

= Abstract =

Fine Needle Aspiration Cytology for Secretory Carcinoma of the Breast in a Female Adult

- A Case Report -

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Secretory carcinoma of the breast is a rare tumor of the ductal origin with a more favorable prognosis than the conventional ductal carcinoma. To the best of our knowledge, there are a few reports on fine needle aspiration cytology (FNAC) of secretory carcinoma in the English literature and one in the Korean literature. Recently, we experienced a case of secretory carcinoma of the breast performed by FNAC. The cytologic smears revealed several clusters and sheets of cohesive neoplastic cells in eosinophilic secretory background. Individually scattered cells were rarely found. Intracytoplasmic vacuolization and occasional signet ring cells with lacy cytoplasm were detected. To make the diagnosis and differentiation of this rare tumor, an identification of the secretory background and microcystic spaces filled with bluish mucin and occasional nuclear atypism of tumor cells is crucial.

Key words: Secretory carcinoma, Breast, Fine needle aspiration cytology

Introduction

Secretory carcinoma of the breast is a rare tumor, which was first described in children.¹⁾ Later Rosen and Cranor²⁾ revealed a much higher frequency in adults than in youths. The cytologic description of this tumor was illustrated in eleven reports.^{3~12)} The cytologic features of secretory carcinoma, which is associated with the comedo

type of ductal carcinoma in situ are described herein and compared with its histologic features. We emphasize on the variable cytologic characteristics of secretory carcinoma for its diagnosis.

Case Report

Clinical History

Fine needle aspiration cytology(FNAC) was

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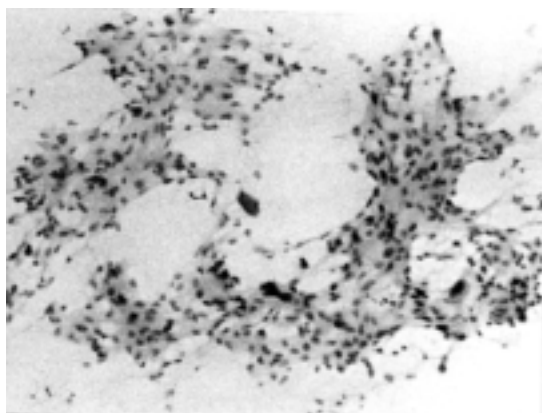


Fig. 1. FNAC findings: The smears exhibited many small to large cohesive aggregates of neoplastic cells. Note faintly eosinophilic lacy material-filled background (H-E, $\times 200$).

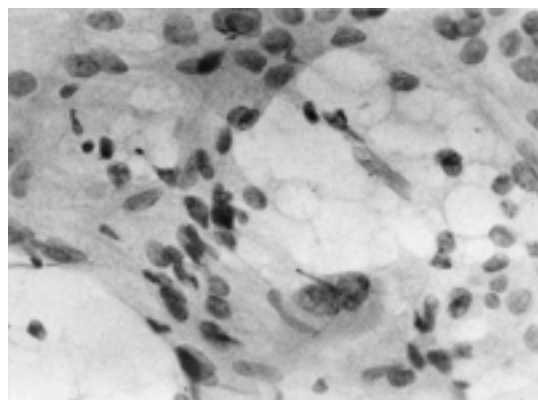


Fig. 2. High power view of FNAC: Tumor cells have granular cytoplasm, round coarse heterochromatic nuclei with nucleoli, and intracytoplasmic lumina containing foamy bubbly material. A few signet ring cells of vacuolated cytoplasm are also noted (H-E, $\times 400$).

carried out in a 49-year-old woman who had two palpable painless masses in her left breast for a few months. The smaller mass in the upper inner quadrant was a relatively well-defined round grayish firm mass, $1 \times 1 \times 1$ cm. The larger one of the lower inner quadrant was adjacent to, but isolated from the former, $1.5 \times 1 \times 1$ cm. FNAC was performed at the upper inner quadrant. The aspiration was done with a 24-gauge needle. Direct smears were prepared for Diff-Quik (Dade, Abingdon, UK), hematoxylin and eosin, and Papanicolaou stains. Modified radical mastectomy was done without additional treatment. During the 2-month follow-up period, the postoperative clinical course was uneventful.

