Diagnostic pitfall in a case of ductal carcinoma—*in situ* with microinvasion

**ABSTRACT**

We report a case of microinvasive carcinoma of the breast cytologically diagnosed as ductal carcinoma—*in situ* in an 80-year-old lady with a breast lump. Extensive sampling of mastectomy specimen showed ductal carcinoma *in situ* (DCIS). Many ducts showed stromal reaction—periductal sclerosis and lymphocytic infiltration—features suggestive of microinvasion. However, no definite invasion was noted histologically. Immunohistochemical study highlighted the microinvasive foci.

**Key words:** Ductal carcinoma *in situ* (DCIS); Immunohistochemistry; microinvasion

**Introduction**

The cytologic presence of necrosis is strongly suggestive of malignancy, but, is particularly characteristic of ductal carcinoma *in situ* (DCIS) and is not often seen in invasive carcinoma.[1] However, focal invasion cannot be ruled out by fine needle aspiration (FNA).[1,2] Proliferation of malignant epithelial cells within the confines of ducts with no microscopic evidence of invasion through the basement membrane into the stroma is termed as DCIS.[1] Currently, DCIS accounts for about 23% of breast cancers, while DCIS with microinvasion (DCISM) is found in approximately 5-10% of DCIS cases. Microinvasion is literally interpreted as an invasive element less than or equal to 1 mm in diameter. However, microinvasive element may often occur with more than one focus, up to three foci, but none should be greater than 1 mm in the largest dimension.[1-4] Immunohistochemistry (IHC) is very useful in the assessment of invasion[1-4] and all suspicious foci should be subjected to IHC.

**Case Report**

An elderly, 80-year-old woman came with complaints of left-sided breast lump that gradually increased over a span of 2 months. On local examination, the upper outer quadrant of the breast showed a 2 cm × 2 cm mobile, nontender lump. FNA was performed, which yielded 0.5 mL of dirty white, necrotic material. Leishman, Pappinacolaue, and Hematoxylin and Eosin (H&E) stained slides showed scattered and loosely cohesive clusters of malignant round to oval cells with ample amount of eosinophilic granular cytoplasm with distinct cell boundaries and vesicular nuclei. Few cells showed irregular nuclear borders and focally prominent nucleoli. Bizarre cells, Tumour giant cells, and mitotic figures were seen. The background showed abundant necrotic material devoid of bare nuclei [Figure 1a and b]. With a cytologic diagnosis of malignant breast lesion suggestive of DCIS,
she underwent modified radical mastectomy (MRM). We received a MRM specimen measuring 18 cm × 12 cm × 2 cm. The nipple and areola appeared unremarkable. Serial sections showed an irregular firm area with a sieve-like appearance measuring 2 cm × 2 cm, that was 0.3 cm away from the deep surgical margin. Dissection of the axillary tail showed six lymph nodes. Histopathological examination showed breast with comedo (with central necrosis) [Figure 1c], cribriform, and micropapillary patterns of DCIS. The dilated small and large ducts were lined by malignant round to oval monotonous cells with pleomorphic vesicular nuclei and a moderate amount of eosinophilic cytoplasm. Apocrine cell change was noted. Some ducts showed irregular contours with periductal stromal reaction and lymphocytic infiltrate [Figure 1d] suggesting microinvasion. However, extensive sampling showed no frank invasion. Adjacent breast showed fibrocystic change. Paget’s disease was not seen. Deep surgical margin and all the lymph nodes were free of tumor. IHC showed a uniform myoepithelial cell layer positive for p63 [Figure 1e] and smooth muscle actin (SMA) outlining the in situ component. Cytokeratin 7 (CK7) was strongly and diffusely positive in the in situ and in the periductal areas confirming microinvasion [Figure 1f]. Estrogen Receptor (ER) score was 4 + 2 = 6. Progesterone receptor (PR) was negative; Cerb-B2 was equivocal with a score of 2+. A diagnosis of DCISM was offered.

Discussion

Although not diagnostic, malignant ductal cells with abundant necrotic material in the breast lump, is a clue for DCIS on cytologic study. The closest differential diagnosis on cytology is centrally necrotising carcinoma (CNC) of the breast that is a highly aggressive subtype of breast carcinoma.\(^{[5]}\) However, the striking histological feature in CNC is the central necrotic zone comprising 70% of tumor load, rimmed by malignant cells, which was not seen in our case. Hence, CNC was ruled out on histologic examination. DCIS has a favorable outlook and need not undergo axillary clearance, whereas DCISM may give rise to metastasis and, therefore, needs an axillary clearance. Hence, it is essential to assess microinvasion in cases of DCIS. Subtle morphologic clue to microinvasion is concentric stromal reaction around DCIS.\(^{[6]}\) Our case showed similar morphology with extensive DCIS surrounded by sclerotic rims. Such potential diagnostic challenge can be overcome by the use of myoepithelial markers such as S100, alpha smooth muscle actin, smooth muscle myosin-heavy chain (SMM-HC), calponin, and high molecular weight cytokeratin.\(^{[5-5]}\) SMM-HC seems to be the most specific marker. Other markers include Maspin, p63, and CD10.\(^{[1-5]}\)

In our case, microinvasion was noted within 0.2–0.3 mm around DCIS on IHC. The prognosis for ductal carcinoma at a microinvasive stage is very good. Patients with microinvasive breast carcinoma have a cure rate very close to 100%, with local treatment alone. Most microinvasive breast carcinomas are treated by radical mastectomy or more recently by breast-conserving surgery.\(^{[3-5]}\) Our patient was old but has met with the surgical procedure well, which seems to be her optimum treatment.

Conclusion

Abundant necrotic material on cytologic study of breast lump should arouse suspicion of DCIS or CNC of the breast. Diagnostic pitfall of missing the possibility of microinvasion on FNA always lurks, as was in our case. Hence, the need for extensive sampling on histopathologic examination, especially in areas showing stromal reaction along with adjunct IHC markers is a must, and is, therefore, emphasized, to rule out microinvasion.
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Conflicts of interest
There are no conflicts of interest.

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