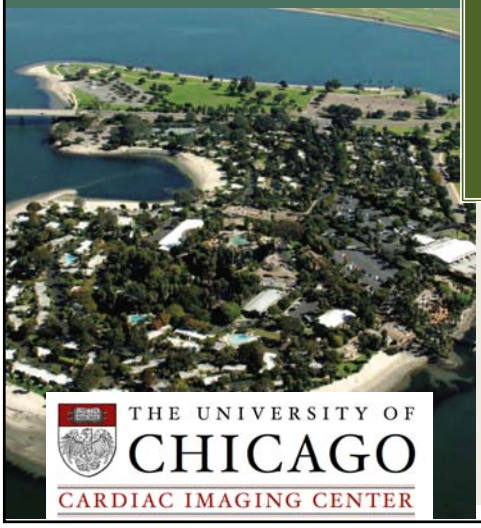
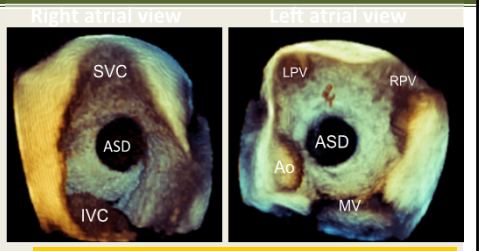
State-of-the-Art ECHOCARDIOGRAPHY

31st ANNUAL



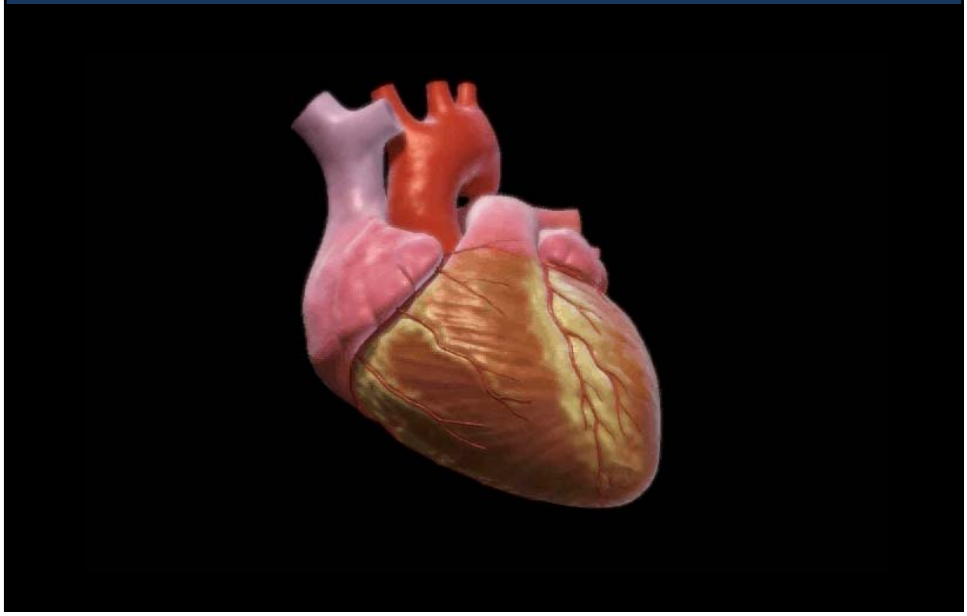
2D/3D in Evaluation of Atrial Septum

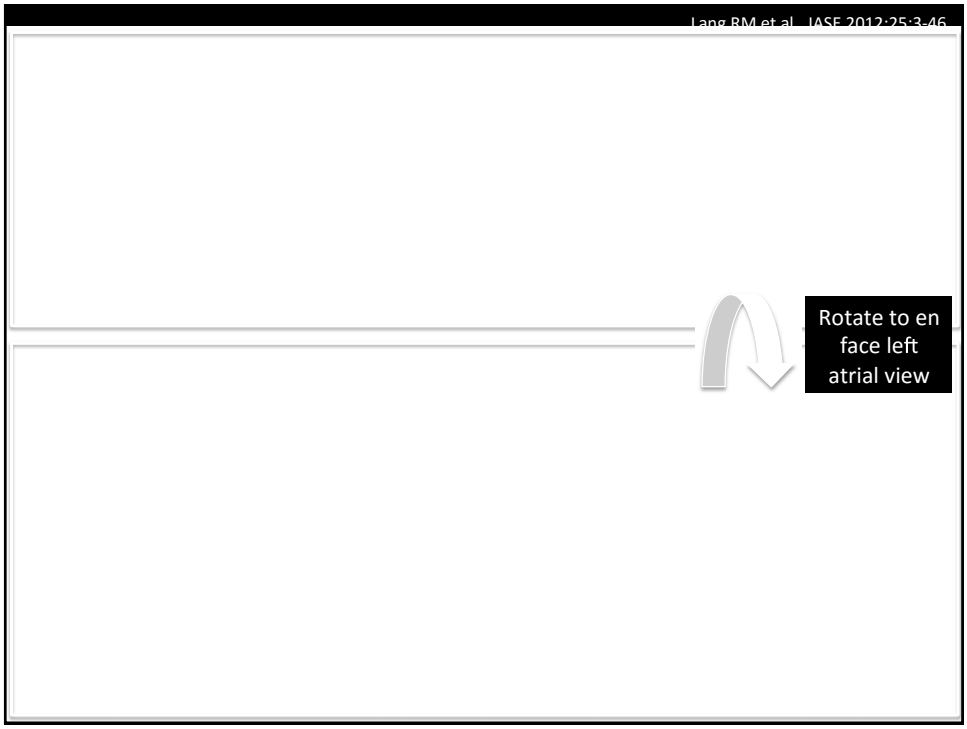


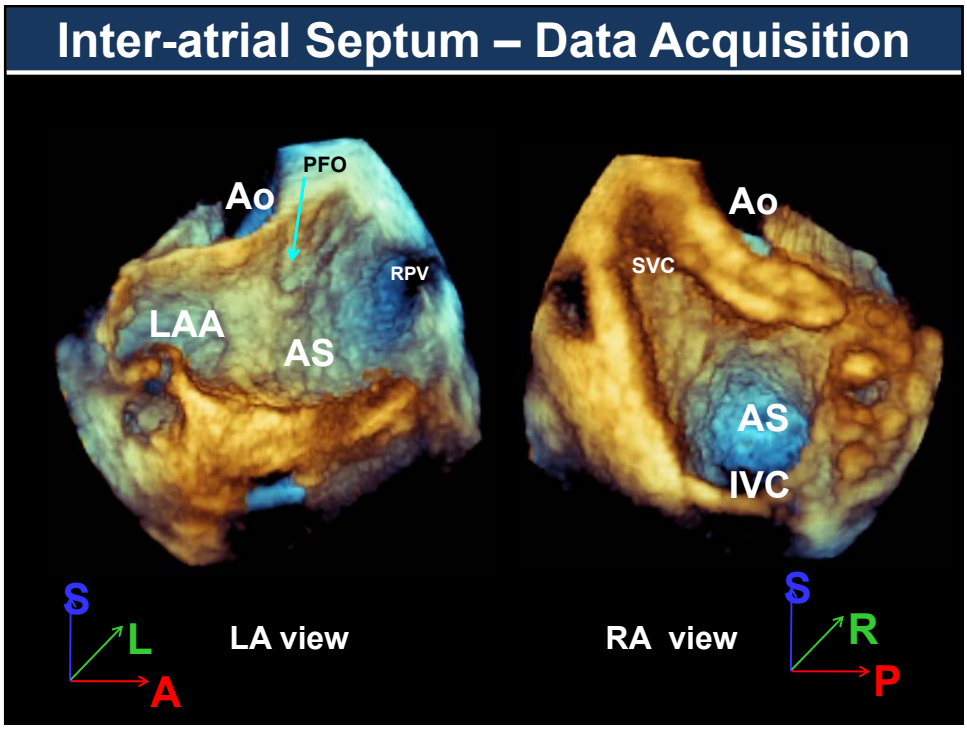
Roberto M Lang, MD

THE UNIVERSITY OF CHICAGO
CARDIAC IMAGING CENTER

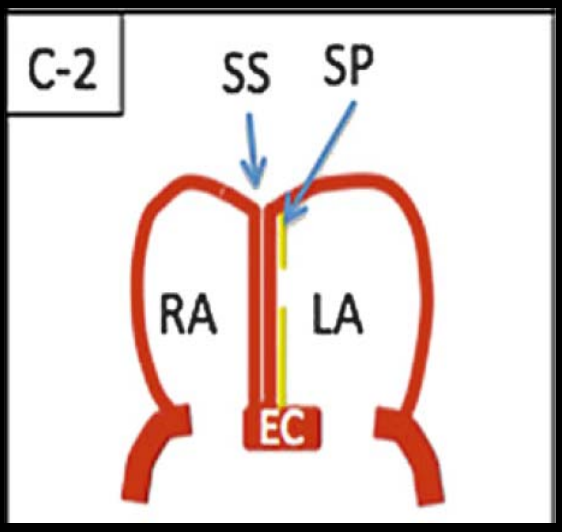
OSTIUM SECUNDUM ASD: 2D AND 3D TRANSESOPHAGEAL ECHO




