



Egyptian Society of
CARDIOLOGY





45TH
45th Annual International Congress of the
EGYPTIAN SOCIETY OF CARDIOLOGY
CardioEgypt 2018

Basics of 3D-TEE “image acquisition & display”

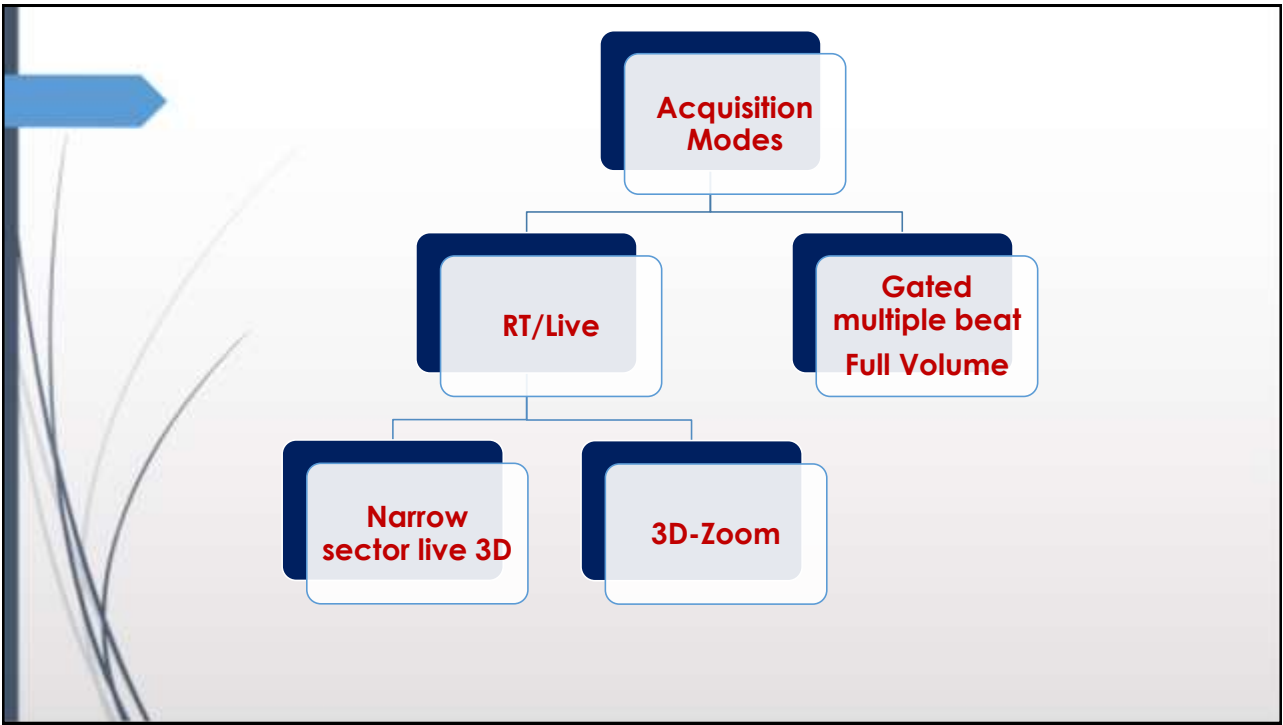
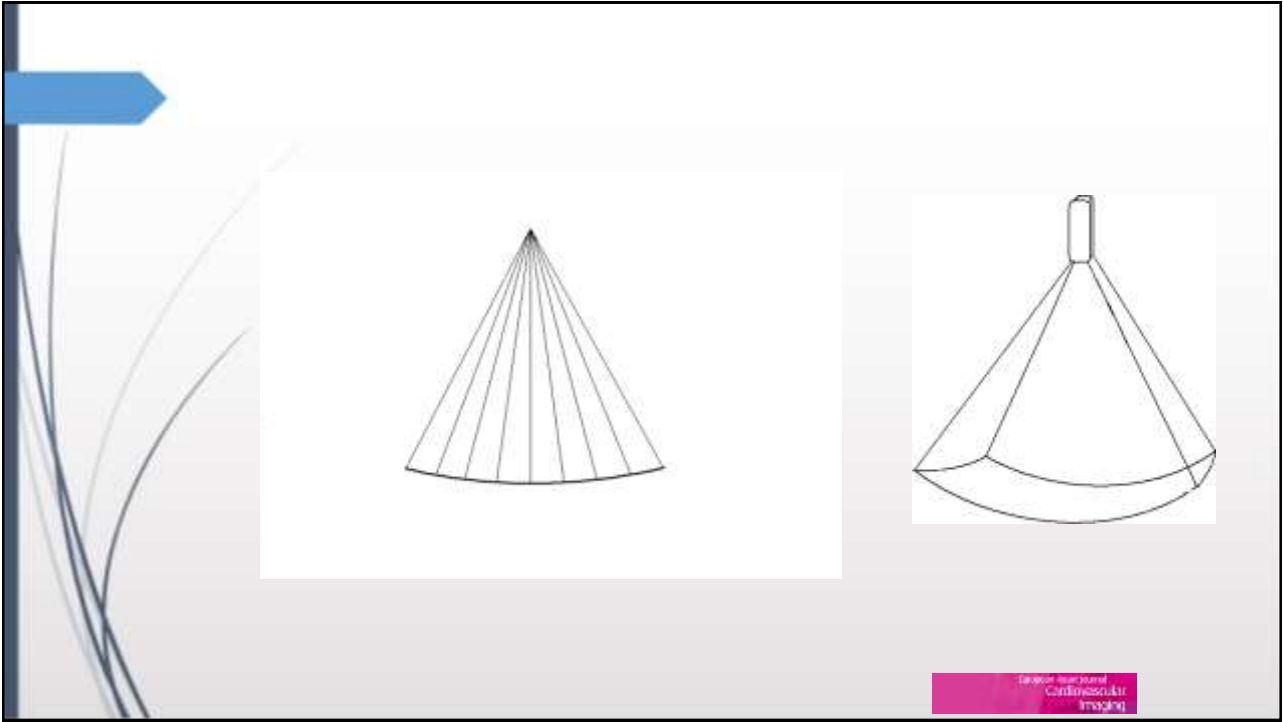
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MBBCH, MSc, FASE
EACVI/HIT Committee member
Associate Consultant, Director of Echocardiography Lab
Aswan Heart Centre, Magdi Yacoub Foundation

