



Case Report

Cardiac metastasis of uterine cervical squamous cell carcinoma: A case report and review of the literature



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ABSTRACT

A 48-year-old woman was referred to the cardiology department due to a large mobile mass in the right ventricle. The patient had undergone radical hysterectomy and bilateral salpingo-oophorectomy for a uterine squamous cell carcinoma approximately 3.5 years before. In order to protect the patient from circulatory collapse, the intracardiac mass was resected surgically. A diagnosis of cardiac metastasis of the uterine cervical squamous cell carcinoma was confirmed histologically. Herein we discuss the possible therapeutic approach to and prognosis of this rare condition by reviewing 24 papers on intracardiac uterine cancer metastasis published in the past 10 years.

<Learning objective: A woman who had undergone radical hysterectomy and bilateral salpingo-oophorectomy for a uterine squamous cell carcinoma 3.5 years before was referred to the cardiology department due to a large mass in the right ventricle. The diagnosis of cardiac metastasis of the uterine cervical squamous cell carcinoma was confirmed histologically. Although metastasis of cervical carcinoma to the cardiac cavity is rare, we should not overlook this possibility during the post-operative patient follow-up.>

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Introduction

Metastasis of malignancies into the heart may also develop, albeit at a low reported frequency of 1.6–8% [1]. This frequency might be underestimated, however, because cardiac metastasis often remains clinically silent, leading to a difficulty of diagnosis during life. In fact, cardiac metastasis has been reported to increase to a frequency of 10–20% among cases with known malignancies during autopsy [2]. Metastasis of cervical cancer occurs usually to the liver, bone, brain, lung, and supraclavicular lymph nodes [3]. It

may occur to the heart, although far less frequently. Herein, we present the case of a 48-year-old woman who was diagnosed to have metastasis of the cervical cancer into the right ventricle 3.5 years after the resection of the primary lesion.

Case report

A 48-year-old woman was referred to our cardiology department for the diagnosis and treatment of a cardiac mass in the right ventricle. The patient had been diagnosed with cervical cancer four years before. After chemotherapy by the BOAI (balloon-occluded arterial infusion) method with cisplatin and CPT-11, the patient underwent radical hysterectomy and bilateral salpingo-oophorectomy (Table 1) under the diagnosis of cervical cancer (FIGO IIA2). A post-operation diagnosis of pT2aN1M0 squamous cell carcinoma was made, and chemoradiation therapy was performed.

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Table 1 Summary of treatments for uterine carcinoma.		
Year	Month	Treatment for the uterine carcinoma
2010	February	Diagnosis of uterine cervical squamous cell carcinoma (stage IIA2) Preoperative chemotherapy (2 courses: BOAI of CDDP and CPT-11)
	May	Radical hysterectomy and bilateral salpingo-oophorectomy Postoperative chemotherapy (5 courses: CDDP), Pelvic radiation therapy
2011	January	Radiation for paraaortic lymph node metastasis
	June	Left supraclavicular lymph node metastasis by FDG-PET/CT Chemotherapy (6 courses: CDDP and CPT-11)
2012	March	Chemotherapy (9 courses: CBDCA and PTX)
2013	January	Radiation to the left supraclavicular lymph nodes
	December	Tumor marker elevation (SCC 6.2 ng/mL) ¹⁸ F-FDG uptake in the right ventricle and diagnosis of the intracardiac mass Surgical resection of the intracardiac mass
2014	February	Radiation for heart and mediastinal lymph nodes
	March	Chemotherapy (CBDCA and PTX)

BOAI: balloon-occluded arterial infusion chemotherapy; FDG-PET: fluorodeoxyglucose-positron emission tomography; CDDP: cisplatin; CPT-11: irinotecan; CBDCA: carboplatin; PTX: paclitaxel.

Metastasis to the paraaortic lymph nodes (11 months later) and to the left subclavian lymph nodes (1.5 years later) was subsequently diagnosed after the initial diagnosis, and thus, chemo- and/or radiation therapy was performed. It was found that serum levels of a tumor marker, squamous cell carcinoma (SCC) antigen, were gradually increasing after the initial diagnosis (SCC 6.2 ng/mL 44-months post-operation). Despite searching for possible tumor recurrence, no obvious local recurrence of metastasis was evident; therefore ¹⁸F-fluorodeoxyglucose (¹⁸F-FDG) positron emission tomography (PET)/computed tomography (CT) was performed that illustrated enhanced ¹⁸F-FDG uptake within the right ventricle (RV) (Fig. 1A and B, arrows). Echocardiography demonstrated a tumorous lesion of 3.7 cm × 1.9 cm in the RV, which seemed to be attached to the free wall of the RV (Fig. 1C, arrow).

