Left ventricular mass: myxoma or thrombus

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Abstract. In this case report a 43-year-old male patient presented with symptoms of embolic right leg ischemia. Transthoracic echocardiography showed a left ventricular mass present toward the apex attached to the interventricular septum with the presumptive diagnosis of myxoma. He underwent a successful removal of the tumor through the mitral valve via the transeptal approach. Histology showed mixed thrombus. Figure 3, Ref. 24, on-line full text (Free, PDF) www.cardiologyletters.sk

Key words: left ventricular mass – transeptal approach – myxoma – thrombus

A patient with embolic episode should always be evaluated for cardiac masses. A mass in the left ventricle (LV) can be a myxoma or a thrombus. In either case, mobile mass with embolic potential should be surgically resected (1 – 4). Here we a report a case of a left ventricular thrombus that was supposed to be myxoma preoperatively undergoing successful resection presenting as an embolic lower limb ischemia.

Case report

A 43-year-old smoker male patient with a negative medical history was admitted due to calf pain and numbness of the toes of the right leg for the preceding ten days. Laboratory, chest X-ray and ECG examinations were normal. Clinical examination of the right leg showed absent peripheral pulses of the dorsal pedis and tibial posterior arteries.

During hospitalization, transthoracic echocardiographic (TTE) examination showed a 1.6x1.7 **(Figure 1)** pediculated hyperechogenic hypermobile mass present in the left ventricle (LV) toward the apex attached to the interventricular septum. No LV regional wall motion abnormality was detected with an LV ejection fraction of 60%. The mass was presumed to be myxoma and considering the clinical presentation of the patient and the potential for further embolization the patient was scheduled for an emergency open heart surgery. For the leg embolism conservative treatment was recommended.

A median sternotomy was performed. The ascending aorta and both venae cavae were cannulated and standard cardiopulmonary bypass (CPB) was performed. The heart was stopped by cross-clamping the ascending aorta. Myocardial protection was achieved by means of intermittent anterograde administration of cold blood cardioplegia. The venae cavae were snared with tourniquets and via the transeptal approach through the mitral valve a fragile jelly-like mass was visible attached to the interventricular septum towards the apex. With care not to injure the valve, chordae tendinae and papillary muscle, the mass was completely removed through the mitral valve and the tumor's pedicle was completely shaved from the endocardium **(Figure 2).** The patient was weaned from CPB easily, without inotropic support. The postoperative course was uneventful, the patient was put on anticoagulation treatment and on postoperative day 7 he was discharged home. The postoperative TTE was normal. A search for a hypercoagulable state revealed normal, prothrombin and partial thromboplastin times, normal antithrombin III, protein C and S and homocystein levels. Screening for anticardiolipin, antinuclear antibodies and lupus anticoagulant were negative. Histopathologic examination showed a mixed thrombus, partially organized **(Figure 3)**. Informed consent from the patient and ethical committee approval were obtained to present the case.

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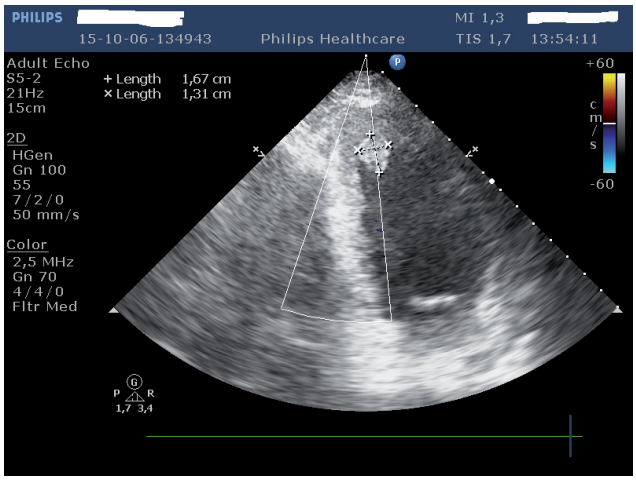

Figure 1 Transthoracic echocardiogram reveals the tumor in the left ventricular cavity attached to the interventricular septum

Discussion

Benign cardiac myxomas constitute 88% of cardiac tumor cases and LV myxomas account for only 2.5% of cases (4).

The first reported case of surgical removal of an LV myxoma was published by Kay et al. (5) in 1959. Since, then at least 71 other surgical cases of LV myxoma, usually originated from the interventricular septum, have been reported mostly as single cases (6).

The clinical features are mostly caused by embolization and obstruction of the left ventricular outflow tract (7). Embolic phenomena are more common than LA myxoma, occurring in 64% of patients with LV myxoma (8). Presenting symptoms of embolic lower limb ischemia are also reported by other authors (9). Considering the risk of embolization, myxomas should be surgically resected as early as possible.

