

# A Rare Cause of Left Atrial Mass



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## INTRODUCTION

We report a case of left atrial (LA) mass in a patient who presented with chest pain. The mass was incidentally found on transthoracic echocardiography (TTE) and evaluated using multimodality imaging including transesophageal echocardiography (TEE) and cardiac magnetic resonance imaging (CMR). The final diagnosis was confirmed by histopathologic examination. Here we report the differential diagnosis and review the literature.

## CASE PRESENTATION

A 42-year-old woman presented to the emergency department of our institution with chest pain of 3 days' duration. The patient was a martial artist and noticed the chest pain during a sparring session. The pain was substernal and associated with shortness of breath. Vital signs on arrival were a body temperature of 37.4°C, a heart rate of 104 beats/min, a respiratory rate of 15 breaths/min, and blood pressure of 106/57 mm Hg. Physical examination was notable for mild regular tachycardia but was otherwise unremarkable. Chest palpation revealed no tenderness. Initial laboratory evaluation revealed elevated troponin I at 0.187 ng/mL that rose to 0.210 ng/mL 2 hours later. Electrocardiography revealed normal sinus rhythm with PR depression and 1-mm ST-segment elevation in leads I and II. Because of concern for acute coronary syndrome, the patient was started on aspirin and intravenous heparin in the emergency department. The cardiology service was consulted and TTE was performed, which did not show any wall motion abnormalities. Coronary angiography showed normal coronary arteries. Interestingly, TTE showed a well-delimited sessile mass measuring 2.0 × 3.2 cm attached to the lateral and posterior wall of the left atrium (Figures 1 and 2). In addition, there was a small posterior pericardial effusion. Subsequently, TEE showed that the mass arose from the lateral wall of the left atrium at or next to the Coumadin ridge and extending toward and above the mitral valve, without creating mitral valve obstruction. Full-volume three-dimensional TEE once again showed a large mass with a broad base attached to the lateral wall of the left atrium and extending above the mitral valve, without creating valve obstruction (Figures 3 and 4, Videos 1 and 2). There was no spontaneous contrast or thrombus in the left atrium and LA

appendage. CMR was performed and confirmed that the mass was in the LA lateral wall, without involving the pulmonary veins (Figures 5 and 6, Videos 3 and 4). By using an inversion recovery gradient sequence, CMR was able to rule out a lipoma. Perfusion sequences were performed and revealed no perfusion of the mass. After discussion with a cardiac surgery consultant and because of the size and the location of the mass, and because another etiology for the mass was not completely ruled out, the decision was made to proceed with surgical resection and biopsy (Figure 7) of the mass.

## Surgical and Biopsy Findings

The patient was taken to the cardiovascular operating room for resection of the mass. Following median sternotomy, inspection revealed a moderate pericardial effusion, and 300 mL of bloody fluid was drained. A large ecchymosis at the base of the left atrium was identified that extended into the lateral wall of the left ventricle, consistent with myocardial contusion. The left atrium was incised and was notable for ecchymosis through the entire posterior aspect of the mitral annulus. There was a large mass that began within the atrioventricular groove and extended along the left lateral (Coumadin) ridge within the wall of the left atrium to the inferior aspect of the pulmonary veins superiorly and to the P3 aspect of the mitral valve inferiorly. The wall of the left atrium was opened, and a moderate amount of dark blood and mass resembling thrombus was revealed. The majority of the mass was resected and sent for definitive diagnosis by the pathologist, which confirmed the diagnosis of thrombus. The LA incision and mediastinum was then closed. The patient did well postoperatively and was discharged 4 days later. Follow-up TTE and CMR were performed and showed no residual mass.

## DISCUSSION

Our patient presented to the emergency department with chest pain 3 days after receiving a kick to her chest during martial arts training and was found to have a mass in the left atrium that was revealed to be an intramural hematoma after surgical resection and biopsy. LA intramural hematoma (LAIH) is a rare entity. It has been reported as a complication of cardiac surgery<sup>1-3</sup> or interventional procedures such as catheter ablation of atrial fibrillation<sup>4-6</sup> and percutaneous coronary intervention.<sup>7-9</sup> LAIHs are rarely associated with interatrial septal dissection after transeptal puncture.<sup>10</sup> Spontaneous LAIHs have also been reported,<sup>11</sup> including one case associated with mitral annular calcification.<sup>12</sup> Posttraumatic LAIHs are even more rare, and only a few cases have been reported after trauma to the chest.<sup>13</sup> To our knowledge, our case is the first case of LAIH after apparently benign chest trauma during martial arts training. Multimodality imaging using TEE and/or CMR can usually lead to the correct diagnosis by showing a well-delimited mass arising from the LA wall<sup>14</sup> and its hemodynamic effect.<sup>15</sup> Absence of underlying structural heart disease and atrial arrhythmias and absence of spontaneous echocardiographic contrast make LA thrombus unlikely.<sup>16</sup> The echocardiographic features of the mass and its large base attachment to the lateral wall of the left atrium make myxoma

