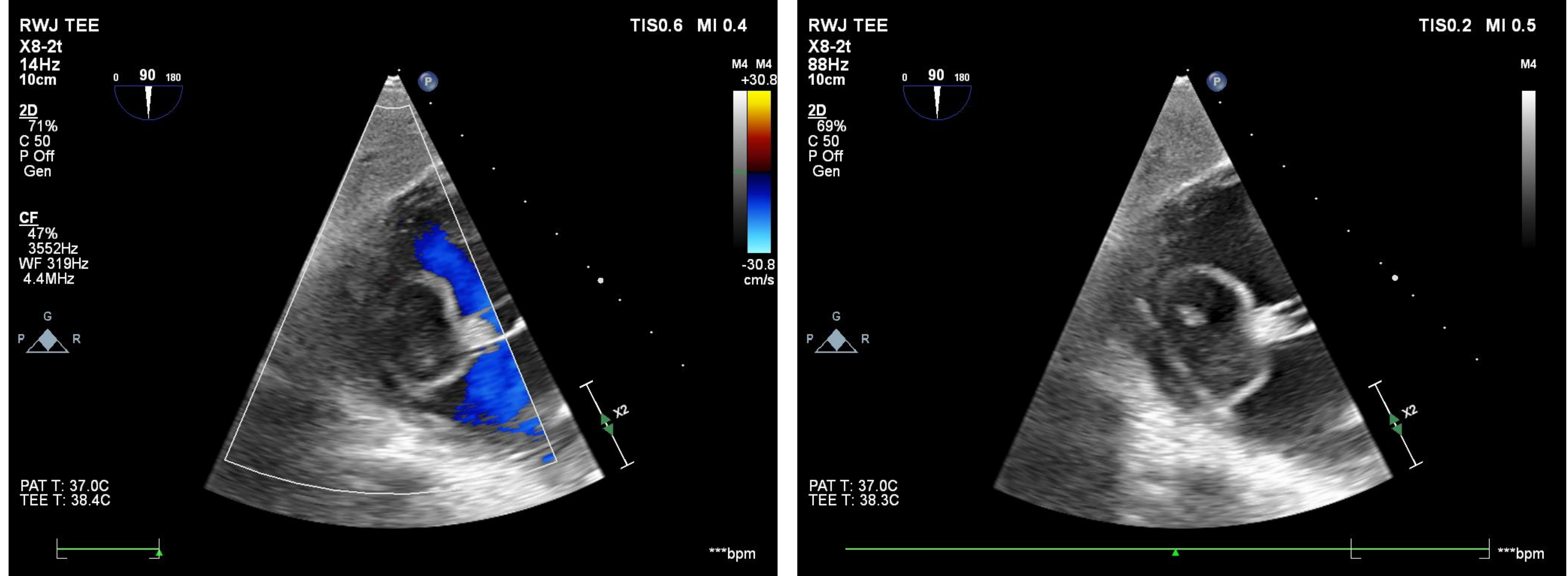
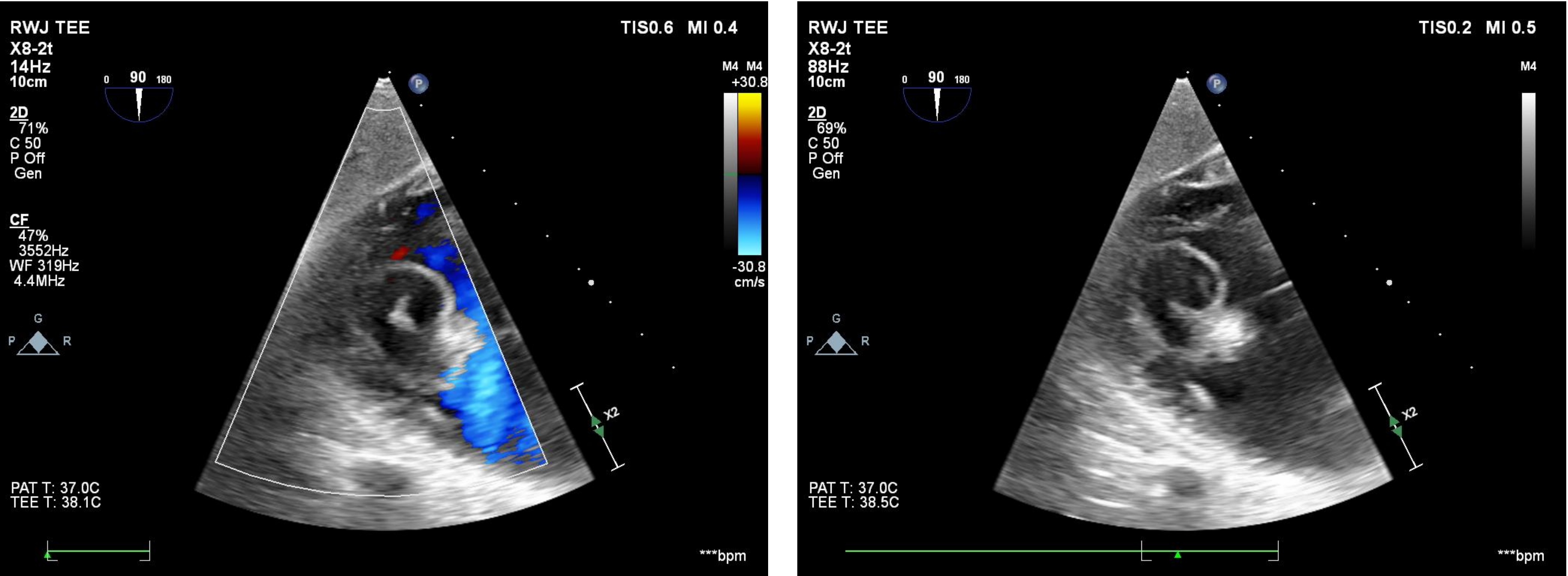


