Trial of a Rare Diagnosis in a Core Needle Biopsy of Breast

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ABSTRACT

OBJECTIVE: Mucinous carcinoma is a rare, special subtype of breast carcinoma associated with a good prognosis. It often presents a confusing appearance with a benign process. For all these reasons, differential diagnosis could be challenging.

CASE REPORT: Eighty years-old woman with a soft, lobulated, and well circumscribed mass at the left breast mimicking a benign process. Pathological examination of a core needle biopsy showed pure mucinous carcinoma.

DISCUSSION: It is a disease of elderly patient, over 60 years, and usually occurs in postmenopausal women. It accounts for only 2% of total breast carcinomas. On pathologic analysis, to be defined as pure mucinous carcinoma, a carcinoma must be made up of at least 90% intracellular or extracellular mucin.

CONCLUSION: Examination of core biopsy material should be done carefully respecting this criteria to confirm the diagnosis of this rare entity and eliminate differential diagnosis.

KEYWORDS: Mucinous, carcinoma, breast, microlobulated, nests

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TYPE: Case Report

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Introduction

Pure mucinous carcinoma (PMC) of the breast is a group of invasive breast carcinomas with a good-prognosis compared to other breast malignant neoplasia such as ductal or lobular variants. It characterized by clusters of epithelial tumor cells suspended in pools of extracellular mucin.[1] Mucinous carcinoma (MC) represents about 4% of all invasive breast cancers and PMC accounts for approximately 2% of all malignant breast tumors.[2] It often occurs in perimenopausal and postmenopausal women, with a median patient age of 71 years.[2] Other terms that are used to identify this tumor include gelatinous carcinoma, colloid carcinoma, mucous carcinoma, and mucoid carcinoma.[3] The 10-year survival rate is about 90.4%. From a histological point of view, it is important to differentiate PMC from mixed types of ductal carcinoma with mucinous component (mixed mucinous breast cancer—MMC). Interestingly, the latter have an identical prognosis compared to non-mucinous tumors. Axillary lymph nodes are rarely involved; nevertheless, a nodal metastatic disease can worsen the survival rates and it is considered as one of the most important prognostic factors.[4]

Herein, we report a case of an 80 years-old woman with pure mucinous carcinoma of the left breast.

Case Report

Case

We present a case of an 80-year-old woman, who had a gradually enlarging lump in her left breast 6 months ago. She had no personal or family history of breast or ovarian cancer. Except this mass, she was in good health.

Methods

Our patient underwent a complete clinical examination with an ultrasound and a mammography leading to the realization of a breast biopsy. For which a careful microscopic examination with molecular profile research has been established.

Observations

The physical exam showed a mass at the upper outer quadrant of the left breast. The mass was soft and well circumscribed. It measured of about 16 × 10 cm without axillary lymphadenopathy. Mammography showed a well circumscribed, lobulated mass mimicking a benign process. Sonographically, the tumor was hypoechoic with posterior acoustic enhancement in the

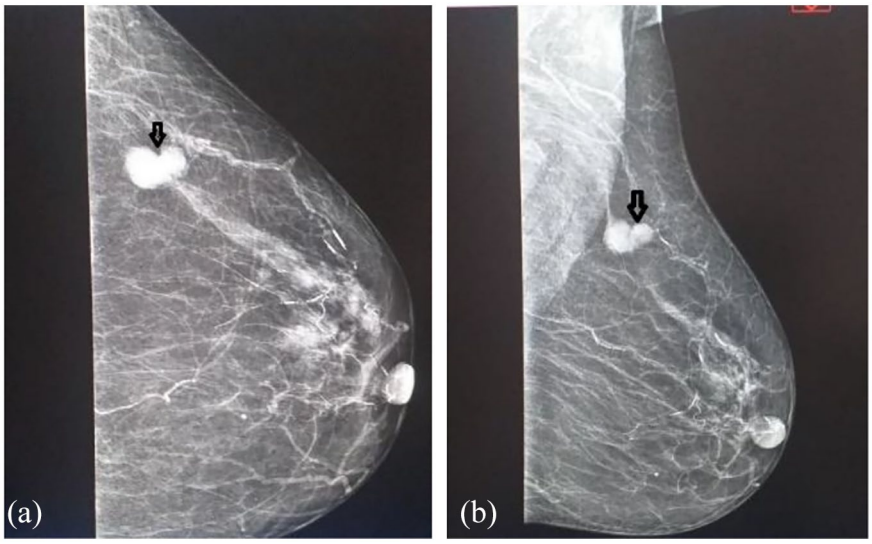

Figure 1. Patient of an 80-year-old with pure mucinous carcinoma of the left breast. mammogram images ((a) face view and (b) profile view): Well circumscribed and lobulated mass.