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### VIDEO HIGHLIGHTS

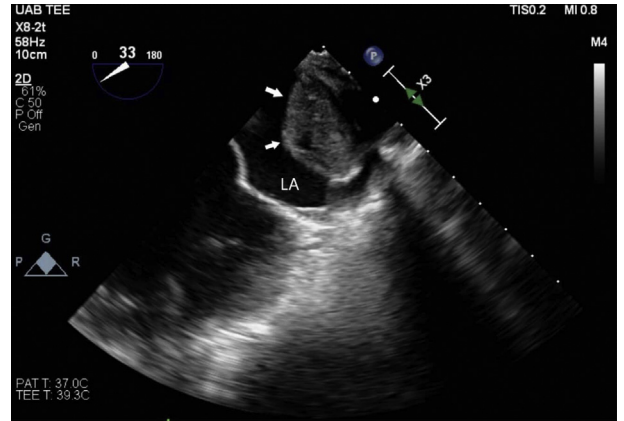
**Video 1:** Real-time two-dimensional TEE of the LA mass showing the broad-based attachment to the lateral wall of the left atrium and extending above the mitral valve.

**Video 2:** Real-time three-dimensional full-volume TEE of the LA mass showing the mass occupying a large portion of the left atrium and extending above the mitral valve without causing obstruction.

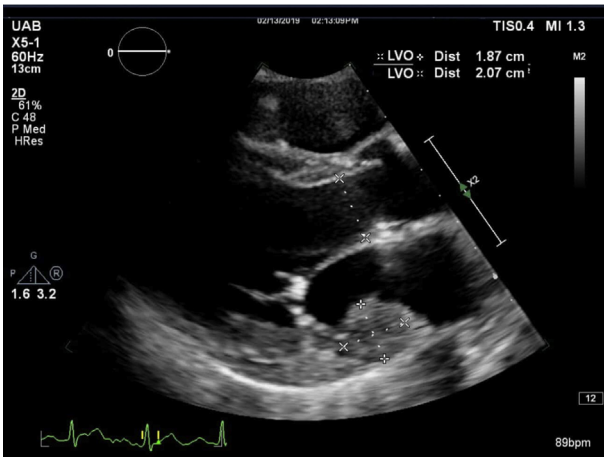
**Video 3:** CMR of the LA mass using a balanced steady-state gradient echo sequence showing a broad-based LA mass.

**Video 4:** CMR with perfusion sequences using an inversion recovery gradient echo sequence showing absence of perfusion, suggesting that the mass is not a lipoma.

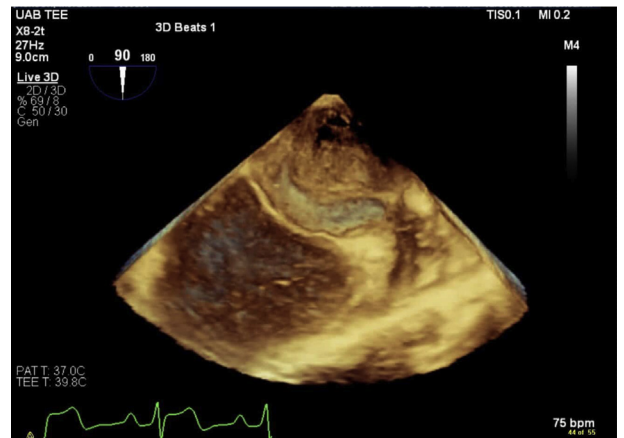
View the video content online at [www.cvcasejournal.com](http://www.cvcasejournal.com).



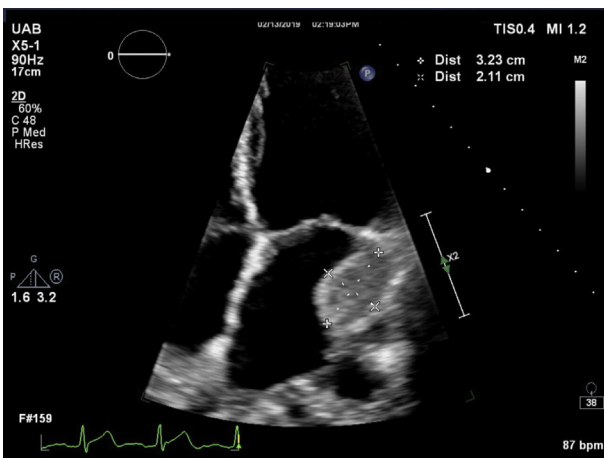
**Figure 3** TEE revealed a left atrial mass (white arrows) arising from or next to the left lateral ridge. LA, Left atrium.



