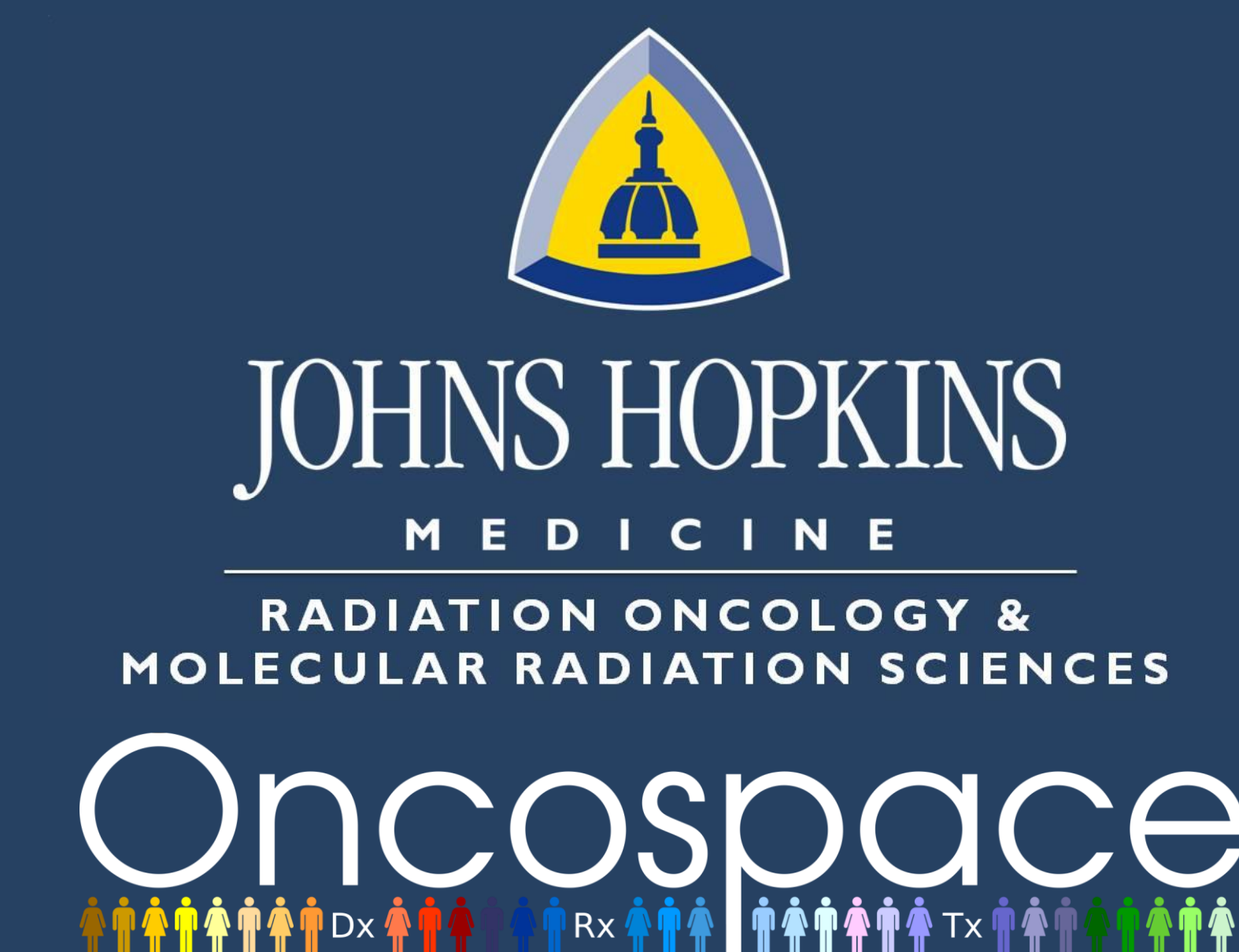


PTV hot-spot volume is associated with improved pathologic response after neoadjuvant stereotactic body radiation therapy for pancreatic cancer

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Purpose/Objectives

- Neoadjuvant stereotactic body radiation therapy (SBRT) has been used in borderline resectable (BR) and locally advanced (LA) pancreatic adenocarcinoma (PCA) patients, but the optimal dose is unclear.
- At our institution, 6.6 Gy x 5 has been our standard prescription, with varying levels of “hot-spots” depending on patient anatomy.
- The effect of increased amount of planning tumor volume (PTV) covered by hot-spots may provide a view into the value of dose escalation
- Our study aimed to characterize the association between PTV hot-spot volume and surgical pathology response.

