Abstract

Background

Transesophageal echocardiography (TEE) probe insertion, although frequently considered routine, remains technically challenging in up to 30% of anesthetized patients and carries a risk of clinically significant pharyngoesophageal trauma. Strategies to improve first-pass success and reduce procedure-related injury remain inadequately standardized.

Methods

We conducted a systematic review of MEDLINE (via PubMed), EMBASE, Scopus, and CENTRAL from database inception through July 2024 in accordance with PRISMA 2020 guidelines. The protocol was prospectively registered in PROSPERO (CRD42024555505). Adult studies comparing videolaryngoscopy (VL)-guided TEE insertion with non-VL techniques (blind insertion, digital guidance, or direct laryngoscopy) were included. Primary outcomes were first-attempt success rate and the incidence of oral, pharyngolaryngeal, tracheal, or esophageal injury.

Results

Eighteen studies, including nine randomized controlled trials, met inclusion criteria. First-attempt success rates with VL ranged from 90% to 100%, compared with 43.9% to 77.6% using conventional techniques, with a statistically significant difference favoring videolaryngoscopy in most trials. Overall insertion time was generally comparable between groups, although time to successful insertion at the first attempt was occasionally longer. VL use was consistently associated with a significant reduction in pharyngolaryngeal injury and blood staining of the TEE probe.

Conclusions

Videolaryngoscopy is associated with higher first-pass success rates and lower rates of upper airway trauma during TEE probe insertion. These findings support consideration of videolaryngoscopy when available, particularly in patients at increased risk of difficult insertion.

Keywords

Echocardiography, Transesophageal ; Laryngoscopy ; Systematic Review ; Iatrogenic Disease