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Encapsulated Papillary Carcinoma of The Breast: A Case Report of Rare Male Breast Cancer Clinically Presented as Soft Tissue Tumor

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ABSTRACT

BACKGROUND: Male breast cancer is a rare condition, accounting for less than 1% of all breast cancers, and infiltrating ductal carcinoma is the most common type. However, Encapsulated Papillary Carcinoma (EPC) in males is a rare type of breast cancer, and the exact etiology is unknown.
CASE REPORT: A 66-year-old male presented with a 15x10 cm mobile swelling over the left side of the anterior chest wall, which was clinically and radiologically diagnosed as a soft tissue tumor. Wide local excision of the swelling of the anterior chest wall was performed. Grossly, it was an encapsulated tumor with solid and cystic areas filled with gelatinous material, papillary excrescences, hemorrhage, and necrosis. Microscopic examination revealed Grade 2 encapsulated papillary carcinoma of the left breast.
CONCLUSION: This case report highlights the importance of considering male breast cancer as a differential diagnosis in patients presenting with anterior chest wall soft tissue swelling.

KEYWORDS: Male breast cancer, encapsulated papillary carcinoma, anterior chest wall swelling.

INTRODUCTION

Male breast cancer is a rare condition, which accounts for 0.5 to 1% of all breast cancers and 0.17% of all male cancers (1). The papillary variant of breast cancer represents 3 to 5% of cases in men and encapsulated papillary carcinoma (EPC) is a rare type of papillary neoplasm of the breast that closely resembles benign papillary breast lesions (2,3). Typically, EPC presents as an asymptomatic lump or with a bloody nipple discharge. Diagnosis requires a combination of clinical examination, radiological assessment, and histopathological examination.

CASE PRESENTATION

A 66-year-old male presented with a history of a swelling over the left side anterior chest wall for 6 months, accompanied by pain for the past 1 month. He has a known history of chronic kidney disease and has been on dialysis for 9 years. There is no history of smoking or alcohol consumption, and the patient has no family history of breast cancer. Physical examination revealed a 15x10 cm mobile mass on the left side of the chest, extending 10 cm below the clavicle in the mid-clavicular line, 2 cm from the sternum, and 7 cm from the mid-axillary line. The skin over the swelling and nipple was normal. There was no warmth or tenderness present, and the margins were well-defined. The consistency of the swelling varied, and it was freely mobile and not fixed to the chest wall. The skin over the swelling was pinchable. No

palpable axillary lymph nodes were found. MRI revealed a 7.7 x 7.3 x 5.4 cm hyperintense lesion involving the left anterior chest wall, including the pectoralis muscle, with multiple hypointense septations. The lesion extended to the subcutaneous plane anteriorly and into the underlying pectoralis major muscle posteriorly. The underlying bone appeared normal. Based on these findings, the clinical diagnosis of a soft tissue tumor of the anterior chest wall was made. Wide local excision of the anterior chest wall swelling was performed, and the specimen was sent for histopathological analysis.

The gross examination showed soft tissue mass of size 11x10x5cm and attached skin with nipple measuring 11x3cm. Nipple appeared normal. The cut surface of the specimen revealed an encapsulated tumor composed of solid and cystic areas measuring 3.8x3.3x2 cm. The tumor was filled with greenish gelatinous material and had papillary excrescences measuring 2x1cm, along with areas of necrosis and hemorrhage (Figure-1). Multiple sections were taken from the solid & cystic areas along with the capsule.

Figure 1: Gross Image of the resected specimen showing solid and cystic spaces contains green gelatinous material (arrow) surrounded by a fibrous capsule.

