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Invasive Breast Carcinoma with Apocrine Differentiation

[1]Dr. Pandey Shreya, Department of Pathology, Dr. D. Y. Patil School of Medicine, Navi Mumbai, Maharashtra, India.
[2]Dr. Dive Prakash, Department of Pathology, Dr. D. Y. Patil School of Medicine, Navi Mumbai, Maharashtra, India.
[3]Dr. Bhalekar Surekha, Department of Pathology, Dr. D. Y. Patil School of Medicine, Navi Mumbai, Maharashtra, India.
Corresponding Author: Dr. Pandey Shreya, Department of Pathology, Dr. D. Y. Patil School of Medicine, Navi Mumbai, Maharashtra, India.

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Abstract

Apocrine-invasive breast carcinoma is a rare subtype, constituting about 1-4%[(1,3)] of all breast cancers. Germline BRCA1 mutations are related to risk for triple-negative cancers[3]. We are reporting a case of a 65 years old female patient who came with complaint of a gradually progressive left breast lump and MRM with axillary dissection was performed for the same. After evaluating gross, microscopic and immunohistochemistry (Triple negative, AR +ve) findings, a final diagnosis of invasive breast carcinoma with apocrine differentiation was given. AR is not widely studied in breast cancers. AR positivity in ER negative tumors has a particular prognostic significance. We are reporting this case for its rarity.

Keywords: Apocrine differentiation, Triple negative, Androgen receptor(AR)

Introduction

Apocrine-invasive breast carcinoma is a rare subtype, constituting about 1-4%[(1,3)] of all breast cancers. Most of them are sporadic, commonly seen in older patients[3]. Patients commonly presents with a palpable mass. Germline BRCA1 mutations are related to risk for triple-negative cancers[3]. Grossly, they are firm or hard on palpation. We are reporting this case for its rarity.

Case Report

A 65 years old female patient came with complaint of a gradually progressive left breast lump of size 3 x 3 cm since 3 months. On physical examination, the lump was present in the upper inner quadrant with nipple retraction. PET CT scan revealed increased metabolic activity in an irregular, ill-defined soft tissue density lesion in the upper inner quadrant of the left breast along with increased metabolic activity in left axillary lymph nodes (likely metastatic). Tru cut biopsy from left breast lump revealed features suggestive of Invasive breast carcinoma, no special type (NST). She underwent surgery and was submitted to Modified radical mastectomy (MRM) with axillary dissection.

Grossly, the MRM specimen showed a homogenous, grey-white tumor with infiltrative borders measuring 2.5 x 2.5 x 1.5 cm. Closest margin being the base which was 0.9 cm away from the tumor.

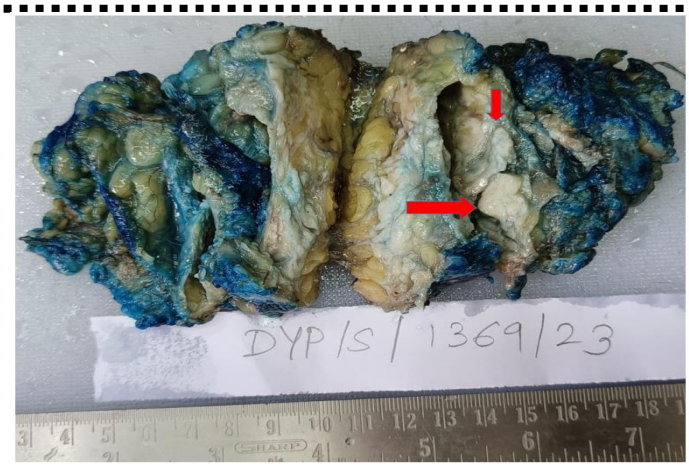

Figure 1: Gross morphology

Microscopically, a malignant tumor was seen arranged in solid sheets, trabeculae, cords, and nests. Individual tumor cells were large with pleomorphic nuclei, prominent nucleoli, and abundant granular eosinophilic cytoplasm. Mitosis was 5-6/HPF. The surrounding area shows extensive Ductal carcinoma in situ (DCIS) component, marked desmoplasia, and moderate chronic inflammatory cell infiltrate. The tumor was also seen infiltrating into the surrounding fatty areas. Lymphovascular invasion was identified. Perineural invasion was not identified. All margins were free of tumor. 9/23 lymph nodes showed tumor involvement with extranodal extension.

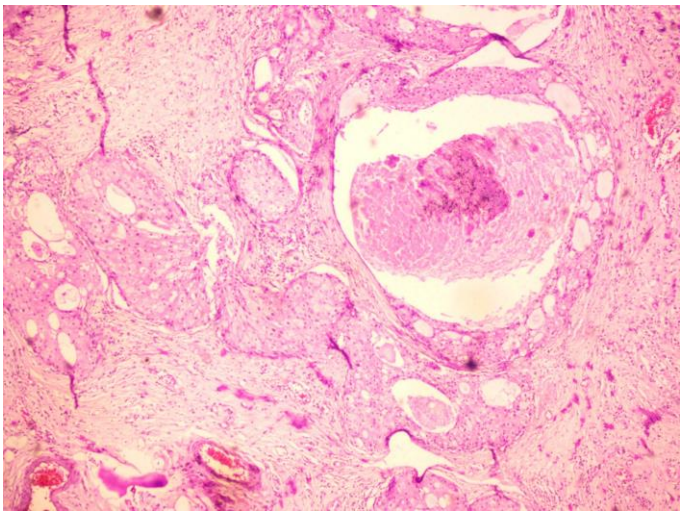

Figure 2: DCIS with invasive component(40X);

