Diagnostic value of X - ray, CT, MRI and 18FFDG PET / CT in multiple myeloma

[Abstract]

Objective To explore multiple myeloma in X-ray, CT , MRI and 18F-FDG PET/CT performance, improve the understanding of multiple myeloma in imaging.

Methods 110 cases confirmed by pathology and clinical patients with multiple myeloma imaging data were retrospectively analyzed.

Results X-ray of 94 cases in 110 cases with abnormal 62 cases, the diagnosis coincidence rate 65.9%, CT 90 cases, 82 abnormal cases, the diagnosis coincidence rate was 91.1%. MRI 36 cases, there were 34 abnormal cases, abnormal diagnosis coincidence rate 94.4%, 18F-FDG PET/CT15 cases, 14 cases are abnormal, diagnostic coincidence rate was 93.3%. There were significant differences between the four methods in the diagnosis of multiple myeloma (χ 2=26.18, P<0.05), and X-ray diagnosis coincidence rate is lower than the other three kinds of inspection, the difference was statistically significant (χ 2=25.98, P<0.05). CT, MRI and 18F-FDG PET/CT three test results have no statistical differences (χ 2 =0.43, P>0.05). Multiple myeloma X-ray and CT main show is sparse, bone expansion and destruction, with pathological fracture and soft tissue mass, a few bone sclerosis; MRI of T1WI is low signal and high T2WI signal, a typical cash as the "salt and pepper". 18F-FDG PET/ CT performance for matching the high 18F-FDG uptake stove and bone dissolve osseous changes.

Conclusion Multiple myeloma has characteristic imaging findings, four inspection methods have their own advantages, to know and understand its imaging findings plays an important role in diagnosis of multiple myeloma.

[Key words] Multiple Myeloma; Magnetic Resonance Imaging; PET/CT; 18F-FDG

多发性骨髓瘤的 X 线、CT、MRI 和 18FFDG PET/CT 诊断价值

【摘要】

目的 探讨多发性骨髓瘤在 X 线、CT、MRI 及 18F-FDG PET/CT 上的表现，提高对多发性骨髓瘤在影像学上的认识。

方法 对经病理及临床确诊的 110 例多发性骨髓瘤患者的影像学资料进行回顾性分析。

结果 110 例中 X 线 94 例，发现异常 62 例，诊断符合率 65.9%；CT90 例，发现异常 82 例，诊断符合率 91.1%；MRI36 例，发现异常 34 例，诊断符合率 94.4%； 18F-FDG PET/CT15 例，发现异常 14 例，诊 断符合率 93.3%。4 种检查方法对多发性骨髓瘤诊断符合率之间差异有统计学意义(χ 2=26.18，P<0.05)，X 线诊断符合率低于另外三种检查，差异有统计学意义(χ 2=25.98，P<0.05)；CT、MRI 及 18FFDG PET/CT 三种检查结果无统计学差异 (χ 2=0.43，P>0.05)。多发性骨髓瘤 X 线及 CT 主要表现是骨质稀疏、膨胀及破坏，伴有病理性骨折及软组织肿块，少数有骨质硬化；MRI 表现为 T1WI 低信号，T2WI 为高信号，典型变现为“盐-椒征”；18FFDG PET/CT 表现为相匹配的 18F-FDG 高摄取灶及骨质溶骨性改变。

结论 多发性骨髓瘤的影像学表现具有特征性，四种检查方法各有优势，认识及了解其影像学表现，对诊断多发性骨髓瘤具有重要作用。

【关键词】多发性骨髓瘤；磁共振成像; PET/CT；18 氟-脱氧葡萄糖

文章来源：中国 CT 和 MRI 杂志

CT 纹理分析技术鉴别甲状腺良恶性结节可行性研究

【摘要】

目的 探讨 CT 纹理分析技术在鉴别甲状腺良恶性结节中的价值。

方法 回顾性分析经我院手术病理证实的甲状腺病变病人 35 例，共 42 个病灶，其中恶性结节 26 个，良性结节 16 个。所有病人治疗前均行颈部增强 CT 扫描。 将 DICOM 格式的 CT 增强图像（层厚和层间距均为 5 mm）导入 CT Kinetics 软件进行纹理及直方图分析得到未经滤过的原始细纹理图像。 CT 纹理分析主要参数包括熵值、偏度、峰态、平均像素值和像素分布的标准 差。甲状腺良恶性结节间纹理参数比较采用独立样本 t 检验或 Mann-Whitney U 检验，并对有统计学意义的纹理参数进行受试者操作特征（ROC）曲线分析，确定诊断阈值。

结果 甲状腺恶性结节的熵值、偏度、峰态、像素值和标 准差分别为 6.65±0.92、0.63±1.37、0.69±1.23、84.08±23.36 和 18.14±3.31； 良性结节分别为 5.96±0.54、0.59±1.42、 0.51±1.17、72.00±24.52 和 20.05±6.10。 熵值在甲状腺良恶性结节间差异有统计学意义（P＜0.05），偏度、峰态、像素 值和标准差在甲状腺良恶性结节间差异均无统计学意义（均 P>0.05）。 ROC 曲线分析显示，以熵值 6.09 为鉴别甲 状腺结节良恶性的阈值，其 ROC 曲线下面积、敏感度和特异度分别为 0.733、71.3%和 70.0%。

结论 CT 纹理参数 对鉴别甲状腺结节的良恶性有一定帮助。

【关键词】 甲状腺结节；CT 纹理分析；诊断，鉴别

Can computed tomography(CT) texture analysis help to differentiate benign and malignant nodules of thyroid

【Abstract】

Objective This study was aimed to determine the ability of texture analysis of contrast -enhanced computed tomography (CT) in differentiating benign and malignant thyroid nodules.

Methods The clinical data of 35 patients with 42 thyroid nodules were retrospectively analyzed. Patients were classified as malignant nodules（n=26） or benign nodules （n=16） group based on their histological examination. All nodules were examined by contrast-enhance neck CT before surgery. The DICOM format enhancement CT images (thickness/gap=5 mm) were imported into CT Kinetics software and the parameters of CT texture were calculated automatically with texture and histogram algorithm to generate unfilter fine texture images. The parameters of CT texture, including entropy, skewness, kurtosis, mean pixels and standard deviation (SD) were derived from contrast-enhanced CT images using unfilter fine texture. The diagnostic value of CT texture parameters were examined with Student’s t-test or Mann-Whitney U test, and receiver operating characteristic (ROC) curve analysis was used to determine optimal CT texture parameters in differentiating malignant and benign lesions.

Results For malignant thyroid nodules, the values of entropy, skewness, kurtosis, mean pixels and SD were 6.65±0.92, 0.63±1.37, 0.69±1.23, 84.08±23.36 and 18.14±3.31, respectively. For benign thyroid nodules, the values of entropy, skewness, kurtosis, mean pixels and SD were 5.96±0.54, 0.59±1.42, 0.51±1.17, 72.00±24.52 and 20.05±6.10, respectively. The entropy values of malignant thyroid nodules were significantly higher than that of the benign thyroid lesions （P＜0.05）; While the values of skewness, kurtosis, mean pixels and SD did not differ significantly （all P>0.05） between the malignant and benign nodules of thyroid. When entropy value of 6.09 was used as a cut-off for differentiating benign from malignant thyroid lesions, the AUC, sensitivity, and specificity in differentiating benign from malignant thyroid lesions were 0.733, 71.3%, and 70.0%, respectively.

Conclusions CT texture analysis is helpful in differentiating the benign from malignant thyroid nodules.

【Keywords】 Thyroidnodules；CT texture analysis；Diagnosis, Differentiation