

Endometrial Carcinoma: Staging Accuracy of Diffusion Weighted Images

Shaza AlSharif¹, Stephanie Nougaret¹, Helen Addley², Jocelyne Arseneau¹, Evis Sala², and Caroline Reinhold¹

¹Radiology, McGill University, Montreal, QC, Canada, ²Radiology, University of Cambridge, Cambridge, United Kingdom

Purpose:

The aim of the study is to compare the staging accuracy of dynamic contrast-enhanced (DCE) sequences versus diffusion-weighted imaged (DWI) for determining the depth of myometrial invasion. The study standard of reference was histopathology.

Materials and Methods:

A total of 83 patients with proven endometrial carcinoma were included in the study. All patients underwent preoperative MR staging.

Blinded image analysis was performed in three separate sittings: T2 only, T2+DCE, & T2+DWI. A separate analysis of the short-axis/axial & sagittal DWI was undertaken to determine which plane correlated best with the histopathological findings.

Diagnostic accuracy, sensitivity and specificity for myometrial invasion of each reader were evaluated.

Results:

31/83 patients had deep myometrial invasion. Diagnostic accuracy, sensitivity & specificity of myometrial invasion were as follows: DWI for readers 1 (83%, 81% & 73%) and for reader 2 (93%, 90% & 97%). DCE for readers 1 (78%, 87% & 73%) and for reader 2 (80%, 81% & 79%).

Both readers correctly staged more patients with DWI (69 and 77 patients, respectively) than by DCE (65 and 66 patients, respectively); it was statistically significant for reader 2 ($p=0.01$).

60 patients underwent both sagittal and axial DWI. In 16 cases artifacts were noted in the sagittal DWI.

Diagnostic accuracy, sensitivity and specificity of myometrial invasion were as follows: for reader 1: axial DWI (87%, 87% & 86%), sag DWI (82%, 78% & 84%), for reader 2: axial DWI (92%, 96% & 92%), sag DWI (80%, 74% & 84%).

Reader 1&2 correctly staged more patients with axial DWI (52 and 56 patients) than by sag DWI (49 and 48 patients, respectively); it was statistically significant for reader 2 ($P=0.03$).

Conclusion:

Pre-operative staging, including accurate assessment of myometrial invasion depth plays an important role in stratifying management particularly with the advent of laparoscopic and robotic surgery.

DWI proved to be comparable to DCE in determining the depth of myometrial invasion. The short-axis of DWI+T2W sequences achieved the best diagnostic accuracy.

These findings suggest that DWI can replace DCE images in assessing deep myometrial invasion. This will be particularly useful in cases where intravenous contrast agent is contraindicated.