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能谱CT在鉴别甲状腺良恶性结节中的临床应用

Clinical application of CT gemstone spectral imaging in distinguishing malignant from benign primary thyroid lesions

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中文摘要:

目的 探讨宝石CT能谱成像(GSI)技术对甲状腺良恶性结节的鉴别诊断价值。方法 收集经手术病理证实的55例甲状腺结节患者,另选35例患者的对侧正常甲状腺为正常组。采用能谱CT(Discovery CT750 HD)进行GSI单能模式平扫及增强扫描。测量并计算病变与正常甲状腺组织的碘浓度和碘浓度比,计算能谱曲线斜率,并与病理结果对照。结果 恶性组、良性组与正常组的碘浓度(100μg/ml)分别为,平扫期:6.19±3.32、10.63±4.71、19.40±8.64;动脉期:7.80±4.30、16.31±7.07、25.25±9.56和静脉期:16.64±8.97、29.06±10.18、38.93±9.09。碘浓度比分别为动脉期:0.26±0.16、0.34±0.20、0.68±0.47和静脉期:0.52±0.19、0.68±0.22、1.06±0.29;曲线斜率分别为平扫期:－0.46±0.30、－0.80±0.33、－1.26±0.65;动脉期:－0.77±0.38、－1.27±0.54、－2.32±0.84和静脉期:－1.17±0.35、－1.91±0.66、－2.91±0.70。在动脉期和静脉期,恶性、良性与正常甲状腺组织间的碘浓度和曲线斜率两两比较差异均有统计学意义(P均<0.05);静脉期时,碘浓度比两两比较差异也有统计学意义(P<0.05)。联合CT形态学及能谱曲线斜率、基物质等多参数分析,可提高甲状腺恶性结节的诊断准确率、敏感度和特异度(91.67%、88.46%和94.11%)。结论 GSI技术多参数联合应用有助于甲状腺良恶性结节的鉴别诊断。

英文摘要:

Objective To investigate the clinical application of Gemstone spectral imaging (GSI) in distinguishing primary malignant from benign thyroid lesions. **Methods** Totally 55 patients with 80 thyroid lesions (33 primary malignant lesions, 47 benign lesions) underwent CT imaging with GSI mode, and the data were retrospectively analyzed. The iodine concentration, normalized iodine concentration (NIC) and slope of spectral curve of each phase of the lesions were calculated. All results were compared with pathology. **Results** The iodine concentration for malignant lesions, benign lesions and normal thyroid tissue was 6.19±3.32, 10.63±4.71, 19.40±8.64 (100 μg/ml) respectively in non-contrast CT scan, 7.80±4.30, 16.31±7.07, 25.25±9.56 (100 μg/ml) in arterial phase (AP), and 16.64±8.97, 29.06±10.18, 38.93±9.09 (100 μg/ml) in venous phase (VP), respectively. NIC was 0.26±0.16, 0.34±0.20, 0.68±0.47 in AP, and 0.52±0.19, 0.68±0.22, 1.06±0.29 in VP, respectively. The mean slope of HU curve of three groups was -0.46±0.30, -0.80±0.33, -1.26±0.65 in non-contrast scan, -0.77±0.38, -1.27±0.54, -2.32±0.84 in AP and -1.17±0.35, -1.91±0.66, -2.91±0.70 in VP, respectively. There were significant differences between each two groups on iodine concentration and slope of HU curve both in AP and VP (all P<0.05). The normalized iodine concentration for three groups was 0.26±0.16, 0.34±0.20, 0.68±0.47 in AP and 0.52±0.19, 0.68±0.22, 1.06±0.29 in VP, respectively. There were significant differences between each two groups on NIC (all P<0.05) in VP. Compared to the pathologic results, the accuracy, sensitivity and specificity for diagnosing malignant lesions using HU curve was 91.67%, 88.46% and 94.11%, respectively. **Conclusion** GSI is a promising method to differentiate primary malignant from benign thyroid lesions.

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