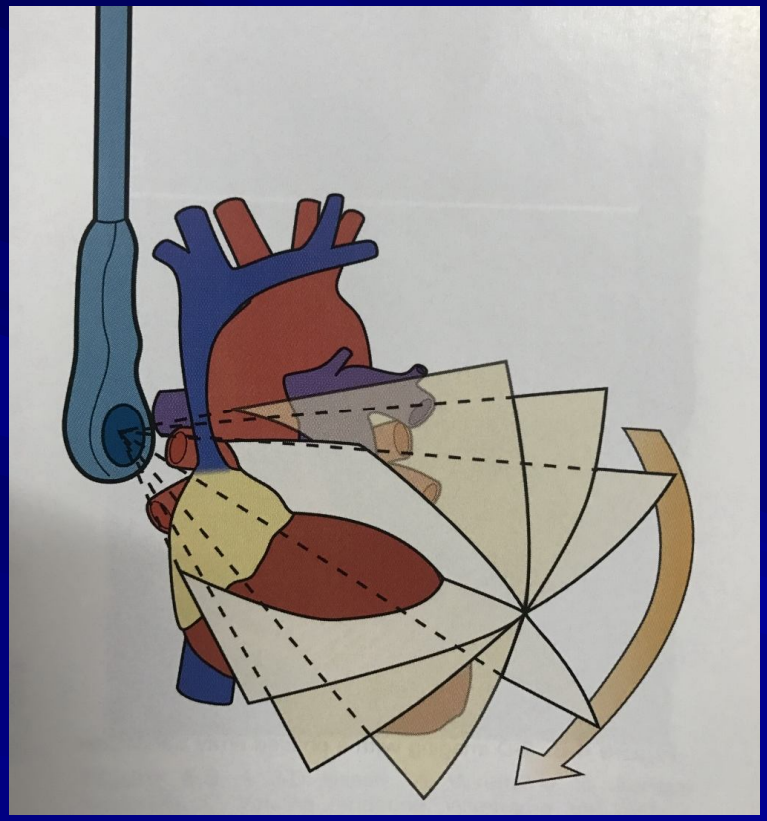
Siêu âm tim 3 D

PGS TS BS Nguyện Tuấn Vũ
BM Nội - ĐHYK PNT
ĐHYK MAINZ CHLB ĐỨC
TTYK Medic

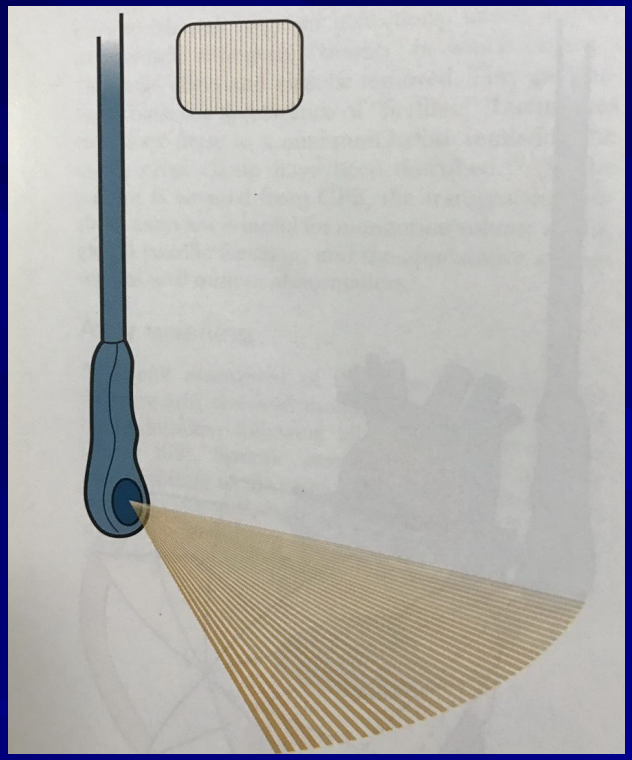
Mở đầu

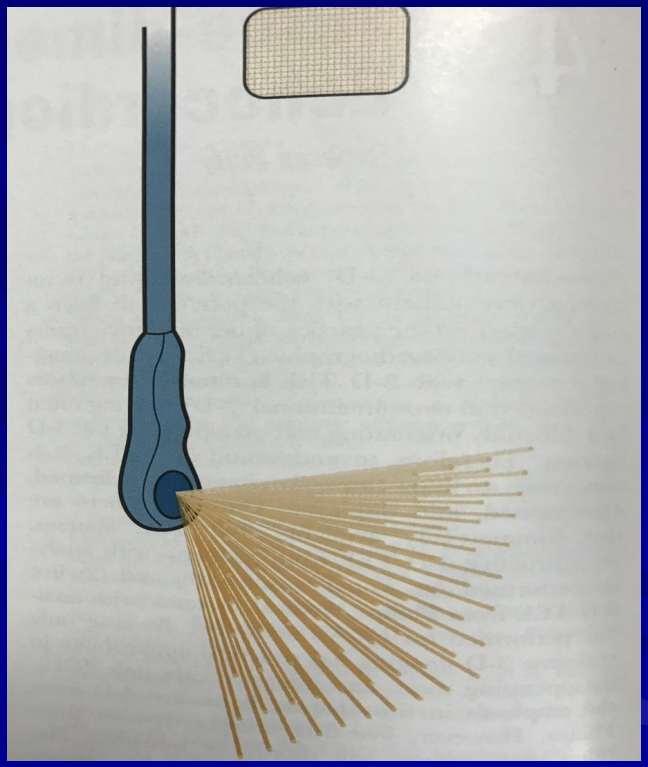
- Siêu âm tim 3D bắt đầu được đưa vào sử dụng từ năm 2000.
- Các tim thể phát sóng sắp xếp theo ma trận (Fully sampled matrix array transducers) .
- Các kiểu siêu tim 3 D gồm Live 3D, 3D Zoom and Full Volume modes.
- Được sử dụng rất nhiều trong can thiệp tim mạch như nong van 2 lá bằng bóng, MitralClip, Thay van ĐMC qua da (TAVI)…
- Siêu âm tim 3 D được sử dụng đầu tiên ở MEDIC vào 01/2012.

Siêu âm tim qua thực quản 2 chiều, đầu dò multiplan

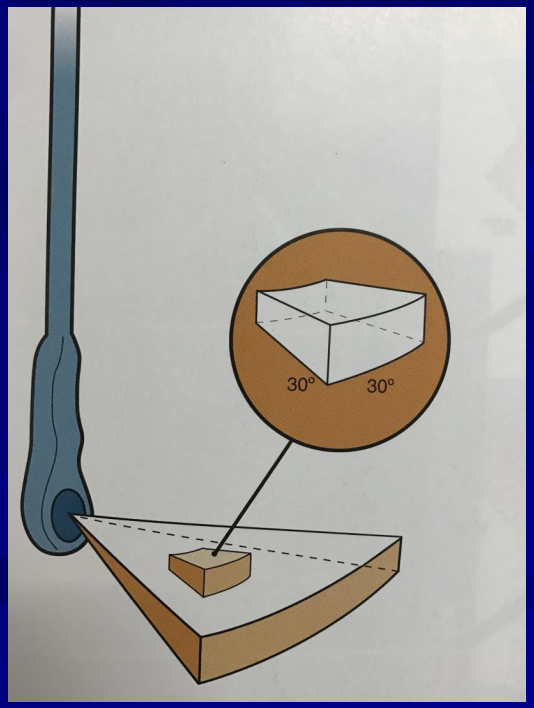


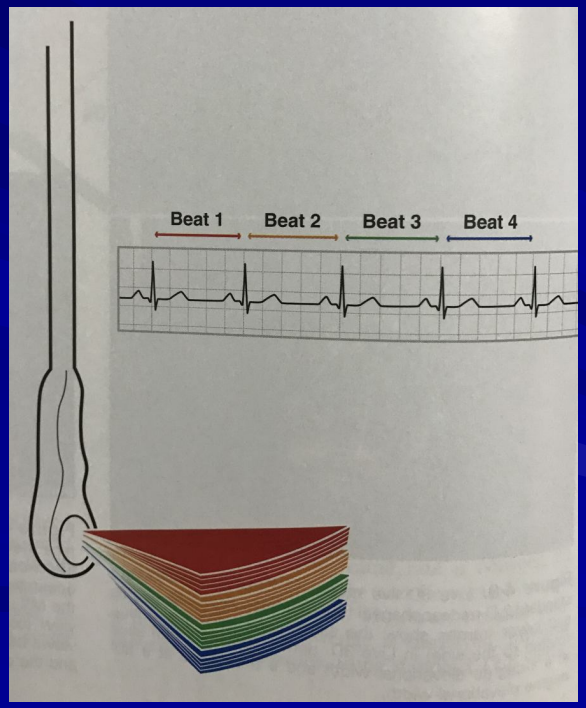
Đầu dò thực quản 2 chiều và 3 chiều



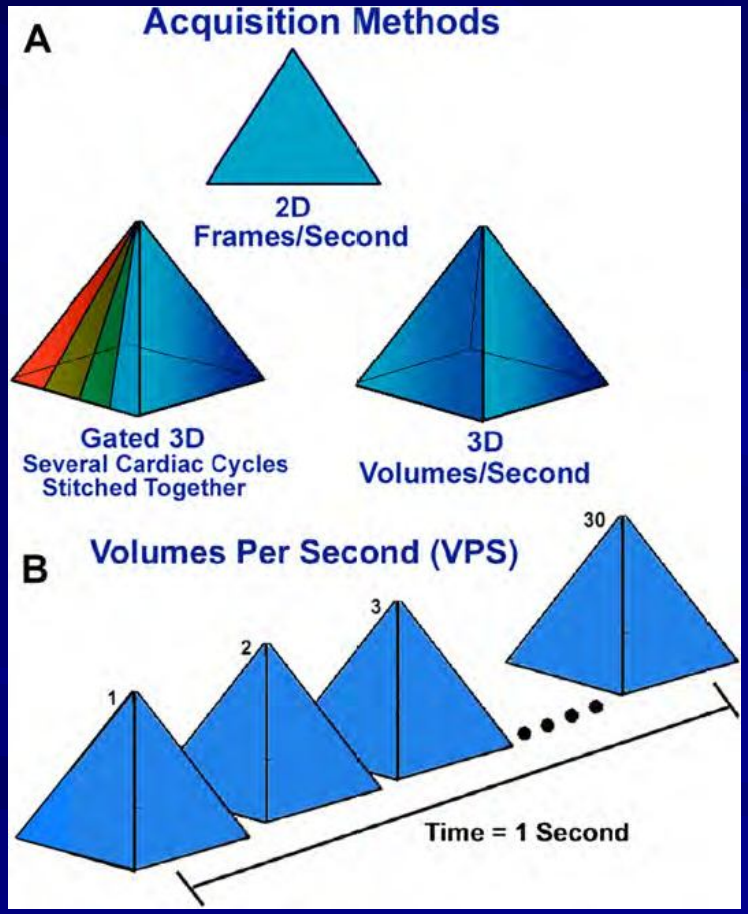


Siêu âm 3D thực quản, thời gian thực và tích hợp nhiều chu chuyển tim



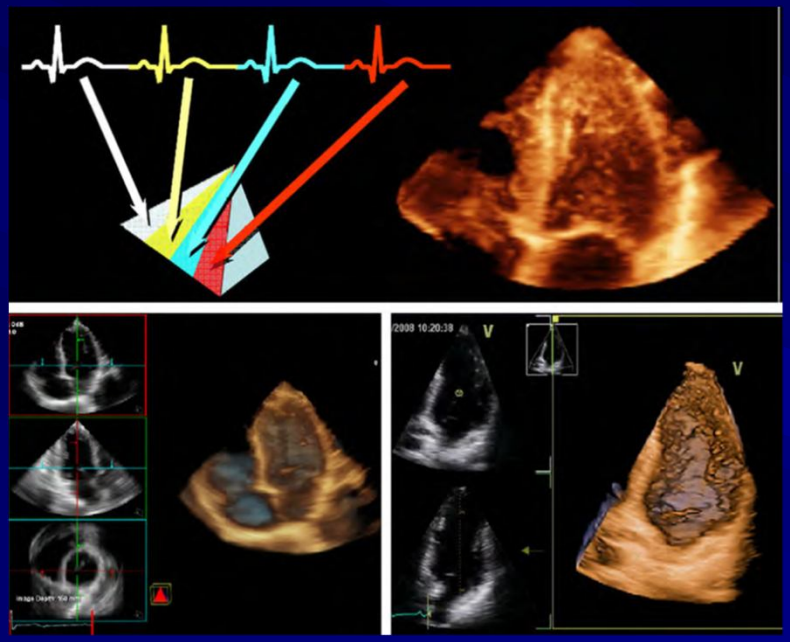


Siêu âm tim 3 D
Thu nhận dữ liệu



- Fully sampled Matrix-Array Transducer
- 3000 Piezoelectric Elements
- TTE 2-4MHz
- TEE 5-7MHz

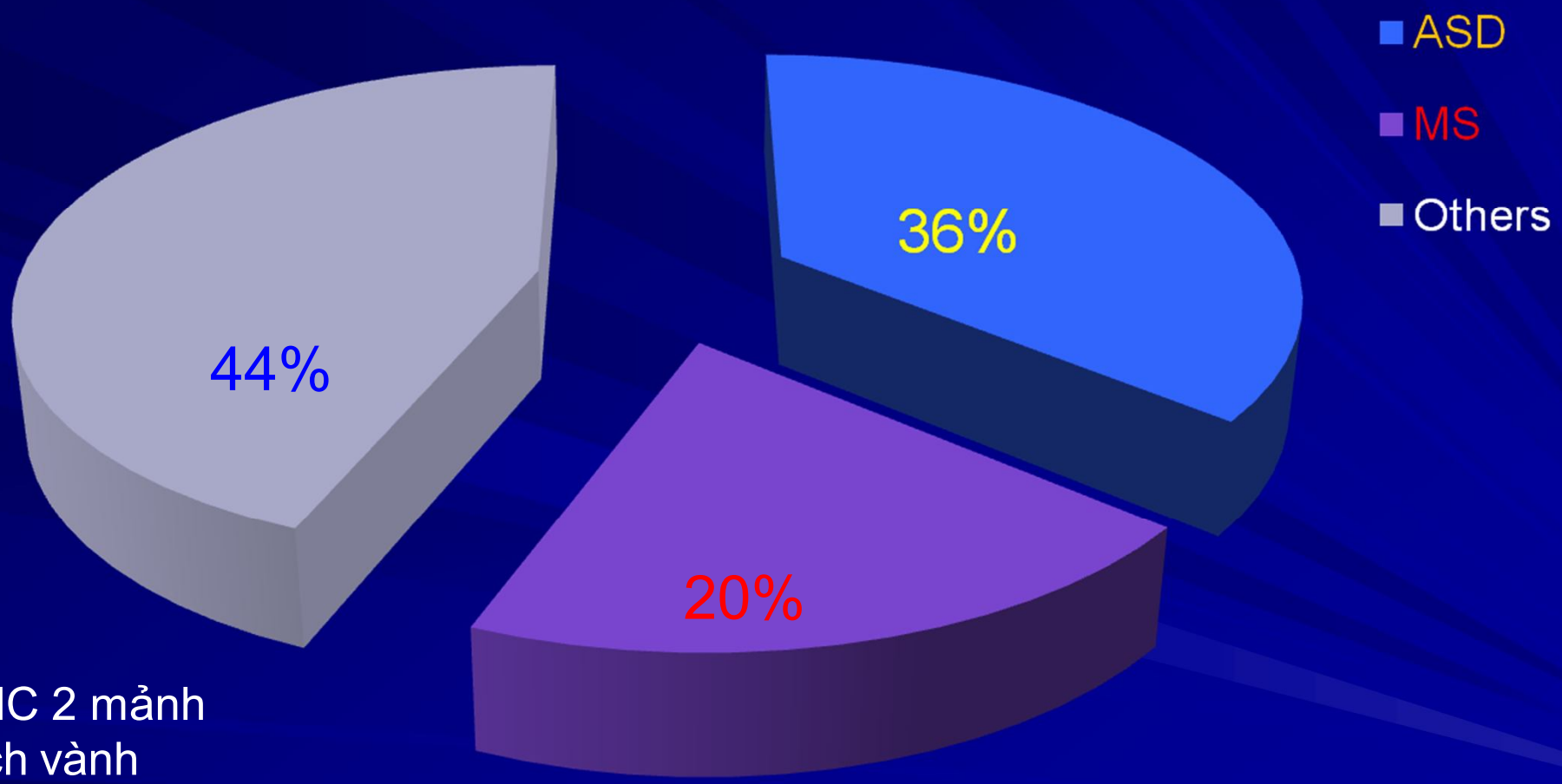
Thu nhận dữ liệu



- Live 3 D : real time 3 D mode, có giới hạn góc mở (narrow sector)
- Full volume: thu nhận dữ liệu theo cách tích hợp các chu chuyển tim kế tiếp nhau (gated acquisition)
- Zoom 3D: khu trú, góc mở siêu âm rộng (focused wide sector)

KẾT QUẢ

343TTE,157TEE



Hở 2 lá
Van ĐMC 2 mảnh
Dò mạch vành
Van cơ học
Viêm nội tâm mạc
U nhầy
Bóc tách ĐMC

BERUFSERLAUBNIS

Herrn

Tuan Vu Nguyen

geboren am 24.01.1965 in Quang Tri/Vietnam

wird auf Grund des § 10 Bundesärzteordnung (BÄO)

DAS RECHT ZUR
AUSÜBUNG DES ÄRZTLICHEN BERUFS

vom 01.01.2012 bis 31.12.2012 in fachlich abhängiger Stellung unter Aufsicht, Anleitung und Verantwortung von approbierten Ärztinnen und Ärzten zum Zwecke der Fortbildung in der Funktionseinheit Echolabor in der II. Medizinischen Klinik der Universitätsmedizin der Johannes Gutenberg-Universität Mainz – ohne Stations- und Bereitschaftsdienst – in Langenbeckstr. 1, 55131 Mainz

widerruflich erteilt.

