Metastatic Malignant Peripheral Nerve Sheath Tumor: Imaging Findings in a Case Report

Saloni Rajkotia[1], Ritesh Suthar[1], Abhishek Palsapure[1], Jahnavi Gandhi[2]

[1] Department of Nuclear Medicine, The Gujarat Cancer and Research Institute, Ahmedabad, India

[2] Department of Oncopathology, The Gujarat Cancer and Research Institute, Ahmedabad, India

Corresponding author: Ritesh Suthar · riteshsuthar264@gmail.com

Received: 4 January 2025 · Accepted and published: 29 January 2025

Swiss Journal of Radiology and Nuclear Medicine · https://www.sjoranm.com · SJORANM GmbH · Switzerland

Abstract

A 28-year-old woman with a history of acoustic neuroma presented with six months of progressive dorsolumbar pain, occasional lower-limb numbness and mild weakness. MRI demonstrated an invasive heterogeneous paraspinal mass extending along the nerve roots. Biopsy showed findings consistent with malignant peripheral nerve sheath tumor (MPNST). FDG PET/CT demonstrated uptake in the primary mass and pulmonary nodules considered metastatic on imaging. The primary tumor was considered unresectable, and chemotherapy and radiotherapy were initiated. This case illustrates the complementary roles of tissue diagnosis, MRI and FDG PET/CT in the assessment of MPNST with suspected pulmonary metastases.

Keywords: FDG PET/CT, MPNST, nerve sheath tumor, metastatic

Clinical Features

A 28-year-old woman presented with six months of progressively worsening dorsolumbar pain. The pain was dull and constant and was exacerbated by movement. She also experienced occasional lower-limb numbness and had a history of acoustic neuroma. On examination, mild lower-limb weakness and tenderness over the dorsolumbar spine were noted. No palpable mass was identified.

Radiological Findings

Initial dorsolumbar radiographs showed an irregular paraspinal mass adjacent to the vertebral bodies. MRI demonstrated a large heterogeneous mass extending along the nerve roots, with necrosis and contrast enhancement. The lesion appeared to infiltrate surrounding tissues and involve the adjacent vertebrae.

Pathological Findings

Biopsy of the dorsolumbar mass showed spindle-shaped cells arranged in fascicles, mitotic activity and areas of necrosis. Immunohistochemical staining was reported as positive for S-100, vimentin and nerve growth factor receptor. The combined pathological findings were consistent with MPNST (Figure 1).

Open Access · CC BY 4.0 · © 2025 The Author(s) · Published by SJORANM GmbH, Switzerland
ISSN 2813-7221 · Swiss J. Radiol. Nucl. Med. 2025 15(1):1-4 · DOI 10.59667/sjoranm.v15i1.12

