

## CASE REPORT

# Primary squamous cell carcinoma of the breast in a young female- A rare ailment

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## Abstract

Primary squamous cell carcinoma of the breast is an extremely rare invasive breast carcinoma with rapid progression and worse prognosis. Careful assessment and diagnosis of the entity should also be considered in a rapidly progressing breast tumor.

## KEYWORDS

Breast, Fibroadenoma, Squamous Cell Carcinoma

## 1 | INTRODUCTION

Primary squamous cell carcinoma (PSCC) of the breast comprises an exceedingly rare form of invasive breast carcinoma with an estimated prevalence of 0.06-0.2% among all breast cancers and less than 0.1% of invasive breast cancers.<sup>1,2</sup> PSCC of the breast is an aggressive disease, associated with larger tumor size, rapid progression, frequent relapses, and high mortality.<sup>3</sup>

Although this diagnosis usually presents in postmenopausal women, cases have been reported in young, pregnant, and lactating women.<sup>4,5</sup> PSCC in an eighteen-year-old female patient has not yet been reported in the literature.

Here, we report a unique case in which an 18-year-old female patient presents with a rapidly increasing left breast mass, ultimately diagnosed as PSCC. This is the only case of an 18-year-old patient diagnosed with this pathology in the current literature.

## 2 | CASE REPORT

An 18-year-old unmarried, regularly menstruating female patient presented with rapidly increasing breast swelling of the left breast for 3 months. The patient has no history of nipple discharge and has not taken estrogen/progesterone-containing medications. She has no family history of breast cancer. Seven months prior, the patient underwent fine-needle aspiration biopsy of a left breast lump and was diagnosed with fibroadenoma. Although she later underwent excisional biopsy, the lesion continued to grow.

On examination of the breast, there was a cystic swelling of approximately 7 cm\*5 cm occupying 60%-70% of the left breast and involving all the quadrants. Axillary lymph nodes and left supraclavicular lymph node were not palpable. Examination of other systems was unremarkable, and all the laboratory investigations were within the normal range. Ultrasonography (USG) of the left breast revealed a large

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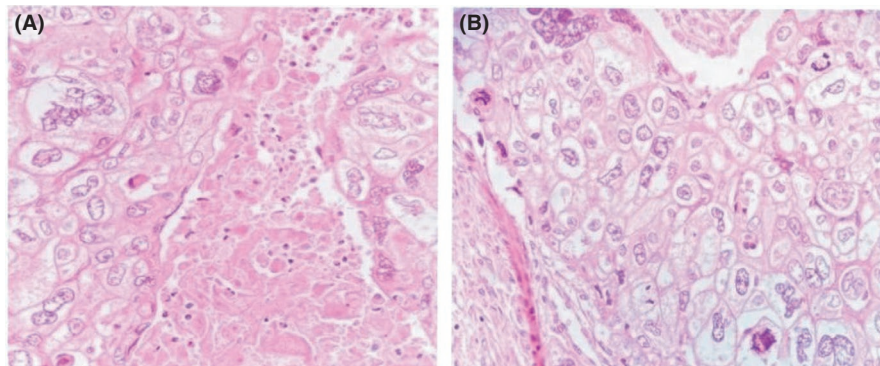
cystic lesion measuring 8.8cm\*6.1cm\*4.0cm with echogenic debris occupying almost 80% of the left breast volume with normal axillary and supraclavicular lymph nodes.

In view of cystic mass and previous FNA report, excision biopsy of the mass was done with peri-areolar incision and medial extension. Axillary dissection was not done in keeping the wish of the patient not to undergo further surgery. Since the breast was cup-sized, no breast reconstruction procedures were performed and the incision was closed with better cosmetic look.

Gross examination revealed solid and cystic tumor mass with maximum dimension of 10 cm involving almost the entire left breast with uninvolved overlying skin, clinically corresponding to cT3N0M0 stage. (Figure 1) Microscopic examination of the mass demonstrated predominantly pleomorphic tumor cells with enlarged nuclei, irregular nuclear contours, prominent nucleoli, and abundant pale eosinophilic cytoplasm with distinct cell borders with bizarre tumor cells, mitosis with atypia, and areas of necrosis. (Figure 2) Circumferential resected margins were free of tumor, and the overlying skin was uninvolved by carcinoma. (Figure 3) The histopathological features were suggestive of poorly differentiated squamous cell carcinoma. No obvious features of ductal carcinoma and metaplastic carcinoma were discerned. On immunohistochemical analysis, tumor cells were positive



**FIGURE 1** Gross examination of the excised mass showing a solid and cystic tumor



**FIGURE 2** Histopathological examination of the excised mass with markedly pleomorphic tumor cells with necrosis and frequent mitosis. (H & E, 40x magnification)

for CK, CK7, p40 with a Ki67 proliferation index of 70% and negative for ER, PR, Her2neu, GATA3, and mammaglobin. Considering the histo-morphological features and p40 immunopositivity, pathologic diagnosis of squamous cell carcinoma was made. (Figure 4).

