ISSN: 3069-0676

Case Report

Journal of Clinical & Surgical Sciences

Malignant Peripheral Nerve Sheath Tumor in a Patient with Recurrent Scalp Neurofibroma: Diagnostic and Surgical Considerations

Godfrey Rukwava[1*], Garikai Mwale[2], and Kazadi Kalangu[3]

[1]Neurosurgery Registrar, Department of Neurosurgery, Mpilo Central Hospital
[2]Consultant and head of Department Neurosurgery, Mpilo Central Hospital
[3]Professor and Head of Department of Neurosurgery, University of Zimbabwe

[*]Corresponding author:
Godfrey Rukwava, Neurosurgery Registrar, Department of Neurosurgery, Mpilo Central Hospital, Zimbabwe.

Abstract

Neurofibromas are benign peripheral nerve sheath tumors that may undergo malignant transformation into malignant peripheral nerve sheath tumors (MPNSTs). Malignant change is uncommon but should be suspected in cases of rapid growth, pain, ulceration, or associated neurological deficits. We report a case of a 61-year-old male patient with a history of multiple scalp neurofibroma excisions. The patient initially presented with a progressively enlarging scalp mass over one year, associated with intermittent headaches and progressive visual loss for two years. The mass, initially excised in South Africa in 2023 and later re-excised in Zimbabwe in 2024, was histologically confirmed as a neurofibroma. Despite surgical interventions, the patient developed recurrent symptoms, including worsening headaches radiating to the left shoulder, increasing pain, cosmetic deformity, and continued visual deterioration following the first surgery. The rapid regrowth, associated neurological deficits, and local aggression raised strong suspicion of malignant transformation into MPNST.MPNSTs arising from pre-existing neurofibromas are aggressive neoplasms with poor prognosis, often presenting with rapid enlargement, pain, and neurological compromise. In this case, recurrent growth despite multiple resections and progressive neurological sequelae underscore the importance of maintaining a high index of suspicion for malignant transformation, particularly in patients with recurrent or symptomatic neurofibromas. Histological evaluation remains the gold standard, though repeat sampling may be required due to overlapping features with benign lesion.

Keywords: Malignant Peripheral Nerve Sheath Tumor, Neurofibroma, Scalp Tumor, Malignant Transformation, Peripheral Nerve Tumors, Surgical Management, Neurofibromatosis Type 1, Case Report.

Received: January 19, 2026;
Accepted: January 25, 2026;
Published: Febuary 02, 2026

Abbreviations

MPNST: Malignant Peripheral Nerve Sheath Tumor,
ANNUBP: Atypical Neurofibromatous Neoplasm of Uncertain Biological Potential,
CDKN2A/B: Are Tumor Suppressor Genes Located at Chromosome 9p21.3.
NF1: Neurofibromatosis Type 1,
RAS-MAPK: Rat Sarcoma - MAPK (Mitogen-Activated Protein Kinase)
Tenofovir Lamivudine, Dolutegravir,
PI3K - AKT: mTOR -Phosphatidylinositol 3-Kinase -Protein Kinase B-Mechanistic Target of Rapamycin.

Introduction

Malignant Peripheral Nerve Sheath Tumor (MPNST) is an aggressive soft tissue sarcoma arising from Schwann cells or their precursors, frequently associated with Neurofibromatosis type 1 (NF1), prior radiation exposure, or sporadically in the general population. Approximately 8-13% of NF1 patients develop MPNST in their lifetime [1,2]. MPNSTs are characterized by rapid growth, local invasion, a high rate of recurrence, poor response to conventional chemotherapy, and overall poor prognosis [3,4]. Because of their aggressive biology,

Citation: Godfrey Rukwava, Garikai Mwale, and Kazadi Kalangu (2026) Malignant Peripheral Nerve Sheath Tumor in a Patient with Recurrent Scalp Neurofibroma: Diagnostic and Surgical Considerations. J Clin & Sur Sci 2: 1-5.

