

Thoracic metastases from breast cancer: A single-institution's experience

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Summary

Objective: Thoracic metastasis from breast cancer (TMBC) is a relatively uncommon condition, and few reports of its therapeutic palliation and patient outcomes exist. We therefore reviewed retrospectively our radiotherapeutic experience of TMBC.

Methods: Between 1981 and 2003, 19 patients were treated with radiation (with doses ranging from 10 Gy to 50 Gy) for palliation of TMBC.

Results: The mean age was 55.4 years. Mediastinal lymph node disease was the most common form of TMBC. TMBC developed within five years of breast cancer diagnoses in 11 patients (58%). Among the evaluable symptomatic individuals, subjective palliation was complete in 78% of the cases. The complete objective response (e.g., complete resolution of clinically manifested superior vena caval obstruction or imaging-demonstrated atelectasis) rate was 50%. There was no significant difference in survival between patients presenting with airway obstruction and women who were not in respiratory distress, asymptomatic and symptomatic patients, and women with and without concurrent extrathoracic metastases.

Conclusion: Although the prognosis of women with TMBC was quite ominous, radiotherapy should be considered in very symptomatic patients because justifiable palliation can be effected in some individuals.

Key words: Breast cancer; Radiotherapy; Thoracic metastasis.

Introduction

Because thoracic metastasis from breast cancer (TMBC) is usually regarded as stage IV disease, a policy of palliative radiotherapy for management of symptomatic patients is reasonable. The intention of this policy, symptom relief, is laudable, but does radiotherapy accomplish this goal in these patients? We retrospectively reviewed our radiotherapeutic experience of this select cohort of individuals (with TMBC) in order to assess patient outcome and whether the intended effect was achieved.

Materials and Methods

The cases of 1,968 women with a histologic diagnosis of breast cancer between 1981 and 2003 were examined for the development of TMBC. Nineteen patients were identified. For the purpose of this study, we defined TMBC as affection of the lung, pleura, hilar or mediastinal lymph nodes. The lesions were demonstrated mostly on imaging studies (e.g., chest radiograph or computed tomography). The diagnosis of TMBC was based on cytological/histological evidence (10 patients); clinical findings such as the presence of an imaging-shown mediastinal mass with clinically manifested superior vena caval obstruction, bronchoscopy-demonstrated extrinsic compression of an upper lobe bronchus or large supraclavicular mass (4 patients); or a demonstrable hilar/mediastinal tumor with coexisting extrathoracic metastases (5 patients).

All patients had been treated for palliation by conventional megavoltage external beam radiation. The total prescribed dose ranged from 10 Gy to 50 Gy; however, an abbreviated course of radiotherapy (30 Gy/10 fractions) was usually prescribed and given through opposed anterior and posterior portals. The irradiated area encompassed the TMBC lesion(s) including the perceived parasternal mass in a few patients.

Therapeutic response was determined at completion of treatment or several months later. Survival time (measured from the time of TMBC diagnosis until death or last follow-up) was estimated by the product-limit method of Kaplan-Meier. The log-rank test was used to determine the significance of the observed differences between compared clinical features. For the purpose of comparative analysis, a patient was considered as having a mediastinal lesion if she had, aside from the mediastinal tumor, another intrathoracic lesion.

Results

Patient ages ranged from 27 to 80 years (mean, 55.4 years). Five women (26%) were younger than 50 years old, while the remaining 14 patients (74%) were 50 years old or older. Table 1 shows that dyspnea was the most common clinical manifestation of TMBC (experienced by nine women, 47%). A parasternal mass, believed to be an extension of mediastinal disease, was observed in five patients (26%). Imaging findings included mediastinal mass (63%), hilar mass (32%), pleural effusion (26%), atelectasis (16%), and lung mass (11%). The location of TMBC was in accord with the side of the original breast

Table 1. — Manifestations of thoracic metastases from breast cancer.

Patient No.	Symptoms & Signs	Imaging Findings
1.	Dyspnea	Atelectasis, Pleural effusion
2.	Asymptomatic	Mediastinal mass
3.	Dyspnea, Hemoptysis	Hilar mass
4.	Dyspnea	Mediastinal mass
5.	Asymptomatic	Mediastinal mass
6.	Chest pain	Mediastinal Mass
7.	Dyspnea	Hilar mass
8.	Dyspnea	Hilar and mediastinal masses
9.	Superior vena caval obstruction ^a	Mediastinal mass, Pleural effusion
10.	Asymptomatic	Hilar and mediastinal masses
11.	Hemoptysis	Atelectasis, Pleural effusion
12.	Dyspnea	Pleural effusion
13.	Asymptomatic	Mediastinal and lung masses
14.	Asymptomatic	Mediastinal mass
15.	Dyspnea	Atelectasis, Pleural effusion, Hilar mass
16.	Cough	Hilar and lung masses
17.	Dyspnea, Dysphagia	Mediastinal mass
18.	Dyspnea, Superior vena caval obstruction	Mediastinal mass
19.	Chest pain	Mediastinal mass