Lang RM et al. JASE 2012;25:3-46
Rotate to en face left atrial view

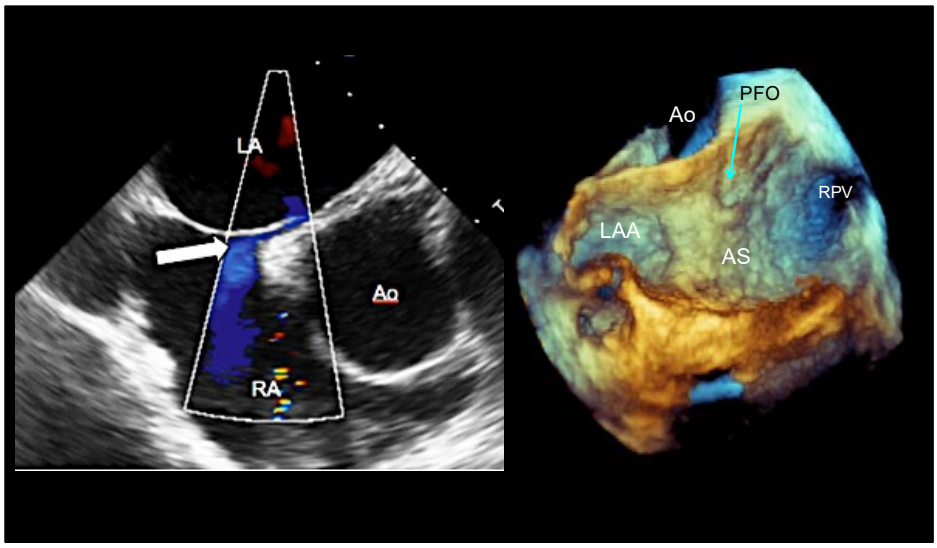

Inter-atrial Septum – Data Acquisition
PFO
Ao
RPV
LAA
AS
Ao
SVC
AS
IVC
S
L
A
LA view
RA view
S
R
P

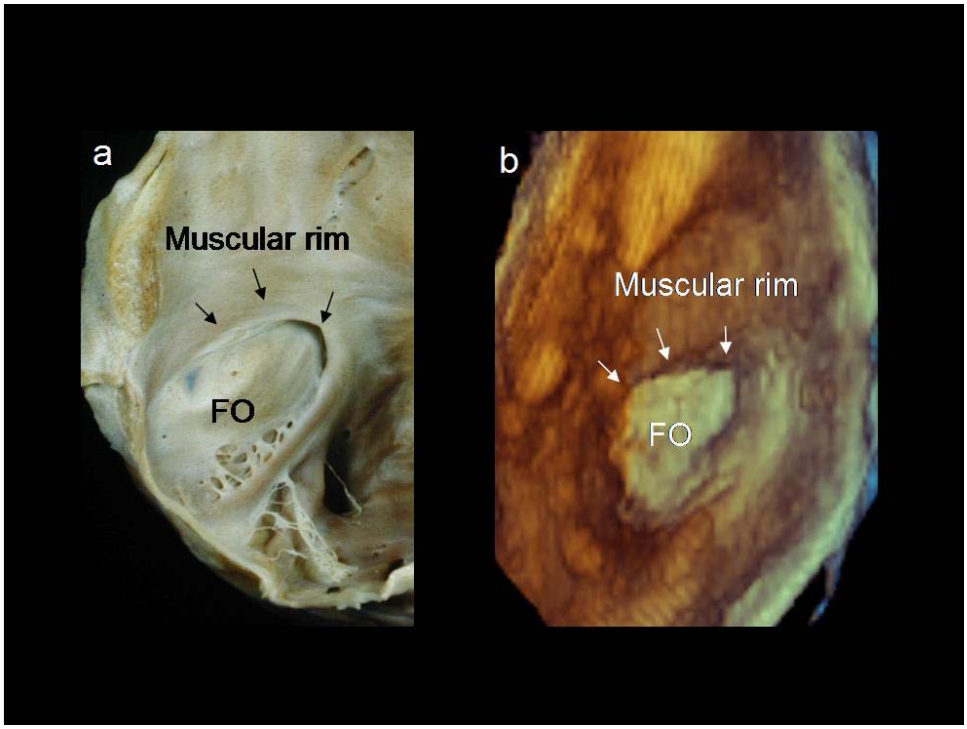
Patent foramen ovale (PFO)



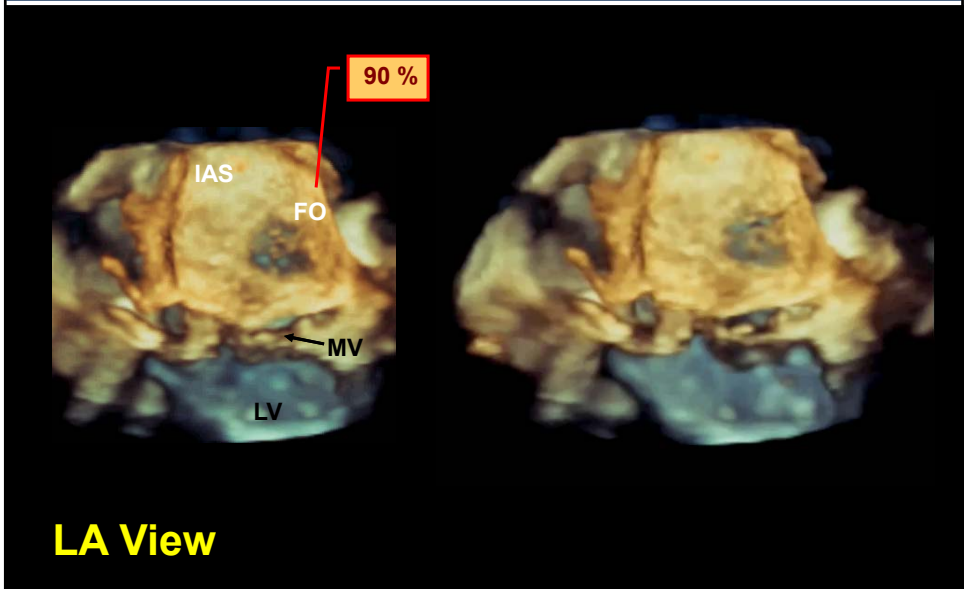
Johri A. Heart 2011;97:1441e1453

THE PATENT FORAMEN OVALE (PFO)

