

Received: 2019.06.19
Accepted: 2019.09.11
Published: 2019.12.24

A Case of Infected Left Atrial Myxoma Presenting as ST-Elevation Myocardial Infarction (STEMI)

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
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Conflict of interest: None declared

Patient: Male, 34-year-old
Final Diagnosis: Infected atrial myxoma
Symptoms: Chest pain
Medication: —
Clinical Procedure: —
Specialty: Cardiology

Objective: Rare disease





Background: Although left atrial myxoma is the most common benign primary cardiac tumor, infected atrial myxoma is rare. This report presents a case of infected left atrial myxoma with embolization to the left anterior descending (LAD) coronary artery, which was identified following an initial presentation with ST-elevation myocardial infarction (STEMI).

Case Report: A 34-year-old man with a history of smoking tobacco and intravenous cocaine use presented to the emergency room with symptoms of a feeling of pressure on the chest and symptoms in the left arm. An electrocardiogram (ECG) showed ST elevation in leads II, III, aVF, and V3–V5, consistent with an anterior-inferior STEMI. He underwent percutaneous intervention (PCI) with two drug-eluting stents to the mid-distal LAD coronary artery. The patient also had fever, chills, a history of weight loss, and signs of peripheral emboli. Blood cultures identified Gram-positive *Streptococcus parasanguinis*, a member of the *Streptococcus viridans* group. Transesophageal echocardiogram (TEE) identified a large, mobile, pedunculated left atrial mass protruding into the mitral valve in diastole and mitral valve vegetations. Surgical excision and the histology confirmed a diagnosis of benign left atrial myxoma containing Gram-positive cocci. The patient required mitral valve replacement and a post-operative two-week course of gentamicin and a six-week course of ceftriaxone

Conclusions: A rare case is reported of infected left atrial myxoma presenting as STEMI secondary to coronary artery embolization, which was treated with PCI, antibiotics, and mitral valve replacement.

MeSH Keywords: Acute Coronary Syndrome • Cardiac Surgical Procedures • Myxoma

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/918192>

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Background

Left atrial myxoma is the most common benign primary cardiac tumor, and myxoma embolism is recognized complication. However, embolization from left atrial myxoma to the coronary arteries is uncommon. Infected left atrial myxoma has been rarely described, but may present with systemic embolization and constitutional symptoms.

This report presents a case of infected left atrial myxoma with embolization to the left anterior descending (LAD) coronary artery, which was identified following an initial presentation with ST-elevation myocardial infarction (STEMI).

Case Report

A 34-year-old man with a history of smoking tobacco and intravenous cocaine use presented to the emergency room with symptoms of a feeling of pressure on the chest and symptoms in the left arm. These symptoms began suddenly, and he presented to the hospital within one hour of onset. An electrocardiogram (ECG) showed ST elevation in leads II, III, aVF, and V3–V5, consistent with an anterior-inferior STEMI (Figure 1). He had a peak troponin level of 34.75 ng/mL (normal range, <0.04 ng/mL). Coronary angiography showed complete occlusion of the mid to distal left anterior descending (LAD) coronary artery. He underwent percutaneous coronary intervention (PCI) with the successful use of two drug-eluting stents and achieved TIMI 3 flow, indicating normal epicardial

perfusion (Figures 2, 3). ECG after PCI showed resolution of ST-segment elevation (Figure 4). A transthoracic echocardiogram (TEE) following PCI showed a large, pedunculated mass in the left atrium and mitral regurgitation.

Following PCI, the patient continued to have symptoms of ongoing embolization, including a transient loss in vision of the left eye and numbness of the right arm. The patient was transferred to a tertiary care center for surgical evaluation. On hospital transfer, the patient was hemodynamically stable, but with a temperature of 101.8°F and a white blood cell (WBC) count of $16.2 \times 10^9/L$. Physical examination identified a 3/6 systolic murmur over the cardiac apex. On further inquiry, the patient reported intermittent fevers, chills, night sweats, and 60 pounds of unintentional weight loss in the previous six months. He was empirically treated with vancomycin and piperacillin/tazobactam. His blood cultures later grew *Streptococcus parasanguinis*, a member of the *Streptococcus viridans* group. Further TEE showed a large, mobile, multilobular, pedunculated mass within the left atrial cavity attached to the atrial septum that was protruding into the mitral valve in diastole. The TEE also demonstrated mild to moderate mitral regurgitation with moderate-sized echogenic densities on both valve leaflets, suggestive of endocarditis (Figures 5, 6).

