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¹⁸F-FDG符合线路显像与^{99m}Tc-MDP骨显像及二者联合对乳腺癌骨转移的检出效能

¹⁸F-FDG SPECT coincidence, ^{99m}Tc-MDP bone scintigraphy and combination of the two techniques for detecting malignant bone metastasis from breast cancer

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中文关键词: [乳腺肿瘤](#) [肿瘤转移](#) [放射性核素显像](#) [18F 氟脱氧葡萄糖](#) [99m 锝亚甲基二磷酸](#)

英文关键词: [Breast neoplasms](#) [Neoplasm metastasis](#) [Radionuclide imaging](#) [Fluorodeoxyglucose F18](#) [Technetium Tc 99m medronate](#)

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中文摘要:

目的 采用ROC曲线比较¹⁸F-FDG符合线路显像、^{99m}Tc-MDP骨显像及二者联合对乳腺癌骨转移的检出效能。方法 收集手术病理诊断为乳腺癌的女性患者113例,均于4周内先后接受¹⁸F-FDG符合线路显像及^{99m}Tc-MDP骨显像;对两种显像结果按5分法评分,以二者评分之和为联合评分值,以病理诊断或临床随访为确诊“金标准”,比较ROC曲线下面积(AUC),评价^{99m}Tc-MDP骨显像、¹⁸F-FDG符合线路显像及联合评分法对乳腺癌骨转移患者的检出效能,比较不同方法在各自最佳诊断阈值下的灵敏度、特异度、准确率、阳性预测值(PPV)和阴性预测值(NPV)。结果 113例中,12例(10.62%)最终确诊为骨转移,101例(89.38%)无骨转移。^{99m}Tc-MDP骨显像、¹⁸F-FDG符合线路显像以及二者联合诊断评分的ROC曲线分析显示三者AUC分别为0.991、0.874和0.993,三种方法对乳腺癌骨转移的诊断效能均佳,尤以^{99m}Tc-MDP骨显像与联合诊断为最佳($P < 0.01$)。最佳阈值点下,单独¹⁸F-FDG符合线路显像、^{99m}Tc-MDP骨显像及联合检出骨转移患者的灵敏度分别为75.00%(9/12)、75.00%(9/12)、83.33%(10/12),特异度为100%(101/101)、98.02%(99/101)、98.02%(99/101),准确率为97.35%(110/113)、95.58%(108/113)、96.46%(109/113),PPV为100%(9/9)、81.82%(9/11)、83.33%(10/12),NPV为97.12%(101/104)、97.06%(99/102)、98.02%(99/101)。结论 ^{99m}Tc-MDP骨显像对乳腺癌骨转移患者的检出效能优于¹⁸F-FDG符合线路显像,二者联合可提高对骨转移患者的检出率。

英文摘要:

Objective To observe the efficacy of ¹⁸F-FDG SPECT coincidence (¹⁸F-FDG SPECT), ^{99m}Tc-MDP bone scintigraphy (BS) and combination of the two techniques (¹⁸F-FDG SPECT+^{99m}Tc-MDP BS) for detecting bone metastasis from breast cancer by ROC curve analysis. **Methods** Totally 113 patients with breast cancer underwent both ^{99m}Tc-MDP BS and ¹⁸F-FDG SPECT within 4 weeks. The images were interpreted according to 5-point scale, and the scale of ¹⁸F-FDG SPECT+^{99m}Tc-MDP BS was the sum of ¹⁸F-FDG SPECT plus ^{99m}Tc-MDP BS. The final diagnosis of bone metastases was established by pathology or follow-up, and then ROC curve analysis was performed. The area under the curve (AUC), the sensitivity, specificity, accuracy rate, positive predictive value (PPV), negative predictive value (NPV) of cut-off point were compared. **Results** Of 113 cases, 12 (12/113, 10.62%) were finally confirmed as bone metastases, while 101 (101/113, 89.38%) were negative. The AUC was 0.991 for ^{99m}Tc-MDP BS, 0.874 for ¹⁸F-FDG SPECT, and 0.993 for ¹⁸F-FDG SPECT+^{99m}Tc-MDP BS, respectively. AUC of ^{99m}Tc-MDP BS and ¹⁸F-FDG SPECT+^{99m}Tc-MDP BS were significantly larger than that of ¹⁸F-FDG SPECT (all $P < 0.01$). The optimal sensitivity of ¹⁸F-FDG SPECT, ^{99m}Tc-MDP BS and ¹⁸F-FDG SPECT+^{99m}Tc-MDP BS was 75.00% (9/12), 75.00% (9/12) and 83.33% (10/12), respectively, the specificity was 100% (101/101), 98.02% (99/101) and 98.02% (99/101), respectively, the accuracy rate was 97.35% (110/113), 95.58% (108/113) and 96.46% (109/113), respectively, while PPV was 100% (9/9), 81.82% (9/11), 83.33% (10/12) and NPV was 97.12% (101/104), 97.06% (99/102) and 98.02% (99/101), respectively. **Conclusion** The efficacy of ^{99m}Tc-MDP BS for detecting malignant bone metastasis was superior to that of ¹⁸F-FDG SPECT alone. The detection ability can be obviously improved by combination of these two techniques.

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