CME 11 (Oncology)
Tuesday, October 16, 14:30-16:00

Session Title
Update on PET/MR in Oncology

Chairpersons
Patrick Veit-Haibach (Toronto)
Gerald Antoch (Düsseldorf)

Programme

14:30 - 14:35 Introduction/Opening

14:35 - 14:55 Harald Quick (Essen): Update on PET/MR Technical Developments

14:55 - 15:15 Juergen Schaefer (Tübingen): Update on PET/MR in Paediatric Oncology

15:15 - 15:35 Patrick Veit-Haibach (Toronto): Update on PET/MR in Abdominal Oncological Diseases

15:35 - 15:55 Geoffrey Johnson (Rochester): Update on PET/MR in Thoracic Oncological Diseases

15:55 – 16:00 Closing Remarks

Educational Objectives

1. Learn and understand the latest technical developments in PET/MR, e.g. new attenuation and motion correction techniques as well as the concept of PET/MR with continuous table movement.
2. Overview over the latest topics in pediatric imaging in different cancers, tracer dose reduction, and PET/MR imaging on therapy-induced changes in various organs/
3. Overview over recent development in PET/MR imaging in liver tumours, pancreatic cancers as well as in Ob/Gyn malignancies.
4. Overview on the latest developments in thoracic malignancies, mainly lung cancer and mesothelioma as well as technical challenges and development in PET imaging and MR imaging in the lung.

Summary

1. Latest technical developments in PET/MR attenuation and motion correction help to further improve the robustness of PET/MR examinations and, furthermore, improve quantification of PET data. The experimental concept of data acquisition with continuous moving table provides seamless whole-body data sets and may allow for new PET/MR data acquisition schemes in oncology.

2. PET/MR imaging might be the best modality for pediatric cancer imaging due to (a) the significantly lower radiation exposure even in comparison to low-dose PET/CT, (b) the higher diagnostic accuracy as compared to PET/CT even when using diagnostic contrast-enhanced CT, (c) the unique possibility to combine distinct MR-inherent contrasts (e.g. DWI) with specific PET-tracers for the evaluation of novel targeted therapies, and (d) the opportunity to stage local and systemic tumor burden within a single examination. However, the availability of PET/MRI systems is still low resulting in to limited scientific evidence, and the method of whole-body-MRI is not broadly adopted. Hence, the next steps to go are harmonization of sequence protocols and tracer dosage by international recommendations, initiation of multicenter studies, and translation of tracers specific for pediatric cancer to assess early treatment response as well as residual disease.

3. PET-MR begins to establish itself as a separate entity which not necessarily needs the comparison with PET/CT anymore. Certain indications are now being investigated with PET/MR alone, not only in academic studies but also in clinical routine. This spans indications in liver, pancreas as well as OB/Gyn indications. This talk will give an overview over the latest advancements in abdominal imaging with PET/MR in the last years.

4. The field has moved on from the critical comparison trials of FDG PET/CT and FDG PET/MR that opened the door to the use of PET/MR for lung cancer. Now we are facing questions of where in the course of patient care is FDG PET/MR most optimally utilized. In addition to FDG, the use of Ga-DOTATATE and other radiotracers are evolving. Future improvements in PET and MRI for evaluation of lung cancer are on the horizon.

Key Words
Attenuation correction, motion correction, continuous table movement