The patient underwent surgical excision of a $6.0 \times 3.1 \times 3.0$ cm mucoid mass arising near the inferior aspect of the atrial septum (Figure 7). Primary closure of the interatrial septal defect was performed after excision of the mass. Due to persistent mitral regurgitation despite attempted mitral valve repair,

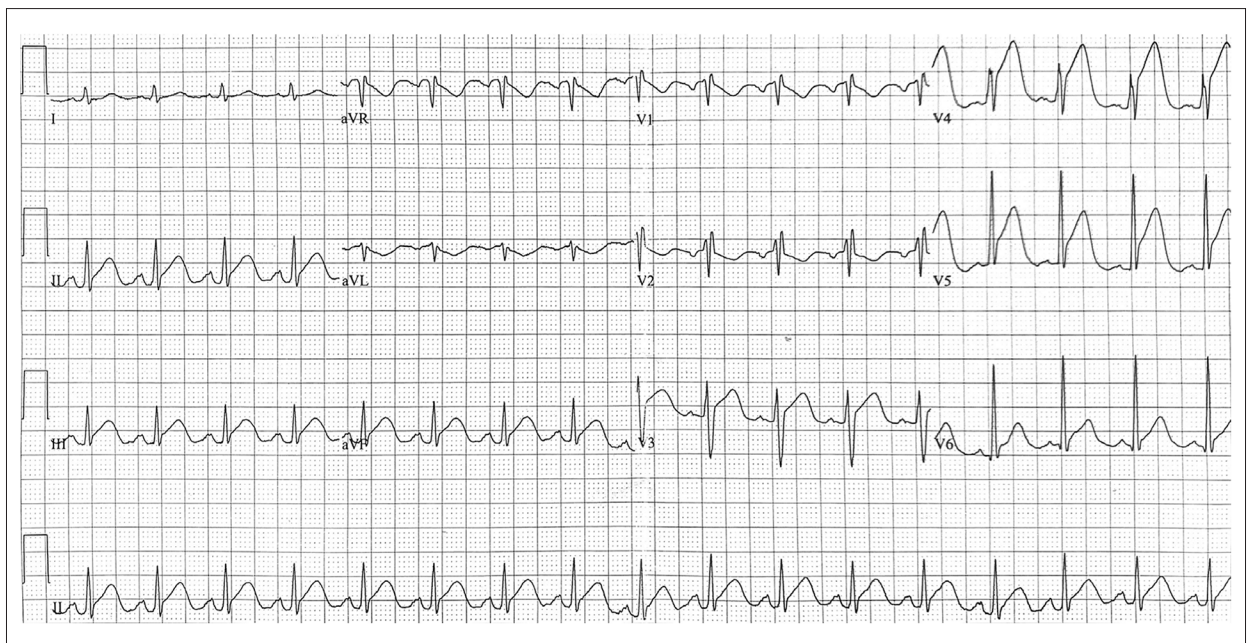


Figure 1. The electrocardiogram (ECG) before percutaneous intervention (PCI) shows an anterior-inferior ST-elevation myocardial infarction (STEMI). The ECG shows ST elevation in leads II, III, aVF, and V3–V5.

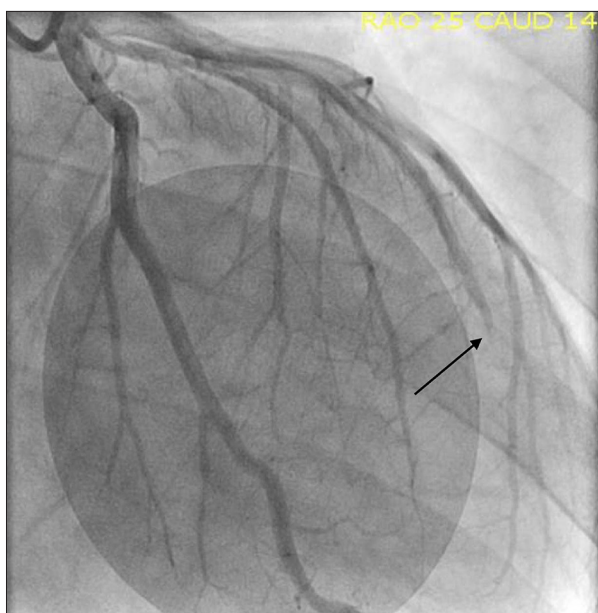


Figure 2. Coronary artery angiogram before percutaneous intervention (PCI). The coronary artery angiogram shows an occluded left anterior descending (LAD) coronary artery (arrow).