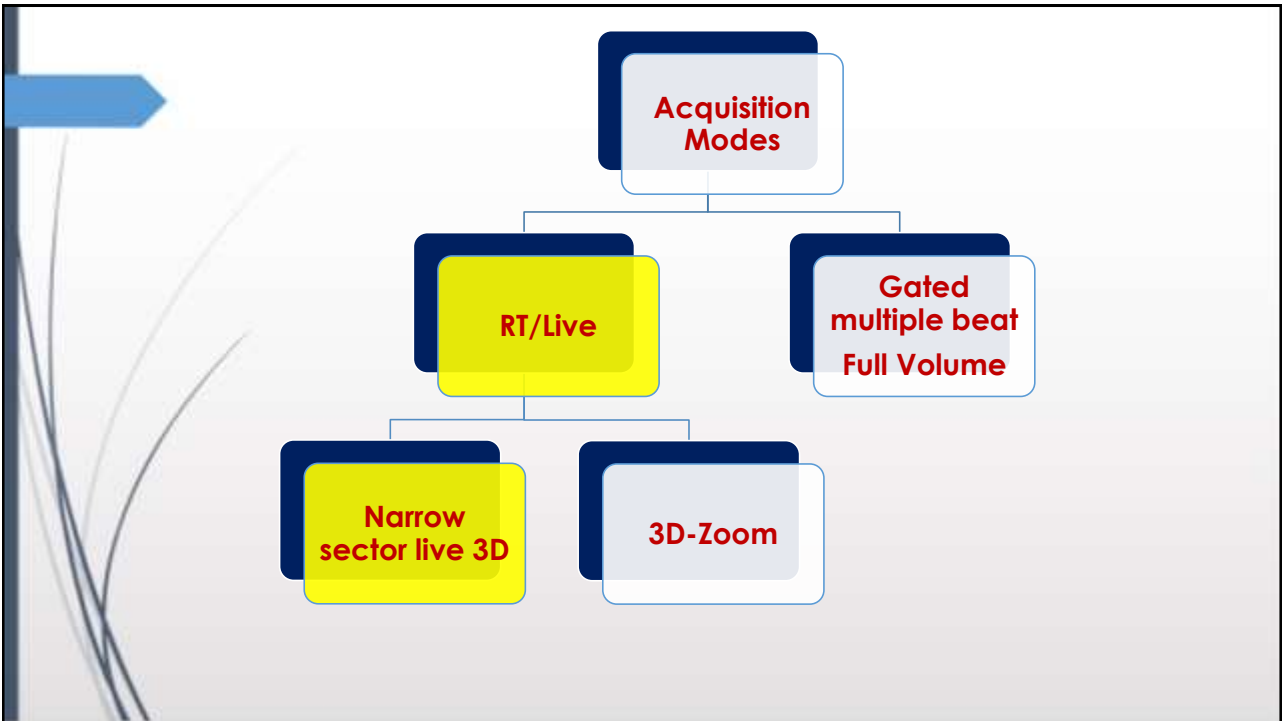
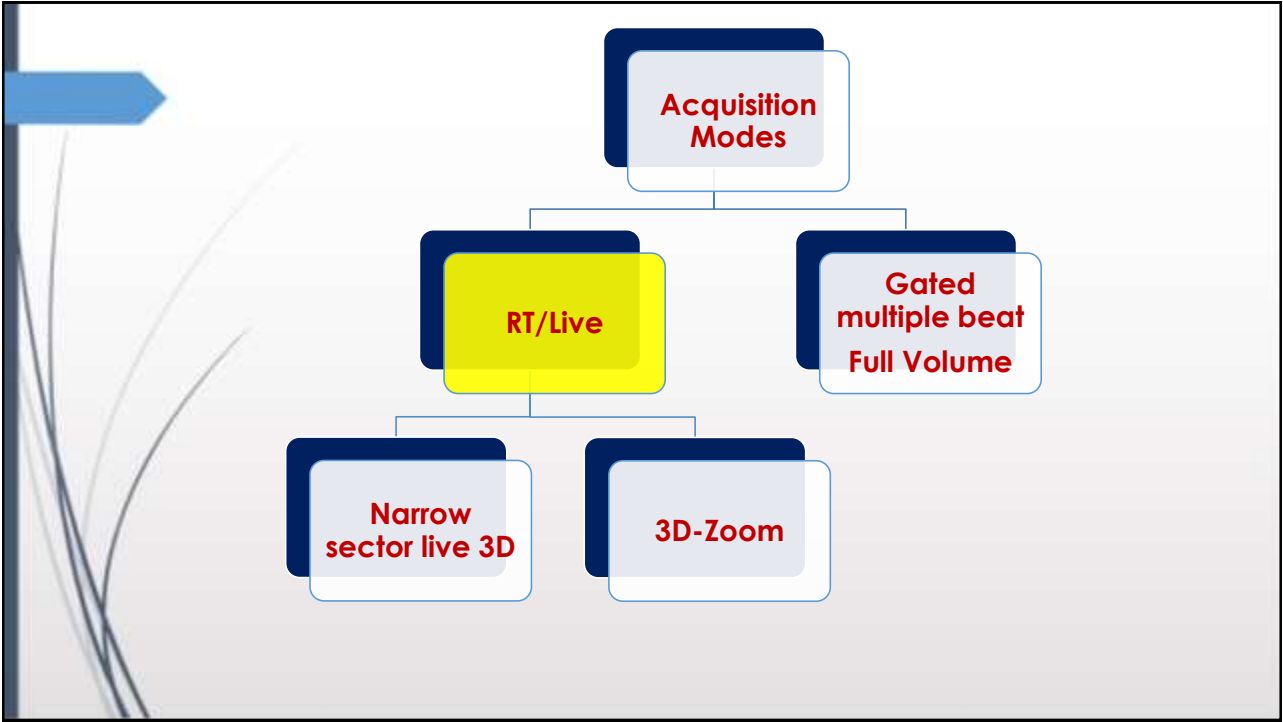



Introduction

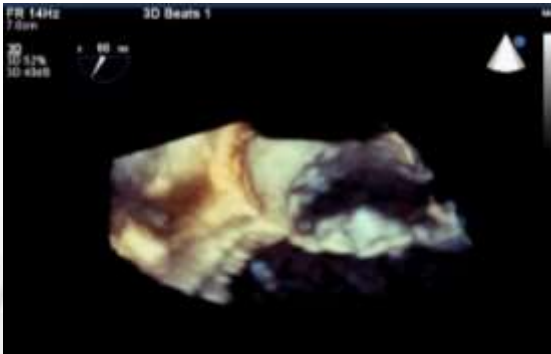
- ❑ fully sampled matrix-array transducers had made it possible for us to get excellent real-time imaging of the beating heart in three dimensions.
- ❑ There were significant technological developments in both hardware and software, including transducer design, microelectronic techniques, and computing.
- ❑ 3D-TEE matrix-array transducers are composed of nearly 3,000 piezoelectric elements with operating frequencies ranging from 5 to 7 MHz.