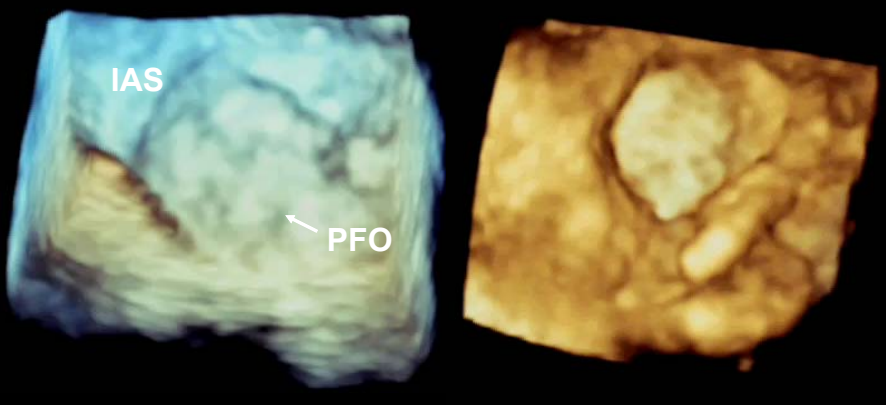




Inter-atrial Septum



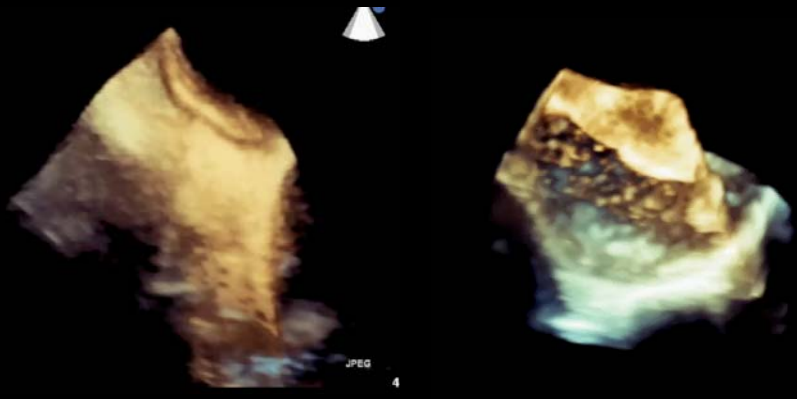
Patent Foramen Ovale



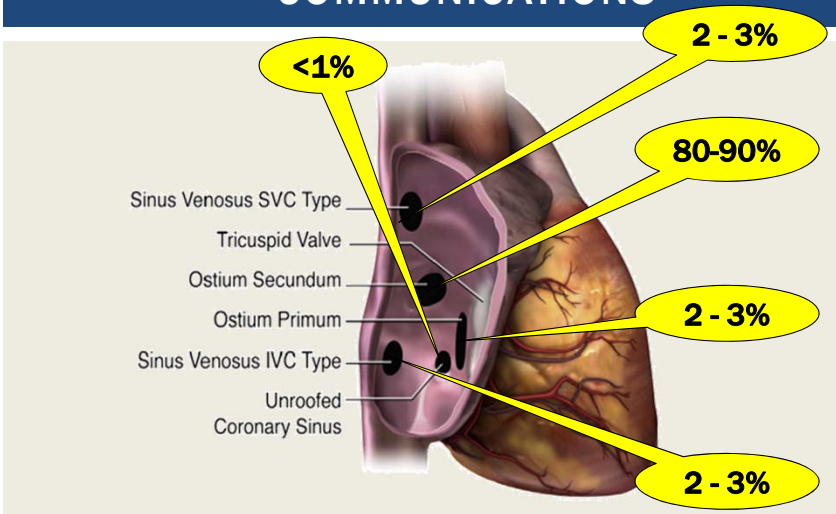
Right atrial perspective

Left atrial perspective

Patent Foramen Ovale

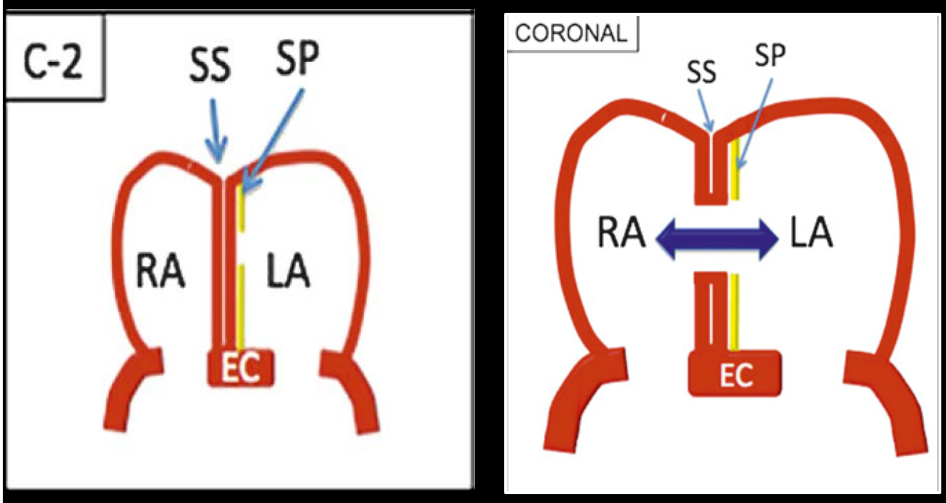


SUBTYPES OF ATRIAL SEPTAL COMMUNICATIONS



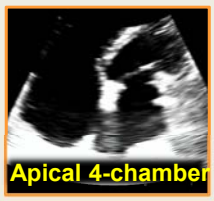
J Am Soc Echocardiogr 2015;28:910-58

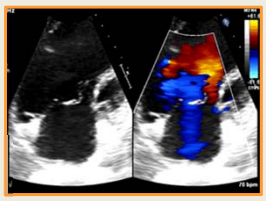
Ostium Secundum



Johri A. Heart 2011;97:1441e1453

OSTIUM SECUNDUM ASD: TRANSTHORACIC ECHOCARDIOGRAPHY





- The IAS is parallel to the US beam in the apical 4-CH view and PSAX view
- The preferred view for imaging/measuring the IAS on TTE is the subcostal view. Here the IAS is perpendicular to the US beam

TRANSTHORACIC ECHOCARDIOGRAPHY FOR INTER-ATRIAL SEPTAL DEFECTS

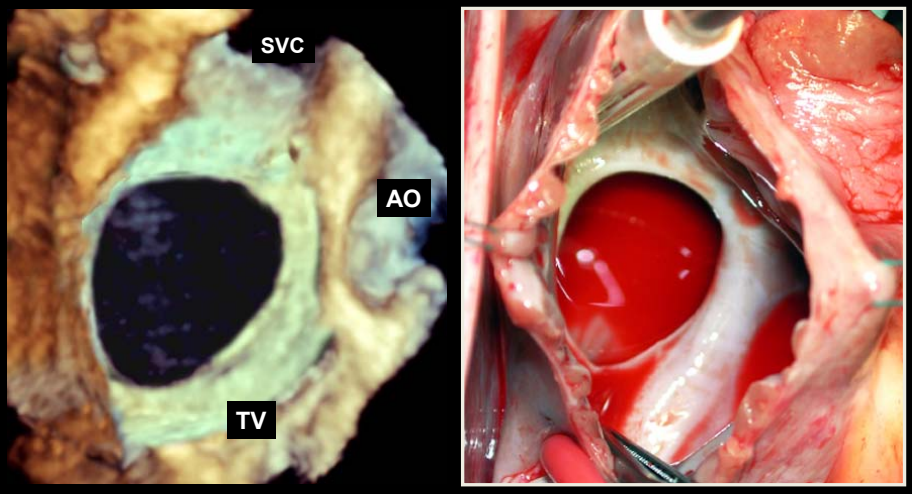
Agitated saline + maneuvers to increase RA pressures (Valsalva, cough)

- ASD → Microbubbles appear in the LA < 3-6 heart beats
- Intra-pulmonary shunting → Bubbles appear > 3-6 heart beats (confirmed if bubbles seen in pulmonary veins)

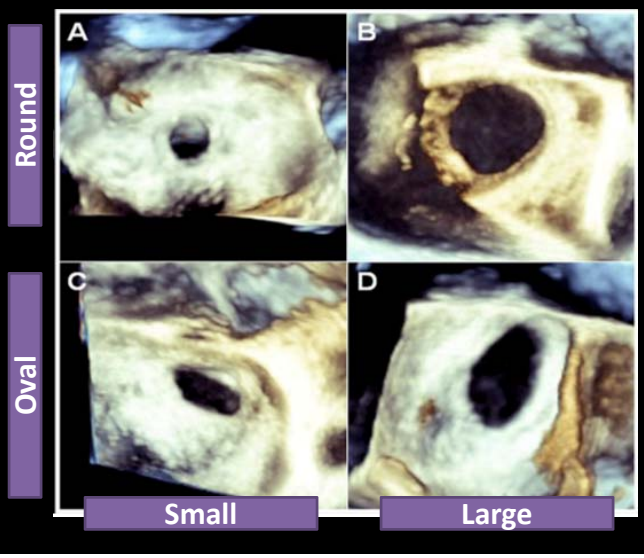
ASD CHARACTERISTICS THAT SHOULD BE REPORTED

