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Adenoid Cystic Carcinoma of the Breast: Diagnosis by Fine Needle Aspiration Cytology

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=Abstract=

Adenoid cystic carcinoma is a rare variant of mammary cancer with better prognosis. The diagnosis is usually made by histologic examination of biopsy specimen.

Recently, we have experienced a case of adenoid cystic carcinoma initially diagnosed by fine needle aspiration cytology which revealed distinct cytologic features in a 45-year-old woman. Pink to red globules in the tumor cell clusters on Diff-Quik staining was a very helpful finding for cytologic diagnosis.

Key words: Fine needle aspiration cytology, Adenoid cystic carcinoma, Breast.

Introduction

Adenoid cystic carcinoma (ACC) of the breast is rare and accounts for less than 1 percent of all mammary cancers[1]. Approximately 110 cases have been reported. The diagnosis is usually made by histologic examination of a biopsy specimen. Fine needle aspiration of primary ACC with its distinctive cytologic characteristics has been described in the submucosal bronchial glands[2], salivary gland[3,4], uterine cervix[5], Bartholin's gland[6] and skin[7].

To the best of our knowledge, this paper reports the first case in the English literature in which the diagnosis was initially suggested by fine needle aspiration (FNA) cytology on ACC of the breast.

Case Presentation

A 45-year-old woman presented with a left breast, mass, which had been noted by herself 10 days ago.

On physical examination, a soft movable mass without tenderness was noted in the upper outer quadrant, measuring 3 cm in maximum diameter. Bloody discharge was noted when the nipple was compressed.

Ultrasonogram of the left breast showed a relatively well marginated hypoechoic mass without septation or tumor calcification (Fig. la).

Mammography of the left breast showed a somewhat lobulated, increased mass density without vessels,duct dilatation or calcification which are

commonly seen in malignancy of the breast (Fig. 1b). The results of other laboratory study were within normal limits.

FNA of the mass displayed cytologic features, diagnostic of ACC. Simple mastectomy with axillary node dissection was done.

Cytologic and Histologic Findings

A FNA of the left breast mass produced scanty amount of mucoid material. The smears of an aspirate revealed tightly cohesive clusters of uniform basaloid cells with dissociated cells at the margin on Diff-Quik (Giemsa) technique (Fig. 4b). Numerous well-defined globules that stained pink to red were found in the clusters and were encircled by the tumor cells. These globules (spheres) were pale and almost glassy in appearance when stained by hematoxylin and eosin technique (Fig. 2, 3, & 4a). The epithelial cells have regular nuclei and barely noticeable rims of cytoplasm with inconspicuous nucleoli. On occasion, abundant hyaline connective tissue separated the tumor cells.

Simple mastectomy of the left breast with dissection of axillary lymph node was done without procedure of frozen section. Cut section of the submitted left breast revealed a relatively well defined, but not encasulated mass, measuring 1.3 cm in diameter. The cut surface of the mass was somewhat mucoid, granular and yellowish grey with small and multiple cystic spaces. The periphery of the mass was

