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Case Report

Estrogen receptor-positive primary squamous cell carcinoma of the breast

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ARTICLE INFO

Article history:
Received 22 August 2016
Received in revised form
5 January 2017
Accepted 5 January 2017
Available online 4 February 2017

Keywords:
Breast
Cancer
Radiology
Squamous

ABSTRACT

Pure primary squamous cell carcinoma of the breast (SCCB) represents around 0.1% of breast carcinomas. Diagnosis requires independence from adjacent skin without metastatic disease. SCCB is often large at presentation with nonspecific mammographic and ultrasound findings. It is typically hormone receptor negative and aggressive. Mastectomy and adjuvant chemotherapy is the most common treatment, although treatment guidelines are not well established. We present a case of pure primary SCCB detected by high risk screening mammogram and treated with breast conserving surgery, chemotherapy, and radiation. We discuss clinical, radiologic, and pathologic findings.

Clinical case

A 74-year-old female with family history of breast cancer presented for asymptomatic high risk screening mammogram. This revealed an oval mass with obscured margins and architectural distortion at 10 o'clock spanning 16 mm (Figs 1A and B). Ultrasound showed a hypoechoic, oval, solid mass with angular margins (Fig. 1C). The mass was nonpalpable on breast examination. Ultrasound-guided biopsy revealed Invasive Ductal Carcinoma, high nuclear grade III, with squamous differentiation. The patient underwent ultrasound-guided needle localization and lumpectomy with sentinel lymph node biopsy. Surgical pathology revealed squamous cell carcinoma without glandular differentiation (Figs 2A-C). Squamous metaplasia was noted in the duct epithelium, supporting the primary SCCB diagnosis. The tumor was ER+/PR−/Her2 neu−. One sentinel lymph node was negative for malignancy. A positron emission tomography-computed tomography was performed 2 months after lumpectomy to rule out metastatic disease, without suspicious findings. The patient received adjuvant chemotherapy and whole breast radiation. At 1 year postsurgery, there is no evidence of additional disease.

Competing Interests: The authors have declared that no competing interests exist.

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http://dx.doi.org/10.1016/j.radcr.2017.01.008

