Micropapillary Pattern: An Aggressive Component in Pure Mucinous Carcinomas of Breast

Bansode Shubhada¹, Chawre Suresh¹, Dantkale Sunita², Kanade Umesh², Birare Shivaji²
¹Assistant Professor, Department of Pathology, Government Medical College, Latur, Maharashtra, India, ²Associate Professor, Department of Pathology, Government Medical College, Latur, Maharashtra, India

Mucinous micropapillary carcinoma of the breast also described as pure mucinous carcinoma with micropapillary pattern has recently come to attention as an unusual form of invasive breast cancer exhibiting dual mucinous and micropapillary differentiation. A 70-year-old lady presented with a complaint of a left breast palpable mass detected 4 months earlier. A firm well-defined mass of size 4 cm × 3 cm was noted with a small focal ulceration. Her past medical records and family history non-contributory. Ultrasonography revealed a well-defined lobulated hypoechoic lesion. Micropapillary pattern being an aggressive counterpart in pure mucinous breast carcinoma. It has increased propensity for lymph node metastasis, so it should recognized by characteristic cytological features and histological findings.

Keywords: Breast, Cytology, Histopathology, Micropapillary, Mucinous carcinoma

INTRODUCTION

Mucinous carcinoma represents a small distinctive subgroup of breast cancers. It accounts for <7% of all breast carcinomas. Histologically, mucinous carcinoma can be classified as pure or mixed.¹ The distinction between pure and mixed mucinous carcinoma is important because patients with former type have much better prognosis in terms of low propensity for lymph node and distant metastasis.²,³ Mucinous carcinoma with tumor cells that have a diffuse micropapillary arrangement morphologically may represent mucinous counterpart of invasive micropapillary carcinoma and which have not been described in literatures.³,⁴ A study by Ranade et al. has revealed pure mucinous breast carcinoma with a micropapillary pattern were more frequent associated with nodal disease, necessitating prompt axillary staging in these patients.⁵,⁶

Micinous carcinoma of the breast with micropapillary pattern has been described in <1% of cases.³ We report a rare case of mucinous carcinoma of the breast with micropapillary pattern and psammomatous calcification.

CASE REPORT

The 70-year-old lady presented with complaint of a left breast palpable mass detected 4 months earlier. A firm well-defined mass of size 4 cm × 3 cm was noted with a small focal ulceration. Her past medical records and family history were non-contributory. Ultrasonography revealed a well-defined lobulated hypoechoic lesion.

RESULTS

Fine-needle aspiration cytology (FNAC) of the breast lump was done. Mucoid aspirate was obtained; smears made were stained with hematoxylin-eosin and pap.

A cytological diagnosis of mucinous carcinoma of the breast was put forth. A study by Ranade et al. has revealed pure mucinous breast carcinoma with a micropapillary pattern were more frequent associated with nodal disease, necessitating prompt axillary staging in these patients.⁵,⁶

Cytological Findings

The smears were highly cellular. The epithelial cells were in loosely cohesive groups, abortive papillae as well as dispersed in single file, and were bathed in abundant mucin. The tumor cells were having mild to moderate atypia with abundant eosinophilic cytoplasm. Nuclei were eccentric, round to oval with vesicular nuclei and inconspicuous nucleoli (Figure 1). Myxovasular fragments which correspond to thin endothelial vessels were seen.
lying in stringy mucin (“chicken wire” blood vessels) (Figure 2). Micinous carcinoma was diagnosed based on these cytological features.

**Histological Findings**

Subsequently, excisional biopsy specimen was received. Tumor showed features of pure mucinous carcinoma with diffuse micropapillary architecture. Neoplastic cells were seen growing in patterns of micropapillae, pseudococini, and trabecule, floating in mucinous pools. Micropapillary architecture was formed by clusters of tumor cells with a central space and serrated outer border. Nuclear pleomorphism, hobnail cells, and frequent psammomatous calcifications were seen (Figure 3a and b). Non-mucinous, solid elements including invasive micropapillary carcinoma (IMPC) were not evident. A week later, modified radical mastectomy with axillary lymph node dissection was performed, and the micropapillary pattern was retained in the axillary lymph node.

**DISCUSSION**

Breast lesions with mucin represent a long list of diagnosis; which includes fibrocystic change (FCC) with luminal mucin, mucococile-like lesion (MLL), pure or mixed type of mucinous carcinoma. Among these mucinous lesions, MLL is an uncommon tumor initially described by Rosen as a benign process of breast.2,6 The subsequent reports on MLLs disclose a spectrum of pathologic lesions from benign tumor, atypical ductal hyperplasia, and carcinoma in situ to invasive carcinoma, further ramifying the diagnostic spectrum. Micinous carcinoma is a variant of breast cancer, characterized by the accumulation of abundant extracellular mucin around invasive carcinoma cells. In practice, a carcinoma should not be classified as pure mucinous carcinoma if more than 10% of the invasive component is non-mucinous, or if the non-mucinous invasive component is poorly differentiated cytologically. In general, pure mucinous carcinomas have a favorable prognosis, and the 10 years survival ranges from 80% to 100%.2,6

The cytologic features of mucinous carcinoma are well-established. However, aspirates with abundant extracellular mucinous material originating from other mammary lesions, especially those with increased cellularity may create a diagnostic challenge for cytopathologist. Cytologic features such as cellularity, shape of the epithelial cell nests, nuclear pattern, background, and stromal component are helpful in the differential diagnosis. In general, the cytologic pattern is highly variable from predominantly discohesive single epithelial cells floating in a mucinous background to predominantly cohesive sheets. A distinct feature of mucinous carcinoma is the presence of thin-walled capillaries, either free-floating or coursing through the thick mucin.