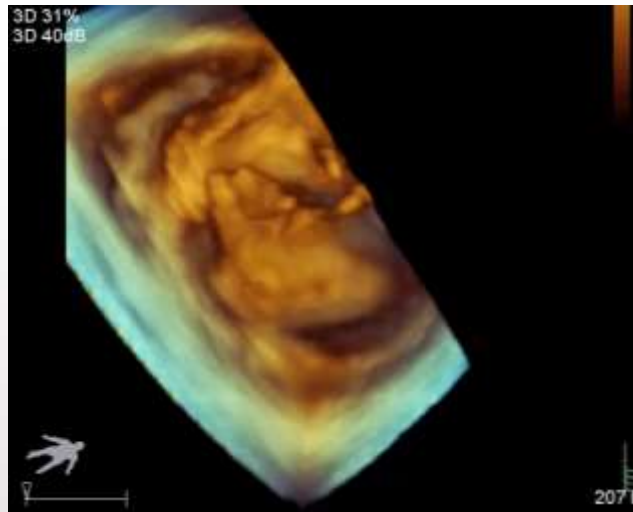


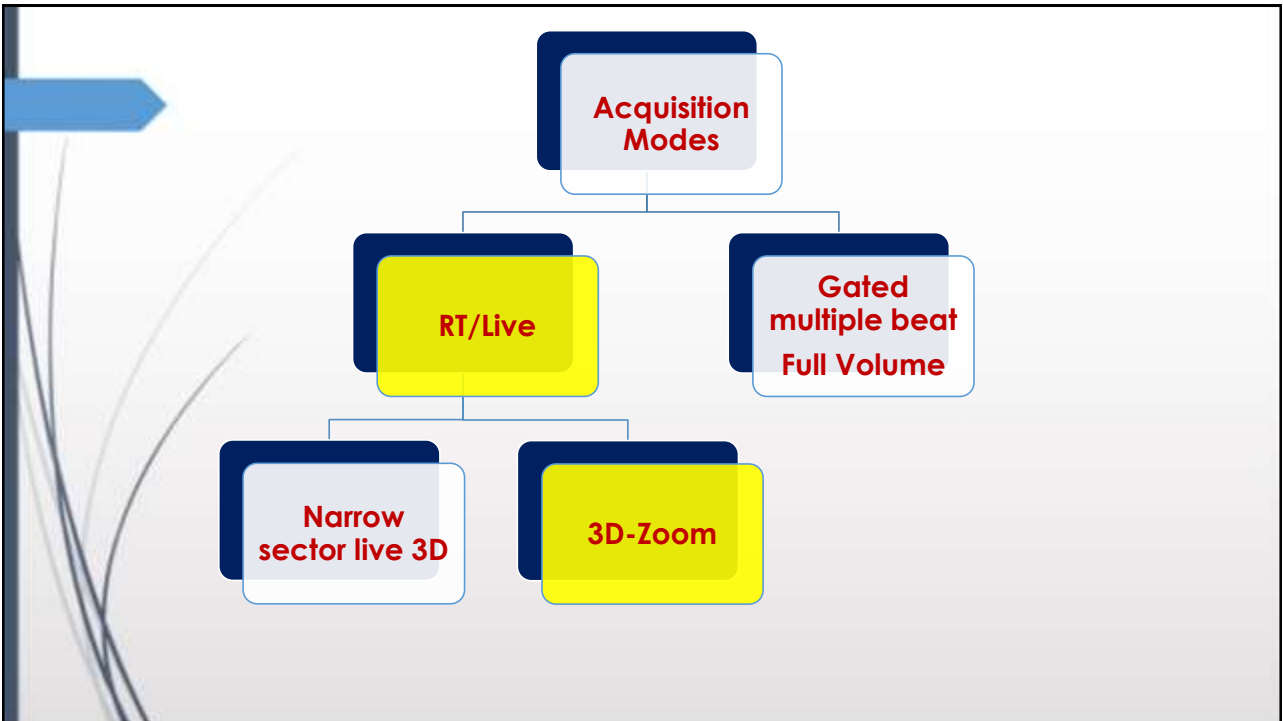
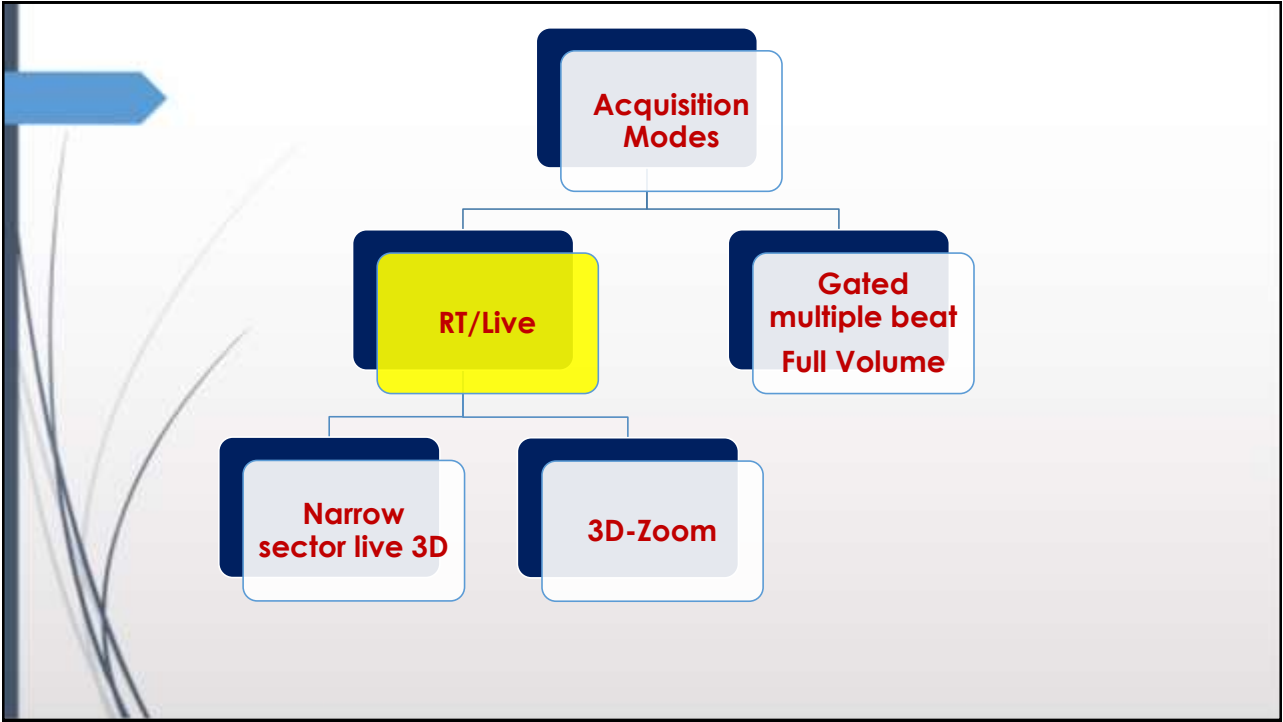
Narrow sector Live 3D mode



