

Appraisal of imprint cytology in the diagnosis of mucinous carcinoma of the breast: a case report

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Summary

A case of mucinous carcinoma of the breast is reported in a female aged 71 years. On gross examination of the left mastectomy specimen two relatively well-circumscribed masses with a gelatinous cut surface were found. Touch imprint cytology was consistent with a low-grade malignancy and histologic and histochemical examination revealed a mucinous carcinoma.

Careful prospective correlation between the cytological appearances of cells in imprints and the subsequent histopathology may lead to a more precise cytodiagnosis of a tumor associated with a comparative good prognosis.

Key words: Mucinous carcinoma; Breast; Mammography; Imprint cytology.

Introduction

Mammary mucinous carcinomas are a relatively rare special type accounting for between 1-2% of all breast cancers [1]. Also termed colloid, gelatinous, and mucoid carcinomas they all contain mucin derived from epithelium [2]. They usually occur in women aged over 60 years and are associated with a good prognosis, provided that strict diagnostic criteria have been applied.

As defined in the WHO classification of breast tumors [3], mucinous carcinoma contains large amounts of extracellular epithelial mucous, sufficient to be visible grossly and recognizable microscopically surrounding and within tumor cells.

In the present work, we describe the cytologic features of a mucinous carcinoma diagnosed in an elderly female patient, as found on imprint smears, and compare them with the histologic appearance of the lesion.

Case Report

A woman aged 71 years underwent a mammography, which detected two circumscribed soft tissue masses (Figure 1). Ultrasound examination also revealed two circumscribed soft tissue echogenic masses with posterior acoustic accentuation. To avoid misinterpretation of malignancy as benign a needle-core biopsy was performed and the patient was treated by mastectomy.

Imprint cytology performed inside the theatre room, revealed findings of a low-grade malignant tumor of non-special type elements (Figure 2). Histologic examination of the surgical specimen demonstrated an invasive carcinoma of the mucinous type (Figure 3). Tumor extension to one out of eight axillary lymph nodes excised was found. The patient has been followed-up for 36 months with no evidence of recurrent disease.

Materials and Methods

Two imprint smears were taken from each tumor mass and one was first cytospray-fixed and subsequently stained with the Papanicolaou technique. The other one was air-dried and then stained with the Hemacolor rapid staining set.

The cells were small, showed little variation in size, and had small indistinct nucleoli. There were no bipolar cells. These features were suggestive of a low-grade malignant tumor.

The surgical specimen was fixed in buffered formaldehyde, embedded in paraffin, cut in 5 mm sections and stained with H&E, PAS and mucicarmine. Immunohistochemical staining was performed using the ABC method to detect the expression of estrogen and progesterone receptors.

Histologic examination of both tumor masses revealed an invasive neoplasm almost entirely consisting of tubular structures of malignant cells within lakes of extracellular mucin (Figure 3).

Histochemical staining showed a strong reactivity of extracellular mucin with PAS and mucicarmine (Figures 4,5). Immunohistochemical staining showed no reactivity of the malignant cells with estrogen and progesterone receptor antigens. This finding is in disagreement with other immunohistochemical studies which have demonstrated nuclear estrogen receptor activity in nearly 90% of cases [4].

Discussion

Pure mucinous carcinomas are described as tumors that are "virtually pure" [5], with at least 50% growing in a mucinous pattern and with extracellular mucin constituting at least 33% of the lesion [6]. A widely accepted standard requires that at least 75% of the tumor have a mucinous growth pattern.

Fine needle aspiration (FNA) cytology has been evaluated as a means of breast cancer diagnosis; however, its usefulness remains debatable due to a high false negative rate (13.2%), and to the danger of hidden malignancy [7].

Very few reports have been published concerning imprint cytology as an adjunct in the diagnosis at breast

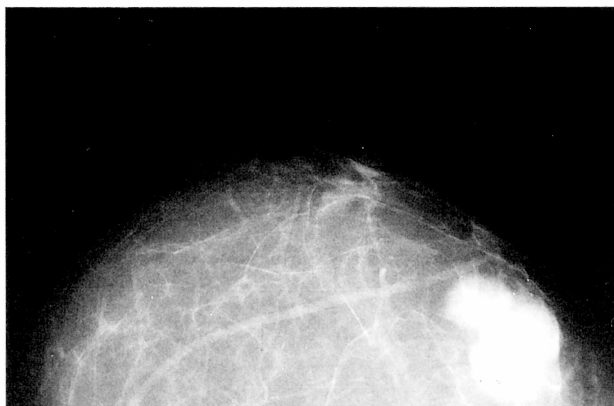


Figure 1. — Mammography shows two well-circumscribed masses.

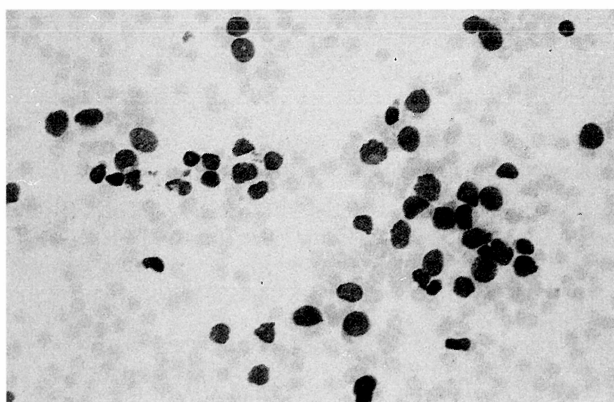


Figure 2. — Mucinous cancer: Imprint cytology preparation.

