Phyllodes tumours of the breast: an update

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Phyllodes tumours of the breast are uncommon fibroepithelial neoplasms, histologically resembling intracanalicular fibroadenomas, and characterized by broad leafy fronded stromal formations surmounted by bilayered benign epithelium. They are classified into benign, borderline and malignant categories based on a constellation of microscopic features, which include the degree of stromal hypercellularity, mitoses and cytological atypia, stromal overgrowth and nature of the margins. The majority of phyllodes tumours are benign, but recurrences can occur, with malignant phyllodes tumours potentially metastasizing.

Phyllodes tumours are reported to account for 0.3–1% of all primary tumours of the breast and for 2.5% of all fibroepithelial tumours of the breast. They usually occur in women in their 5^{th} decade of life. In Asian countries, they constitute a higher proportion of primary breast tumours, and are more frequently discovered in younger women. Thought to be derived from intralobular or periductal stroma, they likely develop de novo, though there are reports of progression of fibroadenoma to phyllodes tumour.

Macroscopically, they comprise generally circumscribed masses that can grow to significant sizes with accompanying haemorrhage or necrosis. Histologically, there is an exaggerated intracanalicular epithelial growth pattern with cellular stroma, and benign phyllodes tumours may be confused with cellular fibroadenomas. Heterologous elements like liposarcoma, osteosarcoma, chondrosarcoma or rhabdomyosarcoma may be seen in malignant phyllodes tumours. Although the three-tiered grading system is widely used, it lacks consistent reproducibility. Many biological markers have been evaluated, but none have achieved independent reliability in predicting outcome.

Molecular studies determined the presence of epithelial-stromal interactions involving the Wnt signalling pathway, cyclin D1, insulin growth factor (IGF) and IGFR1. Gains of chromosome 1q and losses at chromosome 13 are reported to be associated with malignant progression of phyllodes tumours, with an increasing number of chromosomal abnormalities with increasing tumour grade. Preliminary data from array CGH disclose interstitial deletion of 9p21 involving the *CDKN2A* locus, with malignant and some borderline tumours manifesting 9p deletion.

Current challenges include refining a grading system for phyllodes tumours that can be universally applied with outcome prediction, as well as further elucidating molecular mechanisms of progression that can allow specific therapeutic modulation of malignant tumours.