



New techniques in imaging of adult congenital heart disease

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CONFLICT OF INTEREST

- NONE

IMAGING MODALITIES IN GUCH

- TTE / TOE
- Advanced Echocardiography

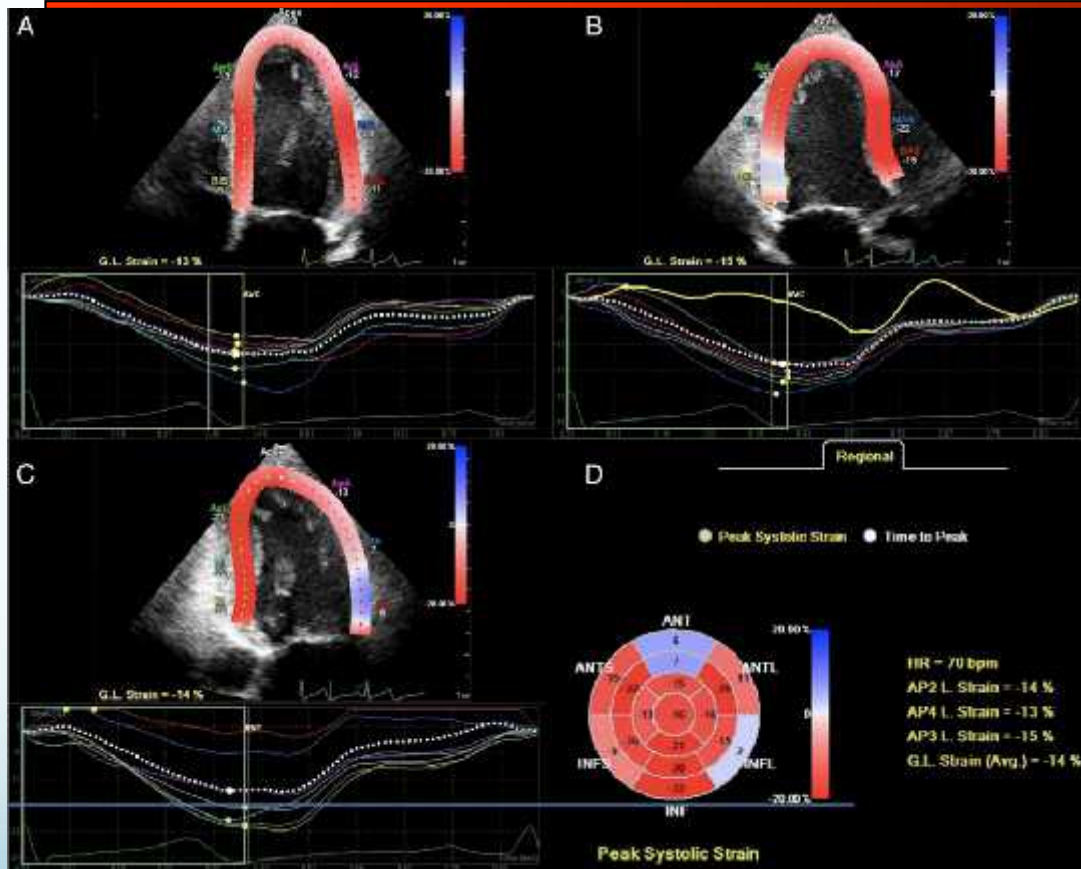
- MRI
- CT
- *CXR*

- MRI + TOE under one GA
- CATH + TOE

ECHOCARDIOGRAPHY

- Investigation of choice for diagnosing CHD
- Provides anatomy and physiology
- 3D Echocardiography has provided recently insight in complex CHD but further imaging modalities are often needed to complete the diagnosis and provide important data on the pathophysiology

ADVANCED ECHOCARDIOGRAPHY



*Imaging of CHD in adults
Babu-Narayan SV, Giannakoulas G,
Valente AM, Li W, Gatzoulis MA.
Eur Heart J. 2015*

- *Despite normal LV ejection fraction, speckle tracking shows LV myocardial dysfunction. The bullseye plot (D) shows that the anterior and inferior segments are akinetic.*

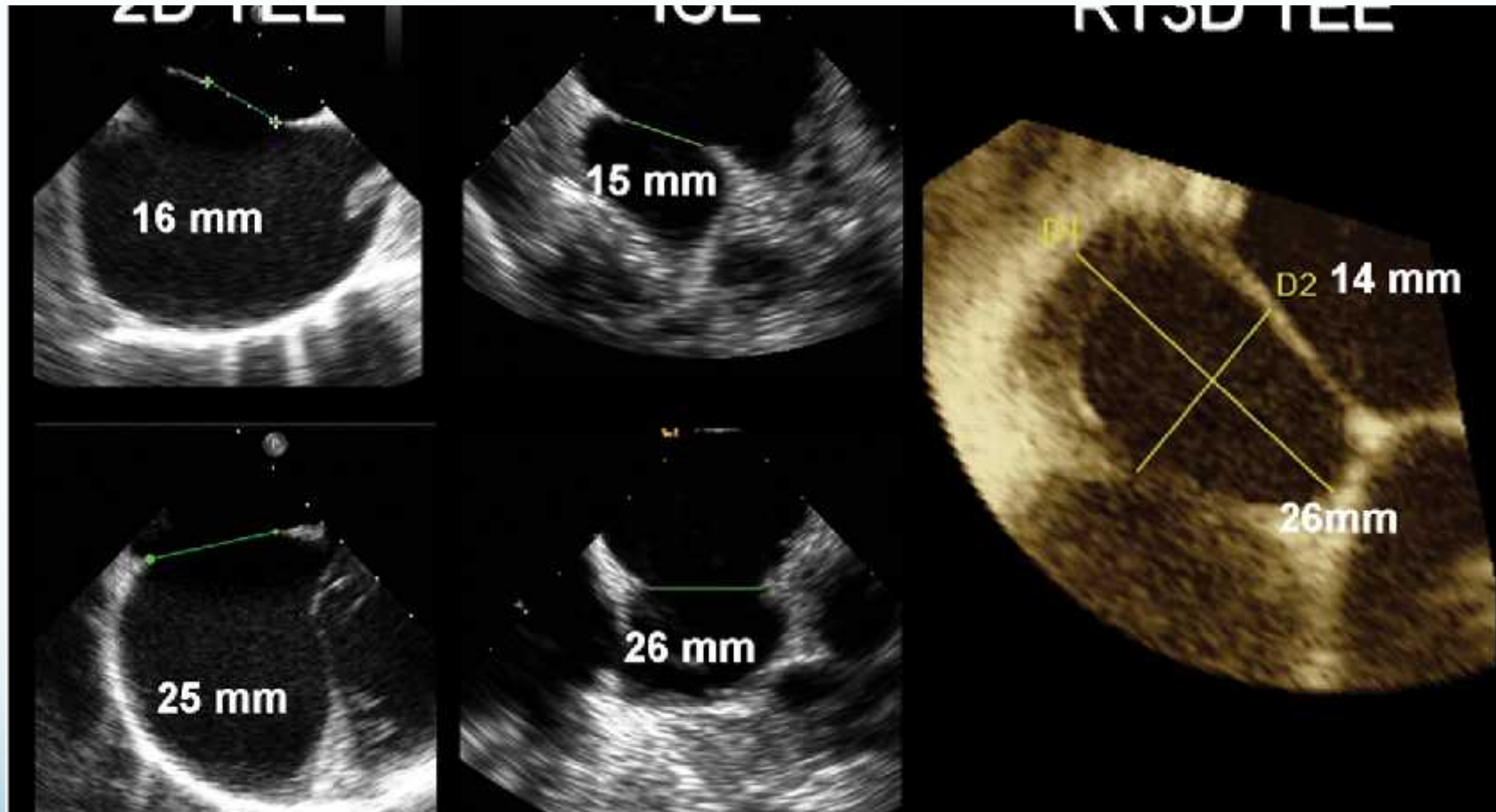
3D Echocardiography

Real-time 3D echocardiography has been used increasingly in the assessment of patients with congenital heart disease

