Case Report

Bilateral Adenoid Cystic Carcinoma of the Breast: Report of a Rare Case with a Rare Presentation

Oncology

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ABSTRACT

Adenoid cystic carcinoma of the breast is very rare (it comprises 0.1% of all the malignant neoplasms of the breast), though adenoid cystic carcinoma is more common in the salivary glands and it is fairly common in other organs like the lacrimal glands, the trachea, etc. Around one hundred and fifty cases have been reported worldwide. We investigated a forty-eight-year-old woman for bilateral, painful breast lumps of one month duration, which later turned out to be the high-grade adenoid cystic carcinoma on both the sides. This is the first case of bilateral adenoid cystic carcinoma of the breast which has been reported in the literature.

Key Words: Adenoid cystic, Bilateral breast cancer, Modified Radical Mastectomy, Adjuvant chemoradiotherapy.

KEY MESSAGE

- Adenoid cystic carcinoma which rarely occurs in the breast, may be bilateral.

INTRODUCTION

Adenoid cystic carcinoma (ACC) constitutes 0.1% of all the invasive breast cancers [1]. It shares morphologically similar features with the adenoid cystic carcinoma of other organs like the major/minor salivary glands, the trachea, the cervix, etc. With proper treatment, it is usually associated with an improved overall survival [2]. ACC, which affects male breasts also [3], does not show any predilection towards laterality [4]. However, ACCs of both the breasts has not been reported [5]. Here, we present a case of bilateral ACC of the breast, which was diagnosed in our hospital.

CLINICAL SUMMARY

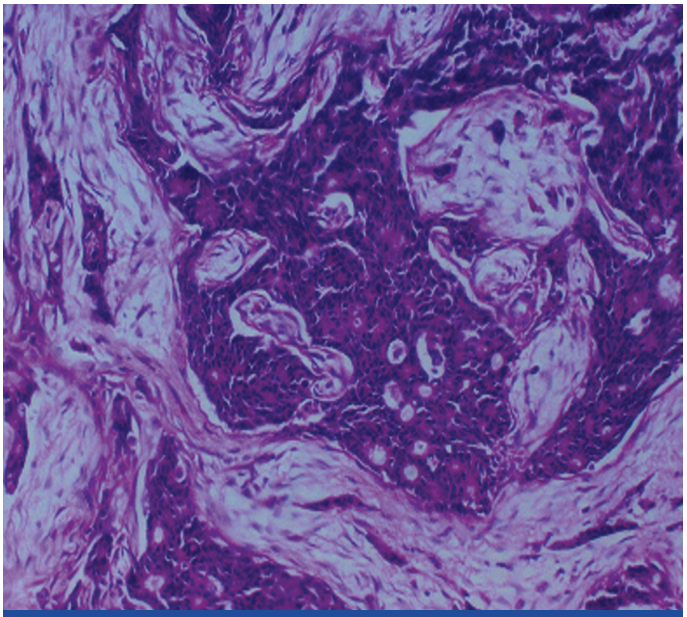
A 48-year-old, pre-menopausal woman consulted a local gynaecologist for gradually increasing pain of one month duration in both the breasts. She was found to have bilateral breast lumps and was referred to our hospital. Clinically, there were solitary, hard and irregular masses in both the breasts, with no lymphadenopathy on either side. The mammogram showed an irregular mass lesion in the lower outer quadrant of the left breast and an ill-defined dense lesion, just superior to the nipple on the right. Fine needle aspiration cytology of both the lesions was positive for atypical cells, which was suspicious of malignancy. The metastatic work-up was negative. Bilateral modified radical mastectomy was done after the frozen sections confirmed invasive carcinoma on both the sides. Though the axillary lymph nodes were impalpable clinically, eleven nodes could be sampled from the left axilla, with no contribution from the right. The resected masses were of size 9.5 x 5 x 7 cm on the left side and 8 x 7 x 2 cm on the right side. The surgical pathology was reported as a bilateral high grade adenoid cystic carcinoma with negative resected margins on both the sides. Genetic studies were not performed, as no specific risk factors were found in her personal and family history. The case was discussed in the breast tumour board and it was decided to give her adjuvant chemotherapy, followed by radiotherapy. Six cycles of the FAC regimen (5-Flurouracil, Adriamycin and Cyclophosphamide) were administered. Subsequently, she received 25 fractions of external radiation to the tumour bed and was then started on hormonal therapy. Now she is on regular follow-up and has completed 3 years since her diagnosis, without any clinical or radiological evidence of recurrent disease.

