

Accuracy of Gadofosveset enhanced MRI for predicting nodal status in primary rectal cancer

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Background:

MRI is known to be reliable for selection of rectal tumors with involved resection margins for preoperative chemoradiation, aiming at reducing the risk for local recurrence. Nodal involvement is another indicator for poor prognosis. Accurate assessment of nodes with MRI would allow differentiation of treatment according to the individual risk. Therefore our goal was to validate gadolinium-based contrast (Gadofosveset) enhanced MRI for prediction of nodal status in primary rectal cancer patients.

Materials and Methods:

32 rectal cancer patients underwent MR imaging including T2-weighted FSE (T2W) and Gadofosveset-enhanced T1-weighted GRE. Patients were stratified into 3 treatment groups; total mesorectal excision (TME) only (n=5), TME with neoadjuvant radiotherapy (n=10) and TME with neoadjuvant chemoradiation (CRT) (n=17). The latter underwent a second MRI post-CRT with additional assessment thereafter. An experienced reader predicted each node for benign or malignant on T2W and Gadofosveset-enhanced images respectively using a confidence level score (0 = definitely benign, 1 = probably benign, 2 = possibly malignant, 3 = probably malignant, 4 = definitely malignant). Nodes were recorded on an anatomic map, used as a template for lesion by lesion comparison with histology. Receiver operator characteristics (ROC) curve-analyses were performed to compare diagnostic performance.

Results:

In 32 patients, 208 nodes were analysed, of which 47 positives in 14 patients. 44 of 47 positive nodes were predicted correctly on Gadofosveset-enhanced MRI. Per lesion sensitivity was 93%, specificity 96%, PPV 88% and NPV 98% for Gadofosveset-enhanced imaging. Area under the ROC-curve (AUC) for Gadofosveset-enhanced imaging was significantly better than for T2W imaging (0.979 vs 0.813, p<0.001). Per patient sensitivity was 93%, specificity 89%, PPV 87%, NPV 94% and AUC 0.917.

Conclusion:

Although larger multicenter studies are needed to confirm our results, Gadofosveset-enhanced MRI is highly accurate and promising for prediction of metastatic nodes in rectal cancer patients

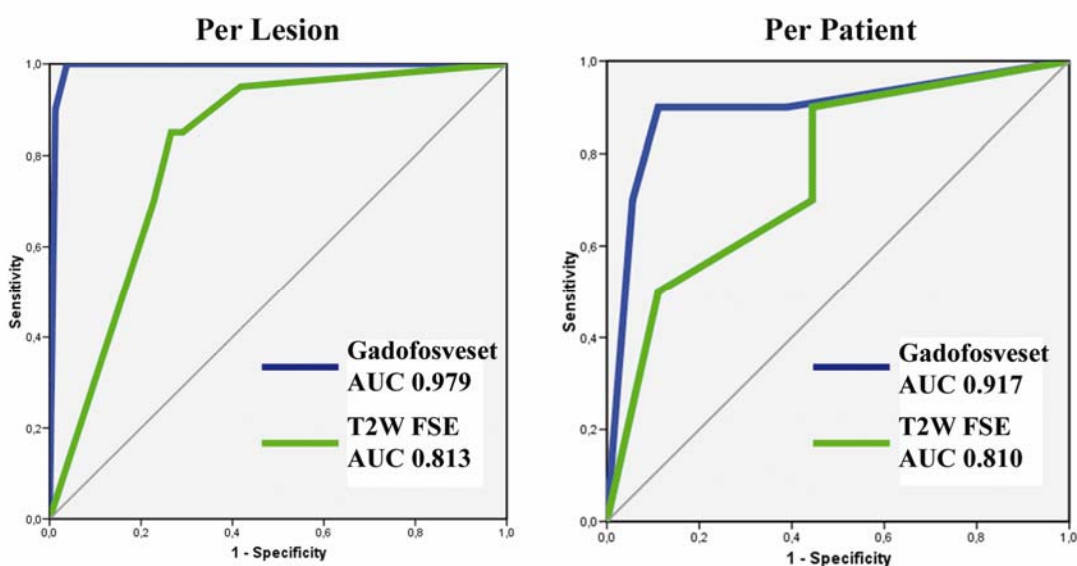


Figure 1. Receiver operator characteristics curves for Gadofosveset-enhanced imaging versus conventional non enhanced T2-weighted imaging (T2W FSE)