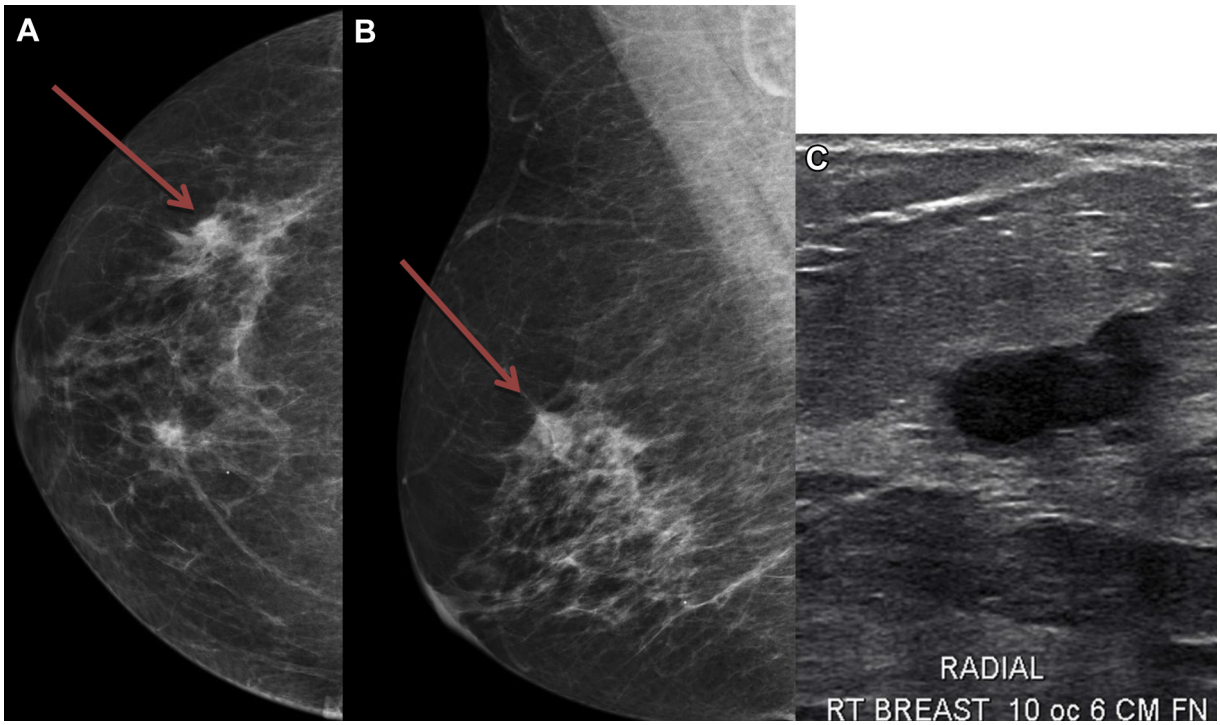

Fig. 1 – Right breast mammogram in craniocaudal (A) and mediolateral-oblique (B) views demonstrate an oval 16 mm mass with obscured margins and architectural distortion in the upper outer quadrant at 10 o'clock (red arrows). (C) Sonographic image demonstrates a hypoechoic oval solid mass with angular margins.

Discussion

The most common type of breast carcinoma is invasive ductal carcinoma, which makes up 80% of breast malignancies. The remaining 20% includes infiltrating lobular and pure or combined types such as squamous cell carcinoma of the breast (SCCB) [1]. Primary SCCB is rare, representing less than 0.1% of breast carcinoma cases [2]. Primary pure SCCB must also be differentiated from breast adenocarcinoma with squamous cell metaplasia or metastatic disease, which are more common than pure SCCB [3].

The histogenesis of SCCB remains unclear. Leading theories include metaplasia of breast parenchyma (either benign diseases including fibroadenomas and cystosarcoma phyllodes, or malignancies including intraductal carcinoma), malignant growth of intrinsic epidermal elements or dermoid cysts, and long-term abscesses [4–6].

SCCB typically has nonspecific clinical examination and imaging findings. On mammography, SCCB varies from well-circumscribed to irregular with indistinct borders and typically lacks spicules or microcalcifications [2,7]. However, microcalcifications have been reported [8]. A cystic component is seen in 60%-80% of cases, and fine-needle aspiration and core needle biopsy are useful in preoperative diagnosis in these cases [9]. Pure SCCB diagnosis requires the tumor to be 90% squamous elements without glandular features (such as columnar differentiation), and it must be independent of adjacent skin or nipple and without other neoplastic elements. As was performed in our case, positron emission tomography-computed tomography scanning should be performed to exclude metastatic disease from a primary tumor arising from another site [5,7,10].

Over 90% of SCCB are estrogen and progesterone receptor negative, and cases of Her2/neu positive SCCB are few [11,12]. This makes our case with ER positivity rare. BRCA 1 gene mutation is rarely seen in SCCB patients, but has been reported [13].

The mean age of SCCB diagnosis is 52 years, although reported patient ages range from 29 to 90 years [7,14]. At presentation, SCCB typically ranges in size from 2 to 5 cm with a median size of 4 cm [3,5]. SCCB usually grows rapidly. Patients typically present with a breast mass that enlarged over 2-3 weeks [4,14].

Although axillary nodal metastasis is seen in 10%-30% of cases, distant metastasis is more common, due to hematogenous spread [10,15]. Outcomes for SCCB are comparable with poorly differentiated breast adenocarcinoma [16], and the 5-year survival rate for SCCB is only 50%-64% [17,18]. Tumor size and stage are the most important predictors of prognosis for SCCB [2].

SCCB treatment often includes surgery and adjuvant chemotherapy. Treatment is planned on a case-by-case basis, as specific treatment guidelines have not been well defined. Studies show that SCCB is resistant to cyclophosphamide, methotrexate, 5-fluorouracil and doxorubicin, but successful treatment with platinum agent-based regimens has been reported [5]. Endocrine therapy is often not possible because most tumors are negative for hormone receptor markers. Our patient was successfully treated with lumpectomy,

