Experience of Transesophageal Echocardiography in the Central Referral Hospital in Nepal

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ABSTRACT

INTRODUCTION: In 1976, Frazin and colleagues first attached a single crystal M-mode ultrasound transducer to the tip of a cable for esophageal imaging. Since that time, improvements in ultrasound technology coupled with miniaturization of transducers and the development of soft flexible tubing have led to a virtual exponential growth in the use of transesophageal echocardiography (TEE).

METHODE: A retrospective study that was conducted in the department of cardiology of NAMS, Bir Hospital, Kathmandu. Transesophageal echocardiography (TEE) was done from April 2008 to March 2010. The procedure was explained to the patient, and an informed consent was obtained from the subjects. All data were analyzed by using statistical package for social science (SPSS) version 10 for windows.

RESULTS: A total of 51 patients were included in the study. Among the 51 patients 29 (56.8%) were female and 22 (43.2%) were male. Mean age was 38 ± 15.1 (range 12-77 years). Atrial septal defect were 25 (49.0%), Normal were 11 (21.6%), Left atrial clot were 4 (7.8%), Constrictive Pericarditis were 4 (7.8%), Right atrial Myxoma were 3 (5.9%), Prosthetic valve were 2 (3.9%), Pericardial cyst was 1 (2.0%), and Vegetation was seen in 1 case (2%). In this study most common problems were nausea and vomiting in 22 cases (43.1%) during procedure. Sore throat was in 3 cases (5.8%) after the procedure. Ventricular premature contractions were seen in 1 case (1.9%).

CONCLUSION: TEE is a safe outpatient procedure. Viscous two percent Lidocaine topical anesthesia was adequate for the procedure. Common indication for TEE was to confirm Atrial septal defect and Left atrial clot.

KEY WORDS: Transesophageal echocardiography, Transthoracic echocardiography

INTRODUCTION

In 1976, Frazin and colleagues first attached a single crystal M-mode ultrasound transducer to the tip of a cable for esophageal imaging. Since that time, improvements in ultrasound technology coupled with miniaturization of transducers and the development of soft flexible tubing have led to a virtual exponential growth in the use of transesophageal echocardiography (TEE). Multiplane transducer technology is the latest innovation in the rapidly changing field of TEE. Multiplane transducers consist of a single array of crystals that is electronically or mechanically rotated about the long axis of the sound beam in a 180°arc, producing a circular continuum of tomographic, two-dimensional transverse and longitudinal images. The primary advantage of multiplane technology is the ease with which an uninterrupted series of adjacent images can be obtained with minimal needs for repositioning of the probe tip. Thus, after nearly a decade of multicenter experience and rapidly advancing probe technology, TEE has truly become a major part of the diagnostic and “therapeutic” armamentarium of the cardiologist.

METHODE

A retrospective study that was conducted in the department of cardiology of NAMS, Bir Hospital, Kathmandu. TEE was done from April 2008 to March 2010. All patients with proper indications were...
subjected to TEE. Instrument used was Toshiba xario (PST 50 AT, 5 MHZ). The procedure was explained to the patient, and an informed consent was obtained from the subjects. All data were analyzed by using statistical package for social science (SPSS) version 10 for windows.

Indications

1. As an adjunct to transthoracic echocardiography (TTE) when the quality of the latter is unsatisfactory (i.e., large patient size, presence of a prosthetic valve, thoracic deformities, etc.)
2. When the transthoracic window to the heart is impeded or unobtainable (i.e. in the operating room, catheterization laboratory, intensive care unit, etc.)
3. For intraoperative evaluation, particularly when significant residual cardiac abnormalities (i.e. outflow tract obstruction, valve regurgitation or stenosis, intracardiac communication) are anticipated or suspected.
4. For intraoperative monitoring of ventricular function in patients with congenital heart disease undergoing noncardiac surgery.
5. For guidance of interventional procedures during cardiac catheterization (i.e. balloon interventions, placement of transcatheter devices, radiofrequency ablation, etc.)
6. When vegetations or masses (which are poorly-imaged from transthoracic windows) are suspected to be present.

