

# PSMA/PET-Guided Stereotactic Radiosurgery of Intra- and Extra-Axial Brain Metastases in Prostate Cancer

## Open Access

## Abstract

Published 03/05/2025

## Copyright

© Copyright 2025

Fekrmandi et al. This is an open access abstract distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Distributed under

Creative Commons CC-BY 4.0

Fatemeh Fekrmandi <sup>1</sup>, Victor Goulenko <sup>2</sup>, Venkatesh Madhugiri <sup>1</sup>, Dheerendra Prasad <sup>3</sup>

<sup>1</sup>. Radiation Oncology, Roswell Park Comprehensive Cancer Center, Buffalo, USA <sup>2</sup>. Division of Gamma Knife Radiosurgery, Roswell Park Cancer Institute, Buffalo, USA <sup>3</sup>. Neurosurgery and Radiology, Roswell Park Cancer Institute, Buffalo, USA

**Corresponding author:** Fatemeh Fekrmandi, fatemeh.fekrmandi@roswellpark.org

**Categories:** Medical Physics, Radiation Oncology

**Keywords:** brain metastases, prostate cancer, psma/pet-guided stereotactic radiosurgery

## How to cite this abstract

Fekrmandi F, Goulenko V, Madhugiri V, et al. (March 05, 2025) PSMA/PET-Guided Stereotactic Radiosurgery of Intra- and Extra-Axial Brain Metastases in Prostate Cancer. Cureus 17(3): a1477

## Abstract

Objectives:

Prostate-specific membrane antigen targeted molecular imaging with positron emission tomography (PSMA/PET) is being increasingly incorporated into the clinical care of patients with suspected metastatic or biochemically recurrent prostate cancer, allowing for metastatic directed therapies as well as PSMA targeted radionuclide therapies with significant survival benefits. Brain metastases from prostate cancer are rare, and historically portend poor prognosis. We are presenting a case series of prostate cancer patients with intra and extra-axial brain metastasis detected on PSMA/PET imaging between 2020-2024.

Methods:

A prospectively collected database was queried for prostate cancer patients who underwent brain SRS from 1/2020 to 10/2024 in an NCI-designated Comprehensive Cancer Center. The patients who underwent F18-PSMA/PET imaging preceding SRS were identified, and their clinical course and imaging findings were reviewed.

Results:

Among nineteen prostate cancer patients who had received brain SRS, nine had undergone PSMA/PET imaging in biochemical recurrent setting, yielding new diagnosis of brain metastases. Three patients had received Lutetium-177 PSMA therapy (Pluvicto) for metastatic skeletal disease a priori. At the time of PSMA/PET imaging, median age was 64years (range: 49-86). Five patients were asymptomatic, two had headaches and two suffered from neurologic changes. One patients had single brain metastasis and four had multiple, and four had calvarium/dural based lesions, with mean standardized uptake values (SUV) of 12.5 (range 6.7-19.5) on PSMA/PET. Brain MRI was acquired for all patients and showed corresponding findings, although extent of base of skull involvement was better delineated with PSMA/PET. Median time to SRS from PSMA/PET imaging acquisition was 3weeks (range 0-15) and two patients had post-SRS resection. Median dose of 18Gy (range 12-21) in 1 fraction was delivered utilizing frame-less Gamma Knife radiosurgery. Patients were followed with subsequent PSMA/PET and/or brain MRIs. No in-field recurrences were seen in median follow up of 6.5months (range 2-24), four required SRS to other brain lesions and three have since died. Three patients had SRS in conjunction with Pluvicto, with no evidence of increased acute radiation toxicity.

Conclusion(s):

Brain metastases from prostate cancer are rare though can be effectively treated with SRS. PSMA/PET imaging combined with brain MRI allows for increased identification of brain metastasis and radiosurgery target delineation. Safety and sequencing of radionuclide therapy and SRS needs to be further studied.