

**Differentiation of papillary renal cell carcinoma subtypes on CT and MRI - Abstract**

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**OBJECTIVE:** The objective of our study was to determine the frequency of atypical papillary renal cell carcinomas (RCCs) and identify imaging differences between type 1 and type 2 papillary RCCs once atypical papillary RCC tumors have been excluded.

**MATERIALS AND METHODS:** Eighty-two papillary RCC tumors were classified at pathology as type 1, type 2, or atypical. The CT and MRI examinations of these tumors were reviewed. Imaging features such as tumor size, margins, heterogeneity, and enhancement were assessed and the findings in type 1 and type 2 tumors were compared.

**RESULTS:** There were 43 type 1 and 13 type 2 tumors. Atypical histologic features (i.e., tumors containing both type 1 and type 2 components, clear cells, or components with atypically high nuclear grade [in type 1 tumors] or low nuclear grade [in type 2 tumors]) were seen in 26 tumors. On CT, type 2 tumors more commonly had infiltrative margins ( $p = 0.05$ ) and were more likely to have calcifications ( $p = 0.04$ ) than type 1 tumors, although these features were seen in all tumor types. Type 2 tumors were also more heterogeneous than type 1 tumors ( $p = 0.04$ ). On CT, 11 papillary RCCs showed enhancement of less than 20 HU, seven of which showed enhancement of less than 10 HU. On MRI, all tumors showed enhancement on subtraction images.

**CONCLUSION:** Nearly one third of papillary RCCs in our patient population had atypical features at histology. On CT and MRI, there are some significant differences in imaging features between type 1 and type 2 tumors; however, substantial overlap precludes categorization on a per-patient basis. On CT, many papillary RCCs do not enhance, indicating that assessment of enhancement alone is insufficient for differentiating papillary RCCs from hyperdense cysts.

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