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Capture of Malignant Tumor Cells by a Carotid Embolic Protection Device During Endovascular Biopsy of a Left Ventricular Mass

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A 22-year-old man with no past medical history presented with an embolic infarct of the left kidney. Imaging demonstrated a large left ventricular mass with extension along the papillary muscles and involvement of the mitral valve (**Figure 1**). Tissue diagnosis was recommended, and after heart team evaluation, percutaneous endovascular biopsy from the left femoral artery approach was performed under transesophageal echocardiographic guidance. Intravenous heparin was administered and prophylactic bilateral carotid embolic protection devices (EPDs) were used, with a 6-mm SpiderFX (Medtronic, Minneapolis, Minnesota) EPD and a 4- to 7-mm Emboshield NAV^6 (Abbott, Abbott Park, Illinois) EPD placed in the left and right internal carotid arteries, respectively (**Figure 2**).

Following EPD retrieval, material was noted in the left carotid device (**Figure 3**) and sent for analysis. Selective bilateral cerebral angiography demonstrated no evidence of embolization, and the patient was asymptomatic post-biopsy with a normal neurologic exam.

Final histologic diagnosis of biopsy samples from the left ventricular mass demonstrated malignant spindle cell sarcoma. Microscopic examination of material captured in the EPD (**Figure 4**) revealed fragments of spindle cell sarcoma and thrombus.

When a potentially malignant cardiac mass is identified, determination of pathological type is essential for therapeutic planning. The preferred method for acquiring tissue remains uncertain and is usually determined on a case-by-case basis. Open surgical biopsy can be performed; however, this procedure is invasive and may be less desirable if concurrent surgical resection is not planned. Percutaneous endovascular biopsy is a recommended less invasive alternative, but experience for left heart masses remains limited (1). Although the use of carotid embolic protection has not been reported previously during endovascular biopsy of left heart masses, the previous images definitively demonstrate the potential for systemic embolization of tumor material during biopsy and strongly support consideration of carotid protection during such procedures.

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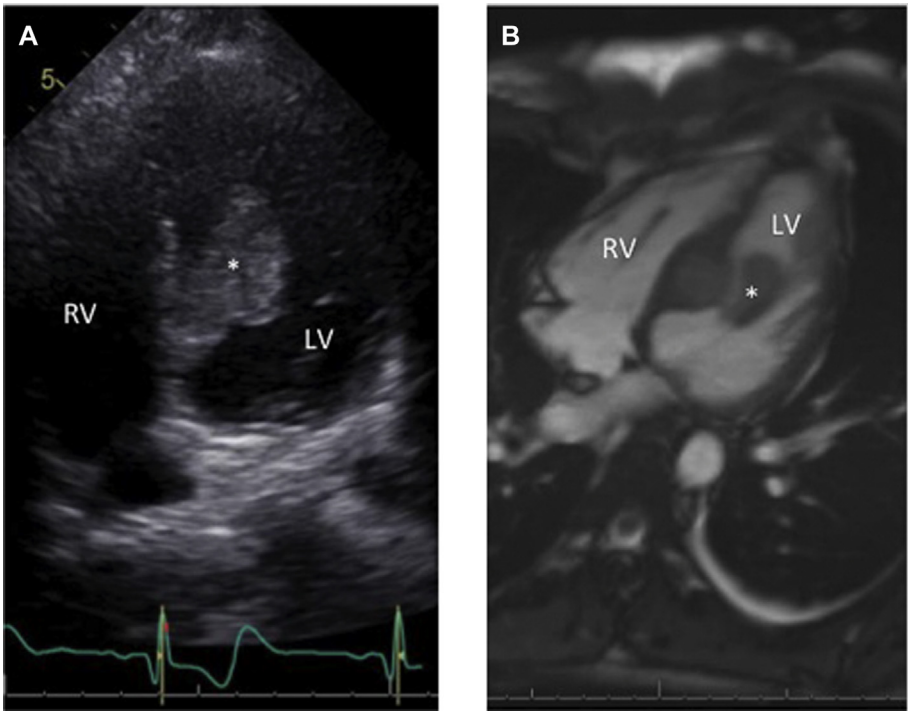
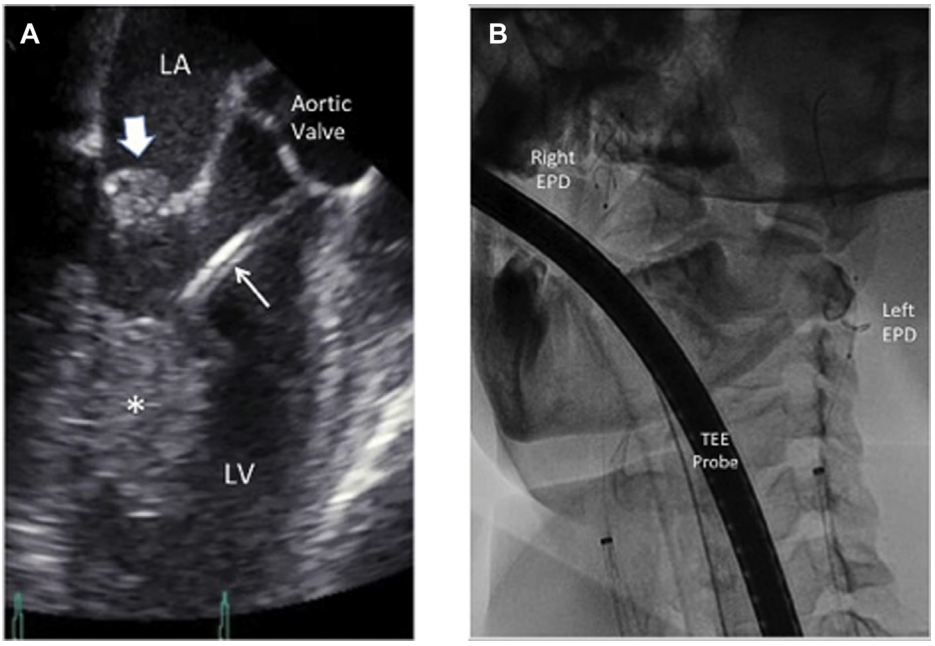
FIGURE 1 Images of the Left Ventricular Mass



