Dokumenttyp: journal article

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Titel des Beitrags:
Impact of nonhybrid 99mTc-MDP-SPECT/CT image fusion in diagnostic and treatment of oromaxillofacial malignancies.

Abstract:
PURPOSE: The aim of this study was to prospectively investigate the clinical impact of image fusion of computed tomography (CT) and single photon emission computed tomography (SPECT) diagnostics in head and neck cancer adjacent or fixed to bony maxillofacial structures.

PROCEDURES: Computer-based manual image fusion has been applied in 74 patients with suspected malignancies in the oromaxillofacial region following CT and SPECT. Afterward, image fusion was compared to separate evaluation of CT and SPECT and visual coregistration with histopathological results serving as control.

RESULTS: In nine out of 74 patients, image fusion achieved more precise anatomical findings regarding tumor dimension than simultaneous evaluation of CT and SPECT, but there was no improvement of identification of bone infiltration.

CONCLUSION: Manual image fusion of CT and SPECT does not improve identification of bone infiltration compared to simultaneous evaluation. Though particularly in complex anatomical regions, a fixed preoperative diagnostic algorithm in image registration lead to a more precise evaluation and treatment of head and neck malignancies.

Zeitschriftentitel / Abkürzung:
Mol Imaging Biol

Jahr: