

Use of Esophageal Doppler Monitor in Prone-Positioned Patients



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Background

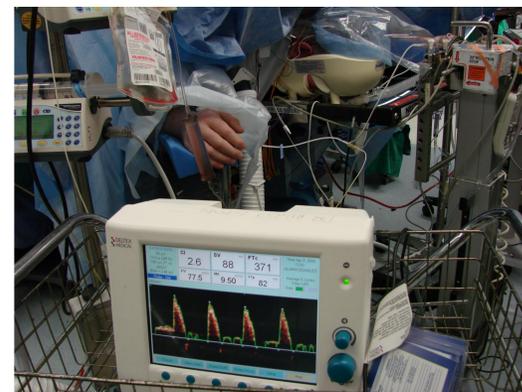
The prone position is associated with decreases in cardiac output and blood pressure. This occurs secondary to reductions in: venous return, ventricular volume, and cardiovascular compliance.¹ These negative hemodynamic effects are furthered exacerbated by general anesthesia² and are commonly seen in those patients with limited cardiac function who require careful fluid management during surgery.

Measurement of cardiac output and other hemodynamic parameters, in prone-positioned patients, has been routinely done with transesophageal echocardiography, central venous pressure, and pulmonary artery occlusion (Swan-Ganz) catheters. We describe the use of the esophageal Doppler monitor (EDM) with the ProneView® head support system.

Technical Challenge

Inserting a biplane TEE probe (outer diameter of 11.5mm) in a prone intubated patient imposes technical challenges to even experienced anesthesiologists. Careful blind manipulation of the probe is required in a narrow up-angulated oropharynx where an equally-sized endotracheal tube may be in the way.

Furthermore, the narrow space, between the reflecting mirror and the head/face support, complicates maneuvering the probe for optimum imaging. Furthermore, the tracheal tube can be easily displaced with probe manipulation. Prolonged compression, of the face and corner of the mouth from the probe, may lead to patient injury. Hydrostatic changes, induced during prone positioning, may also affect the accuracy of central venous³ and pulmonary artery occlusion catheters.⁴



Intervention

The EDM (Deltex) is a minimally-invasive device that measures aortic blood flow velocity, acceleration, and flow time. The EDM then calculates cardiac output, contractility, stroke volume, and total systemic vascular resistance.^{5,6,7,8} The probe has an outer diameter of 5.3 mm and resembles the size of an esophageal stethoscope. It can be easily placed and focused when the patient is initially supine and is then disconnected from the monitor during turning. After prone positioning is completed, the probe is then reconnected to the EDM and the ProneView head support allows access for subsequent focusing without compromising the position of the tracheal tube. The ProneView mirror also allows for continuous inspection of the patient's face and assessment of probe depth (Figure).

Conclusion

Use of the esophageal Doppler monitor, with the ProneView head support system, allows for minimally-invasive hemodynamic monitoring in the prone-positioned patient.

References

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