

Correspondence

Intraoperative transoesophageal echocardiography with a miniaturized probe during spinal anaesthesia

EDITOR:

Transoesophageal echocardiography (TOE) has become an established tool to monitor intraoperative cardiac performance in patients at risk of myocardial ischaemia or negative cardiac events [1]. It is commonly used in patients under general anaesthesia, but during spinal anaesthesia, the cardiac assessment by TOE is strongly limited by the size of the standard probes and the risk of jeopardizing airway patency. We describe a case in which a miniaturized TOE probe (Fig. 1) was inserted transnasally and used to monitor myocardial function and volume load in a patient during the induction of spinal anaesthesia followed by lower extremity surgery.

A 79-yr-old male patient was scheduled for amputation of his right leg for severe peripheral vascular disease. His medical history included chronic obstructive pulmonary disease (COPD), congestive heart failure and coronary artery disease. Preoperative medical work-up also revealed atrial fibrillation. A transthoracic echocardiogram demonstrated severe reduction of global left ventricular function as well as grade 3 mitral and tricuspid insufficiency. The estimated pulmonary artery pressure >60 mmHg.

Spinal anaesthesia was chosen because of the patient's impaired pulmonary function and in an attempt to reduce the risk of phantom limb pain. With informed patient consent, perioperative cardiac monitoring included TOE with a prototype, miniaturized echocardiography probe (Hewlett Packard, Andover, MA, USA), which was inserted via the transnasal route, as described before in awake and anaesthetized patients [2,3].

After routine premedication with midazolam 7.5 mg orally, the patient was transferred to the operating room holding area where he was connected to standard monitoring consisting of five-lead ECG, non-invasive blood pressure measurement and pulse oximetry. Crystalloid solution 500 mL was infused



Figure 1.

Comparison between the transnasal TOE probe and the standard 16-G nasogastric tube.

and topical anaesthesia of the nasal passage and pharynx was achieved with lidocaine 10% spray.

The miniaturized TOE probe was introduced through the right nostril and with gentle pressure was advanced into the pharynx. At this point, the patient was asked to swallow to facilitate probe passage into the oesophagus. The probe was secured in the transgastric short axis position at the level of the papillary muscles to monitor for regional wall motion abnormality and volume load. Throughout probe placement and initial TOE examination, which confirmed the preoperative study results, haemodynamic variables were unchanged and the patient tolerated the procedure very well.

The patient was then turned to a left lateral decubitus position and spinal anaesthesia was performed with a 25-G Sprotte needle using isobaric bupivacaine 3 mL 0.5%. Arterial pressure fell to a minimum of 90/40 mmHg during the next 5 min with anaesthesia reaching the level of T7. The echocardiogram showed reduction of the left ventricular end-diastolic area (LVEDA) from 25 to 20 cm², which was interpreted as relative hypovolaemia due to vascular dilatation from the spinal anaesthesia. With rapid infusion of crystalloid solution 500 mL, arterial pressure and LVEDA returned to baseline. No regional wall motion abnormalities were seen.

The patient was then returned to the supine position and surgery commenced. Throughout the operative procedure, volume management was guided by TOE using the transgastric short-axis view at the level of the papillary muscles. With a total blood loss of about 500 mL, the patient received additional crystalloids 500 mL and hydroxyethylstarch 6% 500 mL. Surgery was completed uneventfully and the TOE probe was removed before the patient was transferred to the post-anaesthesia care unit (PACU).

This case suggests that with miniaturization of echocardiography probes, advanced intraoperative cardiac monitoring can include TOE even during regional anaesthesia, without subjecting awake patients to additional stress or discomfort. Further studies should be performed to clarify indications of TOE in this patient population.

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