Diese Berufserlaubnis hat nur Gültigkeit, wenn eine Aufenthalts- und Arbeitserlaubnis vorliegt.

Koblenz, den 12.01.2012

Landesamt für Soziales, Jugend und Versorgung
des Landes Rheinland-Pfalz

Im Auftrag
Heinz Rommerskirchen

013/2012

Landesamt für Soziales, Jugend und Versorgung Rheinland-Pfalz

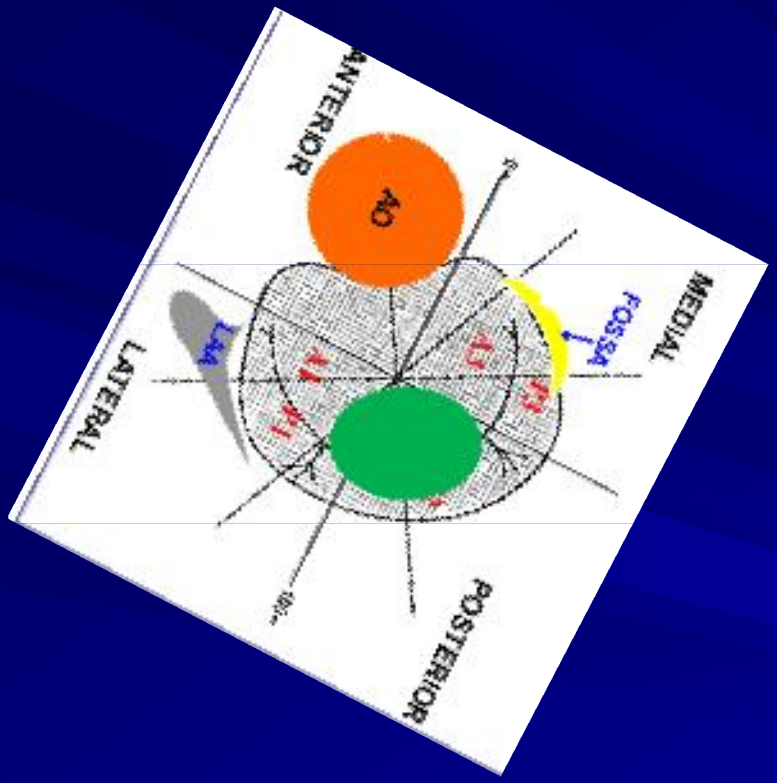


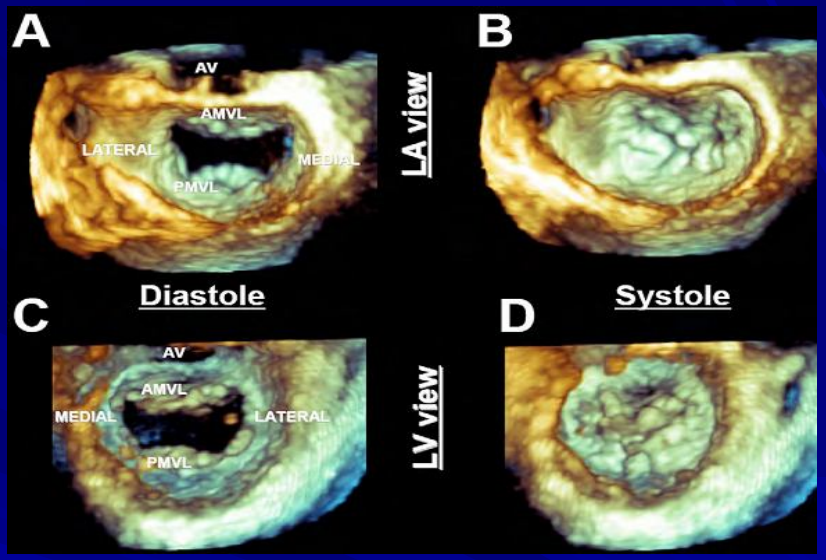
HẸP VAN 2 LÁ

Ưu điểm của SAT 3D

- Thấy rõ toàn bộ các cấu trúc của van 2 lá
- Đo chính xác hơn diện tích mở van 2 lá bằng phương pháp MPR.
- Phát hiện các biến chứng của thủ thuật nong van 2 lá.
- Có thể xoay hình ảnh 3 chiều để nhìn van 2 lá theo nhiều hướng.
- Độ dẽo và cử động lá van 2 lá khảo sát rõ bằng kiểu 3D Zoom.
- Phát hiện huyết khối nhạy hơn, đặc biệt I2 trong tiểu nhĩ trái.
- Theo dõi đường đi của catheter trong nong van 2 lá bằng bóng.

