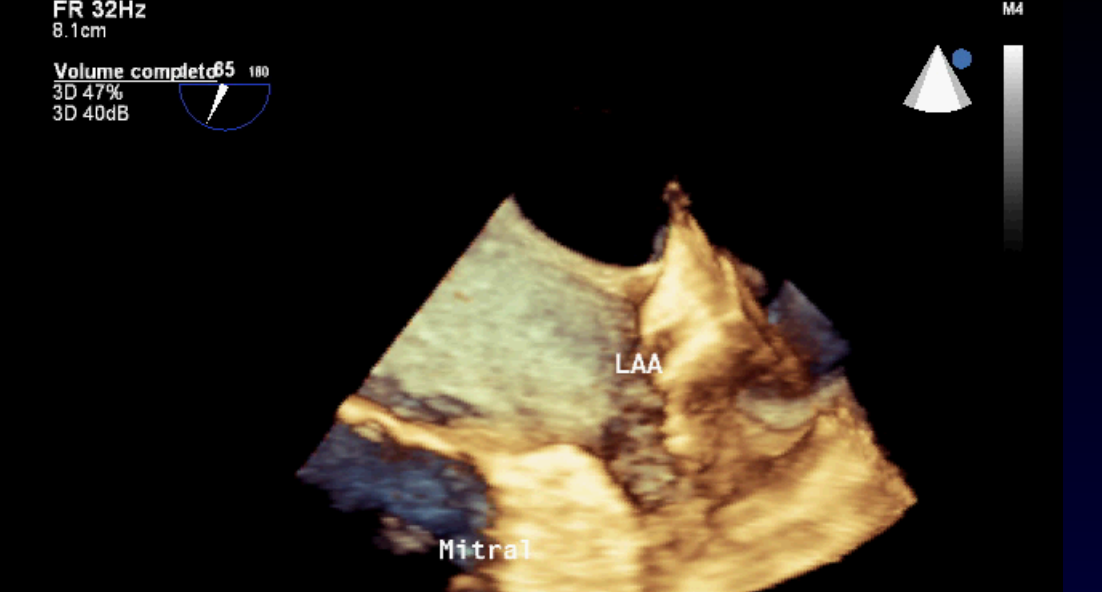
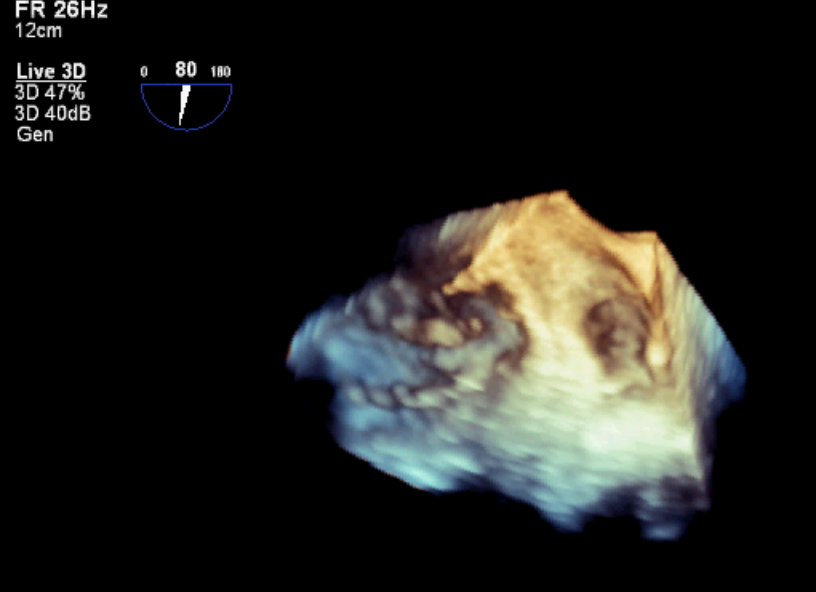
M4

