

Meningioma Revisited: Should Whole-Body Staging with [⁶⁸Ga]Ga-DOTATOC PET/CT of High-Grade Meningiomas Become Standard Practice?

Ekin Ermiş¹, Nicolas Bachmann¹, Katharina Lutz², and Thomas Pyka³

¹Department of Radiation Oncology, Bern University Hospital, University of Bern, Switzerland; ²Department of Neurosurgery, Bern University Hospital, University of Bern, Switzerland; and ³Department of Nuclear Medicine, Bern University Hospital, University of Bern, Switzerland

Metastatic meningioma is known as a rare and aggressive entity (1). Considering its uncommon nature, no established consensus on management is available. Patients often have a poor prognosis, with survival estimated at 50% at 4 y (2). Grade 2 and 3 meningiomas are associated with aggressive behavior and are classified as malignant disease. Because of the presumed local nature of the disease, extracranial staging is not routinely performed.

[⁶⁸Ga]Ga-DOTATOC PET/CT offers advantages for differential diagnosis, treatment planning, and response assessment (3). However, this modality is not yet standard for whole-body staging in patients with high-grade meningiomas. With the advent of PET/CT scanners that have a long axial field of view, whole-body scans for these patients would be possible (4).

Two women, aged 54 and 56 y, who had a history of recurrent grade 3 meningioma and initially underwent local therapies, were incidentally diagnosed with spine and lung metastases found on [⁶⁸Ga]Ga-DOTATOC PET/CT (Fig. 1). PET/CT was performed to guide surgery for intracranial recurrences. Metastatic disease was confirmed with further biopsy. Both patients were asymptomatic. Following multidisciplinary team recommendations, the first patient was treated with stereotactic ablative radiotherapy of the spine. At the 6-mo follow-up, no local failure was detected. The other patient underwent surgery for lung metastasis. She experienced disease recurrence, with multiple new intracranial meningiomas in a shorter follow-up. Radiopeptide ¹⁷⁷Lu-DOTATOC treatment followed, but no clear response was noted. Additional systemic therapy with bevacizumab and everolimus was initially planned; however, her clinical status did not allow it, and the patient died because of further progression.

Given the increasing availability of PET/CT imaging and scanners allowing for routine whole-body imaging, extracranial staging at initial diagnosis or at the time of recurrence could significantly impact the treatment management of malignant meningiomas. Further research is warranted to better define the risk factors for

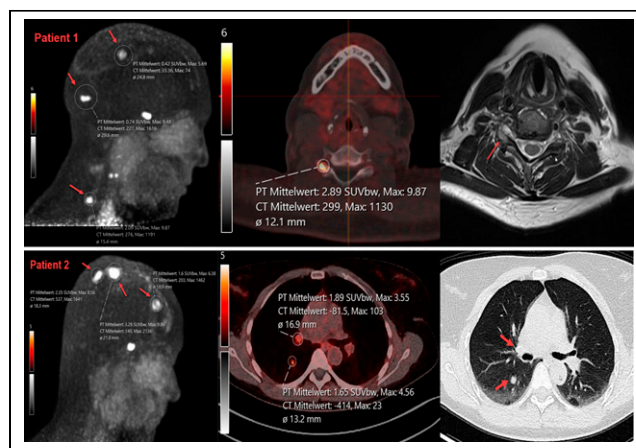


FIGURE 1. (Left) Three-dimensional PET imaging demonstrating intracranial meningiomas (arrows). (Middle) Axial [⁶⁸Ga]Ga-DOTATOC PET/CT. (Right) T2-weighted MRI of C7 spine (top) and CT of right lung (bottom). Metastases are marked with arrows. Intensity scale bars are SUV. Injected activity, uptake time, and scan duration were 162 MBq, 54 min, and 15 min, respectively, for patient 1 and 151 MBq, 39 min, and 15 min, respectively, for patient 2.

metastatic disease and to identify patients at higher risk who would benefit from staging and corresponding treatments.

DISCLOSURE

No potential conflict of interest relevant to this article was reported.

REFERENCES

- Himić V, Burman RJ, Fountain DM, Hofer M, Livermore LJ, Jeyaretna DS. Metastatic meningioma: a case series and systematic review. *Acta Neurochir (Wien)*. 2023;165:2873–2883.
- Vuong HG, Ngo TNM, Dunn IF. Incidence, risk factors, and prognosis of meningiomas with distant metastases at presentation. *Neurooncol Adv*. 2021;3:vdab084.
- Kunz WG, Jungblut LM, Kazmierczak PM, et al. Improved detection of transosseous meningiomas using ⁶⁸Ga-DOTATATE PET/CT compared with contrast-enhanced MRI. *J Nucl Med*. 2017;58:1580–1587.
- Alberts I, Sari H, Mingels C, et al. Long-axial field-of-view PET/CT: perspectives and review of a revolutionary development in nuclear medicine based on clinical experience in over 7000 patients. *Cancer Imaging*. 2023;23:28.

Received Jun. 23, 2024; revision accepted Oct. 15, 2024.

For correspondence or reprints, contact Ekin Ermiş (ekin.ermis@insel.ch).

Published online Nov. 21, 2024.

COPYRIGHT © 2025 by the Society of Nuclear Medicine and Molecular Imaging.

DOI: 10.2967/jnumed.124.267934