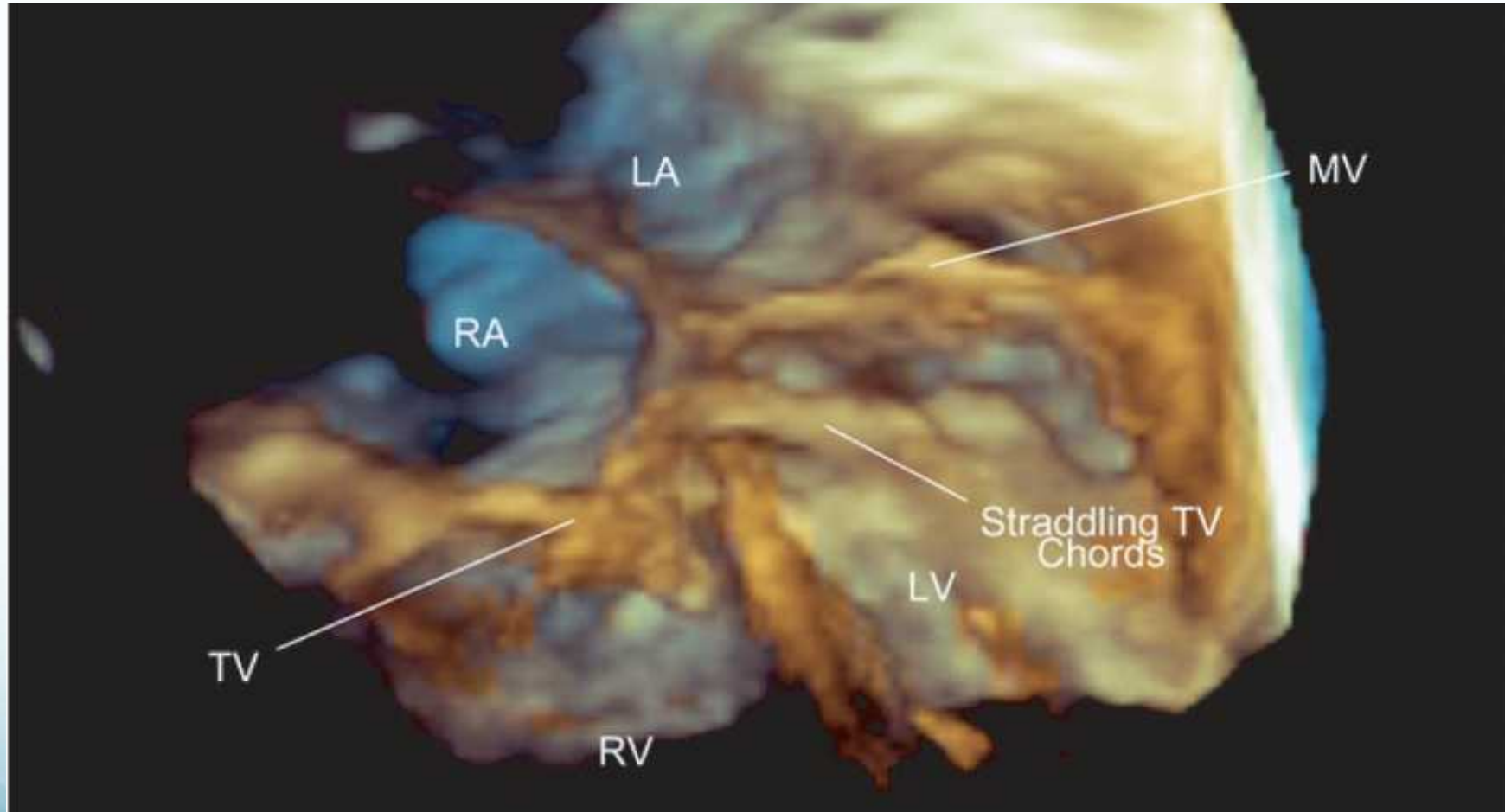
This modality can be used as a complementary method to delineate morphology and spatial relationships of simple and more complex congenital heart lesions during surgical planning

Simulation of surgical views can be achieved, thus minimizing the potential for error related to mental reconstruction

3D assessment for device implantation



Straddling TV cords



*Charakida, Pushparajah, Anderson, Simpson
Circ Cardiovasc Imaging 2014*

Other diagnostic modalities for CHD

- **CT** – Needs to be ECG gated: due to high heart rates the dose of radiation is large



Other diagnostic modalities for CHD

- **Cardiac Catheterisation:**
- Good for vascular anatomy and small vessels (coronaries) but not for complex septal defects or abnormal connections or 3D space imaging
- PVR assessment

MRI for imaging of lesions not able to elude on with Echocardiography...

MRI

ΓΙΑΤΙ ΕΙΝΑΙ ΣΗΜΑΝΤΙΚΟ ΤΟ MRI? – ΔΙΑΓΝΩΣΗ

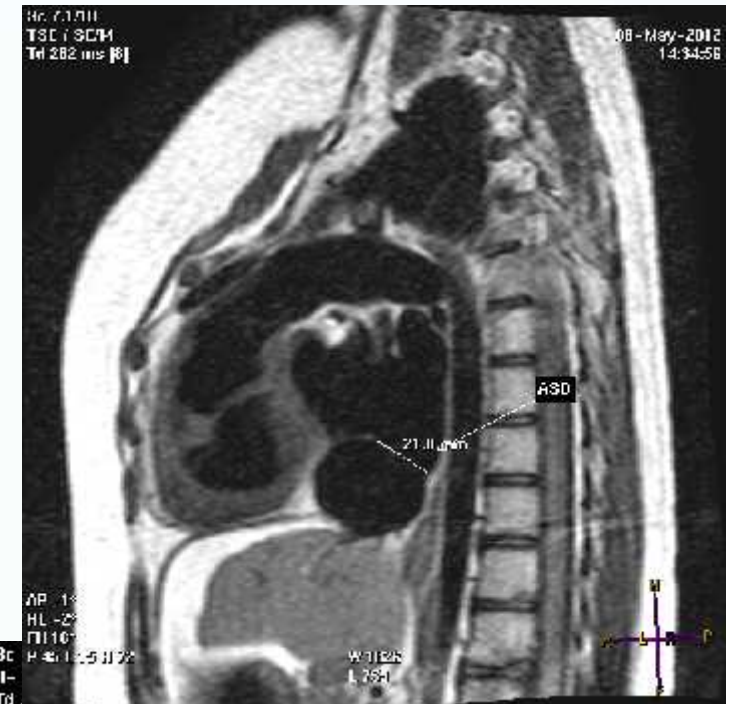
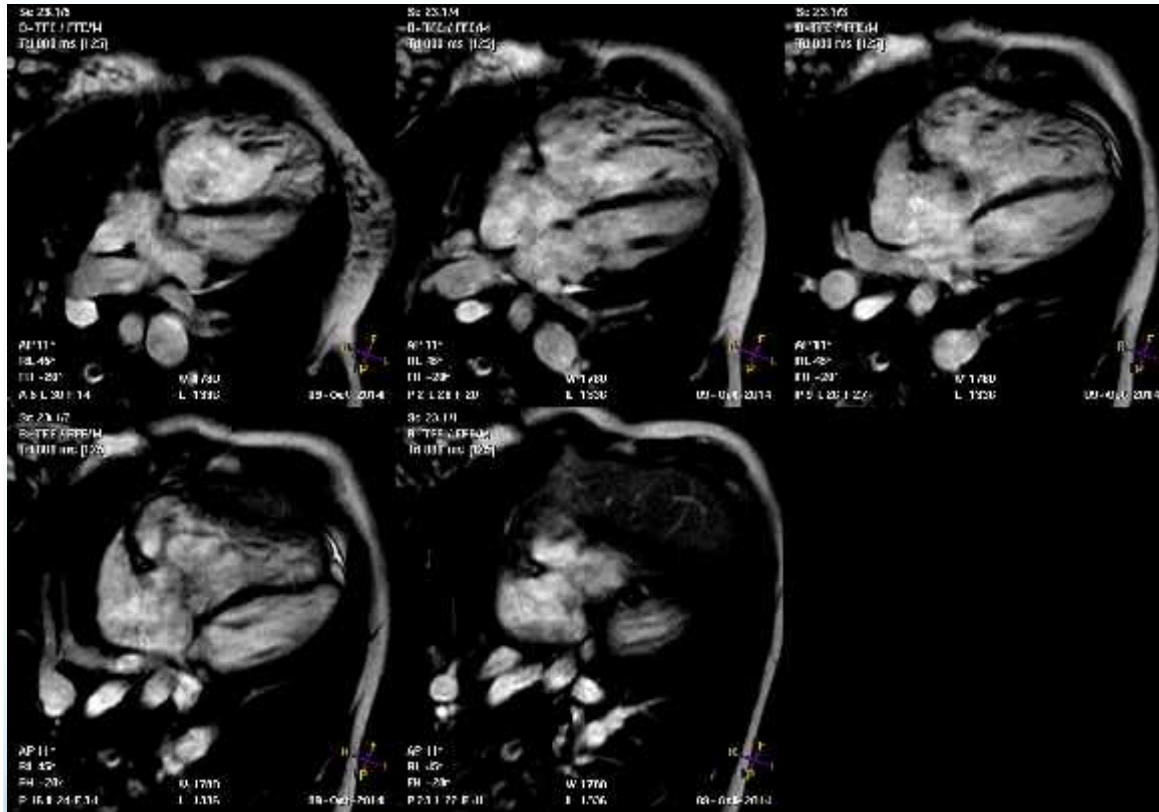
● ANATOMIA