JPEG

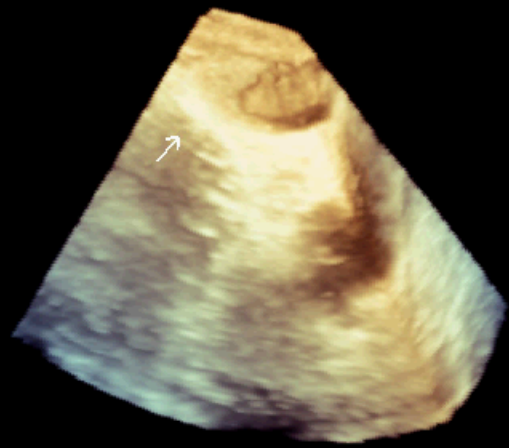
99 bpm

Temp. PAZ.: 37.0C
Temp. TEE: 38.6C

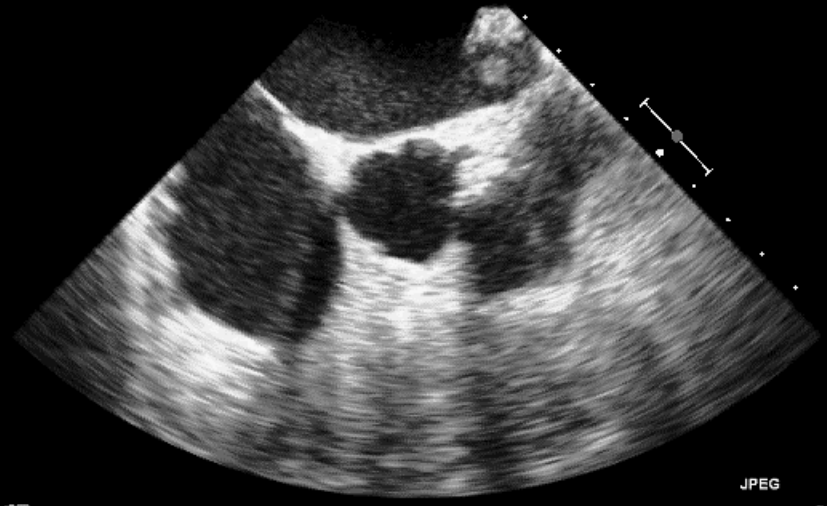




FR 28Hz
11cm
Live 3D
3D 47%
3D 40dB
Gen



FR 52Hz
12cm
2D
69%
C 50
P Off
Gen



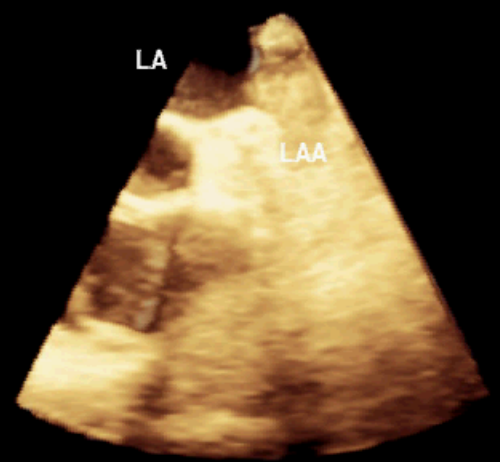
JPE

Temp. PAZ.: 37.0C
Temp. TEE: 38.9C

JPEG

83 bpm

12cm
Live 3D
3D 47%
3D 40dB
Gen



JPEG

83 bpm

Temp. PAZ.: 37.0C
Temp. TEE: 39.6C



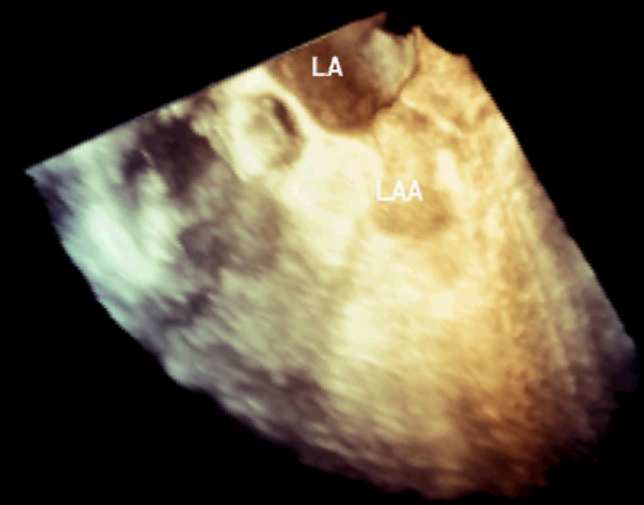
FR 26Hz
12cm
Live 3D
3D 47%
3D 40dB
Gen



Temp. PAZ.: 37.0C
Temp. TEE: 39.5C

JPEG
67 bpm

12cm
Volume completed 55
3D 47%
3D 40dB

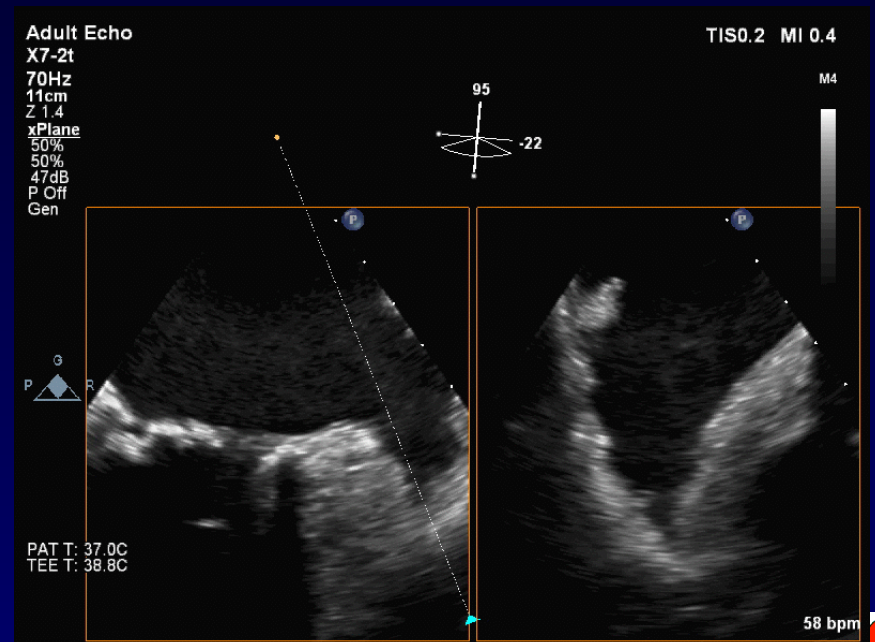
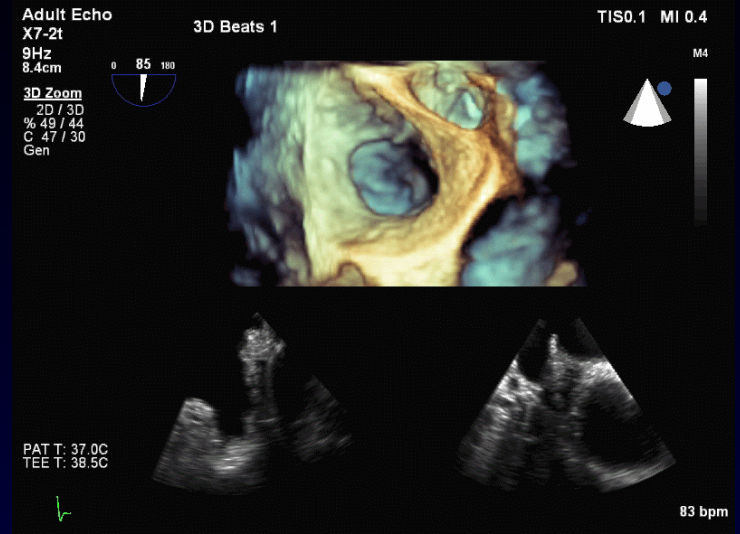
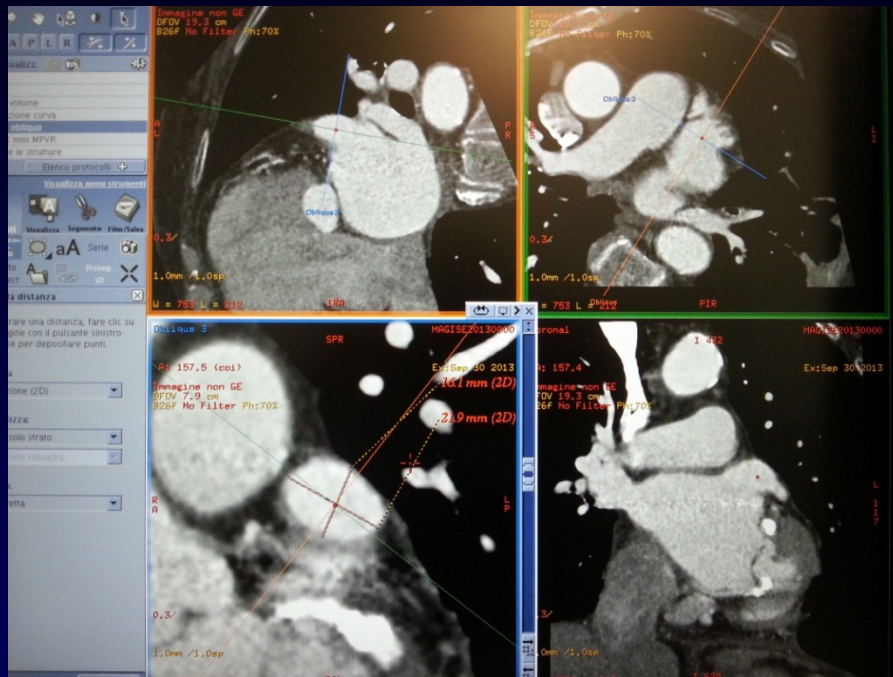


