Left Ventricular Myxoma with Embolization Causes Acute Infrarenal Aortic Occlusion

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Abstract

Keywords

- ▶ left ventricular myxoma
- ▶ aortic occlusion
- ▶ embolization

Atrial myxoma is the most common benign tumor of the heart; moreover, atrial myxoma embolization to the peripheral vessels is rare. We present an unusual case of total acute infrarenal aortic occlusion resulting from embolic implantation from a left ventricular myxoma. A 37-year-old man with acute lower limbs ischemia, spinal cord ischemia, and acute renal insufficiency was urgently operated and discharged after surgery.

The atrial and ventricular myxomas can form emboli large enough to cause vascular occlusion. Peripheral embolization generally results from tumor fragmentation, or from complete tumor detachment, causing syncope, neurologic symptoms, or ischemic limb pain.^{1,2} We present a case of embolization of a left ventricular myxoma resulting in acute infrarenal aortic occlusion.

Case

A 37-year-old man was hospitalized due to sudden back pain and lower extremity paraplegia with sensory loss. On physical examination, the patient had absent bilateral femoral pulses and absent signals by triplex scanning. All lower extremity dermatomes from L3 distally demonstrated dense paraplegia. Computed tomography (CT) angiography revealed total occlusion of infrarenal aorta and the thrombosis of the right renal artery with damage of the right kidney (▶ **Fig. 1**).

Patient was urgently transmitted to the operating room. After unsuccessful embolectomy, exploratory laparotomy was performed. Infrarenal aorta was exposed. The iliac arteries were cross-clamped, and aortic clamp was then placed above the level of the inferior mesenteric artery. On

opening the aorta, a hemorrhagic, partly gelatinous mass was discovered. This mass was adhered to the intima, and a prominent amount of thrombus was noted, with extension into and occlusion of the bilateral iliac arteries. Aortobifemoral bypass was performed with Dacron graft.

In preoperative period and after surgery, patient had complete anuria provoked by the rhabdomyolysis. Due to diagnosis of acute anuric renal failure, the patient started hemodialysis on day 3 after surgery. Triplex study of the legs revealed good permeability of the graft, femoral, popliteal, and tibial arteries and veins. The compartment syndrome of the right leg was successfully treated by tibial fasciotomy.

A transthoracic echocardiogram which was performed 2 days after the aortic operation revealed a 3×3 cm left ventricular mass that was attached to the free wall and extended anteriorly (▶ **Fig. 2**). The patient was readmitted to the operating room 6 days after aortic operation for removal of the left ventricular mass. Under cardiopulmonary bypass, the heart was arrested with cardioplegia. Left ventricle was opened above the level of the apex and total excision of the residual tumor was performed (▶ **Fig. 3**). Satisfactory repair of the left ventricle was performed. The patient was weaned from cardiopulmonary bypass after 35 and 55 minutes total on bypass.

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Fig. 1 Computed tomography angiography revealed infrarenal aortic occlusion and right renal artery thrombosis with failed right kidney.

Renal function was recovered in 20 days after surgery and his paraplegia became reversible after a month. The patient was discharged at the postoperative day 40. The 6 months follow-up was uneventful. The following visits of the patient were monthly. The elements checked during follow-up visits included the patency of the left renal artery and of the aortic bypass recorded by duplex, and renal function.

Fig. 2 Echocardiography revealed residual tumor in the left ventricle.

Fig. 3 The left ventricle is opened above the level of the apex and tumor is removed.

Postoperatively, fractional intravenous heparin for 24 hours was prescribed. Acetylsalicylic acid was used as anti-platelet therapy permanently (100 mg/d).

Microscopic similarities between the lesions removed from abdominal aorta and the left ventricle were identical. The specimen consisted of a gelatinous, focally calcified material. Stellate cells interspersed within an abundant myxoid matrix. Areas of calcification suggested that the lesion was of longstanding. The spinal cord ischemia and extremity paraplegia were a result of the formation of a perimyomatous thrombus that occluded the aortic lumen.

Discussion

Intracardiac myxomas is the most common primary tumor of heart with an estimated incidence of 0.5 per million per year. Most frequently myxomas are localized in the left atrium (80%); 7 to 20% are found in the right atrium and 10% in the ventricles with an approximately equal distribution between the two chambers.^{3,4} Myxomas arise from the endocardium and it is generally believed that they are true neoplasms derived from embryonal rests. They are usually benign.⁴ Although benign lesions, myxoma can by virtue of their location in the blood stream produce significant morbidity in the form of vascular embolism.⁵

Clinically, the lesions can present with obstructive symptoms such as syncope, dyspnea, and transient cyanosis. Congestive heart failure as a result of prolonged outflow compromise may be a primary cause of death.⁶ The use of transesophageal echocardiography is now gaining widespread acceptance as the most useful method for a timely diagnosis.⁷

Patients with diagnosis of a myxoma need early resection because of the high risk of valvular obstruction and embolization.^{8–10} Surgical resection of residual tumor is advocated to avoid recurrence or further embolization.¹¹

Acute aortic occlusion is rare in most of the available literature sources; there are case reports of nonsurgical patients with catastrophic event with 75% mortality and 20 to 50% even after revascularization.¹² Several factors appear to be associated with aortic thrombosis. Surgical manipulation, trauma, fever, thromboembolic disease, dehydration, hypercoagulability, hypotension, atrial fibrillation, neoplasm, and iliac artery occlusive disease have been described.¹³

This syndrome can be mistaken for neurologic disorders and is misdiagnosed in up to 50% of cases presenting with paraplegia.¹⁴ In acute aortic occlusion, paraplegia is caused by occlusion of the aorta above the level of the Adamkiewicz artery, leading to serious cord ischemia and infarction of the peripheral nerves and musculature distal to the occlusion.¹⁵ Aortic occlusion typically presents with intense ischemic pain and a profound systemic response, including tachycardia, diaphoresis, and a mottling of the extremities. CT angiography remains the gold standard modality of diagnosis.¹⁶ Various complications, including renal failure, compartment syndrome, respiratory distress syndrome, myocardial infarction, and disseminated intravascular coagulation were reported.¹⁷

Once the diagnosis is made, anticoagulation should be immediately initiated and urgent revascularization procedures including embolectomy, anatomic or extra-anatomic bypass, and thrombolysis. The choice approach depends on etiology, anatomy, and patient factors.¹² Balloon catheter embolectomy is reasonable in cases where the nature of occlusion is in doubt. For patients with occlusive diseases, the decision must be taken for a bypass procedure. Aortic grafting is probably the operation of choice if the patient can withstand the operation and axillobifemoral bypass is a reasonable alternative in the very high-risk patient. Simple thromboendarterectomy is associated with a high incidence of reocclusion.¹⁸

To the best of our knowledge, this is the first report of the left ventricular myxoma's embolization causing acute infrarenal aortic thrombosis.

Conclusion

Surgical resection of residual tumor of an embolized ventricular myxoma is advocated to avoid recurrence and further embolization.

After surgical intervention of the patient with acute aortic thrombosis, medical treatment should be continued during follow-up as the patient is at high risk of developing other manifestations of aortic thrombotic disease.

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