Hở van 2 lá

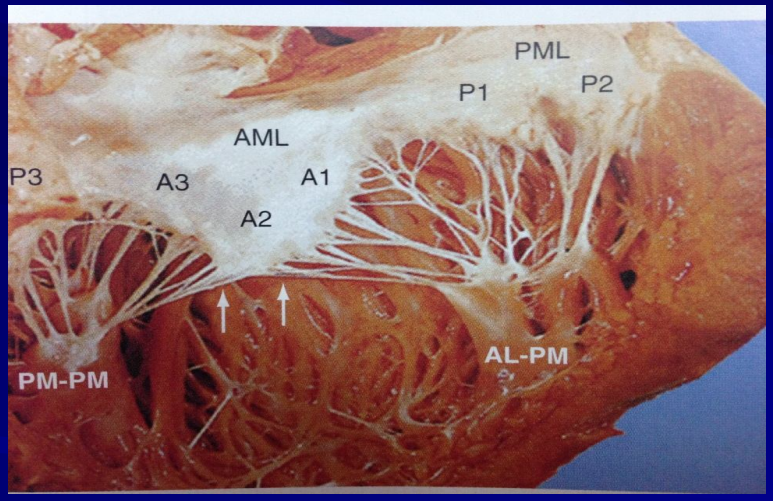




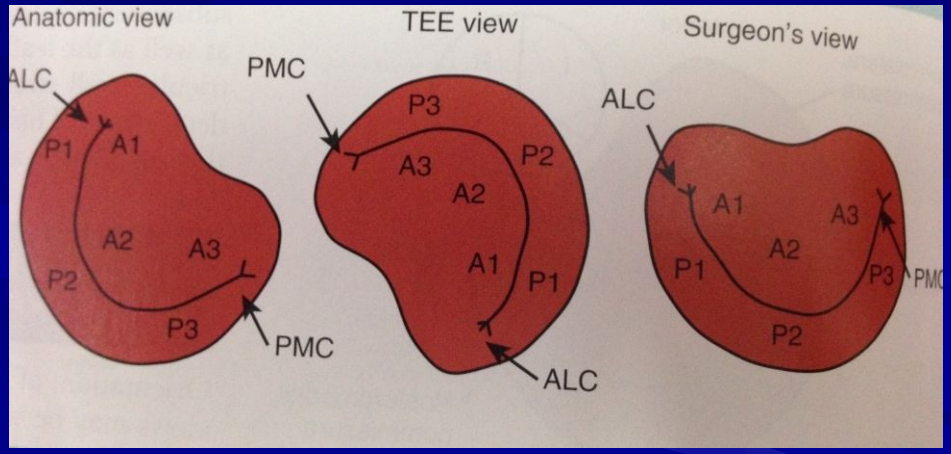
Anatomical detail of MV
Clip 1

Giải phẫu van 2 lá trên siêu âm tim 3 D

Mitral leaflets



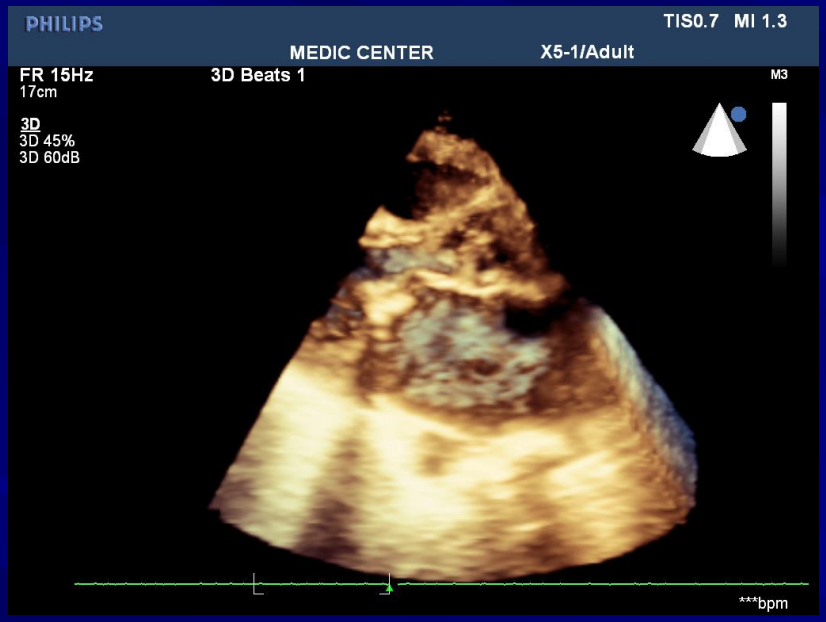
TEE and surgeon view



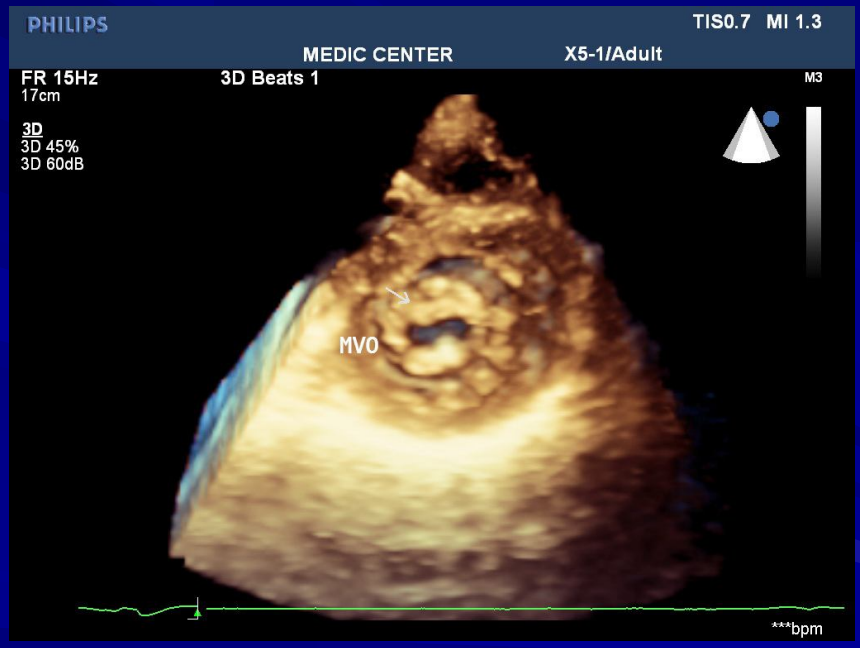
Normal MV fr LA view

Hẹp 2 lá : 3D TTE

LAX View

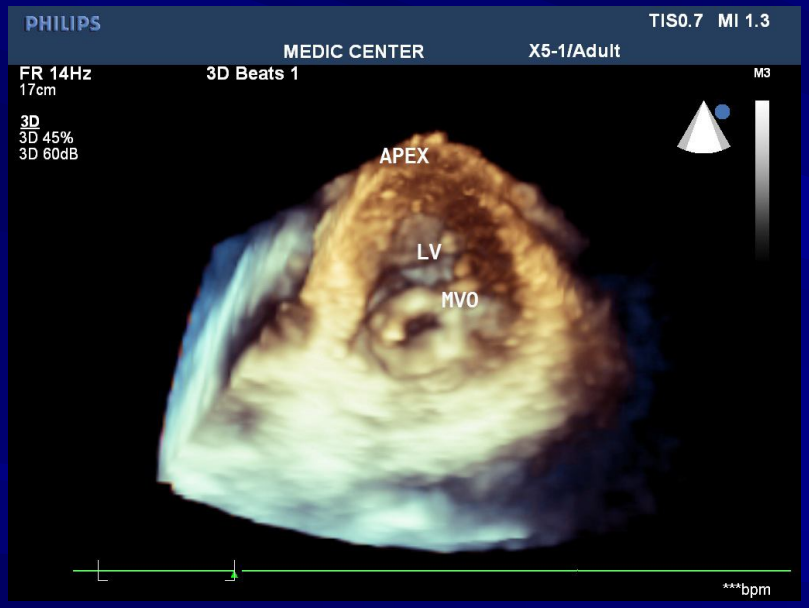


SAX View

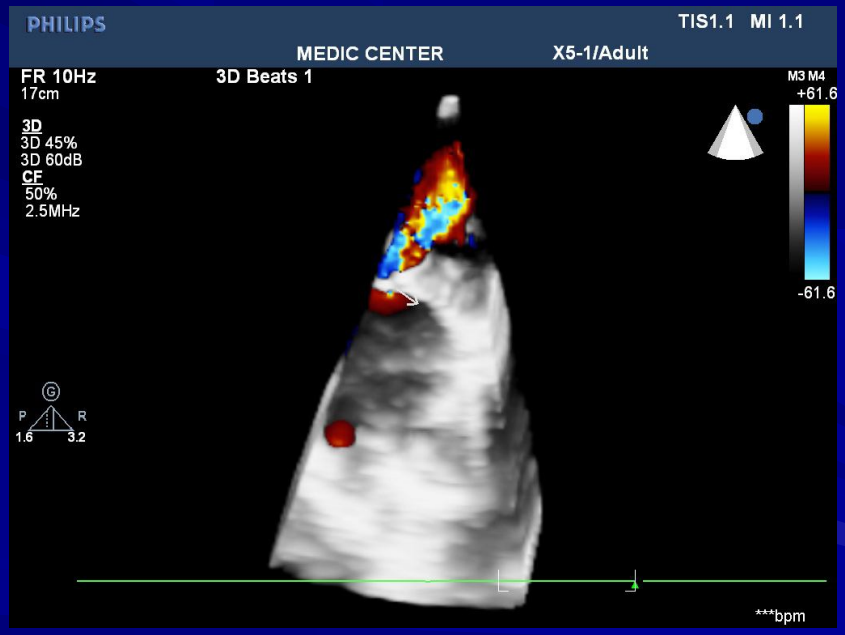


Hẹp 2 lá : 3D TTE

Apical 4 C View



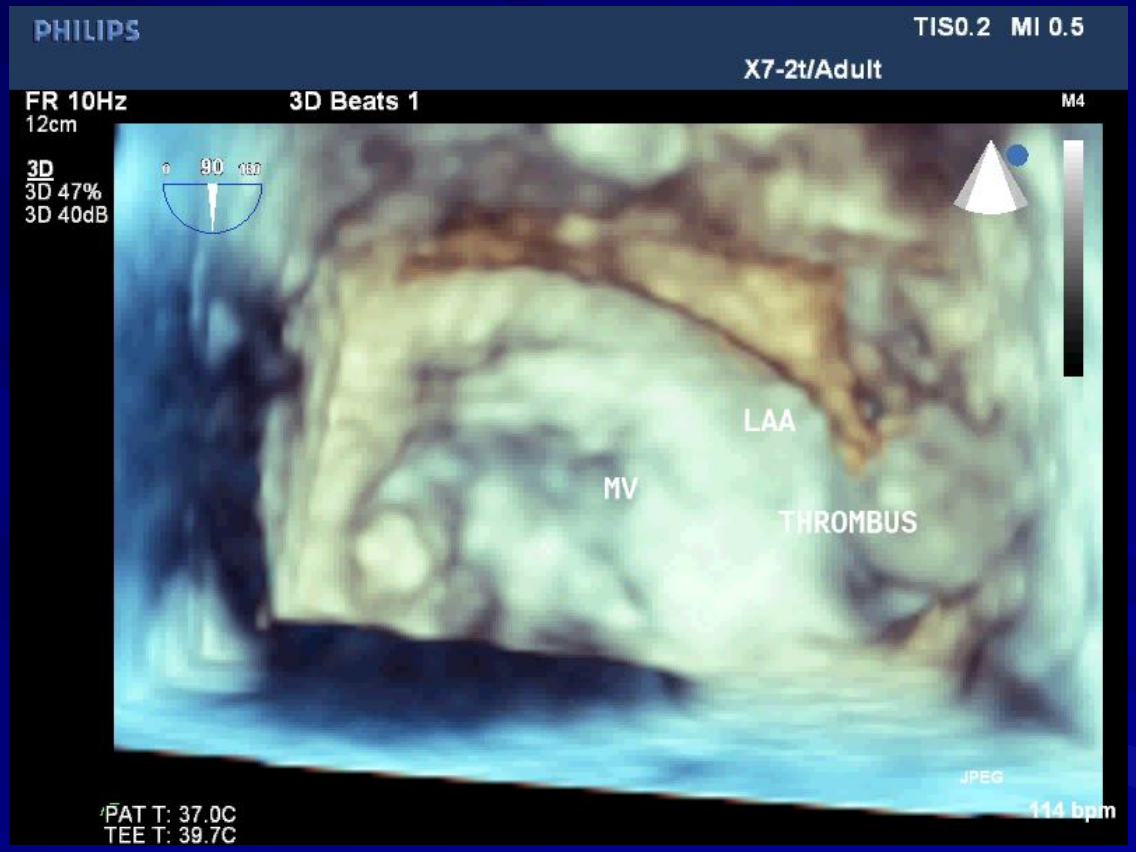
Live 3 D with color



Clip hẹp 2 lá : 3D TTE

- Apical 4C- 2D
- Apical 4C-3D
- I crop 3D
- MVO-3D Zoom

MS, LAA Thrombus

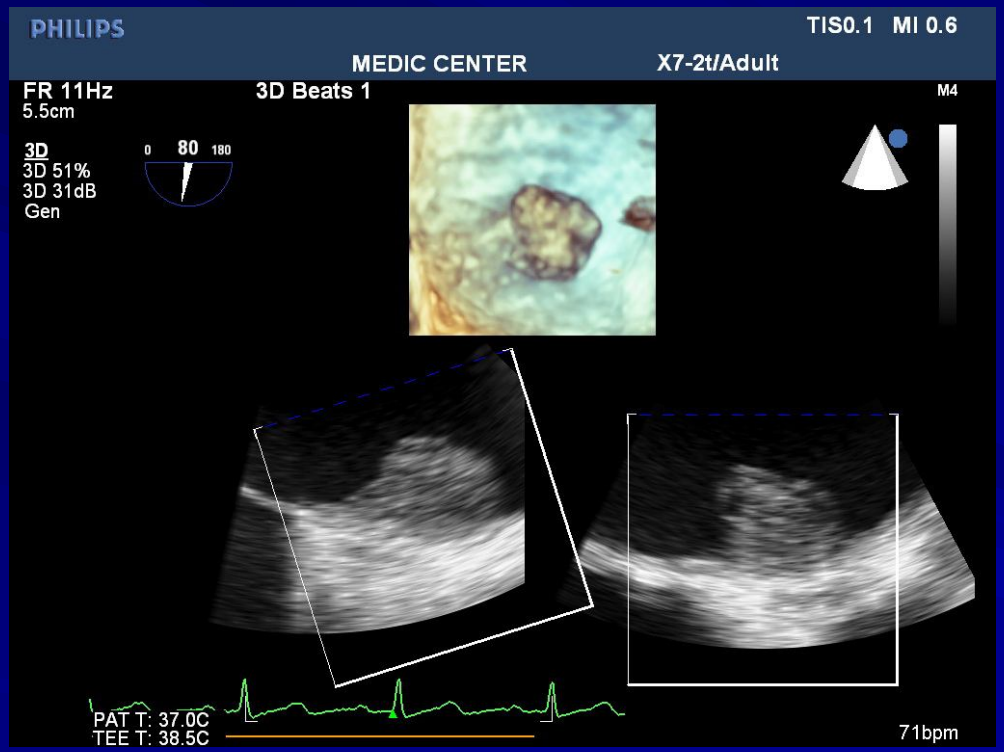


Hẹp 2 lá 3D Zoom



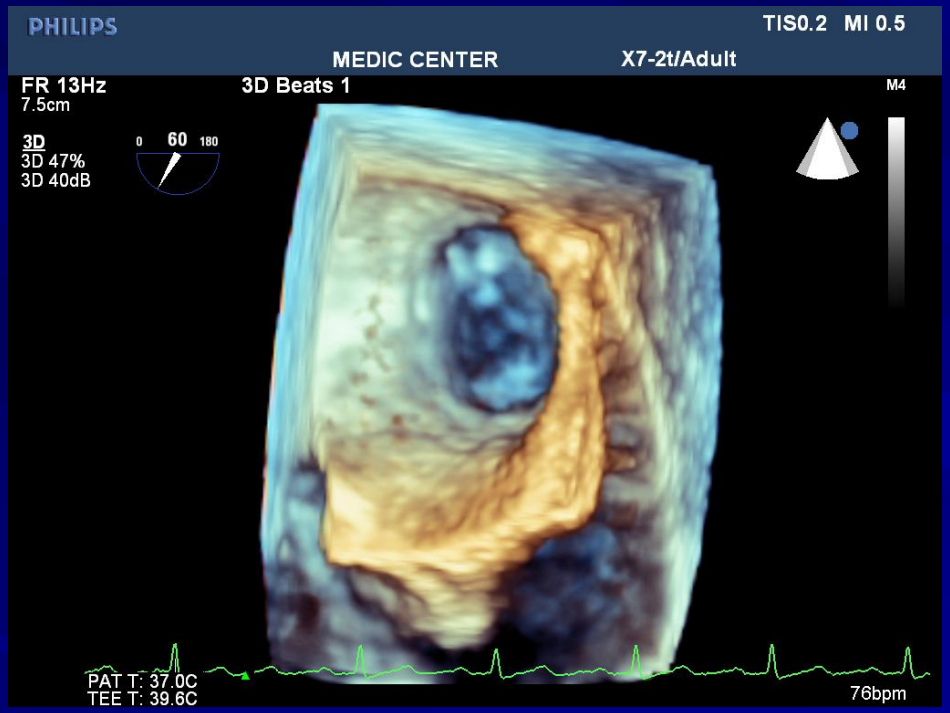
Clip 3 D Zoom

Huyết khối nhĩ trái



I crop LA Thrombus

Huyết khối tiểu nhĩ trái

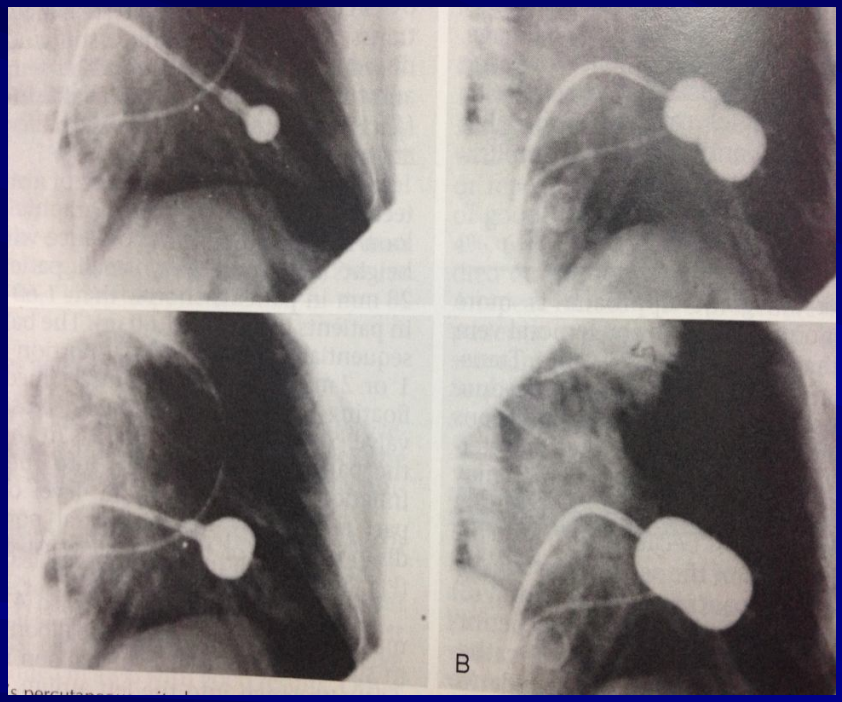


Normal LAA



LAA Thrombus

Định hướng catheter trong nong van 2 lá bằng bóng

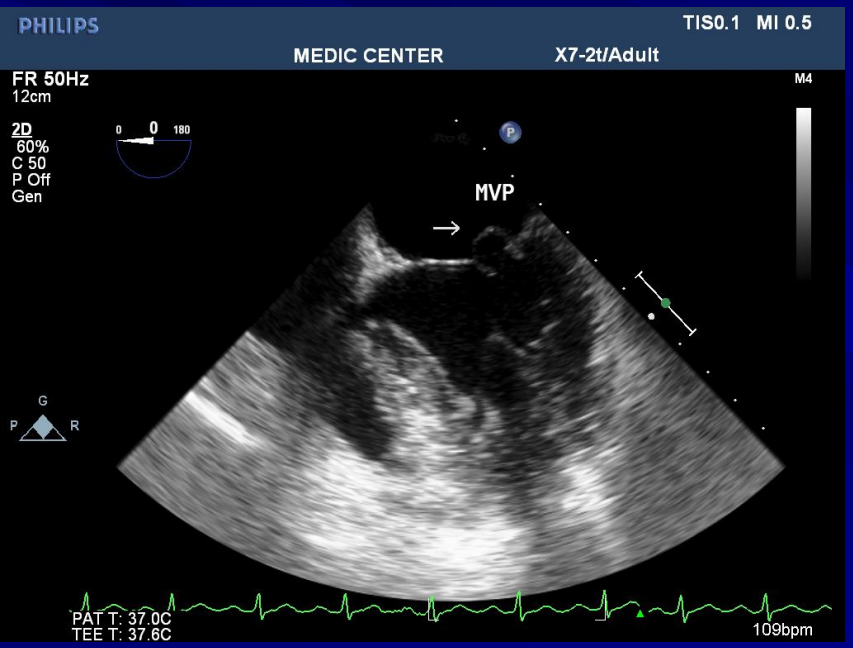


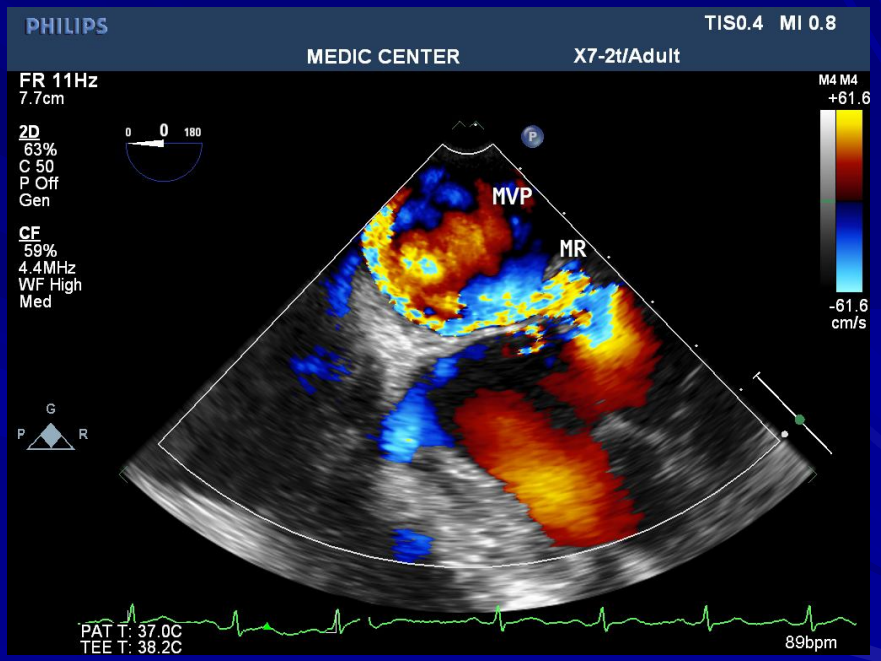
Fluoroscopy



Live 3D Echocardiography

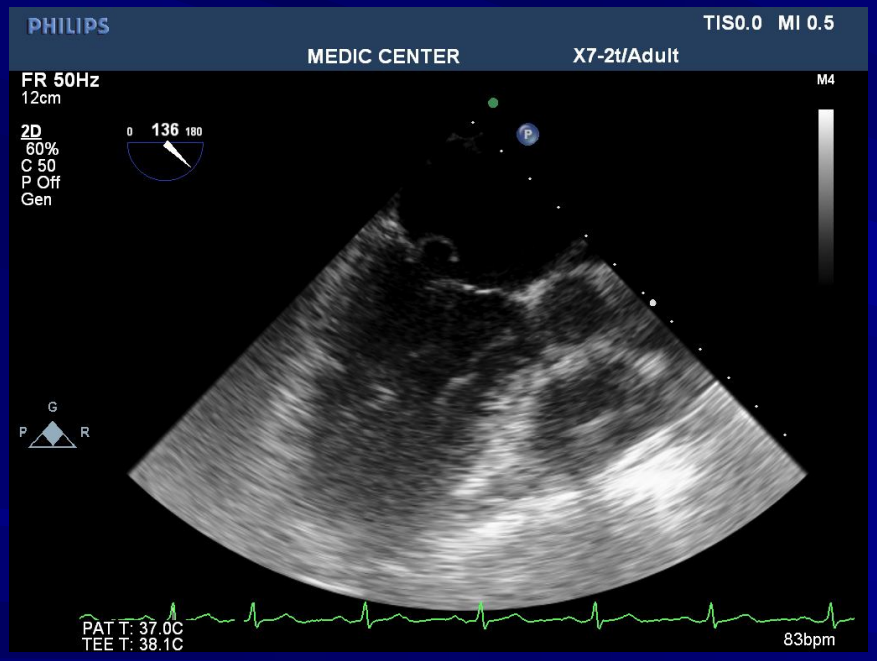
Hở van 2 lá


PHILIPS
TIS0.1 MI 0.5
MEDIC CENTER
X7-2t/Adult
FR 50Hz
12cm
M4
2D
60%
C 50
P Off
Gen
MVP
PAT T: 37.0C
TEE T: 37.6C
109bpm

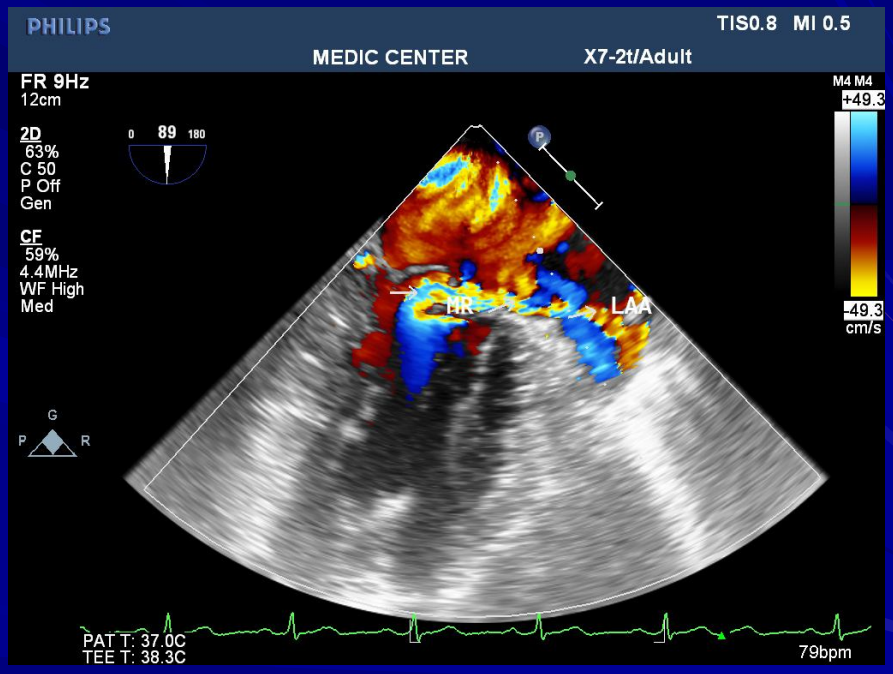

PHILIPS
TIS0.4 MI 0.8
MEDIC CENTER
X7-2t/Adult
FR 11Hz
7.7cm
M4 M4
+61.6
-61.6
cm/s
2D
63%
C 50
P Off
Gen
CF
59%
4.4MHz
WF High
Med
MVP
MR
PAT T: 37.0C
TEE T: 38.2C
89bpm