Histopathology

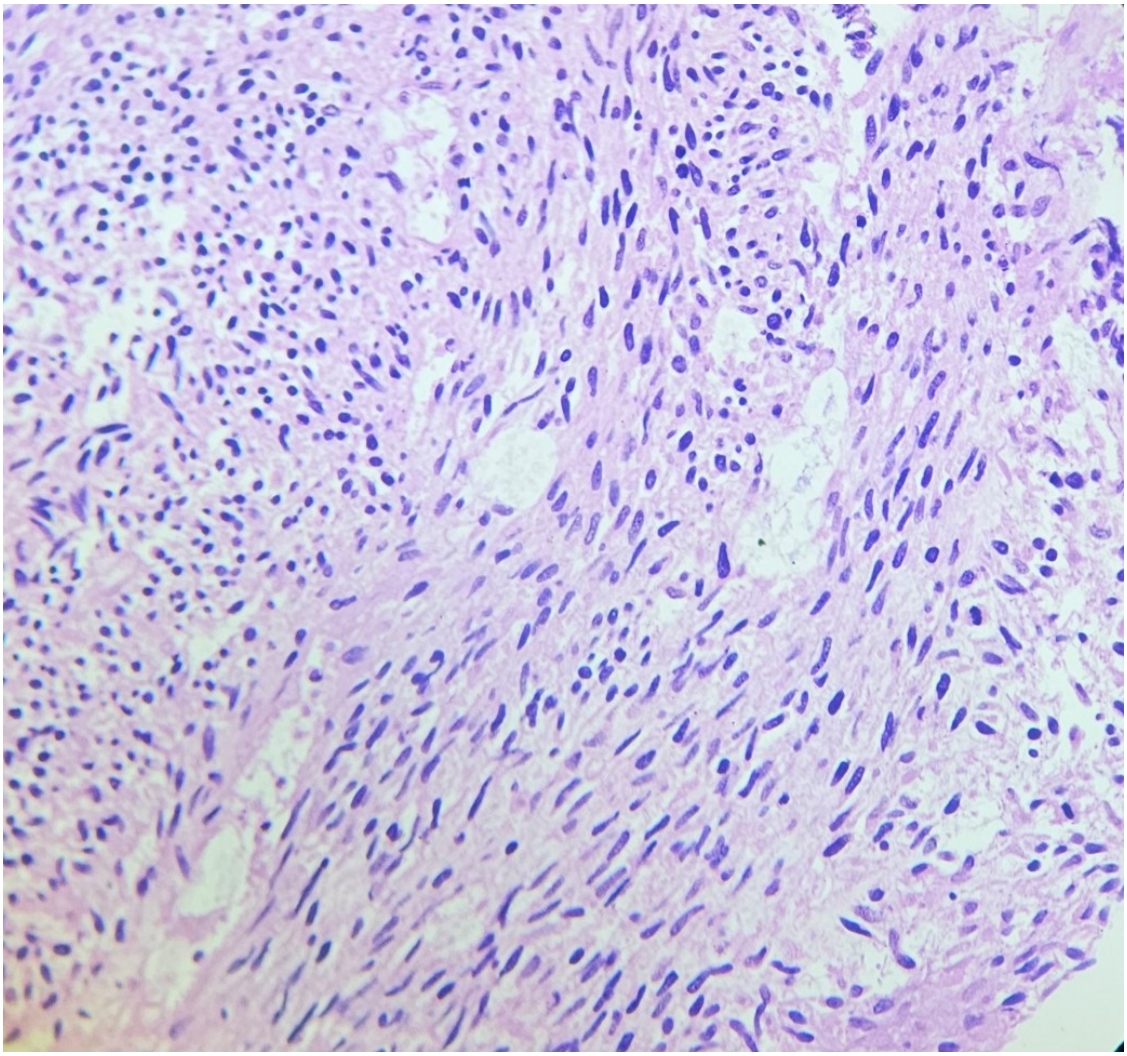


Figure 1. H&E microscopy shows a tissue fragment with spindle cells arranged in fascicles, moderate cytoplasm and oval hyperchromatic nuclei, consistent with the reported diagnosis of MPNST.

FDG PET/CT Findings

Whole-body FDG PET/CT was performed to assess disease extent. The dorsolumbar mass showed increased FDG uptake. FDG-avid pulmonary nodules were considered suspicious for metastases from the primary MPNST (Figure 2).

Management and Intervention

Systemic chemotherapy with doxorubicin and ifosfamide was considered, and palliative radiotherapy to the primary dorsolumbar tumor was recommended for pain relief and local control. Resection was considered infeasible because of tumor size, infiltration of surrounding structures and metastatic disease. Chemotherapy and radiotherapy were initiated, with follow-up planned to assess response and progression. The patient was counselled regarding the poor prognosis associated with advanced disease.

Open Access · CC BY 4.0 · © 2025 The Author(s) · Published by SJORANM GmbH, Switzerland
ISSN 2813-7221 · Swiss J. Radiol. Nucl. Med. 2025 15(1):1-4 · DOI 10.59667/sjoranm.v15i1.12