Temp. PAZ.: 37.0C
Temp. TEE: 39.5C

JPEG
79 bpm

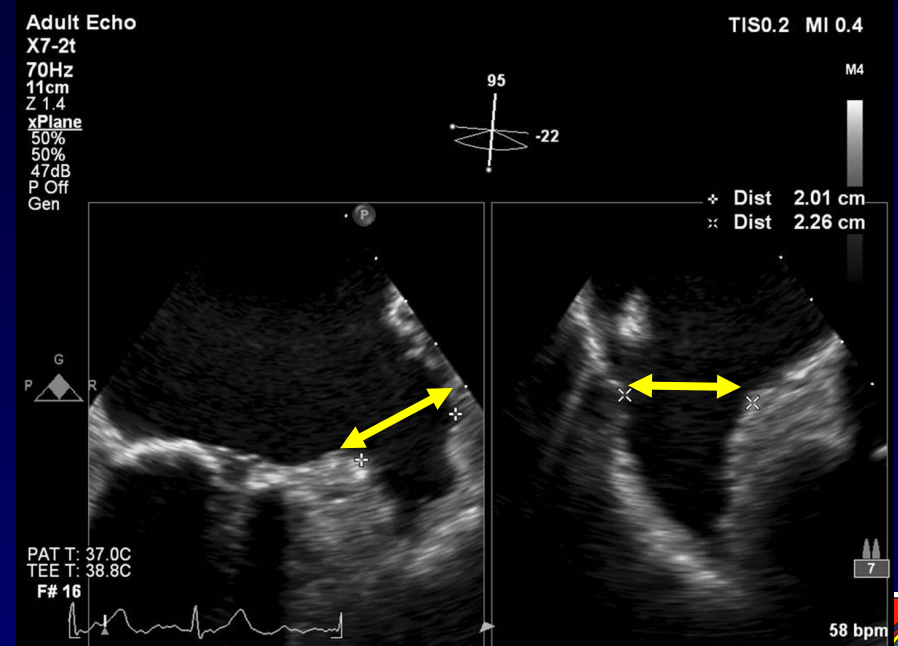
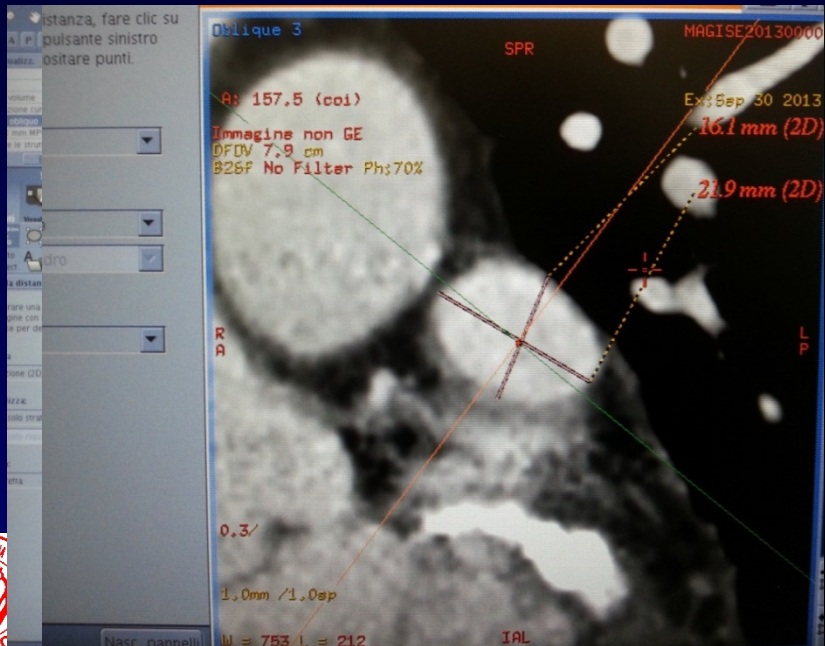
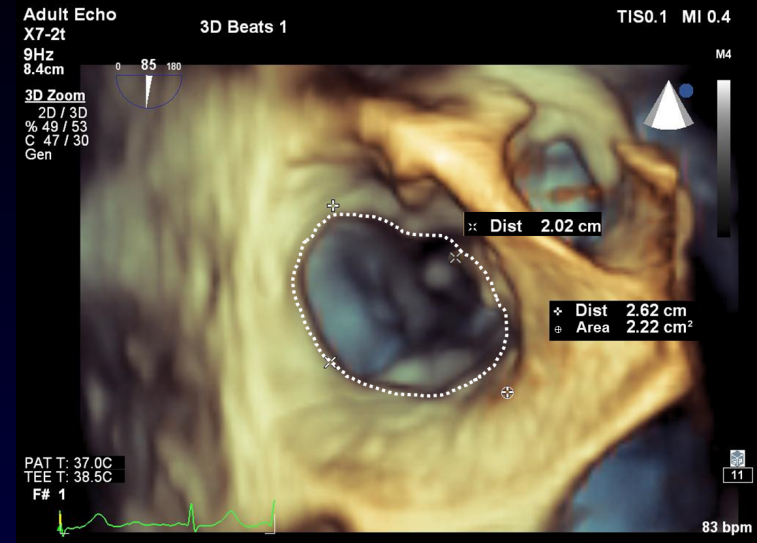