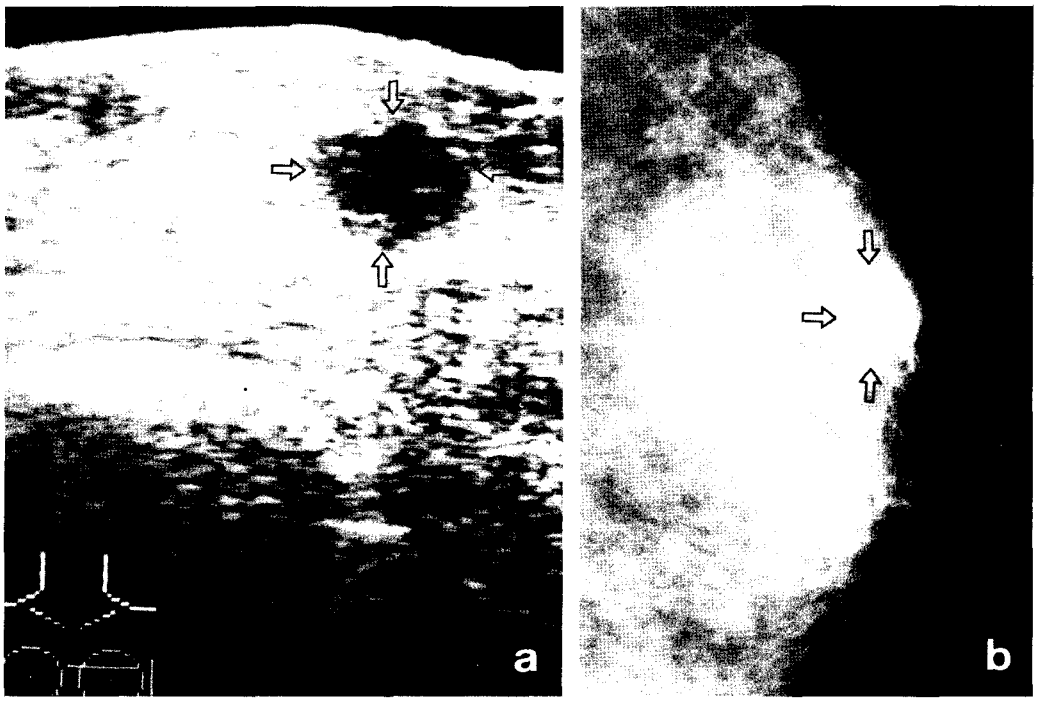

Fig. 1. Ultrasonogram discloses a well marginated hypoechoic mass (arrows) without septation or calcification (a). Mammogram shows a lobulated homogenous mass density (arrows) without vessel, duct dilatation or calcification (b).

Fig. 2. FNA cytology smear demonstrates tight cohesive clusters of uniform tumor cells with cribriform pattern(H-E, ×200).

Fig. 3. Colorless spheres of amorphous material are surrounded by basaloid cells (a : H-E, ×100, b : H-E, ×400).

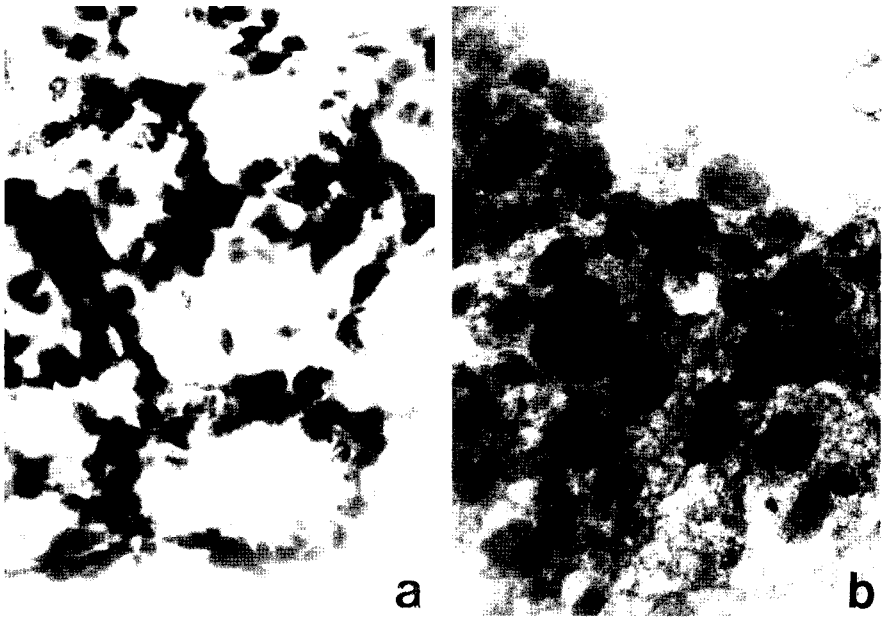

Fig. 4. The transparent acellular cores (a : H-E, ×400) are pink staining globules on Giemsa staining(b : Diff-Quik, ×200).