FDG PET/CT Images

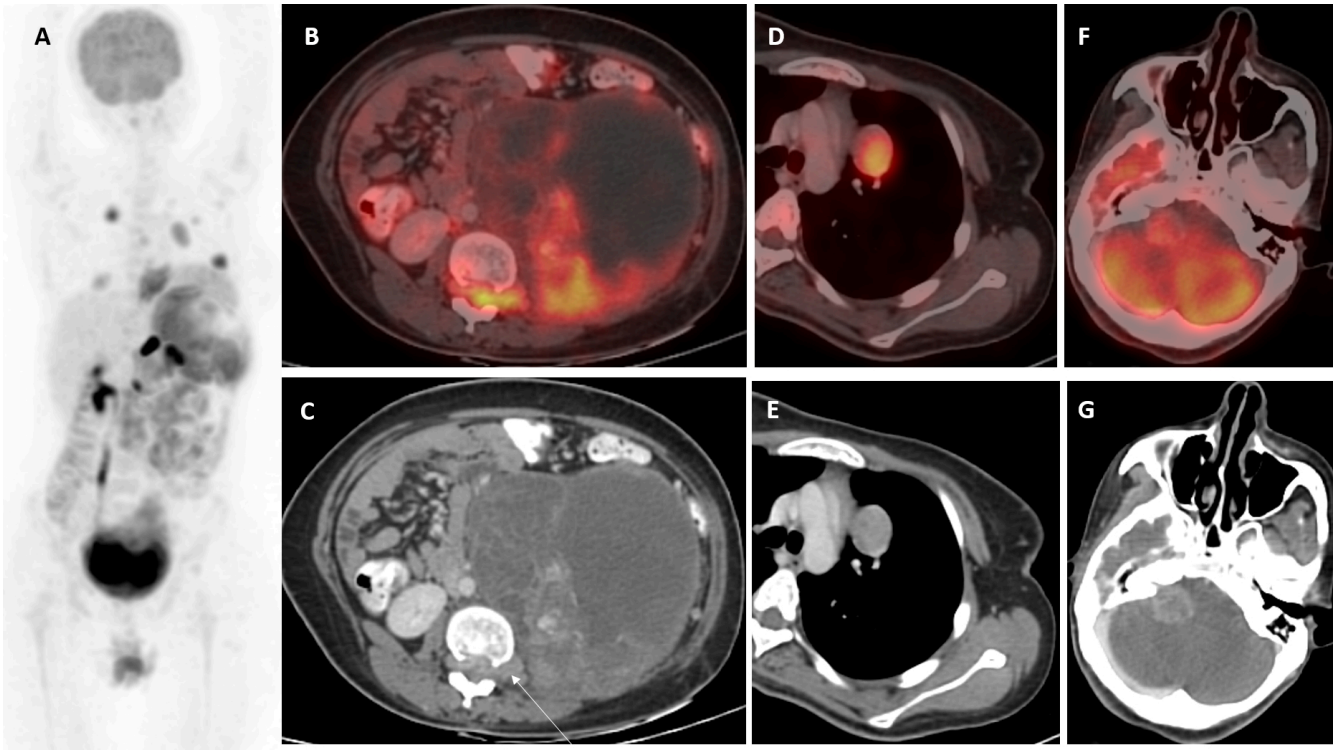


Figure 2. (A) Maximum-intensity projection shows multiple foci of FDG uptake in the abdomen and thorax. (B, C) A large FDG-avid heterogeneous mixed solid and cystic mass in the left lumbar fossa communicates with the adjacent neural exit foramen (arrow in C). (D, E) An FDG-avid pulmonary nodule is suspicious for metastasis. (F, G) A right cerebellopontine-angle lesion corresponds to the reported acoustic neuroma.

Discussion

In this patient, tissue examination established the diagnosis of MPNST, while MRI delineated local extension and FDG PET/CT showed the distribution of metabolically active lesions. Geitenbeek et al. investigated FDG PET/CT for detecting MPNST among patients with NF1 [1]; this does not make PET uptake alone a histological diagnosis or establish the genetic classification of the present case. The pulmonary nodules were considered metastatic on imaging. The patient was treated with chemotherapy and radiotherapy because the primary lesion was considered unresectable and metastatic disease was suspected. Kar et al. described clinicopathological findings and treatment outcomes in a retrospective series of 24 patients [2]. Treatment and prognosis should be discussed in relation to disease extent and resectability rather than inferred from imaging alone.

Conclusion

This case illustrates the complementary roles of tissue diagnosis, MRI and FDG PET/CT in evaluating an invasive MPNST with pulmonary lesions considered metastatic on imaging. The reported history of acoustic neuroma is retained without assigning a hereditary or sporadic classification.

Open Access · CC BY 4.0 · © 2025 The Author(s) · Published by SJORANM GmbH, Switzerland
ISSN 2813-7221 · Swiss J. Radiol. Nucl. Med. 2025 15(1):1-4 · DOI 10.59667/sjoranm.v15i1.12

Correspondence

Dr. Ritesh Suthar · Department of Nuclear Medicine · The Gujarat Cancer and Research Institute · Civil Hospital Campus, Asarwa · Ahmedabad 380016, Gujarat, India

Email: riteshsuthar264@gmail.com · ORCID: https://orcid.org/0000-0002-9383-069X

Phone: +91-79-22688000 · Fax: +91-79-22685490

Author Identifiers

Saloni Rajkotia: https://orcid.org/0009-0008-3089-6705

Abhishek Palsapure: https://orcid.org/0009-0005-9897-8393

Conflict of Interest

The authors declare that there were no conflicts of interest within the meaning of the recommendations of the International Committee of Medical Journal Editors when the article was written.

Disclaimer and Publisher's Note

The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of Swiss J. Radiol. Nucl. Med. and/or the editor(s). Swiss J. Radiol. Nucl. Med. and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

License Policy

This work is licensed under a Creative Commons Attribution 4.0 International License: https://creativecommons.org/licenses/by/4.0/ . This license requires that reusers give credit to the creator. It allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, even for commercial purposes.

LinkedIn Profile of SJORANM

Visit the journal's LinkedIn profile for radiology and nuclear medicine updates. https://www.linkedin.com/in/sjoranm-swiss-j-radiol-nucl-med-4b00b427a/

References

1. Geitenbeek RTJ, Martin E, Graven LH, et al. Diagnostic value of 18F-FDG PET-CT in detecting malignant peripheral nerve sheath tumors among adult and pediatric neurofibromatosis type 1 patients. J Neurooncol. 2022;156(3):559–567. https://doi.org/10.1007/s11060-021-03936-y

2. Kar M, Deo SVS, Shukla NK, et al. Malignant peripheral nerve sheath tumors (MPNST) – Clinicopathological study and treatment outcome of twenty-four cases. World J Surg Oncol. 2006;4:55. https://doi.org/10.1186/1477-7819-4-55

Open Access · CC BY 4.0 · © 2025 The Author(s) · Published by SJORANM GmbH, Switzerland
ISSN 2813-7221 · Swiss J. Radiol. Nucl. Med. 2025 15(1):1-4 · DOI 10.59667/sjoranm.v15i1.12