Approccio Multimodality: TAC – ECO 3D

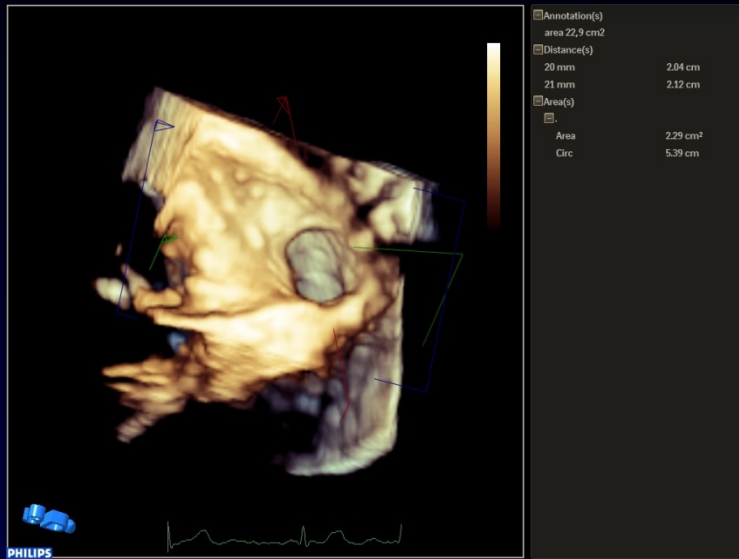


Misure dirette rapide on board su 3D e xPLANE

l'esame TC impiega tecniche di resezione «simili» all'attuale 3D (uso di piani MPR blu, rosso e verde). Oggi però il 3D consente approcci diretti, rapidi e altrettanto precisi anche nella valutazione durante la seduta stessa !



Misure dirette avanzate on board con MPR



ECO 3D-MPR (Multi Plane Reconstruction): i piani BLU, ROSSO e VERDE sono liberamente orientabili nello spazio e quindi permettono il miglior allineamento al fine di effettuare misure ad elevata precisione «anatomica»

3DQ

Tasks Controls QApps

EF BP-3DQ Measurements

Basic Measurements

Perform Basic Measurements

Measure Tools

Annotation Distance Area

20 mm

21 mm

area 22,9 cm²

Results

Annotation(s)

Distance(s)
20 mm 2,04 cm
21 mm 2,12 cm

Area(s)
Area 2,29 cm²
Circ 5,39 cm

La Concordezza di dati...

