Quantitative dynamic ^{18}F-fluorodeoxyglucose positron emission tomography/computed tomography before autologous stem cell transplantation predicts survival in multiple myeloma

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Statistical analysis

Spearman correlation analysis was performed to investigate the correlation between quantitative PET parameters. PFS was measured from the date of start of treatment until disease progression or death from any cause. Kaplan-Meier estimates were generated and median PFS estimated. Median follow-up time was determined by inverse Kaplan-Meier estimation. For univariate comparison of PFS log-rank test was used. Multivariate Cox proportional hazards regression analysis was applied. Maximally selected rank statistics were used to identify the optimal cut point of quantitative covariables used for dichotomization of the cohort with respect to PFS. Statistical analysis was performed using R version 3.4.3 (The R Foundation for Statistical Computing 2017) and R packages survival and maxstat. The results were considered significant for p value less than 0.05 ($p<0.05$).

Supplementary Table 1 Descriptive statistics of SUV values and kinetic PET parameters for ^{18}F-FDG in reference BM and the hottest MM lesions. K_1, k_3 and influx are expressed in 1/min. SUV and V_B have no unit.

Parameters	**reference BM (os ilium)**	**MM lesions**
$SUV_{average}$	median= 2.0, mean= 2.1, SD= 1.1	median= 5.2, mean= 6.1, SD= 3.6
SUV_{max}	median= 3.3, mean= 3.7, SD= 2.1	median= 8.5, mean= 9.3, SD= 5.3
V_B	median= 0.01, mean= 0.02, SD= 0.03	median= 0.04, mean= 0.07, SD= 0.11
K_1	median= 0.18, mean= 0.21 , SD= 0.09	median= 0.30, mean= 0.30, SD= 0.14
k_3	median= 0.05, mean= 0.05, SD= 0.03	median= 0.14, mean= 0.25, SD= 0.35
Influx (K_i)	median= 0.01, mean= 0.02, SD= 0.01	median= 0.04, mean= 0.05, SD= 0.02

SUV, standardised uptake value; PET, positron emission tomography; BM, bone marrow; MM, multiple myeloma

Supplementary Table 2 Effect of the previously established risk PET factors on PFS in MM.

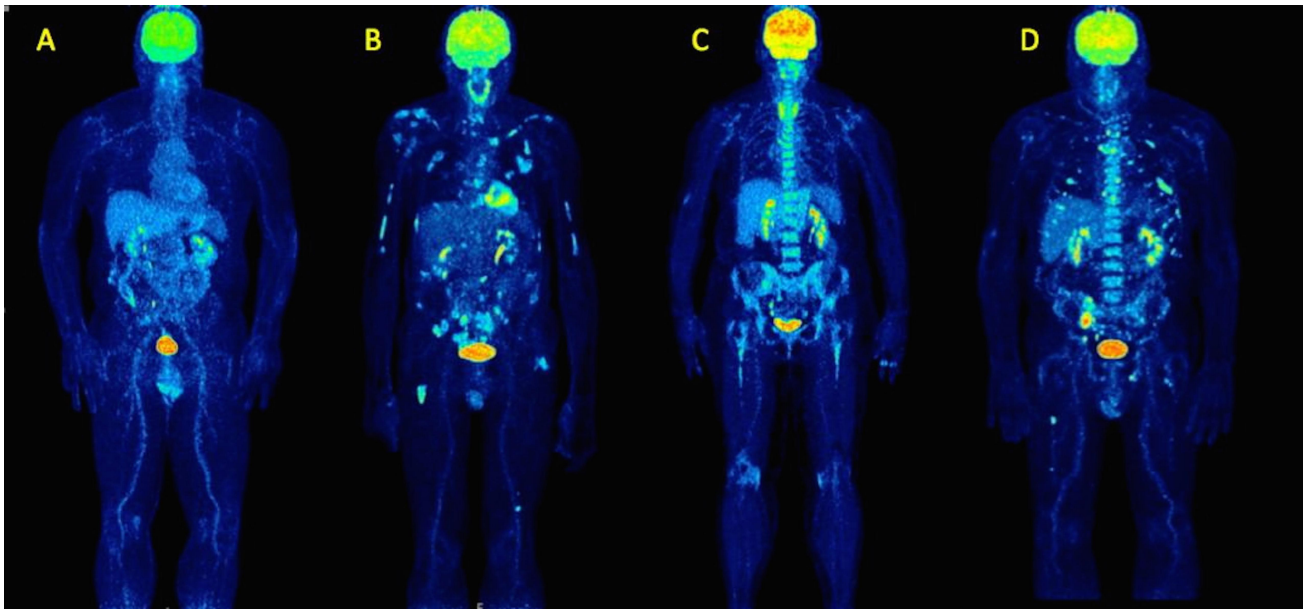
Parameters	**Median PFS at parameter positivity**	**Median PFS at parameter negativity**	**Statistical significance (p value)**
>3 focal lesions	30.5 months (n= 19 patients)	59.4 months (n= 28 patients)	(p= 0.03)*
SUV_{max} >4.2 (reference BM)	21.3 months (n= 16 patients)	59.4 months (n= 31 patients)	(p< 0.001)*
SUV_{max} >4.2 (MM lesions)	31.0 months (n= 24 patients)	39.7 months (n= 23 patients)	(p= 0.08)
EMD	17.2 months (n= 4 patients)	43.9 months (n= 43 patients)	(p= 0.02)*

