A 59-year-old woman with a history of pulmonary emphysema, smoking and dyslipidemia was admitted to our hospital due to persistent cough and dyspnea since 3 months. Clinical examination and laboratory findings, including chest radiogram and electrocardiogram, were within normal limits. Transthoracic 2-dimensional echocardiography (4-chamber view) demonstrated a 29 x 34 mm mass that extended from the right pulmonary veins into the left atrium (Figure 1A). The differential diagnosis included thrombus or tumor deriving from the pulmonary veins and an ultrasound contrast agent (Sonovue) was used in order to assess the microvasculature of the mass (Figure 1B). During a continuous infusion (1 mL/min) of Sonovue (Vueject pump, BRF-INF-100, Bracco, Italy), we observed a mild uptake of the contrast agent by the mass suggesting the presence of microcirculation. The mass had occluded the right upper pulmonary vein, while partially obstructed the right lower vein, as indicated by the increased systolic and diastolic velocities measured by the pulsed wave Doppler of the right lower pulmonary vein (Figure 1C). A transesophageal (TEE) echocardiographic study revealed a heterogenous lobular mass that was filling the right upper pulmonary vein and was growing into the left atrium (Figure 2A and B). Using color Doppler imaging (Figure 3A) and power Doppler imaging (Angio® Vivid 7, GE Medical System, Horten, Norway) (Figure 3B) we demonstrated the presence of vascular flow across the mass (Figure 3, arrows). A chest magnetic resonance tomography showed an atelectatic middle lobe of the right lung and a pulmonary mass of 30 x 25 x 28 mm infiltrating the pulmonary veins. The patient underwent a middle sternotomy and excision of the left atrium mass along with a right lateral thoracotomy and excision of the upper and middle lobe of the right lung plus lymphadenectomy. Biopsy of specimens was compatible with a poorly differentiated, high grade mucoepidermoid lung cancer with a few large arterioles in agreement with our Doppler findings. The patient died 8 months after surgery due to disease progression.

Primary cardiac tumors are rare, with a necropsy incidence of 0.05%. A quarter of all cardiac tumors are malignant, the majority of which are angiosarcomas and rhabdomyosarcomas. Secondary deposits are found more frequently, in 1% of postmortem examinations and mostly affect the epicardium. Carcinoma of lung and breast may spread by local infiltration invading usually the pericardium and rarely the cardiac muscle. Infiltration through the pulmonary veins has also been reported and is usually complicated by obstruction of the mitral valve or arterial embolisation.

In our case we have observed infiltration of the pulmonary veins and growing of the mass within the vein and into the left atrium.
Figure 1  (A) Transthoracic 2-dimensional echocardiography (4-chamber view) demonstrated a 29x34 mm mass that extended from the right pulmonary veins into the left atrium. (B) The mild uptake of the contrast agent by the mass suggested the presence of microcirculation. (C) The increased systolic and diastolic velocities measured by the pulsed wave Doppler of the right lower pulmonary vein indicate obstruction of the vein.

Figure 2  A transesophageal echocardiographic study revealed a heterogenous lobular mass that was filling the right upper pulmonary vein (RUPV) (A) and was growing into the left atrium (B).

Figure 3  Color Doppler imaging (A) and power Doppler imaging (B) demonstrated the presence of vascular flow across the mass (arrows).
left atrium which is not a frequent finding for a mucoepidermoid lung cancer. In conclusion, we have shown that using the newer echocardiographic techniques we can reliably differentiate a cardiac tumor from a cardiac thrombus.

References