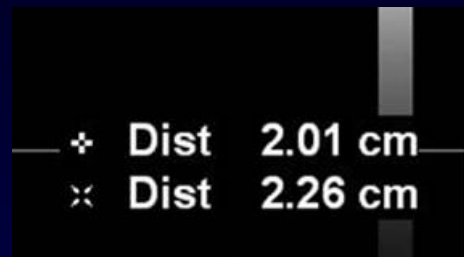
TAC



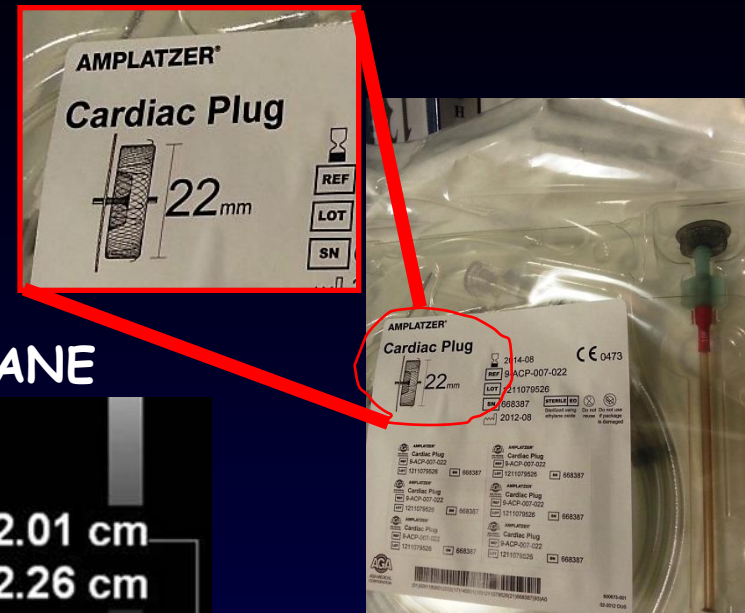
ECO 3D



ECO XPLANE



ECO MPR



3DQ

Tasks Controls QApps

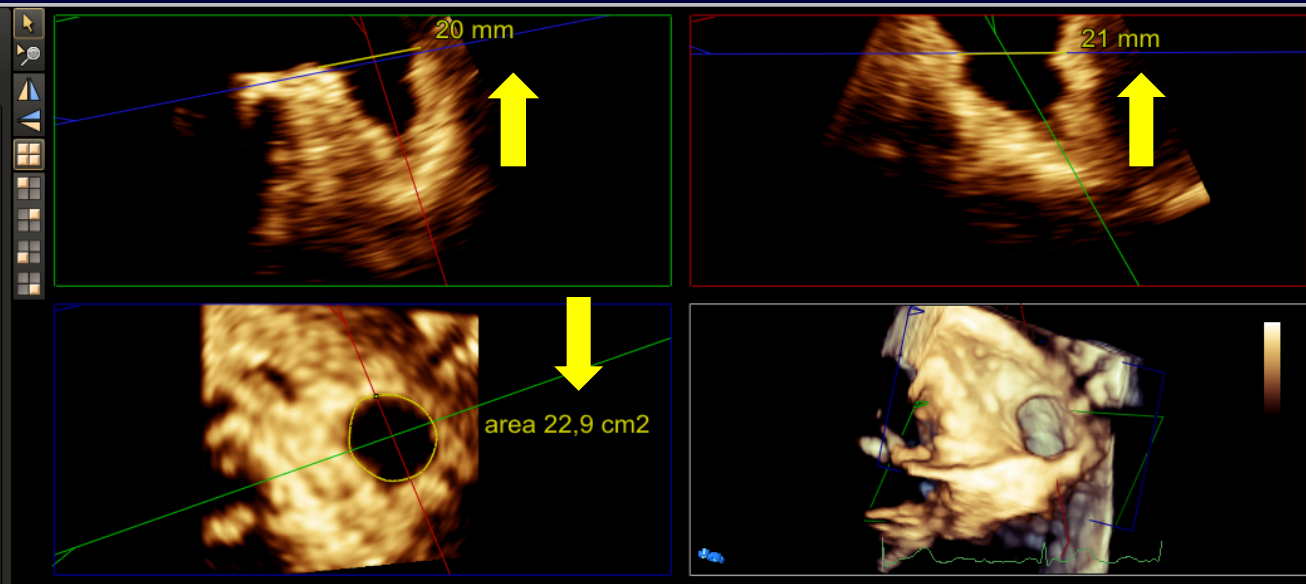
EF BP-3DQ Measurements

Basic Measurements

Perform Basic Measurements

Measure Tools

Annotation Distance Area



Results

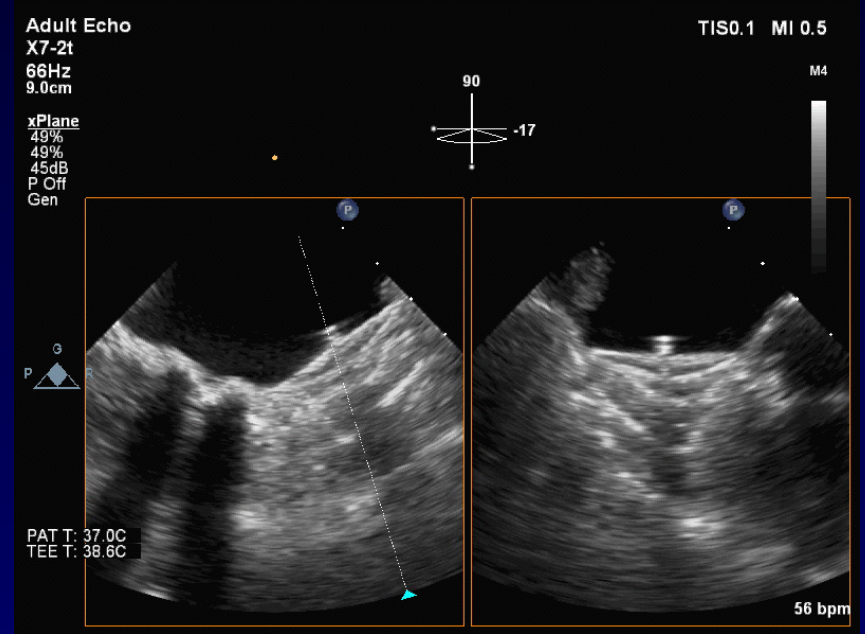
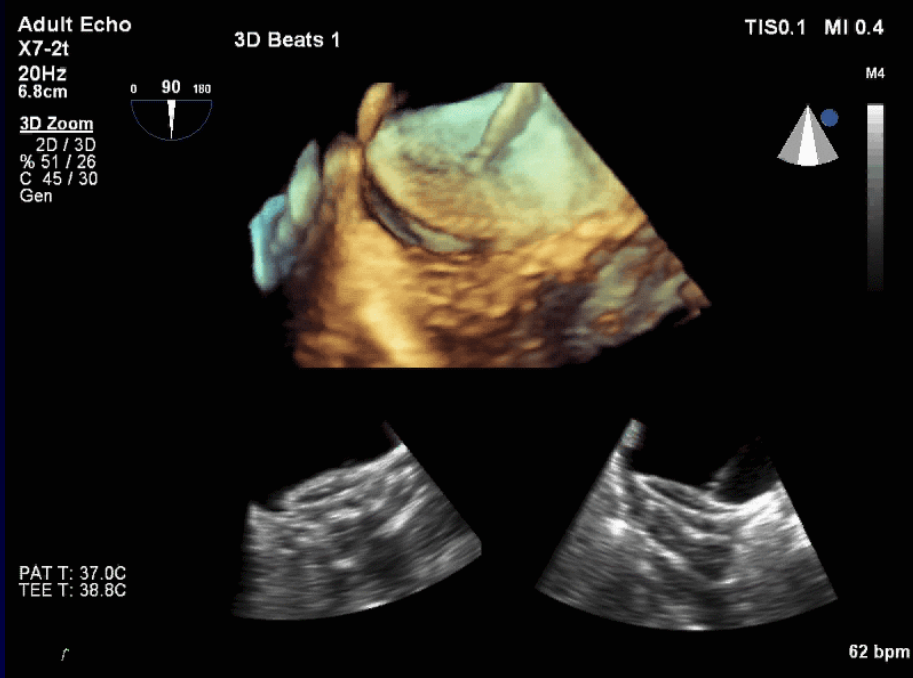
Annotation(s)

Distance(s)

Area(s)

20 mm	2.04 cm
21 mm	2.12 cm
Area	2.29 cm ²
Circ	5.39 cm

Monitoraggio e Verifica post-Amplatzer



<i>Actual Source</i>	<i>Echocardiographic Findings</i>
LV thrombus	Apical aneurysm, presence of thrombus , dilated CM, <i>hypertrabeculation / noncompaction</i>
LA thrombus	Thrombus in LAA , spontaneous echo contrast, LAA emptying velocity, mitral stenosis, interatrial septal low aneurysm
Pelvic veins or LL thrombus	ASD, atrial septal aneurysm, PFO
Native valves	Vegetation , tumor, MVP, mitral annular calcification, sclerotic aortic valve
Prosthetic valves	Thrombus, vegetation
Cardiac tumor	LA myxoma, papillary fibroelastoma
a	Complex aortic plaque , atheroma

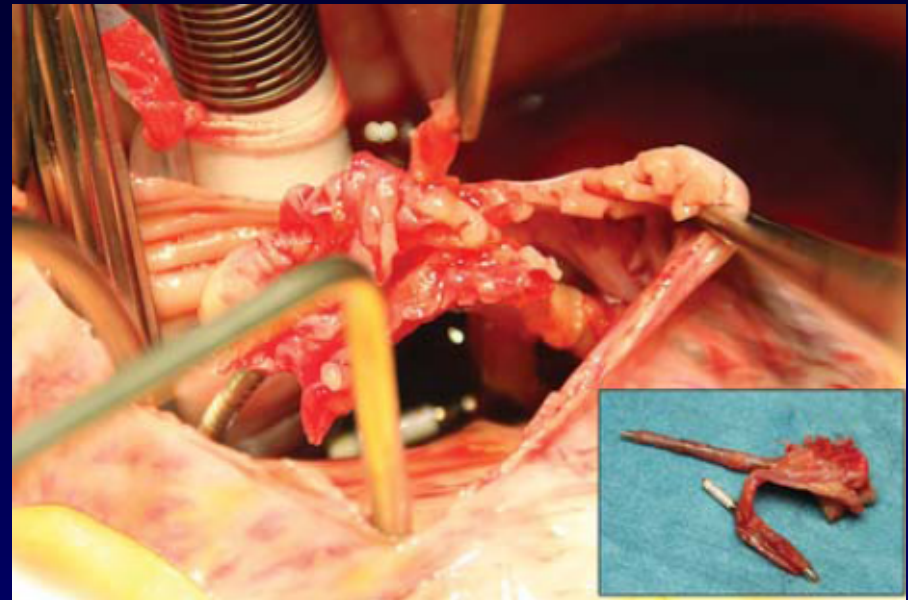
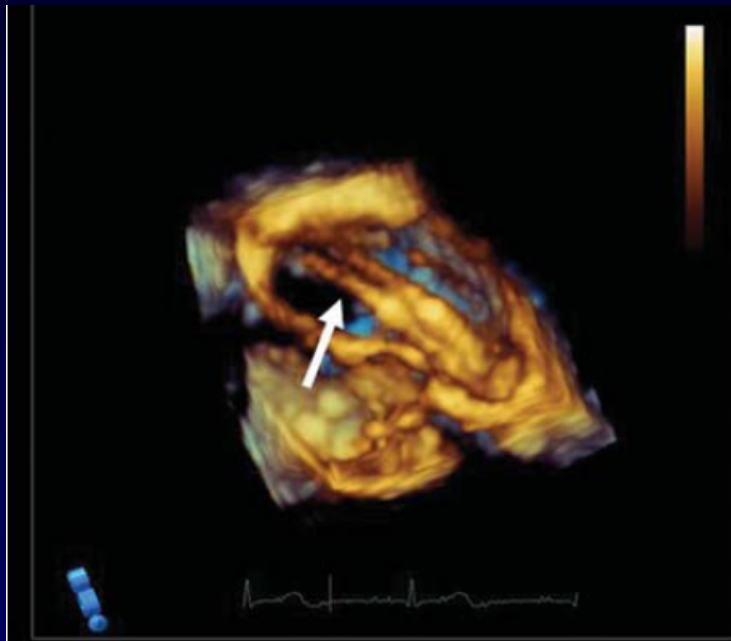
4

