

Abstract

Aim: To evaluate the diagnostic performance of FDG PET/CT in the detection of stent graft infection (SGI) with the use of visual and semiquantitative interpretation, to compare it with standalone CT analysis, to verify the transferability of the experience with FDG PET/CT in surgical prosthesis infection and to define the role of the method in the diagnostic algorithm of SGI.

Subjects and Methods: In this retrospective study, two nuclear medicine physicians have independently analyzed 21 FDG PET/CT examinations performed in 20 subjects (16 men, 66 ± 8 years) between 2010 and 2019 for clinical suspicion of SGI. Six subjects examined from other reasons without signs of infection constituted a control group. The images were evaluated for the uptake pattern and intensity, and by the maximum standard uptake value (SUV_{max}), the target-to-background ratio with blood pool (TBR_{BP}) and liver uptake (TBR_{hep}) as a reference. The SGI was defined as the presence of focal hyperactivity with an intensity exceeding hepatic uptake. CT images were independently assessed for signs of SGI. Clinical review of all further patients' data served as the standard of reference.

Results: Twelve cases were established as SGI by the clinical review. PET/CT correctly diagnosed SGI in eight and yielded a sensitivity of 92 % and specificity of 100 %. The mean SUV_{max}, TBR_{BP}, and TBR_{hep} values were significantly higher in the group with SGI vs. the non-infected group: SUV_{max} 8.8 ± 3.5 vs. 4.0 ± 1.1 , TBR_{BP} 6.5 ± 2.5 vs. 2.6 ± 0.6 a TBR_{hep} 4.4 ± 1.7 vs. 1.8 ± 0.2 ($p < 0.01$ in all). CT alone showed a sensitivity of 82 %, specificity of 100 % and was concordant with PET/CT in 17 / 21 (81 %) cases. The best performing threshold values of SUV_{max}, TBR_{BP} and TBR_{hep} were 5.0, 3.4, and 2.2, respectively.

Conclusion: FDG PET/CT with visual interpretation demonstrated very good diagnostic accuracy for the diagnosis of SGI and can be successfully used as the first-line imaging modality or in the case of failure of conventional imaging. Semiquantification can be useful auxiliary criterion.

Keywords: FDG PET/CT, stent graft infection, vascular graft infection, endovascular treatment