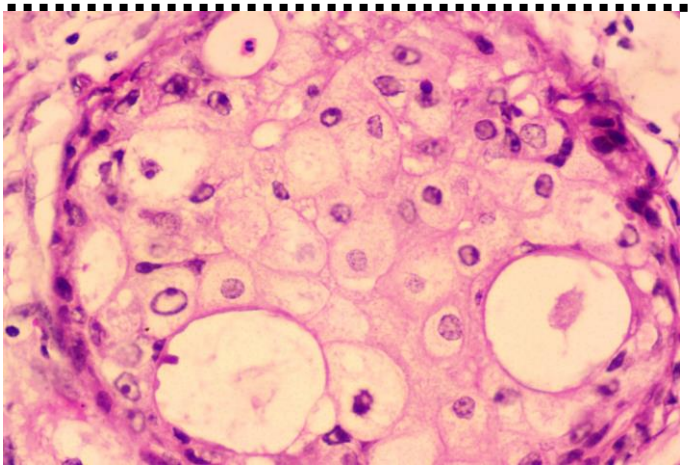

Figure 3: Individual tumor cells were large with pleomorphic nuclei, prominent nucleoli, and abundant granular eosinophilic cytoplasm.

On immunohistochemistry, the tumor cells were negative for Estrogen receptor (ER), Progesterone receptor(PR), and HER2neu. Ki67 was around 25-30%. The tumor cells showed nuclear positivity for Androgen receptor (AR) consistent with Invasive breast carcinoma with Apocrine differentiation.

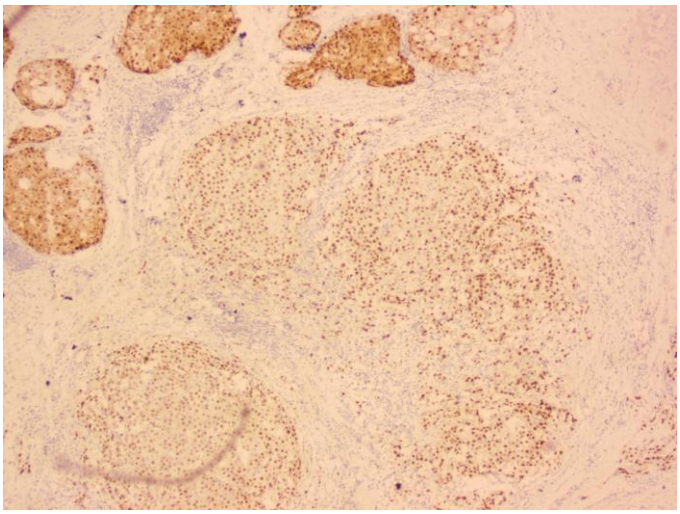

Figure 4 : The tumor cells showed nuclear positivity for Androgen receptor(40X)

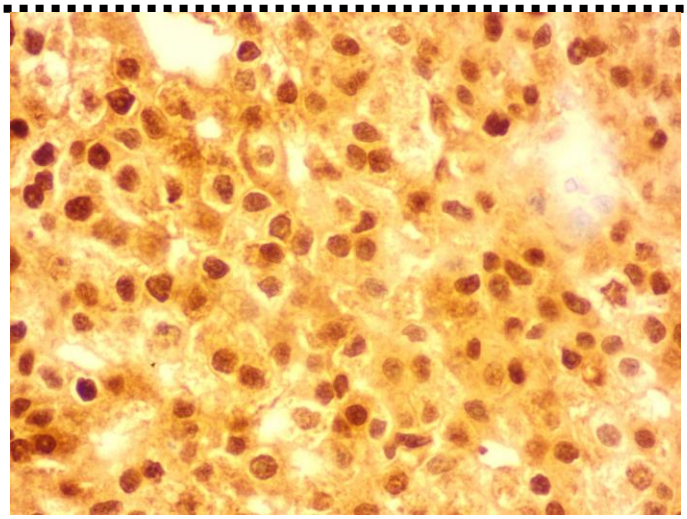

Figure 5 : Androgen receptor positivity(100X)

Pathological diagnosis of poorly differentiated Invasive Breast Carcinoma with apocrine differentiation Grade 3 was given. Pathologic stage classification (pTNM, AJCC 8th Edition) of pT2N2a (pT2- Tumor > 20 mm but </= 50 mm in greatest dimension; pN2a- Metastasis in 4-9 axillary lymph nodes) was provided.

Discussion

AR is a steroid hormone nuclear receptor but is not widely studied in breast cancers. The core significance of ER, PR, and HER2neu as prognostic markers has not diminished. In literature, it has been noted that almost all ER-positive tumors express AR but in ER-negative tumors, AR positivity can be expressed by a few tumors related to Apocrine differentiation[2]. It has been speculated that “molecular apocrine” tumors are either ER-/PR-/HER2+/AR+ or ER-/PR-/HER2-/AR+. In an immunohistochemical study, Gatalica identified frequent AR expression, accompanied by loss of ER and PR in apocrine metaplasia and apocrine ductal carcinoma in situ[2]. Tavassoli et al [2] identified AR expression in 5 of 8 invasive apocrine carcinomas that were negative for ER and PR[2]. Selim and Wells studied 82 cases of apocrine metaplasia, all of which were positive for AR but negative for ER and PR[2]. Our case was concordant with all these studies. In literature, in both ER positive and ER negative groups, AR positivity was associated with more favorable clinical and pathological features. AR positivity in ER negative tumors has a particular prognostic significance. Preclinical studies have shown inhibitory roles of androgens like Dehydroepiandrosterone and its sulphates on ER-/PR-/AR+ cell lines[2]. Similar therapy can be used for ER-/AR+ human breast cancer as an adjunctive therapy.

Conclusion

In conclusion, AR expression in breast carcinomas appear to be a favorable prognostic factor. AR positivity in ER negative tumors can be exploited for an additional targeted therapy.

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