Figure 3. Coronary artery angiogram after percutaneous intervention (PCI). The coronary artery angiogram shows a revascularized left anterior descending (LAD) coronary artery that has distal patency and is shown to supply the apex of the heart. This patient had a type III LAD coronary artery that wrapped around the apex of the heart, with occlusion that resulted in ST elevation in both anterior and inferior leads. The angiogram was taken following percutaneous intervention with two drug-eluting stents. TIMI 3 flow is present, indicating normal epicardial perfusion.

the mitral valve was replaced with a 31 mm St. Jude mechanical valve. Histopathology of the left atrial mass showed acute and chronic inflammatory cells with areas of necrosis and the presence of Gram-positive, consistent with an infected left atrial myxoma (Figures 8, 9). Following surgery, the patient

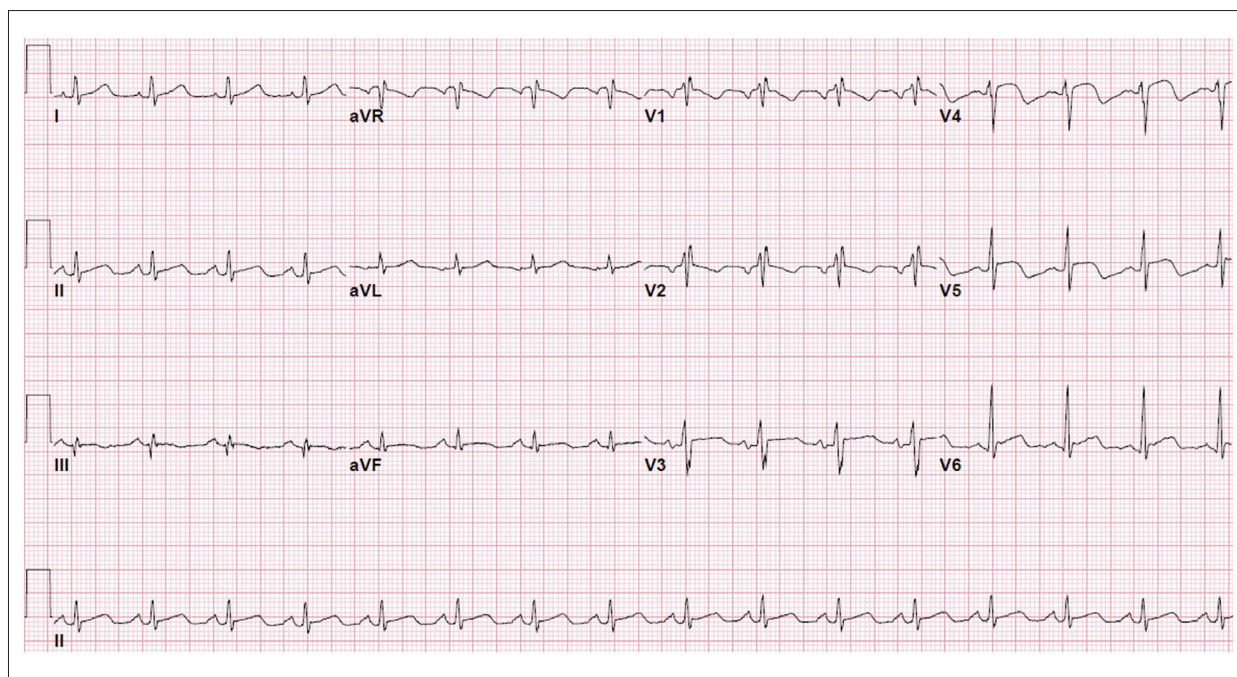


Figure 4. The electrocardiogram (ECG) after percutaneous intervention (PCI) shows resolution of ST-segment elevation following revascularization of left anterior descending (LAD) coronary artery.

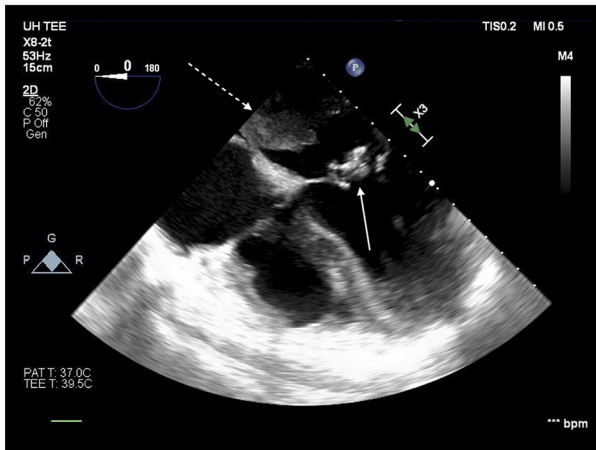


Figure 5. Transesophageal echocardiogram (TEE) during systole shows a left atrial myxoma. The transesophageal echocardiogram (TEE) shows a left atrial mass (dashed arrow) and mitral valve vegetation (solid arrow) seen during systole.

