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Case Report

Another Cause for Mallory Weiss Tear - Transesophageal Echo during CABG

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ABSTRACT

Transesophageal echocardiogram (TEE) is a valuable diagnostic tool commonly used during surgical procedures to assess cardiac structures. Although generally safe, rare complications like esophageal bleeding (0.14% incidence) can occur. Here, we present a unique case of a Mallory-Weiss tear (MWT) secondary to intraoperative TEE in a patient undergoing coronary artery bypass grafting (CABG). MWTs are non-perforating mucosal tears often caused by sudden increases in intra-abdominal pressure; iatrogenic factors such as TEE can also contribute. Proposed mechanisms of TEE-related esophageal injury include prolonged contact between the esophagus and probe and the extended duration of a flexed probe during continuous LV function monitoring as well as fibrinolytic therapy immediately following a TEE, which may be associated with an increased risk of bleeding. Cautious probe insertion and pre-procedural evaluation can mitigate such risks. While most MWTs self-resolve, this case required endoscopic clips for bleeding cessation, highlighting the need for prompt recognition and intervention.

Keywords: Transesophageal echocardiogram; Mallory-Weiss tear; Fibrinolytic therapy; Esophageal

Introduction

Transesophageal echocardiography (TEE) is commonly used in cardiothoracic surgery to provide a clear, unobstructed view of cardiac structures and anatomy, thereby enhancing diagnostic accuracy compared to conventional transthoracic echocardiography[1]. Despite its generally safe reputation, TEE complications are rare, occurring with an incidence of 0.18%1. Complications may include bleeding, hematoma, lacerations, perforations, odynophagia/dysphagia, vocal cord paralysis, and dental injuries[2]. A potentially serious complication associated with TEE is esophageal bleeding, particularly due to the use of anticoagulants during coronary artery bypass grafting (CABG)[3]. Upper gastrointestinal bleeding during intraoperative TEE in cardiac surgery is also infrequent, reported at an incidence of

0.14%[2]. Here, we present a rare case of a Mallory-Weiss tear secondary to intraoperative TEE in a patient undergoing CABG.

Case Presentation

A 72-year-old female with a medical history of hypertension, hyperlipidemia, asthma, and osteoarthritis presented with presyncope accompanied by fatigue, malaise, worsening shortness of breath, dyspnea on exertion, orthopnea, and paroxysmal nocturnal dyspnea. She had recently been seen at urgent care where a diagnosis of viral upper respiratory tract infection was made and treated symptomatically after ruling out COVID-19, influenza, and RSV, but her symptoms persisted. On admission, she was afebrile and hemodynamically stable. Chest X-ray revealed pulmonary edema, and EKG showed left bundle branch block (LBBB) of unknown chronicity. Laboratory findings were notable for elevated N-terminal pro-B-type natriuretic peptide (NTproBNP) levels (1,500 pg/ml), mildly elevated troponin (0.049), and hemoglobin (Hgb) of 8.9 g/dl, with an otherwise unremarkable profile. Physical examination revealed bilateral pitting edema, raising concern for acute decompensated heart failure, prompting initiation of intravenous diuresis.

Transthoracic echocardiogram (TTE) demonstrated severely reduced systolic function with a visually estimated ejection fraction (EF) of 10-15%, alongside diastolic dysfunction. Subsequent right and left heart catheterization revealed multivessel coronary artery disease (CAD) involving severe disease in the mid left anterior descending artery (mLAD), severe disease in the second obtuse marginal artery (oD2), moderate to severe disease in the second obtuse marginal artery (OM2), and severe disease in the right coronary artery (oRCA), with normal filling pressures. Low-dose aspirin was initiated for CAD management. Due to the extent of CAD, cardiothoracic surgery (CTS) was consulted, leading to coronary artery bypass grafting (CABG) followed by intraoperative transesophageal echocardiogram (TEE) which indicated dilated and severely depressed left ventricular (LV) function, EF of 5-10%, and grade 2 diastolic dysfunction. Post-CABG, the patient's EF improved to 20-25% following initiation of low-dose norepinephrine and milrinone.

In the postoperative period, the patient was transferred to the intensive care unit (ICU) where she developed worsening lactic acidosis. Concerns arose due to bloody output from an orogastric tube, a sudden drop in hemoglobin levels from 10.4 g/dl to 7.1 g/dl, and increased vasopressor requirements. The gastroenterology team was consulted for an emergent endoscopic evaluation to investigate upper gastrointestinal bleeding. Esophagogastroduodenoscopy (EGD) revealed a linear mucosal ulcer at the gastroesophageal (GE) junction on the cardia aspect along the lesser curve with signs of bleeding (large blood clots, partially cleared), suggestive of a Mallory-Weiss tear secondary to recent TEE. The tear was managed with the deployment of three clips during the endoscopic intervention, after which there were no further bleeding episodes **(Figure 1)**. The patient was successfully weaned off vasopressor support and remained hemodynamically stable thereafter.

Discussion

Transesophageal echocardiography (TEE) has become increasingly utilized for its superior anatomical visualization and assessment of left ventricular (LV) function[2]. However, the complex maneuvering and prolonged probe manipulation during TEE increase the risk of gastrointestinal (GI) adverse events, including Mallory-Weiss (MW) tears.

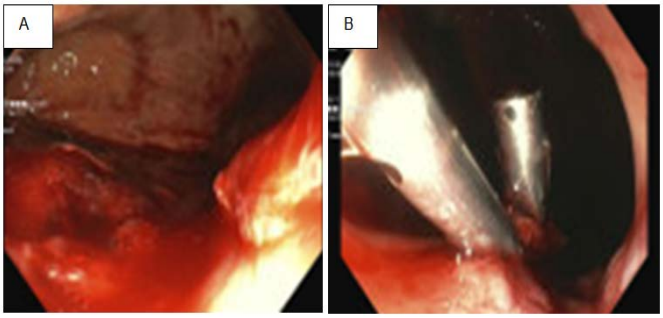

Figure 1A: Mallory-Weiss tear. Red blood in the gastric fundus. **1B:** Clips were placed. Clip manufacturer: Boston Scientific.

