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Sarcomatoid differentiation in renal cell carcinoma: a study of 101 cases.

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Abstract

Sarcomatoid renal cell carcinoma is not a distinct histologic entity and represents high-grade transformation in different subtypes of renal cell carcinoma. It is not known whether any particular histologic type has a predilection for sarcomatoid change or whether the primary histologic type of renal carcinoma undergoing sarcomatoid change affects prognosis. Of 952 consecutively histologically subtyped renal cell carcinomas, the incidence of sarcomatoid differentiation was 8% in conventional (clear cell) renal carcinoma, 3% in papillary renal carcinoma, 9% in chromophobe renal carcinoma, 29% in collecting duct carcinoma, and 11% in unclassified renal cell carcinoma. One hundred one renal cell carcinomas with sarcomatoid change were studied, and clinicopathologic parameters were correlated with outcome. The mean age of patients was 60 years (range, 33-80 years), and the male-to-female ratio was 1.6:1. The median tumor size was 9.2 cm (range, 3-25 cm). The primary histologic subtype of the carcinoma component was conventional (clear cell) renal carcinoma in 80 cases, papillary renal carcinoma in eight, chromophobe renal carcinoma in seven, collecting duct carcinoma in two, and unclassified renal cell carcinoma in four. The sarcomatoid component resembled fibrosarcoma in 54 cases, malignant fibrous histiocytoma in 44, undifferentiated sarcoma (not otherwise specified) in three with focal rhabdomyosarcomatous component in two of them. The spindled elements accounted for 1% to 99% of the sampled tumor (median, 40%; mean 45%). The histologic grade of the spindled elements was intermediate to high in 92 cases and low in nine cases. Most cases were TNM stages III and IV (seven stage I, six stage II, 63 stage III, and 25 stage IV). Follow-up was available in 88 patients; 61 (69%) patients died of disease and had a median survival time of 19 months. Distant metastases, most frequently to the lungs, were documented in 51 (66%) of 77 patients who had available clinical information regarding distant metastasis. The disease-specific survival rate was 22% and 13% after 5 and 10 years, respectively, compared with a cohort of renal cell carcinomas without sarcomatoid change with a 5-and 10-year disease-specific survival of 79% and 76%, respectively. Kaplan-Meier survival analysis showed that tumors with high TNM stage ($p = 0.0027$), at least 50% sarcomatoid component ($p = 0.0453$), and angiolymphatic invasion ($p = 0.0282$) were associated with decreased survival rates. The primary histologic subtype of the carcinoma component and the type and grade of the sarcomatoid component did not affect survival. In a Cox proportional hazard regression model, TNM stage appeared to be the only significant variable in predicting outcome among renal cell carcinomas with sarcomatoid change ($p = 0.018$; risk ratio, 6.984 and 8.439). Compared with a cohort of renal cell carcinomas without sarcomatoid change, sarcomatoid tumors tended to present at a more advanced stage ($p = 0.0001$). Also, when adjusted for stage, necrosis, and tumor size, patients with tumors with sarcomatoid differentiation had a worse prognosis than did patients with tumors without sarcomatoid change ($p = 0.0001$). In conclusion, sarcomatoid change in renal cell carcinoma portends a worse prognosis. Because tumors with even a small component of sarcomatoid change may have an adverse outcome, this finding, when present, should be noted in the surgical pathology report.

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