The Early Presentation of Atrial Myxoma with Acute Myocardial Infarction

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Atrial myxoma as a rare benign heart tumor can cause acute coronary syndrome via coronary embolization. In this report, we present a 54-year-old woman who presented with acute inferior myocardial infarction. In further evaluation a 2.5×3×4 cm mass was found in the left atrium. The mass was excised surgically and its pathology was compatible with myxoma. After resection, the patient was discharged with a favorable outcome.

Keywords: Myocardial infarction • myxoma

Introduction

Primary cardiac tumors are extremely rare. As an example, in one series of over 12,000 autopsies, only seven were identified, for an incidence of less than 0.1%. By comparison, metastatic involvement of the heart is over 20 times more common, and has been reported in autopsy series in up to one in five patients dying of cancer. Cardiac myxoma, a histologically benign tumor of the heart, make up more than 50% of primary cardiac neoplasms. Histologically, these tumors are composed of scattered cells within a mucopolysaccharide stroma. Myxomas produce vascular endothelial growth factor, which probably contributes to the induction of angiogenesis and the early stages of tumor growth.

Most of these tumors are diagnosed by history, physical findings, electrocardiography, or their complications. They can mimic a great variety of cardiovascular and noncardiac diseases. The mean age at the time of presentation in patients with sporadic myxoma is 50 years and two thirds of patients are females.

The tumors arising in the left atrium tend to grow into the atrial lumen and cause symptoms by obstructing the blood flow or creating mitral regurgitation. The most common initial manifestations of myxoma include dyspnea, palpitation, chest pain, signs of embolism, symptoms of congestive heart failure because of cardiac obstruction, and systemic rheumatism depending on the localization, size, and humoral activity of the tumor. Except systemic symptoms such as fever and weight loss, other symptoms are determined by localization and size of the myxoma. Rheumatic symptoms occur in 65 – 90% of patients and are reported to be due to production of interleukin-6. The results of surgical resection are generally very good. In most series operative mortality rates have been reported below 5%.

Acute myocardial infarction (MI) as the first manifestation of the left atrial myxoma is rare. Also, the age at presentation and the symptoms of atrial myxomas and coronary artery disease (CAD) can be similar.

Kamata et al reported 16 patients who underwent surgical excision of the left atrial myxoma. Systemic embolization occurred in ten patients (63%) before surgery; in five patients embolic events were the first manifestation of the tumor. Cerebral infarction had developed in seven patients, transient ischemic attacks in two, MI in two, limb ischemia in two, and multiple infarctions in one.
Case Report

Clinical history
A 54-year-old female patient was admitted to Modarress Hospital with presentation of acute onset of compressive retrosternal chest pain associated with nausea, vomiting, and cold sweating. Her pain was radiating to her left arm, started since four hours prior to her admission. In her medical history she gave no history of relevant previous cardiovascular disease. Her family history and habitual history were also unremarkable.

Physical examination
The patient seemed agitated but did not have respiratory distress or cyanosis. Her vital signs were as follows: blood pressure=140/80 mmHg at presentation, respiratory rate=16/minute, and pulse rate=95 beats/minute. Her body mass index was 26. Other physical findings were unremarkable except vaginal examination, which showed clot passing compatible with her menstrual period.

Laboratory findings
Laboratory reports showed: BS=131 mg/dL, urea=13 mg/dL, creatinine=0.86 mg/dL, Na=140 mmol/L, K=5.0 mmol/L, AST=56 U/L, ALT=16 U/L, LDH=317 U/L, CPK=45 U/L, WBC=11100/µL, Hb=13.4 g/dL, MCV=91.3 fl, platelet count=255000/µL, PT=13 seconds, INR=1, PTT=33.6 seconds, ESR=37 mm/hr, uric acid=4.9 mg/dL, TG=76 mg/dL, cholesterol=219 mg/dL, HDL=79.8 mg/dL, LDL=124 mg/dL, total bilirubin=0.5 mg/dL, direct bilirubin=0.2 mg/dL, Ca=8.8 mg/dL, anti-HIV Ab=negative, anti-HCV Ab=negative, and HBs Ag=negative.

Her urine analysis showed: specific gravity=1.010, RBC=2 – 3, WBC=1 – 2, and few bacteria. Her urine culture was reported as no growth after three days.

Her first CK-MB value was 22 U/I and the next values were 32 U/I at two hours after streptokinase injection; 90 U/I, 12 hours later; 75 U/I in the next day, 54 U/I in the second day, and 24.4 U/I in the third day.

Electrocardiography and chest radiography
Electrocardiography showed a normal sinus rhythm with sings of acute inferior and right ventricular infarction. In her chest radiography we found no cardiomegaly or lung field infiltration.

Transthoracic echocardiography
Transthoracic echocardiography showed a good left ventricular function (ejection fraction=50 – 55%), inferior and basal hypokinesia, mild mitral regurgitation, and a left atrial clot bulging to the left ventricle.