- ✓ Narrow sector (300 x 600 pyramidal volume)
- ✓ Live
- ✓ Reasonable frame rate
- ✓ No stitch artifacts

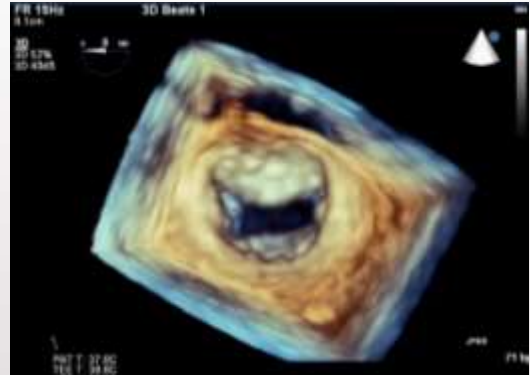
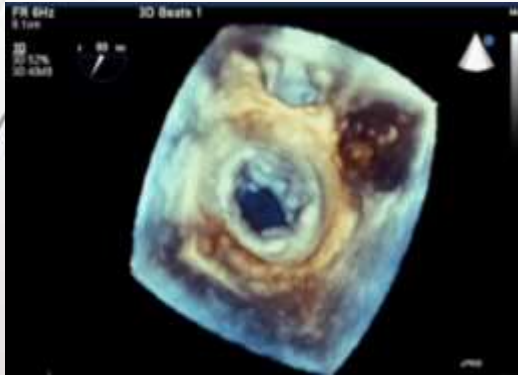
Narrow sector Live 3D mode





3D-Zoom mode (Focused wide sector)

- ✓ Live/Real-time
- ✓ Wide sector is possible
- ✓ Variable frame rate (size dependent)
- ✓ No stitch artifacts



