The prognostic value of $^{18}$F-fluorodeoxyglucose positron emission tomography/computed tomography parameters in patients with malignant pleural mesothelioma

Malign pleural mesothelioma patients who are receiving surgery and/or chemotherapy.

Methods: A total of 65 patients with malignant pleural mesothelioma (34 males, 31 females; median age: 60 years; range, 39 to 84 years) who underwent whole-body $^{18}$F-fluorodeoxyglucose positron emission tomography/computed tomography for staging before treatment between March 2008 and January 2018 were included. Relationships between clinicopathological factors and $^{18}$F-fluorodeoxyglucose positron emission tomography/computed tomography parameters and overall survival were evaluated using a log-rank test and Cox regression analysis.

Results: The median follow-up was 13 (range, 4 to 55) months. The Kaplan-Meier analysis revealed a mean survival time of 17±2.6 months. The cumulative two- and five-year survival rates were 34.8% and 7.8%, respectively. Univariate analysis showed that ≥60 age, left hemithorax involvement, a maximum standardized uptake value of ≥9.8, c-T4 status, c-M1 status, and non-surgery were negatively associated with overall survival (p<0.05). Multivariate analysis showed that ≥60 age, left hemithorax involvement, a maximum standardized uptake value of ≥9.8, c-M1 status, and a total lesion glycolysis of ≥180.2 g were negatively associated with overall survival (p<0.05).

Conclusions: Metabolic parameters of $^{18}$F-fluorodeoxyglucose positron emission tomography/computed tomography have the potential to provide prognostic information for malignant pleural mesothelioma patients who are receiving surgery and/or chemotherapy.

Keywords: Computed tomography, malign mesothelioma, positron emission tomography, prognostic factor, thoracic surgery.

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Malignant pleural mesothelioma (MPM) is rare and aggressive malignancy arising from mesothelial cells. It is usually located in the thorax, but it rarely originates from the peritoneum, pericardium, and the tunica vaginalis of the testicles.[1-4] Malignant pleural mesothelioma is often resistant to chemotherapy and radiotherapy with a median survival of less than one year.[5] After 1990s, multimodal treatments including surgery, chemotherapy, and radiotherapy have improved survival in selected patients.[6] Several prognostic factors such as sarcomatous histological type, sex, and performance status have been described in MPM patients.[7,8] From the aspect of the imaging tool, there is only a limited number of data on prognostic factors.[9-11]

The 18F-fluorodeoxyglucose (FDG) positron emission tomography (PET)/computed tomography (CT) has been utilized to staging of many types of solid tumors.[12-14] Behind standardized uptake value (SUV), prognostic importance of metabolic volumetric parameters such as metabolic tumor volume (MTV) and total lesion glycolysis (TLG) have been described for different tumors.[14-16] In this study, we aimed to evaluate the prognostic value of metabolic 18F-FDG PET/CT parameters in MPM patients.

PATIENTS AND METHODS

This single-center, retrospective study was conducted at Ankara University Faculty of Medicine between March 2008 and January 2018. A total of 232 consecutive patients with MPM were screened and 65 of them (34 males, 31 females; median age: 60 years; range, 39 to 84 years) who underwent whole-body 18F-FDG PET/CT for initial staging before treatment were included. All patients also underwent routine diagnostic chest and abdominal CT. In all patients, the diagnosis was made based on CT scan-guided Abrams’ needle pleural biopsy or by video-assisted thoracoscopic surgery. Pathological diagnosis was based on standard histological, histochemical, and/or immunohistochemical criteria in all patients. Histopathological definitions and assessments were based on the 2004 World Health Organization lung and pleural tumor classification.[17] Routine blood examinations and functional evaluation of the respiratory system, with or without diffusing capacity of the lung for carbon monoxide, and ventilation/perfusion scan and cranial magnetic resonance imaging (MRI)/CT scan were also performed to patients who underwent surgery. A written informed consent was obtained from each patient. The study protocol was approved by the Ankara University School of Medicine Ethics Committee (Approval Date: November 27, 2020, No: İ10-616-20). The study was conducted in accordance with the principles of the Declaration of Helsinki.

The operability was evaluated either clinically or videothoracoscopically based on performance status, pulmonary function, and staging. Echocardiography or cardiac MRI were performed, when necessary. The patients diagnosed as having MPM throughout the study period were followed until death, loss to follow-up, or January 2020. Follow-up was performed based on medical records or consulting the treating physician and occasionally the patients’ self-reports.

