Impact of positron emission tomography on the initial staging and therapy in locoregional advanced squamous cell carcinoma of the head and neck

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OBJECTIVE: To evaluate the impact of 18F-fluoro-deoxy-glucose positron emission tomography after standard diagnostic workup in patients with advanced head and neck squamous cell carcinoma on staging and radiation treatment planning. STUDY DESIGN: Prospective controlled study. METHODS: Forty-eight patients (42 men and 6 women; mean age, 61 y; age range, 35-85 y) with histologically confirmed, advanced-stage (any T, N> or =N2 or T> or =T3, any N) mucosal head and neck squamous cell carcinoma underwent positron emission tomography. The routine workup consisting of physical examination, panendoscopy, chest x-ray film, and contrast-enhanced high-resolution helical computed tomography scan (HRCT) was used for comparison. End points were the extent of lymph node disease, distant metastases, and second primary tumors. RESULTS: In 41 of 48 patients (85%) the lymph node findings between HRCT and positron emission tomography were concordant. In three patients positron emission tomography led to an upstaging of the tumor in its N category, and in four patients positron emission tomography underestimated lymph node involvement. Positron emission tomography revealed more difficulties in delineating lymph node metastases adjacent to the primary tumor than did HRCT, but was superior for the detection of distant and contralateral lymph node metastases. Positron emission tomography suggested distant metastatic lesions in 6 of 48 patients (13%). Cytological workup confirmed distant metastases in two (4%) and second primary tumors in another two patients (4%). Positron emission tomography results were false-positive in two (4%) patients because of inflammatory changes. CONCLUSIONS: Whole-body PET is able to assess lymph node involvement, distant metastases, and second primaries in a single study. Even after a routine clinical staging, positron emission tomography leads to a change of treatment in approximately 8% of patients.

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