^aSuperior vena caval obstruction manifestation (facial, neck and upper limb swelling).

tumor in 8 of the 11 assessed women (73%). Among 14 patients assessed for the presence or absence of extrathoracic disease, nine (64%) possessed synchronous, secondary tumors.

The interval between initial diagnosis of breast cancer and appearance of TMBC ranged from 9 to 197 months (mean, 67 months). Eleven women (58%) developed TMBC within five years of primary tumor detection.

Among the evaluable patients, irradiation promoted palliation in some individuals (Table 2). The complete and absent subjective response rates were 78% (7/9) and 22% (2/9) respectively; the complete, partial, and absent objective response rates were correspondingly 50% (6/12), 17% (2/12), and 33% (4/12).

Table 2. — Response to treatment.

Symptoms & Signs	Pretreatment	Post-treatment ^a		
		CR	PR	NR
Cough	(1) [*]	—	—	(1)
Dyspnea	(8)	(7)	—	(1)
Hemoptysis	(1)	(1)	—	—
Superior vena caval obstruction ^b	(1)	(1)	—	—
Parasternal mas	(3)	(1)	—	(2)
Imaging abnormality ^c	(7)	(3)	(2)	(2)

^{*}Evaluable patients; ^{CR} = Complete resolution; ^{PR} = Reduction in size of imaging-shown thoracic metastasis by 50%; ^{NR} = No response; ^bFace, neck, and upper limb swelling; ^cPleural effusion, atelectasis, or mediastinal/lung/hilar mass.

Concerning survival, the observed one-year survival rate was 12% with a median survival time of three months (95% confidence interval of 2 to 6 months). Table

Table 3. — Analysis of prognostic factors in thoracic metastases.

Variable	Median survival in months ^a		p value ^b
Airway obstruction			
Absent (n = 9) ^c	3	(2 to 5)	
Present (n = 10)	3	(2 to 9)	0.92
Symptoms			
Absent (n = 5)	2	0	
Present (n = 14)	3.5	(2 to 6)	0.67
Extrathoracic metastases			
Absent (n = 5)	6	(1 to 5)	
Present (n = 9)	4	(2)	0.38
TMBC site			
Mediastinum (n = 12)	2.5	(2 to 9)	
Other ^d (n = 7)	4	(2 to 6)	0.69

^a() refers to the 95% confidence interval; ^bValue obtained from the log-rank test; ^c() refers to the number of evaluable patients; ^dOther refers to pulmonary, pleural, or hilar location.

3 shows the comparisons between two groups tested for their associations with survival. Analyses failed to reveal a clinical feature which profoundly influenced outcome in these patients with TMBC.

Discussion

A review of our 23-year experience of 1,968 cases of breast cancer yielded 19 women with TMBC (1%).

The present study confirms previous reports [1-5] that 1) the mean age of afflicted patients is usually in the mid-fifties, 2) secondary intrathoracic affection by breast cancer often occurs on the same side as the primary lesion, 3) the majority of TMBC cases appear within five years after the diagnosis of mammary carcinoma, 4) more than half of the patients do not have TMBC as the only site of metastatic disease, and 5) the prognosis for asymptomatic patients is not meaningfully different from that of symptomatic women. In contrast to our finding of the mediastinum being the most commonly affected site in TMBC cases, other investigators [3] saw that many of their patients developed pulmonary or pleural metastases from breast cancer.

In an analysis of causes of death from breast cancer in 161 cases, Hagemester *et al.* [6] found that 26% died of pulmonary insufficiency and "in another 11% of the cases, tumor contributed significantly to ... upper airway obstruction".

The objective of this communication is limited to describing the results of radiotherapy in patients with TMBC. Hence, it is not concerned with a discussion of the merits and demerits of other treatment options for TMBC such as surgery, chemotherapy or hormonal therapy.

A review of published reports regarding irradiation for palliation of TMBC revealed case reports [7, 8] depicting relief of symptoms with the application of radiotherapy.

Despite the particularly grave prognosis associated with TMBC (in this experience), we believe that radiotherapy should be selectively offered to these women because it could prove worthwhile for some of the patients.

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