PET/CT scans of children

M. Federspiel (Copenhagen)

Working with ill children, and particularly children with cancer, is a very unique challenge. One can acquire technical tools and skills and attend courses in proper paediatric examinations, but it is still a very complex task to work with children when performing a positron emission tomography (PET) scan. Every case is different as the psychological requirements of each paediatric patient vary greatly. It is imperative at all times to maintain a relaxed and controlled rapport with the child and family. This will help greatly in performance and quality of the examination; so much that anaesthesia may be completely avoided. It is essential to have defined the technical parameters of the scan prior to the arrival of the paediatric patient, for example, radiation dose and scan time, so that the technologist can maintain full concentration on the child’s needs.

PET or PET/CT-scanning is seldom the primary choice for paediatric diagnostic imaging. Ultrasound and magnetic resonance imaging (MRI) are often a better alternative, as the paediatric patient is not exposed to ionising radiation. The use of PET and PET/CT scans have not increased so dramatically for the paediatric patient as it has for adult patients, due to the radiation exposure and the possible subsequent adverse effects.

Scanning with the tracer Fluor-18 deoxyglucose (18F-FDG) PET and PET/CT are probably valuable supplements to conventional diagnostic methods. PET is especially valuable for staging, therapy response, and follow-up. In lymphatic cancers, FDG-PET has been proven to give a higher diagnostic accuracy for staging over other conventional diagnostic methods.

By utilizing a combined PET/CT scanner it is possible to perform a diagnostic CT-scan at the same scanning session as the PET scan. This is cost-effective and less stressful for the child.

PET/CT can be used for planning radiotherapy by performing the scan with the child in the same immobilization devices utilized for radiotherapy. The PET/CT-data can be exported to a treatment planning system for virtual simulation. This can be a further timesaving procedure for the patient and the health care system where multiple scan sessions can be combined into one.

References
5. Charron M, Practical Pediatric PET imaging Springer publisher 2006