Caution must be taken in diagnosing any malignant mucinous lesion with a high nuclear grade specifically as micinous carcinoma because these lesions most likely will harbor ductal carcinoma, not otherwise specified.
component. It is recommended that paucicellular lesions lacking cytologic atypia, whether representative of FCC or MLL, be considered for conservative surgical excision based on the lack of reliable malignant features.έ

Classic examples of ductal carcinoma with micropapillary architecture are micropapillary ductal carcinoma in situ (DCIS) and IMPC. The nature of these two entities is different. And probably is not related. Micropapillary DCIS, which is low-grade in situ malignancy that is commonly associated with multicentricity, may undergo cystic changes and may show histologic overlaps with cystic hypersecretory DCIS.έ In general, fine-needle aspirates of DCIS also do not contain discernible amounts of background mucin. In patients with cystic hypersecretory DCIS, thick, colloid-like substances are seen instead.έ IMPC is rare variant of infiltrating ductal carcinoma. Cytology of IMPC showed papillary clustering of hyperchromatic cells with irregular and crowded nuclei but lacking papillary cores, multiple scattered cohesive and morula-like clusters of tumor cells with angulated borders. A feature of the clusters was an “inside-out” pattern with nuclei toward center and apical cytoplasm toward periphery of the clusters.έ Histologically it is characterized by a morular growth pattern within artifically created spaces and reverses cellular polarity.έ Aggressive nature of these carcinomas characterized by high propensity for lymphatic permeation and regional lymph node metastasis, skin and chest wall recurrences and expression of unfavorable prognostic markers.έ

Recently, of mucinous carcinoma with micropapillary pattern has been described. Ng, in a review of 556 ductal carcinomas, found five mucinous carcinomas with a diffuse micropapillary arrangement.έ It is an unique form of invasive carcinoma of the breast exhibiting dual differentiation toward mucinous as well as micropapillary. Micropapillary carcinoma can be identified by FNAC while cytologic features of micropapillary pattern in mucinous carcinoma still underrecognized.έ

In contrast to the micropapillary variant, the neuroendocrine subtype of mucinous carcinoma tends to yield loosely dispersed tumor cells with a plasmacytoid appearance, granular eosinophilic cytoplasm and show stippled chromatin, conversely, fine-needle aspirates of mucinous carcinoma with micropapillary pattern are often hypocellular and are comprised of nondescript cell clusters and sheets. A striking micropapillary pattern is often not identified. It can sometime mimics IMPC because both entities show an essentially similar cellular arrangement. However, mucinous features in IMPC, if any, are just occasional, the tumor cells are often of higher grade and show more florid mitotic activity compared with the tumor cells in mucinous carcinoma.έ The characteristic histological features for labeling a tumor as mucinous micropapillary carcinoma are micropapillary pattern, nuclear pleomorphism, hobnail cells and psammoma bodies in addition to the predominant mucinous component.έ However, it remains unclear whether the micropapillary architecture represents the mucinous counterpart of IMPC or a genuine micropapillary variant of mucinous carcinoma.έ

In spite of the rare incidence (<1% of ductal carcinoma), the existence of micropapillary pattern in mucinous carcinoma warrants special attention.έ Because when compared this to pure mucinous carcinoma this entity (mucinous carcinoma with micropapillary pattern) tends to have a higher nuclear grade, axillary lymph node metastases, lymphovascular invasion and overexpression of HER2, p53, ki67.έ

CONCLUSION

We conclude that micropapillary pattern being a unique and rare variant of mucinous carcinoma should be recognized by characteristic cytologic and histologic features. It has an increased propensity for lymphatic invasion and regional lymph node metastasis reflective of their dual phenotype. It should be reported as a separate category by the pathologist. Its implication has been noticed in recent studies for more accurate classification of the individual tumors and better patient prognostication for the treatment.

REFERENCES

10. Madur B, Shet T, Chinoy R. Cytologic findings in infiltrating...


How to cite this article: Shubhada B, Suresh C, Sunita D, Umesh K, Shivaji B. Micropapillary Pattern: An Aggressive Component in Pure Mucinous Carcinomas of Breast. IJSS Case Reports & Reviews 2015;2(4)-31.

Source of Support: Nil, Conflict of Interest: None declared.