Fig. 5. Gross finding reveals a lobulated mass (arrows) with mucoid and granular cut surface and cystic spaces.

lobulated (Fig. 5).

Microscopically, the tumor disclosed cribriform pattern containing hyaline balls and cylindroma and was separated by a band of dense fibrous connective tissue. The tumor cells were generally basaloid with scanty cytoplasm and hyperchromatic nuclei (Fig. 6). There were areas of solid component, consisting less than 30 percent of the tumor; it was considered as grade Ⅱ of ACC, according to a system used for ACC of the salivary gland[8,9].

Discussion

The FNA cytologic features of ACC the salivary glands have been described by Eneroth and Zajicek[3]. Similar features of the aspiration have been described in primary ACC of other organs[2,5,6,10]. Cytologic features of ACC are: 1) large spherical globules (mucus) surrounded by basaloid tumor cells, 2) solitary, smaller, rounded stromal mass or hyaline finger-like structure between cell cluster, 3) close-packed cohesive uniform round or oval nuclei with little cytoplasms, and 4) hyperchromatic small nuclei with granular chromatin and occasional prominent nucleoli[11]

Although there are pitfalls in the diagnosis, the aspiration cytologic diagnosis of ACC is accurate, particularly, when globules of mucus are present[3]. Since very characteristic feature of ACC is the presence of spherical structures that are colorless or pale-blue with the Papanicolaou and hematoxylin -eosin stains[2,4] and pink with Romanowsky stains[3]. Lobenthal and Saigo[12] warned that such spheres, when isolated, may be missed or misinterpreted as

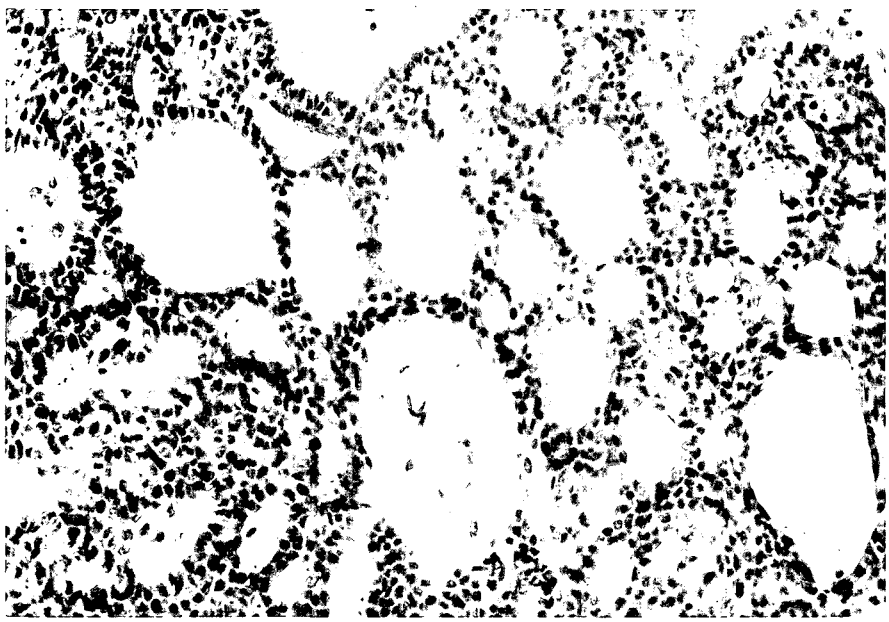

Fig. 6. Histologic finding of the mass is typical of adenoid cystic carcinoma (H-E, ×200).

insignificant debris. These acellular globules have been shown by electron microscopy to consist of layers of basal lamina[13]. Although the presence of these acellular cores could be considered indicative of ACC, Eneroth and Zajicek[3] emphasized that poorly differentiated solid ACC did not always yield these chunks of basal lamina.

