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Introduction: In anal squamous cell carcinoma (SCC), pre-treatment prognostic factors able to identify more accurately patients with high risk of recurrence who may benefit from optimized treatment are lacking. There are increasing evidences that FDG PET examinations are useful in anal SCC management. Our objective was to explore, by two different analyses, the value of pre-treatment quantitative imaging to predict progression-free survival (PFS) in anal SCC patients. **Subjects & Methods:** We conducted a retrospective study on FDG PET examinations for 81 consecutive anal SCC patients at initial staging. Along with clinical variables (age, sex, T-stage, N-stage, HIV and human papilloma virus infections) collection, tumor and lymph nodes (LN) FDG metrics (SUV_{max}, TLG, MTV) were measured using 7 3D-thresholding methods on PET images: 3 with fixed SUVmax threshold (T35%, T41% and T50%) and 4 adaptative methods [$M1^1$, $M2^2$, $M3^3$, $M4^4$]. Each semi-quantitative PET variable is associated with 26 events free survival as a residual disease, local recurrence, distant metastasis or deaths at 0.10 threshold in univariate analysis. A multivariate analysis was conducted with an AIC criterion based Cox model. Evidence ratio (ER) was calculated for each model when PET variable remained significant after adjustment. Due to a small sized cohort with few events compared to the information to be processed, 2 analyses were conducted according to 4 quartiles and median FDG quantitative parameters respectively. **Results**: Six (7.5%), 18 (22.2%), 39 (48.1%) and 18 (22.2%) patients had respectively disease of stage I to IV. Median follow up was 3.3y (2.5-5y). As clinical data, male sex was the uniquely prognostic biomarker (HR: 3.32; CI: 1.38-8.02; p=0.007) of progression free survival (PFS) on univariate analysis. Out of the 57 tumor image intensity features, only 27 were predictive of PFS ($0.0032<p<0.0395$). The four-quartile multivariate analysis ordered total $MTV_{tumor+LN}$, TLG_{LN}, MTV_{tumor} with higher ER (1.0 to 4.8) for T35%, T41%, M2 and M4 methods whereas median multivariate analysis exhibited higher ER (1.0 to 5.2) for T35%, T41% and M1 MTV_{tumor} respectively. **Conclusion**: Whatever how quantitative FDG PET data analysis was conducted (quartile or median) "TLG_{LN}, total MTV or MTV_{tumor}" seemed to be the best pronostic variables to assess PFS in this anal SCC population. An external cohort is warranted to ascertain these results in terms of defined variables and divisions. 1. Vauclin et al. doi:10.1088/0031-9155/54/22/010. 2. Black et al. Int J Radiat Oncol Biol Phys,2004. 3. Nestlé et al. EJNMMI,2007. 4. Tylski et al. doi:10.2967/jnumed.109.066241.