

# Cardiac metastasis from carcinoma of the cervix

## Case Report

Nadereh Behtash\*<sup>1</sup>, Haleh Ayatollahi<sup>1</sup>, Fereshteh Fakor<sup>1</sup>, Morteza M Dini<sup>2</sup>

<sup>1</sup>Gynecology Oncology Department, Vali –Asr Hospital, Tehran University of Medical Sciences, Keshavarz Blvd., Tehran 14194, Iran

<sup>2</sup>Gynecologic Oncology, Advocate Illinois Masonic, Medical Center, Rush Medical College, 836 Wellington Chicago IL 60657

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**\*Correspondence:** Nadereh Behtash, Associate Professor, Gynecologist Oncologist, Tehran University of Medical Sciences. Gynecology Oncology Department, Vali-e-Asr Hospital, Imam Khomeini Hospital Complex, Keshavarz Blvd., Tehran 14194, Iran. Phone: #98-21-6939320, Fax: #98-21-6937321, E-mail: valrec2@yahoo.com, nadbehtash@yahoo.com

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## Summary

The presence of cardiac metastasis from cervical carcinoma is extremely rare. Most of the cases were diagnosed postmortem. There are a few cases of premortem diagnosis and it is believed that in these cases, the prognosis is extremely poor. We present the only case of premortem diagnosis of cardiac metastasis of more than 500 cases of cervical carcinoma in our center during the last 10 years. We present a 59 years-old woman with multiple ventricular metastasis from cervical carcinoma, 2.5 years after the primary diagnosis. She died 10 days after echocardiographic diagnosis of multiple metastatic lesions in heart, following a massive DIC. The rapidly progressive DIC, and death, in the presenting case, confirms the previous finding of poor prognosis of patients (pts) with premortem diagnosis of cardiac metastasis of cervical carcinoma.

## I. Introduction

Cervical carcinoma is the 3<sup>rd</sup> most common cancers in women throughout the world (Disaia and Creasman, 2002).

In contrast to the industrialized world, cancer of the cervix remains the primary cancer killer of women in third-world countries (Disaia and Creasman, 2002).

The incidence of cardiac metastases at autopsy ranges from 15% to 20% (mean 6%) in patients with malignant diseases (Abraham, 1990; MacGee, 1991; Lam et al, 1993). Carcinoma of the lung and breast, malignant melanoma, lymphoma, and leukemias rank among the most common tumors associated with this condition (Nelson and Rose, 1993; Shulman et al, 1997). The most common sites of extrapelvic metastasis in cervical carcinoma are lung, bone, cervical or supracervical lymph node (Brenner, 1982). The presence of cardiac metastases from cervical carcinoma is rare (1.8-3%) (Disaia and Creasman, 2002).

Only with a high index of suspicion, it is possible to make a diagnosis antemortem. It is believed that, when present, cardiac metastasis from cervical carcinoma represents a rapidly fatal condition (Jamshed et al, 1996). Presented here is a case of right ventricular metastases from a stage IIa cervical carcinoma, who died rapidly after

diagnosis.

## II. Case

A 59 year-old female, Gravida 8 Para 7 had been referred to Gynecology Oncologic service in Vali Asr University Hospital in January 1999. She had postmenopausal bleeding for almost 2 years. In pelvic exam, there was a large firm endophytic tumoral cervical mass measured 45mm diameter. Biopsy showed SCC (squamous cell carcinoma).

She underwent a class III Rutledge Radical Hysterectomy and pelvic and paraaortic lymphadenectomy and upper vaginectomy in February /99 following 3 courses of neoadjuvant chemotherapy (Bulky stage IIa) with vincristin plus cisplatin. Preoperative metastatic work up revealed no abnormal findings in pelvic and abdominal CT scan, and chest XR. Pathologic report showed involvement of one iliac node and lower segment of uterus, vaginal margin and parametrium were free of tumor. She had normal pelvic exam, pap smear ,chest XR and CT , and pelvic CT in follow-up period of 24 months. In early postoperative visits, she had some urinary retention symptoms, responded to antibiotic therapy. In June 2001, she was hospitalized with intractable cough, Chest XR and bronchoscopy showed no abnormal finding.

Her respiratory symptoms diminished after medical management for asthma. The patient did well until she started to develop dyspnea, weakness and lower limb edema in early September 2001. Again admitted to the hospital, abdominal and pelvic CT showed free fluid in pelvis. Echocardiography revealed multiple right ventricular tumors (**Figure 1**). This was believed to be consistent with a myocardial metastasis. A few days later, the patient, deteriorated rapidly and developed DIC, cerebral hemorrhage and coma, she died on September 2001 one week from diagnosis of cardiac metastasis.

### III. Discussion

Cardiac metastasis from malignant neoplasm was first described by Bonet in 1700, but the first antemortem diagnosis of cardiac metastasis was not made until 1924 (Hanfling, 1960). Of all malignancies involving the heart, more than 96% are metastatic compared to primary (Lam et al, 1993; Nelson and Rose, 1993). The incidence of cardiac metastasis from carcinoma has increased from 1% in 1891 to 12% in 1953 and has remained stable at about 10-15% since that time (Prichard, 1951; Murphy et al, 1986). It seems the more sophisticated diagnostic techniques, are the main cause of this increasing incidence. Because Patient live longer from their primary malignancy with metastatic disease in other sites controlled, less common sites of metastatic involvement have become evident. A number of theories have been advanced to explain routes of involvement of the heart by metastatic carcinoma. These include embolic tumor emptying into right side of the heart, other mechanisms include direct invasion through either direct extension through the lymphatics of the heart and mediastinal nodes

or retrograde lymphatic flow (Murphy et al, 1986; Kountz, 1993). The occurrences of cardiac metastasis in general are a relatively rare event. Prichard suggested four factors possibly contributing to the low incidence of cardiac metastasis: 1- The strong kneading action of the myocardium, 2- metabolic peculiarities of striated muscle 3- the rapid flow of blood through the heart and 4- lymph flow normally moving away from the heart (Prichard, 1951).

