Use of MRI and FDG-PET/CT to predict fixation of advanced hypopharyngeal squamous cell carcinoma to prevertebral space

Christian M Meerwein, Daniele A Pizzuto, Domenic Vital, Grégoire B Morand, Paul Stolzmann, Gerhard Huber & Martin W Huellner

BACKGROUND
We evaluated the ability of different (18F)fluoro-deoxy-d-glucose (FDG)-positron emission tomography (PET)-based and magnetic resonance (MR)-based parameters to identify prevertebral space (PVS) infiltration by hypopharyngeal carcinoma.

METHODS
Retrospective study on 59 patients with advanced hypopharyngeal squamous cell carcinoma undergoing cross-sectional imaging and triple endoscopy for staging.

RESULTS
Obliteration of retropharyngeal fat plane on T1-weighted MR images was found more often (P < .001) in tumors fixated to the PVS. Complete fat plane obliteration best predicted tumor fixation to PVS (accuracy 99%; CI: 97%-100%; P < .001). With similar accuracy, PET-based models predicted PVS fixation (combination of standardized uptake value [SUV] of the primary tumor and presence of focal FDG-uptake in prevertebral muscles [accuracy 98%; CI 94%-100%; P < .001]; metabolic tumor volume [MTV] [accuracy 98%; CI 95%-100%; P < .001]).

CONCLUSION
Both the MR-based parameter of complete fat plane obliteration and PET-based models (increased SUV in combination with presence of focal FDG-uptake of prevertebral muscles; increased MTV) predict PVS involvement independently with high accuracy.

type: journal paper/review (English)
date of publishing: 18-12-2018
journal title: Head Neck
ISSN electronic: 1097-0347