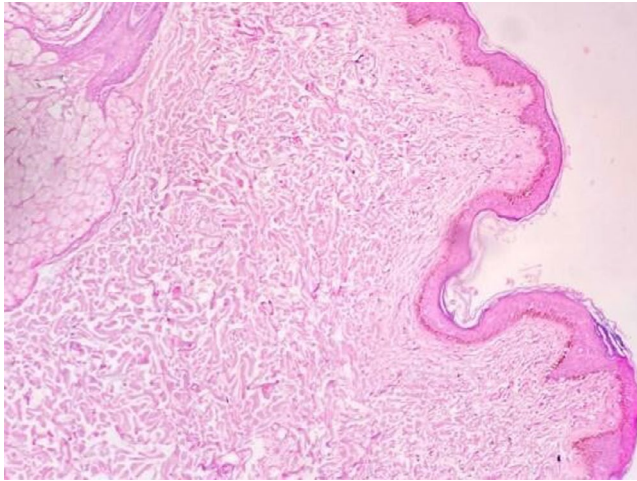
To exclude the primary site/metastasis and stage the tumor, the patient received a series of examinations, including computed tomography (CT) scanning of the head, neck, chest, and the abdomen, none of which revealed any suspicious lesions.

The patient received six cycles of paclitaxel and carboplatin-based adjuvant chemotherapy. Having completed her chemotherapy, the patient is receiving whole breast radiotherapy with boost to the cavity. She is on close follow-up and has remained disease-free for 9 months at the time of writing and is planned for assessment after the completion of adjuvant radiochemotherapy.

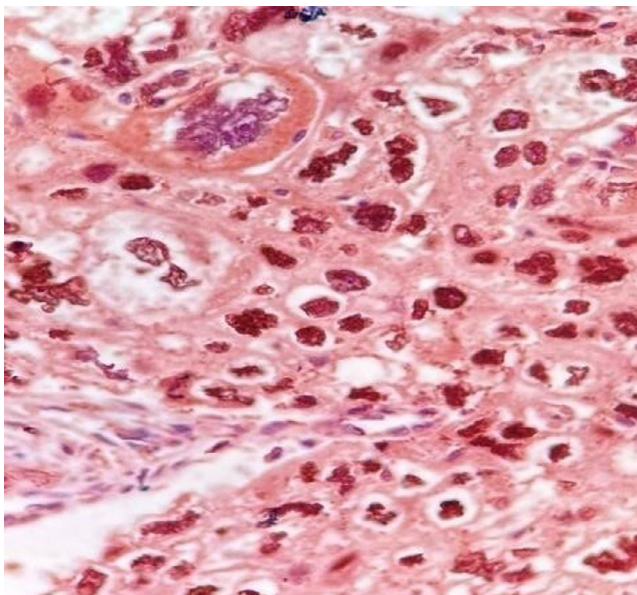
### 3 | DISCUSSION

SCC of the breast was reported as early as 1908 by Troell. However, the epidemiology remains unknown with the available information limited to case series and reports. A study by Yadav et al with 445 cases of SCC of breast found the median age of diagnosis to be 67 years (range: 26-99 years) with the highest incidence noted in the age group of 80-84 years suggesting that SCC of the breast is more common in older women.<sup>1</sup> SCC in young females is extremely rare with few cases reported in the literature. The fact that our patient is 18 years old further highlights that this is a unique case.

Whenever SCC is diagnosed in the breast, the origin of the lesion should be looked for. This is because extramammary SCCs have a tendency to metastasize to the breast, with the most common primary sites being the lung, esophagus, cervix, and urinary bladder.<sup>6</sup> There are specific criteria that differentiate PSCC from extramammary SCC. The diagnosis of PSCC is made when more than 90% of malignant cells are squamous in origin without any other invasive neoplastic elements such as ductal or mesenchymal, the tumor is separate



**FIGURE 3** Uninvolvement of the overlying skin by the carcinoma



**FIGURE 4** p40 immunohistochemistry showing nuclear positivity in tumor cells. (40x magnification)

from overlying skin or nipple, and a squamous cell carcinoma at another site is excluded.<sup>7,8</sup> Our patient meets these criteria and therefore was diagnosed with PSCC.

The exact etiology and pathogenesis of PSCC of the breast are still uncertain and various schools of thought exist. Some have suggested that it arises from squamous metaplasia in benign breast conditions like cysts, chronic inflammations, abscesses, fibroadenoma, or in association with implants.<sup>7,9,10</sup> This is relevant to our patient case, as she had a prior fibroadenoma excised from the ipsilateral breast. Others believe that it may be a very extreme form of squamous cell metaplasia developing into an adenocarcinoma. This may also explain the mixed forms with some suggesting its origin from the breast ductal epithelium.<sup>11,12</sup> According to the fourth edition

of the WHO classification of tumors of the breast published in 2012, PSCC of the breast is classified as a variant of metaplastic carcinoma.<sup>13</sup>

Clinical and radiologic appearances are often nonspecific. These tumors appear as solid, hypoechoic masses with complex cystic components on USG and more helpful in establishing the diagnosis than mammogram.<sup>2,14</sup> Generally, there are no typical findings on mammogram, but there may be some microcalcifications present, which may explain the advanced disease state at the time of diagnosis.<sup>15</sup>

SCC of the breast is generally larger (>4 cm) at diagnosis and may appear cystic in 50% of cases.<sup>2</sup> Because these tumors rapidly grow, lymph node metastases are relatively higher than that of normal breast cancer and often accompanied by necrotic foci, hemorrhagic foci, cyst formation, and inflammatory changes.<sup>16,17</sup> Our patient was reluctant for axillary dissection, and thus, further surgery was not performed. However, CT staging showed no other metastasis and the axilla was clear.

