

Diagnostic Accuracy in the Detection of Cervical Lymph Node Metastases in Head and Neck Squamous Cell Carcinoma Patients: A Comparison of Sonography, CT, PET/CT and MRI

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Abstract : Objectives: The purpose of this study was to assess and compare the diagnostic accuracy of four common morphological approaches, including sonography, computed tomography (CT), positron emission tomography/computed tomography (PET/CT), and magnetic resonance imaging (MRI) for the evaluation of cervical lymph node metastases in head and neck squamous cell carcinoma (HNSCC) patients. Material and Methods: Included in this retrospective study were 26 patients diagnosed with HNSCC between 2010 and 2011 who all underwent sonography, CT, PET/CT, and MRI imaging before neck dissection. Morphological data were compared to the corresponding histopathological results. Statistical analysis was performed with SPSS statistic software (version 26.0), calculating sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy for detection of cervical lymph node metastases. Results: The 5-year survival rate of the patient collective was 55.5%. Risk factors for survival included initial primary tumor stage, initial lymph node stage, initial metastasis status, and therapeutic approaches. Cox regression showed initial metastasis status (HR 8.671, 95%CI 1.316-57.123, $p=0.025$) and therapeutic approaches (HR 6.699, 95%CI 1.746-25.700, $p=0.006$) to be independent predictive risk factors for survival. Sensitivity was highest for MRI (96% compared to 85% for sonography and 89% for CT and PET/CT). Specificity was comparable with 95 % for CT and 98 % for sonography and PET/CT, but only 68% for MRI. While the MRI showed the least PPV (34%) compared to all other methods (85% for sonography, 75% for CT, and 86% for PET/CT), the NPV was comparable in all methods (98-99%). The overall accuracy of cervical lymph node metastases detection was comparable for sonography, CT, and PET/CT with 96%, 97%, 94%, respectively, while MRI had only 72% accuracy. Conclusion: Since the initial status of metastasis is an independent predictive risk factor for patients' survival, efficient detection is crucial to plan adequate therapeutic approaches. Sonography, CT, and PET/CT have better diagnostic accuracy than MRI for the evaluation of cervical lymph node metastases in HNSCC patients.

Keywords : cervical lymph node metastases, diagnostic accuracy, head and neck squamous carcinoma, risk factors, survival

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