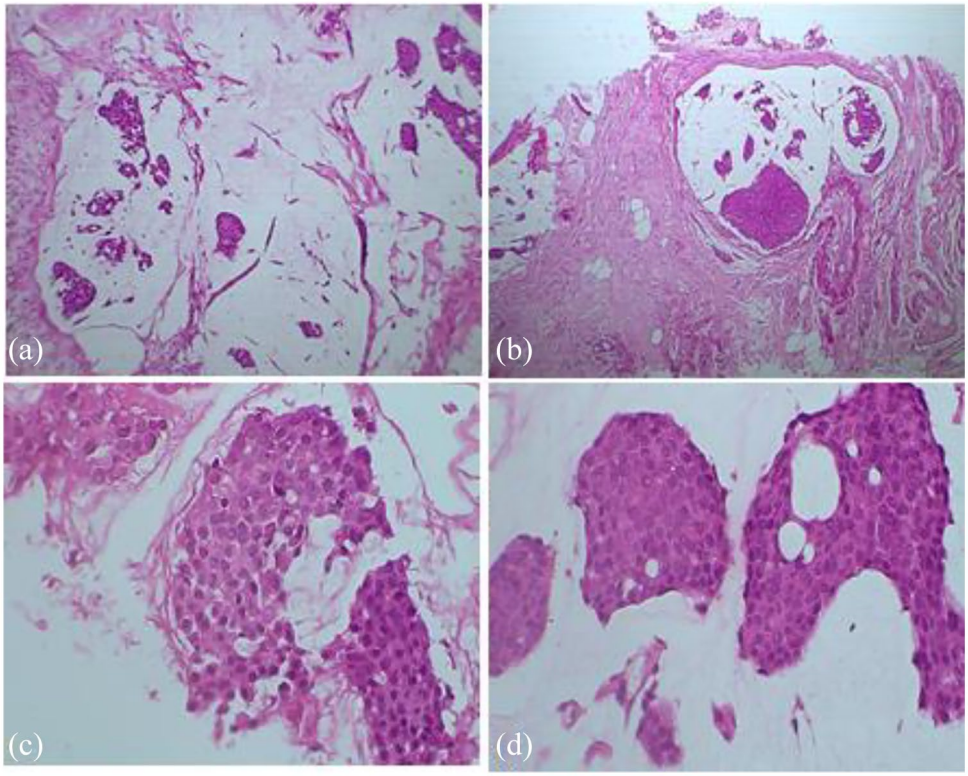

Figure 2. (a and b) HE 20× magnification: nests of tumor cells floating in large lakes of extracellular mucin. (c and d) HE 40× magnification: malignant cells presented mild to moderate nuclear atypia with rare mitotic figures.

upper outer quadrant of the left breast. The radiologist's conclusion was a suspicious finding (ACR 4A) (Figure 1).

The core needle biopsy was performed with ultrasound guidance. Pathological examination showed a microlobulated proliferation including a well differentiated carcinoma classed in Type 1 of Scarf Blood Richardson (SBR 1). At low magnification, there were nests of tumor cells floating in large lakes extracellular mucin divided by delicate fibrous septa containing capillary blood vessels. The tumor contained more than 90% of mucin. At 20× magnification, malignant cells showed mild to moderate nuclear atypia. Mitotic figures were rare, with 4 mitotic figures per 10 high power fields (40×) (Figure 2). No lymphovascular emboli or perineural spread were seen. Tumor infiltrating lymphocytes (Tils) were absent.

