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A Well Disguised Pleural Metastasis of Breast Carcinoma

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ABSTRACT Distant metastasis of breast carcinoma frequently occurs within five years after the diagnosis of the primary tumor. A 58-year-old female sharing a history of mastectomy for invasive ductal carcinoma six years previously admitted to our clinic with dyspnea progressively ongoing for past two weeks. A right-sided massive pleural effusion was diagnosed and also pleural catheter drained. Radiologic studies and cytological examination of the fluid did not introduce any evidence of malignancy while she lately underwent thoracoscopy for the residuary effusion and atelectasis. Pathological study of the punch biopsies through the parietal pleura reported the pleural metastasis of the breast carcinoma but still negative evidence of malignancy for the pleural fluid. After discharge, evaluation with positron emission tomography also did not verify an uptake in any of the pleura, lungs or primary malignancy site. This event is of importance revealing that the patients sharing a past of malignancy should be approached with more caution and suspicion since the routine diagnostic algorithms pending to be reliable may not be applicable for all patients.

Keywords: Breast neoplasms; neoplasm metastasis; diagnosis; pleural effusion

Relapse with distant metastasis occurs in 20% to 30% of patients with breast cancer within a period of 5 years after the surgery for the primary malignancy.[1] Moreover, approximately 20% of these cases develop isolated metastasis in the lung and the pleural space in the metastatic stage.[2] Herein, we present a patient with isolated pleural metastasis of breast carcinoma after a disease-free interval of 6 years.

CASE REPORT

A 58-year-old female admitted to our clinic with dyspnea ongoing progressively for the past two weeks. She shared history of left-sided breast invasive ductal carcinoma for which she underwent breast-sparing mastectomy and received adjuvant radiotherapy six years previously. Her routine follow-ups at the oncology clinic proved neither recurrence nor metastasis of her malignancy during this period. The medical history of this patient was unremarkable while the physical examination revealed decreased breathing sounds of the right hemithorax. A chest X-Ray showed massive pleural effusion which sequentially required drainage with an intrapleural catheter (Figure 1). The cytologic examination of the fluid introduced no evidence of malignancy. Moreover, microbial culture study did not report the growth of any pathological organisms, whereas mycobacterium culture of the effu-

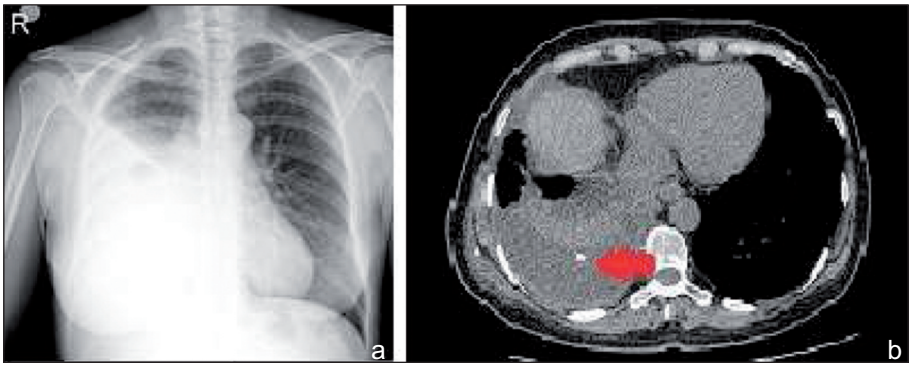

FIGURE 1: Preoperative imaging studies of the patient, **a)** Chest X-Ray showing massive pleural effusion in the right hemithorax, **b)** Computed thorax tomography revealing residuary effusion and atelectatic lung parenchyma after the drainage by catheter (marked with red arrow).

