Soft tissue masses with cystic appearance due to myxomatous stroma: Can conventional magnetic resonance imaging differentiate benign from malignant tumours?

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Objectives: To retrospectively evaluate the diagnostic performance of morphological signs observed on conventional magnetic resonance (MR) imaging to differentiate benign from malignant peripheral solid tumours of soft tissue with cyst-like appearance due to myxomatous stroma.

Methods: MR images from 95 consecutive histopathologically proven tumours (26 benign and 69 malignant) of soft tissues with myxoid components were evaluated in our tertiary referral centre. Two radiologists, blind to pathology results, independently reviewed conventional MR sequences including at least a) one T2-weighted sequence with or without fat suppression; b) one T1-weighted sequence without fat suppression; and c) one T1-weighted sequence with gadolinium-complex contrast enhancement and fat suppression. Multiple criteria were defined to analyse morphology, margins, architecture and tumour periphery and evaluated for each lesion. Intra- and inter-observer reproducibility and Odds ratios were calculated for each criterion.

Results: The most relevant and reproducible criteria to significantly predict malignancy were: (1) ill-defined tumour margins, (2) haemorrhagic component, (3) intra-tumoural fat, (4) fibrosis and (5) “tail sign”. A lesion is classified as malignant if any of these 5 criteria is present, and benign if none of them are observed. Therefore, this combination provides a sensitivity of 92.86% and a specificity of 93.3%.

Conclusion: Conventional MR imaging provides reproducible criteria that can be combined to differentiate between benign and malignant solid tumours of soft tissue with cyst-like appearance due to myxomatous stroma. To avoid the rare false negative, additional careful analysis of the location must be performed including the muscle and articulation proximity.

Keywords : myxoid, MRI sarcoma, PNST, myxoma
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