Cytologic Findings

The FNAC smears had many small to large aggregates of cells. Some clusters had a luminal structure filled with eosinophilic lacy secretory material. Faint lacy background was characteristic

(Fig. 1). There was no necrotic debris. Predominantly cohesive sheets of moderate-sized tumor cells were found. The tumor cells had ill-defined cell borders and lacy cytoplasm showing intracytoplasmic multivacuolization, which occasionally displaced the nuclei. The hyperchromatic nuclei usually had single prominent nucleolus (Fig. 2). Myoepithelial cells and mitosis were not identified within the sheets of tumor cell.

Histologic and Immunohistochemical Findings

On gross examination, two palpable masses were located in the inner half of the left breast. The smaller mass in the upper inner quadrant, where preoperative FNAC was carried out, was a relatively well-defined round grayish firm mass, $1 \times 1 \times 1$ cm. The larger one in the lower inner quadrant was $1.5 \times 1 \times 1$ cm. The cut surface of the former was gray and firm. It showed a mainly solid growth pattern intermixed with a focal microcystic pattern. Occasional mitoses with

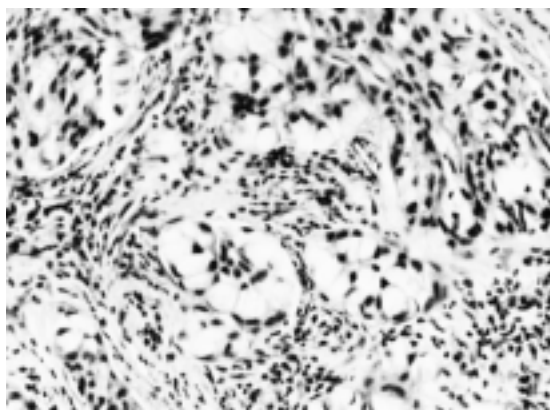


Fig. 3. Histology of secretory carcinoma: It shows a mainly solid and focal microcystic growth pattern and lumina with eosinophilic conspicuous inspissated mucus (H-E, $\times 100$).

hyperchromatic nuclei belonged to an intermediate nuclear grade(Fig. 3). The most characteristic feature of the tumor was the very prominent intra- and extracellular secretion; in most of the cells, there were intracytoplasmic lumina filled with globoid homogenous secretion of different tinctorial quality ranging from pale basophilic to intensely eosinophilic. Secretory eosinophilic material was strongly positive for periodic acid-Schiff(PAS) stain, diastase resistant, and alcian blue stain, and focally reactive for mucicarmine. The neoplastic ductal epithelial cells of secretory carcinoma were positively immunoreactive to carcinoembryonic antigen(Dako, 1:100), cytokeratin(Becton, prediluted), vimentin(Dako, 1:80), and epithelial membrane antigen, and negative to estrogen receptor(Novocastra, 1:200), progesteron receptor(Novocastra, 1:50), S-100 protein(Dako, 1:500), and c-erb-B2(Zymed, 1:80). The latter larger mass showed a comedo type of ductal carcinoma in situ with multifocal calcification. All of the seventeen axillary lymph nodes were free

of metastases.

Discussion

Not many reports have been written about FNAC of secretory carcinoma of the breast. To our best knowledge, only eleven articles have been reported worldwide including one case from Korea.³⁻¹²⁾ Variable findings such as strong cohesiveness, abundant cellularity, intracytoplasmic multivacuolization, large sheet-like arrangements, intercellular spaces, a lacy appearance,^{3, 6, 7)} vacuolated cells,⁴⁾ granular cells,^{6, 7)} a foamy appearance,⁸⁾ bunch of grapes-like structures, and so-called mucous globular structures(MGSs)¹⁰⁾ have been described.

MGSs are composed of a small central core of mucin and a lining of a few tumor cells on the mucous surface.^{3, 10)} Moreover, it histologically corresponds to the follicular, microcystic growth pattern and a thyroid gland-like appearance of secretory carcinoma. Therefore, the case with a predominantly solid growth pattern and a micro-focus of microcysts like our case lacks MGSs.

