

# Analysis of Outcomes Related to Obesity Metrics and Validation of a Pancreas SBRT Registry Established Weight Cutoff in a Single Institution Cohort of Patients Treated for Locally Advanced Pancreatic Cancer

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**Objectives:** Obesity is increasingly identified in the literature as a prognostic factor for worse outcomes in pancreatic cancer. Here, we sought to identify obesity metrics and their association with outcomes following Stereotactic Body Radiotherapy (SBRT) for pancreatic cancer and to validate a previously established weight cutoff of 69.4 kg as a predictor for worse local tumor control.

**Methods:** An institutional database of patients treated with pancreas SBRT from 2014-2019 was analyzed for obesity metrics and association with clinical outcomes. Obesity metrics studied included BMI, weight, and waist circumference. Waist circumference was approximated by measuring anterior-posterior and lateral radii on individual planning or diagnostic CTs, per patient, at the level of the bottom of the L3 vertebral body. A metric of weight > 69.4 kg was previously found to predict for worse local control in the RSSearch Registry database and the validity of this predictive marker was tested in this independent patient cohort.

**Results:** Thirty-three patients were identified for analysis with 27 patients remaining after exclusion of patients with insufficient follow-up. Median age was 69 years (47 - 90 years). Fifty six percent of patients were female and 44% male. Median BMI was 23.7 kg/m<sup>2</sup> (18.27 - 35.29 kg/m<sup>2</sup>) and median weight was 63 kg. Median waist circumference was 82.3 cm. Median follow-up was 15.9 months (1.6 - 32.2 months). BMI greater than the median of 23.7 kg/m<sup>2</sup> was found to be a significant predictor of worse progression free survival (PFS) and yielded a HR of 0.4 (95% CI: 0.16-1.03; p=0.05), but demonstrated only a trend towards worse local control (LC) with a HR of 0.38 (95% CI: 0.12-1.13; p=0.07), and no association with overall survival (OS) with a HR of 0.7 (95% CI: 0.16 - 3.13; p=0.64). The previously established obesity metric of weight > 69.4 kg was associated with worse PFS with a HR of 0.04 (95%CI: 0.15 - 0.98; p= 0.037) in this cohort, but did not meet statistical significance for worse LC with a HR of 0.55 (95% CI: 0.19 - 1.58; p=0.26). Weight > 69.4 was not significantly associated with OS with a HR of 0.28 (95% CI: 0.05 - 1.45; p=0.10). Notably, the median weight of this particular cohort was not significantly associated with any clinical outcome. Waist circumference was not shown to be significantly associated with LC, PFS or OS.

**Conclusions:** Obesity metrics predict for worse progression free survival in patients with pancreatic cancer treated with SBRT. A weight above 69.4 kg was significantly associated with worse progression free survival in this single institution cohort and worse local control in a previously studied large registry database. Waist circumference was not associated with worse outcomes suggesting this may be a metabolic versus anatomic issue. Obese patients are at increased risk for worse clinical outcomes following pancreas SBRT and warrant further study.