* statistically significant differences
PET, positron emission tomography; PFS, progression-free survival; MM, multiple myeloma; SUV, standardised uptake value; BM, bone marrow

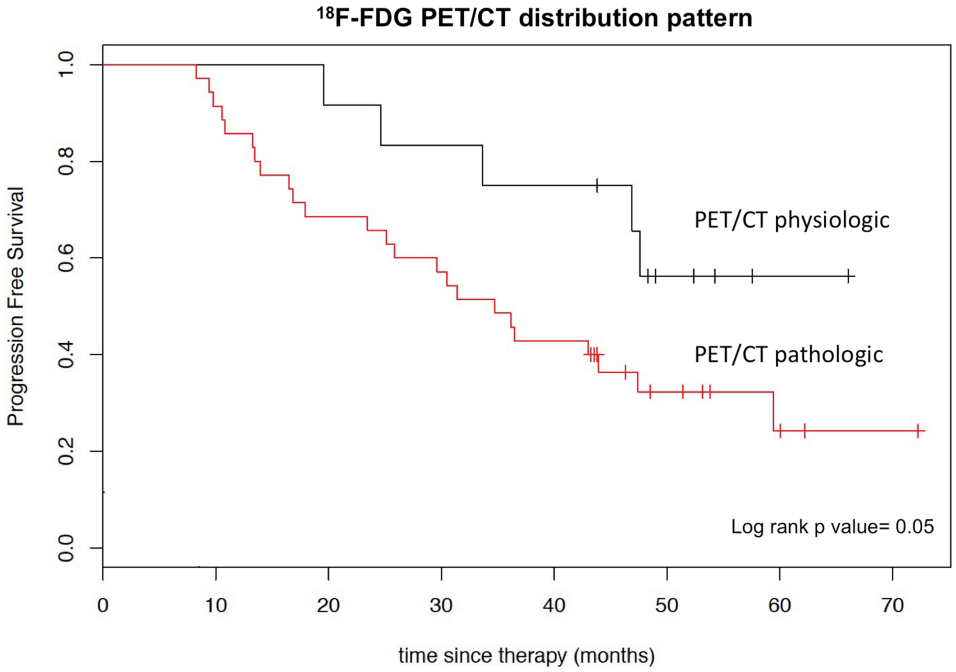
Supplementary Table 3 Multivariate Cox regression analysis of parameters unfavorably affecting PFS.

Parameters	**HR**	**Lower 95% CI**	**Upper 95% CI**	**p-value**
High cytogenetic risk	2.46	0.96	6.30	0.061
SUV_{max} reference	1.20	1.03	1.40	0.021
V_B reference (*1000)	1.01	1.00	1.02	0.009

HR, hazard ratio; 95% CI, 95% confidence intervals; SUV_{max}, maximum standardised uptake value



Supplementary Figure 1 The four different patterns of ^{18}F-FDG uptake on PET/CT: negative (A), focal (B), diffuse (C) and mixed (D).



Supplementary Figure 2 PFS outcome according to physiologic and pathologic ^{18}F-FDG PET/C distribution patterns.