Hở van 2 lá

TEE

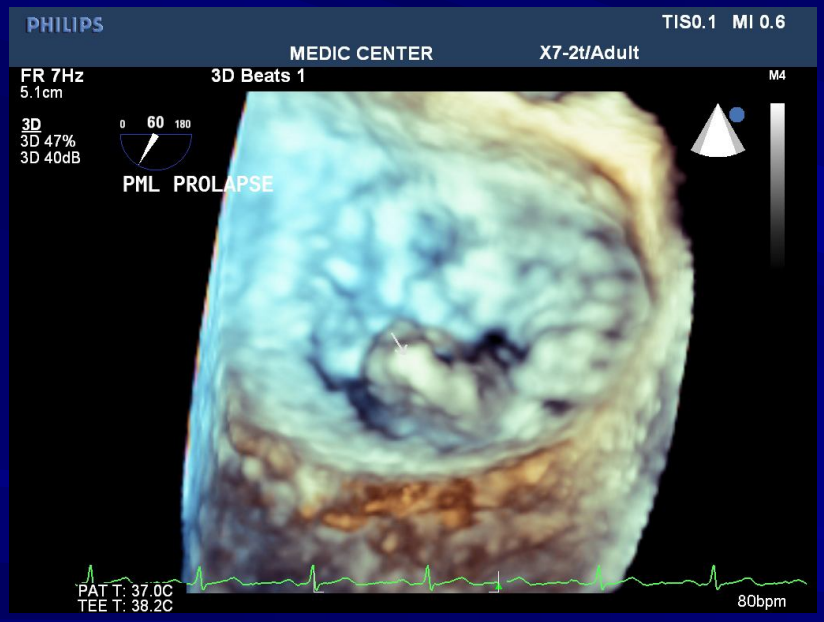


TEE MÀU

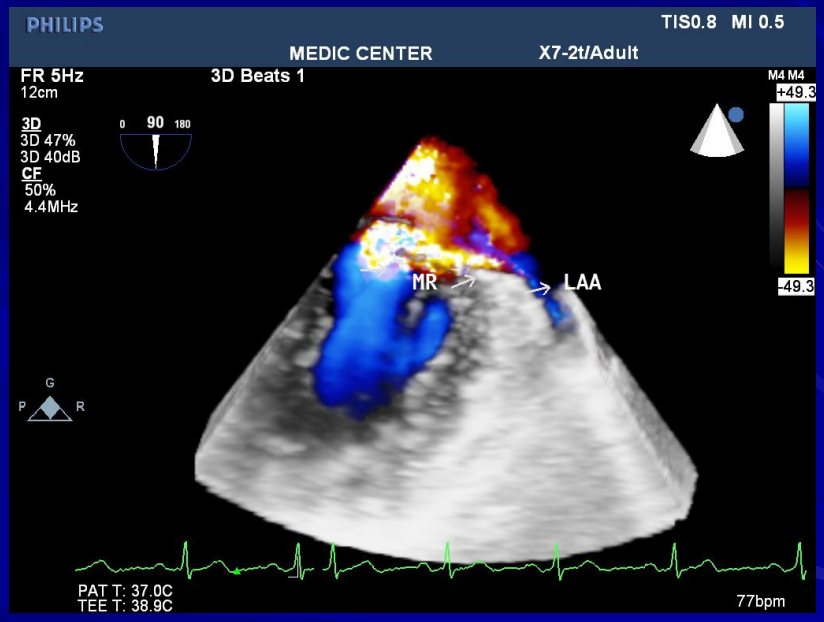


Mitral Regurgitation

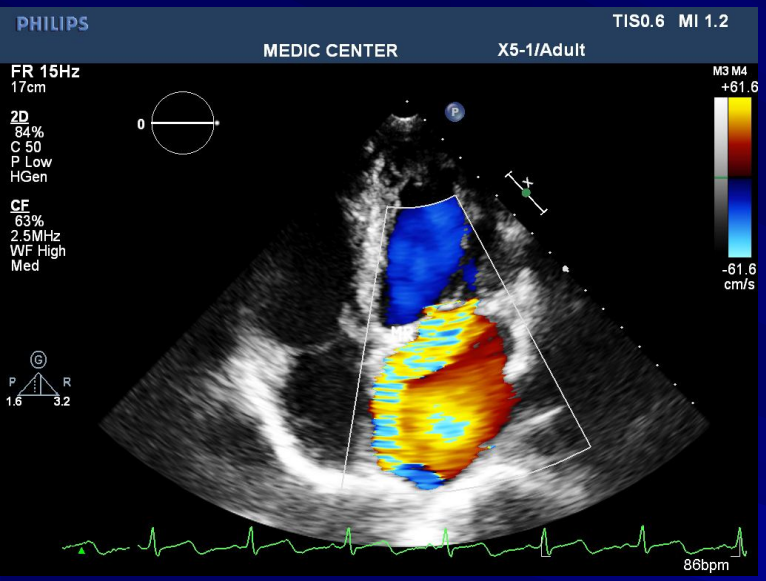
3D Zoom

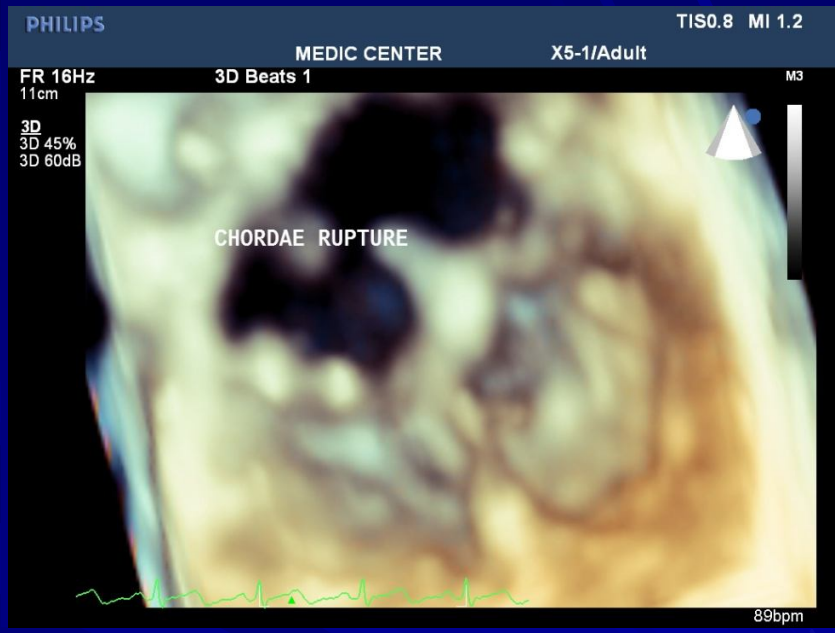


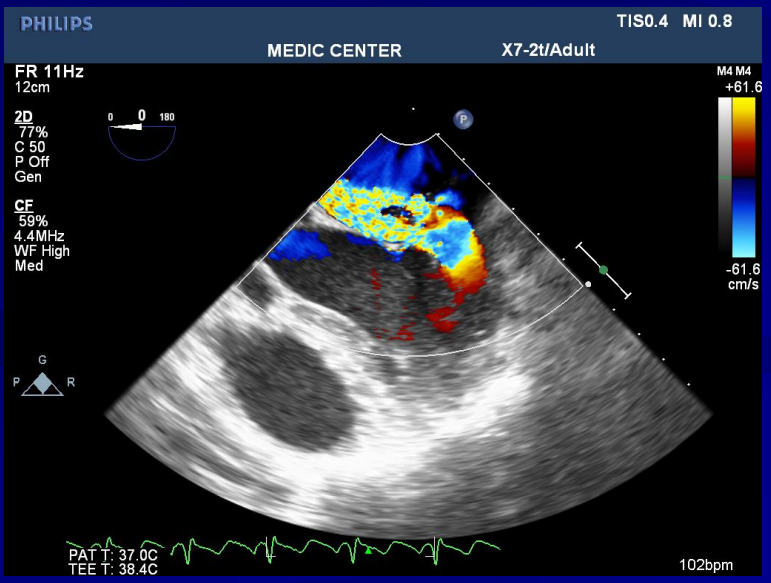
Live 3D with color

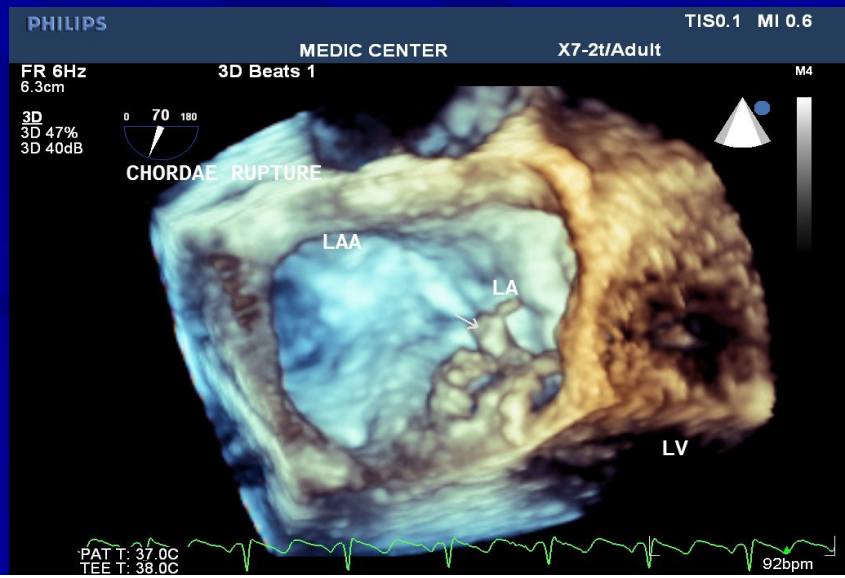


Hở 2 lá: Siêu âm 2 D và 3D

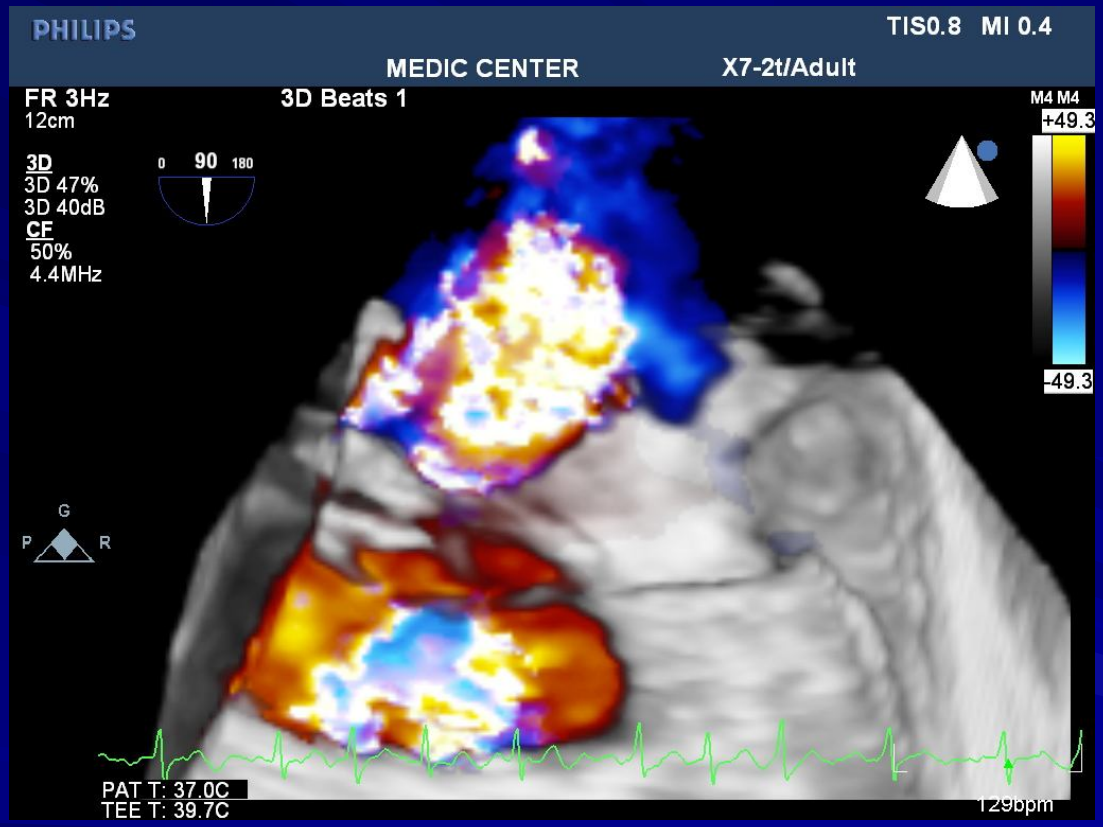




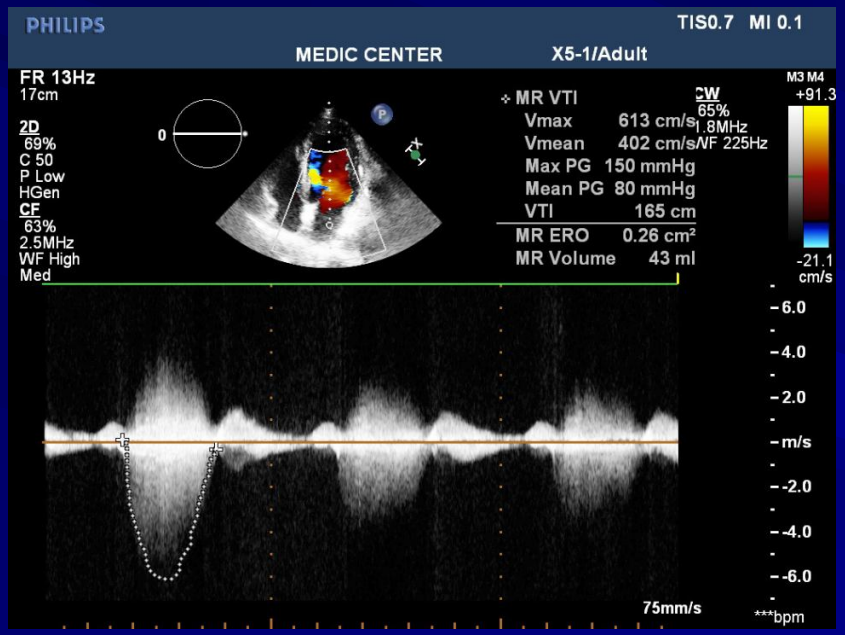




Hở 2 lá có 2 dòng phụt



Định lượng hở 2 lá, PISA



Formal quantification of MR

Severity grading

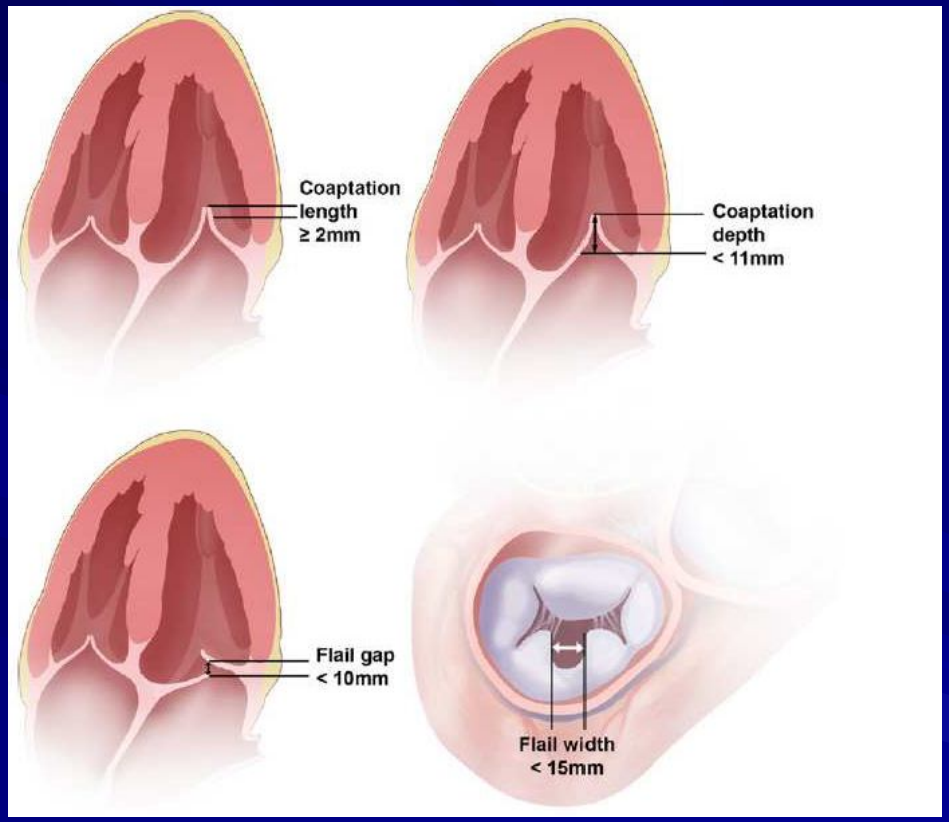
Parameter	Mild	Moderate	Severe
Effective regurgitant orifice (cm^2)	<0.2	0.2 – 0.4	>0.4
Regurgitant volume (ml/beat)	<30	30 – 50	>60
Regurgitant fraction (%)	<30	30 – 50	>50

Hở van 2 lá

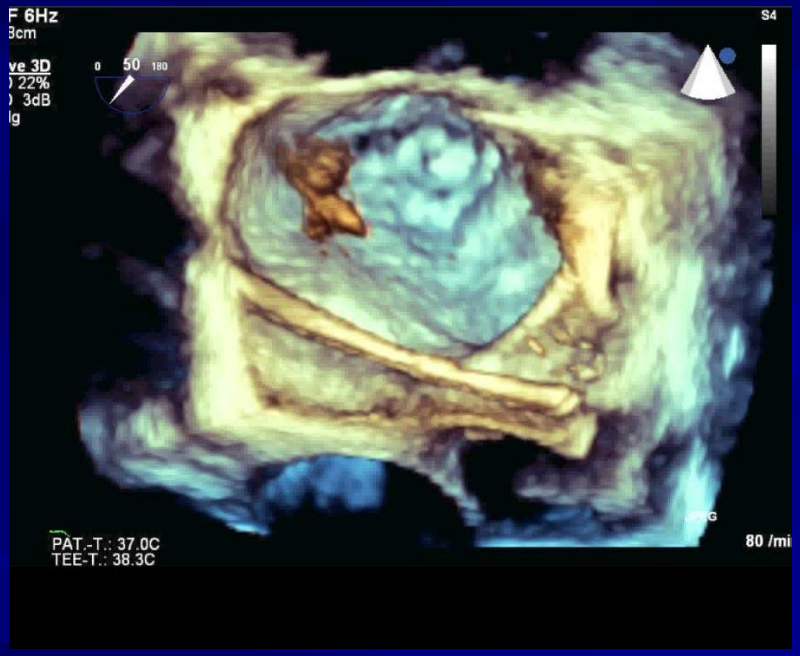
Vai trò siêu âm tim 3 D

- Cơ chế hở.
- Định lượng: Vena Contracta, PISA.
- Phát hiện hở nhiều dòng.
- Khu trú tổn thương van: segment I,II,III
- Theo dõi trong thủ thuật MitralClip
- Tiêu chuẩn làm MitralClip : hở 2 lá cơ năng segment II, PML <10mm .