Learning Objective

This case describes the anesthesiologist role in the intraoperative diagnosis and management of unexpected cardiac masses, with particular emphasis on the utility of transesophageal echocardiography (TEE) for real-time decision making.

Case Description

A 49-year-old female with a history of deep vein thrombosis, essential thrombocythemia, untreated systemic lupus erythematosus (SLE), and a family history of venous thromboembolism underwent a laparoscopic right hemicolectomy with ileostomy for an ascending colonic tumor. Postoperatively, she required surgical ICU care for respiratory support. A CT angiogram revealed a right ventricular (RV) mass, presumed to be thrombus given her prothrombotic risk. She was taken to the operating room for percutaneous removal using a catheter-based aspiration system. However, intraoperative transesophageal echocardiography (TEE) demonstrated two well-circumscribed, round, echo-free, mobile RV masses (largest 2.5 × 1.8 cm) that were cystic in appearance. These findings were concerning for blood cysts. Complicating the picture, the right ventricle was dilated, and McConnell’s sign was noted. Given these atypical features, the procedure was aborted for further evaluation after intraoperative cardiology consultation. This case highlights the value of intraoperative imaging in distinguishing thrombi from rare intracardiac masses.

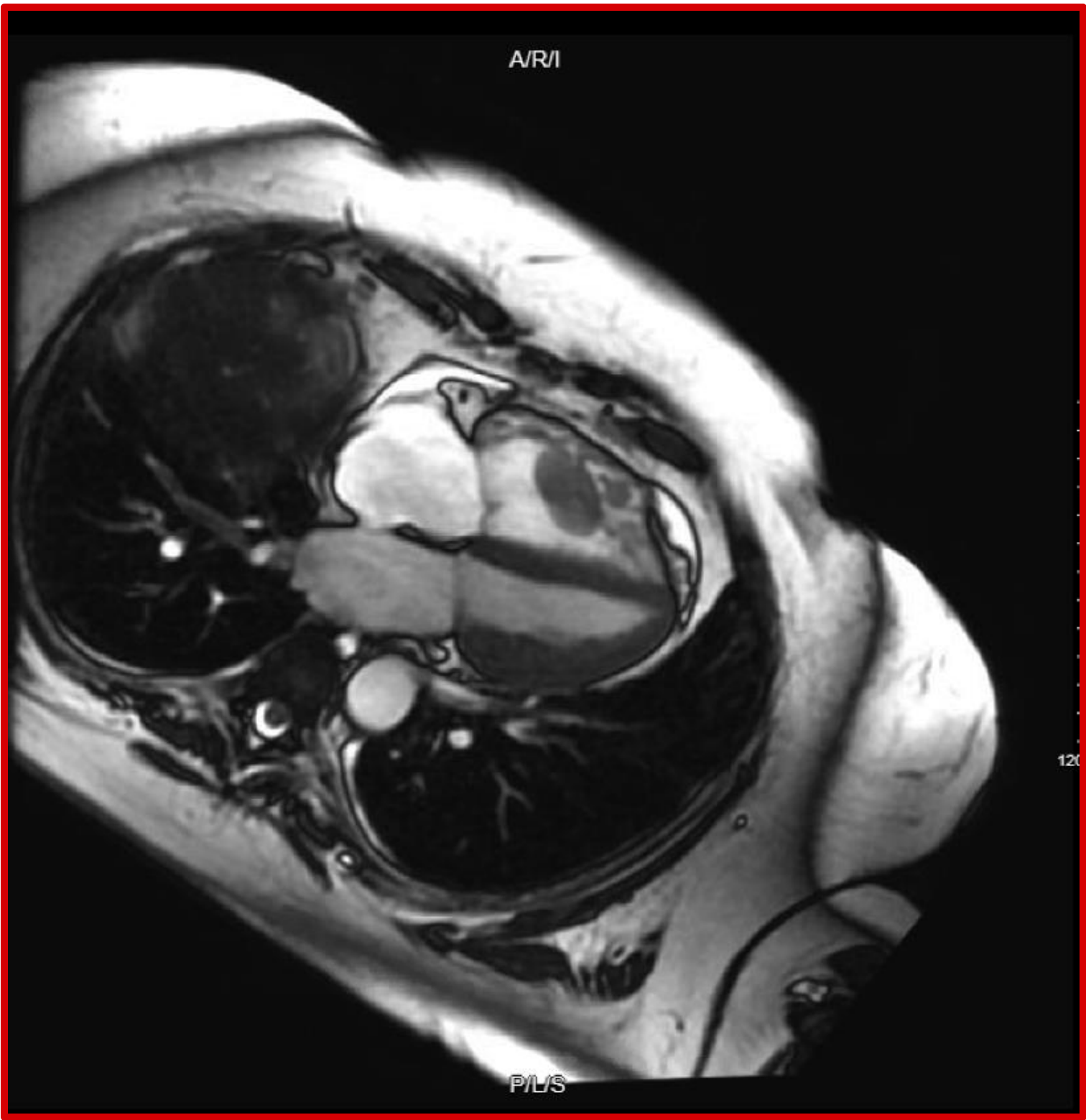


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Discussion

This case underscores the importance of a multidisciplinary approach and the anesthesiologist’s pivotal role in identifying unexpected cardiac masses, modifying intraoperative plans, and facilitating timely diagnosis using integrated imaging strategies. Cardiac masses present significant diagnostic challenges, particularly in distinguishing thrombi from tumors and benign from malignant lesions. Transthoracic echocardiography (TTE) is the primary imaging modality but has limitations in tissue characterization. Contrast echocardiography (CE) enhances visualization and allows for more precise differentiation. The A1/A2 perfusion ratio has emerged