

## IMAGING VIGNETTE

## INTERMEDIATE

## CLINICAL VIGNETTE

# Intracardiac Echocardiography-Guided Biopsy of a Left Ventricular Mass



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## ABSTRACT

Intracardiac echocardiography (ICE) has been used to guide percutaneous biopsies of atrial masses. However, the use of ICE to direct left ventricular mass sampling has not been described. This clinical vignette illustrates the role of ICE-guided left ventricular biopsy in establishing a definitive diagnosis after a failed computed tomography-guided lung mass biopsy. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2019;1:424-5) © 2019 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Intracardiac echocardiography (ICE) has evolved into a key imaging modality to guide various cardiac procedures (1). The use of ICE allows the elimination of general anesthesia, the ability to detect neurological events in real time, and higher-definition imaging of intracardiac anatomy given the proximity of the probe to the imaged structure. ICE has also been used to guide atrial mass biopsies (2). However, the use of ICE to direct biopsy of left ventricular (LV) masses has not been reported.

A 53-year-old smoker with obstructive lung disease presented with weight loss and hemoptysis. His computed tomography images showed a left upper lobe lung mass (7 × 7 cm) and a possible LV mass or thrombus. His echocardiogram demonstrated normal biventricular function. Given the uncertainty about the nature of the LV mass and the risk of embolization during sampling, computed tomography-guided biopsy of the lung mass was performed first. Unfortunately, the sampled tissues revealed necrotic tissue and were deemed nondiagnostic. Hence, an LV mass biopsy was planned. Magnetic resonance imaging showed a 4 × 6 cm mass infiltrating the inferolateral LV wall with mixed texture (tissue or thrombus) (Figures 1A to 1C, Video 1). Because of the desire to avoid general anesthesia given the patient's lung function, as well as the risk of cerebral embolization (hence the need for prompt recognition), ICE was chosen to guide the procedure. During the procedure, the left carotid artery was found to be occluded. Therefore, unilateral protection was achieved with the proximal filter of the Sentinel device (Boston Scientific, Marlborough, Massachusetts) (Figure 1D, Video 2). A ViewFlex ICE catheter (Abbott, Little Canada, Minnesota) was advanced through a 10-F sheath into the right ventricle (Figure 1E). An 8-F Judkins right 4 (JR-4) guide was advanced to the left ventricle over a 0.035-inch wire through a femoral arterial sheath. Under ICE guidance, 7 samples were obtained with 5.2-F Cook Flexible Biopsy Forceps (Cook, Bloomington, Indiana) (Figure 1F, Video 3). Of those samples, 5 were

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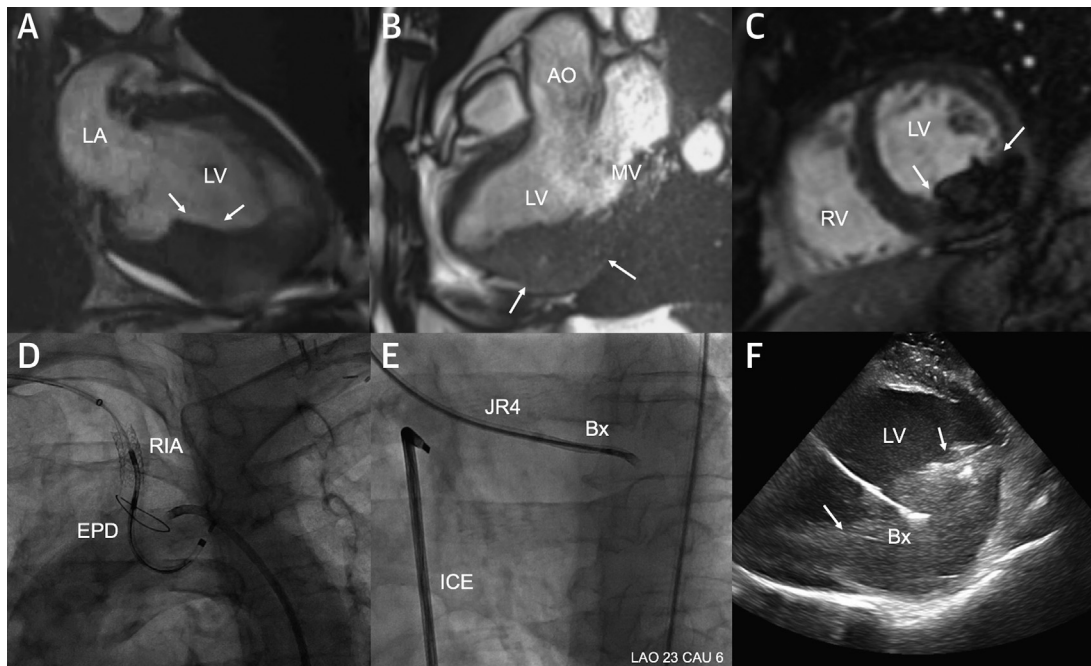
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mixtures of necrotic myocardium and thrombus, and 2 were diagnostic for metastatic squamous cell carcinoma. No complications occurred, but the Sentinel filter retrieved several small clots and necrotic tissue. Brain imaging and positron emission tomography imaging confirmed stage IV metastatic lung cancer. The patient was referred for palliative radiation.

#### ABBREVIATIONS AND ACRONYMS

**CT** = computed tomography  
**ICE** = intracardiac echo  
**LV** = left ventricle

**FIGURE 1** Intracardiac Echocardiogram-Guided Biopsy of a Left Ventricular Mass



(**A and B**) Magnetic resonance imaging showing a mass infiltrating the inferolateral left ventricular walls. (**C**) Late gadolinium enhancement magnetic resonance imaging demonstrating a hypointense mass in the inferior wall with surrounding the enhancement. (**D**) Placement of cerebral embolic protection. (**E and F**) Still images of the intracardiac echocardiogram (ICE)-guided biopsy. See [Videos 1, 2, and 3](#). The **arrows** indicate the left ventricular mass. AO = ascending aorta; Bx = biptome; CAU = caudal; EPD = embolic protection device; JR = Judkins right; LA = left atrium, LAO = left anterior oblique; LV = left ventricle, MV = mitral valve, RIA = right innominate artery; RV = right ventricle.

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**KEY WORDS** biopsy, cardiac mass, intracardiac echo

**APPENDIX** For supplemental videos, please see the online version of this paper.