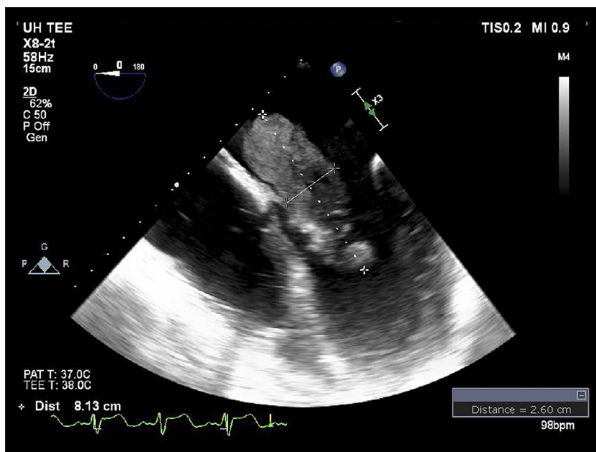


Figure 6. Transesophageal echocardiogram (TEE) during diastole shows a left atrial myxoma. The transesophageal echocardiogram (TEE) shows a left atrial mass prolapsing into the mitral valve during diastole.

continued on a two-week course of gentamicin and a six-week course of ceftriaxone.

On postoperative day 1, he developed hypovolemic shock and mediastinal hematoma requiring surgical exploration and evacuation. On postoperative day 8, he had a subarachnoid hemorrhage that resulted in right-sided weakness. A cerebral angiogram showed a distal left middle cerebral artery mycotic aneurysm, which was embolized successfully by interventional radiology. On follow-up, he had an improvement in speech and improved right-sided motor function.



Figure 7. The macroscopic appearance of the excised left atrial myxoma. The excised left atrial myxoma is shown as a soft tumor mass. There is a stalk (left) that was attached to the left atrial wall. The mass measured 6.0×3.1×3.0 cm.

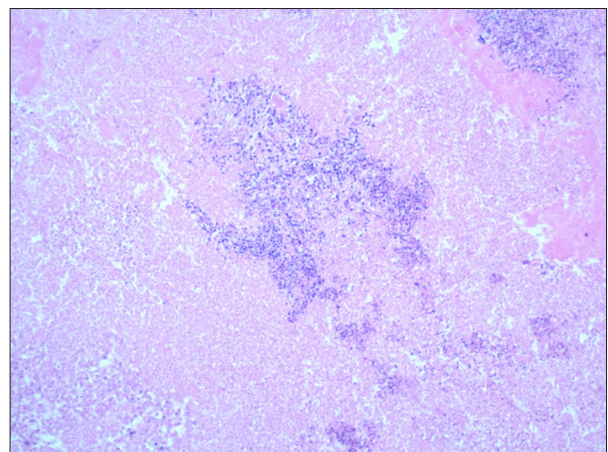


Figure 8. Photomicrograph of the histology of the left atrial myxoma. A benign tumor is seen composed of spindle and stellate cells in abundant myxoid stroma containing acute and chronic inflammatory cells. There are clusters of cocci (dark purple) consistent with an infected atrial myxoma. Hematoxylin and eosin (H&E). Magnification ×600.

Discussion

Primary cardiac tumors are very rare, with a reported incidence ranging from 0.0017–0.19% [1]. The most common primary cardiac tumor in adults is left atrial myxoma [2]. Although the majority of myxomas develop in the left atrium, they can also be found in the right atrium or ventricles [3]. Most cardiac myxomas occur sporadically, although familial cases have been reported, which have an autosomal dominant inheritance

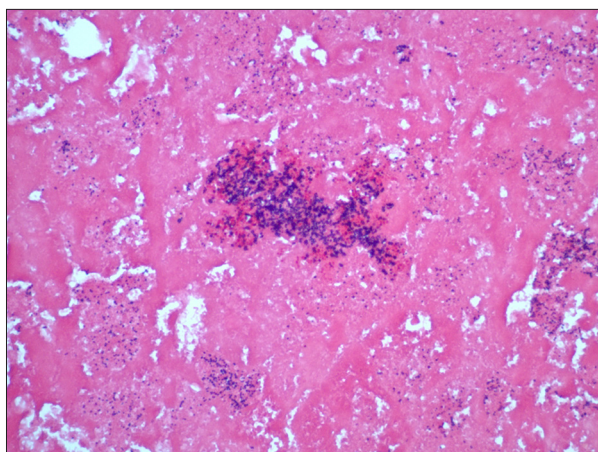


Figure 9. Photomicrograph of the histology of the left atrial myxoma stained with Gram's stain for bacteria. Gram's stain shows Gram-positive cocci (purple) within the tissue of the left atrial myxoma. Microbiological culture identified the bacteria as *Streptococcus parasanguinis*, a member of the *Streptococcus viridans* group.