In our case, the spheres presented densely pink staining globules with Diff-Quik technique, that made the diagnosis of ACC possible immediately at the time of FNA of the mass. Therefore we could advice a therapeutic guide to the clinician. Present case appears to be the first case in the English literature of mammary ACC in which the diagnosis was initially suggested by FNA cytology.

ACC of the breast is usually considered among the group of well-differentiated carcinomas with good prognosis. In 1969, Cavanzo and Taylor[1] recommended simple mastectomy as the treatment of choice for ACC. Ro et al.[14] suggested that the grading of ACC of the breast may be important for prognosis and treatment selection, when the tumor was graded according to a system used for ACC of the salivary gland. Grade Ⅰ tumors are completely glandular and cystic and lack a solid component, grade Ⅱ tumors contain solid areas constituting less than 30 percent of the mass, and grade Ⅲ is tumors in which the solid component makes up more than 30 percent of the mass. For grade Ⅰ ACC, a trial of local excision alone without axillary node dissection is warranted. In grade Ⅱ tumor, a simple mastectomy appears to be the treatment of choice. And mastectomy with axillary lymph node dissection is considered for grade Ⅲ ACC.

In our case, the tumor was composed mostly of clusters of uniform basaloid cells surrounding pink globules on Diff-Quik staining and colorless spherules on hematoxylin-eosin staining. And there were areas of tightly packed basaloid cells in clusters, which could be roughly measured by under 30 percent of the whole population. We suggested that this lesion was regarded as grade Ⅰ or Ⅱ of ACC and then simple mastectomy with axillary node dissection was done without frozen diagnosis. We believe the FNA cytologic diagnosis of ACC in this patient enabled the clinician to plan appropriate and acceptable therapy for the lesion. And we could also get good gross finding of ACC of the breast because of an unnecessity of frozen tissue diagnosis.

Differential features distinguishing ACC from other neoplasms were described in the lung[15] or salivary glands[16]. In the breast, intraductal carcinoma and invasive duct carcinoma with cribriform pattern are known to be the most common sources of confusion histologically[17,18]. Similarly, both of the lesions are composed of smaller cells with a moderate degree of nuclear plemorphism, arranged in a tight globular honeycombed arrangement on cytologic examination. The differentiation from ACC may be difficult on Papanicolau or hemato xylin-eosin staining, however pink to red globules in the tumor on MGG technique can be very helpful for the differentiation.

Usual mammographic findings of infiltrating ductal carcinoma are circumscribed mass with partial loss of sharp border[20], amorphous calcification along the ducts or prompted large veins etc[21]. In the present case, mammography revealed a well circumscribed mass with sharp margin and without calcification or vein dilatation.

The most common ultrasonographic finding of carcinoma of the breast is a jagged or irregular margined mass with hyperechoic density, however, anechoic or hypoechoic area can be found in necrotic or cystic tumor[22]. A well marginated hypoechoic density on the ultrasonogram of present case may represent the macroscopic multicystic nature of this lesion.

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=국문 요약=

유방의 선양 낭포성 암종

-세침흡인 세포검사로 진단된 1예 보고-

순천향의대 서울 병원 해부병리과 및 방사선과*

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유방의 선양낭포암종은 매우 드물며 예후는 좋다. 유방에서 이 종양이 애초에 세포학적으로 진단된 예에 관한 세계 문헌상의 보고는 없다.

최근 저자들은 45세 여성의 좌측 유방 종괴로 부터 세침 흡인 검사를 시행하여 선양낭포성 암종을 진단하였으며, Diff-Quik 염색시 종양세포 집락 내에서 분홍 및 적색으로 염색되는 구형의 물질이 확진에 도움을 주었다.