- Εξαιρετική απεικόνιση ιστών
- Τρισδιάστατες μελέτες / ταυτόχρονη απεικόνιση σε διαφορετικές προβολές
- Έχει υποκαταστήσει τους διαγνωστικούς καθετηριασμούς σε μεγάλο βαθμό (αποφυγή ακτινοβολίας)

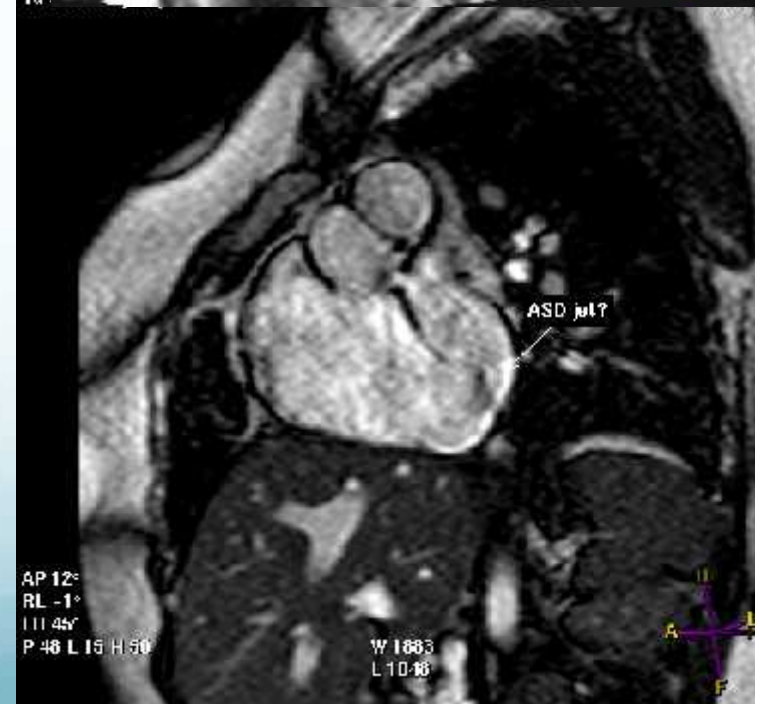
● ΦΥΣΙΟΛΟΓΙΑ

- Μελέτη ροών (αντικατάσταση RNA για εκτίμηση ενδοκαρδιακών ή εξωκαρδιακών shunts)
- Ποσοτικοποίηση βαλβιδικών ανεπαρκειών
- Μέτρηση ογκομετριών