MW syndrome involves non-perforating submucosal tears at the gastroesophageal junction, leading to upper gastrointestinal bleeding. The primary mechanism is a sudden increase in intragastric and intra-abdominal pressure[4]. Risk factors include retching, vomiting, hiccups, blunt abdominal or chest trauma, coughing, presence of hiatal hernia, alcohol use, and iatrogenic causes such as TEE[4].

In a retrospective study of 1,074 cardiac surgical cases involving intraoperative TEE, 111 patients (1.4%) experienced possible complications, including GI bleeding, lacerations, and perforations[2]. The overall complication rate was 0.51%, with esophageal tears occurring at a rate of 0.05%2. Specifically, patients undergoing cardiac procedures showed a 0.67% intraoperative complication rate and 1.1% during hospitalization, with esophageal perforation being the most severe at 0.01%[2].

Esophageal injuries from TEE predominantly occur in the abdominal region, followed by the intrathoracic and cervical segments, and can result from various mechanical and patient-related factors[5]. Proposed mechanisms include prolonged contact of the esophagus with the TEE probe and prolonged use of a flexed probe during continuous LV function monitoring[3]. Risk of esophageal injuries is higher in patients with pre-existing conditions such as esophagitis, varices, malignancy or stenosis1. Medications that affect the integrity of the esophageal mucosa such as steroids or bisphosphonates may also make a patient more at risk of injury[6].

In a single center study experience of 10,000 consecutive TEE looking at esophageal trauma. Patients in the study had certain similar risk factors notably age > 70, difficult intubation, perforations near the hypopharynx and cervical region[6].

Symptoms of esophageal perforation post-TEE include dyspnea, hemoptysis, cough, and odynophagia, and diagnosis is confirmed through endoscopic visualization[7,8]. Many times, these tears go unvisualized due to quick healing depending on the degree of the tear[7]. Recommendations to mitigate risk include careful probe insertion and consideration of pre-procedural esophageal evaluation in high-risk patients[1]. The management of MW tears typically involves conservative measures initially, with endoscopic interventions reserved for cases of persistent bleeding[4]. Initial management focuses on maintaining hemodynamic stability. Most MW-associated bleeding episodes are self-resolving, and management includes NPO status until bleeding ceases, antiemetic therapy to control vomiting, withholding medications that exacerbate

bleeding, and consideration of proton pump inhibitors (PPIs) for acid suppression depending on bleeding severity. Serial monitoring of hemoglobin and hematocrit levels is essential. Endoscopic treatment options include epinephrine injection, electrocoagulation, hemoclip application, or band ligation. If these measures fail, angiographic transarterial embolization may be considered[4].

Recommendations for safe intraoperative TEE include avoiding forceful introducer insertion and ensuring that patients with suspected esophageal disease undergo esophagogastroduodenoscopy (EGD) or barium radiography before TEE. In cases of coronary artery bypass grafting (CABG), fibrinolytic therapy immediately following TEE may increase bleeding risk, as observed in our patient[1].

Conclusion

Mallory-Weiss tears secondary to TEE are rare but should be considered in patients requiring hemodynamic support post-TEE with hematemesis or bloody nasogastric/orogastric output. While most MW tears resolve spontaneously, our patient required endoscopic clipping to achieve hemostasis. Hence, maintaining a high index of suspicion for MW tears post-TEE is crucial, balanced with the need for vigilant hemodynamic support following surgery.

Disclosures

The authors have nothing to disclose.

Conflicts of Interest/Financial Support: There were no competing conflicts of interest including financial, consultant, institutional or otherwise. In addition, no funding was involved in the completion of this case report.

Declaration: We declare this case report is original, has not been published before and is not currently being considered for publication elsewhere. The case has been submitted to the 2024 annual ACG meeting. Informed patient consent was NOT obtained for case publication due to multiple attempts to reach out to patient. All identifiers have been removed.

References

1. Daniel WG, Erbel R, Kasper W, et al. Safety of transesophageal echocardiography. A multicenter survey of 10,419 examinations. Circulation 1991;83(3):817-821.
2. Gangwani MK, Aziz A, Dahiya DS, et al. Transesophageal echocardiography-associated gastrointestinal injuries: systematic review and pooled rates of gastrointestinal injuries. Proc (Bayl Univ Med Cent) 2023;36(6):729-733.
3. De Vries AJ, van der Maaten JM, Laurens RR. Mallory-Weiss tear following cardiac surgery: transoesophageal echoprobe or nasogastric tube? Br J Anaesth 2000;84(5):646-649.
4. Rich K. Overview of Mallory-Weiss syndrome. J Vasc Nurs 2018;36(2):91-93.
5. Mathur SK, Singh P. Transoesophageal echocardiography related complications. Indian J Anaesth 2009;53(5):567-574.
6. Min JK, Spencer KT, Furlong KT, et al. Clinical features of complications from transesophageal echocardiography: a single-center case series of 10,000 consecutive examinations. J Am Soc Echocardiogr 2005;18(9):925-929.
7. Søreide JA, Viste A. Esophageal perforation: diagnostic work-up and clinical decision-making in the first 24 hours. Scand J Trauma Resusc Emerg Med 2011;19:66.
8. Carr JC. The Mallory-Weiss Syndrome. Clin Radiol 1973;24(1):107-112.