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Case Report

Case report of cytological findings of secretory carcinoma of breast in a 12-year-old girl

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ABSTRACT

Secretory carcinoma of breast (SCB) is a rare form of breast cancer. It is the most commonly seen in children as primary breast cancer. It is seen more commonly in women as compared to men. These tumours were initially seen in children. Many studies have shown that these cancers can occur in adults as well. In this case report, a young (12) year old female patient presented with left sided breast lump. Patient was referred for ultrasound which revealed a benign well circumscribed lesion.
Patient was referred from surgical OPD to department of pathology where she underwent fine needle aspiration cytology (FNAC). Based on cytological findings a provisional diagnosis of secretory carcinoma was made which was confirmed on histopathology.
Despite having lower incidence rates these malignant neoplasms should be kept as an important differential in young patients.

1. Introduction

Among all types of invasive breast cancers, SCB are seen in <1% of patients.[1] The term juvenile breast carcinoma was coined by McDivitt and Stewart, in 1966, as they observed that majority of cases were seen in young patients.[2] Subsequently SCB was reported in adults and the term 'juvenile carcinoma' was replaced with 'secretory carcinoma'.[3] These tumours are generally found to have triple negative phenotype.[4] These tumours are known to have indolent course, prolonged overall survival and favourable clinical outcomes even with lymphnode involvement.[5]

2. Case Report

A 12-year-old girl presented with slow growing left sided breast lump for 1 year. On examination lump was palpable in upper inner quadrant of left breast. Lump measured 3x2cm, firm in consistency, slightly tender and was attached to overlying skin. No axillary lymphnodes were palpable. Ultrasonography revealed a benign well circumscribed lesion and a diagnosis of benign breast lesion (BIRADS II) was given. Patient underwent FNAC. Cytological examination of smears showed moderate cellularity. Individual tumours cells were arranged in loose clusters and as well as scattered singly having moderate to abundant amount of vacuolated cytoplasm and centrally to eccentrically placed nuclei. Nucleus showed mild to moderate pleomorphism. No nucleoli were seen. Mitotic activity was not seen. On FNAC, a provisional diagnosis of secretory carcinoma was suggested. Subsequently, patient underwent wide local

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excision. The excised mass was sent for histopathological examination. Grossly, we received formalin fixed specimen m=3.5x2x1cm. Cut section showed a lesion which was gray white in colour and was well circumscribed, firm in consistency with many cystic areas ranging from 0.1 to 0.4cm. Histopathological examination showed many malignant cells arranged mainly in microcystic pattern with few areas showing solid sheets, ducts and tubules. Tumour cells exhibited low grade cytological atypia and bland uniform nuclei. Vacuolated cytoplasm was seen in few tumour cells. Eosinophilic secretions were seen which were PAS positive and diastase resistant. TNM stage was reported as T2N0M0 and Nottingham Histological score was applied and overall grade 1 was given. Immunohistochemistry was performed and strong expression of S-100 and triple negative phenotype was seen. A final definite diagnosis of secretory carcinoma was made based on cytology, histopathology and immunohistochemistry.

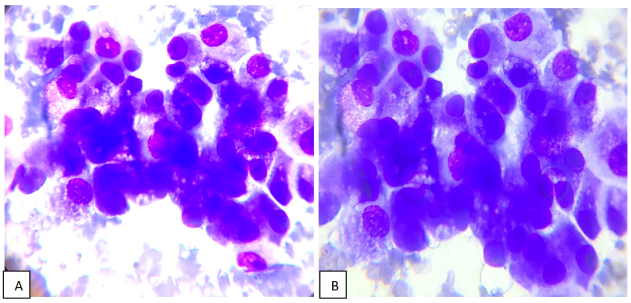

Figure 1: A, B): Shows cells in loose clusters showing cytoplasmic vacuoles

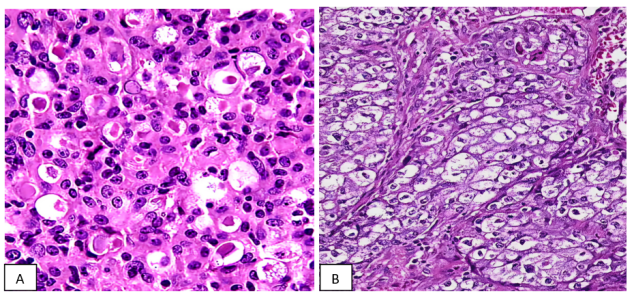

Figure 2: A,B): Microcystic pattern with eosinophilic secretions and cells showing vacuoles in cytoplasm

3. Discussion

Among all other types of invasive breast cancers, this carcinoma is uncommon and shows very less significant progression into a much aggressive form. Initially, it was proposed that these neoplasms were only seen young patients but now it has been reported that these tumours can occur in patients between the age of 3-86 years.[6,7]