Thrombus formation in LV is a known complication of heart failure and acute myocardial infarction (10, 11). Left ventricular thrombus formation in individuals with normal ejection fraction is a rarely seen phenomenon. Very rarely, in a normal functioning LV has been reported in the presence of a hypercoagulable state (12). Main causes of inherited thrombophilia such as, factor V gene mutation, prothrombin gene mutation, antithrombin and protein C and S (13), and the presence of autoimmune disorders, such as antiphospholipid antibody syndrome (14), Behcet disease, lupus erythematosus (15, 16) and myeloproliferative disease, are all associated with LV thrombus formation in normal LV. In addition, other causes that lead to the formation of an LV thrombus in a normal LV are: idiopathic hypereosinophilic syndrome (toxic eosinophilic granules directly traumatize the endocardium), inflammatory bowel disease (platelet aggregation), pheochomocytoma (transient LV dysfunction), and Takatsubo cardiomyopathy (reversible LV dysfunction) (17).

The differential diagnosis of an LV mass between thrombus and myxoma can be challenging. However, there is no diagnostic feature, either by 2D- echocardiography or by direct inspection in which the diagnosis can be confirmed, and either pathology may masquerade as the other (18).

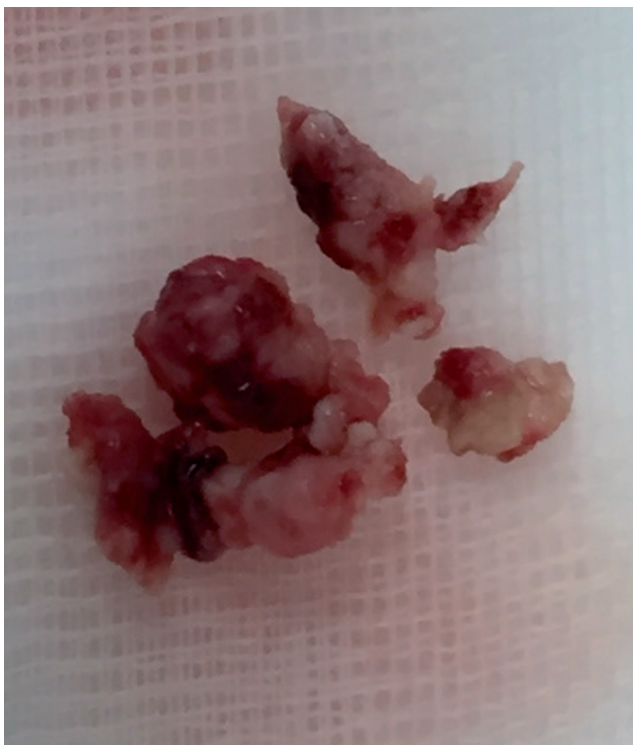

Figure 2 Photograph shows the resected mass

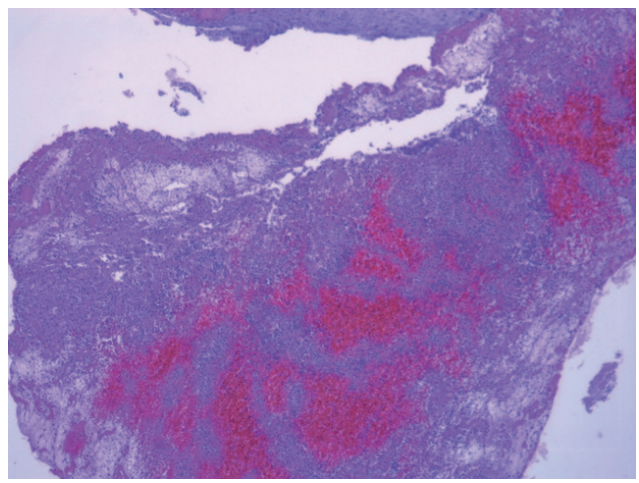

Figure 3 Histologic examination: mixed thrombus, partially organized, hematoxylin and eosin stain

Histopathology is the final court of appeal and must always be performed, as in our report.

The surgical approach we chose to remove the tumor in this location was through the right atrium and atrial septum., but can be carried also by other ways 1. through the left atrium and mitral valve (19), 2. through the ascending aorta with video assistance (20, 21), and 3. through a small longitudinal incision in the left ventricle (6, 22).

We chose the transeptal approach because a), it avoids ventriculotomy and its potential complications like deterioration of the LV function and bleeding, despite the fact that ventriculotomy provides good visibility and the possibility for complete resection, and b) through this approach exploration of the right, left atrium and interatrial septum, if necessary, can be done.

A potential disadvantage of the approach through the mitral valve would be limited room for maneuvering during the mass resection.

Recently, endoscopy and minimally invasive techniques have also been applied (23, 24).

In evaluation of clinical features, and laboratory results and in the absence of cardiac rhythm abnormality, left ventricular dysfunction, malignancy or hypercoagulable state, it is not clear why the patient developed an LV thrombus. In these patients hypothesis of microvascular ischemia has been proposed as a triggering mechanism for the aggregation of platelets by means of inducing patchy areas of endocardial fibrosis and formation of thrombi in these endomyocardial areas (12). ECG in this patient was unremarkable, and he did not describe any episode of chest pain.

First line treatment for a LV thrombus is anticoagulation, although a mobile thrombus presented as an embolic complication, as in this case often requires urgent surgical resection.

In conclusion we report a successful resection of LV thrombus present toward the apex attached to the interventricular septum with the presumptive preoperative diagnosis of myxoma through the mitral valve, via the transeptal approach. The patient was discharged home in good condition.

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