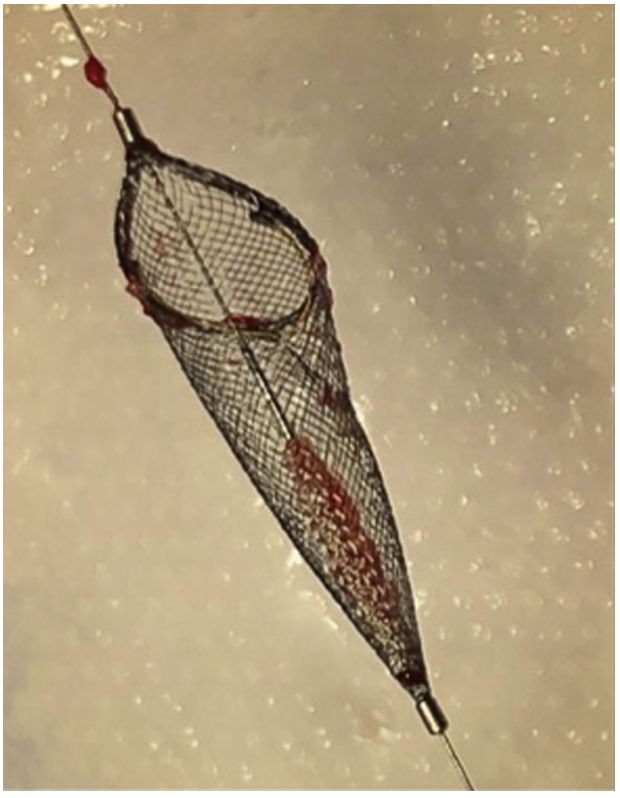
(A) Transthoracic echocardiogram and **(B)** magnetic resonance imaging demonstrating a large left ventricular mass **(asterisk)**. LV = left ventricle; RV = right ventricle.

FIGURE 2 Intraprocedural Imaging During Left Ventricular Biopsy



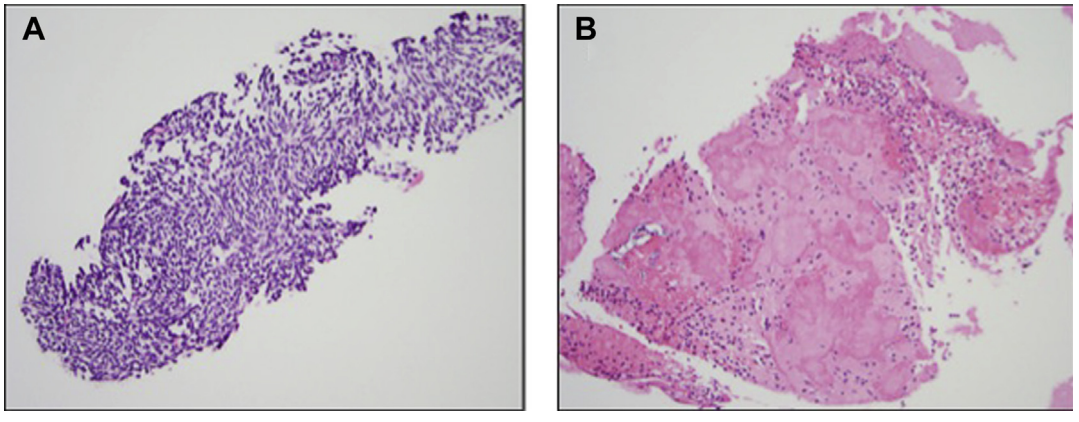
(A) Transesophageal echocardiography (TEE) during biopsy showing left ventricular mass **(asterisk)**, separate mass on the anterior mitral valve leaflet **(thick arrow)** and biopsy guide catheter **(thin arrow)**. **(B)** Bilateral embolic protection devices (EPDs). LA = left atrium; LV = left ventricle.

FIGURE 3 Left Carotid Embolic Protection Device



Captured material in the left carotid embolic protection device.

FIGURE 4 Histology of Material Captured in the Embolic Protection Device



(A) Spindle cell sarcoma and **(B)** thrombus.

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KEY WORDS biopsy, cardiac tumors, cerebral protection