Anesthetic management of previously undiagnosed partial anomalous venous return in pregnancy

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SOAP Society for Obstetric Anesthesia and Perinatology
SOAP 2023 Annual MEETING
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Background:

- Pulmonary hypertension in pregnancy significantly increases the risk of eclampsia syndromes, intrauterine fetal demise, preterm delivery, and major adverse cardiac events. [1]

- Successful management of pregnant patients with known congenital heart disease requires a multidisciplinary approach that includes thorough preconception counseling, risk stratification, and thoughtful delivery and anesthetic planning. [2,3]

- Building upon previous successful management of undiagnosed total anomalous pulmonary venous return (TAPVR) at our institution, we present a case of previously undiagnosed partial anomalous pulmonary venous return (PAPVR) and pulmonary hypertension in pregnancy. [3]

1. Thomas, E., Yang, J., Lima, F.V., Stergiopoulos, K. Pulmonary Hypertension and Pregnancy Outcomes: Insights From the National Inpatient Sample. *J Am Heart Assoc*. 2017 Oct 24;6(10):e006144. doi: 10.1161/JAHA.117.006144.

2. Salciccioli KB, Cotts TB. Pregnancy in Women with Adult Congenital Heart Disease. *Cardiol Clin.* 2021 Feb;39(1):55-65. doi: 10.1016/j.ccl.2020.09.004.

3. Tiouririne M, Baum VC, Battle RW, Arendt KW, Bhatt AB. Pregnant Patient With Uncorrected, Undiagnosed Total Anomalous Pulmonary Venous Return and Severe Pulmonary Hypertension. *Journal of Cardiothoracic and Vascular Anesthesia*. 2013 Oct;27(5):1041-7. doi:10.1053/j.jvca.2013.02.010.

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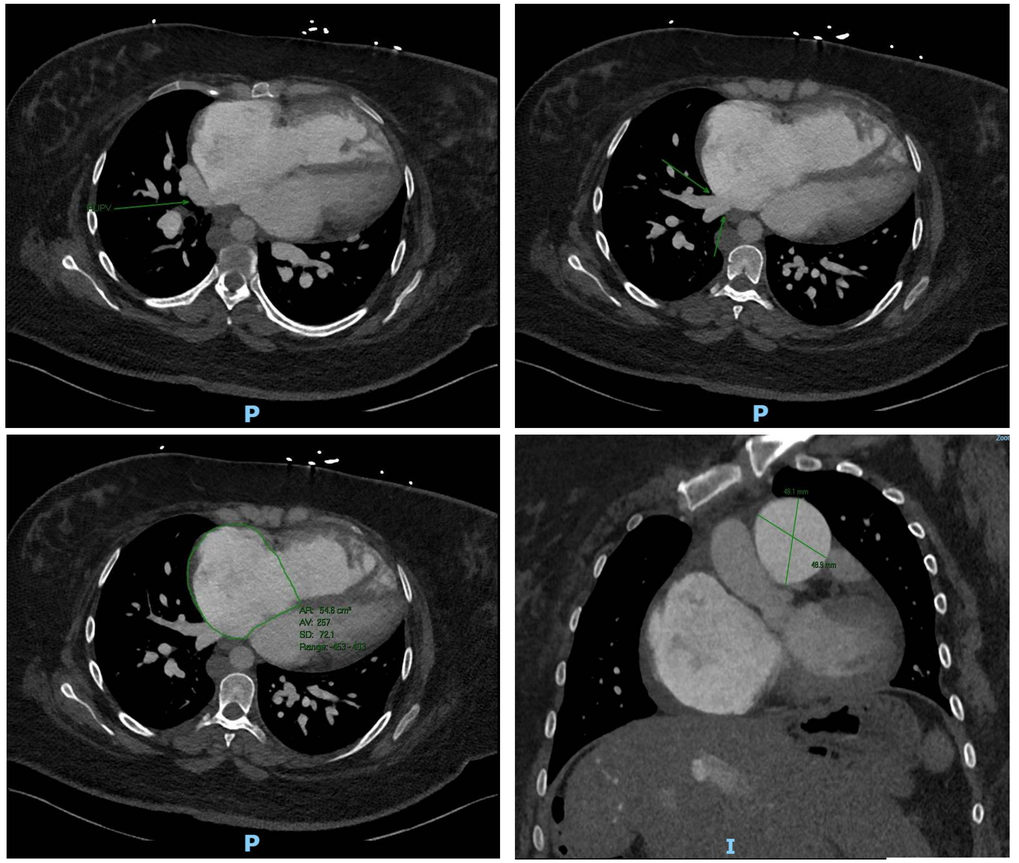
Case Events:

