Solid Variant of Mammary Adenoid Cystic Carcinoma

Ji Eun Kwon · Yoon Hee Lee
Ju Yeon Pyo · Sang Kyum Kim
Byeong-Woo Park1 · Woo-Ick Yang

Department of Pathology, Brain Korea 21 Project for Medical Science, and 1Surgery, Yonsei University Health System, Seoul, Korea

Received: May 14, 2007
Accepted: August 27, 2007

Corresponding Author
Woo-Ick Yang, M.D.
Department of Pathology, Yonsei University Health System, 134 Shinchon-dong, Seodaemoon-gu, Seoul
120-752, Korea
Tel: 02-2228-1765
Fax: 02-2227-7939
E-mail: wiyang9660@yumc.yonsei.ac.kr

Key Words: Carcinoma; Adenoid cystic; Breast

Adenoid cystic carcinoma (ACC) is a rare type of breast carcinoma and this tumor makes up less than 0.1% of all mammary carcinomas; ACC is known to show a relatively favorable prognosis. Among a variety of microscopic growth patterns of mammary ACC, a solid variant is the rarest and this can cause diagnostic difficulties. We present here a case of a solid variant of mammary ACC that occurred in the right breast of a 40-year-old woman who was initially diagnosed with invasive ductal carcinoma. We discuss the histological and clinical characteristics of this case.

Salivary-type neoplasms such as adenoid cystic carcinoma (ACC) rarely occur in other organs and if they do, then this can cause diagnostic difficulties. Primary mammary ACC is rare and it makes up less than 0.1% of all the breast carcinoma.1 Histologically, this neoplasm displays cribriform, tubular, trabecular and solid growth patterns by the combination of epithelial and myoepithelial cells, and the prognosis is relatively favorable, which is contrary to ACC occurring in the salivary gland.2 Shin and Rosen3 have recently described a solid variant of mammary ACC with basaloid features as a histologically distinctive entity that has the potential for axillary lymph node metastases. The purpose of this report is to present a case of a solid variant of mammary ACC that was predominantly composed of basaloid cells, and we review its histologic and clinical characteristics.

CASE REPORT

A 40-year-old woman presented with pain in her right breast, and she had experienced this pain for three months. Mammary ultrasonogram revealed an ill-defined hypoechoic lesion in the right subareolar area and the lesion measured 3.5 cm at its maximal dimension. The initial pathologic diagnosis of a needle core biopsy specimen from a referring pathologist was invasive ductal carcinoma. Following rebiopsy at our hospital, the pathologic diagnosis was solid variant of mammary ACC with basaloid features, and right modified radical mastectomy with axillary lymph node dissection was performed.

The tumor was mainly composed of variable sized solid nests or islands of basaloid cells with infiltrative margins (Fig. 1). Trabeculae and tubules were focally present while any cribriform pattern was not identified. The intervening stroma was densely hyalinized and focally myxoid. The most easily identified cells were basaloid cells; these were medium to large poorly differentiated cells with oval hyperchromatic nuclei and indiscernible cytoplasm (Fig. 2). As other constituent cell types, small round to ovoid or angulated dark cells resembling myoepithelial cells and cuboidal epithelial cells were identified. Frequent perineural invasion was found. There was no carcinoma metastasis in the 17 dissected axillary lymph nodes.

The tumor cells did not express estrogen receptor (ER) or neuroendocrine markers. S100 protein was expressed in most of the basaloid cells as well as some of the ductular epithelial cells (Fig. 3B). Alpha smooth muscle actin and smooth muscle myosin heavy chain were completely negative. Vimentin and P63 were positive only in a few basaloid cells. CD10 was positive in some
basaloid cells and in most of the small dark cells, while the ductular epithelial cells did not express CD10 (Fig. 3A). A positive reaction to c-kit was found in many of the basaloid cells. A luminal type cytokeratin (cytokeratin 8/18) and a basal type cytokeratin (cytokeratin 5) were not selectively expressed in the epithelial and basaloid cells (Fig. 3B, C).

**DISCUSSION**

The most common presentation of mammary ACC is a palpable mass that is frequently found in the subareolar area, and pain or tenderness is frequently associated, the same as in our case. However, perineural invasion has rarely been noted in ACC of the breast, which is contrary to the salivary gland tumors. Interestingly, our case presented with mastalgia and showed prominent perineural invasion and this finding may have caused pain in our patient.

The most important single criterion for the diagnosis of ACC is a biphasic cellular pattern, and several myoepithelial cells markers can be applied for the differential diagnosis. In addition, ER can be used as a useful marker because this tumor is regularly ER negative. The solid or basaloid type of ACC should
also be distinguished from neuroendocrine carcinomas.

Basaloid cells have been used with somewhat different meanings in the morphologic description of ACCs, and this can lead to considerable confusion. In the cribriform and tubular types, basaloid cells have been used to describe small dark modified myoepithelial cells. The basaloid type has been used as a synonym for the solid type in some reports of ACC, while other reports have described the basaloid and solid types as different ones. A recent report on the solid variant of mammary adenoid cystic carcinoma with basaloid features depicted the basaloid cells as medium to large cells with round to hyperchromatic nuclei and scanty, mildly eosinophilic cytoplasm. We performed immunohistochemical staining to understand the nature of the basaloid cells. Among the myoepithelial cell markers, smooth muscle actin and smooth muscle myosin heavy chain were not expressed in the basaloid cells. C-kit and CD10 were expressed in a significant proportion of the basaloid cells, while vimentin and p63 were expressed in a few basaloid cells. So the basaloid cells in our case expressed a limited degree of myoepithelial markers. Contrary to our expectation, a luminal type of cytokeratin and a basal type of cytokeratin were not selectively expressed in the epithelial and basaloid cells. We also support the suggestion that the basaloid cell is a somewhat primitive cell with the capacity for multidirectional differentiation.

Ro et al. reported that mammary ACC with a higher proportion of solid elements demonstrated a tendency for both recurrence and metastases. Recently, Shin and Rosen have also suggested that the solid variant of ACC with basaloid features had a greater propensity for axillary node spread than did the conventional mammary ACC. However, there have been several reports showing contradictory results. So, accurate prognostication of a solid type of ACC needs further investigation with a larger group of patients.

REFERENCES