

## Case Report

### *Uterine Leiomyoma Extending to the Inferior Vena Cava and the Right Atrium*

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#### ABSTRACT

##### CASE PRESENTATION

Metastatic cardiac masses have different primary sites. On rare occasions, uterine tumors are responsible for such masses. We herein describe a woman with a metastatic cardiac mass originating from a benign uterine leiomyoma. The patient had severe and chronic abnormal uterine bleeding, for which she finally referred to our hospital. On admission, she had acute respiratory distress. Echocardiography showed a huge right atrial mass that had occupied most of this atrial space. The mass originated from the inferior vena cava (IVC) and extended across the tricuspid valve to the right ventricle. The mass was successfully resected under cardiopulmonary bypass. Subsequent evaluations, including a pathologic examination, revealed a metastatic uterine leiomyoma extending to the right atrium after invasion into the IVC. (*Iranian Heart Journal 2020; 21(3): 136-140*)

**KEYWORDS:** Cardiac mass, Cardiac surgery, Leiomyoma

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##### CASE REPORT

We herein describe a 36-year-old woman with a long history of excessive abnormal uterine bleeding. The patient referred to our hospital with a complaint of respiratory distress and dyspnea, together with progressive edema in both lower extremities. Transthoracic echocardiography illustrated a huge mobile mass that originated from the inferior vena cava (IVC) and extended to the right atrium. The mass filled a large space in the chamber cavity and also extended across the tricuspid valve to the right ventricle (Fig. 1 & 2). The

instability of the patient's hemodynamic and respiratory status precluded further evaluation and workup before an emergent surgical intervention.

After median sternotomy to open the pericardium, heparin was administered. For the arterial line in cardiopulmonary bypass (CPB), the distal portion of the ascending aorta was used. Nonetheless, for venous drainage, the occlusion of most parts of the IVC lumen made the insertion of the cannula into the IVC impossible. During CPB, the venous return was supplied with a cannula in

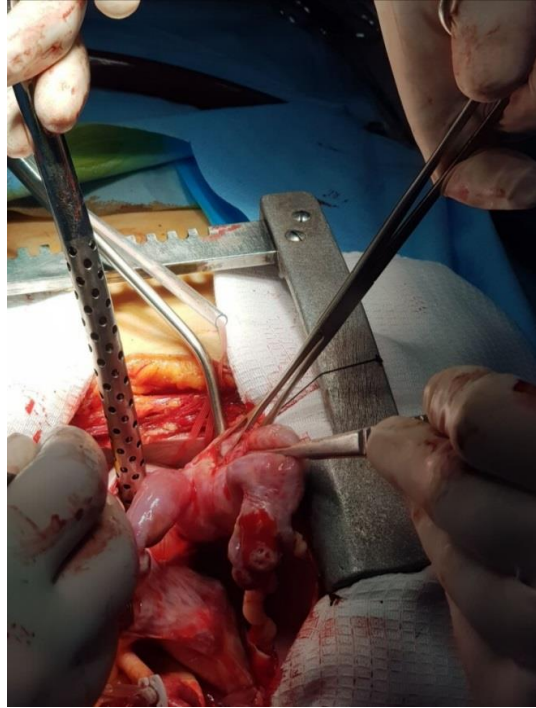
the superior vena cava and also 2 lines for the pump suction in the right atrial cavity after the opening of the right atrium.

A large tumor-like mass that began from the IVC with dense adhesion to the IVC wall and then extended to the right atrium was noted (Fig. 3). A part of the mass had invaded into the right ventricle across the tricuspid valve. During the procedure, the origin of the mass, 5 cm distal to the IVC, was carefully dissected and the mass was removed. Although the remnant of the mass in the IVC was left behind, the other parts of the tumor were removed easily. Next, the right atrium was repaired, and the patient was weaned from CPB without any problems. Nevertheless, due to severe thrombocytopenia (platelet count = 30 000), she suffered severe mediastinal bleeding in the first 24 postprocedural hours, which was managed successfully with blood products.

