

Screen 15 - Attenuation Correction in PET/MRI pediatric Brain Tumors: a preliminary comparison between the ZTE and Atlas techniques

Monday, 30 May 2022 16:15 (1h 15m)

The use of simultaneous hybrid PET/MRI is highly beneficial in children as it allows for a one-stop examination that limits the scanning procedures, the need for a second sedation and also reduces the radiation dose compared to PET/CT. The attenuation correction, in the brain, is performed with Atlas, with Zero Echo Time/Ultrashort Echo Time (ZTE/UTE) sequences or, more recently, with Deep Learning-based methods. In pediatric patients, and in particular in oncological pediatric studies where tumor resection may occur, the size and the abnormal shape of the head maybe critical for a good attenuation correction. In this work, we have compared the two Atlas and ZTE attenuation correction methodologies in a group of treated pediatric patients with brain tumors who underwent 11C-Methionine PET/MRI scans. This preliminary work shows that the use of ZTE or Atlas for the generation of ACmaps can modify the SUVs of the study but the differences in the values are very small. The DICE indexes calculated between lesions VOIs are high. Finally, it should be noticed that some of the patients of our sample have external ventricular drain catheter valves that generate artifacts. In these cases, interestingly, both ZTE and Atlas show bulk of signals but ACmapAtlas has smaller artifacts than ACmapsZTE.

Primary author: Dr SCIFO, Paola (Nuclear Medicine Dept, IRCCS San Raffaele Scientific Institute, Milan, Italy)

Co-authors: Dr BARBERA, Maurizio (Neuroradiology Unit, IRCCS Scientific Institute San Raffaele, Milan, Italy); Dr SAVI, Annarita (Nuclear Medicine Dept, IRCCS San Raffaele Scientific Institute, Milan, Italy); Dr FALLANCA, Federico (Nuclear Medicine Dept, IRCCS San Raffaele Scientific Institute, Milan, Italy); Dr NERI, Ilaria (Nuclear Medicine Dept, IRCCS San Raffaele Scientific Institute, Milan, Italy); Dr BETTINARDI, Valentino (Nuclear Medicine Dept, IRCCS San Raffaele Scientific Institute, Milan, Italy); Dr GATTUSO, Giovanna (Department of Medical Oncology and Hematology, Pediatric Oncology Unit, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy); Dr MASSIMINO, Maura (Department of Medical Oncology and Hematology, Pediatric Oncology Unit, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy); Dr VERDELIO, Paolo (Unit of Bioinformatics and Biostatistics, Department of Applied Research and Technological Development, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy); Dr PIZZAMIGLIO, Sara (Unit of Bioinformatics and Biostatistics, Department of Applied Research and Technological Development, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy); Prof. FALINI, Andrea (Neuroradiology Unit, IRCCS San Raffaele Scientific Institute); Dr GIANOLLI, Luigi (Nuclear Medicine Dept, IRCCS San Raffaele Scientific Institute, Milan, Italy); Dr SPREAFICO, Filippo (Department of Medical Oncology and Hematology, Pediatric Oncology Unit, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy); Prof. PICCHIO, Maria (Nuclear Medicine Dept, IRCCS San Raffaele Scientific Institute, Milan, Italy); Dr BALDOLI, Cristina (Neuroradiology Unit, IRCCS San Raffaele Scientific Institute, Milan, Italy)

Presenter: Dr SCIFO, Paola (Nuclear Medicine Dept, IRCCS San Raffaele Scientific Institute, Milan, Italy)

Session Classification: Poster session

Track Classification: PET/MR and SPECT/MR systems and applications