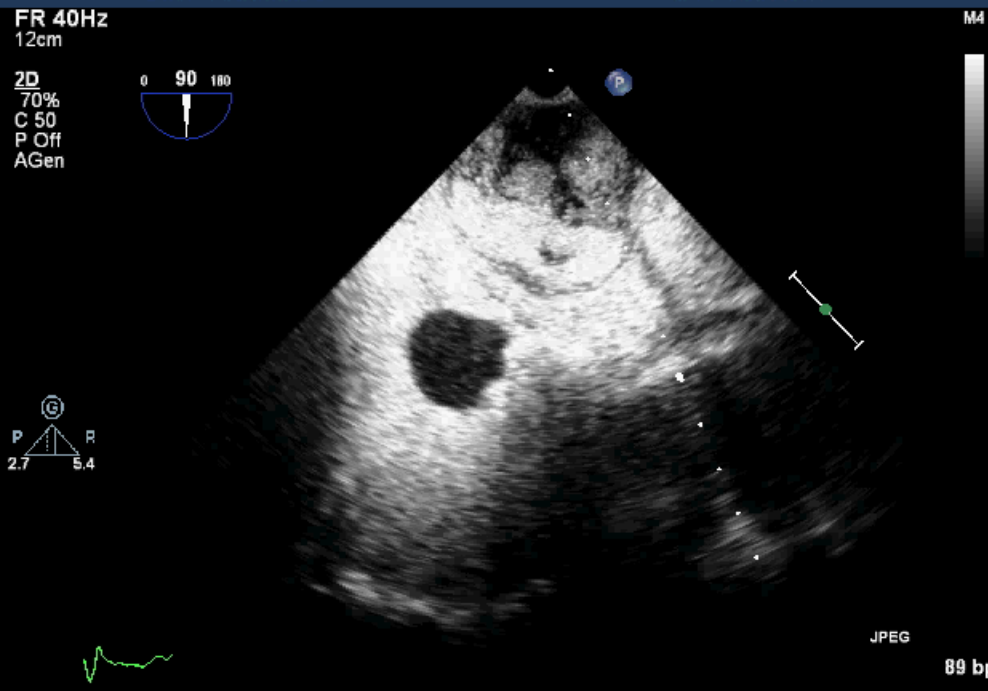
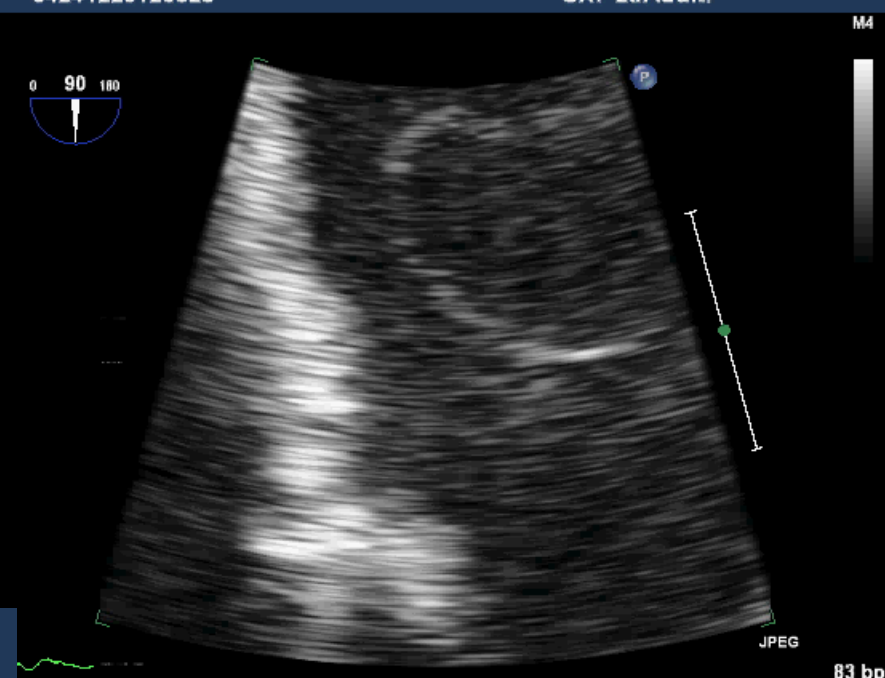
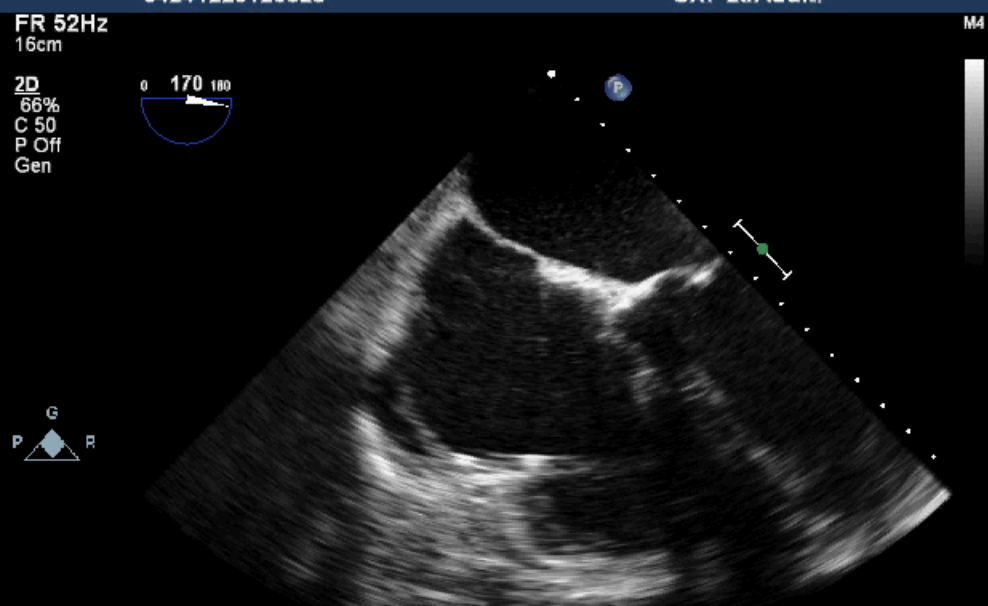


