

Background

- Atrial septal defect (ASD) is the second most common congenital acyanotic heart defect, and accounts for 25-30% of congenital heart defects diagnosed in adulthood.
- Pregnancy’s hyperdynamic state may unmask ASD due to increased left to right shunting, RV overload and pulmonary arterial hypertension (pHTN).
- pHTN in pregnancy is associated with high morbidity and maternal mortality of 25%.

Case Description

- 41-year-old G4P3 at 39w6d presented with 1 week of worsening dyspnea and fevers
- At community hospital found severely dilated RA and RV, thus transferred to our ACOG Level IV hospital
- TTE showed a 20-25mm ostium secundum ASD, left-to-right shunt, severe RV dilation, EF of 60-65%, and no evidence of Eisenmenger’s syndrome
- Cardiac Catheterization showed RV systolic pressure in the mid to high 50s and a L->R shunt fraction of 2.2:1.
- PA catheter was placed in Cath lab for close monitoring of PA and RV pressures throughout labor
- An L4-L5 epidural catheter was placed prior to induction of labor and slowly loaded to maintain stable BP and PA pressures 50s/30s.
- She was monitored overnight in ICU, as the highest central cardiac volume and output demands occur after delivery.
- Discharged postpartum day 4 on ASA and furosemide with ASD repair at 6 months postpartum.

Figures



Figure 1.

Plain film AP CXR demonstrating pulmonary venous congestion and cardiomegaly

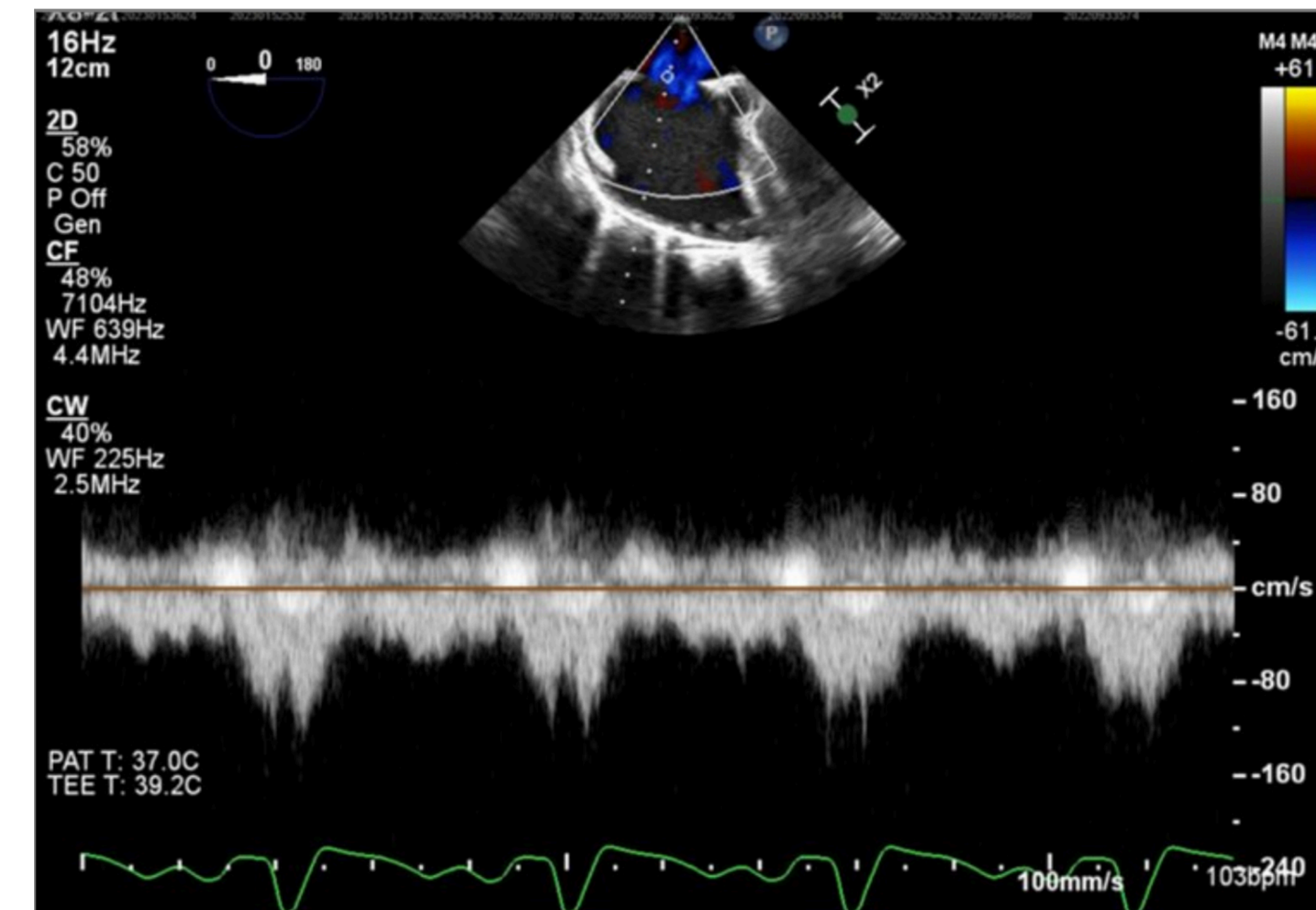


Figure 2.

TEE showing intra-atrial septum with continuous flow doppler and the downward deflection during atrial systole showing predominately left to right shunt

Results

Fick equation

Blood flow= $VO_2 / (1.36 \text{mLO}_2 \times 10 \text{dL/mL} \times \text{hgb} \times (\text{SaO}_2 - \text{SvO}_2))$

Pulmonary blood flow = $(125 \times 1.87) / (1.36 \times 10 \times 12.1 \times (1.00 - .94))$

= $233.75 / (164.56 \times 0.06)$

= **23.6 L/min**

Systemic blood flow = $(125 \times 1.87) / (1.36 \times 10 \times 12.1 \times (.96 - .83))$

= $233.75 / (164.56 \times 0.13)$

= **10.9 L/min**

Qp/Qs (shunt fraction) = 2.2:1

Discussion

- Pregnancy is relatively contraindicated in patients with moderate-severe pHTN.
- A large, uncorrected ASD may be asymptomatic until the CV stressors of pregnancy.
- In the absence of pHTN, ASD is generally well tolerated in pregnancy.
- Direct PA pressure measurement confirms pHTN as ECHO may overestimate PA pressures.
- The diagnosis of pHTN must be made before delivery to direct physiologic goals to avoid fluid overload and triggers that would worsen pHTN (hypoxia, hypercarbia, hyperthermia, acidosis) and potentially increase right-to-left (cyanotic) shunting, which may cause FHR changes and emergency cesarean.

References

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