as a valuable CE marker, with a cutoff of 0.499 demonstrating high sensitivity (88.4%) and specificity (97.9%) for identifying thrombi. Lower ratios are typically seen in chronic thrombi, while elevated ratios suggest acute thrombi with peripheral perfusion. Cardiac magnetic resonance imaging (CMR) provides superior tissue characterization, helping differentiate thrombi from neoplasms and benign from malignant tumors. In the evaluation of cystic lesions, CMR findings such as high T2 signal intensity, sharply defined borders, and absence of contrast enhancement can point toward benign congenital cysts rather than necrotic malignancies or myxomas. Transesophageal echocardiography (TEE), including contrast-enhanced TEE, offers additional intraoperative insight that reinforces its value in real-time surgical decision-making.



MR Imaging Tissue Characteristics of Common Cardiac Masses

Cardiac Mass	T1-weighted Imaging*	T2-weighted Imaging*	After Contrast Enhancement (LGE Imaging)
Pseudotumor			
Thrombus	Low (high if recent)	Low (high if recent)	No uptake†
Pericardial cyst	Low	High	No uptake
Benign			
Myxoma	Isointense	High	Heterogeneous
Lipoma	High‡	High‡	No uptake
Fibroma	Isointense	Low	Hyperenhancement§
Rhabdomyoma	Isointense	Isointense/high	No/minimal uptake
Malignant			
Angiosarcoma	Heterogenous	Heterogeneous	Heterogeneous
Rhabdomyosarcoma	Isointense	Hyperintense	Homogeneous
Undifferentiated sarcoma	Isointense	Hyperintense	Heterogeneous/variable
Lymphoma	Isointense	Isointense	No/minimal uptake
Metastasis¶	Low	High	Heterogeneous

Note.—Table presents typical characteristics, but all tumors can have atypical appearances owing to altered tissue composition.
* T1- and T2-weighted imaging signal intensity is given relative to myocardium.
† Best seen on EGE images (no uptake) 2 minutes after contrast agent administration (Fig 1).
‡ Similar to surrounding fat signal intensity and characterized by marked suppression with a fat-saturation prepulse.
§ However, fibromas are nonenhancing at perfusion imaging because of avascularity.
¶ The exception is metastatic melanoma, which has a high T1-weighted and a low T2-weighted signal intensity.