Radical surgery, including extra-pleural pneumonectomy (EPP) and pleurectomy/decortication (P/D), was performed in patients with resectable Stage I-III MPM who could tolerate aggressive surgery. In the patients who were not candidates for surgical resection, chemotherapy was typically administered with pemetrexed and cisplatin. Palliative radiotherapy was administered, when indicated. Tumor staging was done according to the eighth edition of Tumor, Node, Metastasis (TNM) system of the International Mesothelioma Interest Group.[17]

18F-FDG PET/CT

The 18F-FDG PET/CT images were acquired with a GE Discovery PET/CT 710 series scanner (General Electric, Milwaukee, WI, USA). The patient fasted at least 6 h before imaging and blood glucose levels were checked. Those with a blood glucose above 150 mg/dL did not undergo scanning. Oral contrast was given to all patients. Images from the vertex to the proximal femur obtained, while the patient was in the supine position. The whole-body 18F-FDG PET/CT imaging was performed approximately 1 h after an intravenous injection of 296 to 370 MBq 18F-FDG. During the waiting period, the patient rested in a quiet room without taking muscle relaxants. The PET images were acquired for two min per bed position. The emission PET images were reconstructed with non-contrast-enhanced CT images. The CT images were also obtained from the patient’s integrated 18F-FDG PET/CT with the use of a standardized protocol of 120 kV, 70 mA, tube rotation time of 0.5 sec per rotation, a pitch of 1.375, and a slice thickness of 3.3 mm. The patient was allowed to breathe normally during the procedure. Attenuation-corrected PET/CT fusion images were reviewed in three planes (transaxial, coronal
and sagittal) on Advanced Workstation Volume Share 5 (GE Medical Systems Waukesha, WI, USA). The $^{18}$F-FDG PET/CT images were evaluated and confirmed visually and semi-quantitatively with SUV by consensus of two experienced nuclear medicine specialists. The MTV ($cm^3$) was measured using an automatic isocontour threshold method, which is based on a value greater than 40% of SUV$_{max}$ of the primary tumor. The TLG (g) was calculated by multiplying the SUV$_{mean}$ by MTV.

**Statistical analysis**

Statistical analysis was performed using the SPSS version 23.0 software (IBM Corp., Armonk, NY, USA). Descriptive data were expressed in mean ± standard deviation (SD), median (min-max) or number and frequency. The relationship between sex, age, white blood cell (WBC) count, platelet count, histopathological subtype of tumor, localization of the tumor (right hemithorax involvement/left hemithorax involvement), clinical TNM status, type of treatment, SUV$_{max}$ of pleural surface, MTV, TLG, and overall survival (OS) was analyzed. During statistical analysis, the patients were divided into subgroups according to below and above of the median values for age, WBC count, platelet count, SUV$_{max}$, MTV, and TLG (Table 1). The median survival was calculated using the Kaplan-Meier method and the results were compared using the log-rank test. To identify the independent risk factors affecting the OS, we used multivariate Cox regression analysis following univariate analysis. A $p$ value of <0.05 was considered statistically significant with 95% confidence interval (CI).

**RESULTS**

The median follow-up was 13 (range, 4 to 55) months. Of a total of 65 patients, 34 (52%) in the epithelial, three (7%) in the sarcomatoid, and nine (13.8%) in the biphasic subtypes were included in the analysis. Nineteen patients (29.2%) had no subtype of MPM. Almost all patients had a history of asbestos exposure. Fifteen patients (23.1%) underwent radical surgery (EPP n=1, P/D n=14). In the radical surgery group, four patients received neoadjuvant chemotherapy, while 11 patients received adjuvant chemotherapy and/or chemoradiotherapy (CRT). Of 50 patients in the non-surgery group, 36 received definitive chemotherapy and 10 received definitive CRT, while four patients did not receive any treatment. No mortality was observed in the early postoperative period. The morbidity rate was 13%.

The primary lesion was located in the right and left hemithorax in 40 (61.5%) and 25 patients (38.5%), respectively. Descriptive data and $^{18}$F-FDG PET/CT findings are summarized in Table 2.