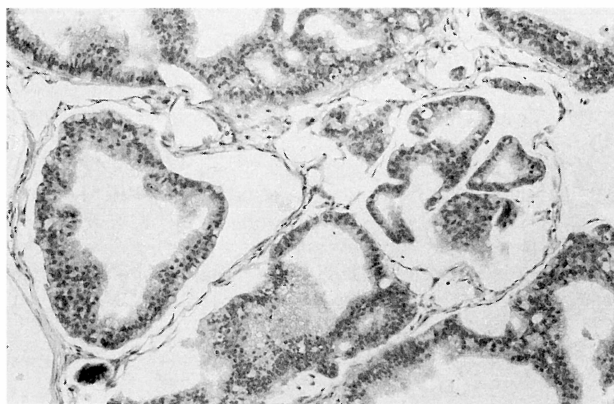


Figure 3. — Mucinous cancer: H&E x 250.

cancer. According to some authors it is of great value sometimes [8-10]. We believe that imprint cytology would provide many fewer false negative results than FNA since imprints are taken from the most suspicious areas of the lesion.

However, in the case of mucinous carcinoma, the prospective correlation with histopathology is less certain. There are no characteristic cytological appearances and the cytologist has to be more concerned about establishing a diagnosis of malignancy rather than the histolo-

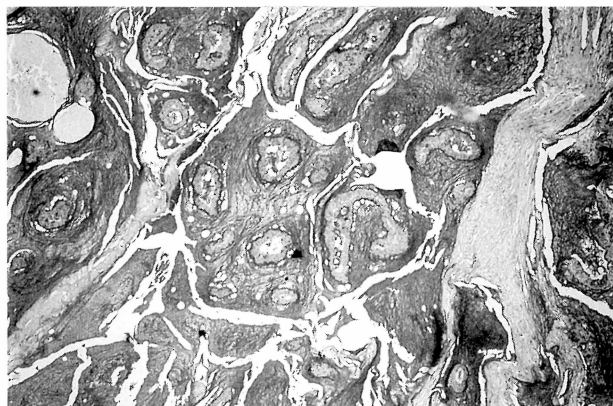


Figure 4. — Mucinous cancer: Histochemical stain PAS x 100.

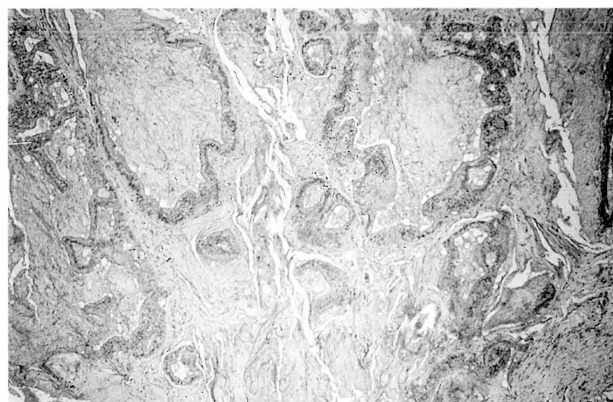


Figure 5. — Mucinous cancer: Histochemical stain mucicarmine x 100.

gical type. In our case the carcinoma cells were small, showing comparatively insignificant atypia, so diagnosis of malignancy was made by the absence of myoepithelial cells.

Cytologists cannot be confident in predicting the histology in which the typical features are seen, although of course the colloid component may be focal rather than the 90% of the tumor volume required to make the diagnosis of a tumor associated with a favorable prognosis [11].

Further research is necessary to establish the value of imprint cytology as a rapid, reliable method of intraoperative efficacy of mucinous carcinoma cytodiagnosis.

Acknowledgments

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References

- [1] Azzopardi J. G.: "Problems in Breast Pathology". Bennington J. L. ed. London, W. B. Saunders, 1974, 294.
- [2] Saphir O.: "Mucinous carcinoma of the breast". *Surg. Gynecol. Obstet.*, 1991, 72, 908.

- [3] WHO: "Histological typing of the breast tumours". *Tumori*, 1982, 68, 181.
- [4] Shousha S., Coady A. T., Stamp T., Janes K. R., Alagband-Zaden J.: "Oestrogen receptors in mucinous carcinoma of the breast: an immunohistochemical study using paraffin wax sections". *J. Clin. Pathol.*, 1989, 42, 902.
- [5] Melamed M. R., Robbins G. F., Foote F. W.: "Prognostic significance of gelatinous mammary carcinoma". *Cancer*, 1961, 14, 699.
- [6] Rosen C., Chistensen I. B.: "Prognostic factors in primary mucinous breast carcinoma". *Am. J. of Clin. Pathology*, 1987, 87, 155.
- [7] Willis S., Ramzy I.: "Analysis of false results in a series of 835 fine needle aspirates of breast lesions". *Acta Cytol.*, 1995, 39, 858.
- [8] Shabaik A., Cox C., Clark R., Reintgen D., Humptirey E., Nicosia S.: "Imprint cytology of needle localised breast lesions". *Acta Cytol.*, 1993, 37, 10.
- [9] Veneti S., Ioannidou-Mouzaka L., Toufexi H., Xenitides J., Anastasiadis P.: "Imprint cytology: a rapid reliable method of diagnosing breast malignancy". *Acta Cytol.*, 1996, 40, 649.
- [10] Suen K., Wood W., Syed A., Quenville N., Clement P.: "Role of imprint cytology in intraoperative diagnosis: value and limitations". *J. Clin. Pathol.*, 1978, 3, 328.
- [11] Trott Peter A.: "Breast Cytopathology A Diagnostic Atlas". Chapman & Hall Medical editions, 1996, 5.

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