prevalent. Cachectic patients had significantly higher GDF-15 (1028 ± 663 vs. 655 ± 293 pg/mL; p = 0.034). GDF-15 correlated with sarcopenia (rho=0.270, p=0.009), myosteatosis (rho=0.293, p=0.030), and negatively with skeletal muscle attenuation (rho=-0.451, p=0.003). No significant association was found with PET/CT glucose uptake (mean SUV) in visceral adipose tissue (VAT) (p=0.441), subcutaneous adipose tissue (SAT) (p=0.911), or muscle (p=0.072). In the Colorectal cohort the mean age was 62.5; 54.3% male. Mean BMI was 28.6 (± 5.1) kg/m^2; cachexia (67.4%), myosteatosis (78.9%), and low muscularity (39.5%) were identified. GDF-15 levels did not differ by cachexia status (p=0.554) but were significantly higher in patients with weight loss (795 ± 400 vs. 404 ± 281pg/mL; p = 0.012). VAT area was significantly larger in patients with GDF-15 >1000 pg/mL (230 ± 35 vs. 136 ± 72, p = 0.017). No association was found with PET/CT uptake in VAT (p=0.774) or SAT (p=0.518). **Conclusion:** GDF-15 was associated with cachexia and musculoskeletal impairment in gastric cancer, and with weight loss and visceral adiposity in colorectal cancer. The lack of correlation with PET/CT glucose uptake suggests GDF-15 influences tissue wasting independent of glucose metabolic alterations in these settings. These results highlight GDF-15 as a potential target for personalized therapeutic interventions in gastrointestinal oncology.

Keywords: GDF-15, Cancer cachexia, Gastric cancer, Colorrectal cancer, PET/CT.

Conflicts of interest: Not declared.

Acknowledgments/Funding: FAPESP (2021/10265) Cancer Theranostics Innovation Center CancerThera, CEPID - Centros de Pesquisa, Inovação e Difusão, FAPESP (2022/06239-4), FAPESP (2024/15448-1) and Research scholarship by the Program for Support of Large Research Centers, Office of the Vice-Rector for Research of the University of Campinas (PRP-Unicamp).

https://doi.org/10.1016/j.htct.2026.106330

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METABOLIC ASSESSMENT OF VISCERAL ADIPOSE TISSUE IN PATIENTS WITH GASTRIC CANCER: AN EXPLORATORY ANALYSIS

Barbara Cipriano, Renata Erbert Contriciani, Fabíola Furtuoso Zarpelão, Leo Victor Kim, Larissa Ariel Oliveira Carrilho, Sandra Regina Branbilla, Luiz Roberto Lopes, Nelson Adami Andreollo, Maria Emilia Seren Takahashi, Ligia M. Antunes Correa, Jun Takahashi, Elba C.S.C. Etchebehere, Celso Dario Ramos, Maria Carolina Santos Mendes, José Barreto Campello Carvalheira