Tiêu chuẩn MitralClip

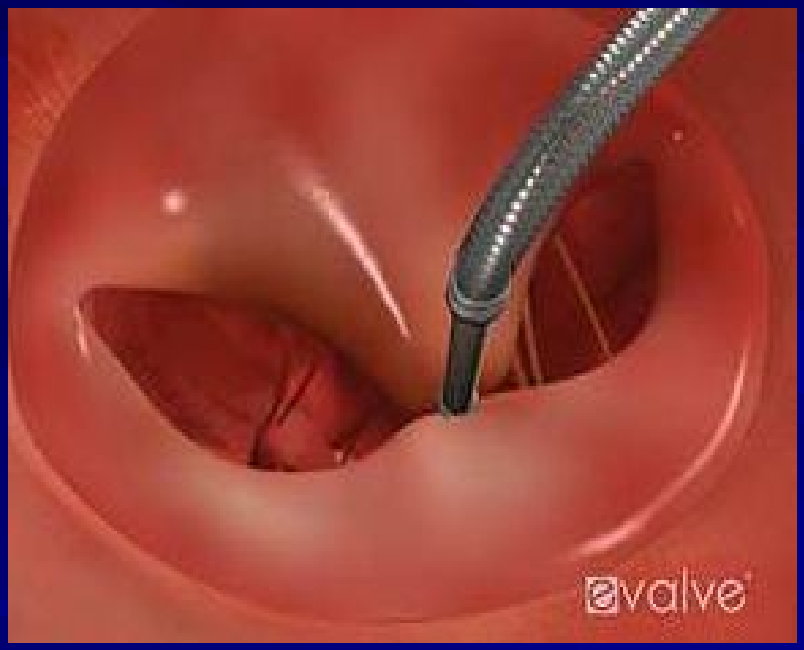


Giúp đâm kim qua vách liên nhĩ trong MitralClip



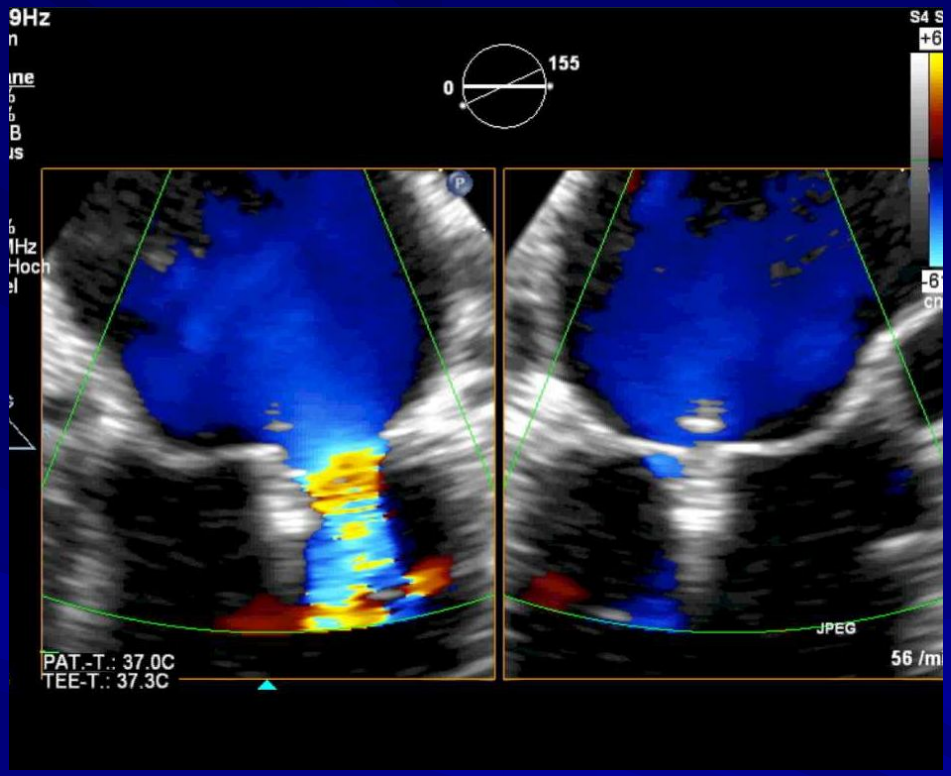


Theo dõi sau MitralClip





MITRAL CLIP
2D-TEE



Clip hở van 2 lá

- 2D TTE.MR
- 2D TTE. Color
- 3D TTE. Zoom
- 2D TEE
- 2D TEE Color
- Live 3D
- 3D TEE Color
- 3D TEE Color.
- 3D TEE Zoom
- 3D TEE Zoom.

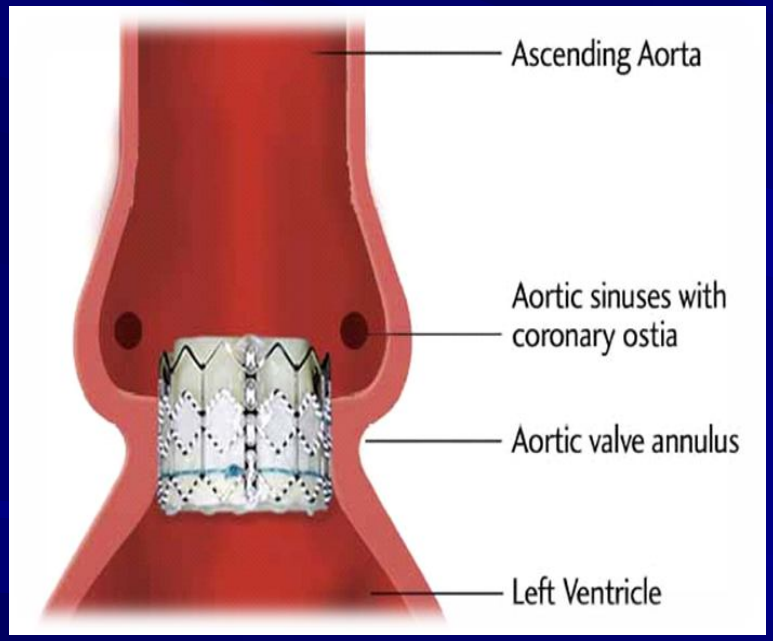
Mitral Clip

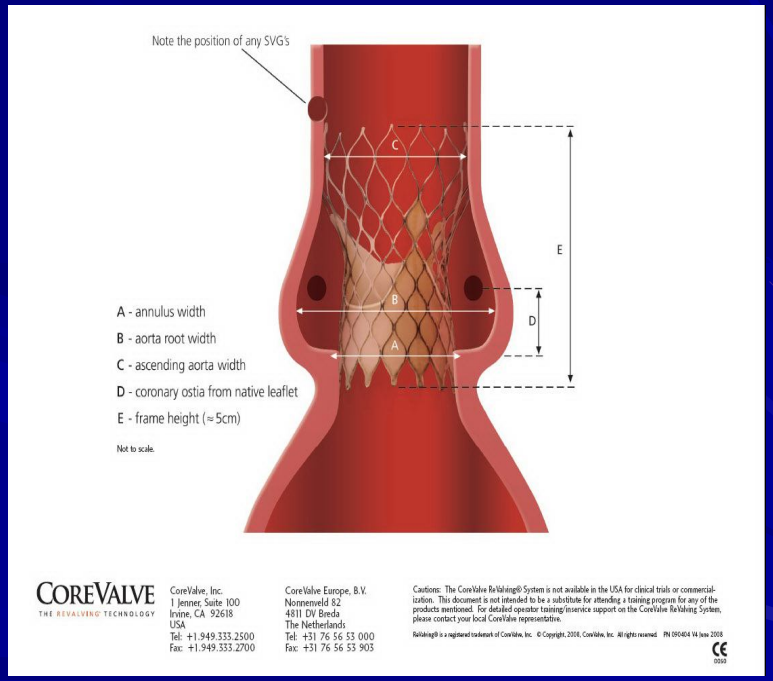
- Mitral Clip 2D
- Mitral Clip 3D

Thay van ĐMC qua da
(TAVI)

- Điều trị tối ưu đối với bn hẹp van ĐMC nặng có triệu chứng mà có nguy cơ cao với phẫu thuật.
- Lựa chọn bn và theo dõi trong khi làm TAVI.
- Clip Core Valve
- Clip Core Valve
- Clip Edwards
- Clip Edwards
- Clip Edwards

Edwards and CoreValve



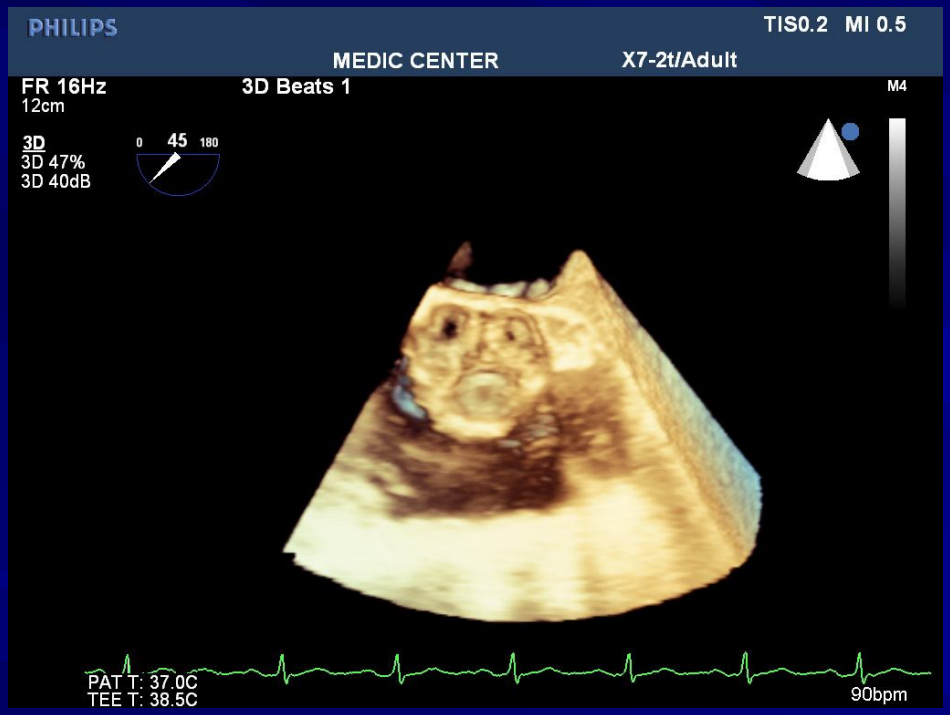


Edwards and CoreValve

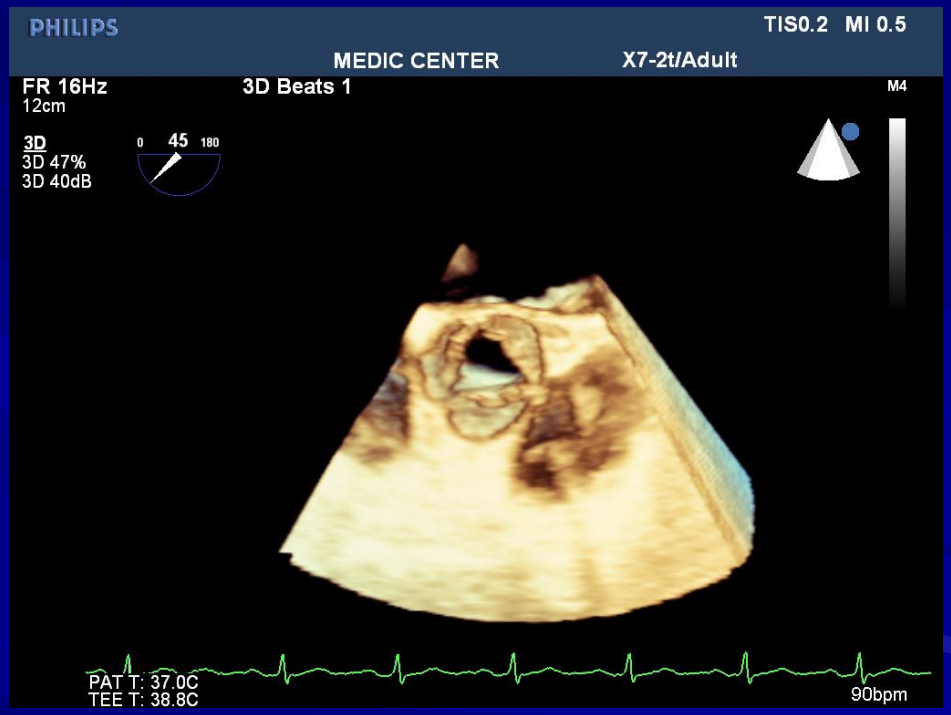
	Edwards SAPIEN™	CoreValve
		
• Material:	Stainless steel bovine pericardium	Nitinol porcine pericardium
• Delivery:	balloon expandable	self-expanding
• Annulus diameter:	18-25mm	19-27
• Size:	23mm, 26mm	26mm, 29mm
• Sheath size:	22F, 24F	18F