wide surgical resection with negative margins remains the primary curative option, though in many cases complete resection is challenging due to tumor size, location, or patient comorbidities [3,5]. In recent years, advances in molecular genetics have deepened understanding of MPNST pathogenesis. Loss of function mutations in NF1, alterations in CDKN2A/B, and dysregulation of pathways such as RAS-MAPK, PI3K-AKT-mTOR, and epigenetic regulators, including the polycomb repressive complex 2, PRC2, are being identified as key drivers [6,7]. These molecular insights have opened potential avenues for targeted therapies and early detection strategies, especially in NF1 patients with plexiform neurofibromas or atypical neurofibromatous neoplasms of uncertain biological potential (ANNUBP), which may serve as precursor lesions [5-7]. Despite these advances, MPNST remains a disease with high morbidity and mortality, especially in resource-limited settings. Delays in diagnosis, limited surgical resources, and lack of access to molecular diagnostic tools and therapies contribute to worse outcomes. This case and others highlight the importance of recognizing clinical red flags (rapid enlargement, pain, ulceration, neurological symptoms), obtaining histological confirmation, and pursuing multidisciplinary management.

Case

A 61 years aged HIV-positive male patient with a history of multiple scalp neurofibroma excisions presented with progressively enlarging scalp masses, headaches radiating to the left shoulder, and progressive visual loss since 2023, following the first surgery in South Africa. Subsequent excision in Zimbabwe also yielded histology consistent with neurofibroma. On current presentation, two large scalp lesions were noted: an extensively large occipital mass extending to the side of the neck (12 × 10 × 12 cm) and a left forehead mass (5 × 6 × 4 cm), with associated right scalp thinning. The masses were painful, cosmetically deforming, and associated with neurological compromise, raising suspicion of malignant transformation.

Staged surgical excision was performed due to intraoperative hemodynamic instability and bleeding. Intraoperatively, the tumor was lobulated with fluid-filled pockets and necrotic areas. Piecemeal debulking was done, and histology confirmed malignant peripheral nerve sheath tumor (MPNST). The patient was managed postoperatively in HDU, discharged home a week later, commenced on ART (TLD), and is currently on multidisciplinary follow-up with plans for recruitment into a selumetinib trial at PGH. He is being reviewed monthly in the neuro-oncology clinic.

