The value of FDG PET/CT in trauma patients with suspected chronic osteomyelitis:
Comparison with MRI

Summary / Zusammenfassung
A first study of our group in trauma patients with metallic implants (1) indicate that FDG PET imaging is highly sensitive and specific in the diagnosis infections in this group of patients. In contrast to acute osteomyelitis, the diagnosis of chronic or subacute osteomyelitis secondary to trauma or surgery is often difficult. MRI and CT have compromised image quality in patients with metallic implants. The distinction between soft tissue and bone infection may not be possible. Therefore, the preoperative planning in these patients with suspected infections is difficult, and the definitive surgical procedure often relies on the intraoperative findings. The results of our first project performed in 29 cases are promising and indicate that metallic implants generate few image artifacts in FDG PET. Compared to the other imaging modalities, PET has the advantage, that FDG is also avidly taken up by activated macrophages, which are the predominating inflammatory cells in the chronic phases of infection, and thus PET may be useful in both in acute and chronic infection.

A general limitation of FDG-PET is that there is little anatomic information available. To improve this, PET/CT imaging may further enhance the use of PET in trauma patients with suspected metallic implant associated infections in both the axial and peripheral skeleton.

Data of a second study (2) of our research group in this setting, this time using PET/CT, showed the following results: Of 33 PET/CT scans, 17 were true positive, 13 true negative, 2 false positive and 1 false negative. Sensitivity, specificity and accuracy for FDG PET/CT was 94%, 87% and 91% for the whole group, 88%, 100% and 90% for the axial skeleton and 100%, 85% and 91% for the peripheral skeleton, respectively. PET/CT allows precise anatomic localisation and characterisation of the infectious focus and demonstrates the extent of chronic osteomyelitis with a high degree of accuracy. FDG PET seems to be especially useful for detecting chronic osteomyelitis in the axial skeleton with no false positive and one false negative finding. However larger series of patients are needed before the clinical use of PET/CT can be recommended and a comparison between PET/CT and MRI should be performed which is usually used in patients with chronic osteomyelitis.

With the current project we prospectively want to evaluate and compare PET/CT imaging and MRI in patients with musculoskeletal infections referring to localisation and extent of the infectious lesion. It is well known that MRI (especially in the postoperative patient) shows bone marrow edema and therefore may not be precise enough to define the extent of infectious bone lesions.

Publications / Publikationen
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Osteomyelitis, MRI, PET/CT, 18F-FDG

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