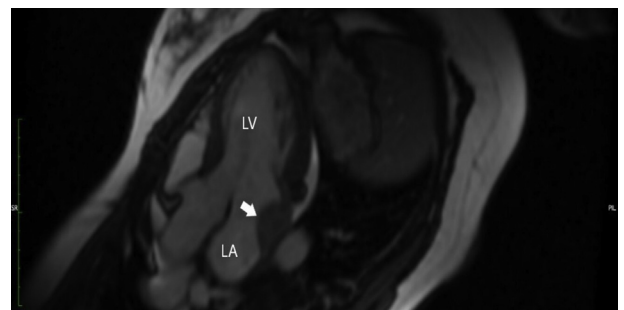
**Figure 1** TTE, parasternal long-axis view, showing the mass attached to the posterior wall of the left atrium.



**Figure 4** 3D Transesophageal echocardiogram image of the mass showing the mass arising from the lateral wall of the LA and extending above the mitral valve (MV).

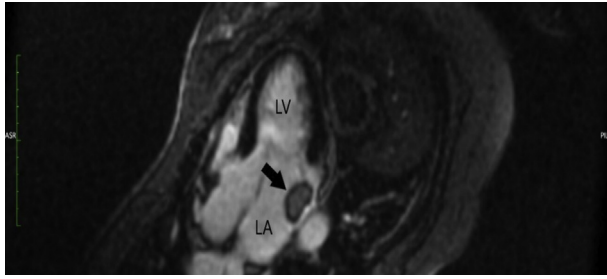


**Figure 2** TTE, apical 4C zoom view focusing on the mass attached to lateral wall of the left atrium.

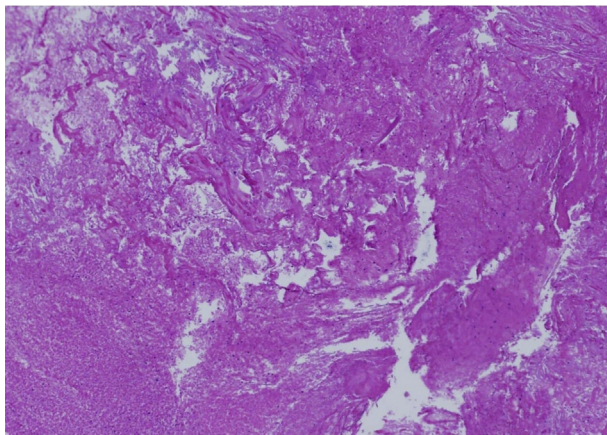


**Figure 5** CMR performed using a balanced steady-state gradient echo sequence showed a broad-based left atrial mass (white arrow). LA, Left atrium; LV, left ventricle.

unlikely as well.<sup>17</sup> However, in some cases imaging studies may remain inconclusive, and tissue biopsy may be needed. The clinical context of recent cardiac surgery or interventional procedures or trauma to the chest, as in our case, may help in the differential diagnosis. In terms of management, most cases may be treated conservatively with



**Figure 6** CMR performed using an inversion recovery gradient echo sequence (late gadolinium enhancement) suggested that the mass (*black arrow*) was not a lipoma. LA, Left atrium; LV, left ventricle.



**Figure 7** LA mass specimen biopsy (hematoxylin and eosin staining, magnification 200 $\times$ ) showing principally red blood cells and platelets enmeshed in fibrin strands. The rare *blue dots* are leukocytes.

anticoagulation if the patient is hemodynamically stable.<sup>18,19</sup> However, in our patient, anticoagulation was not given because of associated pericardial effusion, which could have led to bleeding into the pericardial space with potential tamponade. Fortunately, our patient made a full recovery and was doing well at 1-year follow-up.

## CONCLUSION

LAIH is a rare entity and usually presents after cardiac surgery or interventional procedures. However, it can also present after blunt chest trauma. Multimodality imaging can lead to a correct diagnosis. Management is usually conservative in hemodynamically stable patients.

## SUPPLEMENTARY DATA

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.case.2020.04.004>.

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