Acquisition Modes

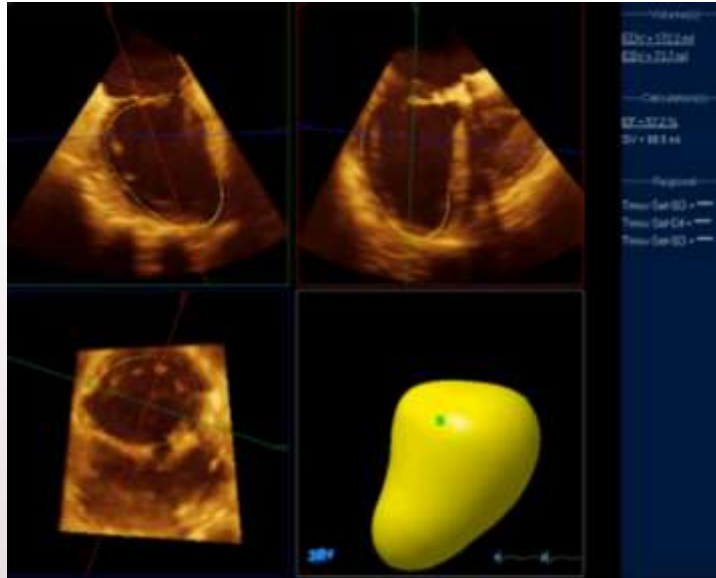
RT/Live

Gated
multiple beat
Full Volume

Narrow
sector live 3D

3D-Zoom

ECG gated multiple beat mode



ECG gated multiple beat mode

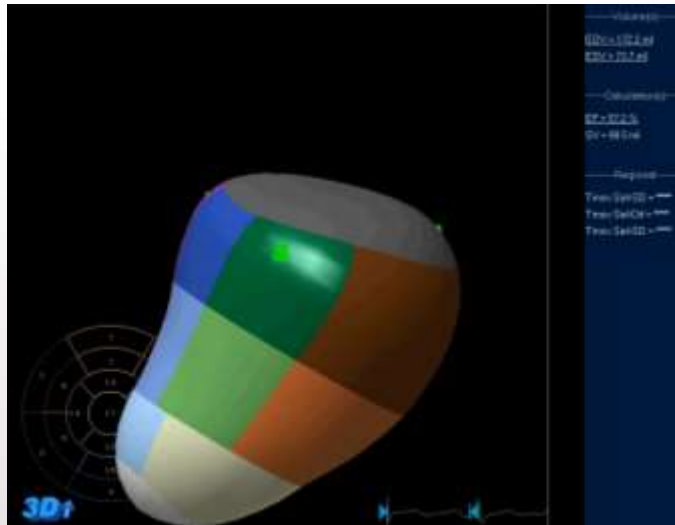
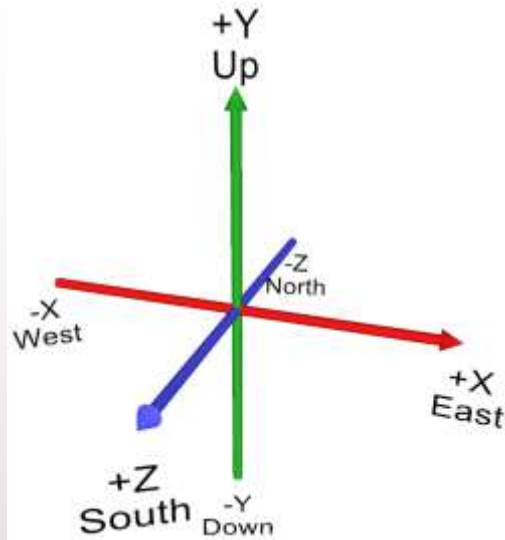
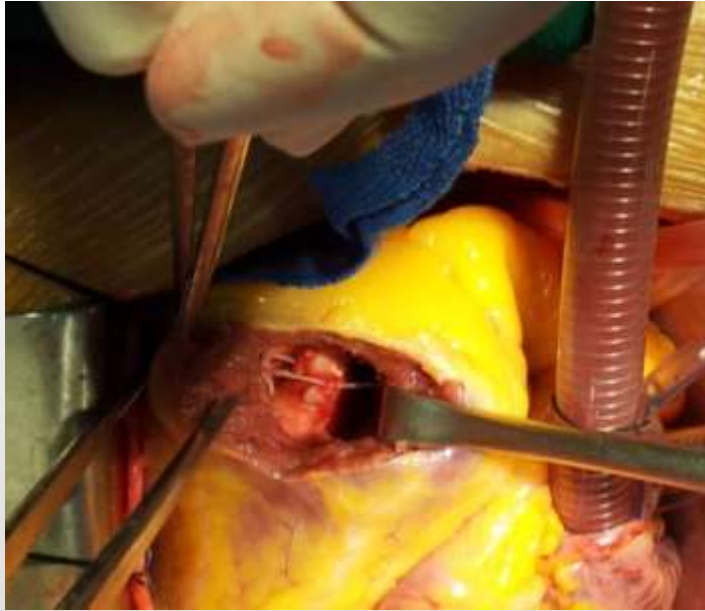


Image Orientation

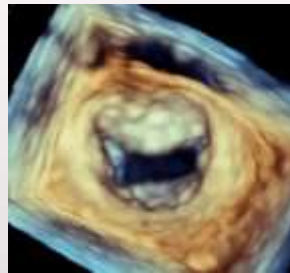
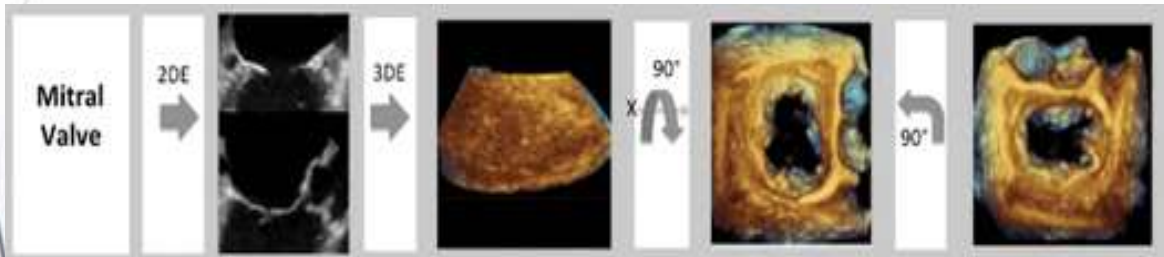


**Full volume acquisition
(LV mass)**



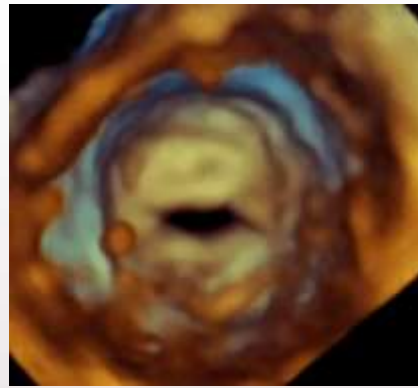
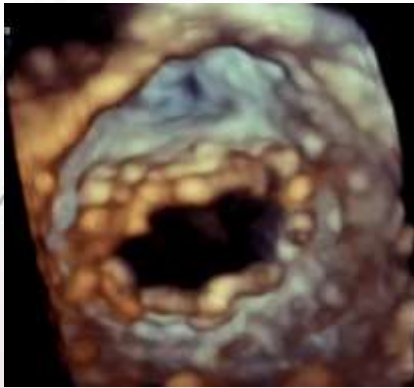
Mitral Valve

