

Role of metabolic tumour burden on surgical outcome in ovarian cancers

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Objective:

As a negative predictor, the presence of peritoneal carcinomatosis (PC) has a great impact on the success of achieving complete cytoreductive surgery (CRS)/debulking surgery for patients with ovarian carcinoma.¹ Aim of this study was to evaluate the use of metabolic tumour burden of PC derived from ¹⁸F-FDG PET/CT for predicting disease resectability.

Material and Methods:

- Patients with ovarian carcinoma who had either CRS/debulking surgery and pre-surgical ¹⁸F-FDG PET/CT were retrospectively reviewed.
- Surgical notes were referred to dichotomize patients into groups with **complete resection (R0)** and with **macroscopic residual disease (R2)**.
- Pre-surgical ¹⁸F-FDG PET/CT was qualitatively assessed and peritoneal lesions detected were semi-quantitatively measured in terms of **PCMTV** and **PCTLG** using 50% threshold settings.
- Pearson Chi-square test was used in categorical analysis of association between the presence of peritoneal carcinomatosis detected by ¹⁸F-FDG PET/CT and surgical outcomes (R0 and R2).
- Receiver operating curve (ROC) analysis was used to determine the optimal cut-off values of PCMTV and PCTLG.
- Based on these cut-off values, the rate of **unnecessary surgical exploration (SE)** and rate of **inappropriate treatment selection of neoadjuvant chemotherapy (NAC)** were calculated.

Results:

- 50 patients (mean age 49 ± 14 years old) were recruited (Table 1).
- 12 patients had residual disease after surgery (R2).
- Patients without PC presence on ¹⁸FDG PET/CT had significantly higher rate of R0 (95.5% vs. 60.7%) and lower rate of R2 (4.5% versus 39.3%) ($p = 0.04$).
- To predict the disease resectability at surgery, ROC curves were generated for **PCMTV_50% (AUC 0.747)** and **PCTLG_50% (AUC 0.775)** (Figure 1).
- The optimal cut-off values of **PCMTV** and **PCTLG** were **24cm³** (9.1% of unnecessary SE, 47.1% of inappropriate treatment selection of NAC) and **25cm³** (3.8% of unnecessary SE, 54.2% of inappropriate treatment selection of NAC), respectively.

Unstaged	Unknown	I	II	III	IV
1	4	15	10	15	5

Table 1 : FIGO staging of 50 patients

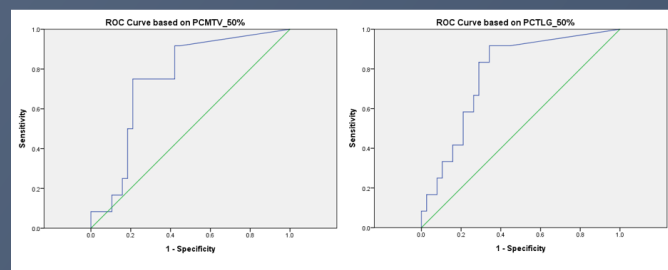


Figure 1 : The ROC based on PCMTV_50% (Left) and PCTLG_50% (Right) for determining resectability.

Conclusions:

Metabolic PC burden was associated with unfavourable surgical outcome (R2), it has potential in assisting treatment stratification in patients with ovarian cancers.

PCMTV = \sum of all PC metabolic tumour volume
PCTLG = \sum of all PC total lesion glycolysis

Reference:

1. Harter P, Hahmann M, Lueck HJ, Poelcher M, Wimberger P, Ortmann O, et al. Surgery for recurrent ovarian cancer: role of peritoneal carcinomatosis: exploratory analysis of the DESKTOP I Trial about risk factors, surgical implications, and prognostic value of peritoneal carcinomatosis. Ann Surg Oncol. 2009;16(5):1324-30. doi: 10.1245/s10434-009-0357-0. PubMed PMID: 19225844.