A brief overview of transesophageal echocardiography

Since the first report as an intraoperative monitor device of the left ventricular function in 1979, transesophageal echocardiography (TEE) has become an important diagnostic tool and a procedural adjunct in cardiac surgery. The indications and contraindications guidelines for perioperative TEE examination have been defined by the American Society of Anesthesiologists and the Society of Cardiovascular Anesthesiologists 1996 and updated 2010. According to these guidelines perioperative TEE should be used in adult patients undergoing cardiac and thoracic aorta open heart (e.g. Valve reconstruction/replacement) procedures, and should be considered in coronary artery bypass graft surgery. TEE is used to confirm and refine the diagnosis, to detect new or unsuspected pathologies, to adjust the anaesthetic and surgical plan, and to assess the result of the surgical intervention.

Intraoperative TEE for noncardiac surgery can provide accurate and reliable haemodynamic evaluation and improve goal-directed therapy. TEE should be used in patients with known or suspected cardiovascular pathology or in surgical procedures where severe haemodynamic, pulmonary or neurological compromise may occur, but merely for diagnosis and management of acute, persistent life-threatening disorders.

In critical care patients, TEE should be used when diagnostic information that is expected to alter management cannot be obtained by trans-thoracic echocardiography or other modalities in a timely manner.

Although, TEE is a low risk semi-invasive image modality, potential complications, ranging from mild dysphagia to life threatening esophageal perforation, have been published. In these case reports the presence of esophageal abnormalities has been suggested to be important predisposing factors. The benefits of performing a perioperative TEE examination have to be weighed against the potential risks.

Therefore, in order to ensure safe use of TEE and to its fullest potential, training and certification of the echocardiographer is of paramount importance. Instead of learning-by-doing we prefer the hands-on-supervised-teaching concept by board certified echocardiographers until the trainee can safely and consistently introduce the TEE probe and perform a TEE examination. Practice with a TEE simulator can be very helpful to trainees as they get more facile in obtaining the appropriate views and improve their skills.

The number of TEE examinations required to get board certified, as well as the examination modalities differ from country to country.

To achieve the maximum benefit for the patient it is recommended to perform a comprehensive TEE examination using 20 standard views that allow the detection and quantification of pathologies. Recently, a basic TEE examination has been proposed by the American Society of Echocardiography (ASE) together with the Society of Cardiovascular Anesthesiologists (SCA) that includes only 11 standard views. The authors emphasise that this basic TEE examination should be performed in an unstable surgical patient for monitoring purpose. For diagnostic purpose they recommend the comprehensive TEE examination. To visualise all important cardiac structures in detail 28 standard views were recently published by the ASE and SCA.

Ender J, MD; Sgouropoulou S, MD
Department of Anesthesiology and Intensive Care Medicine, Heartcenter, University Leipzig, Leipzig, Germany
Correspondence to: Joerg Ender, e-mail: joerg.ender@medizin.uni-leipzig.de
Keywords: transesophageal echocardiography, TEE

© SASA

The impact of perioperative TEE on change of the surgical plan differs in the literature between 4% up to more than 20% in cardiac surgery patients.15-18

Whereas two-dimensional TEE requires mental three dimensional reconstruction from the echocardiographer, the now available real time three dimensional transesophageal echocardiography (RT 3D TEE) for the first time allows three dimensional visualisation of cardiac structures.22,23

In summary, when expertly used in the operating room, the intensive care unit, and the emergency room, TEE is a reliable, rapid and cost-effective technique that can alter medical and surgical therapy and eventually improve outcome.

References
