



Secretory carcinoma of breast: clinicopathologic study of 8 cases

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ABSTRACT

Our aim was to describe clinicopathologic features of secretory carcinoma on a cohort of cases. We retrieved reported cases of secretory carcinoma of breast (SCB) in the Section of Histopathology, Department of Pathology & Microbiology, Aga Khan University Hospital Karachi, from May 2004 to December 2011. The slides were reviewed, and clinicopathologic features were noted. A total of 8 cases of SCB were found. The age ranged from 17 to 60 years (median, 41 years) with a female to male ratio of 7:1. Lumpectomy was done in 6 cases, and mastectomy, in 2 cases. The tumor size ranged from 2.5 to 10 cm (mean, 5.5 cm). Histologically, abundant extra- and intracellular secretory material was seen in all cases. Most of the tumors showed mixtures of patterns with dominant microcystic and papillary patterns. In situ component was seen in only 1 case. Lymph node metastases were seen in both cases with lymph node sampling. In conclusion, SCB is a rare type of ductal breast carcinoma. The papillary pattern of SCB is rare according to published data but was seen in most of our cases. In situ secretory carcinoma is even rarer, and to date, we have seen a single case only. Although most occur in women, these can be seen in men as well.

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1. Introduction

Secretory carcinoma of breast (SCB) is a rare but distinct variant of ductal carcinoma comprising less than 0.1% of all breast cancers [1]. It was first described by McDivitt and Stewart [2] in 1966, who called it *juvenile carcinoma* because the average age of the patients in their series was 9 years. Later, Tavassoli and Norris [3] reported 19 cases in all age groups (range, 9–69 years) and replaced this term by *secretory carcinoma* because of abundant secretions of mucin within the tumor. In most patients, secretory carcinoma has been found to have an indolent clinical course. In this series, we describe 8 cases of SCB that were reported in our section.

2. Materials and methods

All 8 cases of SCB were retrieved from the surgical file records of the Section of Histopathology, Department of Pathology and Microbiology, Aga Khan University Hospital. These cases had been reported between 2004 and 2011. All the specimens had been routinely formalin fixed and grossed according to the guidelines given in Rosai and Ackerman's Surgical Pathology [4]. The formalin-fixed, paraffin-embedded tissue sections were stained with hematoxylin and eosin (H&E). The histologic grading was assigned using the Modified Bloom and Richardson grading system. In 4 cases, immunohistochemical stains epithelial membrane antigen (EMA, monoclonal; dilution

1:200; Dako Cytomation, Glostrup, Denmark) and S100 (polyclonal; dilution 1:200; Dako Cytomation, Glostrup, Denmark) were performed on an automated immunostaining system (Dako autostainer plus Produktionsvej 42 DK-2600, Glostrup, Denmark). Special stains PAS alcian blue and PAS diastase were performed in all cases.

3. Results

3.1. Clinical findings

Of the total 8 cases, 7 cases occurred in women and 1 in a man. The ages of the patients ranged from 17 to 60 years with a mean age of 41 years. All cases presented as palpable lumps in breast. The right breast was involved in 4 cases, and the left, in 3 cases. Laterality was not known in the male patient. Lumpectomy was performed in 6 cases, and mastectomy, in 2 cases. In the 2 mastectomy cases, axillary dissection was done in 1 and only lymph node sampling in the other; the former patient was given neoadjuvant chemotherapy after the initial diagnosis of carcinoma given on trucut biopsy.

3.2. Gross findings

Most of the tumors were circumscribed, solid gray white to light brown (Fig. 1). Others were multinodular except for 1 that had infiltrating margins. Abundant hemorrhage was noted in 1 of the cases, and 1 case showed cystic degeneration. The location of the tumor in the breast was not known in the lumpectomy specimens, whereas in 1 mastectomy specimen, it was described as subareolar. The tumor size ranged from 2.5 to 10 cm with a mean tumor size of 5.5 cm.

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Fig. 1. Gross appearance of secretory carcinoma (case 5). The tumor is solid grayish white.

3.3. Histologic findings

Histologically, 7 cases showed characteristic microcystic pattern, that is, small cysts often merging into larger spaces containing abundant luminal eosinophilic secretions reminiscent of thyroid follicles (Fig. 2A). A lobulated pattern imparted by prominent stromal fibrosis was seen in 6 cases (Fig. 2A). A papillary pattern with papillae having fibrovascular cores was noted in 5 cases as a small component of the tumor and as dominant component in 1 case (Fig. 2B). Tubular and solid pattern (Fig. 3A) was seen in 3 cases. In situ component was noted in only 1 case (Fig. 3B). Numerous small to large intracytoplasmic lumina were seen filled with intense eosinophilic secretions, the fusion of which resulted in microcystic pattern. The tumor cells had pale cytoplasm and small ovoid nuclei with prominent nucleoli. The secretions in both the intracytoplasmic lumina or in the extracellular compartment were PAS alcian blue positive (Fig. 4A) and diastase resistant in all cases. Mitoses ranged from 1 to 2/10 high-power fields. Perineural and lymphovascular invasion was not seen in any case. Tumor infiltration into the muscle was seen in 1 case (Fig. 4B). All tumors were grade 1 according to the Modified Bloom and Richardson grading system. Adjacent breast tissue showed secretory changes in 1 case (case 4). Associated mild chronic inflammation and hemosiderin was seen in 4 cases.

