Anesthesiology Survey
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What is the Perioperative management of incidental Patent Foramen Ovale (PFO) finding prior to posterior spinal fusion (PSF)?

What adverse events are associated with a PFO during spinal surgery?

Is our standard of care (SOC) accurately stratifying complication risk in these patients and is the risk amenable to a simple intervention?

Methods

After IRB approval, we gathered data from a survey sent to 350 pediatric anesthesiologists. We received 49 responses; 46 of whom completed the survey. 81% of respondents practice in surgical settings and 92% provide anesthesia for PSF. 63% had 10-years or more of experience with 88% finishing a fellowship in pediatric anesthesia.

Only 6% reported routinely ordering echocardiograms on surgery patients with idiopathic scoliosis vs. 35% in neuromuscular scoliosis patients who present for PSF surgery. Most respondents (61%) do not advise/require PFO closure prior to PSF. This is consistent with the fact most had not experienced a PSF surgery complication by air embolism (82%) or PAI (86%).

Discussion

Patients with PFO, present with a risk of paradoxical air embolism (PAI). This is where air crosses from venous to arterial circulation via the PFO. The sequelae of the movement of air from the right atrium to the left atrium and into the systemic circulation include stroke, myocardial infarction, splanchnic infarction, cardiovascular collapse, and death.

Our findings show that 35 % of anesthesiologists perform echocardiograms prior to PSF surgery for neuromuscular scoliosis; however, they were often deferred in patients with isolated idiopathic scoliosis. This is despite a 3.6% risk of undiagnosed heart disease in the studied population (4). Respondents answered that they would not routinely advise, or require, PFO closure prior to spinal fusion, even with a study suggesting PFO closure is appropriate prior to spinal fusion to aid in mitigating the risk of air embolism (5).

Of note, our cardiologists will recommend a known PFO closure prior to PSF.

Conclusion

We experienced a low response rate leading to an inconclusive study of the percentage of pediatric anesthesiologists who require PFO closure. Due to this limitation, we were also unable to make a statistically relevant description of the routine use of echocardiography prior to a patient undergoing spinal fusion surgery. It appears most institutions do not require PFO closure prior to spinal fusion. Given the risk of possible fatal events from PAI, this is an area that requires further research.

References