Cancer Imaging

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Whole-body diffusion-weighted MRI versus CT for detection, restaging and operability assessment of recurrent ovarian carcinoma

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Aim

To evaluate whole body diffusion-weighted MR imaging (WB-DWI MRI) for detection, staging and operability assessment in recurrent ovarian cancer compared with CT.

Methods

Fifty-one women suspected for recurrent ovarian cancer underwent 3-Tesla WB-DWI/MRI using 2 b-values (b=0-1000 s/mm²), T2- and contrast T1-weighted sequences in addition to CT. WB-DWI/MRI and CT were compared for per-patient detection of recurrence, per-site detection of disease extent including peritoneal, serosal, retroperitoneal, periportal and distant metastases and for detecting disease extent according to institutional operability criteria. Imaging findings were correlated with surgical/pathological findings or imaging follow-up for at least 6 months.

Results

According to the reference standard, recurrence was confirmed in 48/51 patients. WB-DWI MRI showed 94% accuracy for detecting recurrence, versus 78% for CT. Per-site analysis showed significantly higher sensitivity of WB-DWI MRI over CT for assessing disease extent of the peritoneum, small bowel and colon mesentery and serosa ($p<0.000001$, $p<0.000001$ and $p=0.00002$, respectively), retroperitoneal suprarenal lymphadenopathies and periportal lesions (both $p=0.031$). Following institutional operability criteria, WB-DWI/MRI showed better sensitivity for detection of disease extent compromising operability; mesenteric root infiltration ($p=0.008$), carcinomatosis of small bowel ($p=0.002$) and colon ($p=0.016$), high volumetric peritoneal disease load ($p=0.004$) and irresectable distant metastases ($p=0.016$). WB-DWI MRI correctly predicted complete cytoreduction in 93% patients undergoing cytoreductive surgery versus 40% for CT.

Conclusion

WB-DWI MRI showed higher accuracy compared with CT for recurrence detection while improving the sensitivity for staging and operability assessment of disease extent. WB-DWI MRI may be most valuable to select patients for surgical resection.

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