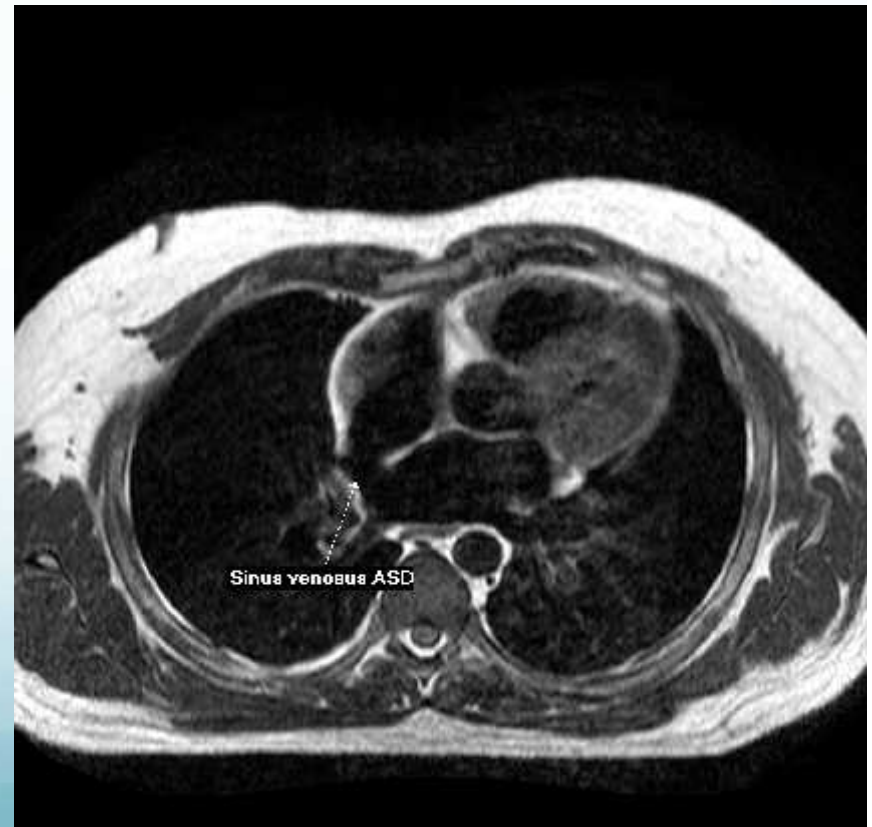
ASD location



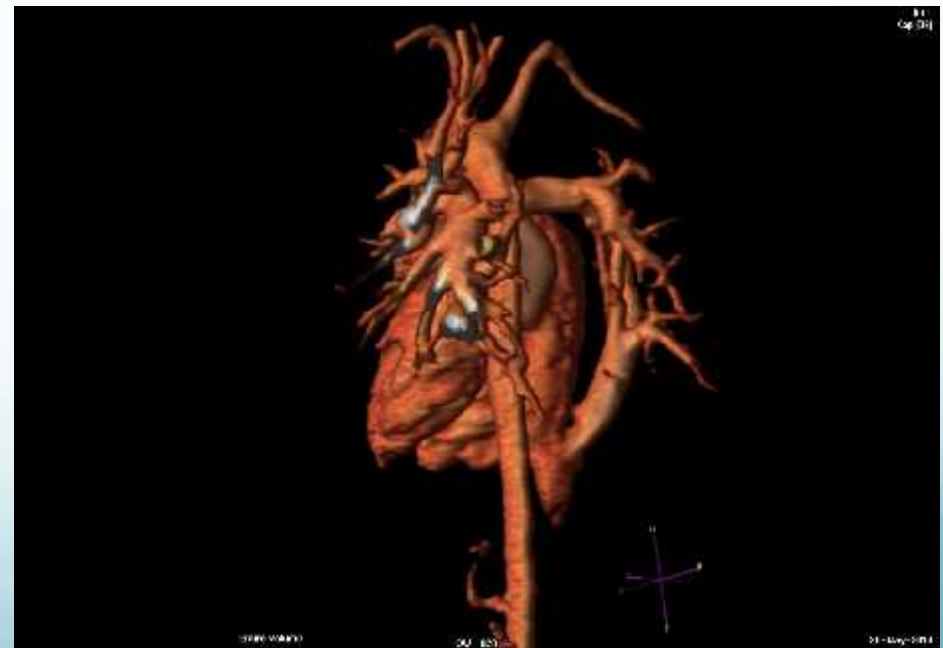
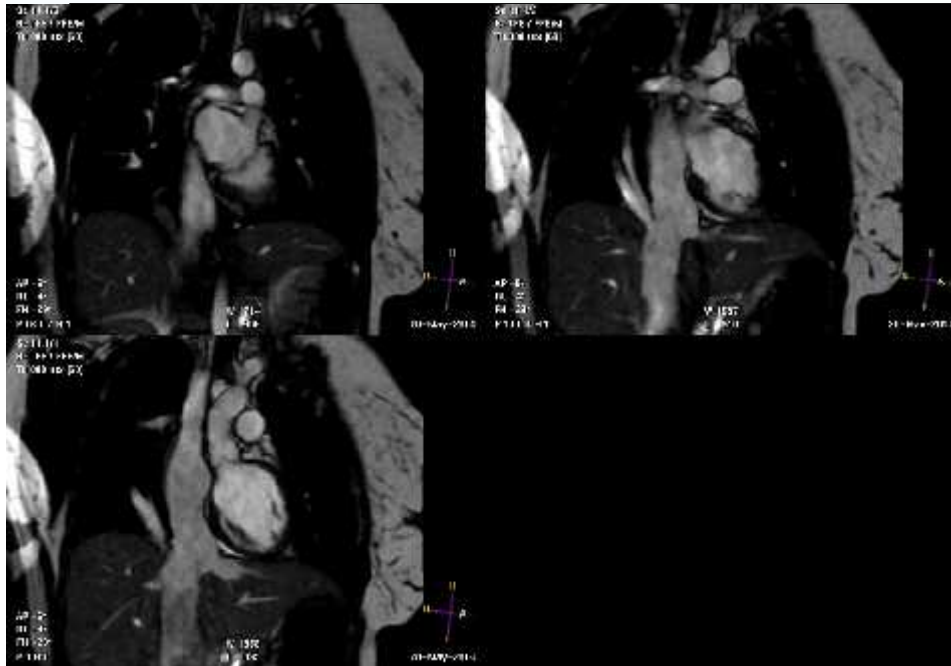
3c
II-
Td