- 28 yo G3P1031 at 30 weeks with PMH of depression, substance use disorder, PE in prior pregnancy, cHTN with superimposed preeclampsia without severe features, and pulmonic stenosis who presented with worsening shortness of breath, orthopnea, new paroxysmal nocturnal dyspnea and peripheral edema.

- Initial TTE showed elevated pulmonary pressures without pulmonic stenosis (mean PAP 43 mmHg, pulmonic valve velocity 2.2 m/s). Subsequent RHC and CTPA revealed previously undiagnosed PAPVR and polysplenia sequence with RV dysfunction and L → R shunt.
  - *CTPA Findings - Right upper & lower pulmonary veins draining entire right lung into right atrium. Normal drainage of left pulmonary veins into the left atrium. Severely dilated main pulmonary artery measuring 50 x 48 mm. Severely dilated right ventricle with severe hypertrophy. Severely dilated right atrium. Normal size left heart. Polysplenia.*

- Cesarean completed in the cardiac OR at 32 weeks under combined spinal epidural anesthesia. Intraoperative monitoring via arterial line and PA catheter.



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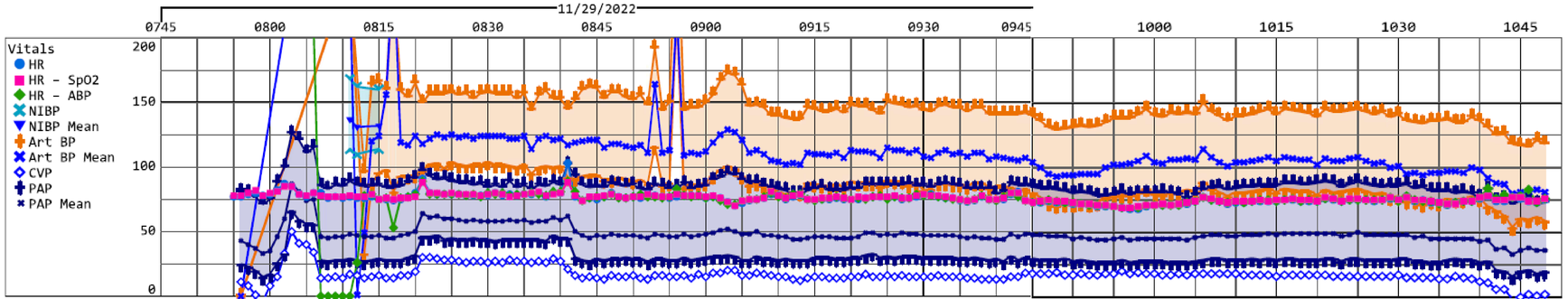
Learning Points:

- Preconception
  - Counseling for risk stratification and to discuss maternal-fetal morbidity and mortality
- Antepartum
  - RV failure and L → R physiology likely driven by PAPVR initially well controlled with diuretic therapy
  - Weekly R heart catheterization and TTE to monitor cardiac function
- Intrapartum
  - Hemodynamic monitoring with arterial line and PA catheter
  - Combined spinal epidural with opioid only spinal followed by incrementally dosed epidural
- Postpartum
  - Fluid shifts and volume concerns managed with furosemide
  - Elevated BP likely related to preeclampsia managed with labetalol



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