Fine-Needle Aspiration Cytology Findings of Mucinous Carcinoma of Breast

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ABSTRACT
Pure mucinous carcinoma (MC) of the breast is a relatively uncommon variant of breast carcinoma with distinctive histological and cytological features. Knowledge of the distinctive cytomorphological appearance of MC would enable correct identification of these lesions as malignant and prompt treatment that could further enhance the survival of these prognostically good breast cancers.

Keywords: Breast neoplasms, Fine-needle aspiration cytology, Mucinous carcinoma.


INTRODUCTION
Mucinous lesions of the breast represent a broad spectrum of entities, which may pose a diagnostic challenge on fine-needle aspiration cytology (FNAC). Mucinous carcinomas (MCs) are so bland cytologically that they may be misdiagnosed as benign lesions, especially in cellpoor samples with ample mucin. Mucinous carcinoma of the breast is a distinctive, well-differentiated type of adenocarcinoma, constituting 2 to 5% of breast cancers.1,2 Pure MC of breast has been reported to have a more favorable prognosis than other well-differentiated adenocarcinomas of breast, with a lower frequency of auxiliary node metastasis and excellent short-term prognosis, especially when the tumor measures less than 5 cm in diameter.3 Fine-needle aspiration has been described to yield copious amounts of mucinous material with a variable proportion of tumor cells. The tumor cells have been described as being generally small and fairly uniform with minimal atypia, and this may give a false impression of benign.

CASE REPORT
A 50-year-old Indian woman complained of left breast mass for 6 months. Her past medical record and family history were unremarkable. Sonography revealed a partially ill-defined and lobulated tumor about 3.4 x 2.5 cm in dimension.

Fine-needle aspiration smear was moderately cellular with clusters of tumor cells against a rich mucinous background (Figs 1A and B). The tumor cells were bathed in wispy or colloid-like mucin material. Tightly cohesive three-dimensional (3D) cell balls and angulated clusters were noticed. The tumor cells exhibited mild to moderate nuclear atypia with small nucleoli.

Figs 1A and B: (A) Moderately cellular with clusters of tumor cells against a rich mucinous background and (B) tumor cells were bathed in wispy or colloid-like mucin material

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DISCUSSION

Breast lesions with mucin represent a broad spectrum of entities, including fibrocystic change (FCC) with luminal mucin, mucocele-like lesion (MLL), pure or mixed type of, and other conditions accompanied by mucin-like material. Among these mucinous lesions, MLL is an uncommon tumor initially described by Rosen as a benign process of breast. The subsequent reports on MLLs disclose a spectrum of pathologic lesions from benign tumor, atypical ductal hyperplasia, carcinoma in situ to invasive carcinoma, further complicating the diagnostic problem. Mucinous carcinoma is a variant of breast cancer, characterized by the accumulation of abundant extracellular mucin around invasive carcinoma cells. In practice, a carcinoma should not be classified as pure MC if more than 10% of the invasive component is nonmucinous, or if the nonmucinous invasive component is poorly differentiated cytologically. Mucinous carcinoma may appear clinically and radiologically benign and FNAC plays important role in the correct preoperative diagnosis. Significant nuclear pleomorphism and necrosis, in addition to extracellular mucin suggests mixed MC invasive ductal carcinoma. In general, pure MCs have a favorable prognosis, and the 10-year survival ranges from 80 to 100%.

The cytologic features of MC are well established. However, aspirates with abundant extracellular mucinous material originating from other mammary lesions, especially those with increased cellularity, may pose a diagnostic challenge on FNAC. Cytologic features, such as cellularity, shape of the epithelial cell nests, nuclear pattern, background and stromal component are helpful in the differential diagnosis. The mucinous material in MC appears thin and wispy or thick and resembling colloid on aspiration biopsy smears. In general, the cytologic pattern is highly variable from predominantly dyscohesive single epithelial cells floating in a mucinous background to predominantly cohesive sheets and 3D aggregates. Cellular atypia is mild to moderate. A distinct feature of MC is the presence of thin-walled capillaries, either free-floating or coursing through the thick mucin. Caution must be taken in diagnosing any malignant mucinous lesion with a high nuclear grade specifically as MC, because these lesions most likely will harbor ductal carcinoma, not otherwise specified (NOS) component. It is recommended that paucicellular lesions lacking cytologic atypia, whether representative of FCC or mucocele-like lesion, be considered for conservative surgical excision based on the lack of reliable malignant features.

REFERENCES