Newly diagnosed RV dilation ? ASD



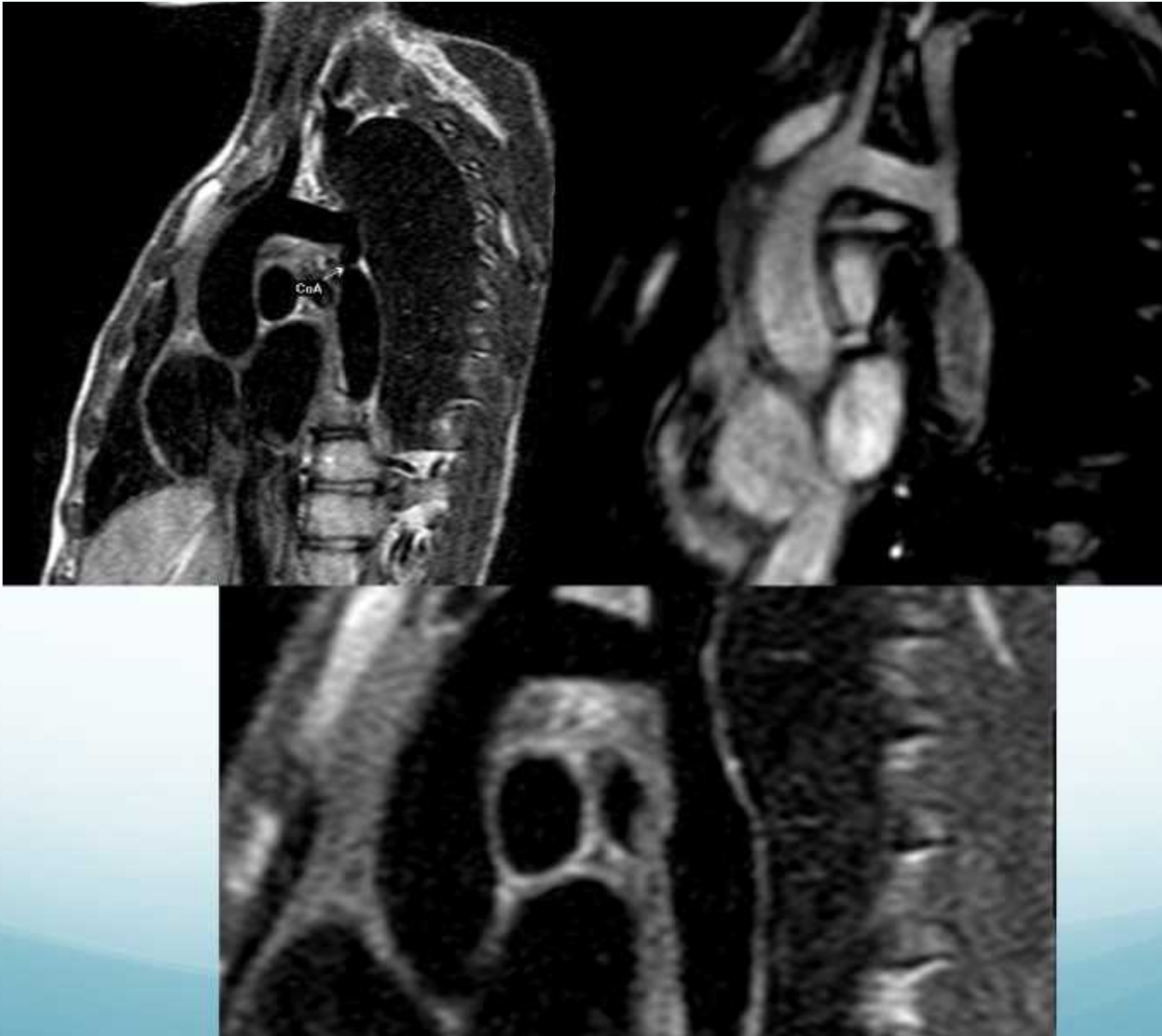
Adult with Scimitar syndrome



AORTIC COARCTATION

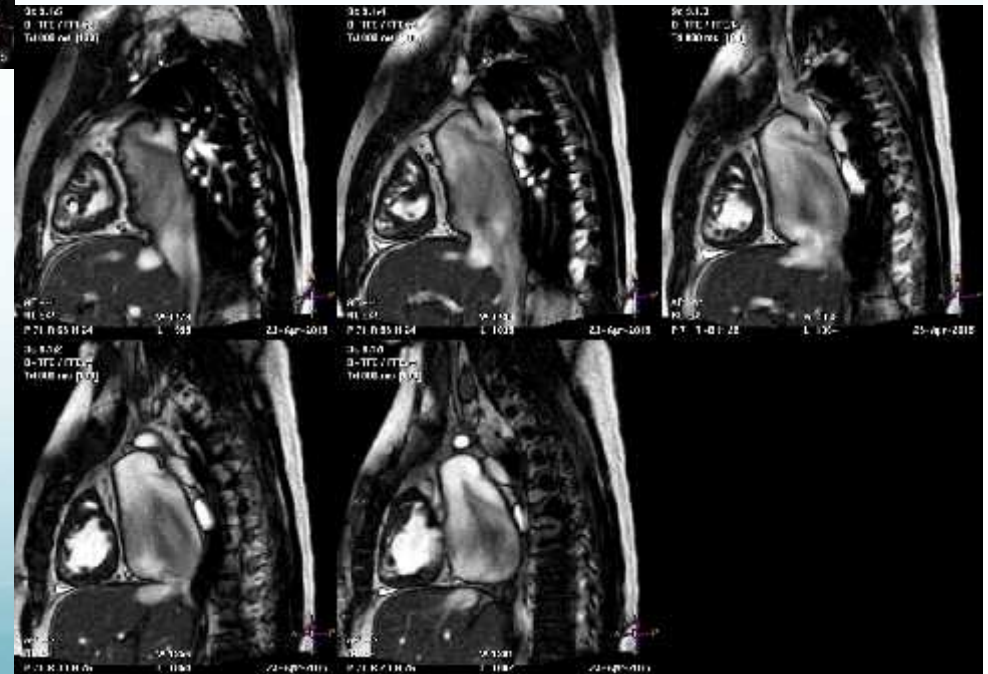
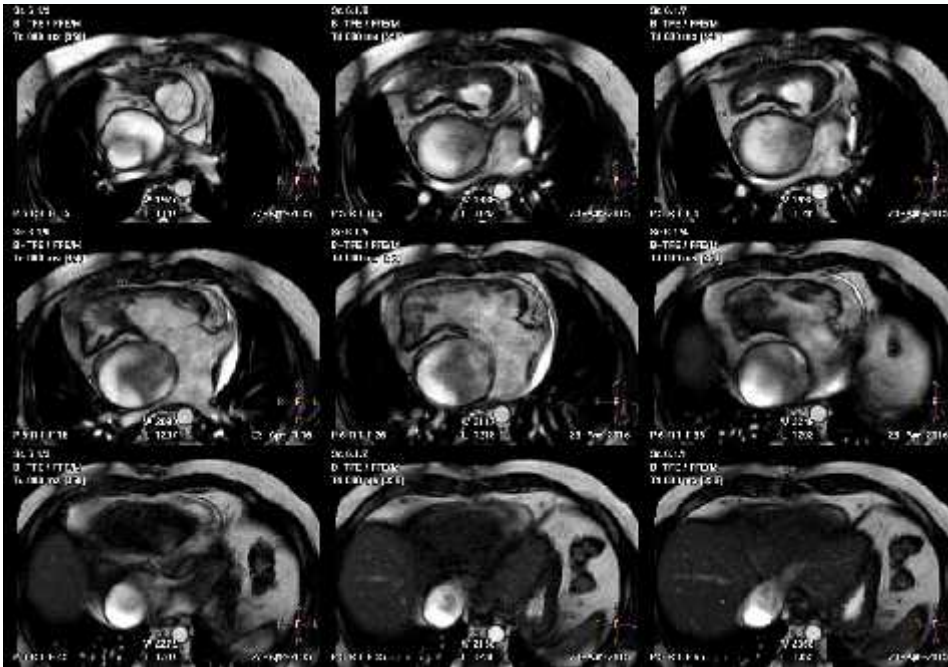