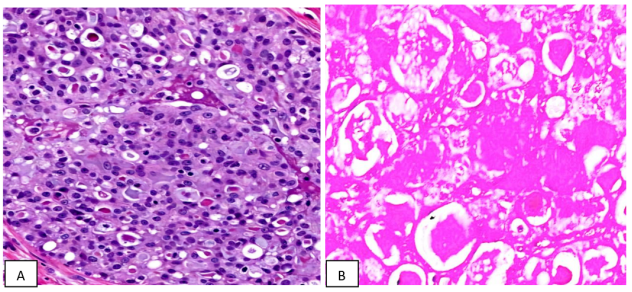

Figure 3: A, B): Eosinophilic secretions which were PAS D positive

However vast majority of studies have seen this tumour mostly in young females.[7] Majority of patients of SCB present as slowly growing breast mass. SCB may resemble a benign lesion on radiology, as it may present as relatively well-circumscribed, round, partially micro lobulated mass with a hypoechoic/isoechoic internal echotexture.[8] Hence, biopsy is essential in making diagnosis of SCB. In this study SCB was diagnosed on FNAC which was very well correlated with histopathology. Main differentials of SCB on cytology are benign changes associated with pregnancy and various types of breast carcinoma such as lobular, mucinous, tubular, adenoid cystic, signet ring, lipid-rich and metastatic carcinoma. The two most important benign proliferating epithelial lesions which are main differentials of SCB on cytology are lactational changes and lactating adenoma.[9] Presence of highly cellular aspirate and absence of bare bipolar nuclei are two important histopathological findings which give clue to malignant nature of the lesion.[10] On histology architecture is usually microcystic, solid or tubular or admixture of all 3 patterns. Individual cells are bland with uniform nuclei showing low grade cytological atypia, abundant pale vacuolated cytoplasm and eosinophilic secretions.[11] Histologic hallmark is characteristic eosinophilic secretory material which is PAS positive and diastase resistant. On Immunohistochemistry there is lack of expression of estrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor (Her-2/neu). However few studies have seen expression of basal cell markers e.g., CK 5/6 and EGFR.[12,13] However, there have been reports of focal/weak expression of estrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor (Her-2/neu).[14] SCBs are recently known to harbour an important balanced genetic translocation i.e., t (12;15), which results in formation of unique fusion gene known as ETV6-NTRK3. This ETV6-NTRK3 chromosomal rearrangement is seen in other tumours as well but is not seen in ductal carcinoma, NOS.[12,13] Few studies have suggested that as compared to ductal carcinoma and its counterparts which exhibit aggressive behaviour are negative for this fusion gene, this tumour shows more indolent behaviour due to

ETV6-NTRK3 fusion gene. These tumours are classified as an indolent disease, with a projected disease-specific survival rate exceeding 90%. Currently, surgical excision remains the main treatment option. Research indicates that secretory carcinoma breast measuring less than 2 cm, diagnosed in individuals under 20 years of age, and exhibiting well-defined margins are associated with a more favourable prognosis.[3] Additionally, axillary metastasis is uncommon, especially when the tumour size is less than 2 cm.[7] Distant metastasis was seen in few cases, although it is rare.[1] Due to rare incidence of these tumours, currently there are no proper guidelines for treatment. Currently surgical excision is considered to be the primary mode of treatment. In children in whom preservation of breast tissue is required as breast development is incomplete, local excision with sentinel lymph node mapping is the preferred modality of treatment. If the sentinel lymph node shows evidence of metastatic deposits, further lymph nodes may be excised. Occasionally, mastectomy is required. In adults, it has been reported that there are chances of late recurrence hence, at least a simple mastectomy is recommended. If on gross examination tumour shows size >2 cm and is ill defined then Modified radical mastectomy is favoured. Despite the frequent administration of adjuvant chemotherapy, its effectiveness has not been comprehensively explored. Generally, the use of adjuvant radiation therapy following breast-conserving surgery leads to better locoregional control and increases disease-specific survival.

4. Conclusion

To conclude, secretory breast carcinoma is an uncommon and slow-growing form of breast cancer. Initially, it was believed that this type of carcinoma only affected juvenile patients. It is characterized by unique cytological, histological, immunohistochemical and molecular genetics. Secretory breast carcinoma often appears as a slow growing painless breast mass in most cases. They usually show features of benign lesions clinically as well as on radiology. On imaging, this type of carcinoma can mimic a benign lesion as it appears as a well-circumscribed lesion. There is no established specific imaging pattern for secretory breast carcinoma in the literature. Consequently, when there is a clinical suspicion, a biopsy becomes essential for differential diagnosis. However, in this case report a provisional diagnosis was given on FNAC. Cytodiagnosis of SCB is difficult however FNAC can be helpful in making a preoperative diagnosis of SCB as it will help in appropriate surgical management. Despite having triple negative phenotype these tumours have favourable prognosis and systemic involvement is rarely observed. The majority of existing studies on this tumor are either case reports or independent analyses, which has hindered a complete understanding of its characteristics and formulation of effective treatment strategies. Hence, the therapeutic approach should be customized according to the patient's overall condition and the unique characteristics of this rare disease.

5. Conflict of Interest

None.

6. Source of Funding

None.

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