The 2 mastectomy specimens with axillary lymph node sampling and clearance showed 1/1 and 2/29 positive nodes, respectively (Fig. 5). The size of largest metastatic focus was 1 cm. Extranodal spread was not identified. Further treatment details and follow-up were not available in any of the patients. One patient had received chemotherapy before mastectomy, having been diagnosed as invasive ductal carcinoma from elsewhere. Immunohistochemical stains EMA and S100 were performed in 4 cases and showed positive results. The summary of all findings are shown in the Table.

4. Discussion

Secretory carcinoma of breast is a rare type of breast carcinoma comprising less than 0.1% of all breast cancers [1]. In 1966, McDivitt and Stewart [2] first described the term *juvenile breast carcinoma* in a series of 7 cases with ages ranging from 3 to 15 years (mean age, 9 years). Later, in 1980, Tavassoli and Norris [3] reported 19 cases of this tumor in all age groups (range, 9–69 years; median age, 25 years) and

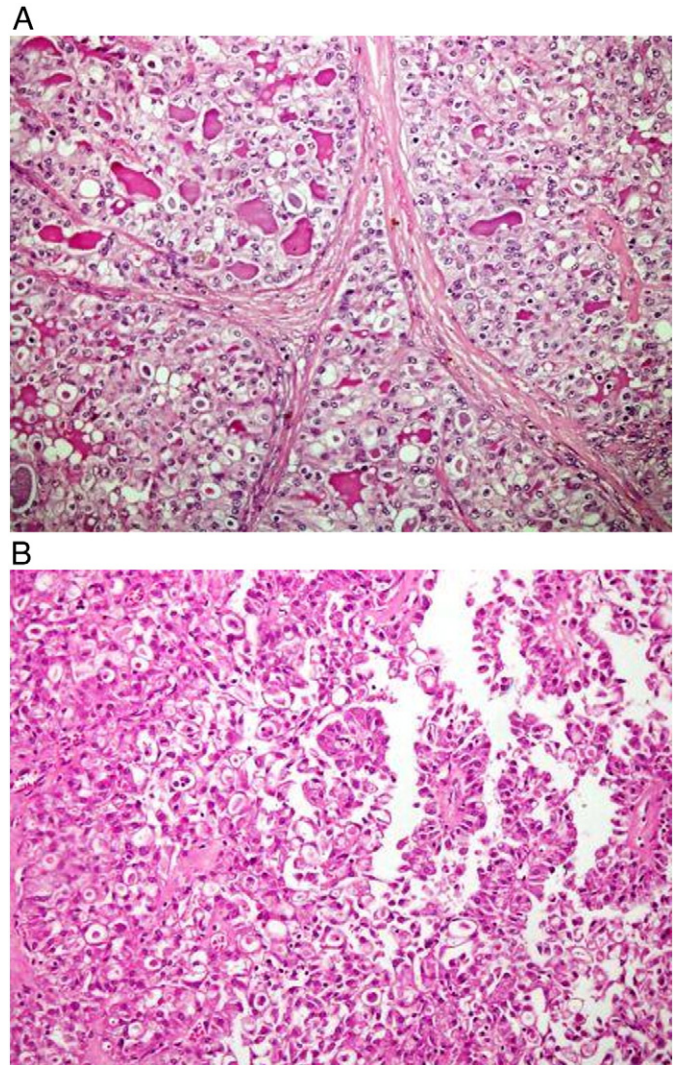


Fig. 2. (A) A microcystic pattern composed of small cysts and larger spaces containing abundant pink eosinophilic secretions. Also note a lobulated pattern caused by stromal fibrosis (H&E, original magnification $\times 200$). (B) A papillary pattern (on the right) and microcystic pattern (on the left) (H&E, original magnification $\times 200$).

replaced the term *juvenile carcinoma* with *secretory carcinoma* owing to abundant secretions within the tumor [3]. The age at presentation ranges from 3 to 87 years (median, 25 years) [1]. Secretory carcinoma occurs in both sexes with a female to male ratio of 6:1 [5]. Only 18 cases have been previously reported in male patients [6]. The age in men ranged from 3 to 66 years with a mean age of 23.5 years. Secretory carcinoma is rare after the age of 50 years [7]. Two patients in our series, however, were older than 50 years.

Secretory carcinoma may occur in any part of the breast as a painless mobile lump. Subareolar tumors have been associated with nipple discharge and are normally seen in prepubertal and male patients because their breast tissue is localized in this region [8]. One of our patients (case 7) had a 6-year history of painless lump. Secretory carcinoma of breast frequently appears as a small benign-looking nodule or group of nodules or sometimes as an intraductal lesion with a low clinical stage on sonography [9].

Grossly, SCB is usually a firm, well-circumscribed, gray white to tan brown mass. The size in various reported series has ranged from less than 1 to 16 cm [10].

Microscopically, a lobulated pattern is often seen, which is imparted by fibrous septae. The 3 major components of tumor are

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