A total of 55 patients (85%) died from MPM. The Kaplan-Meier analysis revealed an mean survival time of 17±2.624 (range, 2 to 64) months. The cumulative two- and five-year survival rates were 34.8% and 7.8%, respectively. The overall five-year survival rate and median survival time are shown in Figure 1 and Table 3. There were no statistically significant differences in the OS between the other groups (Table 4).

Univariate analysis identified that ≥60 age (hazard ratio [HR] 2.5, 95% CI: 1.4-4.4), left hemithorax involvement (HR 1.7, 95% CI: 1.1-3.1), SUV$_{max}$ ≥9.8 (HR 2.2, 95% CI: 0.9-6.2), c-T4 status (HR 3.5, 95% CI: 1.3-9.3), c-M1 status (HR 6.03, 95% CI: 1.7-20.9), and non-surgery group (HR 0.4, 95% CI: 0.2-0.9) were negatively associated with OS.

Multivariate analysis identified that ≥60 age (HR 2.4, 95% CI: 1.4-4.5), left hemithorax involvement (HR 2.4, 95% CI: 1.3-4.4), SUV$_{max}$ ≥9.8 (HR 1.8, 95% CI: 1.04-3.2), M1 status (HR 6.3, 95% CI: 1.6-24.07), and TLG ≥180.2 g (HR 1.9, 95% CI: 1.09-3.5) were negatively associated with OS (Table 5).

| Table 1. Cut-off values for continuous variables |
|-----------------|-----------------|-----|-----|
| Variables       | Min and max range | Group 1 | Group 2 |
| Age (year)      | 39-84            | <60 | ≥60 |
| White blood cell count ($\times 10^9$/L) | 5-17 | <8.75 | ≥8.75 |
| Platelet count ($\times 10^9$/L) | 165-699 | <346 | ≥346 |
| Maximum standardized uptake value | 3-29.6 | <9.8 | ≥9.8 |
| Metabolic tumor volume ($cm^3$) | 0.6-801 | <35.2 | ≥35.2 |
| Total lesion glycolysis (g) | 12.7-8051 | <180.2 | ≥180.2 |
### Table 2. Demographic and clinical characteristics of patients with MPM

| Patient characteristics          | n  | %    | Median | Range |
|---------------------------------|----|------|--------|-------|
| **Age (year)**                  |    |      |        |       |
| <60                             | 31 | 47.7 |        |       |
| ≥60                             | 34 | 52.3 |        |       |
| **Sex**                         |    |      |        |       |
| Male                            | 34 | 52.3 |        |       |
| Female                          | 31 | 47.7 |        |       |
| **White blood cell count (<10^9/L)** |    |      |        |       |
| <8.75                           | 30 | 46.2 |        |       |
| ≥8.75                           | 35 | 53.8 |        |       |
| **Platelet count (<10^9/L)**    |    |      |        |       |
| <346                            | 32 | 49.2 |        |       |
| ≥346                            | 33 | 50.8 |        |       |
| **Maximum standardized uptake value** |      |      |        |       |
| <9.8                            | 31 | 47.7 |        |       |
| ≥9.8                            | 34 | 52.3 |        |       |
| **Metabolic tumor volume (cm³)** |    |      |        |       |
| <35.2                           | 32 | 49.2 |        |       |
| ≥35.2                           | 33 | 50.8 |        |       |
| **Total lesion glycolysis (g)** |    |      |        |       |
| <180.2                          | 32 | 49.2 |        |       |
| ≥180.2                          | 33 | 50.8 |        |       |
| **Histological subtypes**       |    |      |        |       |
| Epithelioid                     | 34 | 52.3 |        |       |
| Non-epithelioid                 | 31 | 47.7 |        |       |
| Sarcomatoid                     | 3  | 4    |        |       |
| Biphasic                        | 9  | 13.8 |        |       |
| Malignant pleural mesothelioma  | 19 | 29.2 |        |       |
| **Localization of the tumor**   |    |      |        |       |
| Right hemithorax involvement    | 40 | 61.5 |        |       |
| Left hemithorax involvement     | 25 | 38.5 |        |       |
| **T status**                    |    |      |        |       |
| cT1                             | 40 | 61.5 |        |       |
| cT2                             | 4  | 6.2  |        |       |
| cT3                             | 16 | 24.6 |        |       |
| cT4                             | 5  | 7.7  |        |       |
| **N status**                    |    |      |        |       |
| cN0                             | 34 | 52.3 |        |       |
| cN1                             | 27 | 41.5 |        |       |
| cN2                             | 4  | 6.2  |        |       |
| **M status**                    |    |      |        |       |
| cM0                             | 62 | 95.4 |        |       |
| cM1                             | 3  | 4.6  |        |       |
| **Type of treatment**           |    |      |        |       |
| Non surgery group               |    |      |        |       |
| Chemotherapy                    | 36 | 55.5 |        |       |
| Chemoradiotherapy               | 10 | 15.6 |        |       |
| No additional treatment         | 4  | 6.1  |        |       |
| Radical surgery group           |    |      |        |       |
| EPP + CRT                       | 1  | 1.5  |        |       |
| P/D + CRT                       | 9  | 13.8 |        |       |
| P/D + RT                        | 1  | 1.5  |        |       |
| Neoadjuvant chemotherapy + P/D + adjuvant CRT | 1  | 1.5  |        |       |
| Neoadjuvant chemotherapy + P/D + adjuvant CT | 2  | 3    |        |       |
| Neoadjuvant chemotherapy + P/D  | 1  | 1.5  |        |       |

