# Cardiac Metastasis Secondary to Endometrial Cancer: an Extremely Rare Presentation

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Endometrial malignancy is the most common gynecologic cancer in developed countries.[1] Metastasis to the pelvic and para-aortic nodes is common. The most usual sites for distant metastasis are lungs, liver, brain, and bones.[2] Cardiac metastasis of infradiaphragmatic tumors are much less frequent. We report a very rare case of metastatic cardiac mass involving the right ventricle secondary to endometrial cancer.

## Case presentation

A 70-year-old woman, without known comorbidities, was diagnosed with endometrial adenocarcinoma locally advanced, without any evidence of distant metastases at the initial imaging and clinical evaluation. She was then successfully submitted to the proposed surgical resection of the reproductive pelvic organs with adjuvant chemotherapy (paclitaxel and carboplatin) and radiotherapy treatment.

At the post-operative six months follow-up, multidetector computed tomography (MDCT) angiography revealed (Figures 1 and 2) a bulky and poorly delimited infiltrative lesion, with areas of internal necrosis, affecting the cardiac right ventricle (RV), notably its tip and its lateral and anterior walls, as well as a little portion of the distal interventricular septum, measuring 9.3 x 6.7 x 5.0 cm (mean 8.3 x 6.5 x 3.7 cm). The lesion extended through the whole myocardial thickness, obliterating the apical portion of the RV with protrusion into the pericardial space, associated with moderate pericardial effusion. There was neither evidence of intracavitary thrombi nor of pulmonary embolism. Superior vena cava, inferior vena cava, aorta and pulmonary artery showed normal dimensions and contours. In addition to strongly suggesting cardiac metastatic mass, cranial magnetic resonance imaging (MRI) revealed a gadolinium-enhanced expansive lesion (0.9 cm) at the right temporal lobe, highly suggestive of brain metastasis of the primary endometrial cancer. Surprisingly, there were not any associated specific cardiac or cerebrovascular symptoms or signals. The initial chemotherapy regimen was, then, modified to liposomal doxorubicin and megestrol acetate.

Despite the adequate treatment strategy, the patient passed away nine months after documentation of cardiac metastasis, which was monitored with echocardiogram and MDCT angiography.

## Discussion

Secondary heart tumors are really rare, but are anticipated to increase with extended survival of oncologic patients due to improved diagnostic and therapeutic modalities.[3]

Malignant cells may reach the heart through the hematogenous or lymphatic routes. Cardiac metastases are most frequently secondary to breast, lung, lymphoma, leukemia and melanoma primary cancer sites. Cardiac implants due to infradiaphragmatic tumors are much less frequent.[2] Most of such tumors (over 90%) remain clinically silent and are often only diagnosed post-mortem.[3]

Noninvasive imaging has a crucial role in the diagnosis of cardiac masses. Certain characteristics identified on imaging may help distinguish neoplastic versus non-neoplastic masses and benign versus malignant tumors. Echocardiography remains the first-line method for cardiac mass evaluation due to its widespread availability, lack of iodinated contrast or radiation exposure, and its dynamic assessment of cardiac masses in relation to the surrounding chambers, valves and pericardium. However, it provides limited assessment of soft-tissue characteristics and extracardiac structures and may be limited by poor acoustic windows. Cardiac MRI is often the preferred imaging modality for cardiac masses because of its superior soft-tissue characterization, high temporal resolution, multiplanar imaging capabilities and unrestricted field of view. Cardiac MDCT is a fast imaging technique that provides high-quality images with superior spatial resolution. Compared to other modalities, it is optimal for the evaluation of calcified masses, global assessment of the chest and lung tissue and corresponding vascular structures, and for ruling out obstructive coronary artery disease or masses which involve the coronary arteries. Cardiac MDCT is also useful to detect metastasis in suspected malignancies especially when coupled with $^{18}$F-fluorodeoxyglucose (FDG) positron emission tomography (PET), whose ability to detect increased metabolism of glucose may help distinguish malignancy from a benign neoplasm.[4]

Although in this case the metastasis was diagnosed in short-term post-operative follow-up (six months), cardiac metastasis has been reported in long-term postoperative follow-up (>15 years).[5]

## Keywords

Metastasis; Endometrial Neoplasms; Computed Tomography Angiography.