The incidence of heart metastases in two most large series, was 10.7%-11.6% in all kinds of human malignancies (Burke and Virmari, 1996; Senzaki et al, 1999).

The literature lists breast, lung, lymphoma, leukemia and melanoma as the most frequent primary sites (Nelson and Rose, 1993; Shulman et al, 1997). The most common location of cardiac involvement is the pericardium and an endocardium site is very rare (Burke and Virmari, 1996). The right side of the heart is more commonly involved than the left side, probably due to direct seeding of the heart by microemboli from lymphatics and venous return (Yanuck et al, 1991).

One of cardinal feature involving diagnosis of metastatic carcinoma to the heart is that there is no early symptom, this was the same as for our patient, she had respiratory problems and intractable cough for more than 4 months. As the condition progresses, however, patients will typically complain of dyspnea. Other symptoms include: pericardial effusion, pericarditis, cardiac tamponade, arrhythmias and sudden death (Yanuck et al, 1991; Kountz, 1993; Okamoto et al, 1993). The diagnosis is usually made only by a strong index of suspicion.



**Figure 1.** Echocardiography showing right ventricular tumor

**Table 1.** Cases of reported premortem diagnosis of cardiac metastasis from cervical carcinoma

Year	Age (Years)	Stage	Histology & type	Symptom	Prognosis
Charles et al, 1977	46	IIIb	SCC	Dyspnea	8m
Richter and Yon, 1979	33	IIB	SCCII	Shortness of breath	15d
Krivokapich et al, 1981	32	IIB	SCCIII	Dyspnea	9m
Itoh et al, 1984	64	IIa	SCCI	Shortness of breath	10d
Yanuck et al, 1991	43	Ib	SCCIII	Chest pain	5m
Okamoto et al, 1993	49	IIa	SCCIII	Dyspnea	9m
Lee and Fisher, 1989	42	IIIb	SCCII	Dyspnea	5d
Lee and Fisher, 1989	37	IIIb	SCC	Cough and dyspnea	3m
Hsuj et al, 1992	36	Ib	SCC	Shortness of breath	9m
Kountz, 1993	28	IIB	SCCI	Ileus	3m
Nelson and Rose, 1993	61	IIIb	SCC	Shortness of breath	12m
Nelson and Rose, 1993	51	IV	SCC	Dyspnea	4m
Jamshed et al, 1996	57	Ib	SCCIII	Cough and dyspnea	5m
Ando et al, 1997	41	IIB	SCCI	Abdominal pain	17m
Lemus et al, 1998	53	Ib	SCCIII	Shortness of breath	1m
Lemus et al, 1998	49	Ib	SCC	Dyspnea	7m
Senzaki et al, 1999	28	Ib	SCCII	Dyspnea	18m
Chiou et al, 1999	56	III	SCC	Cough and dyspnea	Died suddenly
Harvey et al, 2000	44	Ib	SCC	Shortness of breath	8m
Iwaki et al, 2001	49	IIa	SCC	Cough and low grade Fever	2m
Yasuda et al, 2002	38	IIB	SCC	Dyspnea	2m
Inamura et al 2004	58	Ib	SCC	Dyspnea	4m
Behdash et al 2004	59	IIB	SCC	Cough and dyspnea	Died suddenly

Chest X- ray finding, can include pleural effusion and cardiomegaly, though the latter can be absent in cases of endomyocardial metastases, as with our patient. Other helpful diagnostic clues are electrocardiographic changes, echocardiography, cardiac catheterization, CT scanning, MRI scanning and transvenous biopsy (Hanfling, 1960; Cacciapuoti et al, 1988; Lee and Fisher, 1989; Shulman et al, 1997).

One report of 1100 gynecologic cancer patients revealed only 6 cases of cardiac metastases (Greenwald, 1980).

The first antemortem diagnosis for cervical carcinoma was made by Charles et al, (1977). Badib and colleagues reported cases of cardiac metastasis from 278 consecutive autopsy cases with the carcinoma of the uterine cervix (Badib et al, 1968). Antemortem diagnosis of cervical carcinoma metastatic to the heart is, however extremely rare, with only a few cases reported (Table 1).

Interestingly, in many cases of heart metastases from cervical carcinoma, the tumor metastasizes only to the right ventricle, and no other site (including the lung) just the same as our case.

A review of the English language literature revealed that 22 cases of antemortem diagnosis of cardiac metastasis from cervical carcinoma have been described (Table 1).

The mean age of these patients is 45 years (range 28-64). The clinical stage was Ib in 7 cases, IIa in 3 cases, IIB in 6 cases, III in 5 cases, IV in 2 cases. The stage of the disease at initial presentation does not predict the future development of cardiac metastasis. The common symptom was shortness of breath and dyspnea (78%).

The prognosis of these cases was poor. Patient died

on average of 5/5 month after diagnosis.

In conclusion we report a case of stage IIa squamous cell carcinoma of the cervix, in a 59 year-old woman. She underwent a radical hysterectomy after 3 courses of neoadjuvant chemotherapy and presented with a long standing intractable cough and finally dyspnea 30 months after primary diagnosis. She died rapidly after echocardiographic diagnosis. Imaging investigations showed no other site of metastasis (Ando et al, 1997).

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