MR LYMPHANGIOGRAPHY OF THE AXILLA WITH SPIO, IN PATIENTS WITH BREAST CANCER

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PURPOSE: To evaluate the accuracy of MR lymphangiography with superparamagnetic iron oxide (Resovist, Schering AG, Charlottenburg, Berlin, Germany) enhancement for the characterization of axillary lymph nodes in patients with breast cancer, with histopathologic correlation.

MATERIALS AND METHODS: Eighteen women with newly diagnosed breast carcinoma underwent MR imaging within 24-36 hours after the intravenous administration of SPIO, preoperatively. Imaging was performed with a 1.5 –Tesla magnet by using conventional T1-weighted and T2-weighted spin echo sequences, a T2*-weighted gradient echo sequence and Gd enhanced T1 weighted 3D GRE with fat saturation, using a slice thickness of 2.5 mm. MR imaging of the axilla was performed in the supine position using a cardiac surface coil. The axillary lymph nodes were assessed with regard to size, number, anatomic level of malignant lymph nodes, morphologic features and pattern of nodal enhancement after SPIO administration (homogeneous, inhomogeneous and rim enhancement). The signal intensity ratio before and after SPIO administration of malignant versus nonmalignant lymph nodes were evaluated. Level I and II nodes of the axilla were assessed. Surgery was performed within 5 days after MR imaging. The MR findings were correlated with histologic findings.

RESULTS: Intravenously injected small iron oxide particles pass through the vascular endothelium into the interstitium and via the lymphatics into normally functioning and inflamed lymph nodes. The iron particles are phagocytosed by nodal macrophages and result in a signal decrease in normal lymph nodes on T2*- and T2-weighted MR images because of the effects of magnetic susceptibility and T2 shortening on the iron deposits. Metastatic lymph nodes, however have lost their mechanism for phagocytosis and therefore, do not display the reduced signal intensity, which allows them to be differentiated from benign lymph nodes.

SPIO-enhanced MR imaging results were true negative in 9 , true positive in 7, false positive in 0 and false negative in 2 of the 18 patients.

CONCLUSIONS: The use of SPIO contrast material appears enhanced MR imaging appears valuable for assessment of axillary lymph node metastases in patients with breast carcinoma