On admission, the patient exhibited normal sinus rhythm (75 beats per minute) and systolic blood pressure (122/75 mmHg). The patient did not have exertional dyspnea and the blood oxygen saturation (SpO₂) was 98% on room air. On echocardiography, left ventricular diastolic and systolic dimensions, and left ventricular

ejection fraction were 41 mm, 25 mm, and 71%, respectively. Right ventricular was not enlarged, with the dimension of 28 mm × 31 mm. Tricuspid regurgitation was only trivial and the echocardiographic estimate of right ventricular systolic pressure was 36.1 mmHg. A chest roentgenogram showed normal cardiac size and electrocardiography showed normal sinus rhythm with mild ST-T abnormalities in leads II, III, and aVF (Fig. 1D). No abnormal cardiac sounds or murmurs could be auscultated. Contrast enhanced CT showed that peripheral pulmonary artery embolization (Fig. 1E, arrows), in addition to the intraventricular mass, and cardiac magnetic resonance (MR) demonstrated a tumor in the RV that was attached to the free wall and/or apex. On MR imaging, contrast enhancement of the tumor was weaker than that of the myocardium.

Laboratory studies showed a white blood cell count of 5660 cells/μL, a hemoglobin level of 12.1 g/dL, a platelet count of 74 × 10⁴ cells/μL, and a C-reactive protein concentration of 0.12 mg/dL; and the D-dimer level was elevated to 2.8 μg/mL. Coronary angiograms showed no apparent coronary artery stenosis, but small-diameter arteries that might be feeding the intraventricular tumor were observed (data not shown).

Under the tentative diagnosis of metastatic cardiac malignancy, a surgical approach was selected for the purpose of prevention of a further embolic episode, right ventricular collapse, or sudden death due to the large mass dislodging. The operation was carried out on cardiopulmonary bypass through a median sternotomy. The tumor was observed to be located in the RV, attached to the base of the anterior papillary muscle of the tricuspid valve (Fig. 2A). The tumor was considered to have widely invaded the neighboring myocardium; therefore, it could not be completely resected from the heart. The resected mass was histologically confirmed as a metastatic squamous cell carcinoma surrounded by eosinophilic amorphous necrotic tissue (Fig. 2B and C). The cardio-pulmonary bypass time was 7.3 h and bleeding 40 mL. The length-of-stay in the intensive care unit was 2 days, and the patient was discharged uneventfully 25 days after the surgery. The patient received radiation therapy (total dose of 450 Gy) that started 5 weeks after the surgery. In addition, the patient is receiving chemotherapy (combined therapy with paclitaxel and carboplatin). At the moment, 5.5 months has passed, without any significant events, since the patient was discharged from our hospital. The patient has been continuing chemotherapy and is still under careful observation, because her prognosis with metastatic intracardiac lesions is considered to be poor.

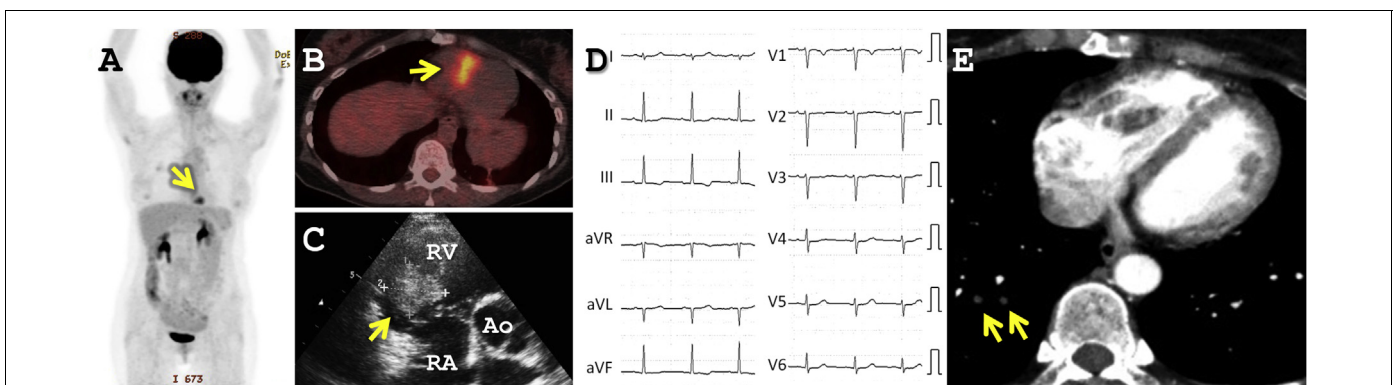


Fig. 1. Clinical images and electrocardiogram. (A) Whole body ¹⁸F-fluorodeoxyglucose positron emission tomography (¹⁸F-FDG-PET). Increased uptake in the heart was observed (arrow). (B) Transverse section of the PET-computed tomographic (CT) merged image. Increased FDG uptake is observed in the heart (arrow). (C) Echocardiography. A tumorous lesion is observed in the right ventricle (arrow). (D) Electrocardiogram obtained on admission. Slight abnormalities in ST-T segments were observed. (E) The CT image showed pulmonary artery embolization (arrows) and mass lesion in the right ventricle.

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