Use of Transthoracic Echocardiography in the Management of Labor in a Parturient with Severe Pulmonary HTN in whom Pulmonary Artery Catheterization was Unsuccessful

Abstract Type: Case Report/Case Series
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A 36 y/o G1P0 with a history of severe pulmonary hypertension secondary to systemic lupus erythematosus (SLE) presented in spontaneous labor at 36.6 weeks EGA. The patient’s medical history was significant for PEA arrest in 2009 following a right heart catheterization that demonstrated a systolic PA pressure of 107 mmHg. Her most recent cardiac catheterization was about 1 yr antepartum and revealed PA pressure 56/27, RV pressure 56/9 and PVR 364 dynes/sec/cm-5. Her pulmonary HTN was managed with digoxin, sildenafil and a continuous infusion of treprostinil via external pump. During gestation her systolic PA pressures ranged from 40-60 mmHg as estimated by serial TTE.

Upon presentation to the labor and delivery suite at 1.5 cm cervical dilation, a right brachial A-line was placed and multiple attempts at internal jugular venous access were attempted but were complicated by pre-existing thrombosis. She then received traditional epidural analgesia, dosed with 10 mLs of Bupivacaine 0.125% in divided doses and 100 micrograms of fentanyl. A test dose was omitted. A left femoral 9Fr cordis was placed uneventfully. At 7cm cervical dilation an attempt to float a PA catheter was also unsuccessful. One PA pressure of 39/17 was transduced.

Her labor was complicated by frequent variable FHR decelerations. Fluid restriction was employed to avoid fluid overload. The patient was noted to be oliguric preceding delivery despite two 250 cc fluid boluses. At 10 cm cervical dilation the patient was taken to the OR for assisted vaginal delivery. TTE was performed to evaluate volume status and estimate PA pressures. A parasternal short access view revealed a mid-papillary left ventricular end diastolic area of 6.3 cm2, consistent with relative hypovolemia. An additional bolus of 1 liter crystalloid fluid was administered. Reliable PA pressure estimates using tricuspid doppler flows were not possible to obtain as instrumental vaginal delivery rapidly ensued. While on a non-rebreather the patient was allowed to perform minimal pushing. The epidural catheter was dosed with 5 mLs of 3% 2-chloroprocaine and forceps assisted delivery was performed. Oxygen saturation was maintained at 99% throughout and there were no resultant maternal or neonatal complications. She was transferred immediately to the ICU where she had an uneventful recovery.

TTE may serve as a reliable alternative to invasive central monitoring in guiding both fluid management and measuring PA pressure in patients in whom TEE is not feasible. In our patient maintenance of strict hemodynamic control using cautious fluid administration, prostacyclin infusion and intra-partum TTE in the absence of a PA catheter contributed to an uncomplicated delivery.