Microscopic examination showed encapsulated tumor tissue with dilated hyperplastic mammary ducts at periphery. The cystic areas of the tumor are composed of simple to complex fused papillary pattern and a glandular pattern of arrangement of monomorphic tumor cells which had a round vesicular nucleus with prominent nucleoli (Figure 2 & 3). Focal areas showed 2-3 mitotic figures/hpf with extensive areas of hemorrhage, necrosis, and mucin lakes. Deeper fat tissue showed inflammatory infiltrates and hemosiderophages. The underlying skeletal muscle tissue is free of tumor infiltration.

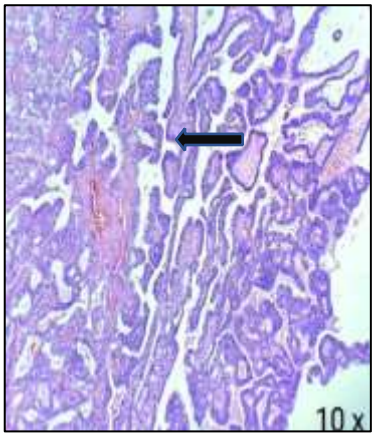
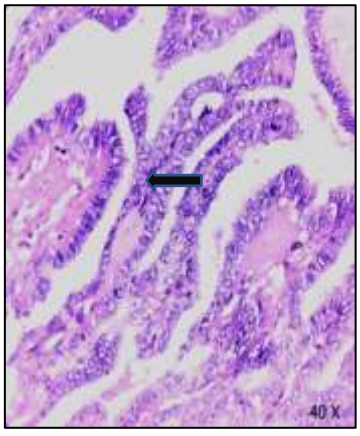


Figure (2)



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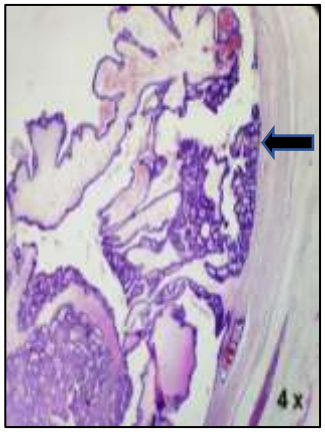
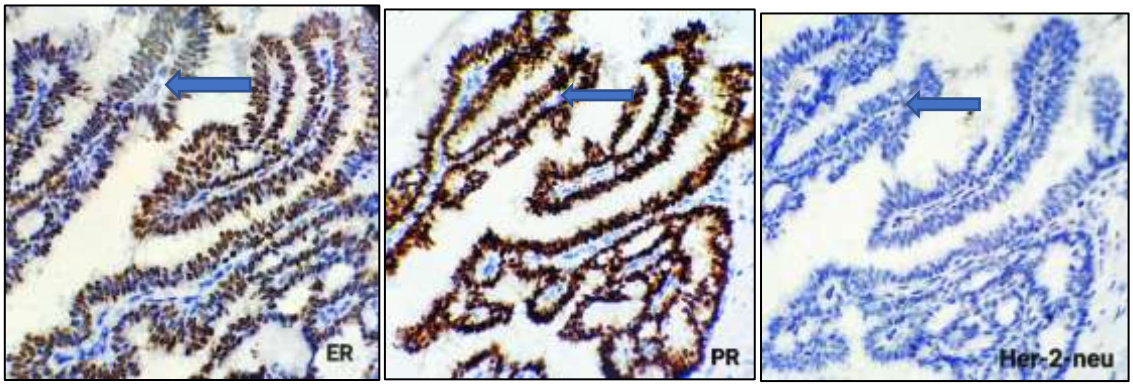


Figure (4)

Figure 2,3&4: Microphotograph showing encapsulated tumor composed of many complex papillary pattern of tumor cells with lack of myoepithelial cells. (arrow) – Hematoxylin & Eosin in 100x/400x/40x.

Histopathological diagnosis of encapsulated papillary carcinoma of the breast – left side with histological grade 2 was made. Based on the disparity between clinical and radiological diagnosis of soft tissue tumor, immunohistochemical staining was

performed to confirm the breast origin. The staining showed diffuse positivity for estrogen receptor (ER), progesterone receptor (PR), and negative for human epidermal growth factor receptor 2 (HER 2) (Figure 4,5,6). This confirmed the histopathological diagnosis of male breast cancer.