pattern [4]. Inherited myxomas tend to occur at an earlier age and with more frequent recurrences of myxomas in atypical locations [4].

Most patients with cardiac myxomas present with at least one of the classic triad of symptoms, which include embolism, intra-cardiac obstruction, and constitutional symptoms [1]. Embolism is a commonly reported complication of left atrial myxoma, with an estimated incidence of 30–40% [1]. In cases of left atrial myxoma, systemic embolization frequently occurs, but embolization to the coronary arteries causing acute myocardial infarction is rare [5]. Infected cardiac myxomas are extremely rare.

In 1998, Revankar and Clark reviewed a total of 40 reported cases of infected cardiac myxoma and proposed criteria for the diagnosis [6]. The diagnosis of infected cardiac myxoma includes a pathologically confirmed diagnosis of myxoma, the identification of microorganisms seen on histology or in positive blood cultures, and the presence of inflammation seen on histology of the myxoma [6]. In 2015, a review identified an additional 39 cases of infected cardiac myxoma [7]. *Streptococcus* spp. were the most commonly isolated organism, and most patients underwent treatment with surgical resection and an extended course of antibiotics [7]. In the 1998 review [6], the overall reported mortality rate in patients with infected cardiac myxoma was 21%, which decreased to an overall reported mortality rate of 5.1% in the 2015 review [7]. The reduced patient mortality over time was attributed to more rapid identification of infected myxoma, early use of antibiotics, and definitive surgical management [7].

The patient described in this case report was diagnosed with an infected left atrial myxoma, according to the criteria proposed by Revankar and Clark in 1998 [6]. He had a myxoma confirmed by pathology with both positive blood cultures and microorganisms seen on histology of the myxoma tissue. However, cases of infected cardiac myxoma presenting with acute myocardial infarction are rare. This patient had a type III left anterior descending (LAD) coronary artery that wrapped around the apex of the heart, and occlusion resulted in ST elevation in both anterior and inferior leads. This patient was at an increased risk for coronary artery atherosclerosis because of his tobacco use, but he lacked other prothrombotic risk factors for early coronary artery disease, including a family history of ischemic heart disease (IHD), a history of hypertension, dyslipidemia, or diabetes [8]. In this case, LAD coronary artery occlusion identified on coronary angiography was consistent with a coronary artery embolism rather than acute atherosclerotic plaque rupture.

In this case, coronary artery aspiration was not performed before percutaneous intervention (PCI), and therefore no pathology specimens were available from the embolic lesion. Given the rapid onset of the clinical presentation and the unknown presence of myxoma at the time of catheterization, proceeding directly to PCI without aspiration was a reasonable acute management strategy. There is evidence that routine manual thrombectomy for patients with STEMI undergoing PCI is not associated with improved outcomes when compared with PCI alone [9]. Although it was not possible to determine the exact origin of this embolic lesion, it is highly likely that the emboli originated from the myxoma, given the size of the mass. Also, it was not possible to determine the origin of the infection with *Streptococcus parasanguinis*. However, it is likely the mitral valve became infected as a consequence of the infected left atrial myxoma as the myxoma was large, protruded across the mitral valve, and histology confirmed bacterial colonization of the myxoma.

This case highlights an unusual cause of STEMI and the role of a broad differential for cases of acute coronary syndrome in a young patient without risk factors for IHD. This case also demonstrates the need for definitive surgical management in cases of infected left atrial myxoma with ongoing embolization and persistent infection. Screening of family members with echocardiography is also important in cases of myxoma, particularly in young patients, given the risk of associated familial syndromes.

Conclusions

A rare case is presented of infected left atrial myxoma with embolization to the left anterior descending (LAD) coronary

artery, which was identified following an initial presentation with ST-elevation myocardial infarction (STEMI). This case highlights that in young patients without known risk factors for atherosclerotic coronary artery disease who present with

acute coronary syndrome, including MI, thorough investigations should be conducted to exclude less common causes of coronary artery occlusion.

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