論 文 内 容 要 旨

Features of Phyllodes Tumours and

Fibroadenomas Differ on MR Image

（MRI における葉状腫瘍と線維腺腫の鑑別）

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Phyllodes tumours (PT) are rare fibroepithelial neoplasms that account for 0.3–1.0% of all breast tumours. In contrast to fibroadenomas (FA), which are also fibroepithelial neoplasms, PT can grow very large with a high reported incidence of local relapse. Therefore, wide local excision with margins is recommended for all grades of PT since residual PT at excision margins comprise a powerful predictor of local relapse. This is in contrast to treatment for FA, which can be safely managed by simple enucleation.

Although their management differs in terms of surgical procedures and prognosis, preoperatively differentiating PT from FA is generally considered difficult. Core needle biopsy (CNB) might be useful for diagnosis. However, PT and FA are in fact similarly dimorphic with both epithelial and stromal components. However, although they can be differentiated if stromal hyperplasia is diagnosed, tumour heterogeneity causes problems and sampling issues can interfere with making a definitive preoperative diagnosis.

This study aimed to determine how the magnetic resonance imaging (MRI) and histopathological findings of PT and FA correlate and verify whether they are useful for preoperative diagnosis.

We retrospectively reviewed 12 PT and 43 FA that were surgically resected after MRI assessment between 2009 and 2015. The shape and signal intensity (SI) of the tumours on T2-weighted images (T2WI), the apparent diffusion coefficient, and SI after injection of contrast medium were dynamically assessed.

All PT were circumscribed, while most were lobulated (83.3%) and heterogeneous (91.7%). The findings of FA were often the same, but other features such as not being circumscribed (18.6%) and internally homogeneous (27.9%) were relatively common. High SI areas suggestive of haemorrhage were significantly more frequent on pre-contrast T1WI of PT than that of FA (66.7% vs. 16.2%, p = 0.00034).

The results of the SI analysis showed a higher intratumoural SI for PT than FA on T2WI (7.07 vs. 4.37, p = 0.0022).A comparison of ADC did not uncover a difference between PT and FA (1.59 vs. 1.58 × 10^{-3} mm²/sec)

Overall enhancement was more intense among PT than FA, while SI was significantly higher at 100 seconds (2.03 vs. 1.60, p = 0.043) when enhanced effects on pre-enhanced tumours were quantified based on SI ratios.

CNB was performed in 10 of 12 PT cases, with the results indicating that six of 10 patients

had PT, three had FA, and one had intraductal papilloma. The CNB findings of almost all FA cases indicated FA (16 of 18 patients).

Histopathological comparisons showed that high intensity on T2WI and low ADC in images of PT corresponded to stromal hypercellular areas with oedema. High intensity on T1WI corresponded to haemorrhaging. Areas of high intensity on T2WI and low ADC in images of FA corresponded to epithelial hyperplasia without oedema.

This study targeted PT and FA surgical patients who underwent preoperative MRI. Tumours that are small or do not exhibit growth tendencies are not resected in actual clinical practice. On the other hand, tumours such as large PT that are indicated for mastectomy are not eligible for MRI. Problems arise in the clinical setting when attempting to differentiate medium-sized PT and FA with growth tendencies. We believe that the preoperative diagnosis of these tumours in patients who are assessed by MRI is of particular significance in selecting the appropriate surgical procedures.

CNB has become a popular means of diagnosing PT and FA. We found that CNB has 60% sensitivity, 100% specificity in our cases. Although CNB was not obtained from all tumours because of the low sensitivity, the high specificity suggested that wide resection with a margin should be the treatment of choice when PT is diagnosed.

Diagnosing PT by MRI using a single parameter is difficult. Appropriate SI cut-off values of 4.81 for T2WI and 1.68 for SI ratio of dynamic study were set using receiver operating characteristics curves since these two parameters significantly differed between PT and FA. The sensitivity for a diagnosis of PT was maximal when values for one or both parameters were high (sensitivity, 100%; specificity, 39.5%). Local resection without a margin could proceed for tumours that are not diagnosed as PT due to a high sensitivity considering cosmetic considerations.

Not only can MRI morphologically differentiate PT from FA, it can also provide information about tissue composition and vascularization, the quantitation of which seems useful for differentiation.