A challenging lead endocarditis

C. Muhl, Z. Geyik, E.C. Cheriex, and J.M. van Opstal*

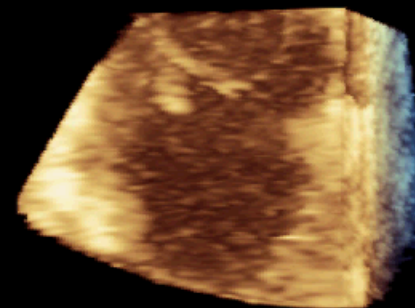
Department of Cardiology, Maastricht University Medical Centre, PO Box 5800, 6202 AZ Maastricht, The Netherlands





FR 31Hz
9.9cm

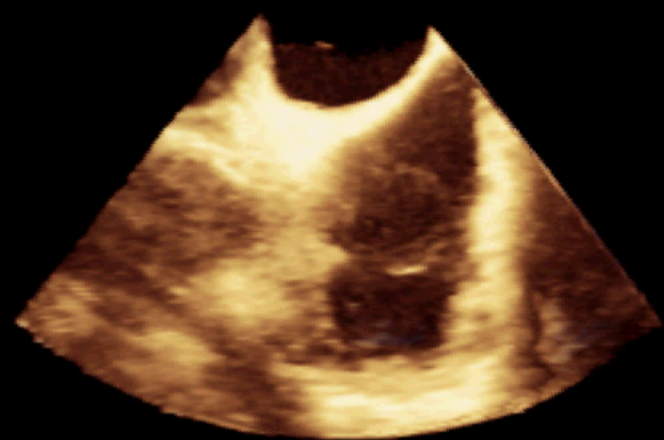
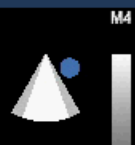
Live 3D
3D 47%
3D 40dB
Gen



