MR Imaging of Tumor Thrombosis in Renal Cell Carcinoma

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Purpose: Tumoral neovascularity characteristic of venous invasion of renal cell carcinoma has been reported by angiography, computed tomography, and color Doppler duplex ultrasonography. Our study was performed to evaluate the usefulness of magnetic resonance (MR) imaging to detect neovascularity of venous tumor thrombi in renal cell carcinomas.

Materials and Methods: MR findings of histopathologically proved renal cell carcinomas with venous tumor thrombi in five cases were retrospectively analyzed to find any neovascularity of tumor thrombus. Spin-echo and single breath-hold gradient-recalled-echo MR pulse sequences were used to find any patchy flow signal in invaded IVC or right atrium. The MR findings were compared with histopathologic findings of tumor neovascularity in venous invasion of renal cell carcinoma.

Results: Histopathologically all five renal cell carcinomas were unilateral with IVC invasion. In one case, the tumor thrombi extended to right atrium. MR images in three among five cases showed patchy flow signals in invaded IVC. Histopathologic specimens from the IVC in all patients showed cords and nests of renal cell carcinoma cells interlaced by neovascular spaces.

Conclusion: MR imaging also may be useful to demonstrate the tumoral neovascularity characteristic of venous invasion of renal cell carcinomas, in addition to angiography, computed tomography, and color Doppler duplex ultrasonography.