Transesophageal echocardiography (TEE) (Figure 1)
A large homogeneous mass was seen at the level of pulmonary vein with extension to the left ventricle. The septum was intact.

Coronary angiography
No evidence of occlusion was found in the angiography, which was performed four days after management for acute MI (Figure 2).

Pathology
The gross finding was a 2.5×3×4 cm piece of soft, gelatinous tissue of polypous structure. Histologic investigation of the tumor demonstrated a myxoma (Figure 3).

Clinical course
After admission, streptokinase (1,500,000 IU) was infused intravenously over one hour and the patient was transferred to the CCU. After diagnosing the myxoma in TEE, the patient was transferred to the Department of Cardiac Surgery in Modarress Hospital and underwent operation with incision of the left atrial wall and posterior to the interatrial groove. The point of attachment of the tumor to the septum was determined by inspection and a sufficient amount of atrial septum was excised to include the tumor attachment. After the tumor was removed, the interior of the left atrium was copiously irrigated with saline to remove any residual tumor fragments. The
specimen was send to pathology department and the suspected atrial myxoma was confirmed by pathologic evaluation. The patient was discharged with a favorable outcome.

Discussion

Cardiac myxoma, the most benign tumor of the heart, can present with variable manifestations, the most common is intracardiac obstruction. Because of the nonspecific presentation of this cardiac tumor, a high index of suspicion is needed. From 1980 through 1992 Mattle et al followed 12 patients with cardiac myxomas for an average of 4.4 years (eight months to 11 years). Presenting symptoms were progressive dyspnea in six patients, neurologic findings in four, peripheral arterial or renal emboli in three, and pulmonary embolism in one.

Coronary emboli as the first presentation of cardiac myxoma is rare. None of the 74 cases of coronary emboli analyzed by Wengner and Bauer in a retrospective autopsy study was due to a myxoma. On the other hand, Braun et al reported a literature search for the years 1970 – 2002 and found about 40 case reports of acute MI because of atrial myxoma. We found six other cases of MI due to atrial myxoma reported in the literature during 2002 – 2006.

Reviewing the reports show that this tumor is more frequent in women but gender per se has no effect on the rate of embolic events.
Both right and left coronary embolism has been documented, although right coronary embolism with inferior MI is more prevalent (20 reports of inferior involvement in comparison with 12 reports of anterior one).\textsuperscript{13} Although inferoposterior involvement has been reported previously,\textsuperscript{16} we found no reports on inferior and right ventricular involvement.

The tendency for embolism into the right coronary could be explained by the angle of the aortic bulb to the horizontal and the right coronary which is caudally sited, so small emboli could be carried into it more easily than into the rostrally sited left coronary artery. Panos and colleagues reported that inferior MI were seen in 63.6% of the cases, anterior infarction in 22.7%, and posterior infarction in 9.1%.\textsuperscript{19} Coronary angiograms showed normal results in 23.8% of the cases, and right coronary artery embolization in 47.6% of the patients with embolism. Those authors have also proposed that the high incidence of embolization to the right coronary artery might have been due to the more conducive position of the right ostium relative to the aortic blood flow.\textsuperscript{19}

Two different types of myxoma have been determined by echocardiography: round with a nonmobile surface, and polypoid that is soft and irregular in shape with a mobile surface. The chance for emboli formation in the second type is more. Thrombolytic therapy usually is not recommended for patients with cardiac myxomas because of the risk of embolism.\textsuperscript{20} There are two possible explanations of why thrombolytic agents cause embolic events: 1) the agents may cause lysis of accumulated thrombus,\textsuperscript{21} and 2) in the presence of hemorrhagic areas and a rich vascular supply, thrombolysis can increase the hemorrhage and can cause the rupture of small fragments.\textsuperscript{20} On the other hand an interesting tendency for spontaneous recanalization has been observed.\textsuperscript{22–24}

In cases of atrial myxoma presenting with acute MI, coronary angiography is mandatory to find the concomitant CAD. Nine out of the 27 cases with documented coronary angiography suffered from extensive MI and greatly raised CK, although their coronaries were totally normal in angiography.\textsuperscript{17} It is reported that the interval between the symptoms and diagnosis plays a role. Hashimoto et al,\textsuperscript{22} Rath et al,\textsuperscript{23} and Soejima et al\textsuperscript{24} suggest that the rate of recanalization is high for coronary embolism from myxomas. After the initial coronary angiography, they followed the clinical course and found in each case that there was complete and spontaneous recanalization of the affected coronary artery within a few days. The histologic composition of myxomas favors the further fragmentation of emboli spontaneously.

After diagnosis of atrial myxoma, immediate operative removal is advisable. For patients aged at least 40, it is advisable to perform coronary angiography preoperatively to find the concomitant CAD, even without cardiovascular risk factors. If the excision of the myxoma is to be performed electively at a later time because of large myocardial necrosis, it would be wise to perform coronary angiography again immediately before the operation, because of the tendency for spontaneous recanalization.

References

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