AORTIC COARCTATION / FU ASSESSMENT

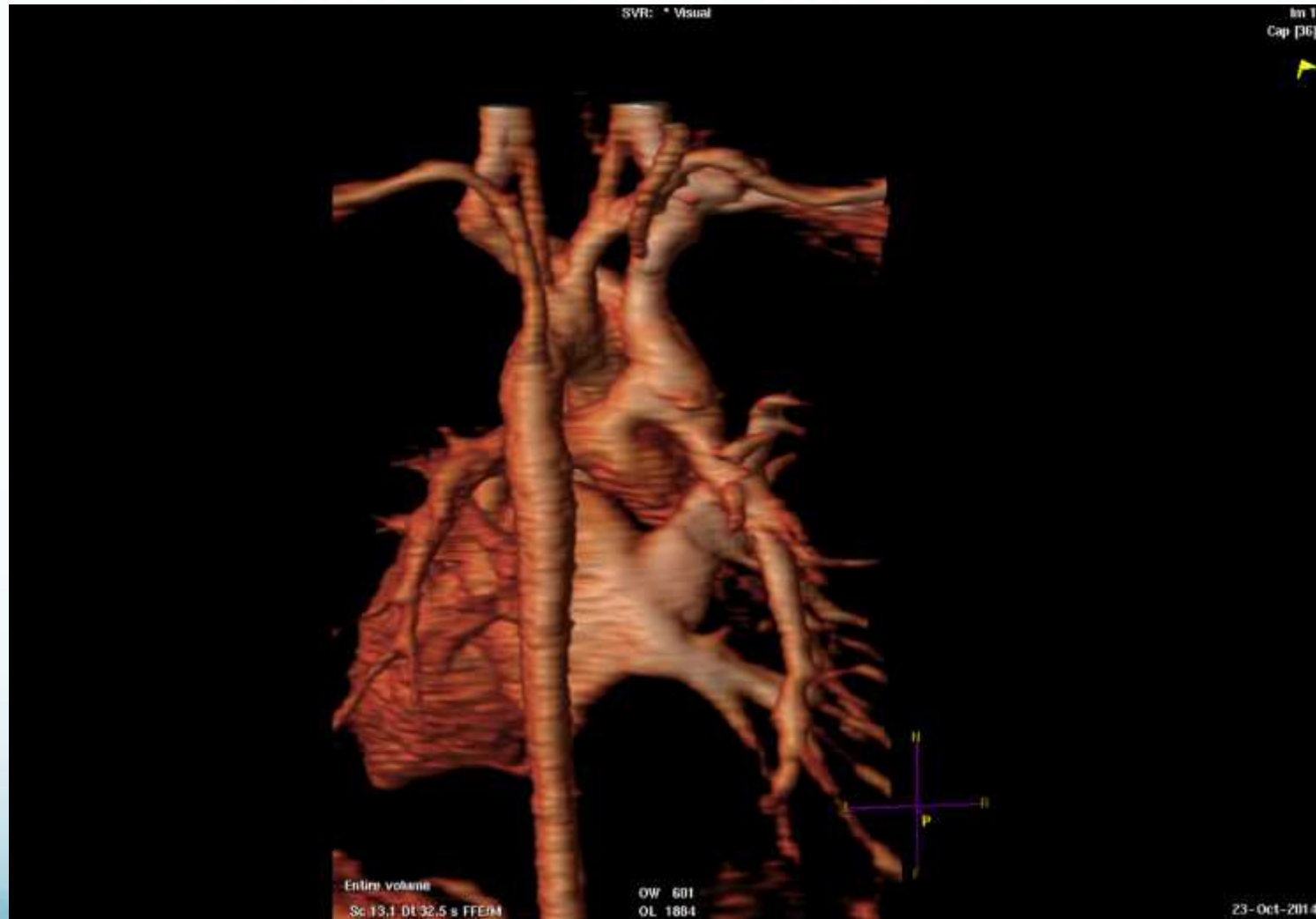


ION FONTAN

Atriopulmonary connection

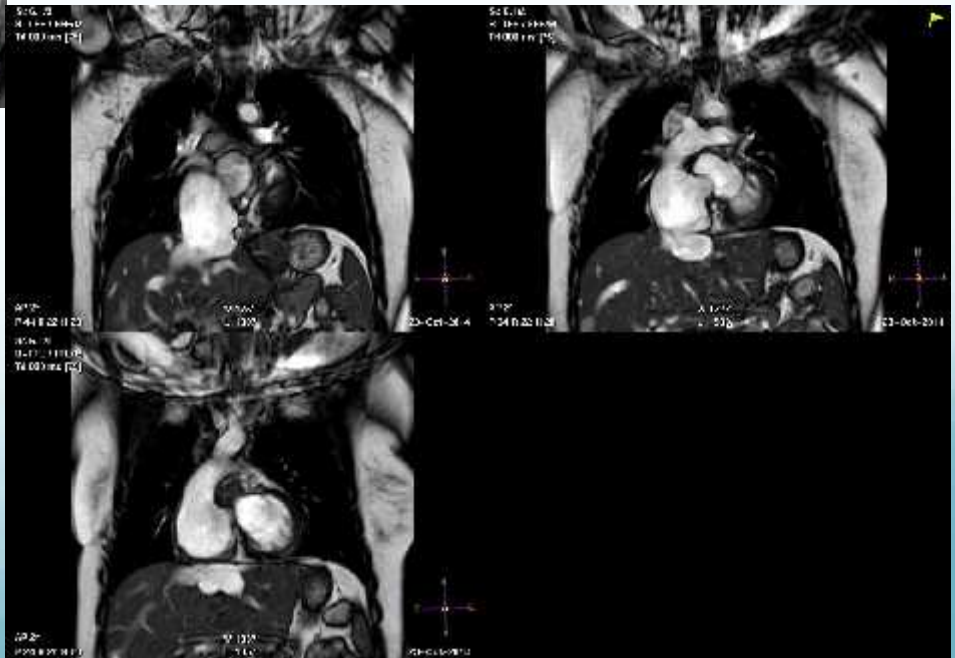
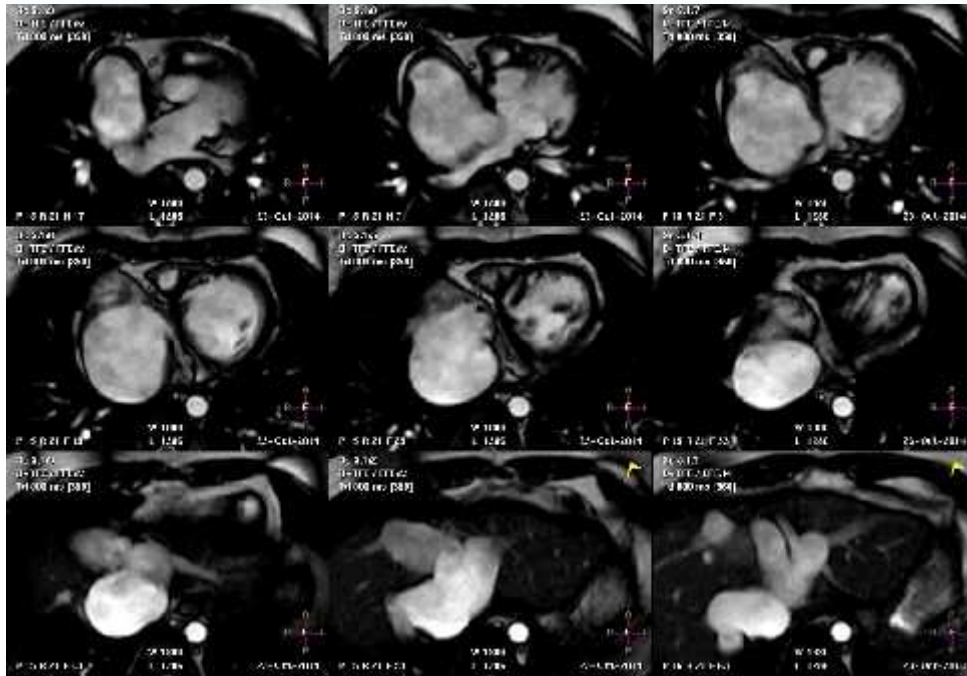


FONTAN: SVC and IVC to pulmonary arteries



FONTAN: SVC and IVC to pulmonary arteries

IONS



The practical clinical value of three-dimensional models of complex congenitally malformed hearts

Eugénie Riesenkampff, MD, Urte Rietdorf, MSc, Ivo Wolf, PhD, Bernhard Schnackenburg, PhD, Peter Ewert, MD, Michael Huebler, MD, Vladimir Alexi-Meskishvili, MD, Robert H. Anderson, MD, Nicole Engel, MD, Hans-Peter Meinzer, PhD, Roland Hetzer, MD, Felix Berger, MD, Titus Kuehne, MD

The Journal of Thoracic and Cardiovascular Surgery
Volume 138, Issue 3, Pages 571-580 (September 2009)
DOI: 10.1016/j.jtcvs.2009.03.011



