First results of [^{18}F]Fluoroethyl-Tyrosine PET for imaging of metastatic malignant melanoma

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Objectives:
The recently developed amino acid tracer 18-F-fluoroethyl-tyrosine (18-FET) might have importance for the PET imaging of malignant melanoma because tyrosine is a precursor of the melanin synthesis. Therefore, it is the aim of this prospective study to compare 18-FET and 18-FDG PET imaging in metastatic malignant melanomas in order to investigate whether the different tracers provide equivalent or complementary findings in reference to sensitivity/specificity and biological parameters (i. e. tumour proliferation, tumour grading).

Methods:
Until today, we examined 7 patients with histologically confirmed metastatic malignant melanoma using two PET scans (18-FET and 18-FDG) within one week. Emission scans started 60 min after injection of 190 (144-236) MBq 18-FET and 228 (181-290) MBq 18-FDG, respectively. After reconstruction of attenuation corrected and uncorrected images, detected foci were compared for the two tracers. Normalized focal tumor uptake was calculated and correlated to cytological/histological parameters (grading, proliferation index using Ki 67, melanin synthesis).

Results:
Comparison of 18-FET vs. 18-FDG yielded 34 vs. 36 metastatic foci in 7 patients. Higher sensitivity was found for 18-FET in 3/7 patients (10 vs. 7, 6 vs. 5 and 3 vs. 1 foci), whereas 18-FDG showed a higher sensitivity in other 3 patients (8 vs. 2, 1 vs. 0 and 10 vs. 9 foci) probably suffering from amelanotic metastases. There was a significant correlation between 18-FET and 18-FDG tumour uptake ($r=0.762$, $p < 0.01$; Spearman correlation coefficient) which showed no significant difference ($p=0.236$; Wilcoxon test). The histological parameters are examined at that time and their results in reference to the PET findings (i. e. tracer uptake vs. proliferation rate) will be presented.

Conclusion:
First results point to the possible clinical importance of 18-FET PET for malignant melanoma imaging enabling the detection of 18-FDG negative metastases.

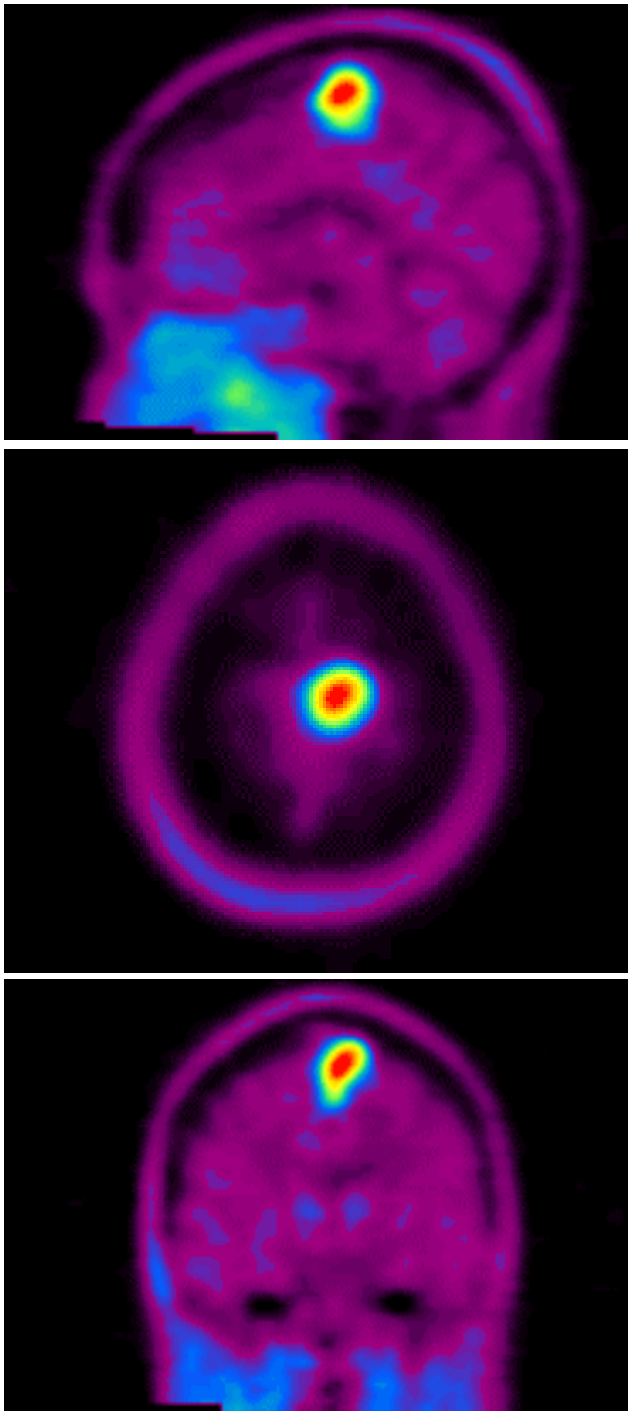

Figure 1: a cerebral melanoma metastas located in the fronto-parietal cortex. The 18-FET tumour/cortex ratio is typically high due to the low 18-FET uptake of normal brain tissue