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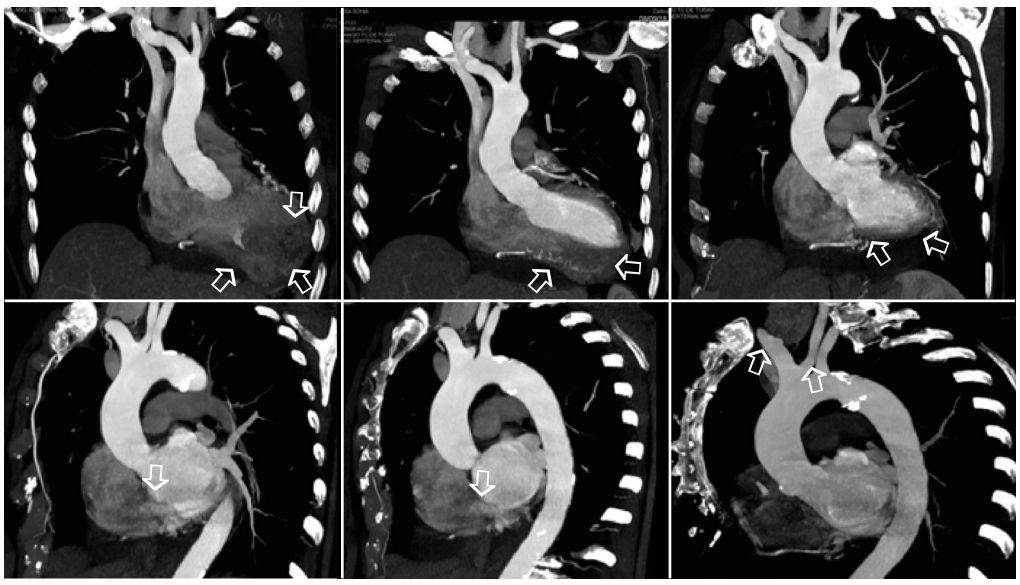

**Figure 1 –** *MDCT angiography: the bulky and poorly delimited infiltrative lesion (white arrows) affecting the RV, notably its tip and its lateral and anterior walls, as well as the distal interventricular septum, extending through the whole myocardium thickness with protrusion into the pericardial space, associated to moderate pericardial effusion. MDCT, multidetector computed tomographic; RV, right ventricle.*

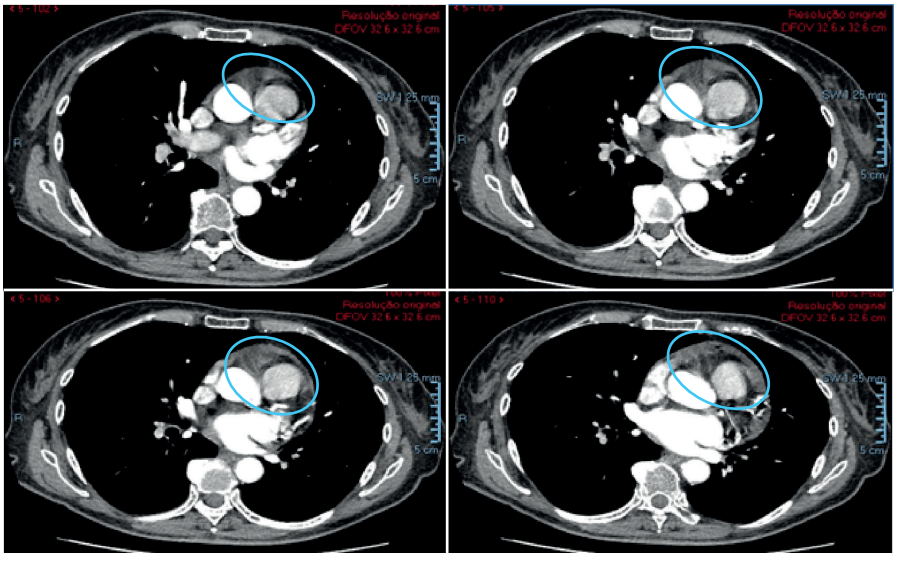

**Figure 2 –** *MDCT angiography: the bulky and poorly delimited infiltrative lesion (blue circles) affecting the RV, notably its tip and its lateral and anterior walls, as well as the distal interventricular septum, extending through the whole myocardium thickness with protrusion into the pericardial space, associated to moderate pericardial effusion. MDCT, multidetector computed tomographic; RV, right ventricle.*

As the histopathological analysis of the cardiac mass was not performed in this case, it is not completely possible to rule out the very low possibility of other pathologies, such as a fast-growing primary cardiac tumor or a secondary lesion from a different primary site. Nevertheless, in this scenario of primary endometrial adenocarcinoma with rapid distant spread by imaging screening, this bulky and poorly delimited infiltrative cardiac lesion was strongly compatible with metastasis from the endometrial malignancy.

## Authors' contributions

Oliveira MDP, Florenzano MT, Santos LF, Navarro PLB, Signorini Filho RC. Acquisition of data: Oliveira

MDP, Florenzano, Santos LF, Navarro PLB, Signorini Filho RC. Analysis and interpretation of the data: Oliveira MDP, Florenzano, Santos LF, Navarro PLB, Signorini Filho RC. Writing the manuscript: Oliveira MDP. Critical revision of the manuscript for important intellectual content: Oliveira MDP, Florenzano, Santos LF, Navarro PLB, Signorini Filho RC.

### Potential Conflicts of Interest

There are no relevant conflicts of interest.

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