Universidade Estadual de Campinas, Campinas, SP, Brazil

Introduction: Visceral adipose tissue (VAT) plays a key role in metabolic and inflammatory regulation and has increasingly been associated with cancer prognosis. Reduced VAT index, along with higher VAT radiodensity and glucose uptake, has been linked to poor outcomes in cancer patients. However, it remains unclear if these alterations result from lipolysis, systemic or tissue inflammation, or adipose tissue beiging/browning. This cross-sectional study aimed to characterize the metabolic profile of VAT in patients with gastric cancer (GC) by integrating imaging-based metabolic assessment with gene expression analysis. **Methodology:** This study analyzed a subgroup of 36 patients with histologically confirmed gastric adenocarcinoma treated at the Clinics Hospital of the University of Campinas (HC-UNICAMP). All patients underwent 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT). PET-derived metabolic activity of VAT was quantified using the mean standardized uptake value (SUVmean). VAT gene expression was evaluated using the nCounter system (Elements panel), targeting genes associated with adipocyte browning and differentiation, including UCP1, PPARGC1A, PRDM16, CIDEA, DIO2, TMEM26, CD137, TBX1, ZIC1, and LHX8. Clinical, nutritional, and inflammatory data were collected, stored and managed using REDCap. Statistical analyses were performed with Jamovi software (v.2.3.28). The study was approved by the Institutional Review Board (CAAE: 76237023.0.0000.5404). Results: Patients were stratified according to VAT radiodensity into low- and high-radiodensity groups based on the median value (16 and 20 patients, respectively). No significant differences were observed between groups regarding demographic or tumor-related characteristics. The high-radiodensity group exhibited a distinct anthropometric and body composition profile, characterized by lower body mass index, smaller waist circumference, and a lower visceral obesity. This group also presented significantly lower visceral and subcutaneous adipose tissue areas and indices, along with higher attenuation of both VAT (p < 0.001) and SAT (p = 0.003). SUVmean increased in the high-radiodensity group (p < 0.001). Gene expression analysis revealed no major differences between groups with low and high VAT 18F-FDG uptake, except for reduced DIO2 expression in the high-uptake group, suggesting attenuated local thyroid hormone–mediated thermogenic signalling. A trend toward higher PPARGC1A expression was observed in the high-uptake group, possibly reflecting early beige adipocyte differentiation, although canonical thermogenic and beige adipocyte markers remained unchanged. No significant differences were observed in systemic inflammatory markers between groups. Patients with lower VAT radiodensity demonstrated greater insulin sensitivity. **Conclusion:** In GC patients, high VAT radiodensity and glucose uptake were associated with reduced adipose tissue mass and a distinct metabolic profile, without evidence of systemic inflammation or established adipose tissue browning. These findings suggest that elevated VAT glucose uptake may reflect an early or heterogeneous metabolic response related to cancer-associated alterations rather than active thermogenic remodeling. Further studies with larger cohorts are warranted to better elucidate the underlying mechanisms and clinical relevance of VAT metabolic changes in gastric cancer.

Keywords: Gastric cancer, Visceral adipose tissue, 18F-FDG PET/CT, gene expression, Radiodensity.

Conflicts of interest: Not declared.

Acknowledgments/Funding: This study was supported in part by FAPESP – Processes #2018/23428-0, #2022/06239-4,

#2023/13673-5, #2024/01746-0, 2024/15448-1, 2024/03958-5, CNPq #140111/2024-7 and Grant FAPESP #2021/10265-8, Cancer Theranostics Innovation Center (CancerThera)/CEPID - Research, Innovation and Dissemination Centers, and Research scholarship by the Program for Support of Large Research Centers, Office of the Vice-Rector for Research of the University of Campinas (PRP-Unicamp).

https://doi.org/10.1016/j.htct.2026.106331

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QUALITATIVE AND SEMIQUANTITATIVE ASSESSMENT OF INTRALESIONAL UPTAKE MISMATCH BETWEEN FDG AND PSMA PET/CT IN NEOPLASTIC LESIONS

Adrhyann Jullyanne de Sousa Portilho, Maria Emilia Seren Takahashi, Simone Kuba, Natália Tobar Toledo Prudente da Silva, Murilo Oliveira Cerci, Carmino Antonio de Souza, Celso Dario Ramos

