Utilization of Trans-Thoracic Echocardiogram to Diagnose Vascular Air Embolism in a Healthy Caucasian Female Following Intraoperative Cardiac Arrest During Cesarean Section Under Spinal Anesthesia

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Jacob W. Shipley, M.D.; Helene Finegold, M.D.; Mark Stypula, M.D.
West Penn Allegheny Health System

Venous air embolism is a common occurrence during cesarean section with a reported incidence between 10 and 60%, and it accounts for approximately 1% of maternal deaths in the United States. However, given its relatively low incidence of major morbidity and mortality, there must be a high index of suspicion combined with the timely application of monitoring techniques to diagnose VAE in the event of an acute cardiac arrest. We present the case of a 24-year-old Caucasian female at 39 weeks gestation presenting for an elective cesarean section under spinal anesthesia suffering an acute, intraoperative cardiac arrest in which the utilization of trans-thoracic echocardiogram identified the inciting insult as a vascular air embolism. The patient underwent spinal anesthesia with the injection of local anesthetic and opioid into the CSF at the L4-L5 interspace. Following the establishment of an adequate anesthetic level, the surgical dissection, uterine incision, and neonatal delivery proceeded without incident. Approximately 35 minutes following induction of spinal anesthesia the patient unexpectedly coughed and became unresponsive and bradycardic. Ventilation was immediately assisted, at which point palpable pulses were lost and the ACLS protocol was initiated. CPR occurred for 3 minutes with tracheal intubation and the administration of two doses of IV epinephrine. Spontaneous pulses returned, and the patient was transferred to the ICU on mechanical ventilation following surgical closure. An immediate post-arrest trans-thoracic echocardiogram was performed displaying a right ventricular systolic pressure of 60-65 mmHg with severe tricuspid regurgitation and a mildly enlarged right ventricle. The patient proceeded to have rapid clinical improvement with self-extubation and a complete neurological recovery. Given the initial findings, a repeat trans-thoracic echocardiogram was obtained on post-arrest day number three which revealed a significant decrease in the pulmonary artery pressure to 33 mmHg with a concomitant regression in tricuspid regurgitation suggesting an acute embolic event. The patient’s complete recovery solidified VAE over other embolic events that impart some degree of systemic sequela. This case highlights a minimally invasive, highly available imaging modality that can be used effectively in identifying the source of a catastrophic perioperative complication, suggesting that anesthesia providers may benefit from additional training in peri-operative TTE utilization and interpretation.