Materials/Methods

Population

- Patients with BR or LA PCA who underwent SBRT followed by surgery between 2010 and 2016

Outcome
Pathologic response from final pathology at time of surgery

- Complete (CR)
- Near complete (NC)
- Moderate (MR)
- Poor response (PR)

PTV hot-spot (V35):
PTV volume (cc) receiving at least 35 Gy, with the PTV defined as the gross target volume with a 2mm expansion

- Co-variables:**
- GTV volume (cc)
 - Chemotherapy duration
 - Time from SBRT to surgery (weeks)

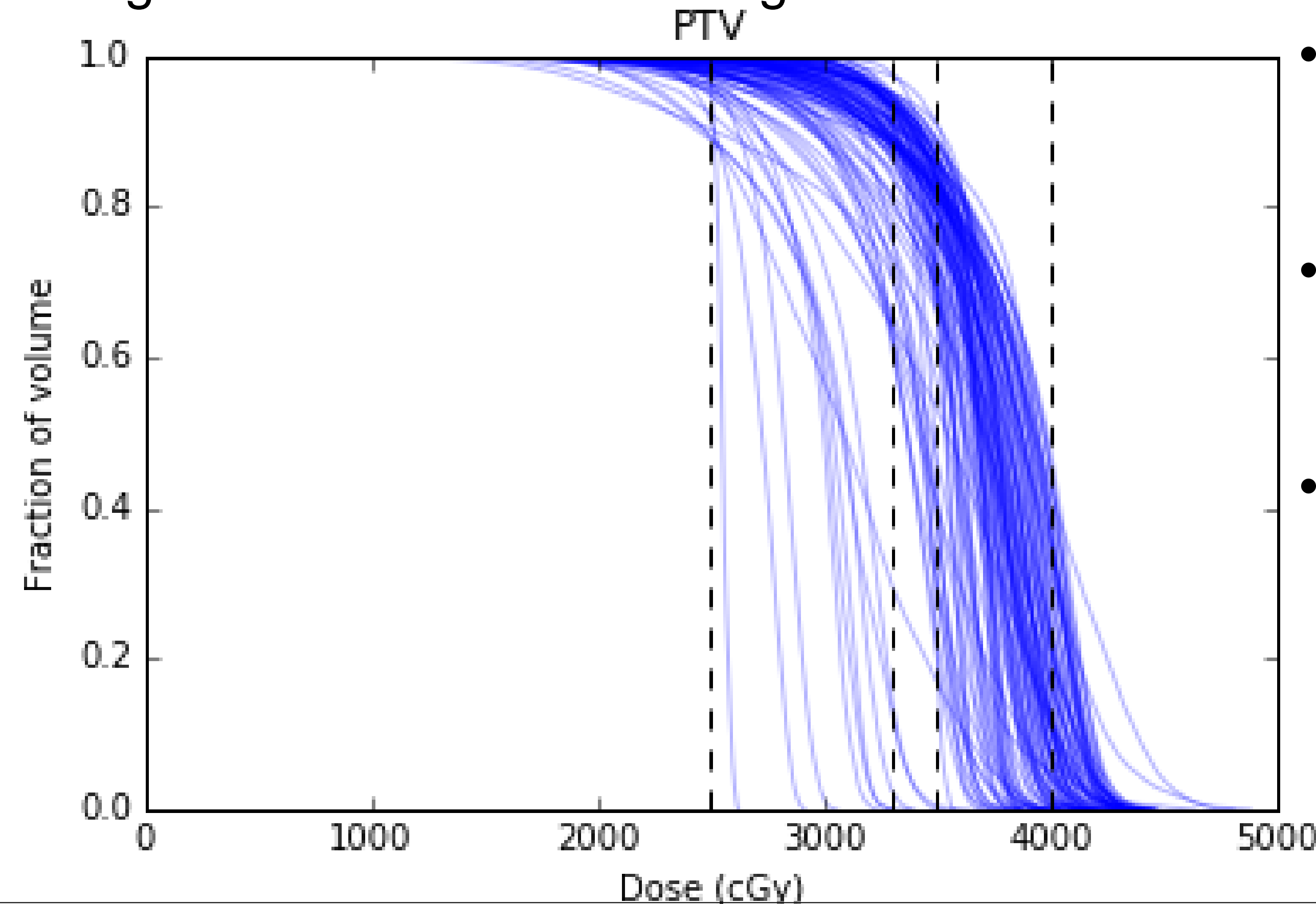
Ordinal logistic regression was performed to identify the association between V35 and pathologic outcomes.

Results

Table 1. Patient characteristics (N=77)

	N or Mean	% or Range
GTV size, cc	35	10-107
Chemotherapy duration		
< 4 months	30	38.96
≥ 4 months	47	61.04
Time from the end of RT to surgery		
< 8 weeks	62	80.52
≥ 8 weeks	15	19.48
R0 resection		
Positive	12	15.58
Negative	65	84.42
Pathology response		
Complete response	5	6.49
Near complete	24	31.17
Moderate response	32	41.56
Poor response	16	20.78

Figure 1. Dose volume histogram for PTV



- The mean V35 for CR, NC, MR and PR group were 50, 39, 30, 32 cc, respectively.
- Increased size of hot-spot (V35) was associated with improved pathologic complete response group (OR = 1.02, 95% CI 1 – 1.04, p = 0.05).

Conclusions

- Increased PTV V35 may be associated with improved pathologic response among BR and LA PCA patients undergoing neoadjuvant SBRT
- This association may support further efforts for dose-escalation in this population