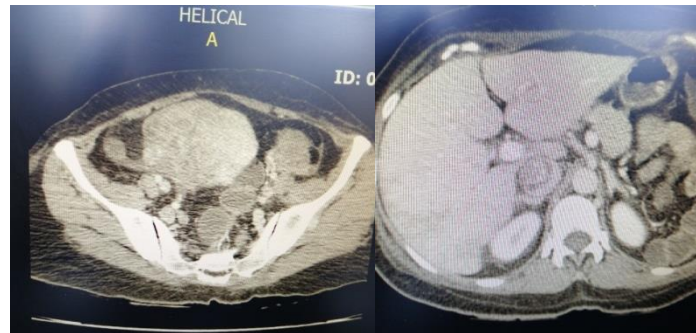
A sample of the cardiac mass was sent to the pathological laboratory for histology study. Two days after the procedure, abdominopelvic computed tomography was performed; it showed a large mass that originated from the uterus and the right ovary and invaded into the IVC before it extended upward into the distal portion of the IVC and the right side of the heart (Fig. 4 & 5). The patient was discharged from the hospital 6 days after surgery in good health status. On follow-up, the pathological examination of the specimen confirmed the mass as a uterine leiomyoma (Fig. 6). The treatment team decided that complete resection of the mass and the residual tumor from the IVC was possible; accordingly, the patient was referred to the department of surgery.



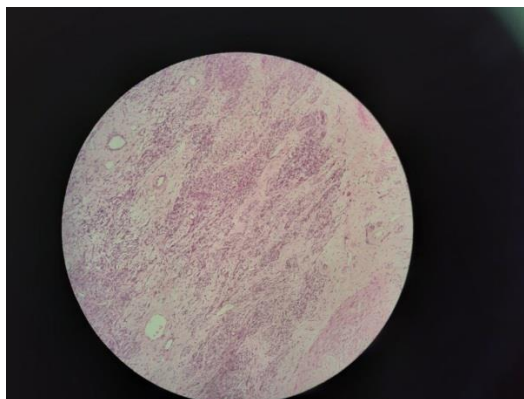
**Figures 1 & 2:** Mass in the right atrium extending to the inferior vena cava and the tricuspid valve



**Figure 3:** Intraoperative view of the mass



**Figures 4 & 5:** Pelvic mass with its origins in the uterus and its invasion into the inferior vena cava



**Figure 6:** Pathologic examination of the metastatic leiomyoma, which involved the right atrium

## DISCUSSION

Cardiac tumors can be divided into primary and secondary tumors. More than 80% of these tumors are secondary and metastatic from a primary site.<sup>1-3</sup> The most common origin for the distal extension of tumors to the heart is renal cell carcinoma, which involves the IVC before extending proximally to the right atrium. After renal cell carcinoma, some other primary regions have also been reported, especially the uterus and ovaries (eg, benign/malignant uterine and ovary tumors).<sup>4-6</sup>

Both benign and malignant tumors of the uterus and ovaries can involve the heart; still, malignant tumors are more common. Although any site of the heart can be involved, the most common site is the right atrium because the majority of the abdominal and pelvic tumors that metastasize to the heart extend from the IVC pathway and involve the right atrium in most cases.<sup>7-9</sup> The presentation of metastatic cardiac tumors is nonspecific and can be different depending on their location and interference with cardiac structures. Cardiac tumors in the right side (ie, the right atrium, right ventricle, tricuspid valve, pulmonary valve, pulmonary artery, superior vena cava, and IVC) usually present with the symptoms and signs of right-sided heart failure with lower extremity swelling, ascites, hepatic congestion, respiratory distress, and the distal embolization of the mass to the pulmonary circulation. Left-sided heart masses can be in the left atrium, left ventricle, mitral valve, and aortic valve; they can manifest themselves with different clinical presentations such as low cardiac output, myocardial infarction, syncope, and cerebrovascular accidents.<sup>10-12</sup>

The diagnosis of metastatic cardiac masses can be established via echocardiography (transthoracic or transesophageal), computed tomography, and magnetic resonance imaging. Surgical intervention on metastatic

cardiac masses is indicated in carefully selected patients faced with life-threatening complications. The curative resection or the complete removal of the mass is usually impossible due to the dense adhesion of the mass to the cardiac structures.<sup>6, 13, 14</sup>

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