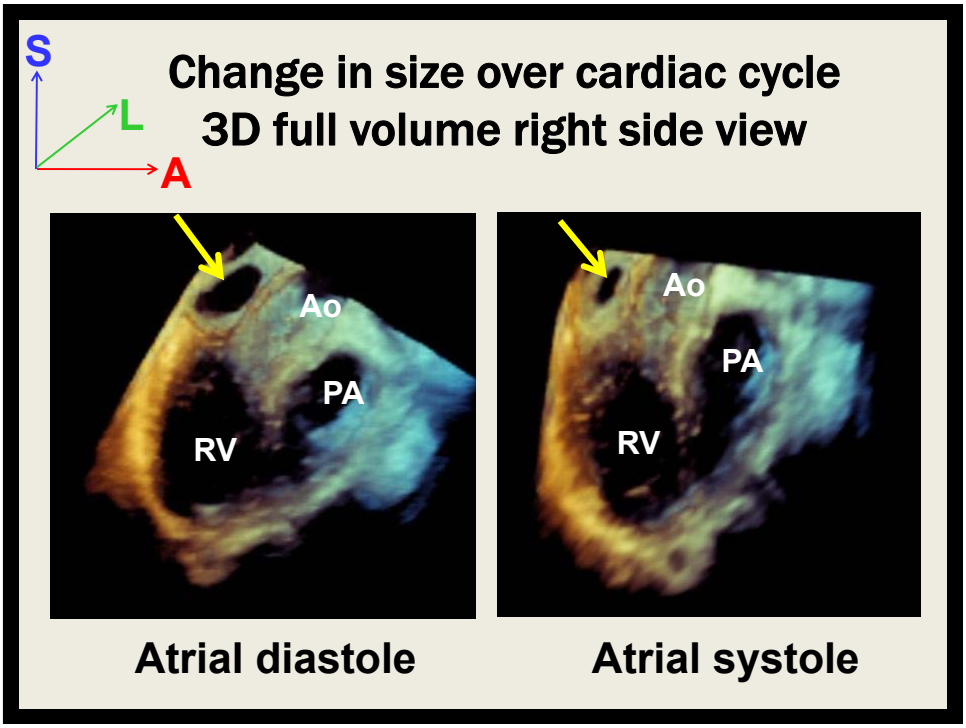
- ASD size and dynamic nature
- ASD shape
- Rims
- Presence of fenestrations
- Presence of an ASA
- ASD type
- ASD location

ASD: Surgeons View

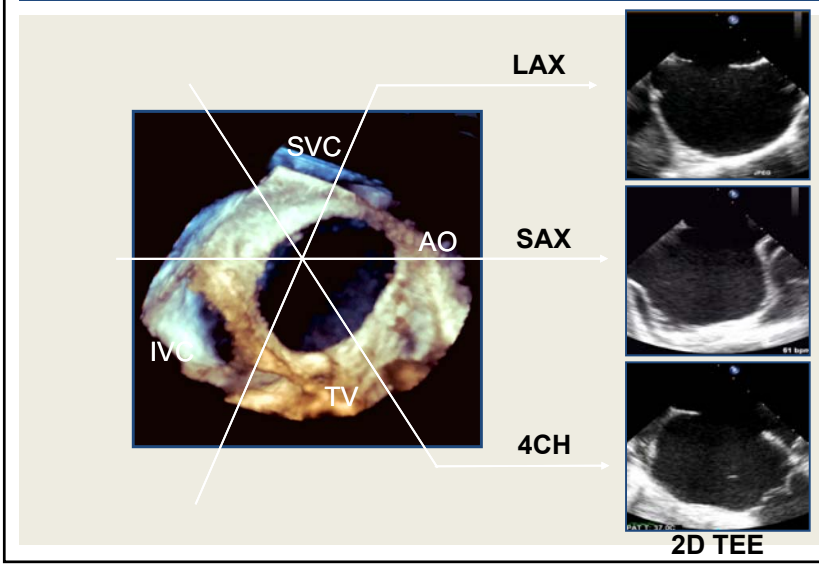


OSTIUM SECUNDUM ASD: 3D TEE

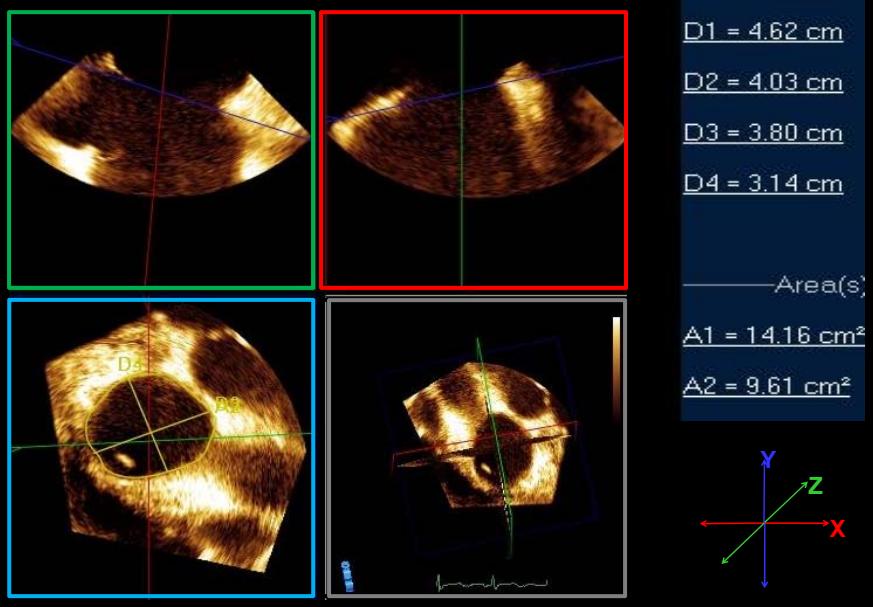




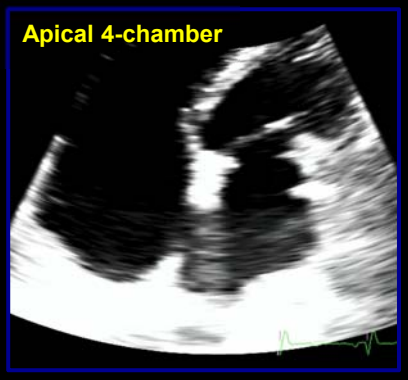
COMPLEX ASD SHAPE: INACCURATE ASSESSMENT WITH 2D IMAGING