Mitral Valve

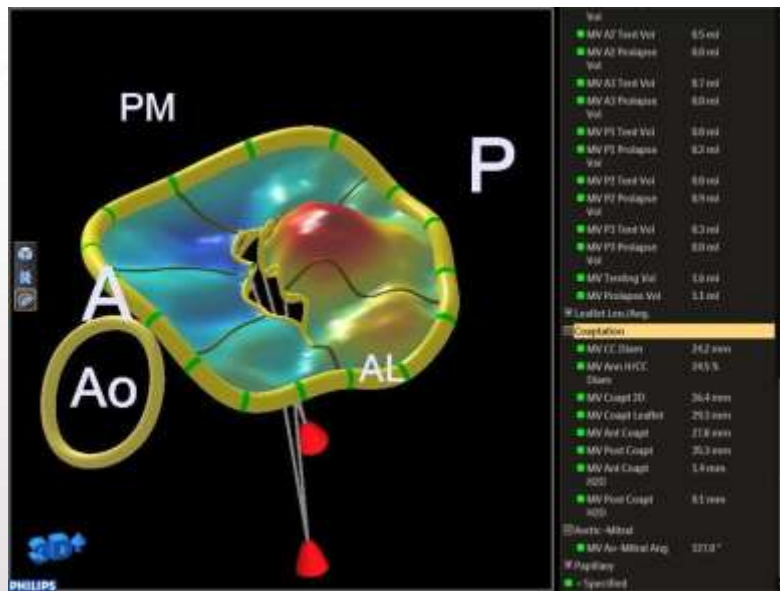


Mitral Valve

RHD + MS



Mitral Valve

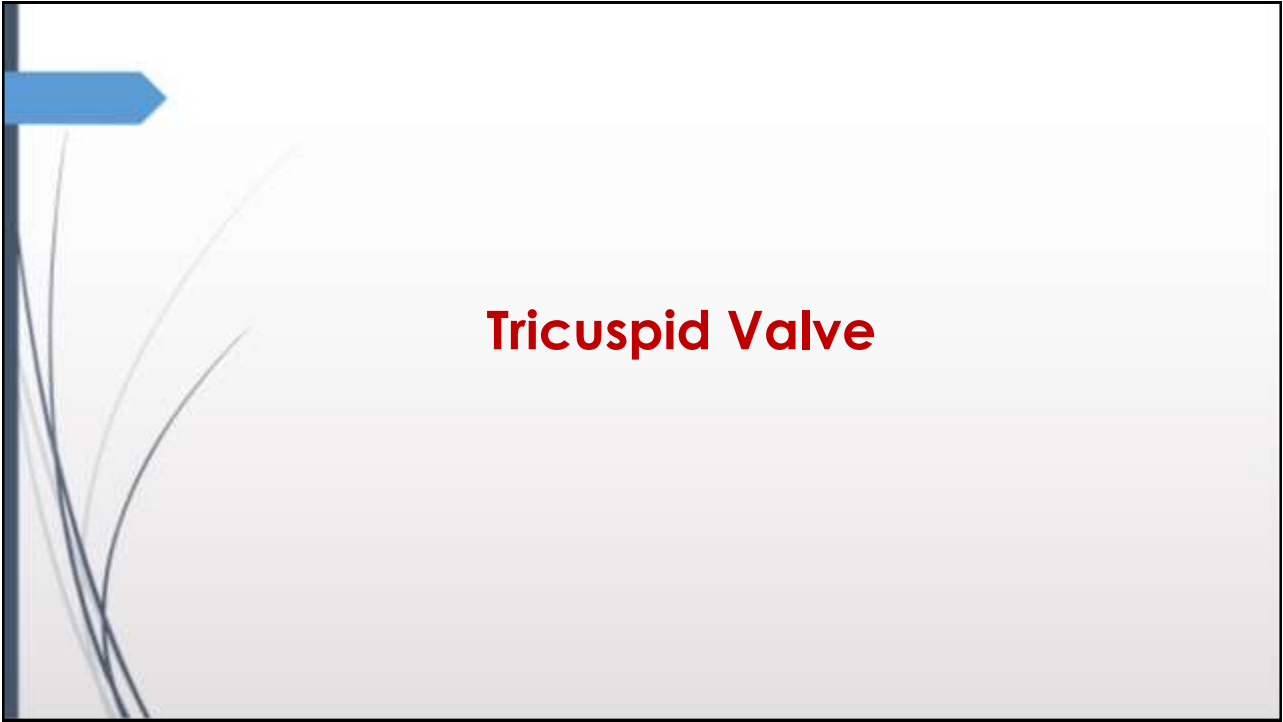


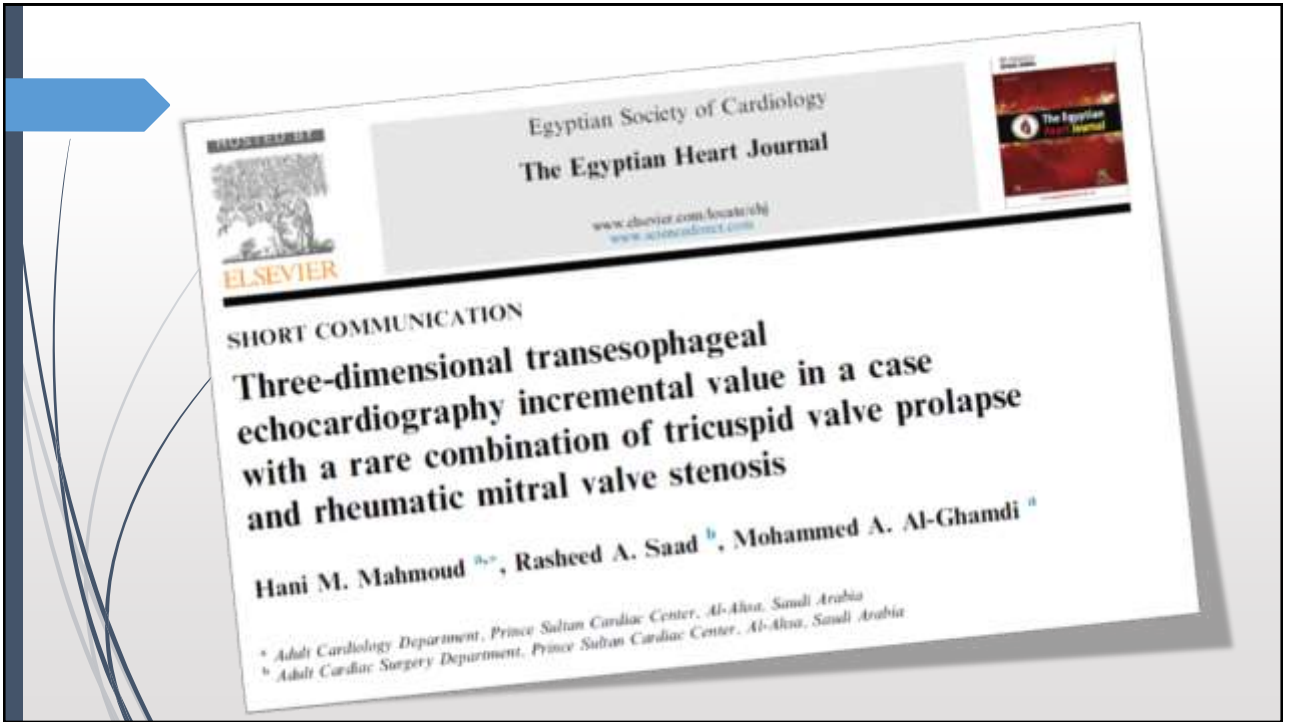


Case

