

VPLIV POLOŽAJA PACIENTOVIH ROK NA PRISOTNOST OKRKNITVENEGA ARTEFAKTA PRI PET/CT PREISKAVAH

IMPACT OF THE POSITION OF A PATIENT'S ARMS ON THE OCCURRENCE OF TRUNCATION ARTIFACTS IN PET/CT IMAGING

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IZVLEČEK

Uvod in namen: V slikovni diagnostiki pogosto ugotavljamo pojav artefaktov, zaradi katerih je preglednost slike slabša. Artefakt je motnja slike, kjer je prikazana struktura, ki ni dejansko prisotna na predmetu, ki ga slikamo. Med zajemanjem podatkov pri pozitronski emisijski tomografiji/računalniški tomografiji (PET/CT) ima pacient med preiskavo roke nameščene nad glavo. V primerih, ko pacient ni zmožen namestiti rok nad glavo oziroma je zaradi klinične indikacije to potrebno, imajo pacienti med preiskavo roke ob telesu.

Namen raziskave je preveriti, ali obstajajo razlike v prisotnosti okrnitvenega artefakta v predelu komolcev na PET in CT slikah glede na položaj rok.

Metode: Izvedli smo primerjalno študijo. Spremenljivki, ki smo ju preverili sta prisotnost okrnitvenega artefakta na PET in CT slikah glede na položaj pacientovih rok. Podatke smo zbirali na Oddelku za nuklearno medicino Onkološkega inštituta Ljubljana. V analizo smo retrogradno vzeli priložnostni vzorec 104 pacientov z indeksom telesne mase med 25 kg/m² in 30 kg/m², ki so v letu 2023 opravili 18F-FDG (fluorodeoksiglukoza) PET/CT preiskavo celotnega telesa. Za vsako preiskavo smo naredili tri *postprocesing* rekonstrukcije v transversalni ravnini, v predelu komolcev. Prisotnost artefaktov so nato ocenjevali trije specialisti nuklearne medicine s pomočjo programa ViewDex 3.0. Zbrane podatke smo s X² testom analizirali v programu SPSS Statistics 20.0. Pri testiranju raziskovalnih vprašanj smo upoštevali možnost napake 5 %.

Rezultati: Analiza podatkov je pokazala statistično značilen vpliv položaja rok na prisotnost okrnitvenega artefakta na PET ($p=0,001$) in CT ($p\leq 0,001$) slikah.

Razprava in zaključek: Prisotnost okrnitvenega artefakta je bila pri rokah, nameščenih ob telesu, v primerjavi z rokami, nameščenimi na pacientovem trebuhu, višja pri PET slikah za 39,54 % in pri CT slikah za 37,14 %.

Ključne besede: artefakti, položaj rok, PET/CT

ABSTRACT

Introduction and purpose: In imaging diagnostics, we often find the appearance of artifacts that can make the clarity of the image worse. Typically, PET/CT data acquisition takes place with the patient's arms placed above the head during the examination. In cases where the patient is unable to place their arms above their head or when it is necessary due to clinical indication, patients have their arms down.

The aim of the research was to check whether there are differences in the presence of a truncation artifact in the elbow area, depending on the arm position.

Methods: The empirical part comprises a comparative study. The variables that we checked in the research were the presence of a truncation artifact on the PET and CT image.

The data necessary for the research were collected at the Department of Nuclear Medicine of the Institute of Oncology Ljubljana. Retrospectively, we took a random sample of 104 patients with a body mass index between 25 kg/m² and 30 kg/m² who underwent a total body 18F-FDG (fluorodeoxyglucose) PET/CT examination in 2023. After accessing the data, we made three additional post-processing transverse plane reconstructions in the elbow area. The reconstructions were uploaded anonymously to the ViewDex 3.0 and evaluated by three nuclear medicine specialists. The collected data were analysed using the X² test in the SPSS Statistics 20.0. We also considered a 5% possibility of error.

Results: The data analysis showed the statistically significant impact of the position of a patient's arms on the occurrence of a truncation artifact on PET ($p=0,001$) and CT ($p\leq 0,001$) images.

Discussion and conclusion: The presence of a truncation artifact was higher in PET images by 39.54% and in CT images by 37.14% for arms placed next to the patient's body compared to arms placed on their abdomen.

Keywords: artifacts, arm position, PET/CT

LITERATURA / REFERENCES

- Sarikaya I, Sarikaya A (2021). PET/CT image artifacts caused by the arms. J Nucl Med Technol 49:19–22.
- Simpson D, Bui-Mansfield L, Bank K (2017). FDG PET/CT: Artifacts and pitfalls. CDR 40(5):1–8.
- Sureshbabu W, Mawlawi O (2005). PET/CT imaging artifacts. J Nucl Med Technol 33(3):156–61.