

Combined diffusion-weighted magnetic resonance imaging and MR lymphography reliably detect and evaluate sentinel lymph node in cervical cancer

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Purpose

To evaluate whether combined diffusion-weighted magnetic resonance imaging (DWI) and MR lymphography (MR-LG) reliably detect and evaluate sentinel lymph nodes (SLNs) metastasis in cervical cancer

Materials and Methods

A total of 38 patients with stage IB1, IB2, IIA cervical cancer were preoperatively underwent interstitial MR-LG with gadodiamide injection after completed the conventional MRI and DWI examinations at a b-value of 1000 s/mm², and the first one or several lymph node(s) in the lymphatic drainage pathway was/were defined as the SLN(s). Blue dye SLN biopsy was performed on all patients. The morphologic features of all the SLNs on MR lymphographic images were analyzed. The relative apparent diffusion coefficient (rADC) of each SLN was measured. Diagnostic accuracies of the combined MR-LG and DWI approach compared with only MR-LG without DWI versus histopathology were evaluated.

Results

All the SLNs were successfully identified and corresponded well with those identified on SLN biopsy, with an accuracy of 90.5%. In patients with non-metastatic SLNs, oval or round enhanced SLNs were visualized by MR-LG. In patients with metastatic SLNs, the enhanced SLNs were visualized with or without filling defects in all patients except three in which SLNs were not enhanced. The sensitivity, specificity, accuracy, and positive and negative predictive values (PPV and NPV) for using filling defects on MR-LG as a diagnostic criterion were 78%, 72%, 90%, 65%, and 89%, respectively.

MR-LG detected 89.6% of 2 to 3 mm micro-metastatic deposits. Meanwhile, there were statistically significant differences between metastatic and non-metastatic SLNs in rADC ($P < 0.01$). With the addition of DWI, the diagnostic accuracies increased obviously: sensitivity, 80%; specificity, 87%; accuracy, 91%; PPV, 78%; NPV, 94%.

Conclusion

The combination of DWI and MR lymphography was useful not only in reliably detecting the SLNs but also in improving the diagnostic accuracy of SLN metastases in patients with early stage of cervical cancer.

Reference:

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