HISTOPATHOLOGICAL FINDINGS

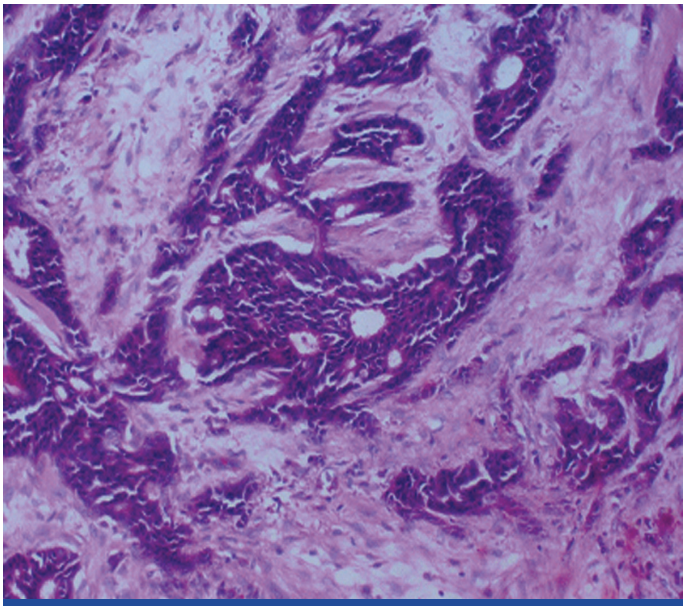
Sections from both the breasts (Table/Fig 1, 2, 3, 4 and 5) showed an infiltrating neoplasm with cells which were arranged in trabecular, tubular, cording and focal cribriform patterns. The atypical cells were medium-sized, with irregular hyperchromatic nuclei and a moderate amount of dense eosinophilic cytoplasm. The stromal areas exhibited dense sclerosis and some of the tubular areas showed dense globular eosinophilic material in between. Intraductal basophilic secretions as well as micro-calcification were noted. The hyaline basement membrane was surrounded by cytokeratin-positive epithelial cells and vimentin-positive myoepithelial cells, which formed the cylindromatous component of the tumour. The cells around the hyaline globules stained positive for SMA, thus representing the myoepithelial population. The tumour cells on both the sides were positive for ER and PR, and negative for Her2-neu. All the eleven nodes showed reactive hyperplasia and sinus histiocytosis.

DISCUSSION

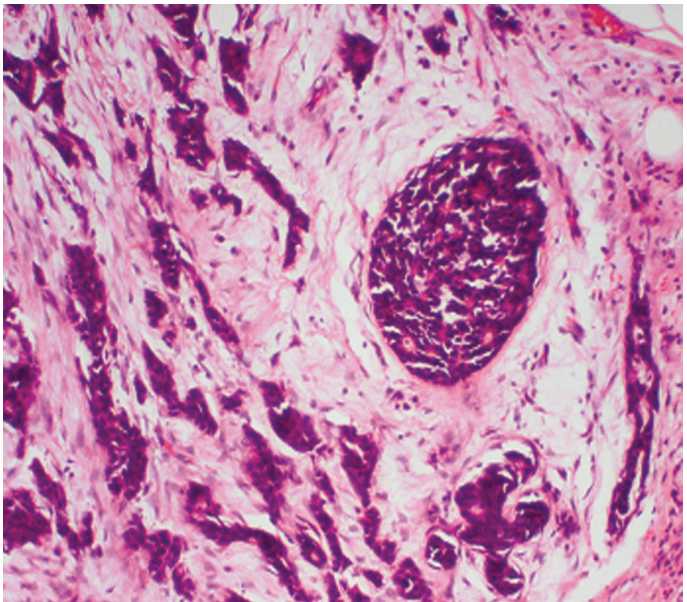
ACC of the breast constitutes about 0.1% of all its invasive neoplasms [1]. Its age of incidence ranges from 30 to 90 years, with a peak being observed during the fifth and sixth decades of life [6]. Though the term 'ACC of the breast' was proposed by Spies in



