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Peritoneal Dissemination: Comparison of 18F-FDG PET/CT and DWI with Conventional MRI

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PURPOSE: The purpose of this study was to evaluate the diagnostic performance of 18F-FDG PET/CT in peritoneal dissemination detection, in comparison to MRI with and without diffusion-weighted imaging (DWI). **METHOD AND MATERIALS:** Prospective subjects with peritoneal metastases were recruited for 18F-FDG PET/CT and MRI, performed within 4-week of each other, without intervening therapeutic interventions. Images were evaluated in separate sessions as following: DWI alone, conventional MRI alone, DWI with conventional MRI, and 18F-FDG PET/CT for peritoneal dissemination in 16 anatomical sites. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy of each method were evaluated. **RESULTS:** There were 96 sites in 6 subjects for analysis. DWI combined with conventional MRI was the most sensitive method (sensitivity 96%, specificity 100%, accuracy 99%, PPV 100%, NPV 98%), as compared with DWI (79%, 100%, 95%, 100%, 93%) and conventional MRI (83%, 100%, 96%, 100%, 94%) but results were comparable to 18F-FDG PET/CT (92%, 100%, 98%, 100%, 97%). **CONCLUSION:** DWI improves the diagnostic performance of conventional MRI in peritoneal metastasis detection. This is the first prospective study with direct comparison between 18F-FDG PET/CT and DWI with conventional MRI in peritoneal dissemination evaluation, and demonstrated similar high diagnostic accuracies. **CLINICAL RELEVANCE/APPLICATION:** DWI/MRI appears promising in follow-up when the disease is confined to the abdomen and pelvis. 18F-FDG PET/CT remains excellent in staging due to its ability to detect supra-diaphragmatic disease.