

# The Assistance of 18F-FDG PET/CT in Prostate Cancer: A Case Report

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## Introduction and overall goal:

The utility of positron emission tomography (PET) with 18F-fluorodeoxyglucose (18F-FDG) in prostate cancer depends on the stage of the disease and the natural history of this malignancy, which is common in men. While FDG uptake in normal benign and malignant tissue can usually overlap significantly, aggressive primary tumors with a Gleason score greater than 7 (4+3) usually have high 18F-FDG uptake.

**Specific aim:** The aim of this case report is to showcase the utility of 18F-FDG PET/CT in the era of 68Ga-PSMA PET/CT, particularly in patients presenting with synchronous malignancies. Synchronous primary prostate and lung cancer is rare.

**Rationale and background:** Due to increased life expectancy and advances in cancer diagnosis and therapy, the incidence of synchronous and metachronous malignancies is increasing worldwide, requiring us to optimize our molecular imaging diagnostic methods.

**Methods and Materials:** We present the case of a 76-year-old man diagnosed with advanced prostate adenocarcinoma with a Gleason score of 8 (4+4) with multiple adenopathic conglomerates supra- and infradiaphragmatic and bone metastases, for which he received chemotherapy. A biopsy of the left supraclavicular lymph nodes confirmed extensive involvement of the lymphatic system. The most recent contrast-enhanced computed tomography (CECT) scan revealed a new pulmonary nodule measuring 14 mm with spiculated margins extending to the visceral pleura in the basal segment of the right lower lung, with apparent involvement of the lymph nodes in the right hilum.

**Results:** A PET/CT scan with 18F-FDG was performed, which showed increased uptake of 18F-FDG of the lung nodule with a SULmax of 4.18 and also revealed an FDG avid lymph nodes (SULmax of 4.08) in the right pulmonary hilum. No uptake was shown in the prostate. Adenopathic conglomerates and bone lesions showed minimal to no uptake of FDG, raising the suspicion of a new primary lung tumor.

**Discussion and conclusion:** While the PET/CT with 68Ga-PSMA is the preferred molecular imaging for staging and monitoring prostate cancer, because of the high specificity and sensitivity in detecting local and metastatic tumors, PET/CT with 18F-FDG can help to assess the primary or secondary origin of a new tumor in a patient presenting with prostate adenocarcinoma with low to no avidity to 18F-FDG.