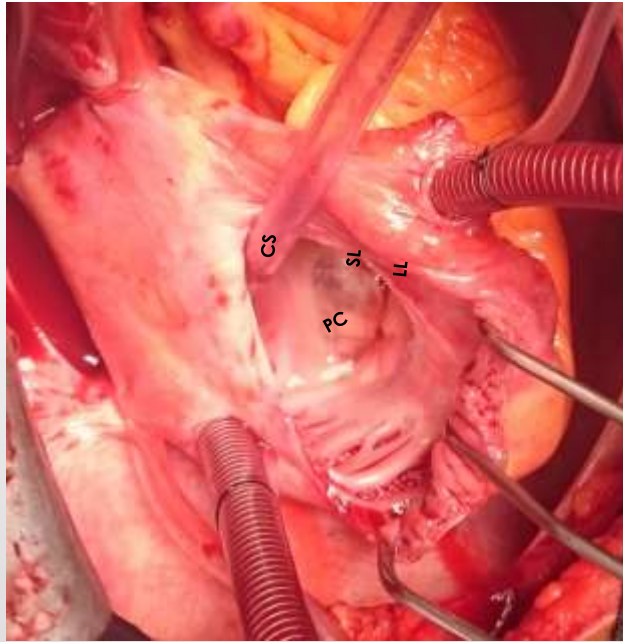


Case



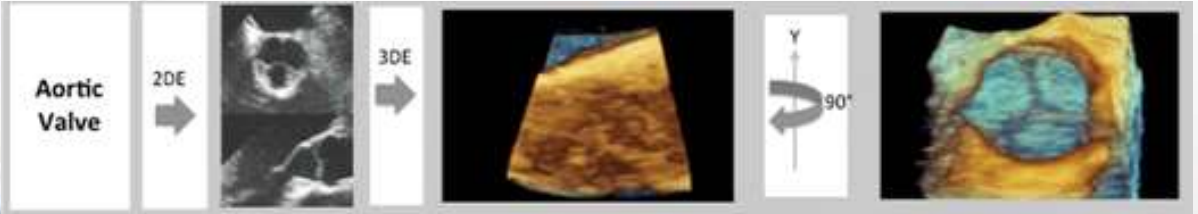


Case



Aortic Valve

Aortic Valve



Case

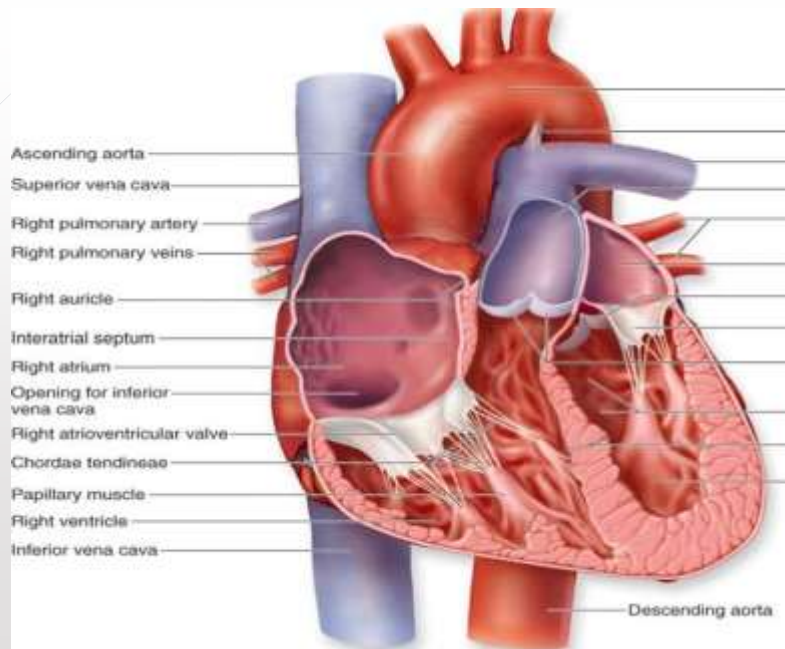


How many cusps can you see?

