

Pre-operative PET Usage & Pathologic Response in Neoadjuvantly Treated Pancreatic Adenocarcinoma

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INTRODUCTION

Background

- Pathologic response to neoadjuvant therapy (NAT) in pancreatic ductal adenocarcinoma (PDAC) is currently confirmed only after surgical resection using tumor regression grading such as the College of American Pathologists (CAP) score [1].
- Conventional imaging, such as CT, may incompletely reflect treatment response and residual tumor can have similar appearances after NAT [2].
- FDG-PET provides a metabolic measure of tumor activity (SUV) and may better capture treatment-related changes
- Prior studies have associated reductions in SUV after NAT with pathologic response and survival [3]. These assessments generally rely on timed pre-and post-treatment PET imaging.

Objective

- To describe preoperative FDG-PET utilization and timing relative to NAT and explore the relationship between tumor SUVmax and CAP tumor regression grade in a single institution cohort of patients with resected PDAC.

METHODS

This is a retrospective descriptive chart review conducted at a single institution (MSU IRB #10679).

Study Design

- 165 patients screened
- 47 underwent preoperative FDG-PET.
- 9 received NAT followed by surgical resection and met inclusion criteria

Variables Collected

- Demographics
- Neoadjuvant regimen and duration
- PET timing and tumor SUVmax
- CA 19-9
- CAP tumor regression grade
- Adjuvant therapy

Pathologic Response

- **Responders:** CAP 0-1
- **Non-responders:** CAP 2-3

RESULTS

Cohort Characteristics & PET timing

- Of the 9 patients who met inclusion criteria, 6 were men and 3 were women (mean age at diagnosis 71.3 ± 9.78).
- Neoadjuvant regimens included gemcitabine/paclitaxel (n=4), FOLFIRINOX (n=3), gemcitabine monotherapy (n=1), and sequential gemcitabine/paclitaxel and FOLFIRINOX (n=1).
- Median time from diagnosis to PET was **15 days**.
- PET timing relative to NAT was variable: **5 scans preceded cycle 1, while 4/9 occurred during or after treatment**.
- Post-neoadjuvant CA 19-9 values were available for 6 patients (mean 85.4 ± 64.2).
- CAP grade was available for **7/9 patients**; 3 were responders (CAP 0-1) and 4 were non-responders (CAP 2-3).

Table 1. Clinical Characteristics by CAP Tumor Regression Response

Variable	CAP 0-1 (n=3)	CAP 2-3 (n=4)	p-value
Age (y)	68.0 $\pm$ 12.2	75.5 $\pm$ 3.3	0.5926
Duration of neoadjuvant therapy (days)	79.0 $\pm$ 30.5	75.0 $\pm$ 44.3	0.7213
Preoperative CA 19-9	66.7 $\pm$ 115.5	121.3 $\pm$ 241.2	0.8454
Preoperative SUVmax	5.3 $\pm$ 2.4	3.9 $\pm$ 2.6	0.8597
Post-operative CA 19-9	52.0 $\pm$ 48.14	101.3 $\pm$ 116.8	0.5295
Adjuvant therapy (%)	100% (3/3)	75% (3/4)	1

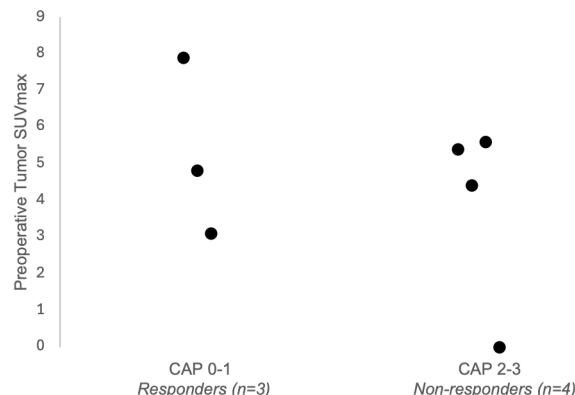


Figure 1. Preoperative Tumor SUVmax by CAP Response

DISCUSSION

- Prior studies suggest that **metabolic response over time**, including reductions in SUVmax following NAT, may correlate with pathologic response and survival in PDAC [4].
- In this single institution cohort, PET timing relative to NAT was variable and pre-and post-treatment imaging was not consistently available.
- A single preoperative SUVmax measurement did not demonstrate a clear relationship with CAP response in the small cohort. These findings highlight the importance of standardized PET timing when evaluating FDG-PET as a maker of treatment response.

Limitations

- Small sample size
- Single-institution retrospective design
- Variable PET timing relative to NAT

CONCLUSION

- Preoperative FDG-PET timing relative to NAT was highly variable in this cohort, limiting assessment of metabolic treatment response.
- A single preoperative SUVmax measurement was not clearly associated with CAP tumor regression grade.
- **Future directions:** expand the cohort to include patients with metastatic PDAC who underwent FDG-PET and chemotherapy.

REFERENCES