EPP: Extra-pleural pneumonectomy; CRT: Chemoradiotherapy; P/D: Pleurectomy/decortication; RT: Radiotherapy; CT: Computed tomography.
Table 3. Kaplan-Meier survival analysis (statistically significant results are shown in the table)

| Variables                          | 5 years OS (%) | Median survival (month) | 95% CI           | p   |
|-----------------------------------|----------------|-------------------------|------------------|-----|
| Age <60 years                     | 17.1           | 24                      | 3.9-44.09        | 0.001|
| Age ≥60 years                     | 0              | 13                      | 10.1-15.8        |     |
| Radical surgery                   | 24.9           | 24                      | 6.1-41.8         | 0.034|
| Non-surgery                       | 3              | 13                      | 9.1-16.8         |     |
| Right hemithorax involvement      | 13.2           | 22                      | 6.4-37.5         | 0.041|
| Left hemithorax involvement       | 0              | 14                      | 9.1-18.8         |     |
| SUV\textsubscript{max} <9.8       | 12.7           | 29                      | 13.3-44.6        | 0.002|
| SUV\textsubscript{max} ≥9.8       | 3.7            | 10                      | 5.4-14.5         |     |
| M0                                | 8              | 18                      | 12.6-23.3        | 0.001|
| M1                                | 0              | 7                       | 2.1-11.8         |     |
| T1 vs. T4                         | 8              | 22                      | 11.2-32.7        | 0.021|
| T2 vs. T4                         | 25             | 20                      | 0-42.54          |     |

OS: Overall survival; CI: Confidence interval; SUV\textsubscript{max}: Maximum standardized uptake value.

Figure 1. Kaplan-Meier overall survival curves for patients with MPM according to (a) all patients, (b) SUV\textsubscript{max} (p=0.002), (c) MTV (p=0.483), (d) TLG (p=0.085).

SUV\textsubscript{max}: Maximum standardized uptake value; MTV: Metabolic tumor volume; TLG: Total lesion glycolysis.
The management of patients with MPM is extremely challenging and overall reported survival is less than one year. In our study, the Kaplan-Meier analysis revealed a mean survival time of 17±2.6 months. The cumulative two- and five-year survival rates were 34.8% and 7.8%, respectively.

The mean age of patients with MPM is approximately 60 years; however, it may vary depending on genetic factors and environmental/industrial asbestos exposure. The male-to-female ratio is 4:1 with a predominance of right side over the left (60:40). The best-known clinical prognostic scoring systems for MPM was developed by the European Organisation for Research and Treatment of Cancer (EORTC) and the Cancer and Leukemia Group B, and the use a combination of biological and clinical factors. Poor performance status, non-epithelioid histology, male sex, low hemoglobin, high platelet count, high WBC count, and high lactate dehydrogenase were found to be poor prognostic indicators in MPM, and subsequently validated. In our study, we found the five-year OS rate to be 17.1% and 0% with a median OS time of 24 months and 13 months in <60 age and ≥60 age, respectively (p=0.001). The five-year OS was 13.2% and 0% with a median OS time of 22 months and 14 months in right hemithorax involvement and left hemithorax involvement group, respectively (p=0.041). Univariate and multivariate analysis identified that ≥60 age and left hemithorax involvement were negatively associated with OS.