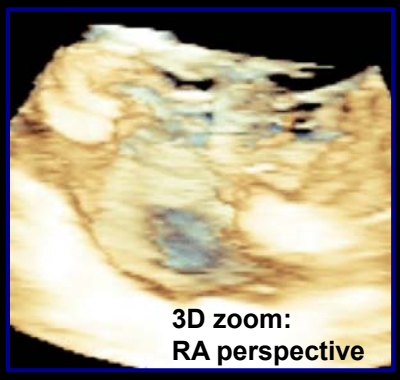


MPR quantitation

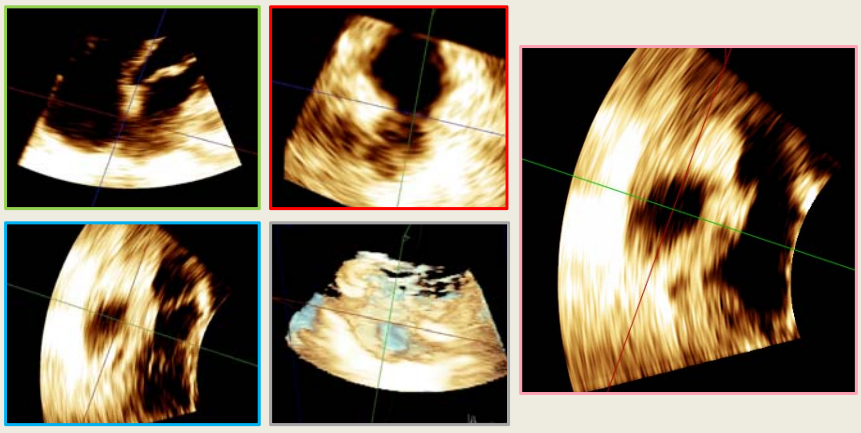


ASD's : TTE



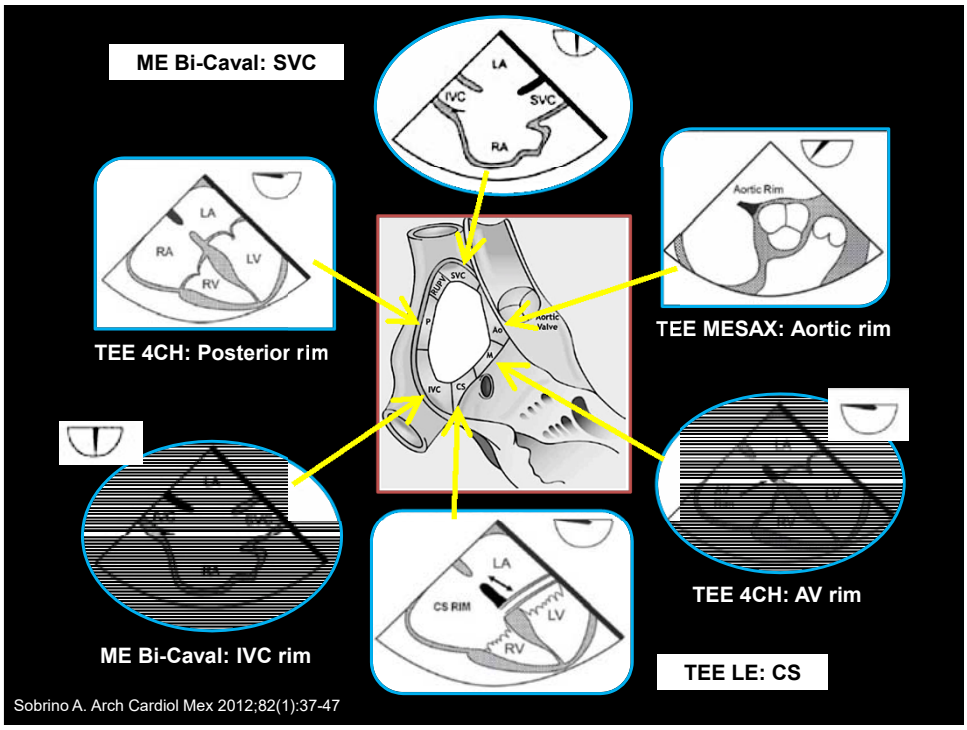


OSTIUM SECUNDUM ASD: 3D TRANSTHORACIC ECHOCARDIOGRAPHY

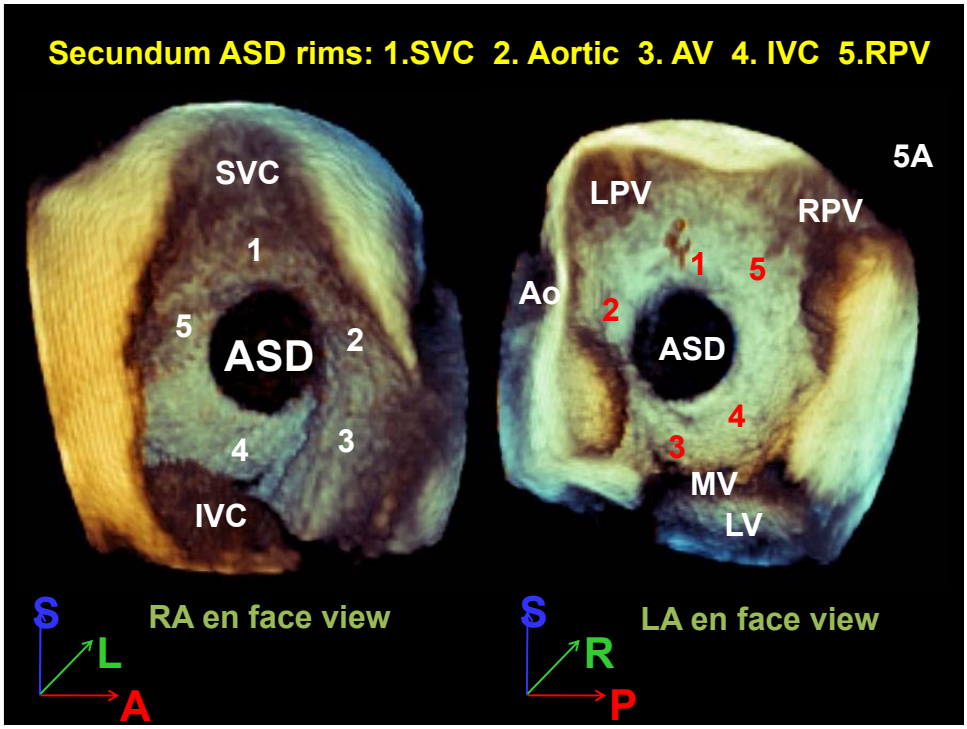


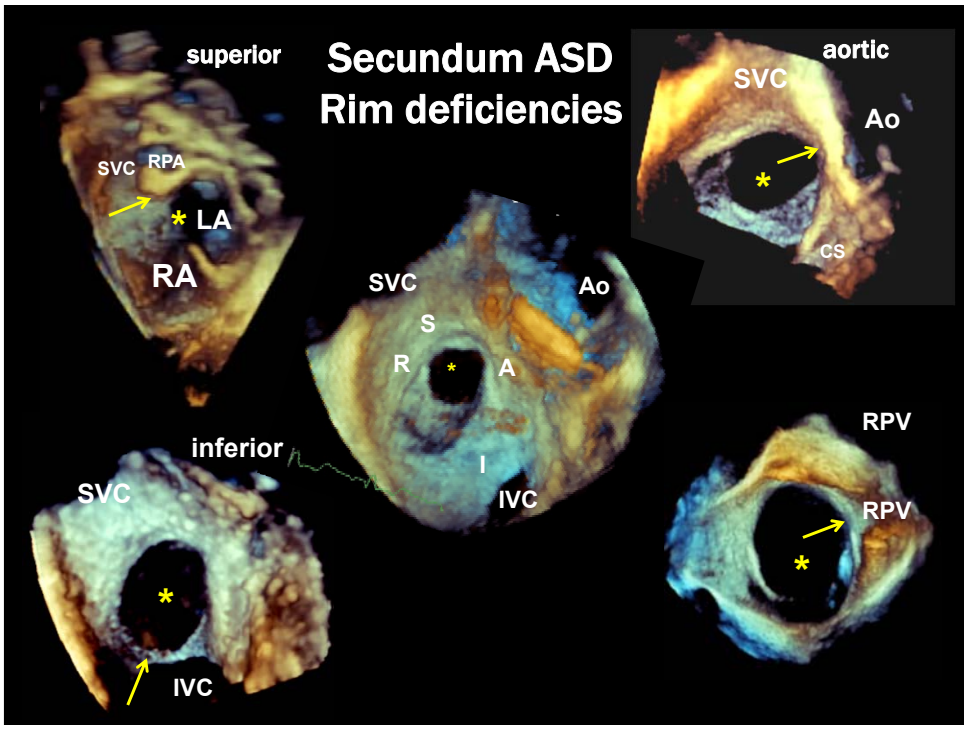
ASD CHARACTERISTICS THAT SHOULD BE REPORTED

- ASD size and dynamic nature
- ASD shape
- Rims
- Presence of fenestrations
- Presence of an ASA
- ASD type
- ASD location



Sobrino A. Arch Cardiol Mex 2012;82(1):37-47


Secundum ASD rims: 1.SVC 2. Aortic 3. AV 4. IVC 5.RPV
SVC
1
5
ASD
2
4
3
IVC
RA en face view
S
L
A
5A
LPV
RPV
1
5
Ao
2
ASD
4
3
MV
LV
LA en face view
S
R
P


