Case report

Pure mucinous carcinoma of the breast- a rare case report

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Abstract
Pure mucinous carcinoma or colloid carcinomas of the breast account for not more than 2% of mammary carcinomas. Pure mucinous carcinomas have a favourable prognosis and are usually seen in post menopausal women. We describe a case of 65 years old female with a small, mobile mass in the right breast of 1 year duration which was diagnosed mucinous carcinoma of breast on basis of radiological and cytological studies and was confirmed by histology, special stains and immunohistochemistry. Reasons to present this case are: because of its rarity, axillary lymph node involvement and the favourable prognosis.

Keywords- Mucinous carcinoma, mammary, immunohistochemistry.

Introduction
Breast cancer is the first leading malignancy in women worldwide. It has different histologic types that reflect not only histologic features but also clinical and biological aspects. Mucinous carcinoma (MC) of the breast is a distinctive, well differentiated type of adenocarcinoma, constituting 2% of breast cancers.1,2 It is divided into 2 main subtypes, the pure type and the mixed type.3 The distinction between these subtypes is based upon the quantification of cellularity. The mucoid component varies between 30% to over 90% of the tumor. 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 axillary node metastasis and excellent short term prognosis, especially when the tumor measures less than 5 cm in diameter.4

Case report
A 65 years old female presented with a non tender, retroareolar mass in the upper outer quadrant of right breast of 1 year duration. The mass measured 3 x 4 cm and was not fixed, either to the skin or to the underlying structures. The overlying skin and the nipple was normal, no axillary lymph node was palpable on that side, the opposite side breast and axilla were normal, a clinical diagnosis of carcinoma of right side of breast was made. The mammogram revealed 25 mm mass in right side retroareolar region.

Fine needle aspiration (fig i) of mass was performed which revealed large pools of mucin with singly dispersed malignant ductal cells with mild atypia. Small clusters of malignant ductal epithelial cells
were also seen. Modified radical mastectomy (MRM) with axillary tail and lymph node resection was done.

**Pathological findings**

**Gross:** MRM specimen of right breast with axillary tail was received. Specimen of the breast (fig. ii) measured 15 x 18 x 5 cms with an elliptical skin flap with intact nipple and areola. Cut section revealed a well circumscribed, lobulated, moist, firm 4 x 3.5 x 3 cm. tumor in retro areolar region with scattered foci of hemorrhage. The tumour was 1 cm from the base and 1 cm from the skin surface. The axillary fat length attached to the breast tissue was 7 cm in length and a total of 12 lymph nodes were isolated largest being 2 x 1 x 1 cm. The cut surface was grayish in colour.

**Microscopy:** Multiple sections from the tumor area showed small clusters of solid, acinar and tubular arrangements of tumor cells floating in a sea of mucin (fig. iii and fig. iv). The tumor cells were round to polyhedral with mild atypia with pleomorphic, hyperchromatic nuclei with occasional prominent nucleoli with plenty of cytoplasm. These pools of extracellular mucin were divided by thin fibrous septa. The surrounding area showed focal necrosis and infiltration by chronic inflammatory cells. Sections from the nipple and areola, all the margins (superior, inferior, medial, lateral) and base were free from tumor infiltration. Out of the 12 lymph nodes 2 lymph nodes showed presence of similar histological findings as described above and remaining 10 showed sinus histiocytosis.

Special stains like PAS (fig. v) and Alcian Blue (fig vi) were performed to confirm the presence of mucin, both were positive. Immunohistochemical studies revealed ER (fig vii) and PR (fig viii) as positive and HER 2 (fig ix) negative.

**Discussion**

The identification of patients is important as it would spare the patient from medically unnecessary and potentially harmful interventions. The prognosis of pure mucinous carcinoma is much better than that of mixed one. The pure mucinous carcinomas are further subdivided into cellular and hypo cellular variants. The most common admixture is with regular invasive duct carcinoma. The lesions most likely to be confused with mucinous carcinoma are mucoid fibroadenoma and a mucocele-like lesion. The incidence of axillary lymph node involvement in mucinous carcinoma (14%).

Pure mucinous carcinoma generally has a less aggressive growth pattern as defined by tumor size, estrogen and progesterone receptor positivity and primary axillary lymph node metastasis.

The 5-year overall survival (OS) was 80% for mucinous carcinomas and 77% for not otherwise specified (NOS) carcinoma. Only 3-15% of the pure variety show axillary lymph node metastasis. Disease Free Survival (DFS) is significantly better for mucinous carcinomas compared with NOS carcinomas, with a 5-year DFS of 90% for mucinous and only 80% for NOS carcinomas. However, node positivity for mucinous carcinomas conferred a substantially worse prognosis, with a 5-year DFS of 76%, similar to the prognosis for node positive NOS carcinoma patients. The 5-year OS for node-positive patients was 81% for mucinous and 69% for NOS carcinomas. The tumor cells have been described as being generally small and fairly uniform with minimal atypia, and this may give a false impression of “benignancy”, a term used to describe this uncommon condition. It is mucin rather than the tumor cells that is invading the stroma which explains the good prognosis of pure mucinous.
carcinoma. The mucin production is typically extracellular.  

**Recommendation:** A post menopausal women presenting with a small, mobile, non tender mass in the breast should always raise a suspicion of mucinous carcinomas because of the different treatment modalities and favourable prognosis as compared to the invasive carcinomas of the breast.

![Image](image1.jpg)

**Figure i. Microscopy of FNA (10x)** showing pools of mucin with clusters of malignant ductal cells scattered within.

![Image](image2.jpg)

**Figure ii. Gross specimen of MRM right breast with tumor.**

![Image](image3.jpg)

**Figure iii. Microscopy (4x) showing clusters of malignant ductal epithelial cells floating in pools of mucin.**
Figure iv. Microscopy (40x) showing clusters of malignant ductal epithelial cells floating in pools of mucin.

Figure v. Microscopy (4x) of PAS stain showing pools of mucin.

Figure vi. Microscopy (4x) of Alcian blue stain showing pools of mucin.

Figure vii. Microscopy (4x) of ER showing positivity.
References