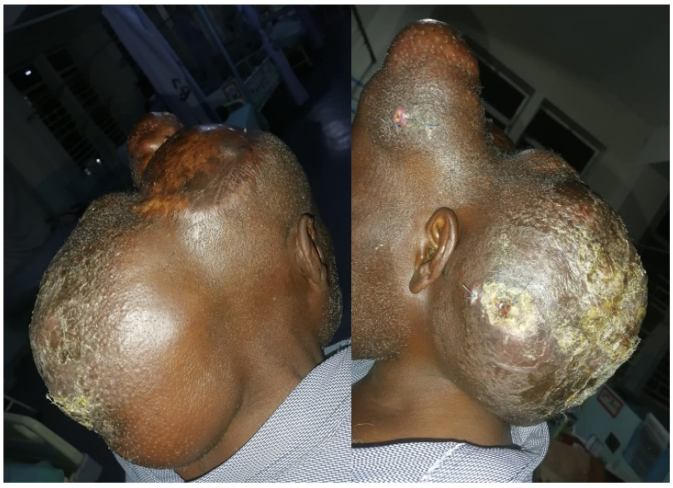

Figure 1: Posterior view and lateral view of the scalp lesion on presentation

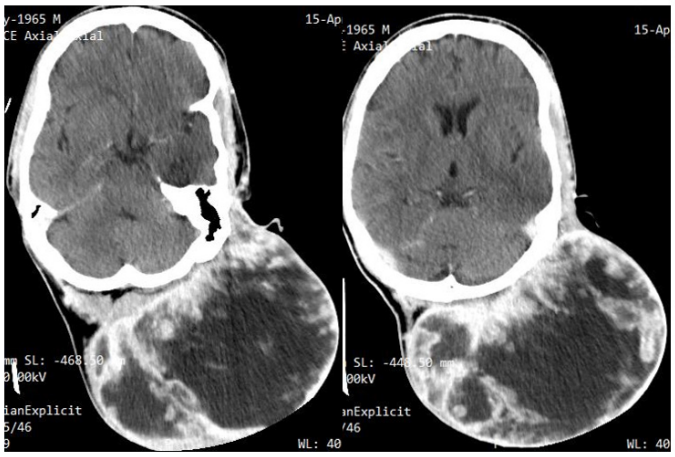

Figure 2: CT scan of Brain

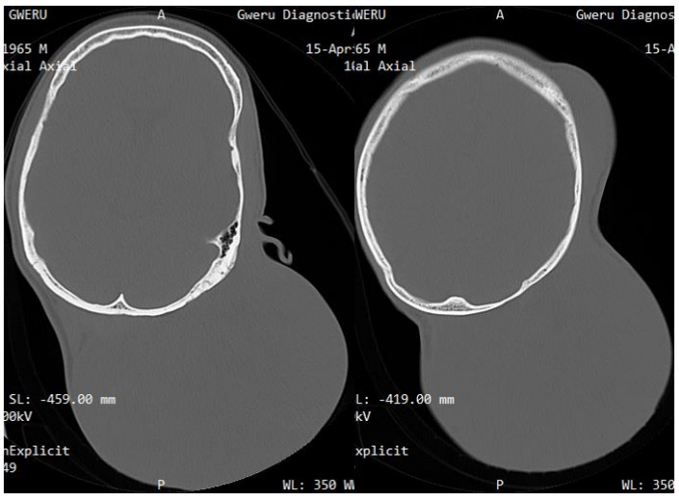

Figure 3: CT scan Bone window

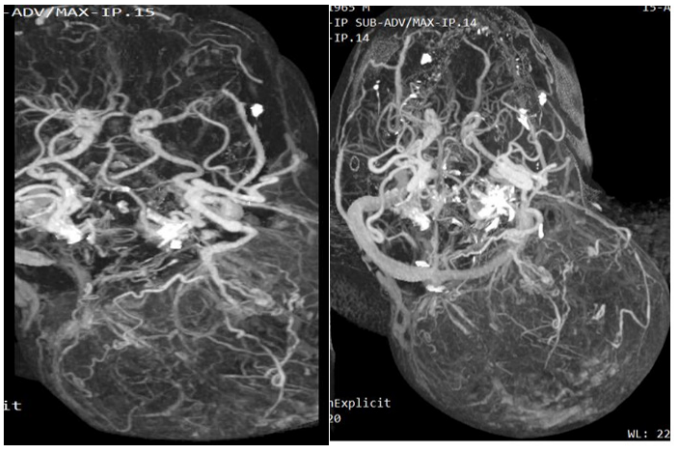

Figure 4: CT Angiography

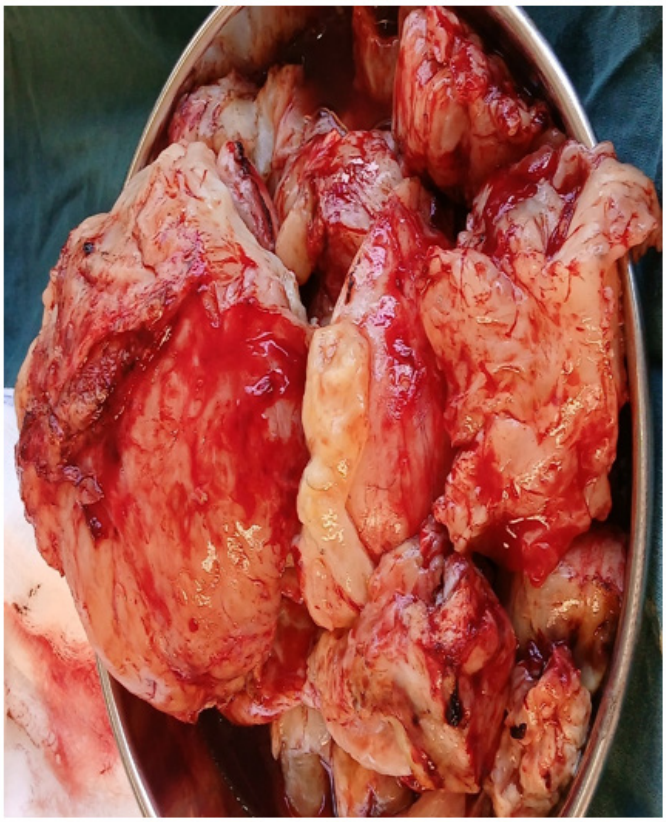

Figure 5: Intraoperative images first surgery

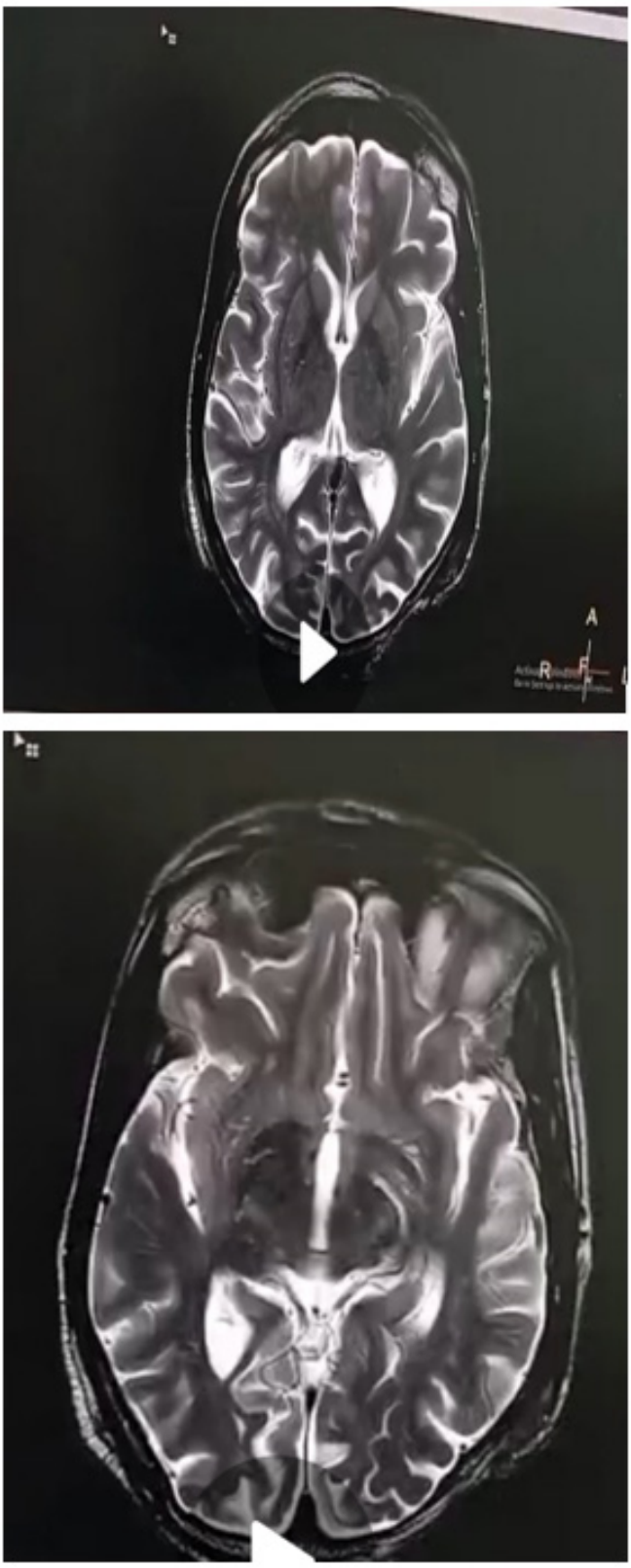

Figure 6: MRI scan Brain post first surgery

Figure 7: Post second stage surgical debulking

Discussion

This patient's presentation is highly suggestive of malignant peripheral nerve sheath tumor (MPNST) arising from prior neurofibroma excisions, illustrating malignant transformation of a benign lesion. Several features support this diagnosis. The clinical history and evolution show a scalp mass progressing over one year in a patient with a history of prior neurofibroma resections, an archetypal sequence for transformation from benign to malignant nerve sheath tumor. Many MPNSTs arise from preexisting neurofibromas, particularly plexiform types, in up to 60% of cases [8,9]. Aggressive features such as rapid enlargement, pain, ulceration, cosmetic deformity, necrosis, as observed intraoperatively, and neurological symptoms including headache and visual impairment indicate high-grade behavior and probable invasion into adjacent structures such as the skull, dura, or even intracranial extension [9-11].