Khảo sát van ĐMC, SAT 3D

Diastole



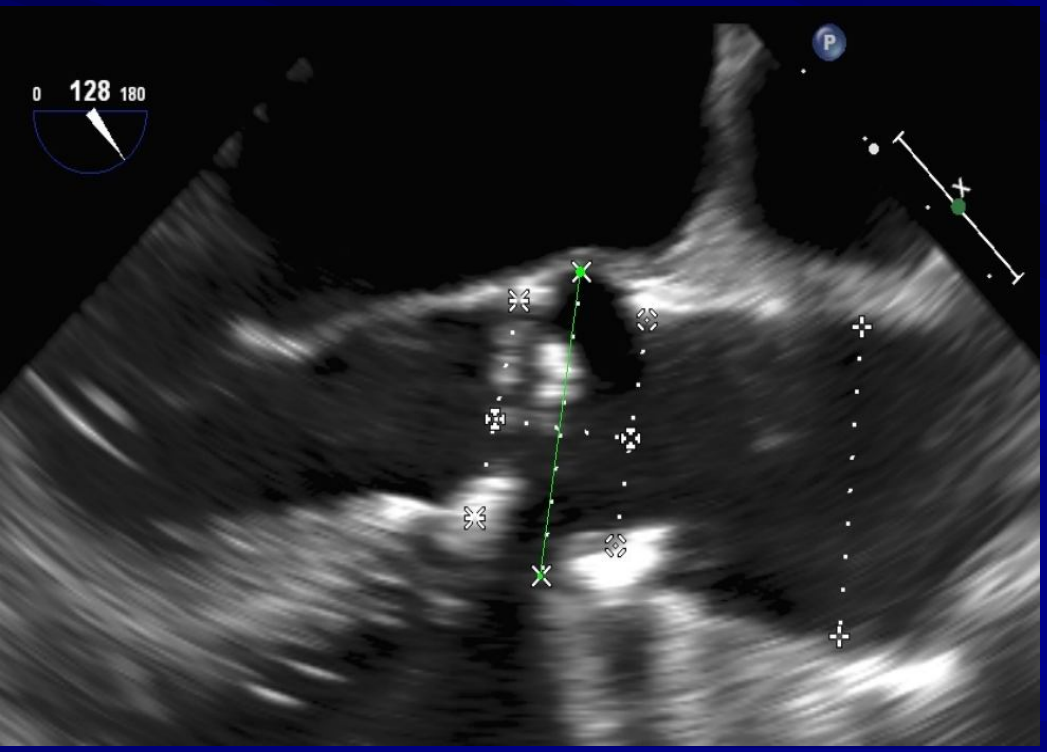
Systole

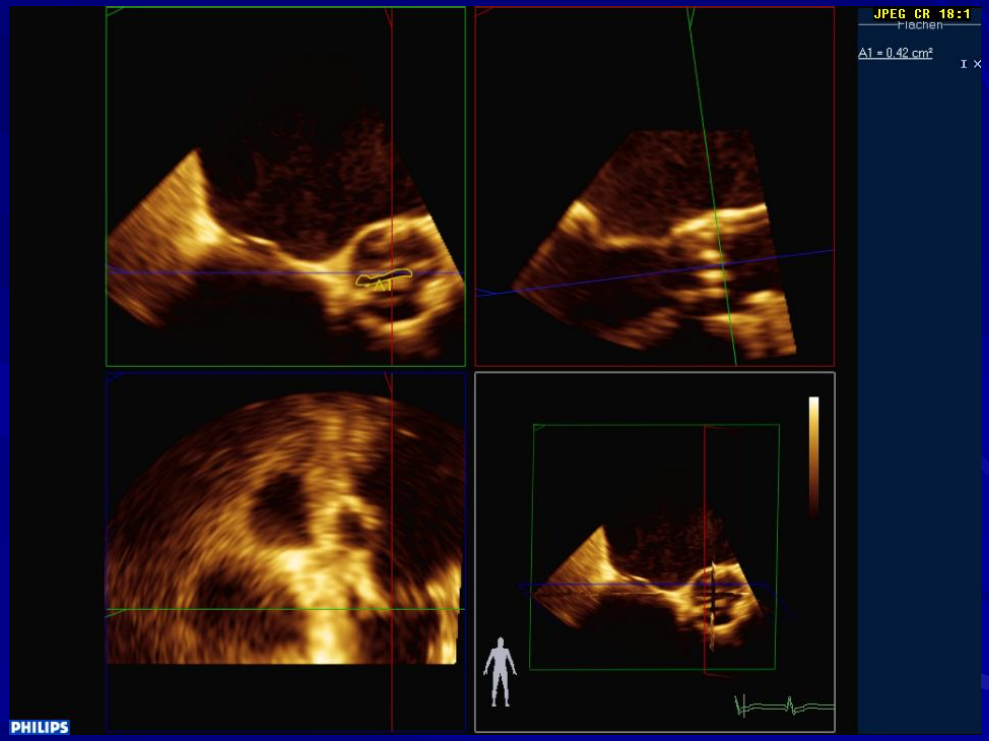


Đo đạc trước TAVI

Asc. Aorta

Measure AVA by use of QLAB

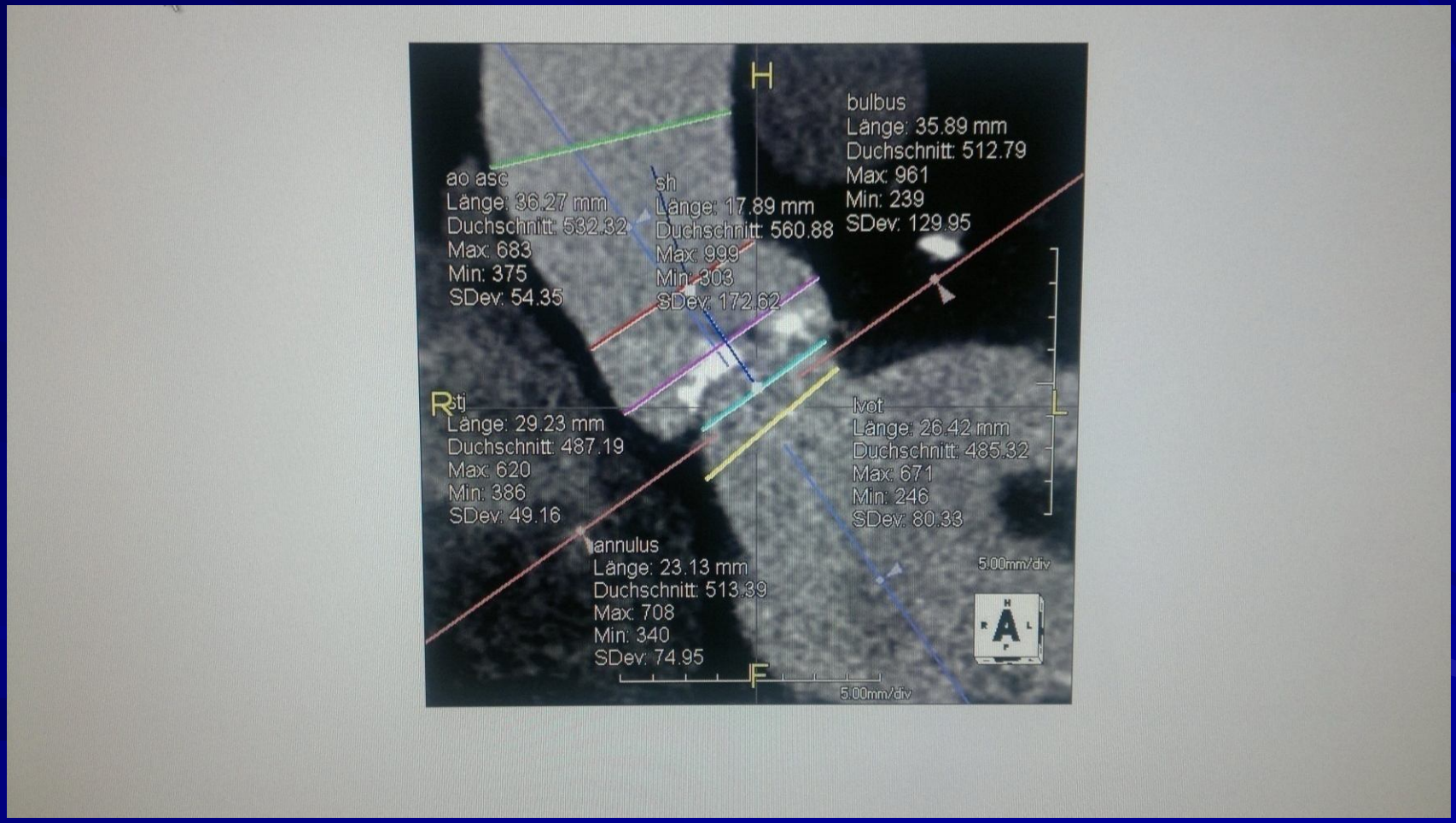




Siêu âm tim 3 D trước và sau làm TAVI

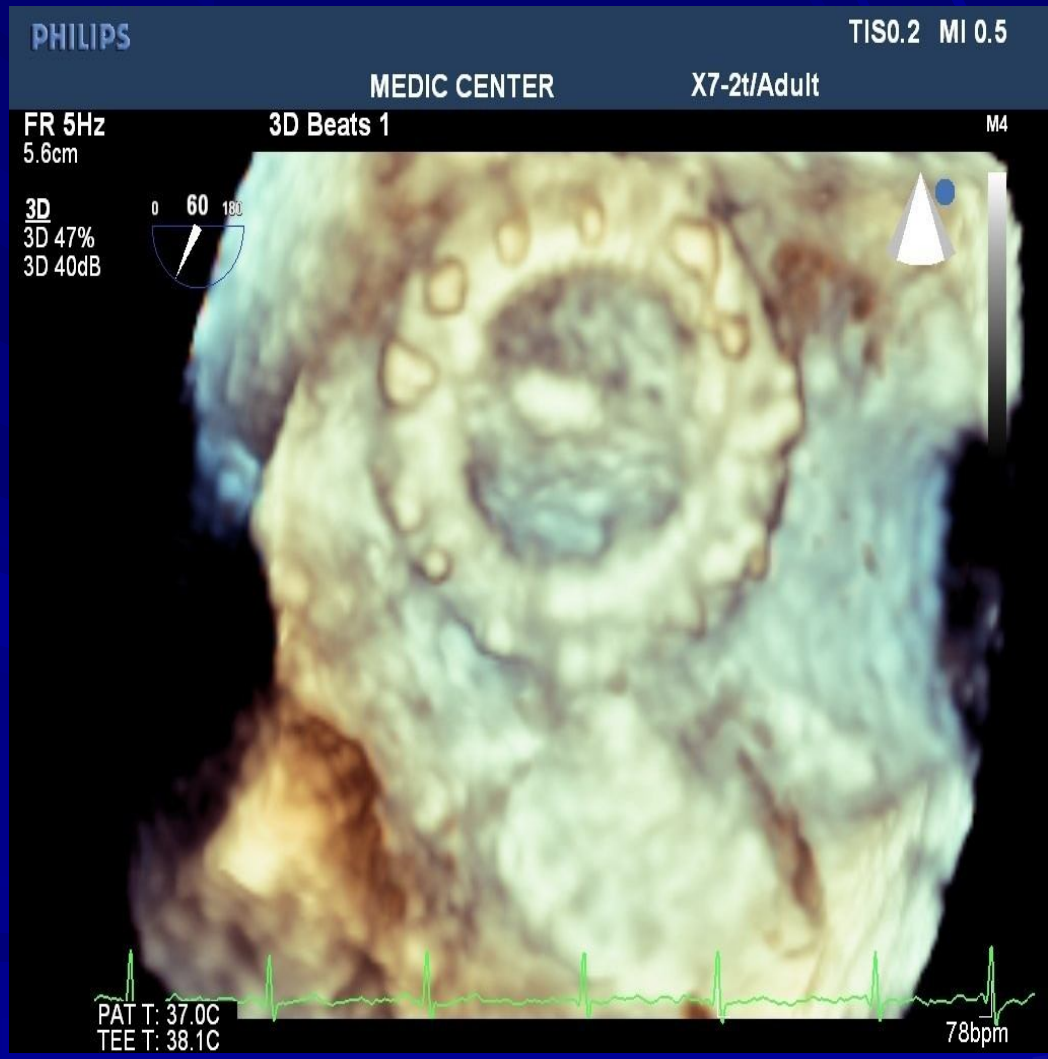
- Study aortic cusps , SAX
- Study aortic cusps , LAX
- Apical 5C View, 2D
- Apical 5C View, 3D
- Apical 3C View, 3D with color

MSCT & TAVI

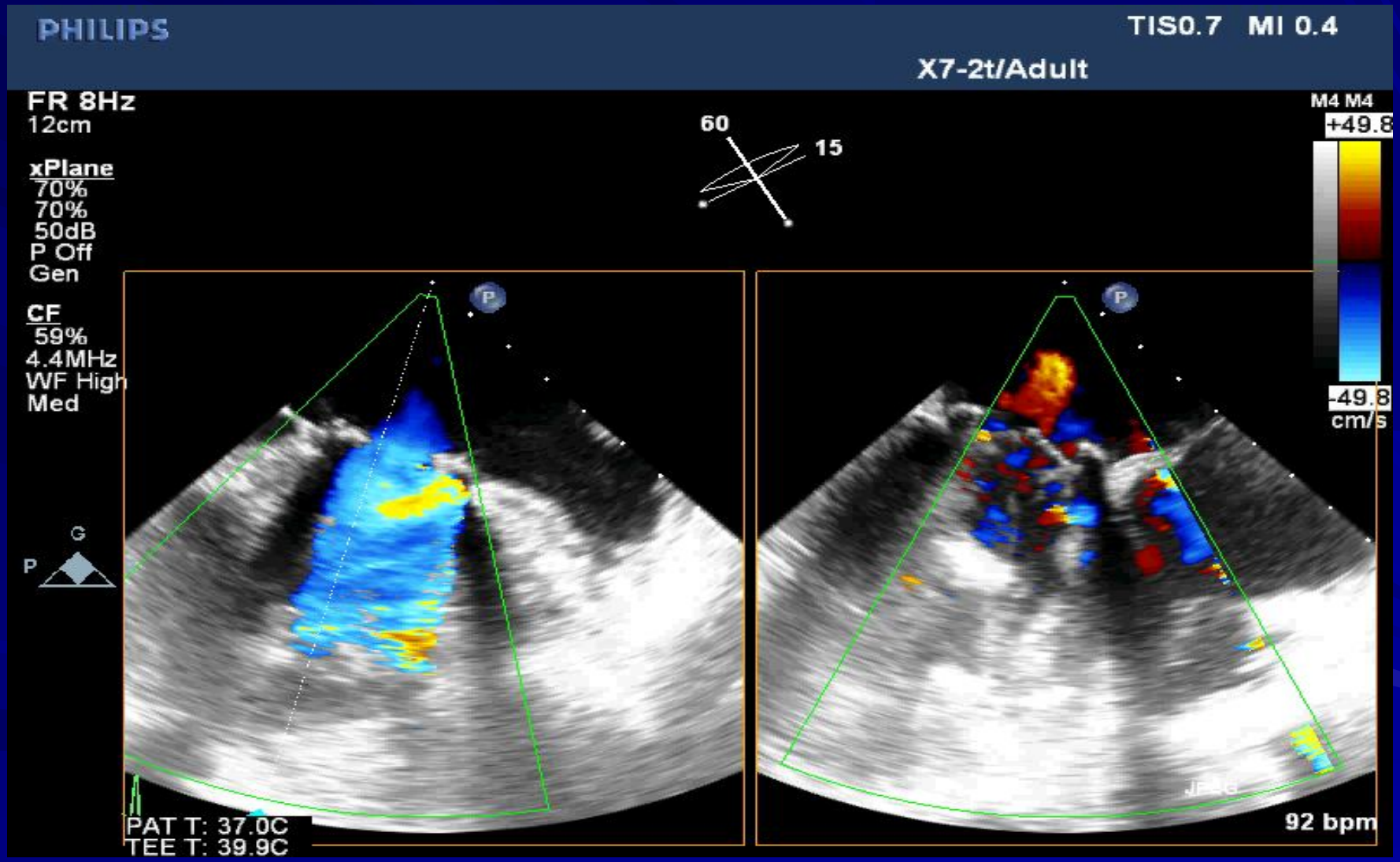

H
bulbus
Länge: 35.89 mm
Duchschnitt: 512.79
Max: 961
Min: 239
SDev: 129.95
ao asc
Länge: 36.27 mm
Duchschnitt: 532.32
Max: 683
Min: 375
SDev: 54.35
sh
Länge: 17.89 mm
Duchschnitt: 560.88
Max: 999
Min: 303
SDev: 172.62
R
stj
Länge: 29.23 mm
Duchschnitt: 487.19
Max: 620
Min: 386
SDev: 49.16
lvot
Länge: 26.42 mm
Duchschnitt: 485.32
Max: 671
Min: 246
SDev: 80.33
L
annulus
Länge: 23.13 mm
Duchschnitt: 513.39
Max: 708
Min: 340
SDev: 74.95
5.00mm/div
F
5.00mm/div

Khảo sát van cơ học (3D Zoom)





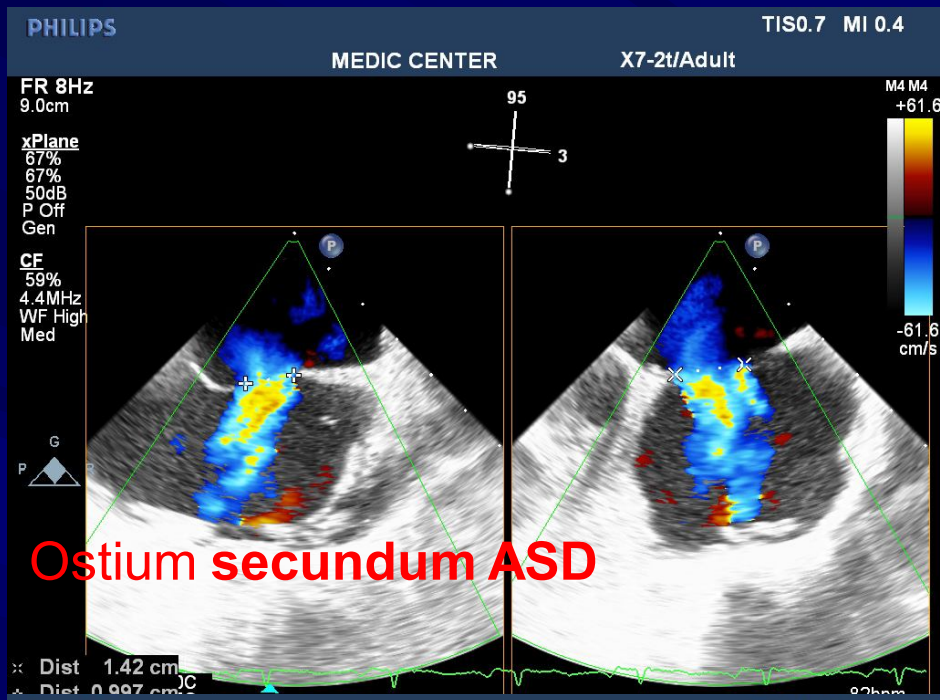
Khảo sát hở 2 lá sau thay van cơ học bằng TEE