Secundum ASD
Rim deficiencies
superior
SVC
RPA
* LA
RA
SVC
Ao
S
R
*
A
I
IVC
aortic
SVC
Ao
*
CS
inferior
SVC
*
IVC
RPV
RPV
*

ASD CHARACTERISTICS THAT SHOULD BE REPORTED

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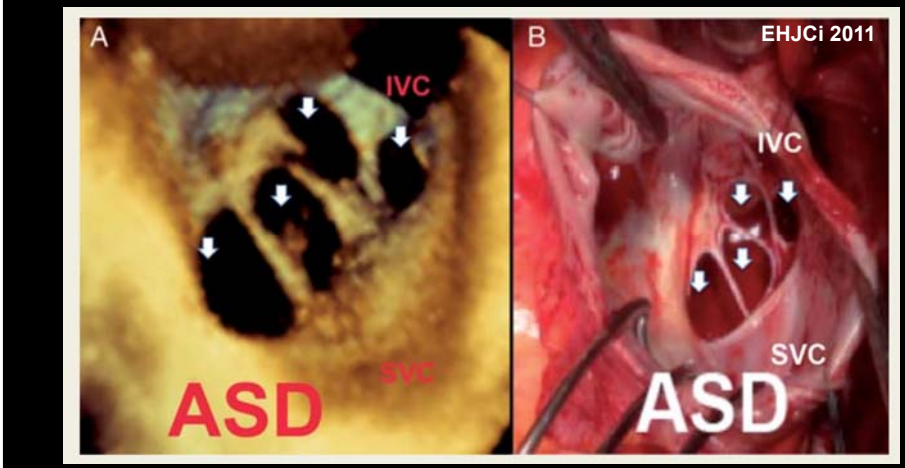
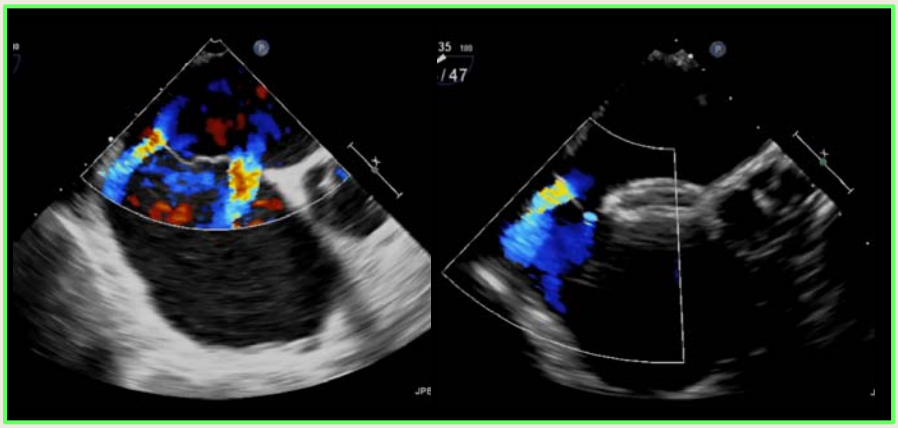
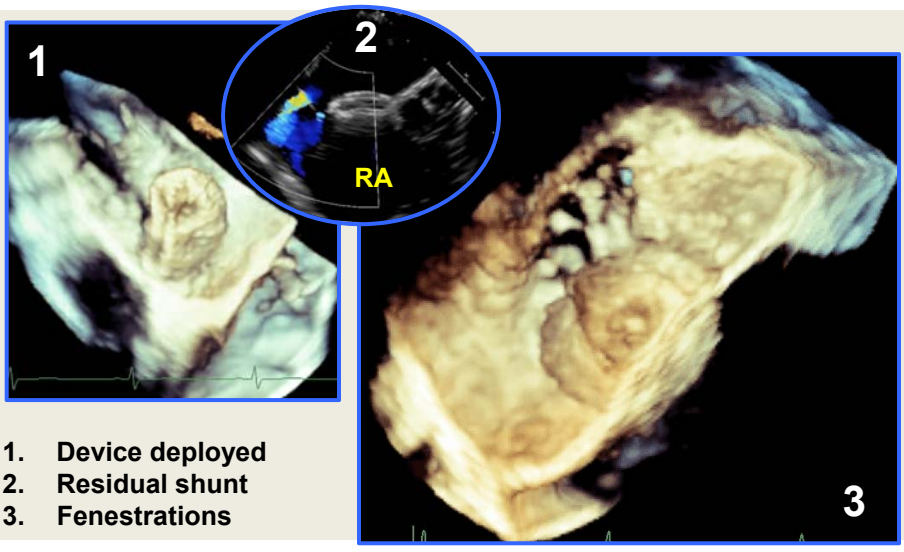
- ASD shape
- Rims
- Presence of fenestrations
- Presence of an ASA
- ASD type
- ASD location



COMPLEX ASD REPAIR



COMPLETE ASSESSMENT OF THE INTER-ATRIAL SEPTUM IS IMPORTANT



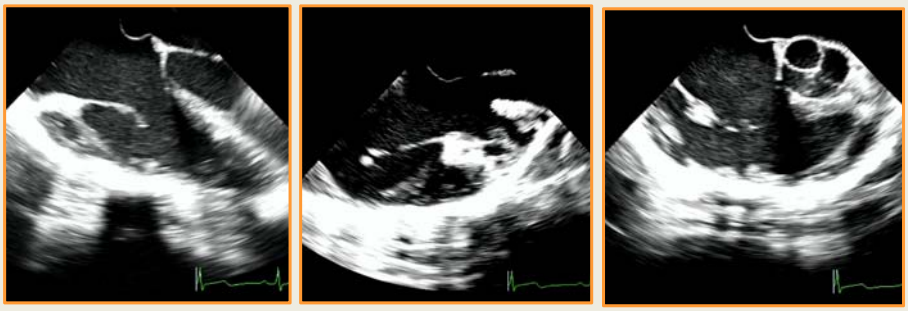
1. Device deployed
2. Residual shunt
3. Fenestrations

COMPLETE ASSESSMENT OF THE INTER-ATRIAL SEPTUM IS IMPORTANT

ASD CHARACTERISTICS THAT SHOULD BE REPORTED

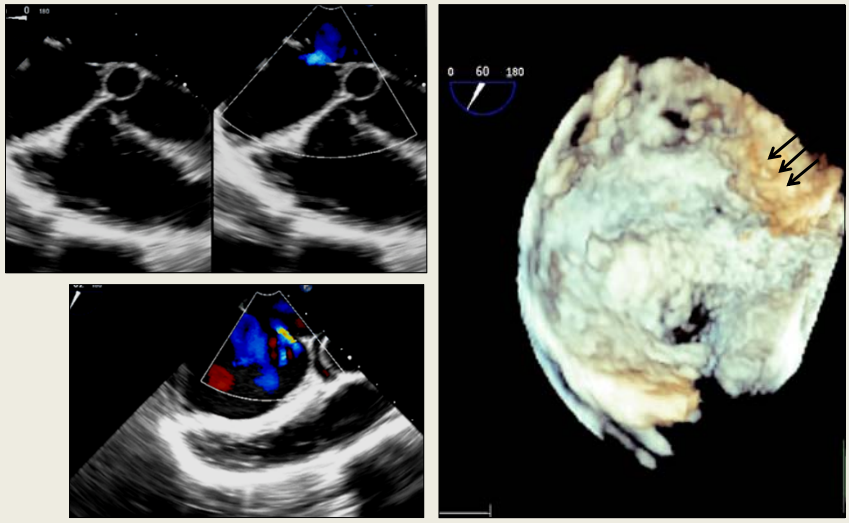
- ASD size and dynamic nature
- ASD shape
- Rims
- Presence of fenestrations
- Presence of an ASA
- ASD type
- ASD location