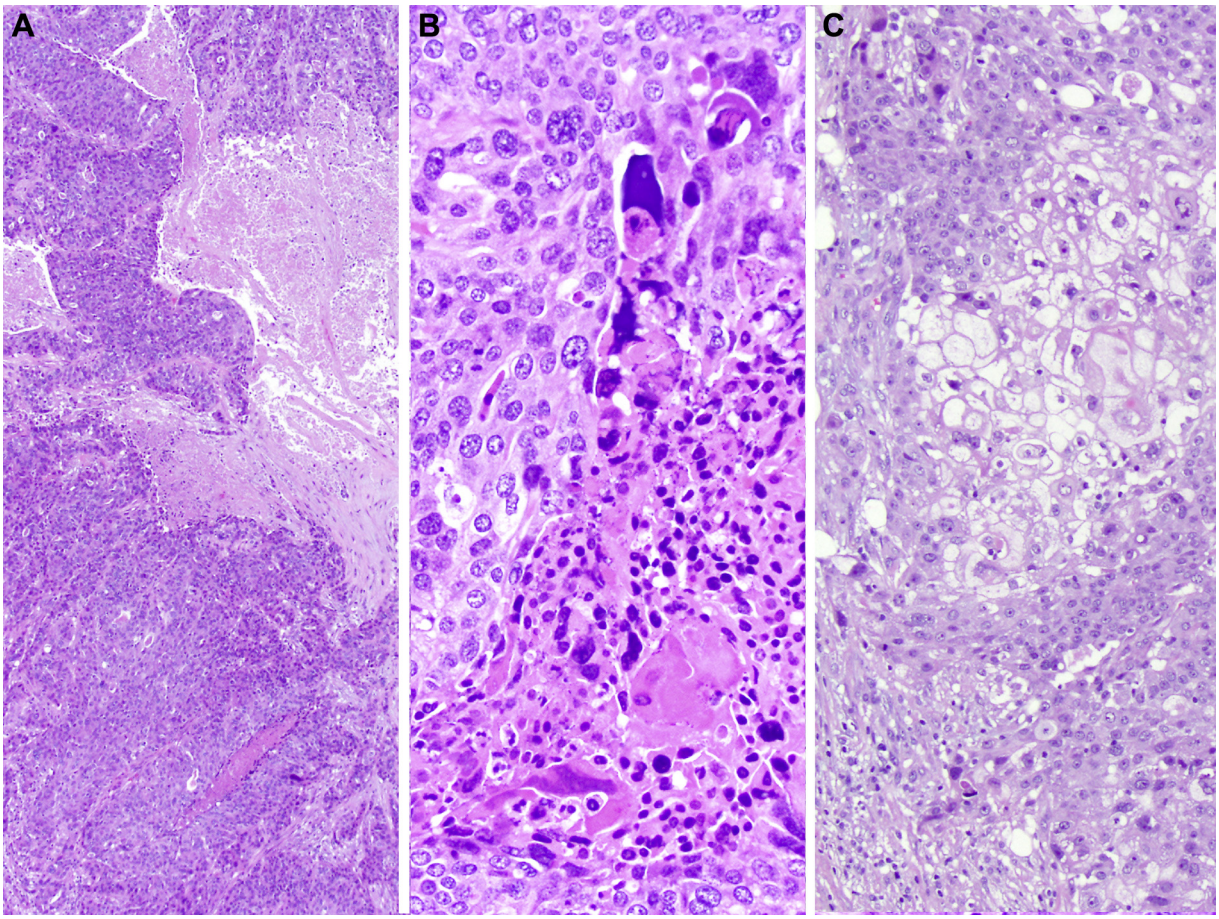

Fig. 2 – Histology shows (A) partly cystic poorly differentiated squamous cell carcinoma (Hematoxylin and Eosin stain, 40×); (B) rare dyskeratotic cells and focus of keratinization (200×); and (C) well defined cell borders and cytoplasmic clearing (200×).

chemotherapy, and radiation. Breast conserving therapy was possible because SCCB was detected at an early stage with high risk screening mammogram before local invasion or metastasis occurred. Future studies should establish further treatment guidelines for SCCB.

Conclusion

SCCB is a rare breast malignancy that is typically aggressive and carries a poor prognosis. Treatment with radical mastectomy with adjuvant chemotherapy is the standard of care, although breast conserving therapy may be possible if diagnosed at an early stage, as in our patient. Future studies should work toward establishing further SCCB treatment guidelines.

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