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Cardiovascular Pathology 18 (2009) 178 – 182

CARDIOVASCULAR PATHOLOGY

Case Report

Endometrial adenocarcinoma metastatic to the right ventricle: a case report and review of the literature

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Received 26 October 2007; received in revised form 10 November 2007; accepted 11 December 2007

Abstract

Background: Endometrial adenocarcinoma of any histologic type rarely metastasizes to the heart. Only three such metastases to the myocardium and three to the pericardium have been reported antemortem in the literature. The rarity of this metastasis is likely explained by the relative avascularity of the endocardium and velocity of blood. **Methods and Results:** A 62-year-old female was admitted for increasing shortness of breath over the previous month. Her past medical history was significant for a resected Stage IC endometrial adenocarcinoma endometrioid type 15 months prior. The tumor was found to be a poorly differentiated (Grade 3) endometrial adenocarcinoma invading over half the myometrium. The periaortic and pelvic lymph nodes as well as the cervix and pelvic organs were free of tumor. The patient was later treated with adjuvant external beam radiotherapy. An echocardiogram demonstrated a large right ventricular mass. Subsequent endocardial biopsy showed a poorly differentiated, Grade 3, endometrial adenocarcinoma of endometrioid histologic type. The tumor was deemed inoperable given its size and vast involvement of the myocardium so palliative care was provided and the patient expired 17 days later. **Conclusion:** Management of metastatic adenocarcinoma to the heart is not well established due to the rarity of this lesion. Previously reported cases vary in the therapeutic approach as well as the outcome. To this date the best outcome has been a survival of 6 years after treatment of the metastasis with radiotherapy and concurrent cisplatin and pegylated liposomal doxorubicin. © 2009 Elsevier Inc. All rights reserved.

Keywords: Endometrium; Adenocarcinoma; Cardiac; Ventricle; Metastasis; Mass; Cancer

1. Case

1.1. Materials and methods

We report the case of a 62-year-old white female seen for increasing shortness of breath of 1 month duration. Fifteen months earlier she was diagnosed with Grade 3 endometrial adenocarcinoma endometrioid type. This cancer involved the outer half of the myometrium and was staged as IC. At that time, the patient was staged and treated with total abdominal hysterectomy, bilateral salpingo-oophorectomy, pelvic node dissection, peritoneal washings, and was given adjuvant radiotherapy. Initial histologic studies showed no evidence of serosal, cervical, extra-uterine pelvic organ or periaortic and pelvic lymph node involvement, and peritoneal washings were negative for malignancy. Adjuvant external beam radiotherapy was given first with 4500 cGy to pelvis and vagina over a 1-month period, and an extra 540 cGy to the pelvis later.

Physical examination on admission revealed edema of the lower extremities, an S3 heart sound, a 3/6 pulmonic pansystolic murmur, and irregular pulse. Her baseline rhythm varied from atrial fibrillation to junctional escape with a right bundle branch block. Echocardiography demonstrated a right ventricular mass involving the tricuspid valve with severe tricuspid regurgitation (Fig. 1). This finding was confirmed by CT angiogram shown in both axial (Fig. 2A) and computerized reconstruction views (Fig. 2B). The mass measured 10.5×7×5 cm arising from the right ventricle with little distinction from the ventricular myocardium. An endocardial biopsy was performed confirming the

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doi:10.1016/j.carpath.2007.12.007

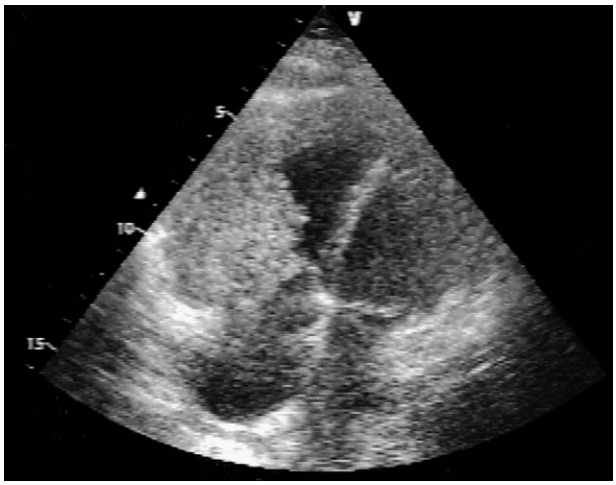

Fig. 1. Transthoracic echocardiogram showing right ventricular mass occupying most of the cavity.

diagnosis of endometrial adenocarcinoma, and further metastatic workup was negative.