ATRIAL SEPTAL ANEURYSM

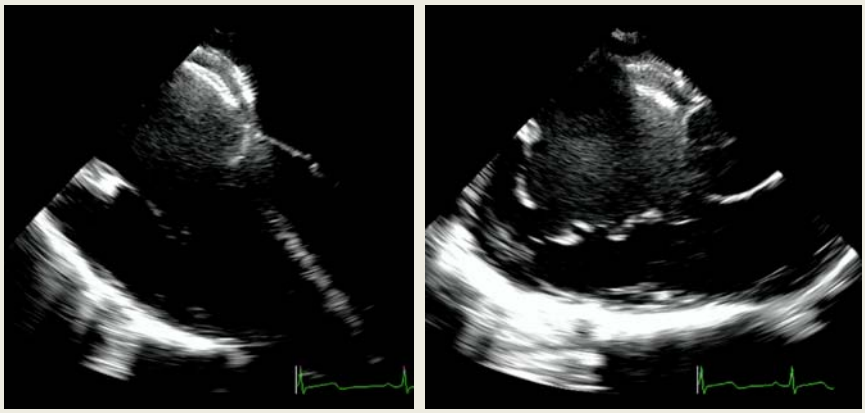


Redundancy or saccular deformity of the atrial septum associated with increased mobility. Defined as an excursion of 10 mm from the plane of the atrial septum into the RA or LA or a combined excursion right and left of 15 mm

ATRIAL SEPTAL ANEURYSM

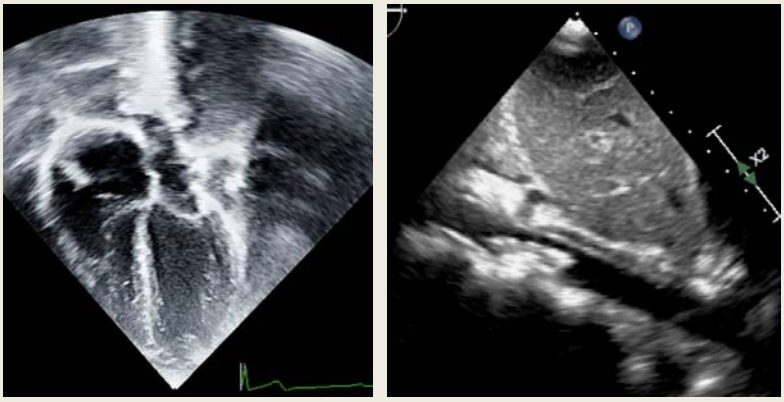


ATRIAL SEPTAL ANEURYSM



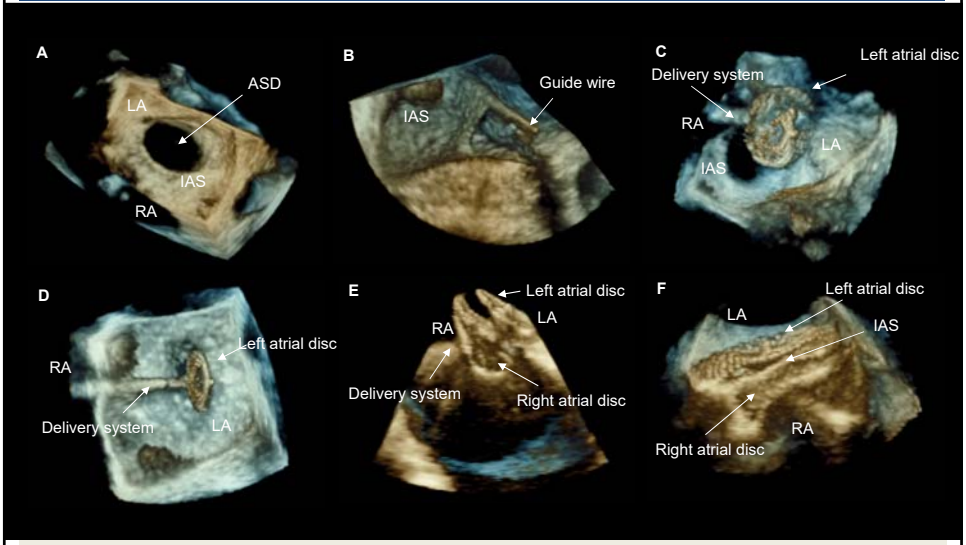
Amplatzer device closure

ATRIAL SEPTAL ANEURYSM



1 day post device closure

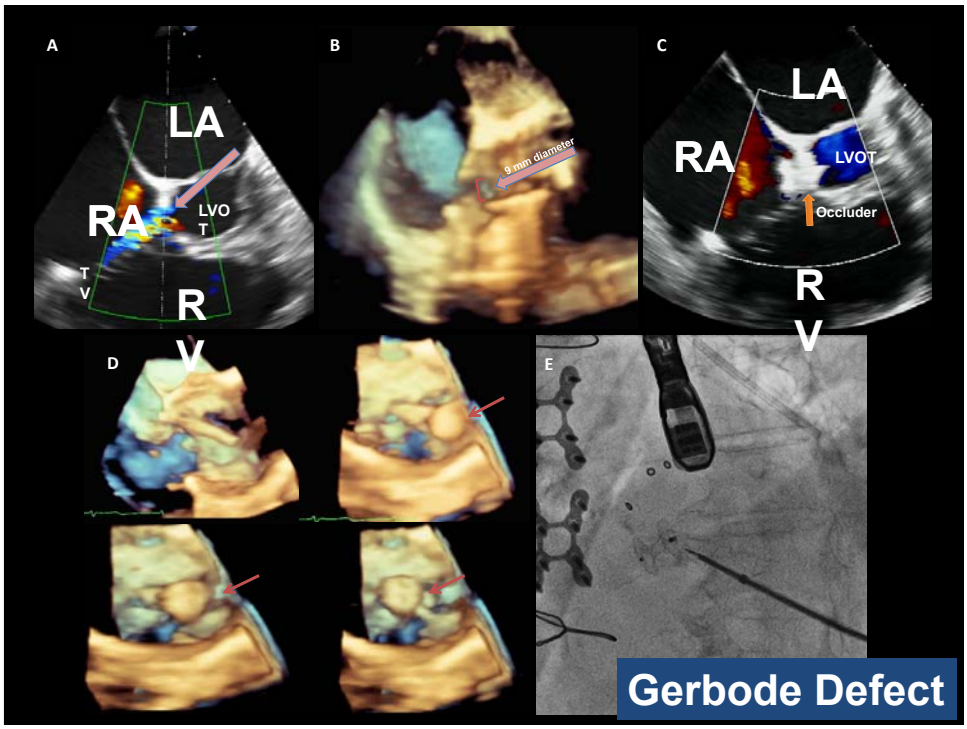
RT3DE TEE GUIDANCE OF ASD CLOSURE



PERI-INTERVENTIONAL 3D TEE
PFO CLOSURE

ASD CHARACTERISTICS THAT SHOULD BE REPORTED

- ASD size and dynamic nature
- ASD shape
- Rims
- Presence of fenestrations
- Presence of an ASA
- ASD type
- ASD location



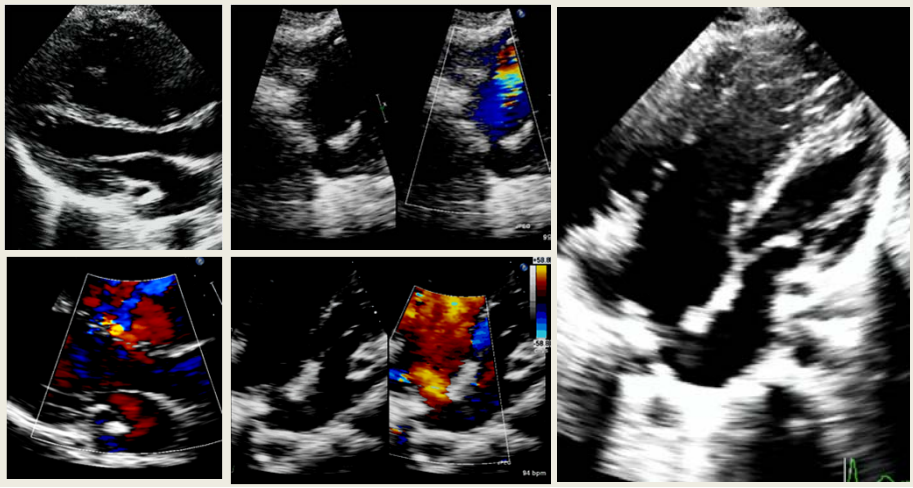
SINUS VENOSUS ASD

Partial/complete absence of sinus venosus septum between

- SVC and the right upper pulmonary vein (SVC type)
- Right lower and middle pulmonary veins and the RA (IVC type)

