**ASE – Sunday June 12, 2022**

**Advances in Echocardiography for the Assessment of Congenital Heart Disease**

**TEE is great for the following**

* Closure for VSD , both multiple VSD’s and complicated VSD repair
* For transeptal puncture when repairing any congenital heart defects that require a transeptal puncture
* For aortic or mitral valvuloplasty and/or valve repairs
* Other intracardiac repair such as supravalvular stenosis, ASD repairs, Total anomalous pulmonary venous return just to name a few
* 3D TEE should be used in the following forms of adult congenital heart disease: hypoplastic left heart syndrome, transposition of the Great arteries, double outlet right ventricle, Ebstein’s anomaly, single ventricle valve repair

Ability to visualize inferior/superior and left/right lateral perspectives all at the same time. This obviously increases the accuracy of the repair to any valve or defect; but really it’s advantageous to to to any surgical approach. As more research comes out, we are finding patients have better outcome with 3D TEE imaging

**RVEF by 3D**

Eisenmenger patient - which echo parameters really matter?

What is it:

* There is systemic-to-pulmonary congenital cardiovascular communication
* Pulmonary arterial disease
* Cyanosis

Left to right shunt leads to an increase in pulmonary blood flow which leads Pulmonary vascular disease, increasing the pulmonary vascular resistance. Lastly, there is then shunt reversal leading to cyanosis and secondary erythrocytosis.

**Echo features of Eisenmenger syndrome include the following:**

* Right ventricular hypertrophy
* Right ventricular enlargement
* Elevated TR velocity
* Reduced tricuspid annular systolic plane excursion (TAPSE) & tricuspid annular peak systolic velocity (s’)
* Reduced RV free wall strain
* Evidence of intracardiac shunt (use agitated saline to assess for shunt especially if it hasn’t been mentioned yet)

Track TAPSE > .15

Right atrial dilation

Right ventricular dilation and decrease in RV systolic function

Short axis RV function is higher versus your classis pulmonary hypertension presentation

**Remember, Cardiac remodeling differs from PAH patients**

Longitudinal deformation declines similarly but transverse deformation

Unrepaired PDA? Could lead to Eisenmenger syndrome

Stretched ASD/PFO? Relevant to perform bubble study for ES patients because the RA dilation can lead to a stretch septum resulting in a PFO/ASD.

**Other predictors of mortality:**

Pre-tricuspid shunts such as an ASD or Partial anomalous pulmonary venous return have a trend towards worse prognosis

The larger the RV, the greater the impact on LV function

* TAPSE <15mm
* Systolic:diastolic duration of > 1.5
* RA area > 25cm squared
* RA:LA > 1.5

**Strain in Eisenmenger’s Syndrome**

Patients with ES have a a higher peak transverse strain compared to other forms of PAH

Free wall and global longitudinal strain does not vary

Higher free wall transverse strain is associated with better survival

**LV dysfunction**

Over the age of 50, an EF <50 is associated with reduced survival

**Pericardial effusion**

Commonly present in 9-25% of ES patients. One study suggests that there is a 2 fold increase in mortality. However, there are multiple other studies that find no association with mortality. All in all jury is still out