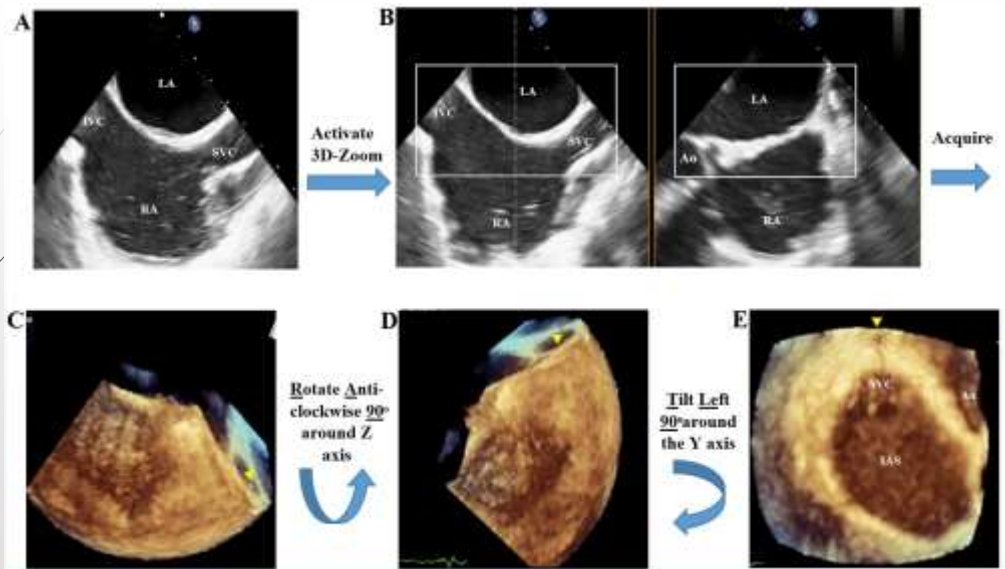


Case

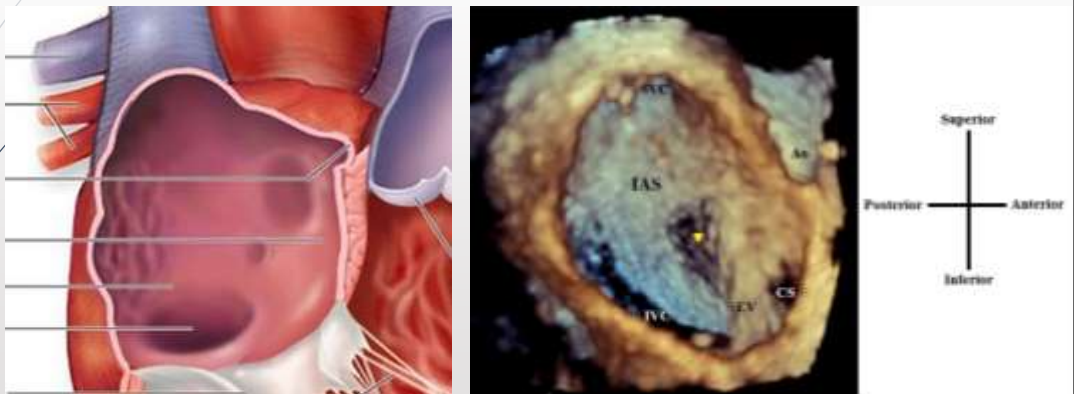
Inter-Atrial Septum



RATLe-90 maneuver



H. Mahmoud et al. *Cardiol Res Pract*, 2015. doi:10.1155/2015/174051



H. Mahmoud et al. *Cardiol Res Pract*, 2015. doi:10.1155/2015/174051



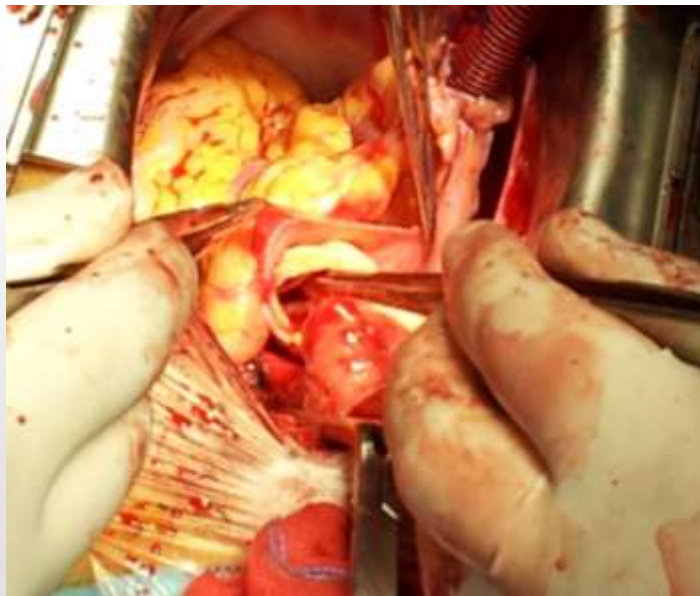
Aortic Root & Thoracic Aorta

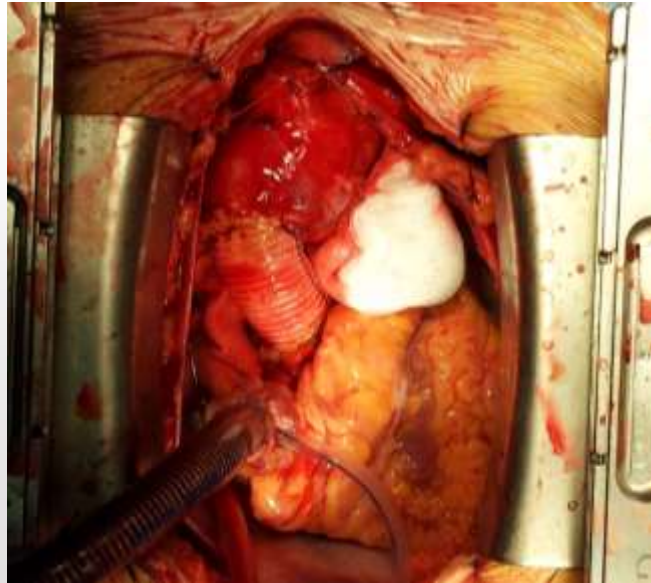


Aortic Root & Thoracic Aorta

Acquisition:

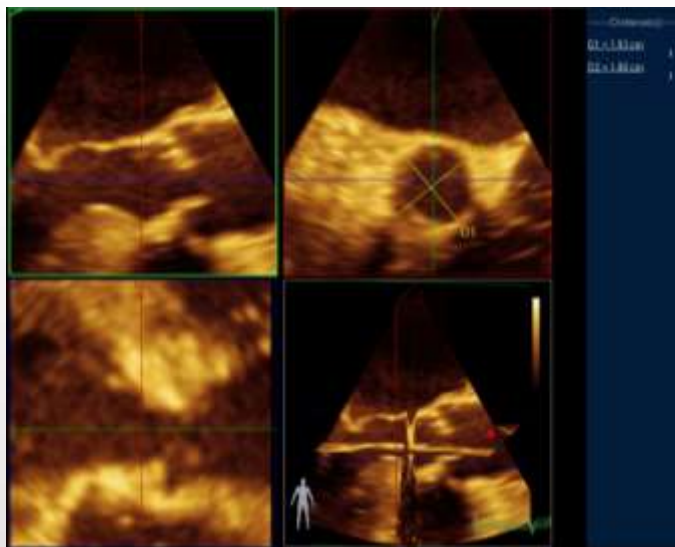
120 degrees-Mid esophageal (LVOT view) for Aortic root & any view for the thoracic aorta. Then activate the 3D-Zoom or Multiple beat acquisition.





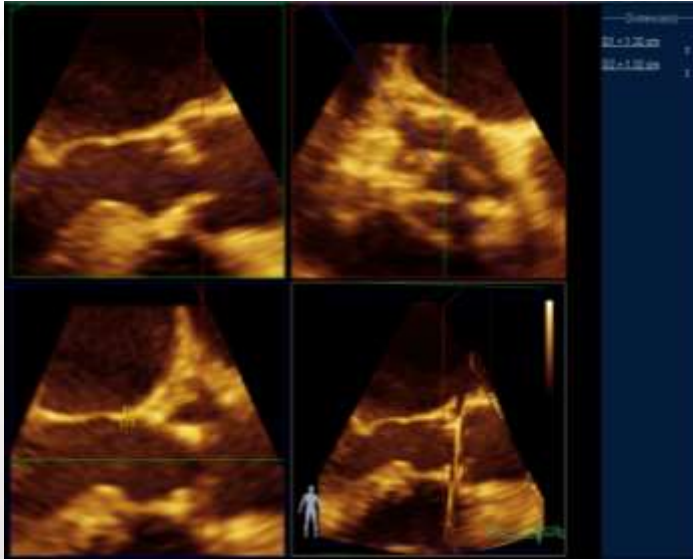
Aortic Root & Thoracic Aorta

Annulus dimensions



Aortic Root & Thoracic Aorta

Annulo-osteal distance



Left Atrial View

Left Atrial View

Acquisition:

0-120 degree mid-esophageal views. Then activate 3D-Zoom or Multiple beat acquisition modes.





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A group photograph of approximately 25 individuals, including men and women of various ages, dressed in professional attire such as suits, blouses, and dresses. They are standing in two rows against a plain, light-colored wall.