SINUS VENOSUS ASD

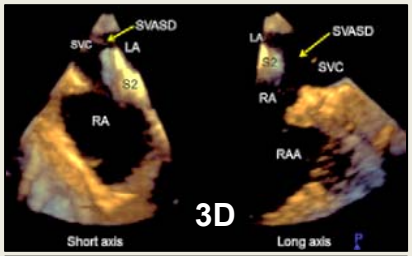
An sinus venosus septal defect can be difficult to detect on TTE

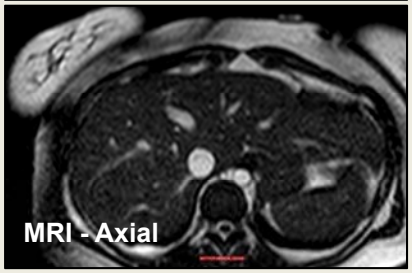


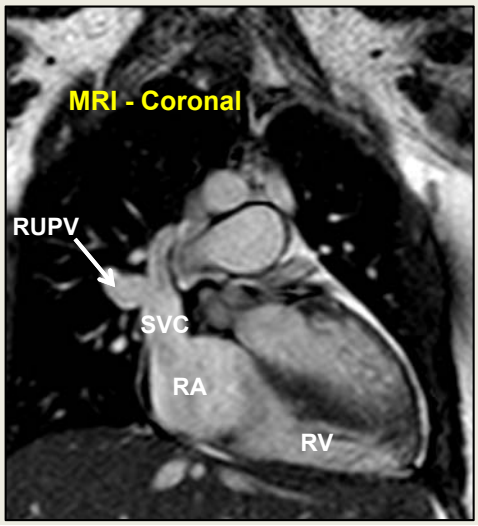
SINUS VENOSUS ASD

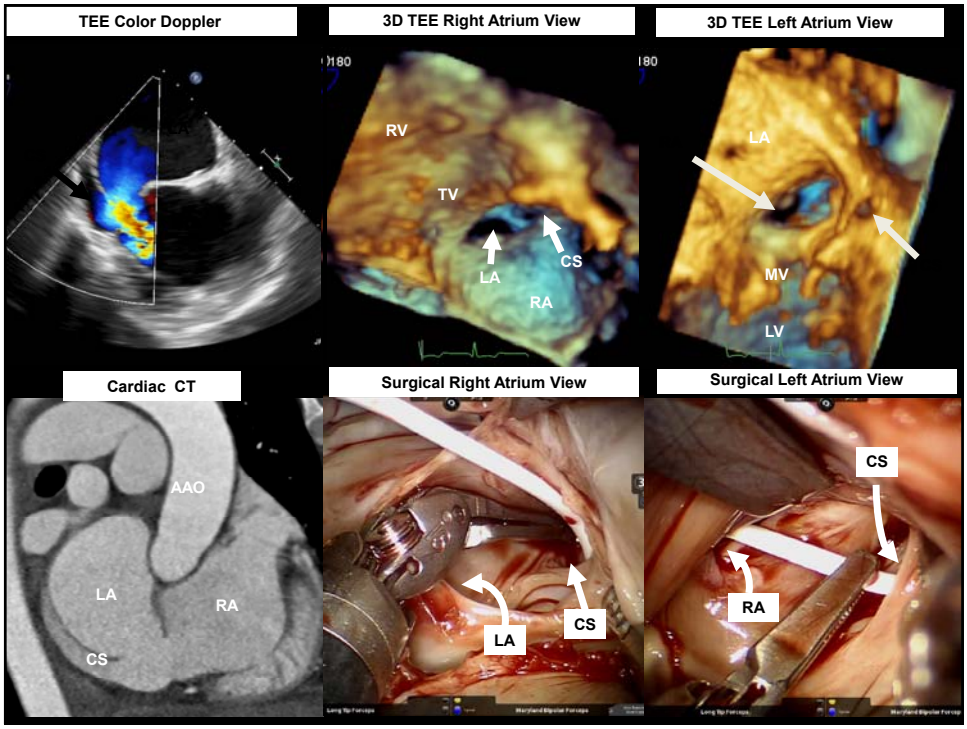
An sinus venosus defect can be identified on TEE by the absence of the atrial septum immediately beneath the orifice of the SVC

SUPERIOR SINUS VENOSUS ASD

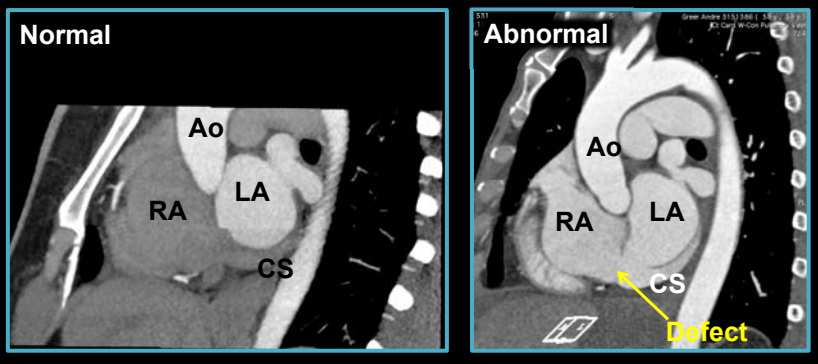




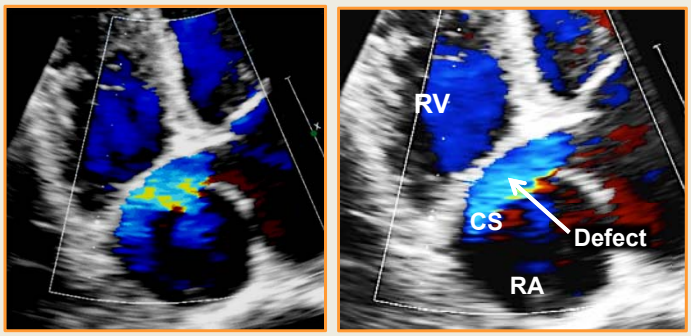




CARDIAC CT: UNROOFED CORONARY SINUS DEFECT

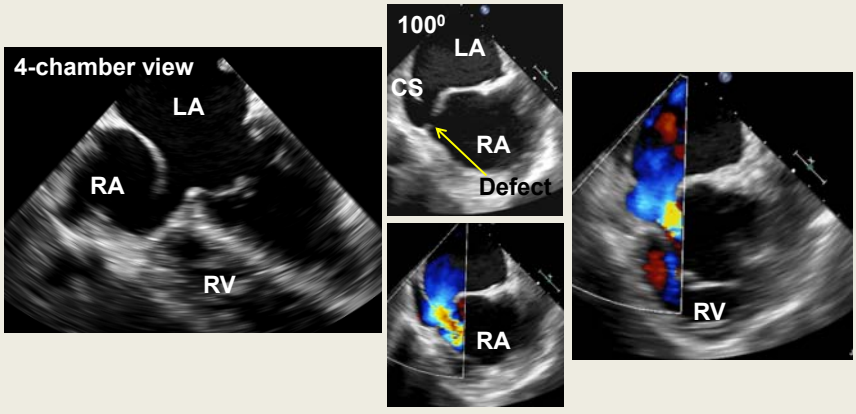


UNROOFED CORONARY SINUS DEFECT: TRANSTHORACIC ECHOCARDIOGRAPHY

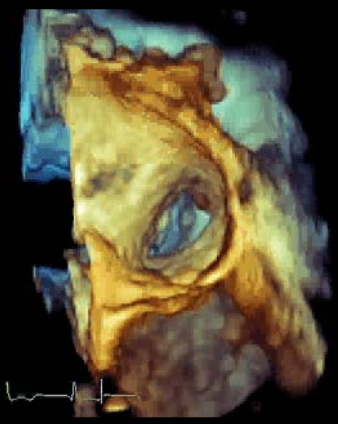


Wall of the coronary sinus in the LA is deficient or absent

UNROOFED CORONARY SINUS DEFECT: 2D TRANS-ESOPHAGEAL ECHO



3D TEE: THE UNROOFED CORONARY SINUS FROM LEFT TO RIGHT



THE OPERATING ROOM