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Case Report

Pathology Section

Mixed Mucinous and Infiltrating Carcinoma Occurring in Male Breast-Study of Clinico-Pathological Features: A Rare Case Report

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ABSTRACT

Mucinous carcinoma is a less common histologic variant of breast cancer. Cases of mucinous carcinomas in male breast are extremely rare. Here, we describe a case of mixed mucinous carcinoma i.e. mucinous carcinoma with infiltrating ductal carcinoma component and showing apocrine differentiation in a 73-year-old man. This uncommon tumour entity has dismal prognosis and treatment depends largely on the tumour type, size, lymph node involvement and hormonal status.

Keywords: Apocrine differentiation, Infiltrating ductal carcinoma, Male breast cancer, Mucinous carcinoma

CASE REPORT

A 73-year-old man visited the Surgery department of our tertiary care hospital with complaints of lump in the right breast since eight years, insidious in onset and gradually progressive in nature. Lump had rapidly progressed in last six months to reach to the present size. It was not associated with pain, discharge or retracted nipple. There was no family history of breast carcinoma. Patient was hypertensive, on regular treatment since 10 years. On examination, 5x5 cm lump was palpable in the right breast. Fine needle aspiration was suggestive of marked epitheliosis with apocrine metaplasia. Incisional biopsy was suggestive of mucinous carcinoma following which right modified radical mastectomy was done. Grossly, a tumour was identified in the breast measuring 9.5x6.5x4.5 cm, cut section showed grey white and soft myxoid areas [Table/Fig-1].

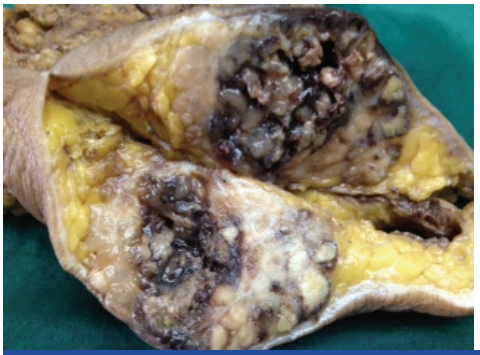
Histology revealed an infiltrating tumour composed of trabeculae, nests, cribriform pattern and islands of cells with moderate amount of eosinophilic cytoplasm, round nuclei with mild anisonucleosis, prominent nucleoli and occasional mitotic figures in extracellular pools of mucin, constituting the mucinous carcinoma component. Also, seen were nodules and solid nests of malignant polygonal cells with moderate to abundant amount of granular eosinophilic cytoplasm, mildly pleomorphic vesicular nuclei and prominent nucleoli with <5 mitotic figures/10hpf in a desmoplastic stroma representing the IDC component of SBR (Scarff-Bloom-Richardson) grade II with apocrine differentiation [Table/Fig-2,3]. Apocrine differentiation was confirmed by PAS (Periodic acid Schiff's stain) and PAS-DR (PAS-Diastase resistance) stains [Table/Fig-4]. Congo red and synaptophysin (clone SY38, Dako, Carpentaria, California, USA) were negative hence ruling out associated medullary carcinoma and neuroendocrine differentiation respectively. All dissected lymph nodes were free of tumour.

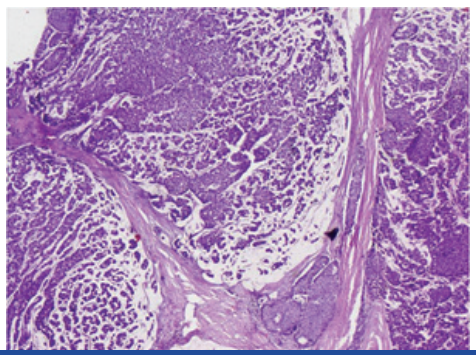
IHC for ER (Estrogen receptor: clone EP1, Dako, Carpentaria, California, USA), PR (Progesterone receptor: clone PgR636, Dako), Her-2-neu (clone c-erbB-2, Dako) and proliferating index Ki67 (clone MIB-1, Dako) showed positive ER, PR with a Quick score of 7 and equivocal 2+ Her-2-neu score. Ki67 was 11% in mucinous carcinoma component and 25% in IDC component [Table/Fig-5].

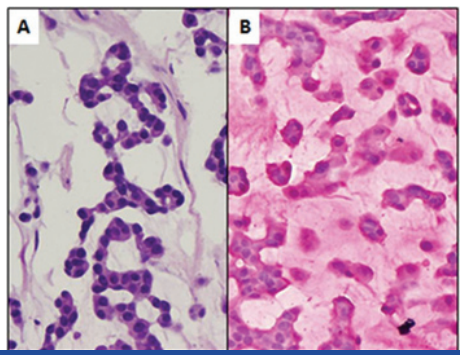
A final diagnosis of mixed mucinous carcinoma of breast – 60% mucinous component with 40% IDC component (SBR grade II) with apocrine differentiation was given. Patient was referred to oncology for adjuvant treatment. Post mastectomy radiotherapy 42.5 gray/ 16#/ 3.1 week to right chest wall followed by boost plan 10 gray/ 5#/ 1 week was given. Patient tolerated the therapy with grade 1 dermatitis. This was followed by hormonal treatment. Patient came for follow up for eight months which were uneventful.