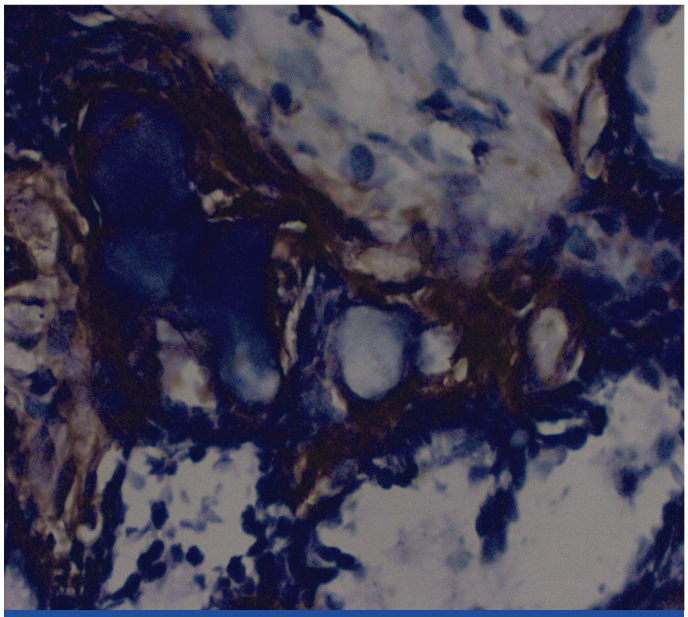
[Table/Fig-1]: Showing cells arranged in cribriform pattern with focal hyaline globules. The stroma shows myxoid change (H&E, x100).



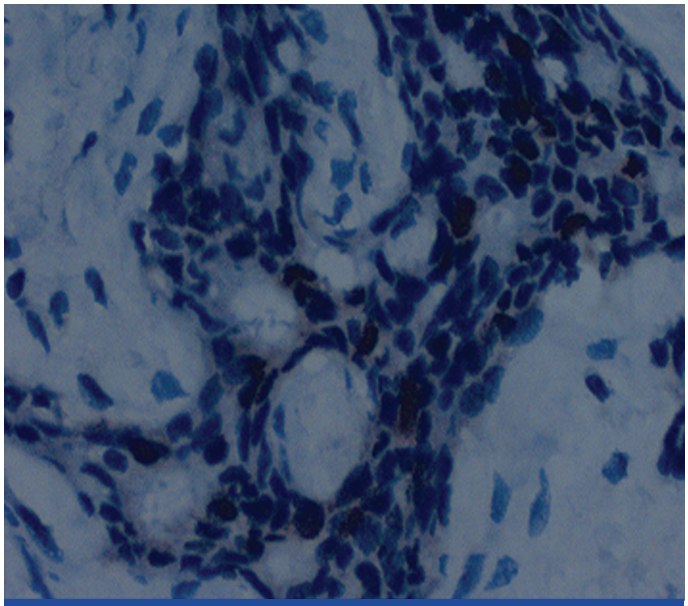
[Table/Fig-2]: Showing cribriform pattern (H&E, x100).



[Table/Fig-3]: Showing cylindromatous and cording patterns (H&E, x100).



[Table/Fig-4]: Cells around the hyaline globules show focal SMA positivity highlighting the myoepithelial cell population (IHC, x1000).



[Table/Fig-5]: ER and PR showing 50% positivity (IHC, x400).

as early as 1930 [7], the definitive criteria of this entity were set forth only in the 1970s with the help of the electron microscope and histochemistry. 'Cylindroma' (as coined by Billroth in 1856, when he first described this breast tumour) is still a legitimate synonym for ACC of the breast. ACC of the breast shares similar morphological features with ACC of other organs such as the salivary gland [2] and it does so with the chromosomal alterations also, including abnormalities in the 6q chromosome [8]. It has a better prognosis than, and its clinical behaviour is distinct from that of the non-ACC breast cancers and the ACC of other organs for unexplained reasons [5].