However, squamous cell carcinomas are reported to result in less lymphatic spread than adenocarcinomas.<sup>18</sup> The biopsy of the excised mass is the only confirmatory investigation. Similar to our case, the histological features include malignant squamous cells with abundant eosinophilic keratinizing cytoplasm and the presence of intercellular bridges in the background of necrosis and inflammation.<sup>19</sup> In immunohistochemistry, PSCC is p63 positive; CK 5/6 positive; and ER, PR, and HER2 negative which is helpful in differentiating it from the infiltrating ductal carcinoma with focal squamous metaplasia.<sup>20</sup> Due to similarity in the expression profile with the “basal-like” subtype of breast tumors, PSCC of the breast has aggressive histological features at presentation and poor outcomes.<sup>20,21</sup>

For our patient, the immunohistochemistry of the excised mass was triple-negative for hormone receptors, positive for CK, CK7, and p40. The optimal therapeutic strategy remains unknown for the SCC of the breast. Studies suggest that surgery should be prioritized over chemotherapy as the initial treatment for this disease.<sup>22</sup> Most studies on SCC of the breast favor mastectomy instead of breast conservative surgery (BCS) as the efficacy and the safety of BCS for this entity are undetermined.<sup>23</sup> However, Teerthanath et al suggested that the patients treated with breast conservative surgery experience similar local control and survival outcomes to those treated with mastectomy.<sup>24</sup> Our patient underwent excision biopsy of the mass. As the patient opted out for further surgery and clear axilla with no metastasis on staging CT scan, axillary lymph node dissection and completion modified radical mastectomy were not performed.

Though the role of chemotherapy in disease-free survival and overall survival in patients with PSCC of the breast cannot be undermined, the optimal chemotherapy regimen is still in debate. Studies have reported anthracycline-based chemotherapy, cisplatin-based chemotherapy or CMF

(cyclophosphamide, methotrexate, and 5-fluorouracil) could be effective.<sup>25-27</sup> However, advanced SCC of the breast is poorly responsive to chemotherapy.<sup>23</sup> Our patient received six cycles of paclitaxel and carboplatin-based chemotherapy.

In addition, distant metastases to the lungs, the soft tissue of the neck, and mediastinum are attributed to treatment failure.<sup>2</sup> Combined overexpression of EGFR and CK5/6 can be considered as independent prognostic factors for PSCC of the breast with some implication on use of EGFR inhibitors as a chemotherapy-sensitizing agent.<sup>28</sup> A recent study conducted a multivariate analysis that demonstrated postoperative radiotherapy significantly improved overall survival for breast SCC patients.<sup>29</sup> This remains controversial, because locoregional relapse is frequent with an irradiated field pointing toward the radio-resistant property of SCC of the breast.<sup>30</sup> However, considering the aggressive nature of the tumor, after completion of chemotherapy, our patient received radiotherapy and is planned to reassess the response to the treatment after completion of the treatment regime. The patient is well tolerating the chemoradiotherapy and is doing well with no recurrences till date.

Endocrine therapy is often unsuccessful as most tumors are negative for hormone receptors. These tumors are often very aggressive and have a worse prognosis, with a 5-year cause-specific survival of 63.5%. Older age and higher tumor or nodal stage at presentation predict poor prognosis independently for locoregional stages.<sup>1</sup> This mandates an early diagnosis and treatment of this rare entity which are critical to patient prognosis.

## 4 | CONCLUSIONS

This case report is unique in that we present a female patient that is 18 years old that was ultimately diagnosed with PSCC of the breast, highlighting that this pathology can present at an early age. A careful assessment must be made when considering breast tumors, cystic breast masses, and particularly tumors with rapid growth. The early diagnosis and treatment constitute the cornerstone in the prognosis of this rare disease.

## ACKNOWLEDGMENTS

We gratefully acknowledge the work of members of our hospital and the patient. A written informed consent was obtained from the patient prior to the submission of the report. The signed Institutional Consent Form is on-file.

## CONFLICTS OF INTEREST

None.

## AUTHOR'S CONTRIBUTIONS

PS was involved in counseling and treatment of the patient. HPD, MS, and AKS: examined and interpreted the

pathology. PS: collected all the required case information, images, slides, and reports and contributed to writing manuscripts. SS and SK: reviewed the literature and contributed in both writing and editing the manuscript. All authors read and approved the final manuscript.

## ETHICAL APPROVAL

Review board of National Cancer Hospital and Research Center, Harisiddhi, Lalitpur, Nepal, provided approval.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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