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Integrative Imaging Approach in the Diagnosis of Metastatic Breast Cancer: A Case Study

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Case Study

Metastatic breast cancer is a complex condition requiring a multifaceted diagnostic approach to ensure accurate detection and effective treatment planning. This case study focuses on a 52-year-old female patient with a history of invasive ductal carcinoma of the breast, initially treated with surgery, chemotherapy, and radiation therapy. After five years in remission, the patient presented with new symptoms of persistent back pain and fatigue. Initial clinical examinations and laboratory tests raised the suspicion of metastatic disease. The diagnostic journey began with conventional imaging techniques, including chest X-ray and mammography, which revealed no obvious signs of recurrence in the breast tissue. However, given the patient's symptoms, further investigation was warranted. A contrast-enhanced Computed Tomography (CT) scan of the chest, abdomen, and pelvis identified multiple lytic lesions in the spine and pelvis, raising the suspicion of bone metastases. To gain a more detailed understanding of the extent and nature of the metastatic spread, a whole-body positron emission tomography-computed tomography scan was performed. This advanced imaging modality highlighted areas of increased metabolic activity, consistent with metastatic disease, not only in the bones but also in the liver and lungs [1].

Magnetic Resonance Imaging (MRI) of the spine was subsequently conducted to better characterize the spinal lesions and assess the risk of spinal cord compression. The MRI confirmed extensive involvement of the vertebral bodies with impending cord compression at the T8 level, necessitating urgent intervention. Additionally, a biopsy of the liver lesion, guided by ultrasound imaging, was performed to obtain tissue for histopathological and molecular analysis. The biopsy confirmed the diagnosis of metastatic breast cancer, with the same hormonal receptor status as the primary tumor, guiding further systemic therapy decisions. This case underscores the importance of an integrative imaging approach in the diagnosis of metastatic breast cancer. The combination of CT, PET-CT, MRI, and ultrasound-guided biopsy provided comprehensive insights into the extent and nature of the metastatic disease, enabling tailored treatment planning. The use of multiple imaging modalities was crucial in overcoming the limitations of individual techniques and ensuring a thorough and accurate diagnosis. This integrative approach highlights the critical role of advanced imaging in the management of complex oncological cases, ultimately contributing to better patient outcomes [2].

Keywords: Metastatic breast cancer; Integrative imaging; Bone metastases

Conflict of Interest

None.

References

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