



Use of multi-imaging modalities in detection of false passage of TEE probe

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Intraoperative transesophageal echocardiography (TEE) is an invaluable tool for the management of cardiac surgical procedures. It allows evaluation of myocardial function, valvular pathology, atheromatous disease, dissection of the aorta, and estimation of pulmonary artery pressure. Despite its relative safety, TEE has a reported estimated risk of 0.18%. Esophageal injury is the major risk associated with TEE placement. This is a case report of a patient who sustained a contained esophageal dissection during insertion of a TEE probe prior to minimally invasive mitral valve repair. It is also a demonstration of use of the multi-imaging modalities used to evaluate and manage patients until full recovery. © 2007 Elsevier Inc. All rights reserved.

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This is a case report of a patient who sustained a contained esophageal dissection during insertion of a TEE probe prior to minimally invasive mitral valve repair.

Case report

An 84-year-old, 88-kg Caucasian male presented for a minimally invasive mitral valve repair. Past medical history consisted of hypertension, Type 2 diabetes mellitus, hyperlip-

idemia, temporal arteritis treated with steroids, and gastroesophageal reflux disease (GERD). Symptoms on admission included recent onset of fatigue, dyspnea on exertion, and substernal pain associated with nausea, vomiting, and diarrhea. Serial troponins and EKG were negative for myocardial infarction. Cardiac catheterization revealed severe mitral regurgitation with mild coronary artery disease (30% LAD lesion). Transthoracic echocardiogram revealed an ejection fraction of 65% to 70%, moderate to severe mitral regurgitation with an eccentric regurgitant jet directed anteriorly, and 1-2+ plus aortic insufficiency.

Prior to induction, conventional monitors and a radial arterial line were inserted under local anesthesia and midazolam sedation. Anesthesia was induced with titrated doses of etomidate, sufentanil, and cisatracurium. The trachea was intubated with a 37-French endobronchial tube to facilitate single lung ventilation during the right thoracotomy. An 18-French orogastric tube was passed to empty the stomach with no difficulty. Several attempts at inserting a well-lubricated Acuson TE-V5Ms, Siemens TEE probe (17-mm tip diameter nominal fit) failed, but finally the probe passed the upper esophageal sphincter without resistance. Resistance was then encountered a few centimeters more distally.

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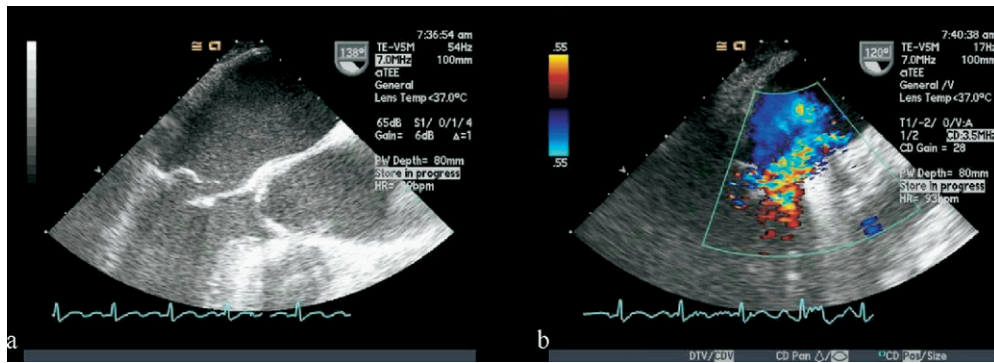


Figure 1 Images of transesophageal echocardiograms, plain (a, left) and with color flow (b, right), recoded from the false lumen showing prolapsed posterior leaflet of the mitral valve.

Advancement of the probe was immediately stopped. Due to the high index of suspicion for esophageal injury, a thoracic surgeon was emergently consulted in the operating room. Hemodynamics and lung compliances remained stable. Without further probe advancement or manipulation, a series of TEE video clips were obtained, as illustrated in [Figure 1](#). Due to the TEE mid-esophageal location, six multiplane image clips viewing the mitral valve were recorded.

While the patient still anesthetized, the TEE probe was withdrawn. Blood had soiled the probe without measurable hemorrhage. Diagnostic upper endoscopy was performed with the use of a Pentax 27-French adult fiberoptic endoscope. A false passage was detected fiberoptically just adjacent to the upper esophageal sphincter, which involved a dissection of the esophageal mucosa, but without perforation of the esophageal musculature. The false channel beneath the mucosa started at 16 cm and ended at 20 cm as determined with the adult scope. Circular muscle fibers of the esophagus were visualized beginning from the start of the false lumen at 16 cm. Using a smaller Pentax 18-French pediatric endoscope, the cricopharyngeal area and upper esophageal sphincter were visualized ([Figure 2](#)). However, the scope would not pass through the esophagus without

resistance, and further attempts were terminated. The surgery was cancelled and the patient was allowed to recover in the ICU. When the patient was fully awake, a barium swallow video esophagogram with contrast was conducted to evaluate the tear and rule out frank perforation. This study showed a contained esophageal dissection with barium trapped in the false lumen ([Figure 3](#)). There was no evidence of extravasation into the mediastinum or pleural spaces.

The patient was kept NPO, and antibiotics were instituted prophylactically to prevent mediastinitis. He remained hemodynamically stable, afebrile, and with normal lab values. Repeat video esophagograms on post-injury day 6 and post-injury day 30 ([Figure 4](#)) showed a closed redundant lumen, and contrast was no longer entering the dissection. After tolerating a clear-liquid and ultimately a full-liquid diet without pain, dysphagia, nausea, or vomiting, the patient was discharged on post-anesthesia day 8.

Prior to surgery, there was no knowledge of a history of dysphagia. Post-operatively in the ICU, the patient's wife revealed that the patient would occasionally choke on meat.

Two months later, the patient underwent minimally invasive mitral valve P2 resection (quadrangular resection) with insertion of a 29-mm Duran annuloplasty ring. A TEE

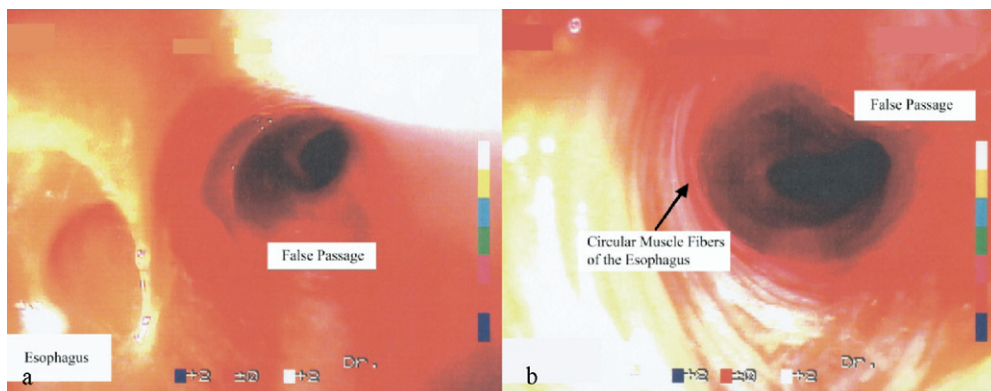


Figure 2 Images taken during esophageal endoscopy as seen from the hypopharynx. (a, left) Images of the upper esophageal sphincter and the intra-esophageal false passage. (b, right) Close-up view of the false passage showing the circular muscle fibers of the esophagus.

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