Lacy background might be seen in other mucin producing lesions including the usual mucinous carcinoma.¹³⁾ More localized accumulation of mucus which is assumed to have been derived from ruptured or enlarged MGSs is helpful for differentiating secretory carcinoma from mucinous carcinoma.³⁾ The amount of mucus in the background of the secretory carcinoma was less than that of the mucinous carcinoma because the former demonstrated intra-and extracellular secretion, while the latter showed mainly extracellular secretion.

In addition, the prominent intracytoplasmic vacuoles of secretory carcinoma might resemble

those of lobular carcinoma and secretory carcinoma.⁷⁾ In lobular carcinoma, granular or vacuolated cells are not diffuse as in secretory carcinoma.⁴⁾ Large secretory vacuoles containing proteinaceous eosinophilic material are also similar to the background secretion. These vacuoles could also be seen in the ductal, lipid-rich, glycogen-rich, and mucinous carcinomas. Lipid-rich and glycogen-rich carcinomas could be ruled out with histochemical staining, such as oil-red O stain or air-dried smears for lipid-rich carcinoma, and PAS with diastase reactivity for glycogen-rich carcinoma.^{4, 12)} The vacuoles in ductal, lobular, and mucinous carcinoma are nearly always smaller than secretory carcinoma.¹⁴⁾ In mucinous carcinoma, mucus pool stains pale blue with Giemsa stain as compared to bright pink in secretory carcinoma due to the somewhat different histochemical composition. The secretory materials in secretory carcinoma are composed of α -lactalbumin as well as acid mucopolysaccharides and sialomucin.¹⁵⁾ Some have reported of ultrastructural identification of intracytoplasmic lumina.^{5, 14)} However, intracytoplasmic lumina might be identified in other forms of breast carcinoma of lobular carcinoma or conventional ductal carcinomas.

The importance of background proteinaceous material has been reported recently.¹²⁾ The background mucin could be easily detected by Giemsa stain rather than Papanicolaou-stained smears, which is histochemically acid mucopolysaccharides and sialomucin.^{14, 16)}

Local excision is preferred as the initial treatment modality for this favorable carcinoma, particularly in the young age group. Thus the importance of FNAC diagnosis should be emphasized. Prolonged follow-up is needed to

assess the accurate biological behaviors of this rare type of tumor.

In summary, morphologic findings of the present case such as eosinophilic lacy background as well as the intracytoplasmic lumen and mucin are characteristic cytologic hallmarks of secretory carcinoma of the breast. We emphasize that correct cytologic diagnosis could be possible through careful search of secretory material in the smear background, intercellular lumen, and intracytoplasmic mucus-filled vacuoles in highly cellular aspirates.

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= 국문초록 =

성인여성에서 발생한 유방의 분비성 암종의 세침흡인 세포학적 소견

- 1에 보고 -

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유방의 분비성 암종은 관 기원으로 통상의 침윤성 관암종보다 예후가 좋은 드문 종양이다. 현재까지 분비성 암종에 대한 세침흡인 세포검사의 세포학적 소견에 대해 보고한 영문보고는 소수이며 국내에는 단 1예의 보고가 있다. 최근 저자들은 세침흡인 세포검사로 진단한 유방의 분비성 암종 1예를 경험하였기에 이를 보고한다. 세포학적 소견은 약호산성의 분비성 물질로 이루어진 배경에 종양세포들이 관상구조를 보이며 개개로 떨어지는 세포는 거의 없었다. 레이스양 세포질의 다공성 변화는 간혹 반지양 모양을 이루기도 하여 분비성 암종에 합당하였다. 본 증례에서 알 수 있듯이 분비성 도말 배경과 점액으로 채워진 소낭성 공간 및 간혹 관찰할 수 있는 관상피 세포의 이형성은 유방의 드문 종양인 분비성 암종의 정확한 세포학적 진단에 매우 유용한 소견이다.

Key words: 분비성 암종, 유방, 세침흡인 세포검사