Universidade Estadual de Campinas, Campinas, SP, Brazil

Positron emission tomography/computed tomography (PET/CT) with [18F]FDG is widely used to assess tumor glycolytic metabolism, whereas [18F]PSMA-1007 or [68Ga]PSMA-11 PET/CT is associated with tumor neovascularization. Notably, some lesions exhibit an intralesional "mismatch", in which different regions within the same lesion demonstrate higher uptake of either [18F]FDG or PSMA-targeted radiotracers, suggesting distinct metabolic phenotypes and possible intratumoral heterogeneity. However, few studies have explored the combined use of these tracers. To evaluate the intralesional distribution of [18F]FDG and ([18F]PSMA-1007 or [68Ga]PSMA-11) in PET/CT images across malignancies using qualitative and semiquantitative parameters, aiming to investigate patterns of intralesional uptake mismatch. This retrospective cross-sectional study included patients with differentiated thyroid cancer, lung cancer, hepatocellular carcinoma, lymphoma, and multiple myeloma undergoing staging or restaging. All patients underwent both [18F]FDG and [18F]PSMA-1007 or [68Ga]PSMA-11 PET/CT within an interval. The largest soft-tissue lesion (or bone lesion with a soft-tissue component) with a maximum diameter = 4 cm was selected for analysis. PET/CT images were evaluated qualitatively and semiquantitatively. Qualitative assessment of intralesional tracer uptake differences was performed using a classification system. Intralesional PSMA distribution relative to FDG uptake was classified as peripheral (1), central (2), diffuse (3), or segmental (4). Semiquantitative parameters, including SUVmax, SUVmean, metabolic tumor volume (MTV), and total lesion metabolism (TLM; MTV × SUVmean), were measured with a PET/CT viewer plug-in for ImageJ (FIJI). MTV was defined using a fixed SUV threshold (= 2.5) for [18F]FDG and uptake above the mediastinal blood pool for PSMA tracers.Eleven patients were included: 3/11 (27%) thyroid cancer, 3/11 (27%) lung cancer, 2/11 (18%) hepatocellular carcinoma, 2/11 (18%) multiple myeloma, and 1/11 (9%) lymphoma (3 males, 8 females; mean age 63.4 ± 13.8 years). Visual analysis demonstrated predominantly peripheral PSMA uptake in 5/11 patients (46%), including all thyroid cancer cases. Segmental PSMA uptake was observed in 3/11 (27%), central uptake in 2/11 (18%), and diffuse uptake in 1/11 (9%). Median (range) SUVmax, SUVmean, MTV, and TLM for PSMA and FDG were respectively: 21.5 (4.9–73) vs 14.8 (4.1–36.6) [p = 0.4389]; 6.22 (2.93–12.5) vs 7 (3–17.6); [p = 0.9314]; 81.7 (3.3–228.9) vs. 77.2 (14.9–313.5) [p = 0.6665]; and 519.5 (9.7–1345.3) vs 716.2 (46.8–4229.2) [p = 0.5457].Intralesional uptake mismatch between FDG and PSMA is highly prevalent across neoplastic lesions from different malignancies. However, semiquantitative parameters did not differ significantly at the population level, possibly due to the limited sample size or because this phenomenon is predominantly spatial and not fully captured by global metrics. The frequent peripheral PSMA uptake pattern may reflect neovascularization surrounding relatively hypoxic or necrotic tumor cores. Segmental and central uptake patterns may suggest the coexistence of distinct tumor cell clones within the same lesion, whereas diffuse uptake may reflect more homogeneous tumor biology. Further studies integrating PET imaging with spatially correlated, multi-site tumor biopsies are warranted to clarify the biological significance of intralesional FDG/PSMA mismatch patterns across different cancers.

Keywords: FDG PET/CT, PSMA PET/CT, Intralesional mismatch, Tumor heterogeneity.

Conflicts of interest: Not declared.

Acknowledgments/Funding: Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) – Processo n° 2021/10265-8 e FAPESP 2023/13788-7.

https://doi.org/10.1016/j.htct.2026.106332

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ASSESSMENT OF THE METABOLIC PROFILE IN GASTRIC CANCER ASSOCIATED CACHEXIA

Leo Victor Kim, Maria Emilia Seren Takahashi, Jun Takahashi, Renata Erbert Contriciani, Fabíola Furtuoso Zarpelão, Larissa Ariel Oliveira Carrilho, Bárbara Zanette Cipriano, Sandra Regina Branbilla, Ligia M. Antunes Correa, Luiz Roberto Lopes, Nelson Adami Andreollo, Elba C.S.C. Etchebehere, Celso Dario Ramos, Maria Carolina Santos Mendes, José Barreto Campello Carvalheira

Universidade Estadual de Campinas, Campinas, SP, Brazil

Introduction: Cancer-associated cachexia is a complex syndrome defined by the progressive loss of fat and skeletal muscle, resistant to conventionally used nutritional interventions. Recent