The patient's hospital stay was complicated by rapid deterioration of her cardiovascular status. The patient died due to heart failure 17 days after presentation.

2. Results

2.1. Histologic findings

Endocardial biopsy of the mass revealed a poorly differentiated (Grade 3) endometrioid-type endometrial adenocarcinoma.

Microscopic examination of multiple biopsies showed malignant tumor. In some areas, there were epithelioid cells and in other areas, the cells certainly became more spindled. Focal myxoid change was apparent. No definite gland formation was appreciated (Fig. 3A). The neoplastic cells had enlarged rounded to irregular nuclei with prominent macronucleoli and abundant spindled to epithelioid cytoplasm. Mitotic figures were numerous and sometimes abnormal (Fig. 3B).

2.2. Immunohistochemical findings

The immunostains showed that the tumor cells were strongly positive for cytokeratin (Fig. 4A). They were also positive for vimentin (Fig. 4B) and showed scattered positivity with CD68. The negative stains included desmin, leukocyte common antigen S-100, CD34, and actin (Fig. 5).

3. Discussion

Metastatic tumors to the heart are far more common than primary ones with an incidence historically reported between 1.3% and 20.6%, and are 30–40 times more common than primary malignant heart tumors [1–11]. Malignant neoplasias from any organ can potentially metastasize to the heart and pericardium [6,12]. The first reported case of myocardial metastasis was reported by Rösler in 1924, who described bundle involvement in a patient with slow ventricular rate and high atrial rate [5].

Carcinomas, melanomas, leukemias, and lymphomas are the most common metastatic cancers to the heart [3–5,7,11–15]. Carcinomas of the lung, breast, and esophagus top the list. Metastases to the heart from the urinary and reproductive systems of males and females have been documented. Primary malignancies from the ovaries, testicles, bladder, cervix, and endometrium have also been reported [4,6,7,15–19]. Endometrial adenocarcinoma metastatic to the heart is rare, described by Hayashi et al. [18] as less than 0.3% of cases. Greenwald et al. [20] reported 6 of 1100 cases of gynecological cancers to have metastasis to the

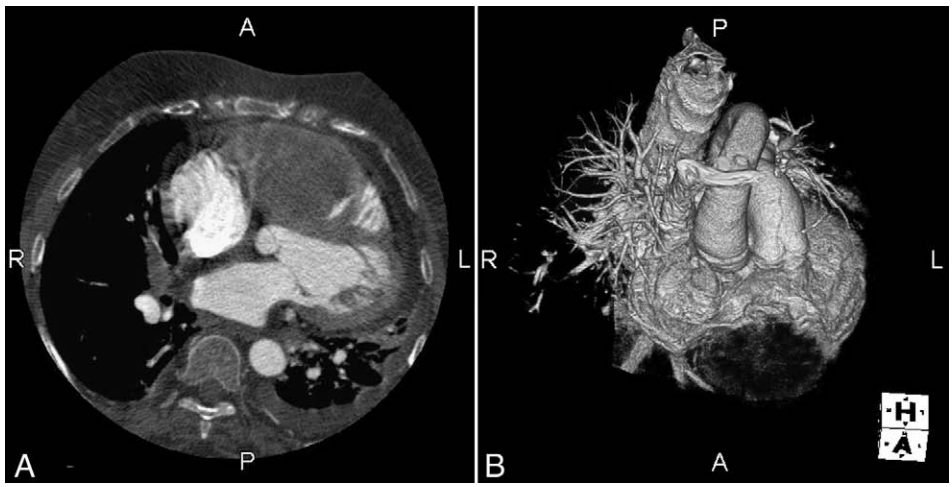

Fig. 2. (A) Computed tomography showing relation of mass to the right ventricular wall and septum. (B) Three-dimensional computed tomography reconstruction of intraventricular metastasis.

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