Imaging and anatomical burden further substantiate this: the large scalp lesions, occipital region measuring approximately 12×10×12 cm and the left frontal mass measuring 5×6×4 cm, with associated scalp thinning and mass effect indicate extensive local involvement. Such giant MPNSTs of the scalp have been rarely reported in the literature [12]. Histologic confirmation from the second surgery, which revealed malignant peripheral nerve sheath tumor, conclusively confirmed malignant transformation.

Differential diagnoses, while considered, are less likely. Recurrent benign neurofibroma would typically exhibit slower growth and lack necrosis, ulceration, and neurological symptoms. Malignant transformation into other sarcomas such as malignant fibrous histiocytoma or dermatofibrosarcoma protuberans is possible but less commonly associated with a background of neurofibroma. Cutaneous or scalp sarcomas such as angiosarcoma or Kaposi sarcoma, especially relevant given the patient's HIV-positive status, were excluded based on clinical and histopathological findings. Metastatic lesions to the scalp are also less probable given the long-standing local history and features of direct progression.

Although MPNST is not classically associated with HIV, immunosuppression could theoretically influence tumor biology, secondary malignancy risk, and treatment tolerance. MPNSTs of the scalp are exceedingly rare. Firdaus et al. reported two cases of giant scalp MPNSTs with intracranial extension, while Wang et al. described similar cases emphasizing the surgical challenges associated with achieving clear margins [8,10]. The literature indicates that complete resection with wide margins followed by adjuvant radiotherapy remains the best chance for local control [12]. However, many scalp MPNSTs present late with dural or bony invasion, rendering total excision difficult and leading to poor prognosis [8,13]. Case series also highlight that recurrence and metastasis are common, particularly in cases of incomplete resection or positive margins [14].

Management in this patient was particularly challenging. Intraoperative hemodynamic instability and significant bleeding necessitated staging of the resection. Complete end bloc excision was not feasible in a single session, thus raising the risk of residual disease. The extensive tumor burden and local invasion made achieving clear margins difficult however it was achieved. Furthermore, the patient's HIV-positive status and recent initiation of ART (TLD regimen) may affect tolerance to systemic or adjuvant therapies. Access to adjuvant radiotherapy or chemotherapy is often limited, and their benefit in scalp MPNSTs remains uncertain.

Given the poor response to conventional therapy, emerging targeted therapies such as MEK inhibition are of special interest. Selumetinib, a MEK inhibitor, has shown promise in NF1-related MPNSTs by targeting the MAPK pathway, which is frequently dysregulated in these tumors. The SARC031 trial is evaluating selumetinib in combination with sirolimus for unresectable or metastatic MPNSTs [15,16]. Combination strategies targeting both MEK and mTOR pathways may enhance treatment response [14]. Additionally, the SCART trial evaluated selumetinib in HIV-positive patients with Kaposi sarcoma, demonstrating safety and feasibility of MEK inhibition in patients on ART [17]. Although focused on a different malignancy, these results support the rationale for considering selumetinib in MPNST in HIV-positive patients. The plan to recruit this patient into the selumetinib trial at PGH is therefore well-founded, provided careful monitoring for drug interactions and immune status.

The overall prognosis for scalp MPNST remains guarded. Poor prognostic factors include large tumor size (>5 cm), high-grade histology, incomplete resection, and local invasion [13]. Given the likelihood of residual disease after staged surgery, adjuvant radiotherapy, if available, or inclusion in a targeted therapy clinical trial offers the best opportunity for improved local control and delayed recurrence. This case underscores the clinical and biological complexity of scalp MPNST, especially in immunocompromised patients, and highlights the importance of multidisciplinary management, access to novel therapies, and consideration of clinical trial enrollment in optimizing outcomes

Conclusions

This case highlights a rare and clinically significant example of malignant peripheral nerve sheath tumor (MPNST) of the scalp arising from a pre-existing neurofibroma in an HIV-positive patient. The patient's history of multiple neurofibroma excisions, followed by the development of a rapidly enlarging,

painful, and ulcerated scalp mass associated with neurological symptoms, is strongly suggestive of malignant transformation. Histopathological confirmation following the second surgical resection substantiates the diagnosis of MPNST. The aggressive local behavior, size, and evidence of necrosis, combined with neurological compromise, reflect advanced disease with likely invasion of adjacent structures such as the skull and dura, as described in similar cases in the literature.

