

Palliative Radiation for Lung Cancer Metastases to the Breast: Two Case Reports

Andreas Rimner, MD, and Kenneth E. Rosenzweig, MD

Metastases from non-small cell lung cancer to the breast represent an unusual diagnosis. We present two cases of metastatic lung cancer to the breast that were treated with palliative radiation with achievement of good local control and symptom relief. We suggest the use of palliative radiation therapy as an effective and simple treatment modality for metastatic disease to the breast.

(*J Thorac Oncol.* 2007;2: 1133–1135)

Breast metastases from non-breast primary tumors are a rare finding. They represent approximately 0.5% to 1.3% of all clinically diagnosed breast tumors. Autopsy series have found a slightly higher incidence (1.7–6.6%) of metastases to the breast. Distant metastases from extramammary primary tumors to the breast are most commonly derived in descending order from malignant melanomas, lymphomas, lung cancer, ovarian carcinoma, soft tissue sarcoma, gastrointestinal and genitourinary tumors.¹ To date, fewer than 500 cases with metastases to the breast have been reported in the literature. Of these, approximately 80 patients had a primary tumor originating in the lung.²

Typically, non-small cell lung cancer (NSCLC) spreads to the brain, skeletal bone, liver, and adrenal glands. In approximately 21% of patients, metastatic disease is found at presentation.³ Rarely does NSCLC metastasize to the skin or breast. Although mammograms or computed tomographic (CT) scans can provide some information for distinguishing primary breast cancer from metastatic disease, pathological examination using fine-needle aspiration is essential for the correct diagnosis of metastases to the breast.⁴

We present two patients who were found to have biopsy-proven lung metastases to the breast. Both women were treated with a course of palliative radiation therapy (RT) using two different fractionation schemes with good local control and symptom relief.

Department of Radiation Oncology, Memorial Sloan-Kettering Cancer Center, New York, New York.

Disclosure: The authors declare no conflict of interest.

Address for correspondence: Kenneth E. Rosenzweig, MD, Department of Radiation Oncology, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021.

Copyright © 2007 by the International Association for the Study of Lung Cancer

ISSN: 1556-0864/07/0212-1133

CASE 1

A 49-year-old woman presented to a local emergency room with acute onset of altered mental status, dyslexia, and a 3-week history of severe left frontal and temporal headaches. Work-up revealed multiple brain lesions on CT and a right upper lobe (RUL) mass on chest radiograph.

The patient underwent a subtotal excision of a left temporal lesion, which was found to be positive for CAM 5.2, chromogranin, and synaptophysin, consistent with metastatic high-grade neuroendocrine carcinoma of the large-cell type. No immunohistochemical staining for ER, PR or TTF-1 was performed because the lesion was most consistent with a primary lung tumor. The patient was treated postoperatively with whole-brain RT to a total dose of 3750 cGy in 15 fractions using Cobalt-60. She tolerated the treatment well, and her neurological symptoms resolved shortly after surgical intervention.

The patient was then started on six cycles of chemotherapy with cisplatin (75 mg/m²) and vinorelbine (30 mg/m²). At 6 months after initial presentation, she developed left breast mastitis in the superior outer quadrant, which was initially treated with dicloxacillin. Physical examination was significant for tenderness on palpation in the superior outer quadrant of the left breast and a mass measuring approximately 6 × 5 × 4 cm without any palpable axillary lymphadenopathy. A CT scan of the chest confirmed a new indistinct nodularity involving the left breast with new left-sided axillary lymphadenopathy, as well as a slight increase in the previously noted RUL mass and a new hepatic nodule (Fig. 1).

Biopsy confirmed metastatic lung cancer to the patient's left breast, histologically similar to the left temporal lobe lesion. She was treated with palliative RT to the left breast via a tangent technique and received a total dose of 4000 cGy in 20 fractions using 6 MV photons. The patient tolerated the treatment well and reported decreased pain in her breast toward the end of treatment. The patient maintained good local control of the left-sided breast mass until her death from progressive metastatic disease 7 months after breast irradiation.

CASE 2

An 81-year old woman presented with a large left-sided pleural effusion. Analysis of the pleural fluid revealed malignant cells consistent with adenocarcinoma. A CT scan of the chest confirmed a left hilar mass extending to the anterior



FIGURE 1. Case 1. Computed tomographic scan of the chest. A left-sided breast mass and right upper lobe lesion are seen.

chest wall with pleural thickening and left hilar and axillary lymphadenopathy. The patient was started on 150 mg erlotinib daily as single-agent therapy and had stable disease for 7 months, at which time the patient noted asymmetry and nipple retraction in her left breast.

On physical examination, a painless, hard left breast mass measuring approximately 6 cm was palpable. Neither inflammatory changes of the skin nor nipple discharge were noted. Bilateral mammograms of the breasts showed multiple masses in the medial and lateral left breast, measuring up to $4.0 \times 1.2 \times 1.9$ cm in size (Fig. 2), as well as enlarged left-sided axillary lymph nodes. An ultrasound-guided core needle biopsy revealed invasive, poorly differentiated adenocarcinoma consistent with a pulmonary origin, as it was positive for TTF-1 and negative for ER, PR, and HER2/NEU.

The patient was treated in the prone position with a palliative course of radiation to the whole breast and underlying chest wall via tangent fields. A total dose of 3975 cGy was delivered in 15 fractions. The patient tolerated the treatment well without excessive skin toxicity, inflammatory changes, or other radiation-related complications. On follow-up, her left breast mass had improved significantly 3 months after radiation. The patient, however, was noted to have increased pleural-based thickening, carcinomatosis, and a left upper lobe mass.

DISCUSSION

The standard of care for metastatic lung cancer remains chemotherapy, most commonly cisplatin/carboplatin, taxanes, gemcitabine, and vinorelbine. For patients with metastatic disease to the breast, surgical management with mastectomy and lumpectomy has been described.^{5,6} Although surgical excision may be a reasonable treatment option for

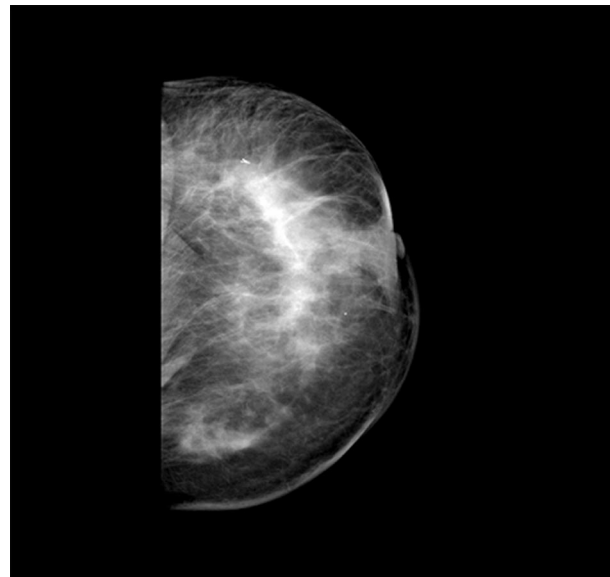


FIGURE 2. Case 2. Mammogram reveals a left-sided breast mass measuring $4.0 \times 1.2 \times 1.9$ cm and nipple retraction.

metastases from radio-resistant primary tumors, such as melanomas and carcinoid tumors, or in the absence of any other systemic disease,⁷ RT should be considered as a less invasive palliative treatment modality for metastases to the breast. Because there is no established standard fractionation for palliative breast RT, we chose to give 20 fractions of 200 cGy each in the first case and 15 fractions of 265 cGy each in the second case. Both regimens achieved good local control and symptom relief. We hesitated to give the second patient a higher dose per fraction (e.g., 300 cGy) because of concerns of excessive skin toxicity, as her tumor was in a rather superficial location. For that patient, we used the prone position technique,⁸ which allowed us to achieve higher dose homogeneity and to treat only minimal volumes of lungs and heart.

Mean survival for patients with breast metastases has been described as 10.9 to 12.9 months after diagnosis.^{9,10} Our first patient died 8 months after her diagnosis of breast metastasis. The second patient is alive 6 months after completion of her radiation.

CONCLUSION

We treated two patients with metastatic lung carcinoma to the breast with palliative radiation with good local control. Given the non-invasive nature of treatment delivery and good morbidity profile of a palliative radiation course, we encourage the use of radiation as a palliative modality for metastases to the breast.

REFERENCES

1. Akcay MN. Metastatic disease in the breast. *Breast* 2002;11:526–528.
2. Alva S, Shetty-Alva N. An update of tumor metastasis to the breast data [letter]. *Arch Surg* 1999;134:450.
3. Quint LE, Tummala S, Brisson LJ, et al. Distribution of distant metastases from newly diagnosed non-small cell lung cancer. *Ann Thorac Surg* 1996;62:246–250.

4. Sneige N, Zachariah S, Fanning TV, Dekmezian RH, Ordonez NG. Fine-needle aspiration cytology of metastatic neoplasms in the breast. *Am J Clin Pathol* 1989;92:27–35.
5. Loffeld A, Marsden JR. Management of melanoma metastasis to the breast: case series and review of the literature. *Br J Dermatol* 2005;152:1206–1210.
6. Gomez-Caro A, Pinero A, Roca MJ, et al. Surgical treatment of solitary metastasis in the male breast from non-small cell lung cancer. *Breast J* 2006;12:366–367.
7. Luketich JD, Martini N, Ginsberg RJ, Rigberg D, Burt ME. Successful treatment of solitary extracranial metastases from non-small cell lung cancer. *Ann Thorac Surg* 1995;60:1609–1611.
8. Merchant TE, McCormick B. Prone position breast irradiation. *Int J Radiat Oncol Biol Phys* 1994;30:197–203.
9. Vassalli L, Ferrari VD, Simoncini E, et al. Solitary breast metastases from a renal cell carcinoma. *Breast Cancer Res Treat* 2001;68:29–31.
10. Ravdel L, Robinson WA, Lewis K, Gonzalez R. Metastatic melanoma in the breast: a report of 27 cases. *J Surg Oncol* 2006;94:101–104.