Figure(4) **Figure(5)** **Figure(6)**

Figure 4,5&6- Microphotograph showing positive expression of ER, PR and negative expression of HER 2-neu (arrow). Immunohistochemistry x 400.

DISCUSSION

EPC is a rare subtype of breast cancer which usually occurs in postmenopausal women with mean age of presentation of 65 years [(2).] Male breast cancer is an uncommon disease that constitutes 1% of all breast cancers, and EPC is a rare type of malignant male disease [(4)]. Literature suggests that male patients with EPC present clinically with a painless breast mass, with or without nipple discharge. In our case, the patient was presented with a huge chest wall swelling with pain but without nipple discharge.

EPC usually arises as a mass lesion from a large cystically dilated duct, and usual size varies from 2-3cm. [(5).] In our case, it is a large mass of nearly 11cm, which leads to the mistaken clinical diagnosis of a soft tissue tumor. Gross examination of EPC typically presents as a capsulated cystic mass with solid mural nodule like lesions. In our case, the predominant cystic spaces are filled with greenish gelatinous material, like mucinous carcinoma, which is a quiet characteristic finding of this lesion.

Encapsulated papillary carcinoma (EPC) is characterized microscopically by a fibrous capsule surrounding the tumor with a papillary architecture. It is a histologically unique carcinoma type with a thick fibrous capsule at the periphery and a papillary architecture with a fibrovascular stalk. A characteristic feature is the absence of myoepithelial cells in the papillary fronds. The fibrovascular cores of EPC are lined by neoplastic cells with enlarged nuclei and prominent nucleoli. The stroma between the fibrovascular cores may contain lymphocytes and plasma cells.

This EPC case can pose a diagnostic difficulty due to encapsulation, as it bears a close resemblance to benign papillary breast lesions [(2)]. But The lack of myoepithelial cells in papillary fronds confirms this rare tumor entity. Although it is a carcinoma and lacks myoepithelial cells, EPC maintains a slow developing nature.

The histological features of EPC may resemble other types of breast cancer, such as papillary ductal carcinoma in situ or invasive papillary carcinoma [(3,6).] The absence of myoepithelial cells at the periphery of the duct distinguishes it from papillary ductal carcinoma in situ, and the absence of capsular invasion differentiates it from invasive papillary carcinoma in our case. EPC is typically estrogen and progesterone receptor-positive, and HER2negative [(7)]. Lymphovascular invasion is uncommon in EPC, and the incidence of lymph node involvement and distant metastasis is low. Similarly, our case demonstrated ER and PR

positivity and HER2 negativity with no lymphovascular invasion.

Somatic PIK3CA gene mutation has been reported to be the most common genetic alteration in papillary breast neoplasms, including EPC [8,9], However, further genomic studies are required to explore this in detail. Treatment of EPC consists of surgery (wide local excision or mastectomy) ± hormonal therapy. The question of an axillary procedure remains open, as some investigations report the metastatic potential of EPC and recommend sentinel lymph node biopsy (SLNB) [10].

The prognosis of EPC is excellent, with low rate of local relapse and few distant metastases or death due to breast cancer. This good prognosis results from the slow growth nature of the tumor, with 10-year survival of 100% and a 10-year disease free survival of 91% [4].

CONCLUSION

In summary, we concluded that male breast cancer clinically presenting as a huge chest wall soft tissue tumor without skin involvement is unusual, and encapsulated papillary carcinoma of male breast sub type is also quite rare among men. This case is reported here for the rarity of this subtype among male breast cancer and the importance of considering male breast cancer as a differential diagnosis in patients presenting with a huge chest wall swelling that was misdiagnosed as a soft tissue tumor clinically and radiologically.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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