Contraindications

TEE is an invasive procedure; thus, when the risk to patient health outweighs the benefit of the procedure, a contraindication (relative or absolute) exits. Absolute contraindications include:
1. Esophageal obstruction or stricture
2. Active gastrointestinal bleeding
3. Perforated viscus
4. Unrepaired tracheoesophageal fistula
5. Severe respiratory decompensation
6. Inadequate control of the airway

Relative contraindications include:
1. Esophageal varices
2. Esophageal diverticulum
3. Cervical spine injury or deformity
4. Oropharyngeal distortion or deformity

Preparation:

A careful history was obtained before performing the transesophageal echocardiographic examination. In addition to a thorough cardiovascular history, specific questions was asked regarding past esophageal injury or surgery, swallowing difficulty, gastrointestinal bleeding, medications (e.g., aspirin), and allergies to medications (e.g. lidocaine). To minimize the risk of aspiration during the procedure the patient had nothing by mouth for at least four hours and preferably six to eight hours before the procedure. Topical anesthesia of lidocaine viscous gargle was routinely used during the procedure. The patient was advised not to take anything by mouth for 30 to 60 minutes after the procedure. The incidence of bacteremia (4% to 8%) and the risk of endocarditis with upper endoscopy are considered negligible in most published reports. In the recent recommendations of the American heart Association, "Endoscopy with or without gastrointestinal biopsy is considered a low risk procedure in which endocarditic prophylaxis (is) not recommended."

Results

A total of 51 patients were included in the study. Among the 51 patients 29 (56.8%) were female and 22 (43.2%) were male. Mean age was 38 ± 15.1 (range 12-77 years) and majority of them were atrial septal defect patients (Table – 1)

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial septal defect (ASD)</td>
<td>25</td>
<td>49.0</td>
</tr>
<tr>
<td>Constrictive Pericarditis (CP)</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>Left atrial clot (LA clot)</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>Normal</td>
<td>11</td>
<td>21.6</td>
</tr>
<tr>
<td>Pericardial cyst</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Prosthetic valve</td>
<td>2</td>
<td>3.9</td>
</tr>
<tr>
<td>Right atrial Myxoma (RA myxoma)</td>
<td>3</td>
<td>5.9</td>
</tr>
<tr>
<td>Vegetation</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>100</td>
</tr>
</tbody>
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Transesophageal Echocardiographic assessment of heart diseases
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DISCUSSION

In general TEE is performed there is a clinical question for which the information obtained by TTE is insufficient. This way be to better define pathology that has been identified by TTE or to obtain better Images when transthoracic images are inadequate. The close position of the esophagus to the heart allows for improved visualization of many cardiac structures, particularly those that are posteriorly located. In reported series, the incidence of major and minor complications is 2% to 3% with most being minor complications. Major complications (death, esophageal perforation, significant arrhythmias, congestive heart failure, and aspiration) occur with a frequency of 0.3%, with a reported mortality of less than 0.01%. Reported minor complications include transient hypotension, hypertension (particularly with agitation), hypoxia, and arrhythmias (such as sustained ventricular tachycardia, nonsustained ventricular tachycardia, and transient atrioventricular block). Methemoglobinemia has been rarely reported due to the anesthetic spray and should be considered if cyanosis occurs. In this study most common problems were nausea and vomiting in 22 cases (43.1%) during procedure. Sore throat was in 3 cases (5.8%) after the procedure. Ventricular premature contractions were seen in 1 case (1.9%). The improved resolution and anatomic detail provided by TEE, as compared with TTE is what makes it such a powerful diagnostic tool. However, this can also lead to misinterpretation of normal structures, Trabeculations in the atrial appendage can be mistaken for thrombi, and lipomatous hypertrophy of the intertribal septum be incorrectly labeled as a mass, as can the Eustachian valve. The transverse and oblique sinuses can be mistaken for abscess cavities. These pitfalls are best minimized by the experience of the operator, but variations in anatomy may provide diagnostic dilemmas for even the most skilled echocardiographer.

CONCLUSION

TEE is a safe outpatient procedure. Viscous two Percent lidocaine topical anesthesia was adequate for the Procedure. Common indication for TEE was to confirm ASD and LA clot. Complications of TEE was very few.

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REFERENCES