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Tytuł pracy: Stability of PET FDG radiomic features in patients with head and neck cancer using different imaging protocols
Temat:
Autor / Autorzy: Andrea d'Amico[1], Damian Borys[1], Izabela Gorczewska[1], Paweł Bzowski[1], Tomasz Rutkowski[1], Gabriela Kramer-Marek[2]
[1]Department of Nuclear Medicine and Endocrine Oncology, Maria Sklodowska-Curie National Research Institute of Oncology, Gliwice branch
[2]Department of radiopharmacy and laboratory PET Imaging, Maria Sklodowska-Curie National Research Institute of Oncology, Gliwice branch
Abstrakt:
Aim/Introduction: The aim of this work is to compare radiomics features between two different image reconstruction settings in head and neck PET FDG study and to perform statistical analysis toward verification if the reconstruction setting will change statistically significantly the radiomics features values.
Materials and Methods: 10 patients with primary tumours in head and neck area were selected and two PET/CT series were analyzed for each patient- one standard whole body examination (256x256 pixels resolution) and second high resolution reconstruction of the area of the head and neck (400x400 pixels). Region of interest (ROI) of the primary tumour was performed manually by experienced specialist using MIM software tool (v 7.0.1). Using pyRadiomics (v3.0.0) 100 radiomics features for the original image were computed in groups: shape, first order and texture based (GLCM, GLRLM, GLSZM, GLDM). Data analysis was performed using python numpy, scipy and pandas modules to compare parameters if they differ significantly in both settings. Statistical significance was determined using Wilcoxon matched-pairs signed rank test. A p-value less than 0.05 was considered significant.
Results: A total of 46 parameters was found statistically different ($p<0.05$). Almost all shape features were statistically different. First order statistics features as SUVmean or SUVmax were not influenced by reconstruction settings. Finally, about half of textural features shows significant differences.
Conclusions: Two subsets of radiomics features can be identified. The first is stable regarding the changes in imaging protocol while the second one had some degree of variability which limits its potential as a biomarker.