sion was also negative. Computed tomography (CT) applied for the opasity appearing continually on daily follow-up chest X-Rays revealed the residuary pleural effusion and the partial atelectasis of the right lung's lower lobe (Figure 1). The patient underwent video-assisted thoracoscopic surgery (VATS) including pleural drainage and also punch biopsies through multiple localisations of the pleural implants with macroscopically suspicious appearance and size ranging between 0.5 and 3 cm. completed with talc pleurodesis. Biochemical analysis of the pleural fluid represented 7.1 of pH, 52 mg/dL of glucose and 438 U/L of lactate dehydrogenase. The pathological study of the specimens following immunohistochemical staining reported the pleural metastasis of the breast carcinoma but still negative cytologic evidence of malignancy for the pleural fluid (Figure 2). Then the patient was referred to the oncology clinic where she received a chemotherapy of cyclophosphamide and epirubicin and also evaluated by positron emission tomography (PET-CT) which did not report increased fluorodeoxyglucose (FDG) uptake in any of the pleura, lungs or primary malignancy site. An informed written consent was obtained from the patient for reporting this case.

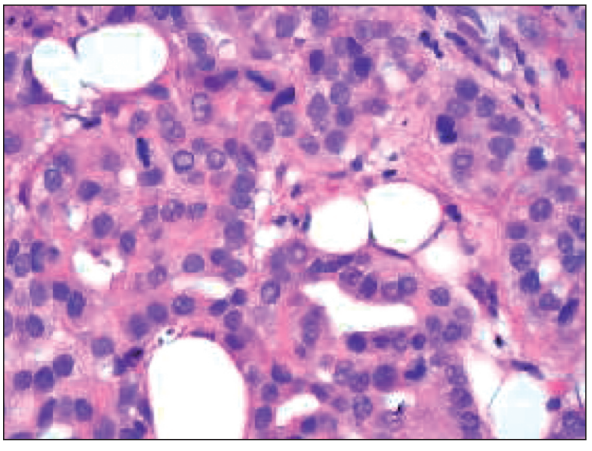

FIGURE 2: Cytologic view of pleural metastasis of the breast carcinoma. Hematoxylin and Eosin stain, original magnification 200x.

DISCUSSION

Lungs and pleura are addressed as common fields for breast cancer as first site of distal recurrence as well as one of the main targets during the metastatic process.[3] Despite the progress in oncological treatment, pleural metastasis of any primary malignancy is still associated with poor survival ranging from 3 to 12 months.[3-5]

Malignant pleural effusion (MPE), resulting from direct infiltration of the pleura by cancer cells, develops in 2% to 11% of the patients with breast cancer within the metastatic course.[4] Moreover, pleural metastases occur within the first 5 years following the surgery for the underlying primary tumor at a rate of 80%.[5] The diagnostic yield of pleural fluid cytology has a mean sensitivity of 60% making it an initial diagnostic test but also precludes its use to unmistakably differentiate malignant from benign pleural effusions.[6] Current cancer therapies targeted to tissue-specific

gene expression or receptor status necessitates adequately-sized pleural biopsies increasing the use of thoracoscopy as an effective tool for the investigation of suspected malignant pleural effusions and metastases with negative fluid cytology.[7]

Contrast-enhanced thoracic computed tomography is the current gold-standard imaging modality for the pleura with high specificity (88-94%) but low sensitivity (36-51%) in identifying malignancy.[8] However, one-third of patients with pleural malignancy may not demonstrate evident features of cancer on CT.[9] Meta-analysis of 14 studies including a total of 639 patients evaluated the role of PET for diagnosing malignant pleural effusions reporting its sensitivity between 81% and 91% and specificity up to a maximum rate of 75%, respectively.[10]

CONCLUSION

Regarding the potential false negative cytology of the pleural fluid and moderate accuracy of imaging methods for the diagnosis of malignant pleural disease, patients especially with massive pleural effusions and also baring a history of malignancy shall be evaluated with more caution and suspicion. Thoracoscopy performed for the drainage of the residuary effusion in this case has conducted the diagnosis of pleural metastasis of a breast cancer treated six years ago via pleural biopsies through the localisations that did not raise doubts on initial imaging studies and showed no clues of recurrence on PET applied lately. In conclusion, the patients sharing a past of malignancy should be approached hypercritically regarding the idea that every accustomed diagnostic modality may not be convenient for every one of these patients.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

This study is entirely author's own work and no other author contribution.

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