### DISCUSSION

The management of patients with MPM is extremely challenging and overall reported survival is less than one year. In our study, the Kaplan-Meier analysis revealed a mean survival time of 17±2.6 months. The cumulative two- and five-year survival rates were 34.8% and 7.8%, respectively.

### Table 4. Kaplan Meier survival analysis with log-rank test

| Sex | Histological subtypes of MPM | c-N status | WBC count | Platelet count | MTV | TLG |
|-----|-------------------------------|------------|-----------|----------------|-----|-----|
| 0.339 | 0.194 | 0.677 | 0.156 | 0.343 | 0.483 | 0.085 |

MPM: Malignant pleural mesothelioma; WBC: White blood cell; MTV: Metabolic tumor volume; TLG: Total lesion glycolysis.

### Table 5. Univariate and multivariate Cox regression models

| Variables | Univariate | Multivariate |
|-----------|------------|--------------|
| p | Hazard ratio | p | Hazard ratio |
| Sex | 0.351 | 1.2 (0.7-2.2) | 0.802 | 1.08 (0.5-2.09) |
| Age | 0.002 | 2.5 (1.4-4.4) | 0.004 | 2.4 (1.4-4.5) |
| White blood cell count | 0.961 | 0.6 (0.4-2.1) | 0.637 | 0.8 (0.4-1.7) |
| Platelet count | 0.296 | 0.7 (0.4-1.3) | 0.071 | 0.5 (0.3-10.48) |
| Localization of the tumor | 0.048 | 1.7 (1.1-3.1) | 0.005 | 2.4 (1.3-4.4) |
| SUV$_{\text{max}}$ | 0.003 | 2.2 (0.9-6.2) | 0.035 | 1.8 (1.04-3.2) |
| Metabolic tumor volume | 0.492 | 0.8 (0.4-1.4) | 0.934 | 1.03 (0.4-2.2) |
| Total lesion glycolysis | 0.095 | 1.5 (0.9-2.6) | 0.024 | 1.9 (1.09-3.5) |
| Histological subtypes of MPM | 0.206 | 1.4 (0.8-2.3) | 0.889 | 1.06 (0.4-2.3) |
| c-T status | 0.035 | 0.419 |
| c-T2 | 0.907 | 0.9 (0.2-3.07) | 0.195 | 2.6 (0.6-11.6) |
| c-T3 | 0.051 | 1.8 (0.9-3.4) | 0.313 | 1.5 (0.6-3.8) |
| c-T4 | 0.012 | 3.5 (1.3-9.3) | 0.519 | 0.6 (0.1-2.7) |
| c-N status | 0.690 | 0.416 |
| c-N1 | 0.466 | 1.2 (0.7-2.1) | 0.193 | 0.4 (0.1-1.4) |
| c-N2 | 0.537 | 1.3 (0.4-3.9) | 0.575 | 0.6 (0.1-2.9) |
| c-M status | 0.005 | 6.03 (1.7-20.9) | 0.007 | 6.3 (1.6-24.07) |
| Type of treatment | 0.042 | 0.4 (0.2-0.9) | 0.152 | 0.5 (0.1-1.2) |

SUV$_{\text{max}}$: Maximum standardized uptake value; MPM: Malignant pleural mesothelioma.
Rusch et al.[22] reported that T stage, N stage, and M stage significantly affected survival, with the exception of T1 and T2 and N1 and N2 in an international database analysis.[22] In our study, significant differences were found between c-T1 vs. T4, c-T2 vs. T4 and c-M0 vs. M1 in terms of five-year survivals. Univariate analysis identified that c-T4 status and c-M1 status were negatively associated with OS. Multivariate analysis revealed that M1 status was negatively associated with OS.

Multimodal treatment of MPM with surgery, radiotherapy, and neoadjuvant or adjuvant chemotherapy is the sole path to extended survival for selected patients with favorable prognostic factors. If MPM is in a resectable stage (Stage I-III), macroscopic complete resection via EPP or P/D is the basic concept for surgical approach.[17] The preoperative cardiorespiratory evaluation is necessary for the selection of EPP or P/D cases using the following measurements: pulmonary function test, diffusion capacity, pulmonary scan, complete cardiological study with a stress test for inducible myocardial ischemia, echocardiogram with Doppler, and pulmonary artery measurement.[22] In our study, we found the five-year OS to be 24.9% and 3% with a median OS time of 24 and 13 months in radical surgery group and non-surgery group, respectively (p=0.034). Univariate analysis revealed that non-surgery group was negatively associated with OS.