CLINICAL CHARACTERISTICS

Though ACC of the breast tends to arise around the nipple and the areola region [9], it is very unusual for it to develop nipple fixity and discharge. Similarly, skin and chest wall fixities are rarely encountered [4]. Perineural invasion, which is frequently associated with it and is the cause of pain / tenderness in ACC of the salivary gland, is rarely seen in ACC of the breast, where pain and tenderness are still common for unclear reasons [10]. Its spread to

the regional lymph nodes is a very rare, as is evidenced by the fact that only 2.5 % of all the cases which have been reported in the literature had histologically-confirmed axillary lymphadenopathy [5]. However, ACC of the breast tends to metastasize to distant organs before any microscopic evidence of lymph nodal involvement [6]. The lung is the most common organ to be metastasized [11]. The uncommon local recurrence is probably because of incomplete tumour excision [8]. Arpino has maintained in his study that local recurrence is seen only in patients who do not receive adjuvant radiotherapy [6].

SCREENING AND DIAGNOSIS

Because of its slow growing nature with minimal metastatic potential, this tumour is diagnosed by screening more often than clinically [12]. However, the chance of false negativity is little high in detecting it radiologically [11]. In the event of the clinical presentation, the patients are more often present with breast pain and tenderness, unlike in typical breast carcinoma, where a painless lump is more common [4]. In general, it is difficult to define bilateral breast carcinoma of any type (whether it is simultaneous, synchronous or metachronous) without appropriate genetic studies that are usually performed if the family history is positive and if the clinical indications demand them [13]. In our patient, the term "bilateral" was employed on the basis of the diagnostic chronology.

MAMMOGRAPHY

The experience and knowledge about the patterns of appearance of ACC of the breast on mammography are hardly found in literature. Studies have been observed that most of the cases were seen on mammography as circumscribed, lobulated nodules, usually in the upper quadrants or in the para-areolar region, while few cases exhibited different patterns such as focal asymmetrical density. Santamaría proposed that the lesions which appear as ill defined or partially ill defined, most often have microscopic invasion into the surrounding parenchyma, while the ones that appear as fairly well-defined, nodular lesions less frequently invade the surrounding parenchyma. In the latter case, the differential diagnoses would be benign tumours like fibroadenomas or circumscribed malignant masses like medullary and mucinous carcinomas [14]. Regardless of these observations and the proposed correlations, it is only the histopathological evaluation that accurately makes the diagnosis.

HISTOPATHOLOGY AND IMMUNOHISTOCHEMISTRY

The tumour cells typically arrange themselves in a characteristic cribriform pattern, although they may exhibit the trabecular and solid patterns of arrangement [1], [5]. Ro et al proposed a grading system based on the presence or absence of the solid component (and its proportion) and classified ACCs of the breast as grade 1 (no solid component), grade 2 (< 30% solid component) and grade 3 (> 30% solid component). They correlated the grades with the overall prognosis and formulated the treatment guidelines, where local excision for the grade 1 tumours, simple mastectomy for the grade 2 tumours and mastectomy with axillary dissection for the grade 3 tumours, were advised [15]. While the basaloid cells were found to express proteins like laminin, fibronectin, vimentin, CK14 and type IV collagen, the luminal cells were found to express fodrin, E-cadherin, beta-catenin, etc. [8]. Laminin and fibronectin will be useful in distinguishing between ACCs of the breast and other breast carcinomas with a cribriform pattern, as they will stain positive for pseudocysts in the former and negative for cysts in the latter. Although ACC is one of the triple negative tumours of the breast, ER and PR positivity have been observed in a few cases [6].

MANAGEMENT

The treatment guidelines for ACCs of the breast have not been standardized as yet. The types of treatment which are being tried range from simple lumpectomy with radiotherapy, to radical mastectomy. There is very little data on adjuvant chemotherapy [10]. As of now, though several authors have proposed different treatment strategies, an optimal management would be the one that is tailored, based on the stage and extent of the disease, the general condition and the co-morbidities of the patient, and the historical experience.

ENDNOTE

As like with other types of breast carcinoma, bilateralism is possible with ACCs of the breast also. Physicians should think of this rare breast malignancy while encountering bilateral, especially painful and tender breast lumps.

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