Figure 1

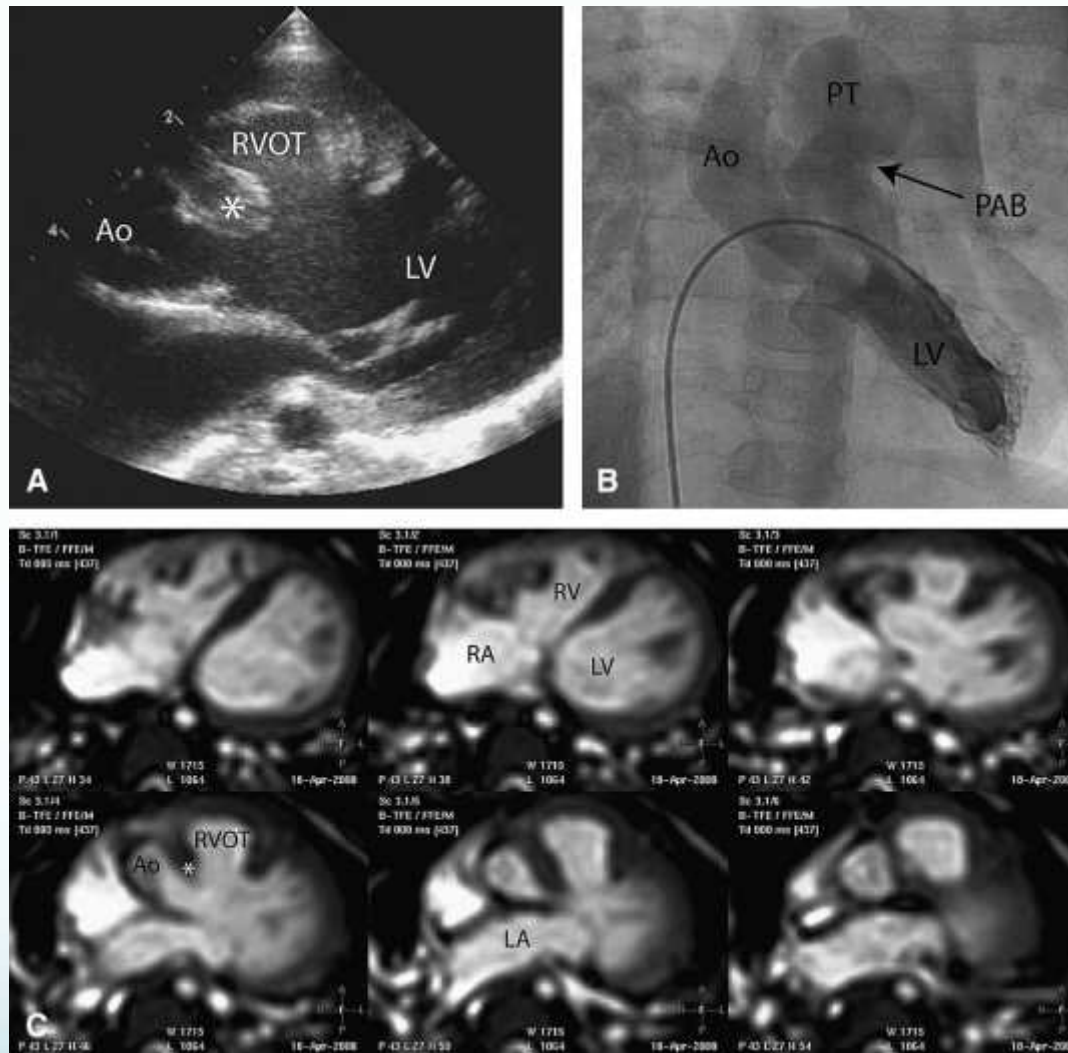


Figure 2

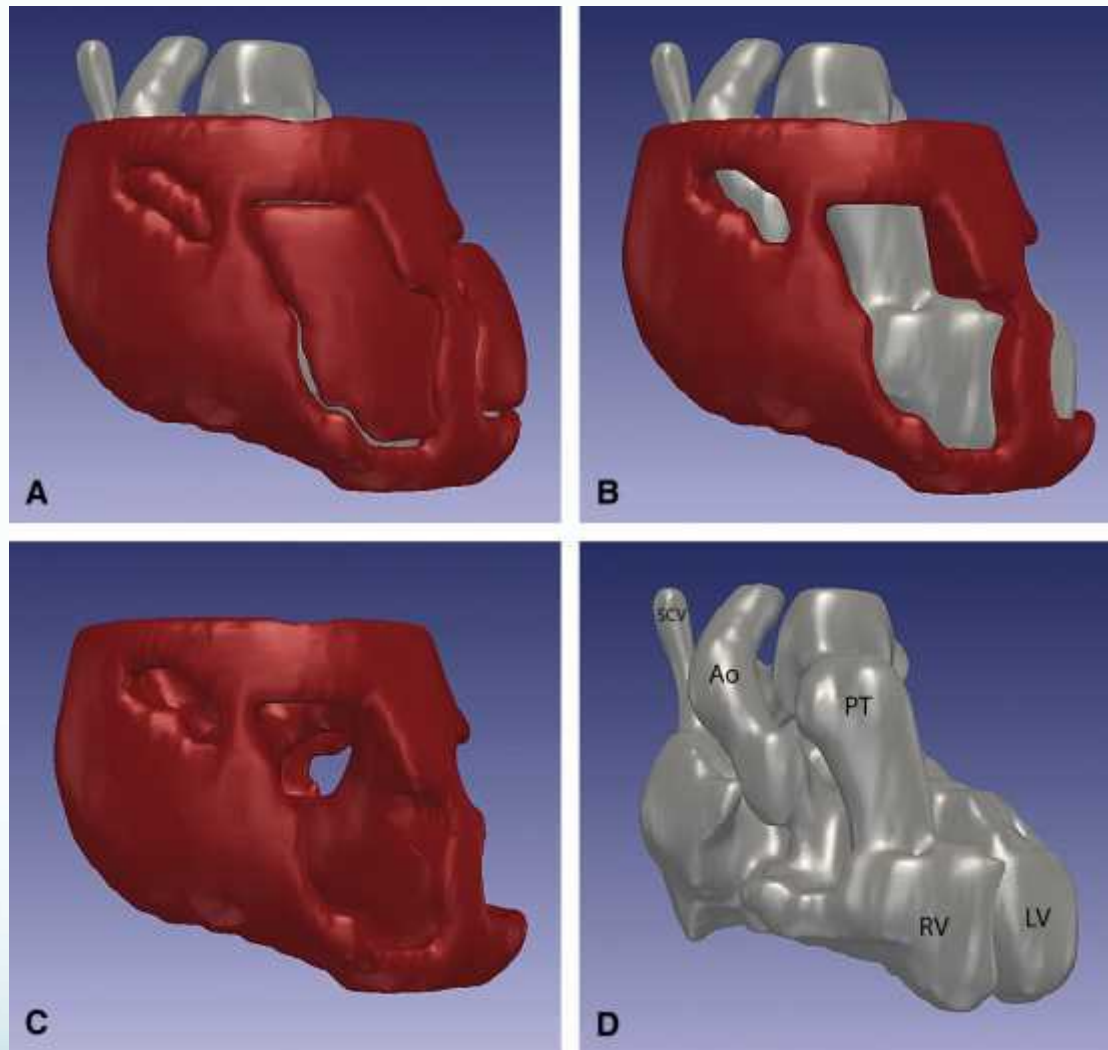


Figure 4

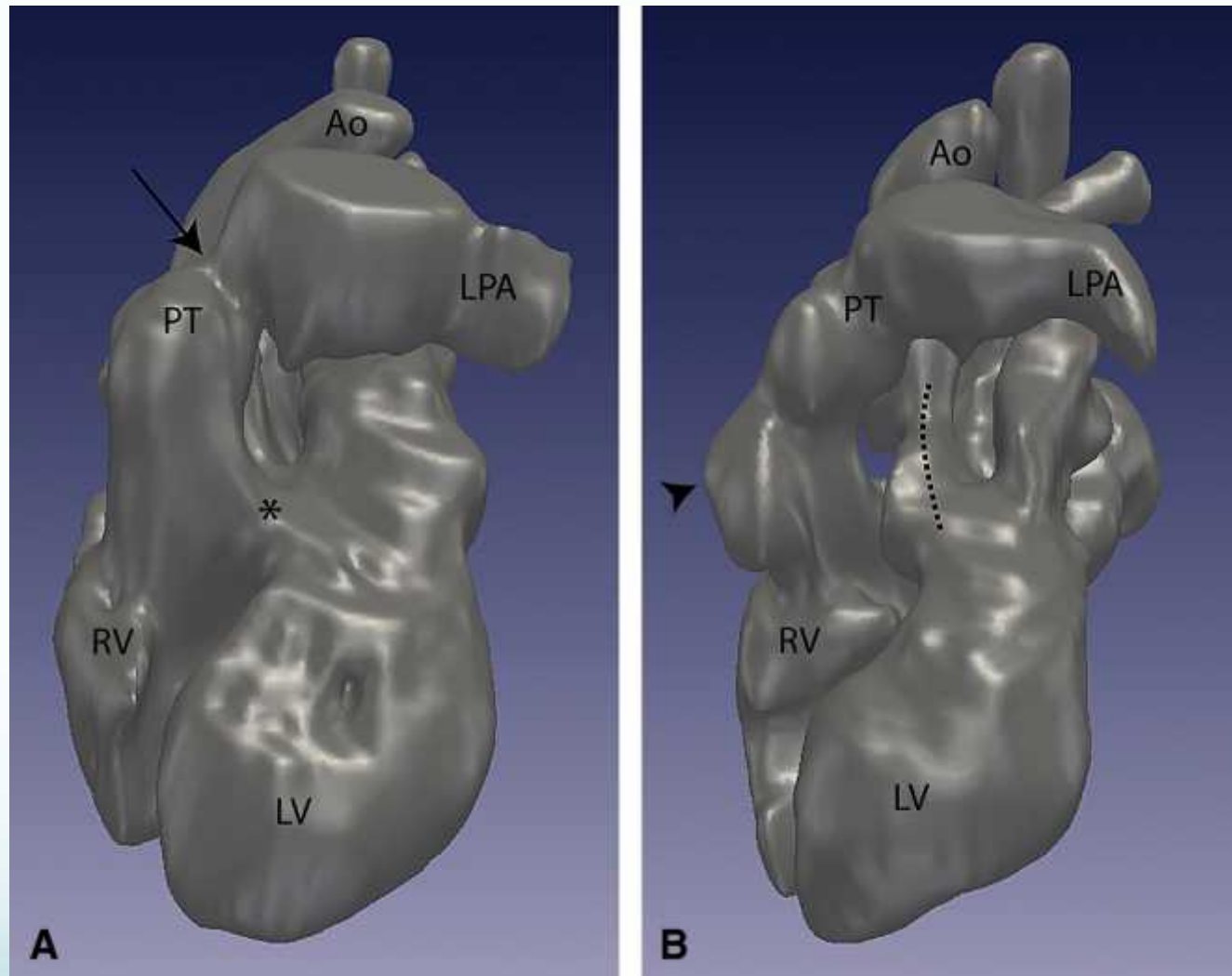


Figure 5

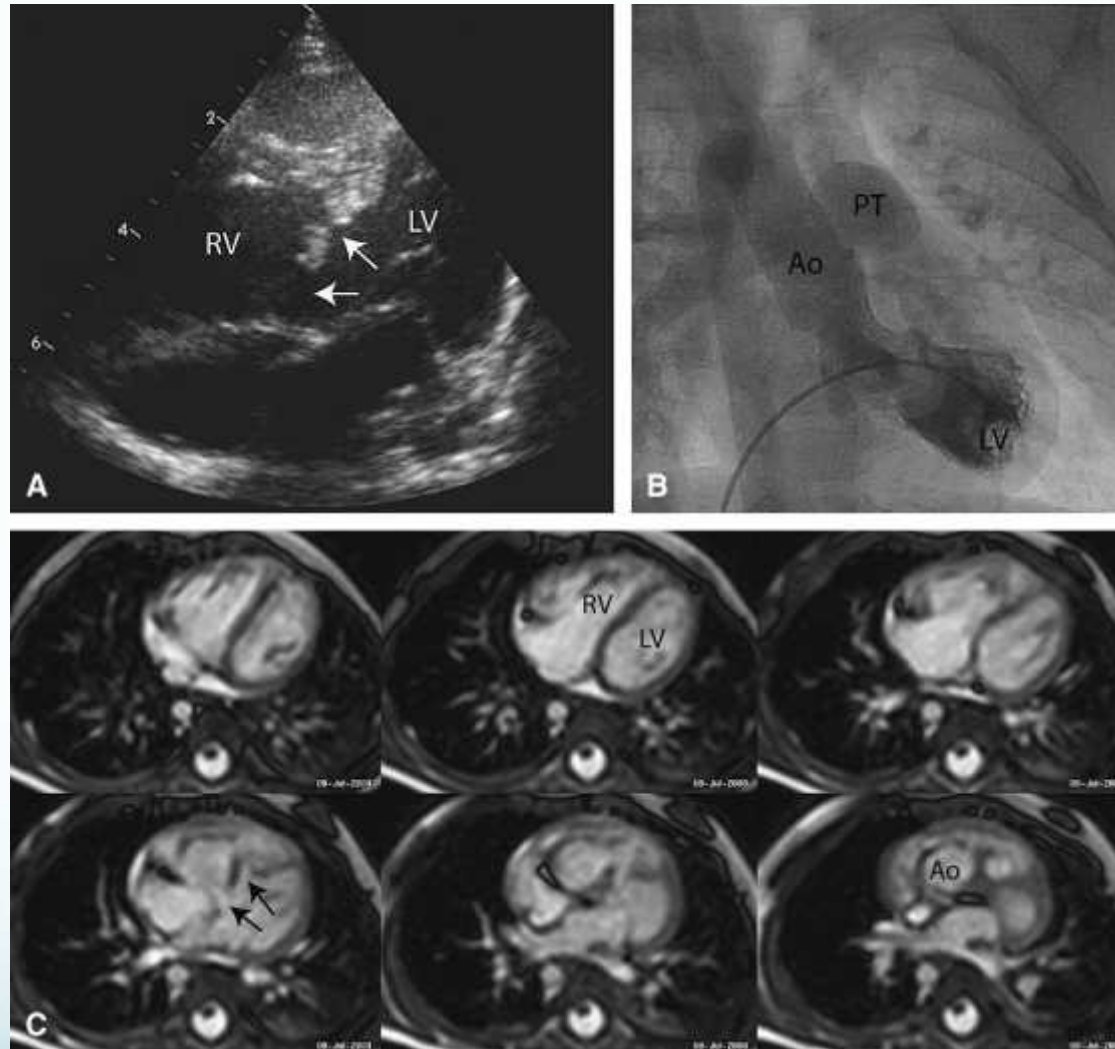
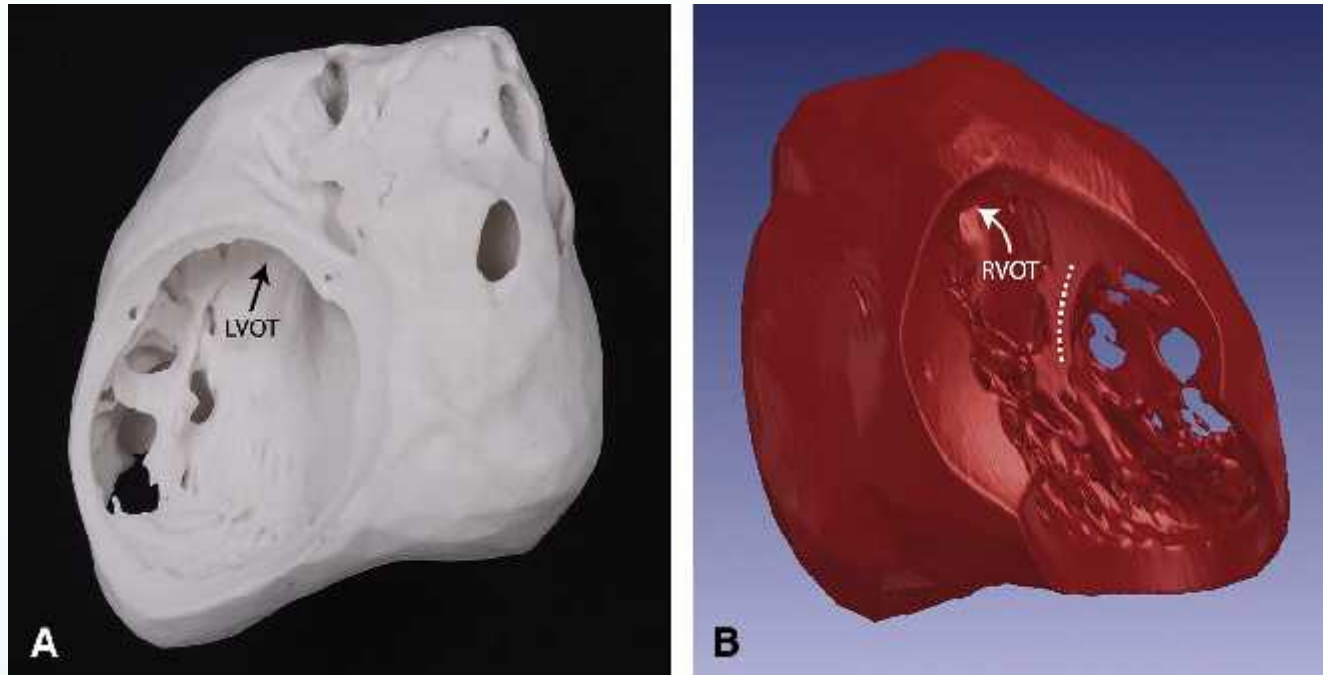


Figure 8



CONCLUSION

- MRI is the most requested investigation nowadays for assessment of complex congenital anatomy and physiology
- Think of simultaneous TOE when a GA MRI or cath is being performed
- 3D Echocardiography for CHD assessment is an invaluable tool
- Reserve cardiac cath for interventional procedures ONLY..

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