The neoplastic cells were strongly positive for ER, PR, without superexpression of HER-2/neu, and a weak proliferation

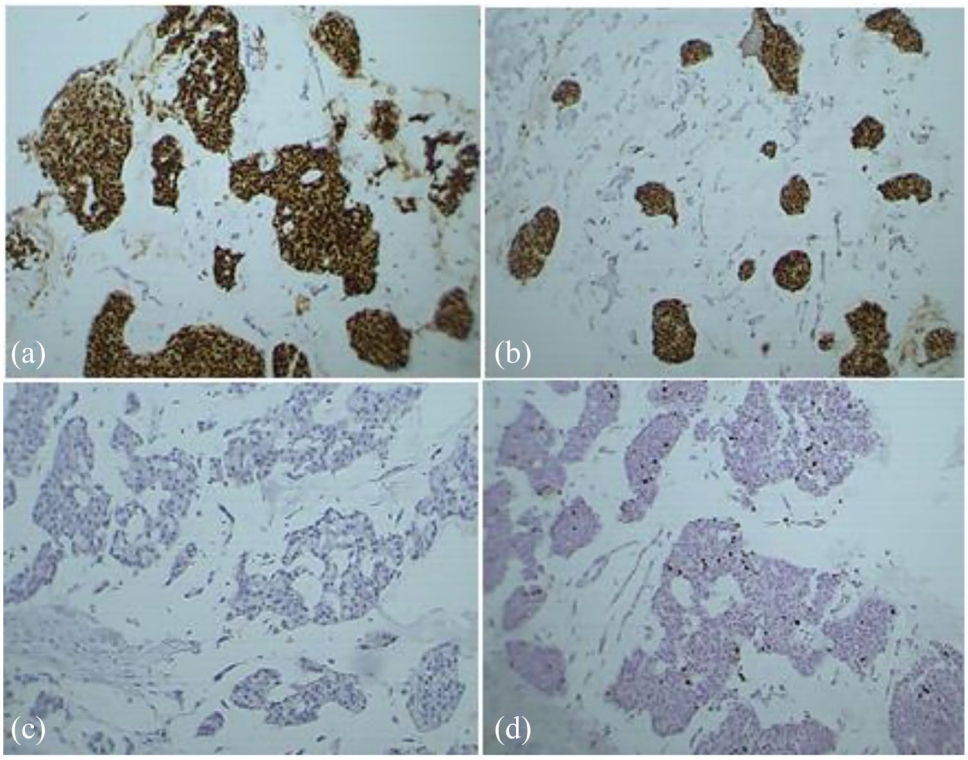

Figure 3. Immunohistochemistry 10× magnification: the neoplastic cells were strongly positive for ER (a), PR (b), without superexpression of HER2/neu (c), and a week proliferation index evaluated by Ki-67 (d).

index evaluated by Ki-67 (Figure 3). The tumor was classified as luminal A molecular subtype.

We proposed a breast conserving surgery for our patient and she got hormone treatment with a good clinical course.

Discussion

The definition of pure mucinous carcinoma consists of nests of tumor cells floating in lakes of mucin, whereas the mixed form also contains common infiltrating ductal carcinoma not specific type (NST).[5] The percentage of the mucinous component is used to distinguish between pure and mixed mucinous carcinoma. However, pure mucinous carcinomas are generally defined as containing more than 90% mucin, and mixed mucinous carcinomas are those containing 50% to 90% of mucin.[6] The presence of less than 50% mucin is considered as ductal carcinoma with a mucinous component.

Clinically, these mucin-containing cancers often present as soft masses due to their semisolid mucin constituents. Most mucinous carcinomas are readily detected on mammography. They appear as low-density, well-defined or microlobulated oval masses and generally belong to the category of "well-circumscribed" breast carcinomas.[7] Microlobulated margins have been associated with higher mucin content, while irregular or spiculated margins correspond to lower percentages of mucin and infiltrating margins histologically. The irregular and infiltrating margins seen on mammography and histology have been attributed to greater degrees of fibrosis associated with the non-mucinous components.[8] Albeit rare, calcifications seen in conjunction with mucinous tumors frequently correspond to the invasive ductal component of the cancer in a mixed mucinous tumor.[9] Sonographically, mucinous carcinomas typically present as complex masses of mixed echogenicity with solid and cystic-appearing components. However, up to 20% of these lesions may present as homogenous masses on ultrasound. They are isoechoic or hypoechoic to subcutaneous fat, with posterior acoustic enhancement. A microlobulated contour is often more readily demonstrated on sonography rather than mammography.[7,10]