References

1. Xiao K, Yang K, Hirbe AC (2025) A Sequencing Overview of Malignant Peripheral Nerve Sheath Tumors: Findings and Implications for Treatment. Cancers (Basel) 17: 180.
2. Mitchell DK, Brewster K, Makri SC, Khan J, Albright EA, et al. (2025) Distinguishes Subsets of NF1-Associated Malignant Peripheral Nerve Sheath Tumors with Divergent Molecular Signatures. Clin Cancer Res 31: 1988-2009.
3. Seres R, Hameed H, McCabe MG, et al (2024) The Multimodality Management of Malignant Peripheral Nerve Sheath Tumours. Cancers (Basel) 16: 3266.
4. Somatilaka BN, Sadek A, McKay RM, Russell D, Lee Alexander TJ, et al. (2022) Malignant peripheral nerve sheath tumor: models, biology, and translation. Oncogene 41: 2405-2421.
5. Yao C, Zhou H, Dong Y, Alhaskawi A, Ezzi SHA (2023) Malignant Peripheral Nerve Sheath Tumors: Latest Concepts in Disease Pathogenesis and Clinical Management. Cancers 15: 1077.
6. Knight SWE, Knight TE, Santiago T, Murphy AJ, Abdelhafeez AH, et al. (2022) Malignant Peripheral Nerve Sheath Tumors-A Comprehensive Review of Pathophysiology, Diagnosis, and Multidisciplinary Management. Children (Basel) 9: 38.
7. Somaiah N, Paudyal B, Winkler RE, Van Tine BA, Hirbe AC, et al. (2024) Malignant Peripheral Nerve Sheath Tumor, a Heterogeneous, Aggressive Cancer with Diverse Biomarkers and No Targeted Standard of Care: Review of the Literature and Ongoing Investigational Agents. Target Oncol 19: 665-678.
8. Wang J, Ou Sw, Guo Zz, Wang Y-j, Xing D-g, et al. (2013) Microsurgical management of giant malignant peripheral nerve sheath tumor of the scalp: two case reports and a literature review. World J Surg Onc 11: 269.
9. Bin Abdul Halim WMA, Bin Mat Hassan S, Hassan SBM, Awang MB, Abdullah MAH, et al. (2024) Malignant Transformation of Plexiform Neurofibroma Due to Neglected Giant Soft Tissue Swelling of the Back: A Case Report. Cureus 16: e63807.
10. Firdaus M, Gill AS, Mukarramah DA, Andriani Rini, Sari L, et al. (2018) Malignant peripheral nerve sheath tumor of the scalp: Two rare case reports. Surg Neurol Int 9: 102.
11. Alabado JC, Valera E, Valencia PV (2021) Malignant Transformation of a Neurofibroma. Journal of Ophthalmic Science- 2: 22-30.
12. Farid M, Demicco EG, Garcia R, Ahn L, Merola PR, et al. (2014) Malignant peripheral nerve sheath tumors. Oncologist 19: 193-201.
13. Jha VC, Alam MS, Sinha VS (2023) Malignant Peripheral Nerve Sheath Scalp Tumor: A Short-Term Institutional Experience with Literature Review. AJNS 18: 157-164.
14. González-Muñoz T, Kim A, Ratner N, Peinado H, et al. (2022) Need for New Treatments Targeting MPNST: The Potential of Strategies Combining MEK Inhibitors with Antiangiogenic Agents. Clin Cancer Res 2022 28: 3185–95.
15. Tormod Kyrre Guren (2021) A Study of Pembrolizumab in Patients with Malignant Peripheral Nerve Sheath Tumor (MPNST), Not Eligible for Curative Surgery, Oslo University Hospital, ClinicalTrials.gov IDNCT02691026.
16. Girish Dhall (2025) Trial of Selumetinib and Bromodomain Inhibitor with Durvalumab for Sarcomas, University of Alabama at Birmingham, ClinicalTrials.gov ID: NCT05253131.
17. Young RJ, Kirkham A, Savage J (2025) Selumetinib in Combination with Anti-Retroviral Therapy in HIV-associated Kaposi sarcoma (SCART): an open-label, multicenter, phase I/II trial. BMC Cancer 25: 505.