Detection of radiorecurrent prostate cancer using diffusion-weighted imaging and targeted biopsies.

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Abstract

OBJECTIVE: The primary purpose of this study was to evaluate the detection rate of local radiorecurrent prostate cancer by using diffusion-weighted MR imaging (DWI) and targeted biopsies. The secondary purpose was to assess the value of performing random biopsies.

MATERIALS AND METHODS: This study included 42 consecutive patients with biochemical recurrence after external beam radiation therapy (EBRT). At the time of biopsy, the mean age±SD was 67±6 years, median serum prostate-specific antigen level was 4.0±3.0 ng/mL, and mean elapsed time between EBRT and biopsy was 5.6±2.8 years. MRI examination included high-resolution axial T2-weighted and DWI sequences and was classified as either negative or positive. Transrectal ultrasound-guided targeted biopsies were obtained from all patients with positive findings on MRI using a soft image fusion system. Random sextant biopsies were obtained from both lobes in patients with negative findings on MRI and from the lobe contralateral to the MRI target in patients with positive findings on MRI. The biopsy results were classified as negative or positive and defined as the criterion standard.

RESULTS: MRI findings were positive in 40 of 42 (95%) patients, and the overall positive biopsy rate was 79% (33 of 42 patients). Targeted biopsies were positive in 33 of 40 (83%) patients. Random biopsies were positive in 6 of 30 (20%) patients, all of whom had positive targeted biopsies.

CONCLUSION: DWI is highly sensitive for detecting radiorecurrent prostate cancer, and a few targeted biopsies may confirm a positive diagnosis. However, random biopsies may assess the tumor burden more exactly.

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