

Does reduced field of view Diffusion sequence has the ability in assessing microsatellite instability? An initial experience

Hypotheses: The primary objective of this study is to assess the ability of diffusion imaging using IVIM to determine MSI in the tumor in clinical FIGO stage IA disease.

Materials and methods: Approval from institution IRB was obtained. IVIM images were obtained on 12 patients on a 3 T scanner using six b values (0, 50, 100, 150, 200, 600) were applied along all three gradient directions for sagittal acquisition. Mathematically derived parameters were obtained and images were created for D (true diffusion Coefficient), D^* (pseudodiffusion) and f (perfusion fraction) and ADC maps. The tumor was localized on the T2 weighted sequence on the AW workstation and 3 ROIs were placed which automatically populated the ROI at the same location on all the IVIM generated sequences. The average of the 3 ROIs was recorded. This was then correlated with the pathologic findings for MSI.

Statistical analysis: Summary statistics were performed of pathology depth of invasion by MSI status. Wilcoxon rank sum test was performed to assess IVIM with MSI.

Results: The average age of the patients was 54.5 years (maximum 67 years and minimum 46 years). There were six patients who has MSI stable tumor and six had MSI-H tumor. Four of the six patients who has MSI-H tumor had lynch syndrome. There was no association of depth of myometrial invasion and MSI stability $p < 0.99$, based on the pathological analysis. MSI stable tumors had a significantly higher ADC and true Diffusion than the MSI-H tumors $p < 0.03$ (mean and $p < 0.05$).

Conclusion: IVIM may be able to assess MSI in EC prior to surgical resection.