Gross examination of these tumors shows a glistening and gelatinous nodule with pushing margins and a soft, viscous consistency. The tumor size ranges from <1 to >20 cm.[11] The histopathological appearances of PMC consist of clusters or sheets of neoplastic cells suspended in abundant extracellular mucin, partitioned by delicate fibrous septa containing capillary blood vessels.[3] The tumor clusters vary in size and shape. Nuclear grade is low or intermediate. Tumors with high nuclear grade have been described,[11] but they are best classified as invasive breast carcinoma-NST with mucin production. Furthermore, pure MC may be classified as hypocellular (PMC-A) and hypercellular (PMC-B). The difference between these 2 subtypes lays in their growth pattern. The hypocellular variant may have different growth patterns (tubular, cribriform, cord-like, papillary, or micropapillary), and the hypercellular type shows only a single pattern, spreading outward in solid nests that often show neuroendocrine differentiation. The mean metastatic rate is 15%[12] and the prognosis is better compared to no special type breast cancer.[2] Other mucin-producing carcinomas of the breast include a variety of carcinomas that are characterized by the

production of abundant extracellular and/or intracellular mucin. Among these are mucinous cystadenocarcinoma, columnar cell mucinous carcinoma, and signet ring cell carcinoma.[3] All of these tumors must be excluded to retain MCs. Carcinomas with signet-ring cells without extracellular mucin are not classified as MCs. Primary carcinomas of the breast with signet-ring cell differentiation must be distinguished from metastases to the breast from signet-ring cell carcinomas from other organs, in particular from the gastrointestinal tract.[2]

The differential diagnosis of MC includes non-neoplastic mucocele-like lesions (MLLs) with stromal mucin and it may be challenging to distinguish MCs from MLLs, especially in core biopsy material. The absence of cytological atypia in the epithelium lining the mucin-filled ducts and the presence of myoepithelial cells adherent to the detached epithelial strips present in the mucin pools favor a non-atypical MLL over MC.[10] MC is usually positive for ER and PR, and it is positive for AR in 80% of cases. ERBB2 (HEB2) overexpression and/or amplification is rare in MC but is found in >10% of MCs with a micropapillary pattern.[4,5] Pure and mixed MCs express WT1 and GATA3.[11]

The rarity of these entities has impaired the possibility of an extensive clinical evaluation. Most of the information on outcome and treatments comes from small series and case reports. Therefore, clear recommendations concerning clinical management are still lacking.[4] The 2014 NCCN Guidelines include specific treatment recommendations for favorable mucinous histotypes. In a hormone receptor-positive tumor with absence of nodal involvement, adjuvant endocrine therapy can be avoided if tumor size is less than 1 cm. If T is between 1 and 3 cm, endocrine therapy should be considered, and it is recommended for T greater than 3 cm. However, with nodal involvement endocrine therapy is indicated with or without chemotherapy.[10]

Pure MC is generally associated with low rates of local and distant recurrence and has an excellent 5-year disease-free survival. Late distant metastases may develop. There is no prognostic difference between type A and type B MCs. In one retrospective series, MCs with $a > 50\%$ micropapillary component had a significantly worse prognosis.[11]

Data obtained from our case are similar to other clinical studies interested to clinical, pathological outcomes, biological profiles, and therapeutic methods of this rare tumor.

Our aim is mainly to add a new case in the series of this rare entity in breast cancer, hence to remind its diagnostic difficulties contrasting with the simplicity of effective management.

Conclusion

Mucinous carcinoma should be in the differential diagnosis when imaging microlobulated masses of the breast. Even though mucinous carcinoma is an invasive breast cancer, it tends to be a less aggressive type that responds well to treatment. A simple and rapid core needle biopsy gives important information about this tumor and optimize its treatment.

Author Contributions

Fayrouz Rabhi and Fatima Zohra Soussi collected the clinical findings. Ouafae Karmouni collected radiological images. Karima Idrissi serhrouchni, Jinane Kharmoum and Mariame Chraibi analysed and interpreted the specimen. Karima Idrissi serhrouchni wrote the manuscript. All authors critically revised the manuscript.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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