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Case Report

Primary neuroendocrine carcinoma of the breast: report of 2 cases and literature review

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ABSTRACT

Neuroendocrine tumors of the breast are very rare accounting for less than 0.1% of all breast cancers and less than 1% of all neuroendocrine tumors. Focal neuroendocrine differentiation can be found in different histologic types of breast carcinoma including in situ and invasive ductal or invasive lobular. However, primary neuroendocrine carcinoma of the breast requires the expression of neuroendocrine markers in more than 50% of the cell population, the presence of ductal carcinoma in situ, and the absence of clinical evidence of concurrent primary neuroendocrine carcinoma of any other organ. Reports discussing the imaging characteristics of this rare carcinoma in different breast imaging modalities are scarce. We present 2 cases of primary neuroendocrine carcinoma of the breast for which mammography, ultrasound, and magnetic resonance imaging findings and pathology findings are described. A review of the medical literature on this particular topic was performed, and the results are presented.

Case report #1

A 58-year-old asymptomatic female presented for an annual mammogram.

Mammography (Figs. 1A–D) demonstrated a persistent focal asymmetry with associated amorphous, indistinct, and coarse, heterogeneous calcifications spanning approximately 5.0 cm in maximum length in the left breast lower inner quadrant. There were additional coarse heterogeneous calcifications in the immediate left retroareolar region spaced approximately 5.0 cm from the anterior margin of the focal asymmetry.

Breast ultrasound (Figs. 2A–C) showed a 1.0 × 0.8 × 0.7 cm irregular, spiculated, hypoechoic not parallel mass with posterior acoustic shadowing in the left breast at the 8 o'clock axis, 8.0 cm from the nipple, in the area of focal asymmetry on mammogram. Ultrasound-guided core needle biopsy of the mass at 8 o'clock was performed, and the results showed well-differentiated neuroendocrine carcinoma (Fig. 3). Immunohistochemistry showed tumor cells to be positive for E-cadherin, estrogen receptor (ER), progesterone receptor (PR), gross cystic disease fluid protein-15, cytokeratin 7, chromogranin, and synaptophysin (Figs. 4A–E). Immunohistochemistry was negative for cytokeratin 20 and human epidermal growth factor receptor 2.

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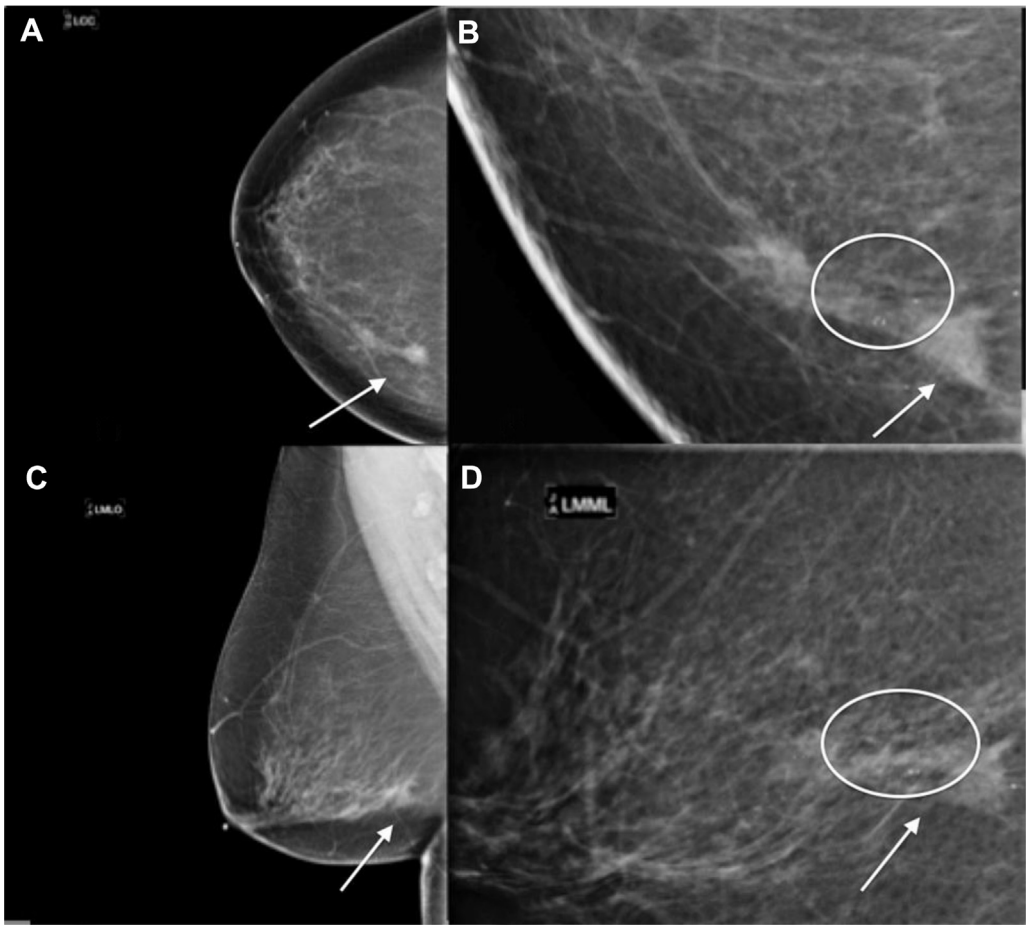

Fig. 1 – A 58-year-old female with left primary neuroendocrine carcinoma of the breast. Findings: left CC (A), left spot compression CC (B), left MLO (C), and left spot compression MLO (D) views demonstrate a focal asymmetry (arrow) with associated heterogeneous calcifications spanning 5 cm in length in the left breast lower inner quadrant (circle) and retroareolar heterogeneous calcifications (circle). Technique: (A) left breast full field digital mammographic craniocaudal (kVp 30; mAs 78), (B) Spot compression craniocaudal views (kVp 32; mAs 34), (C) left breast mediolateral oblique (kVp 30; mAs 80), and (D) spot compression mediolateral (kVp 32; mAs 52) projections. CC, craniocaudal; MLO, mediolateral oblique.

The patient then underwent presurgical breast magnetic resonance imaging (MRI) (Figs. 5A–D) which demonstrated 2 confluent spiculated enhancing masses with rapid wash-in and delayed washout enhancement (progressive kinetics), heterogeneous on T2, isointense on T1 located in the left lower inner quadrant corresponding to area of mammographic and ultrasound findings. There was a focus of signal void artifact corresponding to a biopsy clip adjacent to the most posterior mass. There were several associated adjacent small sub centimeter enhancing satellite lesions. The entire area of abnormality on breast MRI measured approximately 5.5 × 3.5 × 2.5 cm.

Subsequently, the patient underwent a left breast lumpectomy with sentinel lymph node biopsy. The final pathology (Figs. 6A–C) revealed 2 different foci of well-differentiated neuroendocrine carcinoma of the breast measuring 15 mm and 8 mm in greatest microscopic dimension with negative margins and negative sentinel nodes (stage: pT1cN0M0).

Case report #2

A 62-year-old asymptomatic female presented for an annual mammogram.

Mammography (Figs. 7A and B) demonstrated a 0.9 cm oval partially obscured mass and an adjacent 0.5 cm oval circumscribed mass in the right breast upper outer quadrant at 10 o'clock.

Breast ultrasound, (Figs. 8A–C) showed a 1.0 × 0.5 × 0.7 cm oval hypoechoic circumscribed parallel mass without posterior