The 18F-FDG PET/CT is a non-invasive imaging modality which has the ability to visualize and quantify the glucose metabolism of malignancies including MPM. It can be utilized to distinguish malignant from benign pleural effusion and it has better diagnostic consistency than contrast-enhanced CT.[23] The reported SUVmax for malignant effusions in the literature ranges between 1.2 and 27.2.[9,24] These wide variations may be due to pleural thickness differences and histopathological subtypes evaluated. Despite its limitations, 18F-FDG PET/CT seems to be superior to other imaging methods in the diagnosis of MPM. Flores et al.[25] incorporated SUVmax into a prognostic model with stage and histology, suggesting that a SUVmax of ≥10 was associated with poor prognosis. Similarly, the SUVmax was an independent predictor of survival in two other patient series, with cut-off values of 10.7 and 5, respectively.[26,27] In contrast, Nowak et al.[28] reported that FDG-PET volumetric parameters significantly predicted survival, whereas the SUVmax did not. In our study, all patients with MPM showed detectable FDG uptake (median SUVmax =9.8). In particular, baseline total glycolytic volume was included in a nomogram of pre-treatment prognostic factors for MPM. Recently, Klabatsa et al.[29] confirmed TLG and histology as independent prognostic factors, whereas Hooper et al.[30] found baseline total glycolytic volume to be an independent predictor of worse OS in this disease.[31] Moreover, Kadota et al.[32] reported that the baseline level of SUVmax could also identify the subgroup having a worse prognosis among patients with epithelial histology.

Hooper et al.[30] evaluated metabolic PET parameters in 21 MPM patients who received platinum/pemetrexed chemotherapy. They accepted metabolic response as 25% drop in the SUVmax, SUVmean, and TLG and reported no prognostic effect of metabolic response after chemotherapy. However, the authors reported that baseline SUVmax and SUVmean were found to predict for OS. Finally, they concluded that baseline SUVmax >15 and SUVmean >5 were indicators of poor prognosis. Similarly, Lee et al.[33] evaluated pre-treatment PET parameters in 13 MPM patients. They found a significant difference in MTV between subgroups with and without tumor progression. In their multivariate analysis adjusted for treatment modality showed that MTV and TLG were independent factors associated with tumor progression. In the current study, we additionally attempted to describe pre-treatment prognostic factors in our specific epidemic MPM patient group. In the same geographic region, Ozmen et al.[9] reported the results of 51 patients. The authors did not mention the epidemic nature of their sample, but found pleural thickening greater than 13 mm, SUVmax higher than 8.6, and MTV greater than 112 cm³ were associated with poor survival. In our study, we found the five-year OS to be 12.7% and 3.7% with a median OS time of 29 months and 10 months in the patient groups with a SUVmax of <9.8 cm³ and SUVmax of ≥9.8 cm³, respectively (p=0.002). On univariate and multivariate analyses revealed that a SUVmax of ≥9.8 and a SUVmax of ≥9.8 and TLG ≥180.2 g to be negatively associated with OS, respectively.

The initial experience for recently developed integrated PET/MRI systems for MPM was reported from Germany.[10] The evaluation of SUVmean on 18F-FDG PET/CT and apparent diffusion coefficient (ADC) on PET/MRI showed that there was an inverse correlation between the SUVmean and ADCmin. As a novel diagnostic tool, future perspectives of PET/MRI in MPM patients should be well-defined, as well as other tumors.

The limitation of present study; this study was retrospectively performed with patients enrolled from a single center. Therefore, further studies with
multi-center and long-term follow-up are necessary to validate the results of the study.

In conclusion, our study results show that the maximum standardized uptake value, a metabolic positron emission tomography-derived parameter, has a significant prognostic value in patients with malignant pleural mesothelioma. Total lesion glycolysis also appears to be an independent prognostic indicator. Metabolic parameters of $^{18}$F-fluorodeoxyglucose positron emission tomography/computed tomography have the potential to provide prognostic information for malignant pleural mesothelioma patients who are receiving surgery and/or chemotherapy. Despite the limited number of studies and sample sizes, metabolic positron emission tomography parameters seem to have a prognostic value in malignant pleural mesothelioma. Further large-scale, prospective studies are needed to confirm these findings.

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