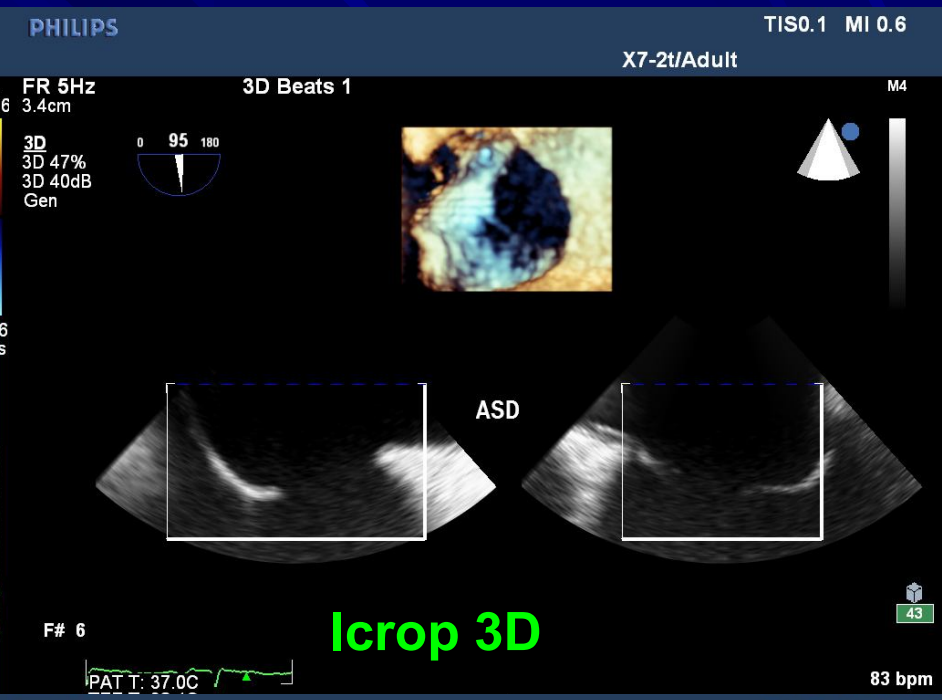


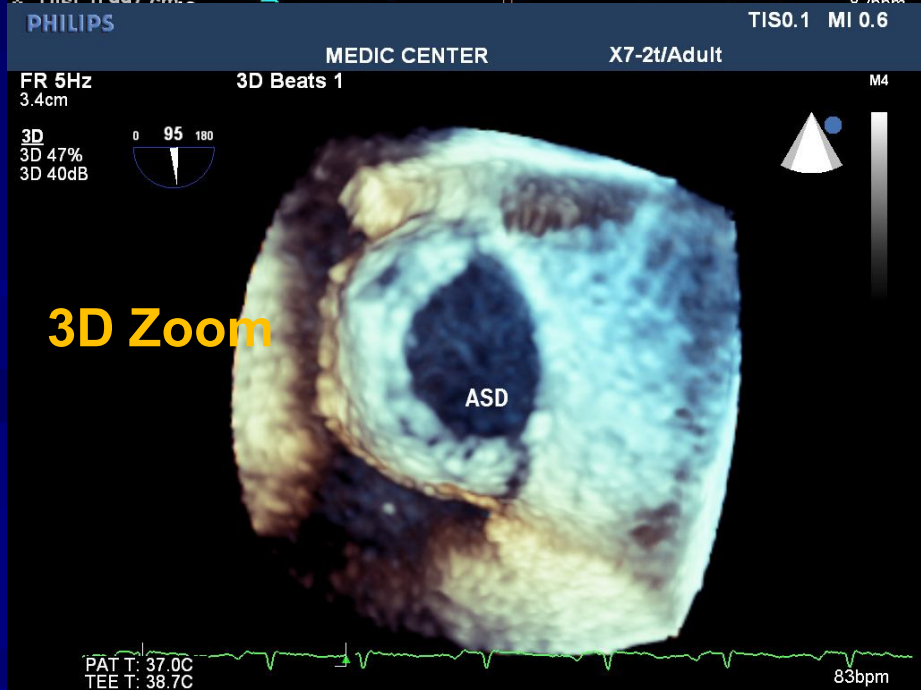
Hở 2 lá trong van

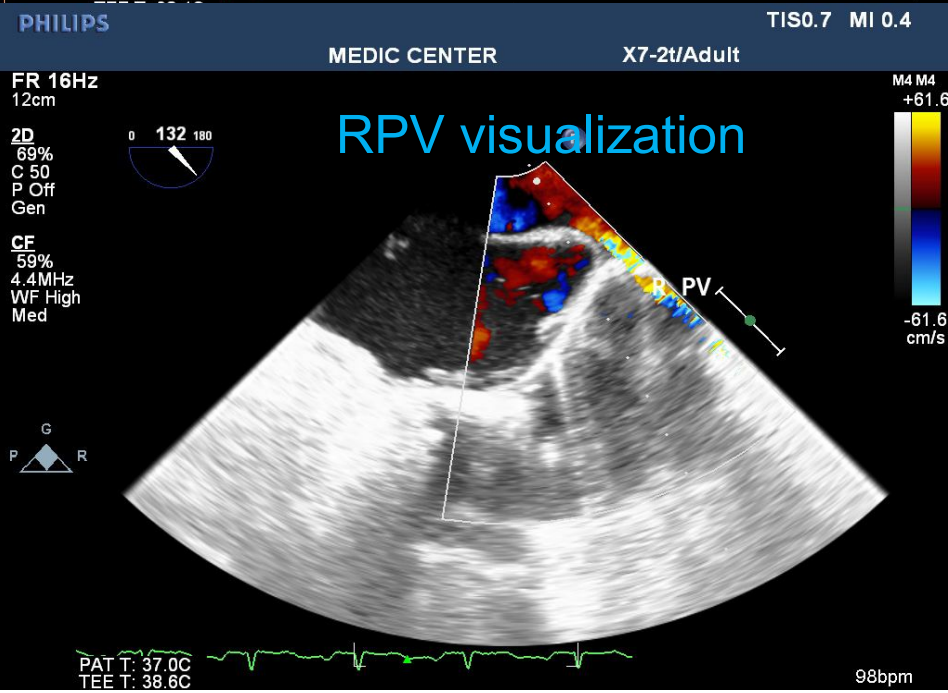


Thông liên nhĩ

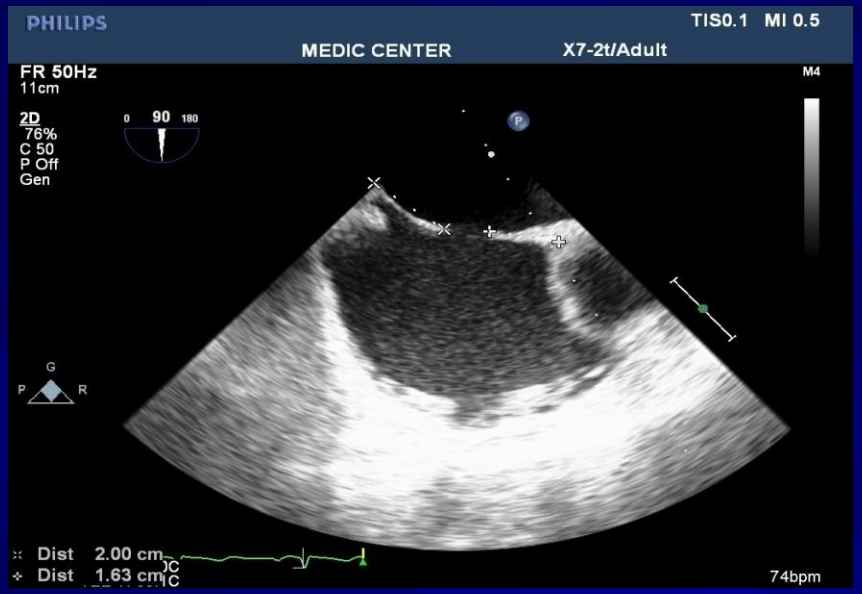




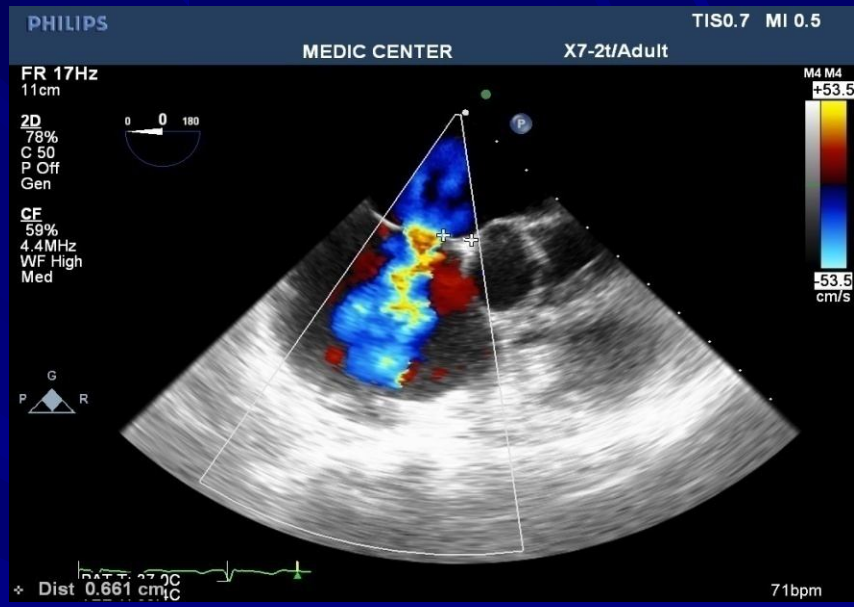




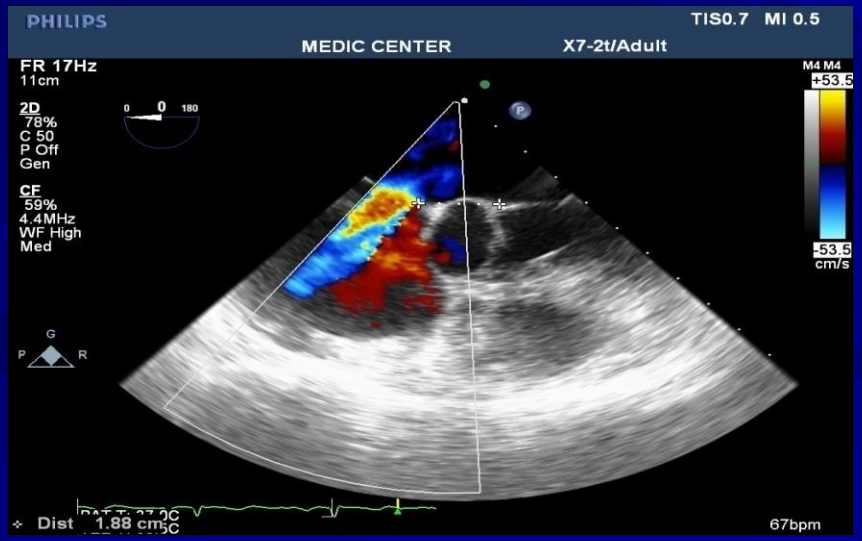
Đo rìa vách liên nhĩ



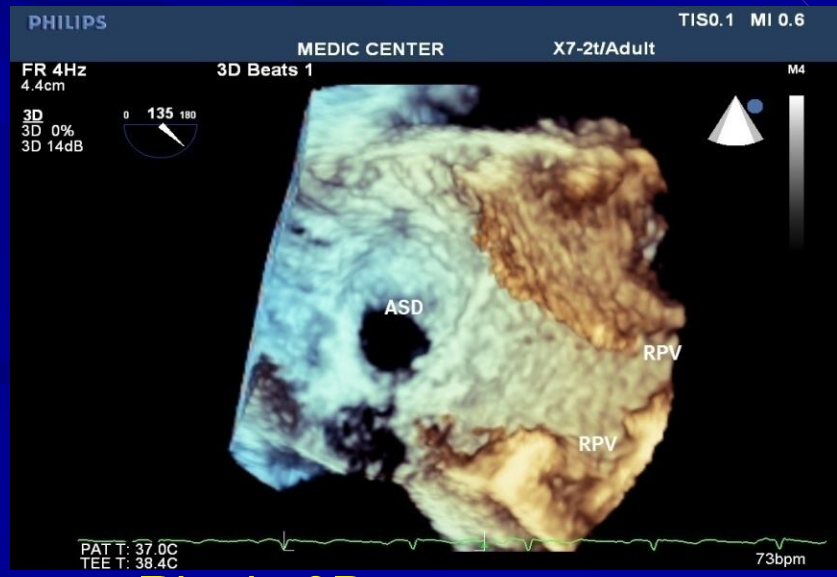
SVC & IVC



MV

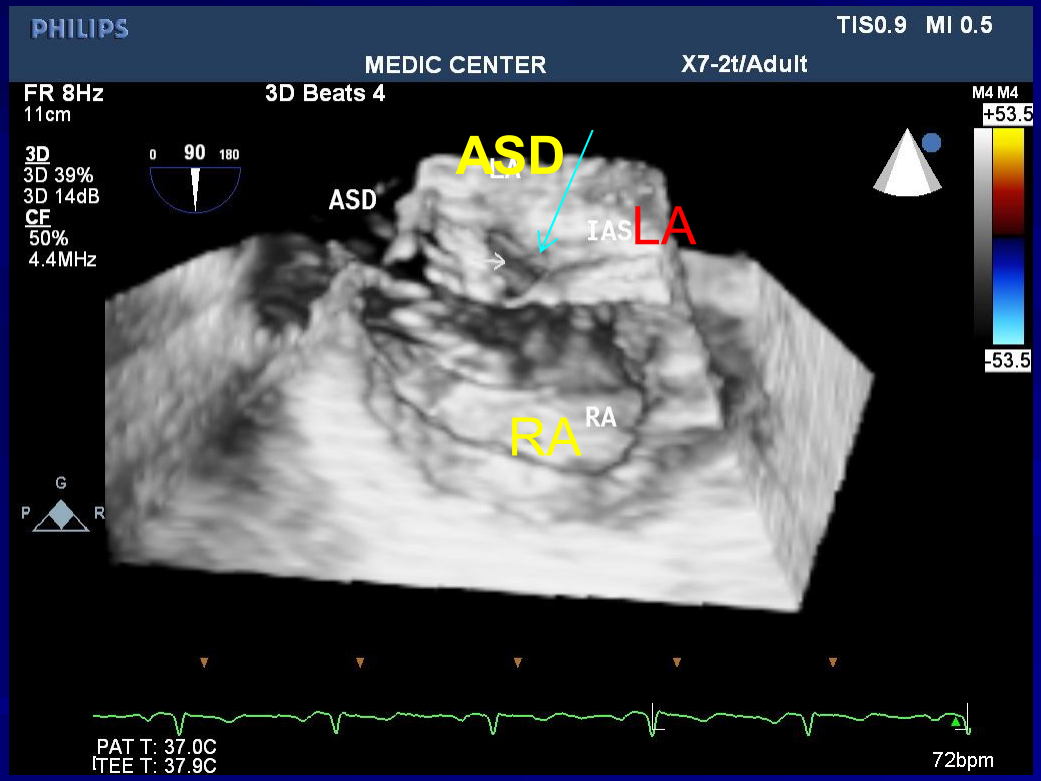


AO

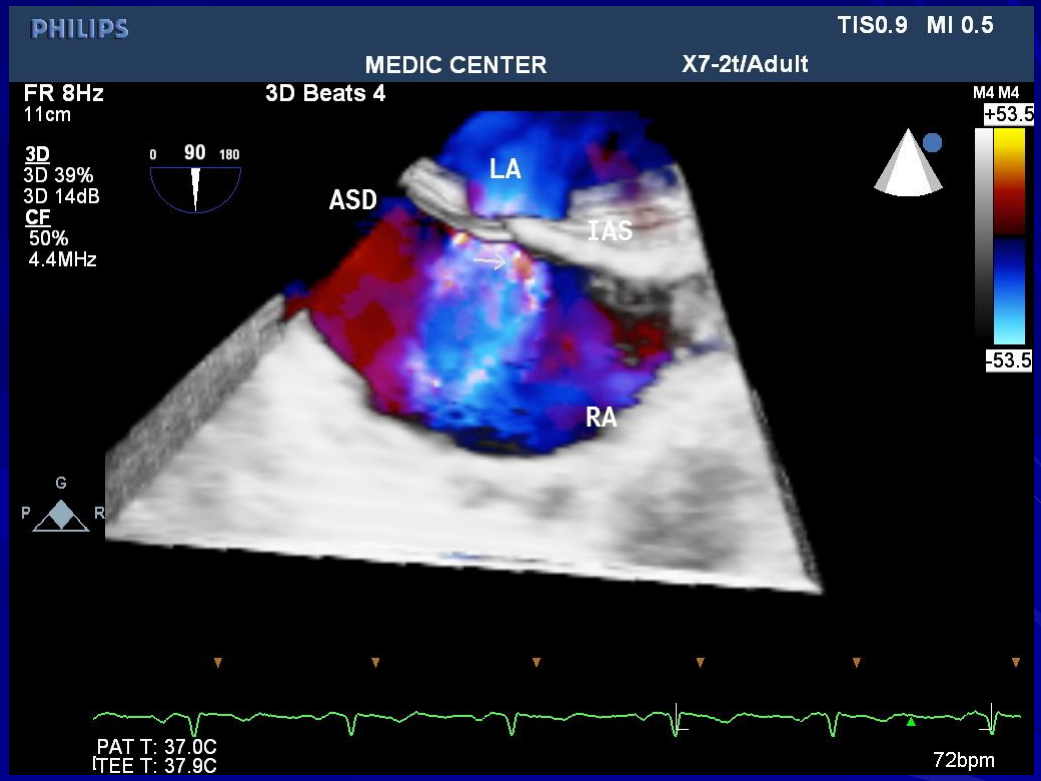


Rim in 3D

Live 3D TEE

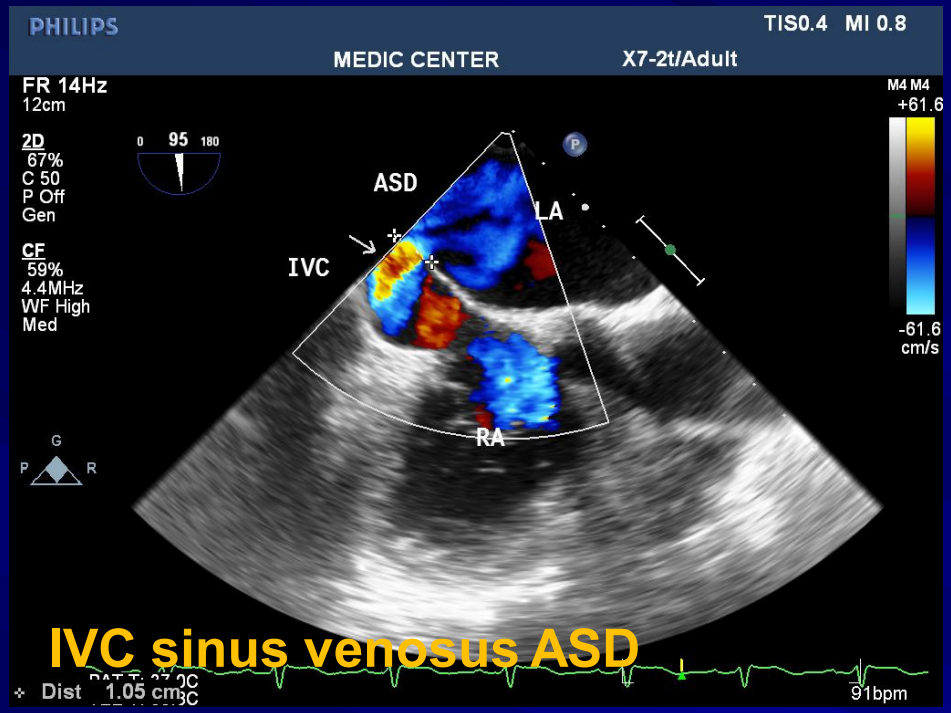


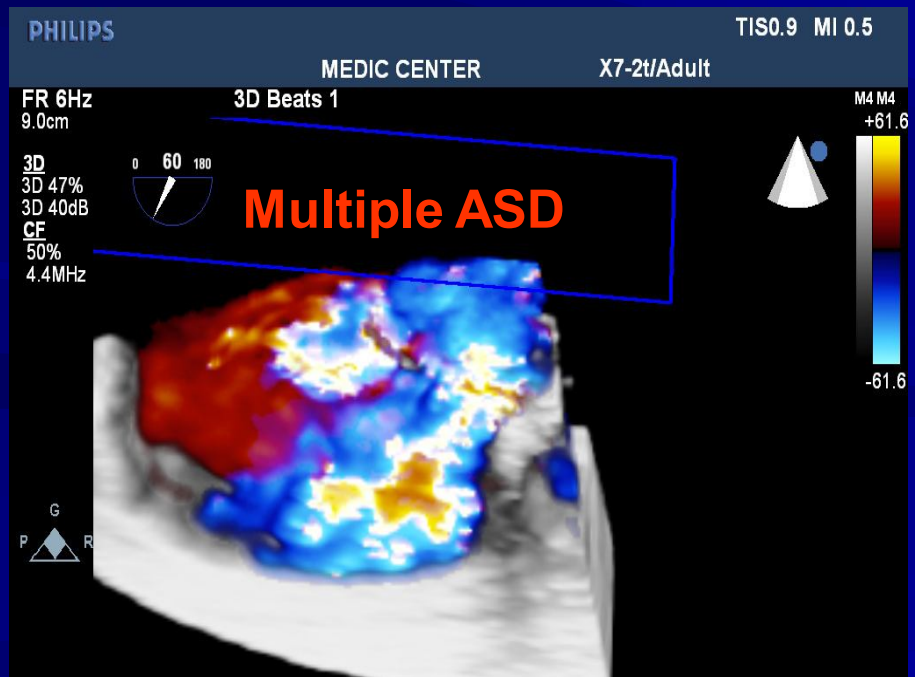
Without color



With color

TLN type sinus venosus

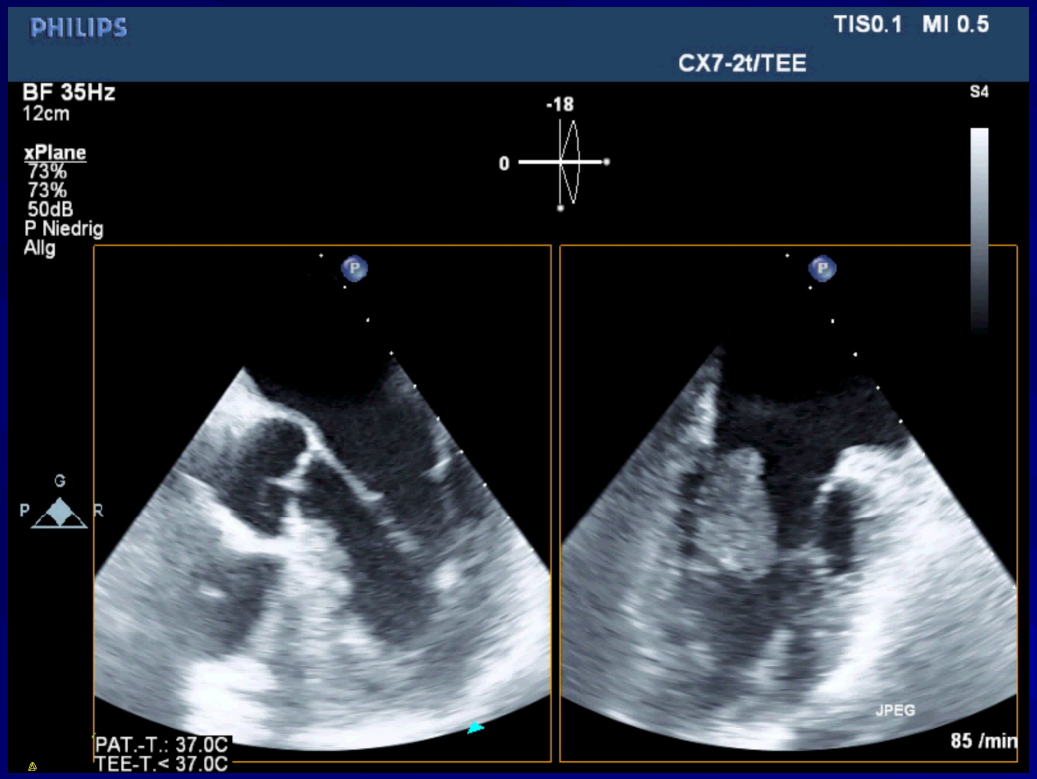


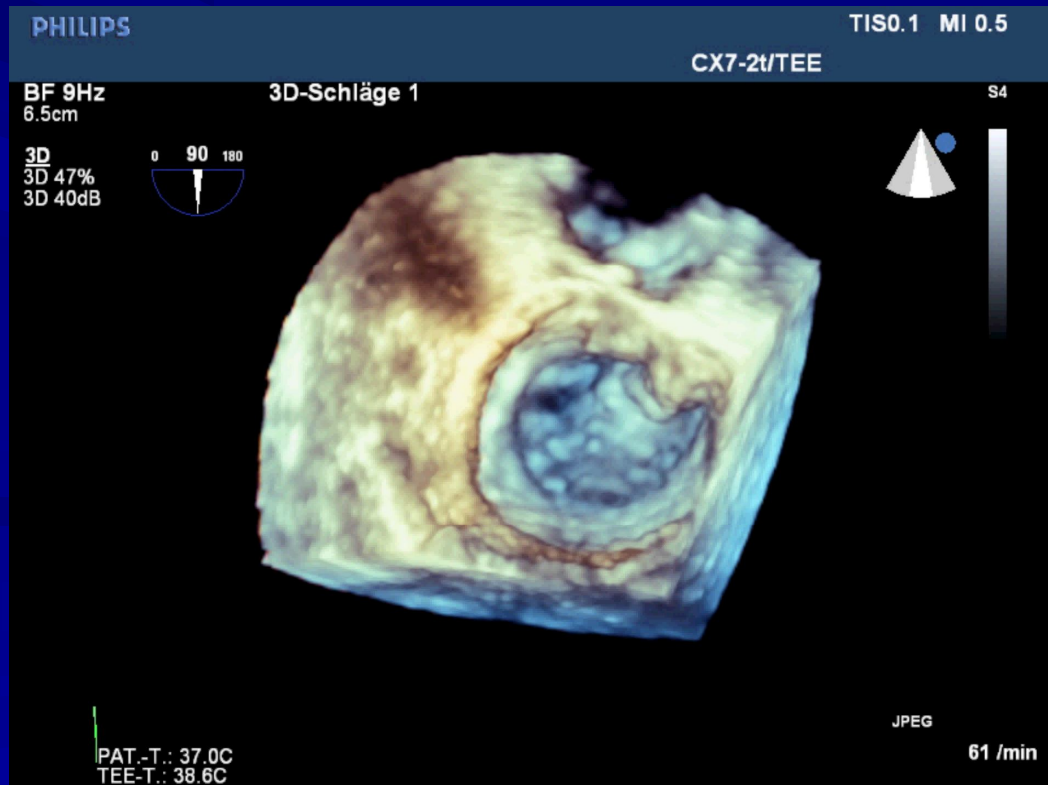


Sinus venosus ASD

- SVC sinus venosus ASD
- SVC sinus venosus ASD. 3D
- **Multiple ASD**
- Multiple ASD 2 D
- Multiple ASD 3D
- Multiple ASD 2D color
- Multiple ASD 3D color

U nhầy nhĩ trái





TLN lỗ thứ phát

2D Echocardiography