DISCUSSION

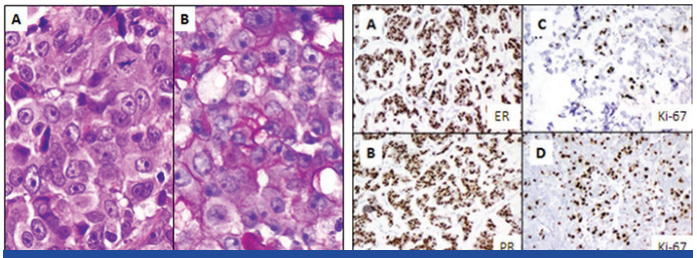
Although male breast carcinoma is an extremely rare tumour, its incidence shows an increasing trend and accounts for significant morbidity and mortality. It usually occurs in old age, with a peak incidence at around 60 years. In agreement with literature [1,2], our patient was aged 73. The underlying pathogenesis is not completely understood yet, but both genetic and hormonal causes have been described in literature. Associated genetic factors are BRCA2 mutations and Klinefelter syndrome. Hormonal causes include obesity, radiation exposure and testicular malignancies. Also prostate malignancies and gynaecomastia are described as suspected predisposing factors [2-4].







[Table/Fig-1]: Cut section shows solid, grey white and myxoid areas **[Table/Fig-2]:** Mucinous component with infiltrating ductal carcinoma component (H&E, X20)
[Table/Fig-3]: Mucinous component a) H&E, X200; b) Mucicarmine stain, X200



[Table/Fig-4]: Solid component with apocrine differentiation a) H&E,X400; b) PAS-DR,X400
[Table/Fig-5]: Mucinous component demonstrating immunoreactivity for a) ER, X200; b) PR,X200; c) Ki67, X200 and Solid component showing immunoreactivity for d) Ki67,X200

Mucinous carcinomas are classified into pure and mixed types. In pure type mucinous component constitutes >90% of the tumour [1]. The mixed type is defined as having both mucinous and conventional IDC components with latter forming more than 10% of the tumour. Pure mucinous carcinomas are further sub-classified into type A, hypocellular and type B, hypercellular type. They are frequently associated with lower rates of recurrence and indolent behaviour. Mixed type behaves as aggressively as isolated invasive carcinoma [5,6]. These tumours have both mucinous and invasive solid component. The solid component may be formed by ductal carcinoma in situ, IDC or carcinoma with neuroendocrine differentiation [1,6,7]. A rare case report of mucinous carcinoma associated with lobular carcinoma with signet ring cells has also been described in literature [8]. Our case was mixed mucinous carcinoma with solid component formed by IDC with apocrine differentiation. This apocrine differentiation was suggested as the cells had abundant granular eosinophilic cytoplasm with round mildly pleomorphic nuclei. To further confirm, we performed PAS stain which highlighted the eosinophilic granules in the cytoplasm of the cells and was diastase resistant.

Apocrine carcinoma was ruled out as the tumour cells in our case were not as pleomorphic as otherwise described in apocrine carcinoma. Also the cells were ER and PR positive as against the ER and PR negativity reported in majority of the cases of apocrine carcinoma [9,10]. We also performed IHC synaptophysin to rule out neuroendocrine differentiation which is commonly associated with mucinous carcinomas [7]. Pure mucinous carcinoma has got better prognosis than mixed types. It also has a lower rate of lymph node metastasis. Mixed mucinous carcinoma with IDC component clinically behaves as isolated ductal carcinoma with a poorer prognosis. Studies have shown that male breast carcinomas tend to be of higher grade than female counterparts and this could be attributed to lesser awareness in men for breast masses as compared to women [2]. In addition, the breast tissue in men has lesser amount of fat, hence pushing the tumour closer to the skin and increasing the likelihood of infiltration into the dermis and base. However, in our case both skin and base were free of tumour.

Literature review states that tumour size in mucinous carcinoma is very important and is directly proportional to the incidence of lymphnode metastasis [4]. In our case the tumour presented with SBR grade II and there was no lymph node metastasis categorizing it into more favorable prognosis. The immunohistochemical profiles of mucinous carcinoma in males are comparable with those in females. They show positive immunoreactivity for ER and PR in more than 90% of cases, and Her2neu and p53 expression are not amplified. Our case also presented with similar profile of ER and PR moderate positivity however, Her2neu expression was equivocal. As far as the reason for this high hormonal receptor positivity in males is concerned, literature describes that similar to postmenopausal women, this could be a consequence of aberrant steroid receptor upregulation in the estrogen deprived setting [3]. Despite of this benign hormonal status male breast carcinomas have poorer prognosis than the stage matched female breast carcinomas [11]. This implies that men are exposed to a different hormonal environment, and to some other associated factors. Further studies are required to elucidate the clinico-pathological features of male breast carcinomas.

The standard therapy for all male breast carcinomas is modified radical mastectomy with sentinel lymph node biopsy and followed by adjuvant therapy. In this regard, hormonal therapy has got an important role because of high percentage of positive hormonal status seen in male breast carcinomas [12]. The same treatment protocol was followed in our case.

CONCLUSION

The present case of mixed mucinous carcinoma in male breast is unique as the solid IDC component was associated with apocrine differentiation. There was no overlying skin infiltration. Awareness to the clinicians and pathologists help in early diagnosis, focussed treatment strategies and improved survival of the cases.

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