

SURGERY

Vascularisation patterns of solid renal tumours: differentiation of benign and malignant renal masses

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Background. Renal masses present a wide histological spectrum ranging from benign oncocytoma and angiomyolipoma to malignancies as high grade renal clear cell carcinoma.

Aim. The task was to study imaging patterns, including vascularization of renal masses on Computed tomography (CT) to increase the accuracy of visual differentiation to further facilitate the decision of choosing treatment tactics.

Methods. The retrospective study with 100 patients with total renal tumour resection. Qualitative and quantitative parameters were evaluated to determine benign and malignant prognostic imaging parameters, including contrast uptake and wash-out patterns in the lesion, and relative to the renal parenchyma in preoperative CT examinations.

Results. 100 patients with solid renal lesions, male 49% vs. female 51% (31–84 years, mean 64 years). From 100 lesions benign were 22 (14% oncocytoma, 6% AML, 2% adenoma), malignant were 78 (RCC 72%, urothelial 6%).

Statistically significant association between benign masses and homogeneity in non-enhanced CT was found ($p=0.019$). Positive, mild correlation ($r=0.236$; $p=0.020$) of homogeneity and benign lesions in non-enhanced scans and AML and homogeneity in the arterial phase using χ^2 test was found ($p=0.031$). AML showed mild wash-out ($p=0.018$), and adenoma showed moderate wash-out ($p=0.018$) in venous phase.

Malignant lesions uptake contrast more than benign ($U=465.5$; $p=0.013$), also malignant masses uptake more contrast relative to the cortex compared with benign lesions ($U=545.5$; $p=0.38$).

In the delayed phase malignant masses washed-out slower than benign ($U=1123$; $p=0.002$).

Conclusions. Qualitative and quantitative evaluation reveals differences between benign and malignant renal masses, showing that benign masses are predominantly homogeneous on non-enhanced CT examination, whereas malignant masses retain the contrast longer in the venous phase and wash-out slowly in the delayed phase.

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