Importance of Transesophageal Echocardiography for Stroke Prevention in Patients Undergoing Coronary Artery Bypass Graft Surgery

INDIANA UNIVERSITY
SCHOOL OF MEDICINE

Anthony Moseman, BA, Indiana University School of Medicine, Alec Raniwsky, MD, Indiana University School of Medicine

ABSTRACT

Background: Transesophageal echocardiography (TEE) has become routine during cardiovascular and thoracic anesthesia. It plays a key role in surgical planning and provides vital hemodynamic information intraoperatively.
Case Presentation: A 61-year-old female undergoing coronary artery bypass graft (CABG) surgery, in which an intraoperative TEE was performed. Subsequently, a left atrial appendage thrombus was discovered. The case was postponed , allowing for adequate anticoagulation. Successful CABG was performed after outpatient TEE determined the resolution of the left atrial appendage thrombus.
Conclusions: The use of TEE intraoperatively stresses the importance of stroke prevention in patients undergoing high-risk surgeries.

Case Presentation

-61-year-old female with PMH of hyperlipidemia and multivessel coronary artery disease (CAD) presented for elective CABG. The patient had a strong family history of CAD and atrial fibrillation

-Patient was brought to operating room where they underwent induction of general anesthesia with endotracheal intubation. TEE was performed, while obtaining imaging in the mid-esophageal two-chamber view, a thrombus in the left atrial appendage (LAA) was noted (Figure 1).

-The surgery was subsequently canceled, and the patient was discharged home on daily apixaban. After 6 weeks of anticoagulation, the patient underwent outpatient TEE that revealed resolution of the LAA thrombus. The patient proceeded with elective CABG and was discharged home with an uneventful postoperative course.

Figure 1

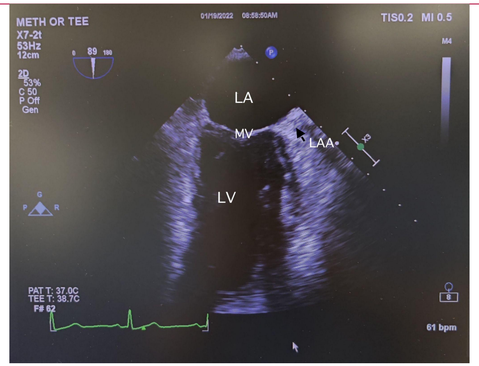

Figure 1. Mid esophageal two-chamber view on TEE, left atrial appendage (LAA) thrombus (Arrow). Left Atrium (LA), Left Ventricle (LV), Mitral Valve (MV)

Figure 2

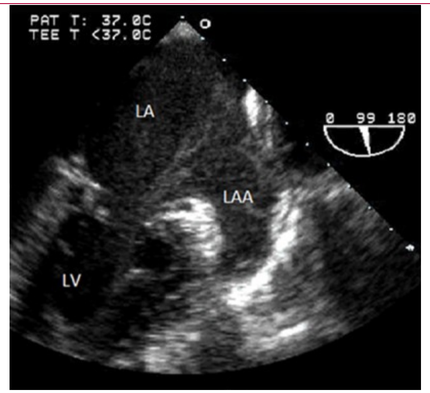

Figure 2. Mid esophageal two-chamber view on TEE, left atrial appendage (LAA), Left Atrium (LA), Left Ventricle (LV)

Figure 3

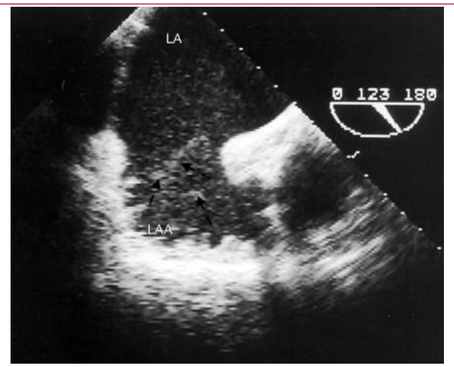

Figure 3.Left atrial appendage (LAA), Left Atrium (LA), Spontaneous Echo Contrast (Arrows)

Figure 4

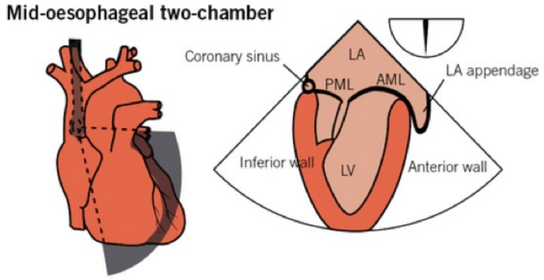

Figure 4. Diagram of Mid-esphageal two-chamber view, Left Atrium (LA), Left Ventricle (LV), PML (Posterior Mitral Leaflet), Anterior Mitral Leaflet (AML) [5].

DISCUSSION

-Risk of perioperative stroke has been reported up to 10% in patients undergoing high risk brain surgery or cardiac surgery (such as CABG) [2]. Perioperative stroke leads to increased morbidity and mortality, with perioperative complications of CABG's having an estimated cost of $2 billion annually [2].

-The LAA is a small pyramidal structure situated on the lateral aspect of the left atrium between the pulmonary artery above and the left ventricle below (Figure 2) [1]. This is the most prominent site of thrombus formation with more than 90% of thrombi generated within this structure [3].

-The LAA is best visualized with two standard mid-esophageal views; the short axis aortic valve (30-60 degrees) and the two chamber view (80-100 degrees) (Figure 4).

-TEE can also detect LAA spontaneous echo contrast (SEC); a smoke like swirling pattern soon on 2D imaging that can reflect rouleaux formation resulting from blood stasis and thus thrombus formation (Figure 3). Presence of SEC in the LAA has been associated with higher risk of thromboembolism and cerebrovascular accident [4].

CONCLUSIONS

Identification of pathology on TEE can change operative planning and decrease adverse patient outcomes, including stroke. Applications for TEE in perioperative settings are expanding and more research is needed to fully understand the value of TEE in perioperative stroke prevention.

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