

Pediatric Cardiac Anesthesiologist as Perioperative Transesophageal Echocardiographer

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From the first use of esophageal ultrasound in 1971, transesophageal echocardiography (TEE) has become a critically important cardiovascular imaging modality. Perioperative transesophageal echocardiography (PTE) is now the standard of care in the treatment of patients with congenital heart disease. It has the potential of dramatically influencing the perioperative management in these patients. The American College of Anesthesiologist and the Society for Cardiovascular Anesthesiologist (SCA) jointly published PTE guidelines in 1996; the SCA and the American Society of Echocardiography (ASE) have published several updates to the guidelines since then, with the latest in 2013.^{1,2} As PTE is an invasive medical procedure which carries rare but potentially life-threatening complications, it should be performed by a skilled echocardiographer having a thorough understanding of the anatomy and the physiology of various cardiac defects.

In this issue, Abhi Misra et al have studied the impact of PTE in pediatric population undergoing cardiac surgery.³ What adds to the importance of this study, is the elaborate cost effective analysis, which gains importance in a resource poor country like ours. Not unexpectedly, perioperative echocardiography documented new findings in 24 patients (6.8%) and led to a change in the surgical plan in 20 patients. This was contributed by both transthoracic echocardiography (TTE) and TEE. A closer look at the results show that perioperative TTE diagnosed 2 patients of tetralogy of fallot (TOF) who were due intracardiac repair (ICR), with small pulmonary arteries.

Similarly, PTE diagnosed two TOF patients due for ICR, as having hypoplastic left ventricle. This is important as ICR in these patients would have been catastrophic. Also, some patients preoperatively diagnosed with shunt lesions associated with coarctation of aorta (COA) were found to have no significant gradient across COA and were managed with closure of shunt lesions alone. These patients could have been managed with transcatheter device closure and surgery could have been avoided in the first place. Even if the above mentioned factors are taken into account in the cost effectiveness analysis, the final result would still be in the favor of benefit as is observed in the present study. The benefits of PTE go far beyond the cost effectiveness and the perioperative monitoring that it provides to the surgeons and anesthesiologists is indispensable. It also acts as a good diagnostic modality to check, on table, for the adequacy of the surgical results. In the present study, 29 patients (8.4%) showed residual lesions and 19 of these patients required a rerun cardiopulmonary bypass. Correction of these lesions at the same time avoids a repeat future procedure in those with hemodynamically significant residual lesions. As far as safety issue is concerned, the study reported a PTE related complication rate of 2.5% without any fatality. This shows that the procedure is quite safe when performed by experienced echocardiographers and the benefits far outweigh the risks.

In the current article, the surgical decision was changed based on transthoracic echo in operating theater (smaller pulmonary artery in tetralogy of Fallot and coarctation of aorta diagnosis) before surgery was started. These points need to be emphasized and better way of improving in future would be close collaboration of cardiac surgeon, pediatric cardiologist and cardiac anesthetist as team in the form of presurgical conference.

In the same issue, Manchula Navaratham et al have given a comprehensive PTE assessment in patients of congenital heart disease undergoing surgical repair.⁴ With the availability of smaller probes, user friendly software and extended postoperative monitoring, outcomes of cardiac repair in pediatric population is improving. The SCA and ASE have described 20 views for performing complete multiplane PTE examination and 11 relevant views for a basic PTE evaluation.² In the absence of dedicated PTE guidelines for pediatric congenital heart disease patients, the guidelines for adults are extrapolated for use in this patient subset. Tracy et al have elucidated views particularly useful in various types of intracardiac defects in addition to the standard transesophageal and transgastric views, which are practically more useful.

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With the advent of newer pediatric three dimensional TEE probes, the quest for improved PTE monitoring and better patient outcomes continues. From the time when the role of anesthesiologists as the performer of PTE was debated, we have come a long way. With adequate training, practice and quality assessment, pediatric cardiac anesthesiologists have now breached the barrier, once considered the domain of only the pediatric cardiologists.

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