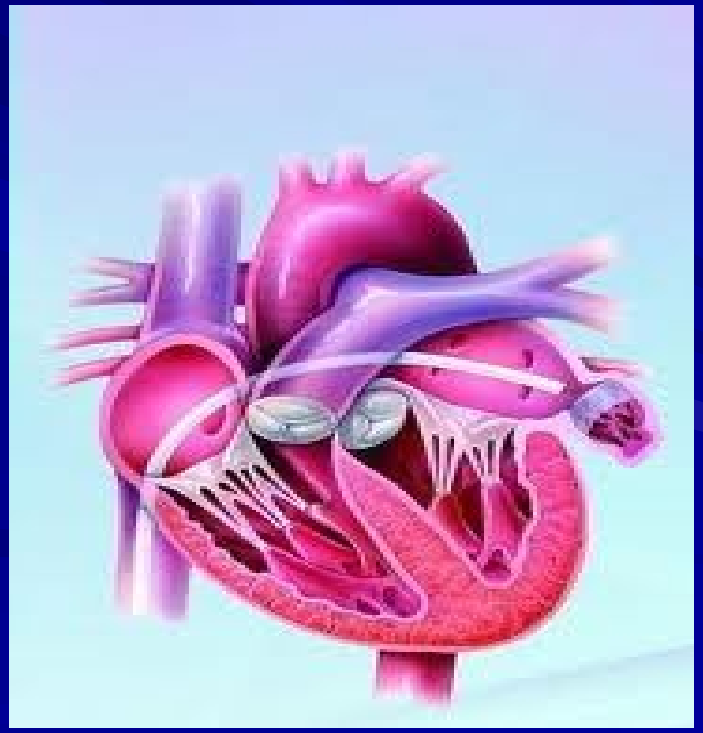
- TEE 2D
- TEE 2D Color

3D Echocardiography

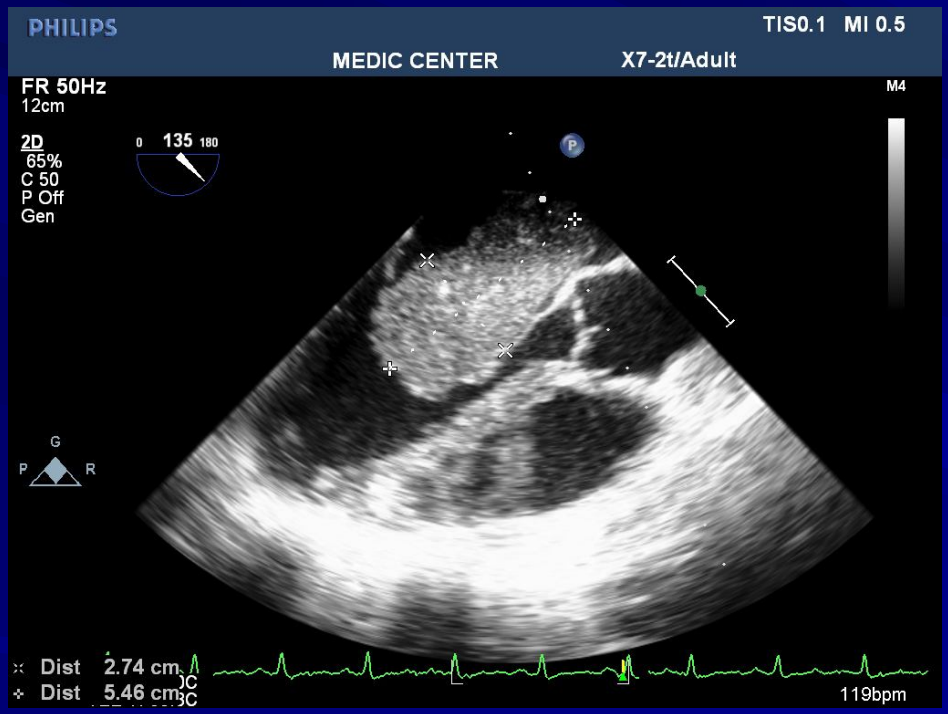
- TEE 3D without color
- TEE.3D.Color
- TEE.3D Color.1
- TEE.3D.Color.2
- TEE.3D.Color.3
- TEE.3D.Color.4
- TEE 3D Zoom
- Device closure
- Device closure.1

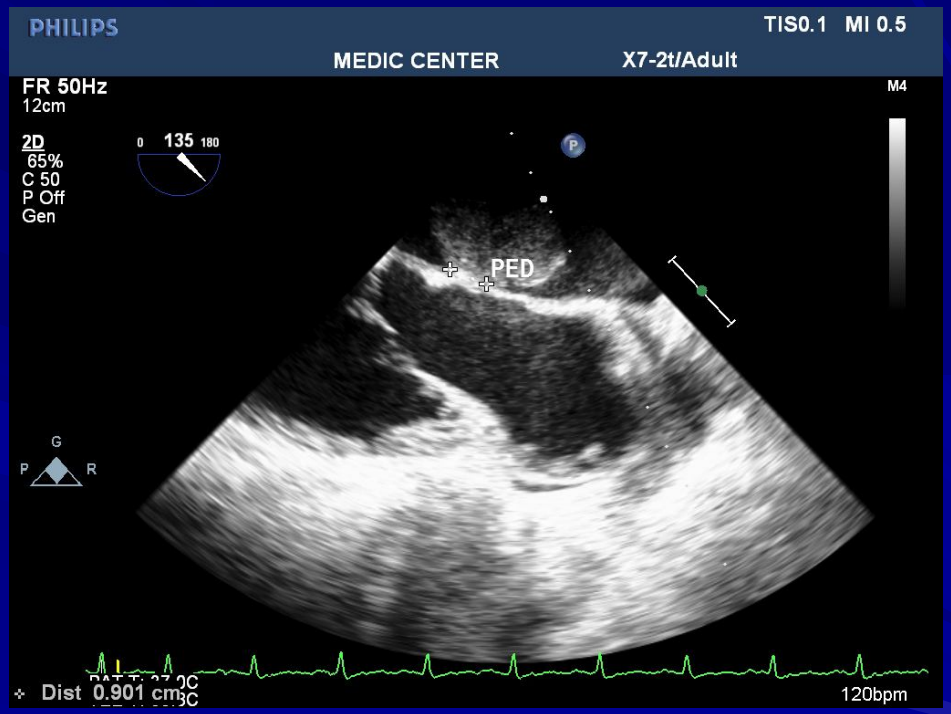
Các bệnh tim khác

- Bicuspid Aorta
- Thrombose of Descending Aorta
- TAVI Procedure
- PFO Closure
- Watchman Device
- Myxoma

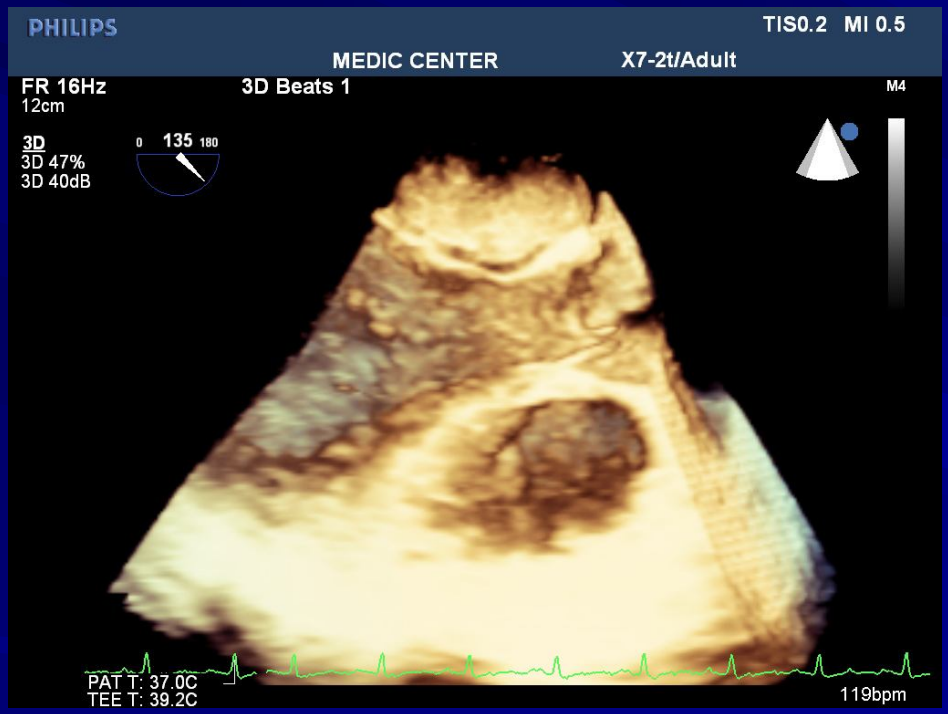


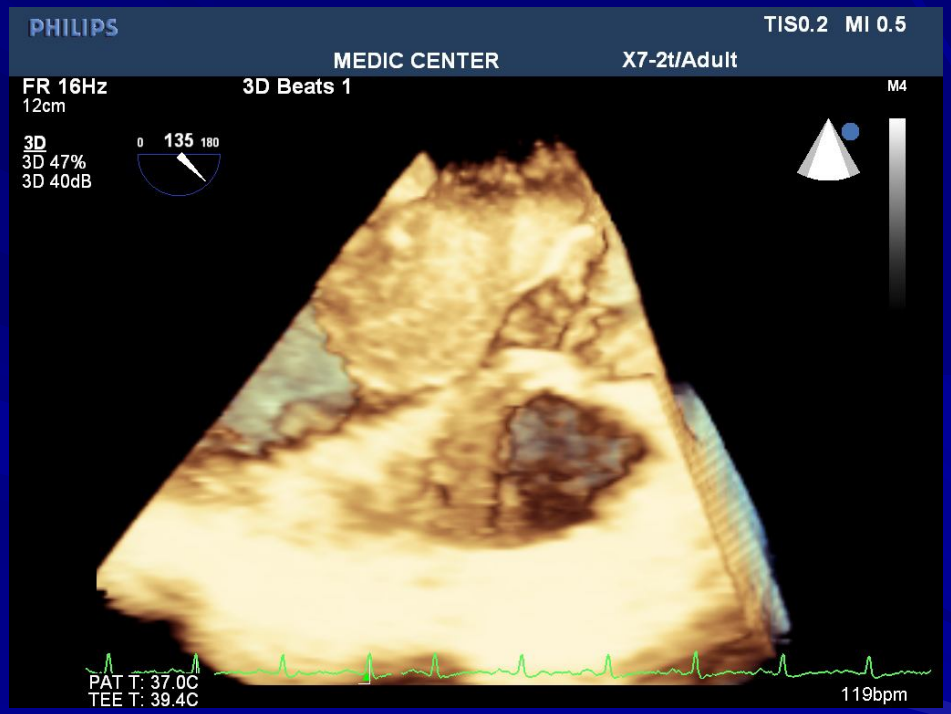
Siêu âm tim qua thực quản 2 chiều





Siêu âm tim qua thực quản 3 chiều





Hình u nhầy nhĩ trái sau phẫu thuật



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- Catherine Otto, The Practice of Clinical Echocardiography, 4th Ed, Elservier Saunders 2012.
- Feigenbaums’ Echocardiography, 7th Ed, William Wilkins 2010.
- Topol, Textbook of Interventional Cardiology, 5th Ed, Elservier Saunders 2008.



Vielen Dank !