

IMAGING

Differentiation of renal clear cell carcinoma and renal papillary carcinoma using quantitative CT enhancement parameters

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Objective: The purpose of our study was to evaluate quantitative multiphase CT enhancement patterns of malignant renal neoplasms to enable lesion differentiation by their enhancement characteristics. We used a new method to standardize enhancement measurement in lesions on multiphase CT not being influenced by intrinsic factors like cardiac output.

Conclusion: The new correction method is a simple tool for excluding intrinsic influences on the enhancement of lesions. Quantitative enhancement evaluation with this method of the influence of intrinsic factors enables accurate differentiation between renal clear cell carcinoma and renal papillary carcinoma.

Editorial Comment

The authors present an interesting and standardized method of measurements of the attenuation of renal tumors on computed tomographic studies, which are designed to eliminate the influence of intrinsic factors on the measured attenuation values of these lesions. This method was able to differentiate the most common malignant renal tumors accurately and was performed using multiphase CT (unenhanced, corticomedullary, and nephrographic phases). In this study, the author used an enhancement correcting method in the corticomedullary phase, which allowed them to differentiate renal clear cell carcinoma from renal papillary carcinoma with an accuracy rate of 95.7. In other words this study showed a high enhancement in the corticomedullary phase in renal clear cell carcinoma with a slight washout in the nephrographic phase; it showed a low enhancement in many renal papillary carcinomas - sometimes less than 12 H in the corticomedullary phase - but in the nephrographic phase, the enhancement of renal papillary carcinoma was clearly higher than 12 H.

Several recent papers have dealt with the CT capabilities of distinguishing the histological type of renal cell carcinoma. The reason for this effort is related to the potential effect of this differentiation in the preoperative and operative strategies. As we know the papillary sub-type of renal cell carcinoma has better prognosis than the clear cell carcinoma. This information might be useful in the management of patients with high surgical risks. Because renal papillary carcinoma are usually hypovascular they may also show less propensity for bleeding during surgical resection or during conservative treatments such radiofrequency ablation or cryotherapy.

Further studies, with larger number of patients, is necessary to confirm the CT capabilities to differentiate the histological sub-types of renal cell carcinoma.

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Organ-confined prostate cancer: effect of prior transrectal biopsy on endorectal MRI and MR spectroscopic imaging

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Objective: Our aim was to determine the effect of prior transrectal biopsy on endorectal MRI and MR spectroscopic imaging findings in patients with organ-confined prostate cancer.

Materials and Methods: Endorectal MRI and MR spectroscopic imaging were performed in 43 patients with biopsy-proven prostate cancer before radical prostatectomy confirming organ-confined disease. For each sextant, two independent reviewers scored the degree of hemorrhage on a scale from 1 to 5 and recorded the presence or absence of capsular irregularity. A spectroscopist recorded the number of spectrally degraded voxels in the peripheral zone. The outcome variables of capsular irregularity and spectral degradation were correlated with the predictor variables of time from biopsy and degree of hemorrhage after biopsy.

Results: Capsular irregularity was unrelated to time from biopsy or to degree of hemorrhage. Spectral degradation was inversely related to time from biopsy ($p < 0.01$); the mean percentage of degraded peripheral zone voxels was 18.5% within 8 weeks of biopsy compared with 7% after 8 weeks. Spectral degradation was unrelated to the degree of hemorrhage.

Conclusion: In organ-confined prostate cancer, capsular irregularity can be seen at any time after biopsy and is independent of the degree of hemorrhage, whereas spectral degradation is seen predominantly in the first 8 weeks after biopsy. MRI staging criteria and guidelines for scheduling studies after biopsy may require appropriate modification.

Editorial Comment

This study provides several important information related to the performance and interpretation of endorectal MR and MR spectroscopic imaging of the prostate after transrectal biopsy. As we know a thickened and irregular prostate capsule is an important MRI sign of extra-prostatic tumor extension. The authors suggests that these capsular changes are common in organ-confined prostate cancer and are unrelated to time from biopsy and extent of post-biopsy hemorrhage and that these changes may represent a normal variant rather than a biopsy artifact. Another interesting finding was related to the presence of spectral degradation on MR spectroscopic studies. This spectral curve degradation was significantly more frequent within the first 8 weeks after transrectal biopsy and was caused by post-biopsy changes. It is well known that post- biopsy hemorrhage usually precludes an optimal result in the conventional endorectal MRI study performed for local staging of prostate cancer. Since post-biopsy changes precludes also an optimal spectroscopic evaluation of the metabolites, the authors recommend that a period of 8 weeks after biopsy is necessary before submit the patient to a MRI and MR spectroscopic evaluation. This information is very important because recent studies have shown that the ideal MRI protocol for local staging of prostate cancer is obtained with the association of conventional endorectal MRI and 3D-MR-spectroscopic techniques. 3D-MR-spectroscopic imaging offers important additional information to the conventional endorectal MRI exam such as: estimative of tumor volume, better prediction of an extra-prostatic disease and information about tumor aggressiveness. As the authors pointed out, this optimized post-biopsy interval for an adequate MRI and MR spectroscopic imaging should be balanced against patient anxiety, although this interval is probably negligible in terms of the natural history of prostate cancer.

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