Comparison of PET/CT and MRI for the detection of bone marrow invasion in patients with squamous cell carcinoma of the oral cavity.


Abstract:

Our aim was to retrospectively assess the diagnostic performance from combined positron emission tomography/computed tomography (PET/CT) and magnetic resonance imaging (MRI) for the detection of bone marrow invasion of the mandible or maxilla in patients with oral cavity squamous cell carcinoma (OCSCC). A total of 114 patients with OCSCC, arising from or abutting the upper or lower alveolar ridge, underwent staging PET/CT and MRI studies before surgery. The possibility of bone marrow invasion on PET/CT and MRI was graded retrospectively on a 5-point score. Histopathology was taken as the reference standard. Sensitivity, specificity, predictive values and likelihood ratios were calculated. Clinical factors affecting the performance, like tumor origin and dentate status were also explored. PET/CT was found to be more specific than MRI (83% vs. 61%, respectively, p=0.0015) but less sensitive (78% vs. 97%, respectively, p=0.0391). Dentate status and tumor origin affected the diagnostic performance of PET/CT. In patients with positive MRI, sensitivity and specificity of PET/CT were 78% and 100% in dentate patients with alveolar ridge tumors, 75% and 80% in dentate patient with buccal tumors, 90% and 33% in edentulous patients with alveolar ridge tumors and 0% and 63% for edentulous patients with buccal tumors, respectively. PET/CT is more specific than MRI and can be used to complement the role of MRI. A negative MRI result can confidently exclude the presence of bone marrow invasion, while in patients with positive MRI findings, a negative PET/CT may be useful to rule out bone marrow invasion in dentate patients.

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