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能谱CT碘含量定量分析乏脂性肾血管平滑肌脂肪瘤与透明细胞癌

Spectral CT-based quantitative analysis of iodine content for differentiating angiomyolipoma with minimal fat and clear cell renal cell carcinoma

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作者	单位	E-mail
刘静红	大连医科大学附属第一医院放射科, 辽宁 大连 116011	cjr.liuailian@vip.163.com
刘爱连	大连医科大学附属第一医院放射科, 辽宁 大连 116011	
田士峰	大连医科大学附属第一医院放射科, 辽宁 大连 116011	
汪禾青	大连医科大学附属第一医院放射科, 辽宁 大连 116011	
马春梅	大连医科大学附属第一医院放射科, 辽宁 大连 116011	
鞠焯	大连医科大学附属第一医院放射科, 辽宁 大连 116011	
孙博	大连医科大学附属第一医院放射科, 辽宁 大连 116011	

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中文摘要:

目的 评价能谱CT碘含量对乏脂性肾血管平滑肌脂肪瘤(AML)与肾透明细胞癌(CCRCC)的鉴别诊断价值。方法 选取在我院接受能谱CT扫描且经手术病理证实的肾脏实质性肿块患者27例,其中CCRCC 20例,乏脂性AML 7例,直径均 ≤ 3.0 cm。使用GE Discovery HD 750能谱CT机,采用能谱扫描模式进行三期动态增强扫描。利用GSI Viewer分析软件生成碘水密度图,记录肿瘤最大层面的绝对碘水密度值和相对碘水密度值。采用独立样本t检验分析两种病变各期相的绝对碘水密度值、相对碘水密度值的差异;绘制ROC曲线,分析各期碘水密度值的诊断效能。结果 三期扫描中,CCRCC的相对碘水密度值均高于乏脂性AML($P < 0.05$)。皮质期、髓质期及延迟期相对碘水密度值的曲线下面积分别为0.779、0.943及0.900。皮质期、髓质期及延迟期相对碘水密度值阈值分别为42.98($100 \mu\text{g}/\text{cm}^3$)、68.01($100 \mu\text{g}/\text{cm}^3$)、72.09($100 \mu\text{g}/\text{cm}^3$),诊断AML与CCRCC的敏感度和特异度分别为55.0%、100%、85.0%、100%、75.0%、85.7%。结论 应用能谱CT增强扫描,以髓质期相对碘水密度值68.01($100 \mu\text{g}/\text{cm}^3$)作为诊断阈值,可以很好地区分乏脂性AML与CCRCC。

英文摘要:

Objective To evaluate the differential diagnostic value of iodine content based spectral CT for renal angiomyolipoma (AML) with minimal fat and clear cell renal cell carcinoma (CCRCC). **Methods** Twenty-seven patients with small solid renal masses, including 20 cases of CCRCC and 7 cases of renal AML with minimal fat confirmed with pathology were scanned with spectral CT. The diameter of each tumor was not more than 3 cm. All patients underwent three-phase enhance spectral CT imaging using GE Discovery CT750 HD, the iodine-based material decomposition images were reconstructed with gemstone imaging Viewer, and absolute and normalized iodine concentrations for renal lesions were obtained. All results were analyzed statistically with independent-samples *t* test. The diagnostic performances were evaluated using ROC analysis. **Results** Normalized iodine concentrations of CCRCC were higher than that of renal AML with minimal fat in all three phases ($P < 0.05$). According to ROC, area under curve of normalized iodine concentration was 0.779, 0.943 and 0.900 in the cortex phase, corticomedullary phase and equilibrium phase, respectively. Taking normalized iodine concentration 42.98 ($100 \mu\text{g}/\text{cm}^3$), 68.01 ($100 \mu\text{g}/\text{cm}^3$) and 72.09 ($100 \mu\text{g}/\text{cm}^3$) as threshold values of the cortex phase, corticomedullary phase and equilibrium phase, the sensitivity and specificity was 55.0% and 100%, 85.0% and 100%, 75.0% and 85.7%, respectively. **Conclusion** Taking normalized iodine concentration 68.01 ($100 \mu\text{g}/\text{cm}^3$) as threshold value in the corticomedullary phase can help to differential diagnosis of CCRCC and renal AML with minimal fat.

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地址:北京市海淀区北四环西路21号大猷楼502室 邮政编码:100190 电话:010-82547901/2/3 传真:010-82547903

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