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家兔急性肺栓塞模型双源CT双能量肺灌注成像与核素肺灌注显像

Dual-energy CT lung perfusion imaging and perfusion scintigraphy in rabbit models of acute peripheral pulmonary embolism

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中文摘要:

目的 探讨双源CT双能量肺灌注成像(DEPI)与核素肺灌注显像诊断实验性急性肺栓塞的价值。方法 24只家兔,20只采用股静脉入路注射明胶海绵制成急性肺栓塞模型,另外4只注射生理盐水作为对照组。栓塞后2 h行DEPI及核素肺灌注平面显像。以病理结果为金标准,比较两种方法在肺叶基础上诊断急性肺栓塞的准确性。比较增强DEPI图像上栓塞区与正常肺实质的CT值和强化值(Overlay值)。结果 对照组DEPI图像表现为大致均匀的黄红色伪彩,栓塞后栓塞区肺灌注图像表现为灌注缺损,核素肺灌注显示栓塞区放射性稀疏或缺损;DEPI和肺灌注平面显像诊断肺栓塞的敏感度、特异度、阳性预测值、阴性预测值分别为100%、97.50%、95.24%、100%;67.50%、81.25%、64.29%、83.33%。增强后栓塞区和非栓塞区CT值及强化值的差异均有统计学意义($P<0.05$)。结论 与核素肺灌注显像相比,DEPI诊断实验性急性肺栓塞有更高的敏感度和特异度。

英文摘要:

Objective To explore the clinical value of dual-energy CT lung perfusion imaging and perfusion scintigraphy in acute pulmonary embolism (PE) rabbit models. **Methods** Acute PE models were established in 20 rabbits with femoral vein injection of sponge as embolus materials, and 4 rabbits were injected saline as control group. Two hours after embolization, dual-energy CT and perfusion scintigraphy imaging were performed respectively. Taking the pathological findings as the reference standards, the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of both imaging methods were compared. CT values and enhancement degree (overlay value) of the embolic areas and normal pulmonary parenchyma were measured in DEPI image after embolization. **Results** Normal lung was color-coded as homogeneously yellowish red, perfusion scintigraphy displayed rarefaction or absence. The sensitivity, specificity, PPV, NPV of DEPI was 100%, 97.50%, 95.24%, 100%, and of perfusion scintigraphy was 67.50%, 81.25%, 64.29%, 83.33%, respectively. Increased CT values and overlay values of embolism areas in DEPI images were lower than those of normal pulmonary parenchyma ($P<0.05$). **Conclusion** DEPI has higher sensitivity and specificity than perfusion scintigraphy for detection of pulmonary emboli in an acute PE rabbit models.

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