JPEG 80 bpm

FR 24Hz
12cm

Volume completed
3D 47%
3D 40dB



JPEG 78 bpm



54241220120328

CX7-2t/Adultl

54241220120328

CX7-2t/Adultl

FR 20Hz
16cm

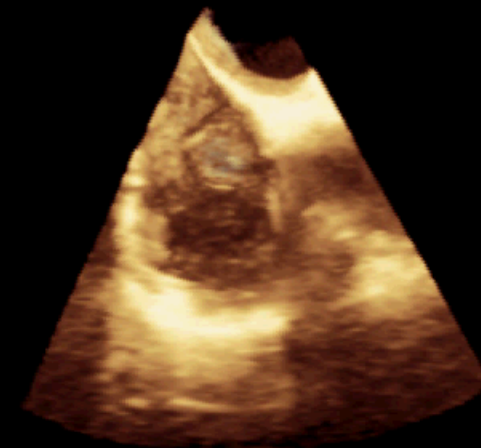
Live 3D
3D 47%
3D 40dB
Gen



JPE

FR 20Hz
16cm

Live 3D
3D 47%
3D 40dB
Ris



JPEG

M4



92 bpm

54241220120328

CX7-2t/Adultl

FR 20Hz
16cm

Live 3D
3D 47%
3D 40dB
Gen



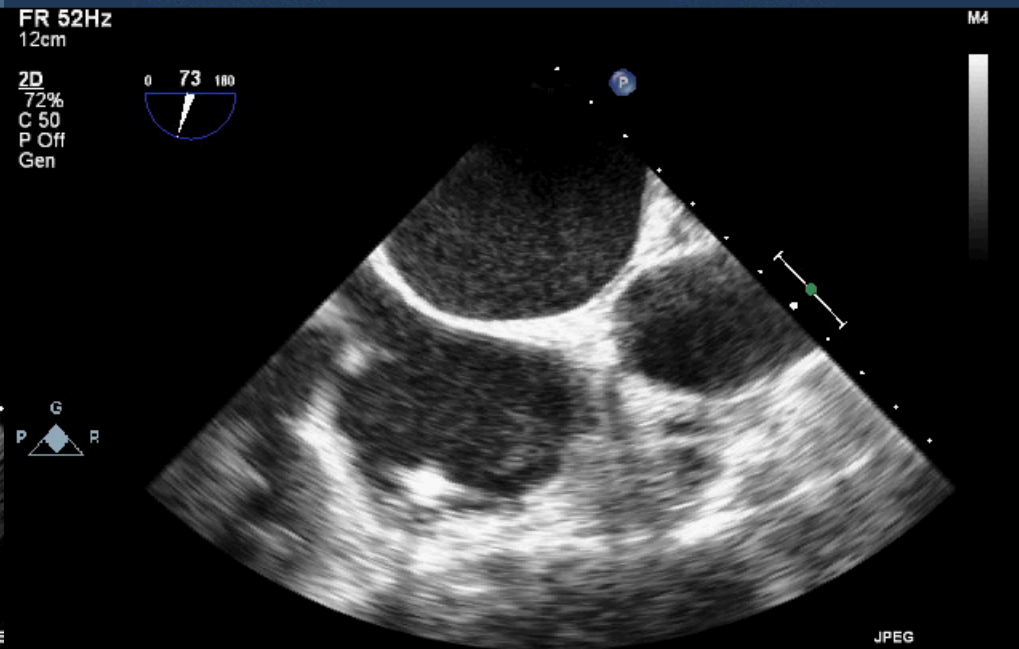
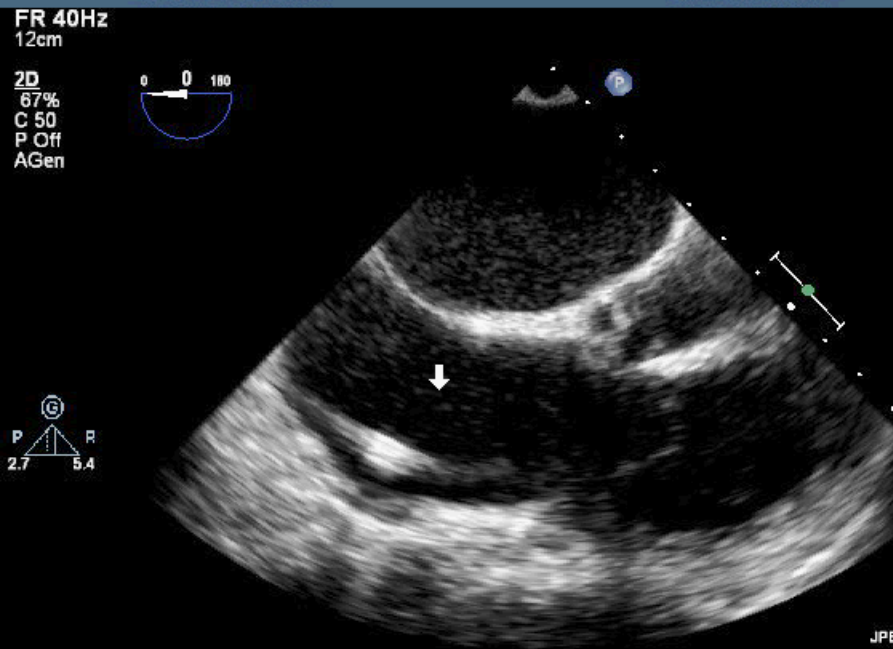
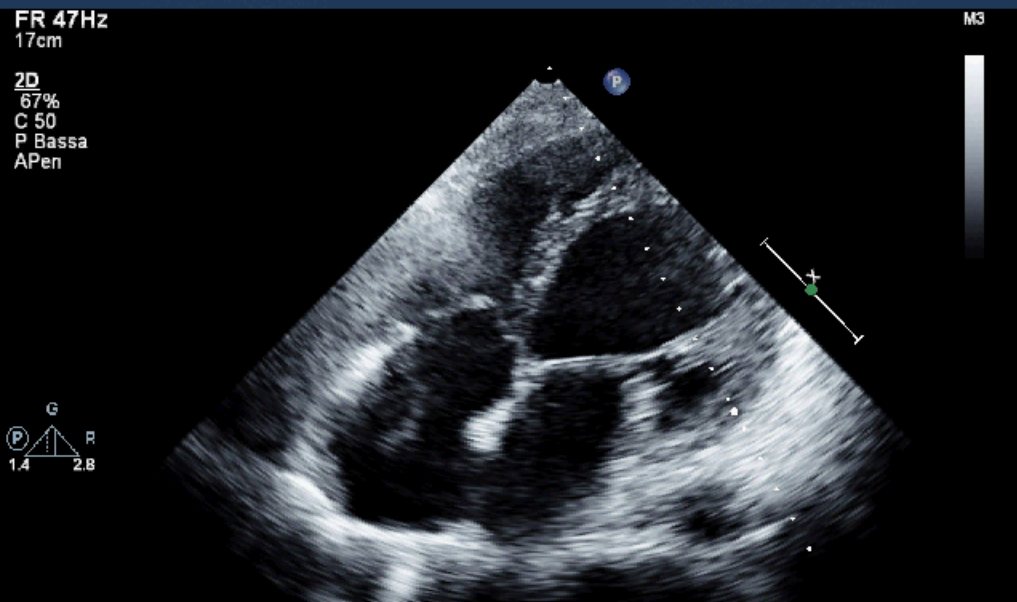
M4



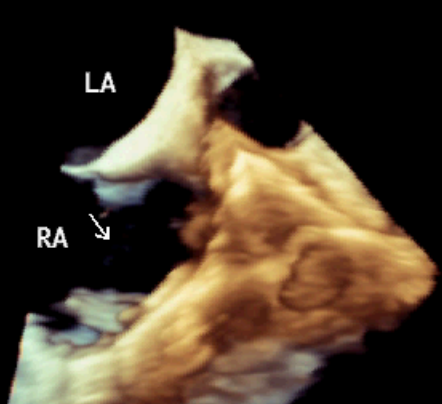
28

43 bpm

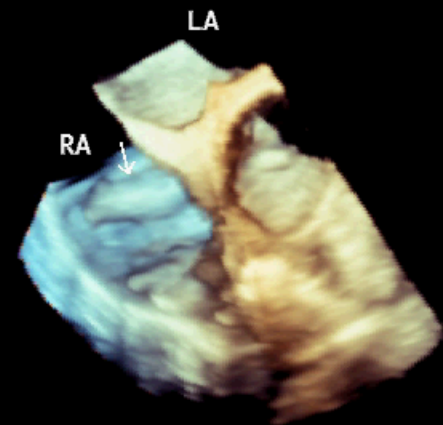




FR 26Hz
12cm
Live 3D
3D 47%
3D 40dB
Gen

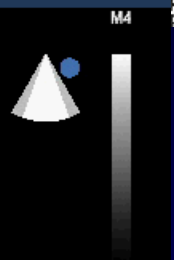


FR 26Hz
12cm
Live 3D
3D 47%
3D 40dB
Gen



PHILIPS Cardiology Hosp Policlinico Bari 05/06/2012 13:34:41 TIS0.2 MI 0.5
37341220120601 CX7-2t/AdultI

FR 26Hz
12cm
Live 3D
3D 47%
3D 40dB
Gen



Temp. PAZ.: 39.2C
Temp. TEE: 41.2C

JPEG 94 bpm

Temp. PAZ.: 39.2C
Temp. TEE: 41.2C

JPEG 96 bpm



L'Eco 3D come grande opportunità clinica nella ricerca di fonti emboligene

- **Importanza in casi selezionati**
- **Utilità con immagini di buona qualità (TT o meglio TE)**
- **Non sostituisce la diagnosi 2D ma la integra con spazialità 3D**
- **Ti accorgi della utilità solo quando ce l'hai a disposizione ... con un solo pulsante**



Grazie per l'attenzione

