MAR Oncology and Hematology (2026) 6:3

Case Report

When Cure Becomes a Cause: Radiation Induced Sinonasal sarcoma- A Case Report

Monisha K. Ramamuraly *[1], Khin Thuzar Pyone [2], Phing Phing Tang [3], Norhafiza Mat Lazim [1]

1. *Department of Otorhinolaryngology-Head and Neck Surgery, School of Medical Sciences, Health Campus, 16150, Kubang Kerian, Universiti Sains Malaysia, Kelantan, Malaysia.*
2. *Department of Nuclear Medicine, Radiotherapy & Oncology, School of Medical Sciences, Health Campus, 16150, Kubang Kerian, Universiti Sains Malaysia, Kelantan, Malaysia.*
3. *Department of Otorhinolaryngology- Head and Neck Surgery, Jalan Rasah, Bukit Rasah, Hospital Tuanku Ja'afar, 70300, Seremban, Negeri Sembilan, Malaysia.*

*__Correspondence to__: Norhafiza Mat Lazim, Department of Otorhinolaryngology-Head and Neck Surgery, School of Medical Sciences, Universiti Sains Malaysia, Health Campus, 16150, Kubang Kerian, Kelantan, Malaysia.

Received: 15 April 2026

Published: 01 May 2026

DOI: https://doi.org/10.5281/zenodo.19939202

Abstract

Radiation- induced sarcoma is a devastating long term complication of radiotherapy. This case highlights a difficult case encountered two decades after the first malignancy was treated.

Introduction

Radiation-induced sarcoma (RIS) is a rare but deadly complication of radiotherapy. Radiotherapy remains a mainstay treatment for most head and neck cancers and is responsible for the increased overall survival rate among cancer patients. However, with the increasing survival of cancer patients, the number of RIS cases is expected to rise.

RIS is typically aggressive, presents late, and carries a poor prognosis. Most cases occur within previously irradiated fields, and have a wide latency period ranging from 3 to 37 years. In patients with nasopharyngeal carcinoma (NPC), RIS usually arises in adjacent regions such as the maxilla or mandible; while nasopharyngeal recurrence is rare. We report a case of RIS arising in the nasopharynx decades after treatment for NPC

Case Presentation

A 71-year-old Chinese lady presented in April 2024 with a two month history of left-sided double vision, facial numbness, and nasal obstruction. She denied weight loss or appetite changes. Her medical history was significant for stage II NPC diagnosed in 2001, for which she received concurrent chemoradiotherapy. She received External Beam Radiotherapy (EBRT) as that was the treatment available in Malaysia at that time. She was disease-free and discharged from follow-up after 10 years of surveillance.

Examination revealed fixed, dilated pupils bilaterally, cranial nerve II and IV palsy bilaterally, left cranial nerve V and VI palsy, and a 2×3 cm firm, fixed, painless left neck swelling at level II. Nasoendoscopy showed a large, friable, bleeding mass occupying the left nasal cavity, extending into the right postnasal space. A biopsy was taken over the nasal mass and histopathological examination revealed cells which showed immunohistochemistry positive for vimentin (Figure 1), cells focally positive for smooth muscle actin (Figure 2). Cells also demonstrated interlacing fascicles and hemangiopericytoma- like vascular pattern characterized by dilated, branching blood vessels resembling "staghorn" or "fishhook" which supported the diagnosis of a leiomyosarcoma. (Figure 3)

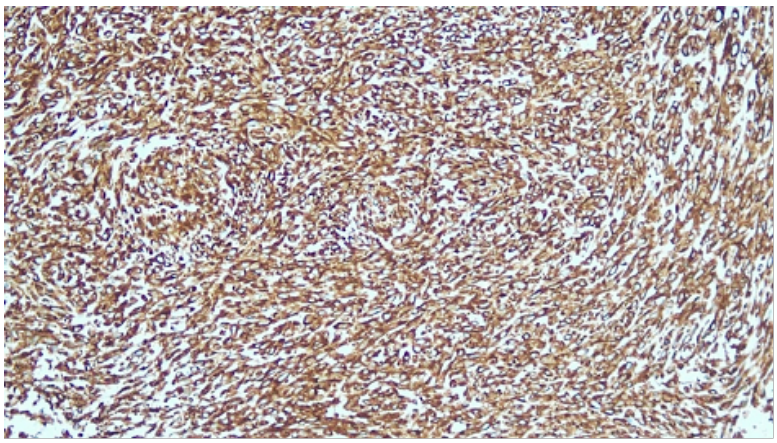

Figure 1

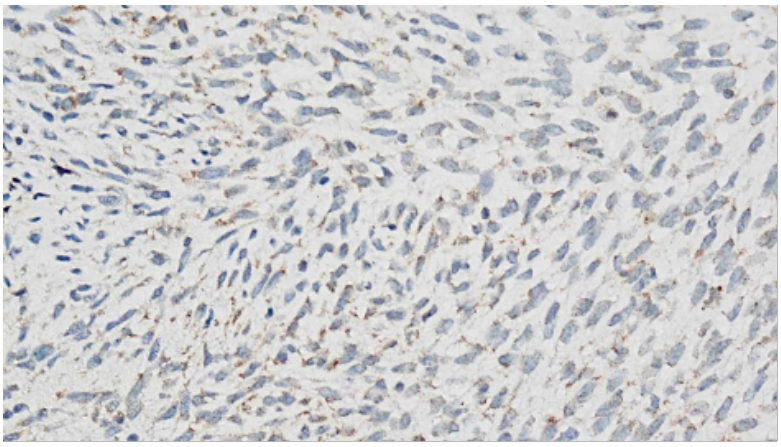

Figure 2

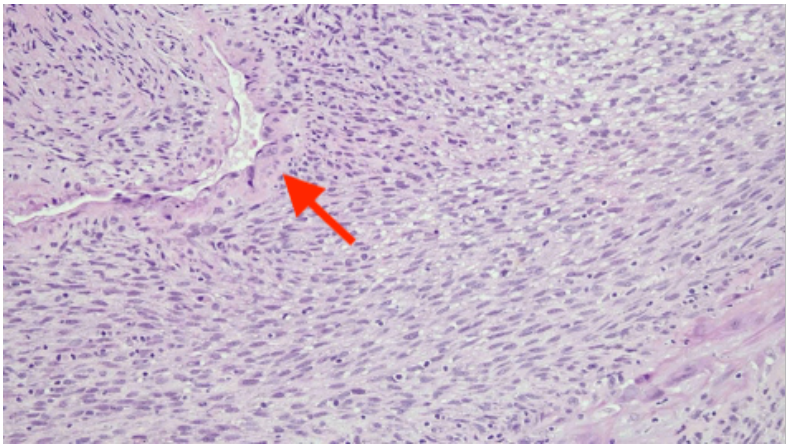

Figure 3

A Computer Tomography (CT) scan done demonstrated an ill-defined heterogenously enhanced mass seen arising from the left nasopharynx seen in Figure 4(a) & 4(b). Posterosuperiorly, it cause erosion of the petrous apex, sphenoid body, sellar turcica and clivus. The mass also showed infiltration into bilateral cavernous sinuses with narrowing of bilateral optic canal, superior and inferior orbital fissures, and infiltrates intracanalicular and intracranial segments of bilateral optic nerves.

Given the extent of local invasion, prior radiation, and the patient's advanced age, surgical intervention was deemed not feasible. She was referred to oncology for palliative chemotherapy, however developed neutropenic sepsis after the first cycle and succumbed to the illness shortly after.

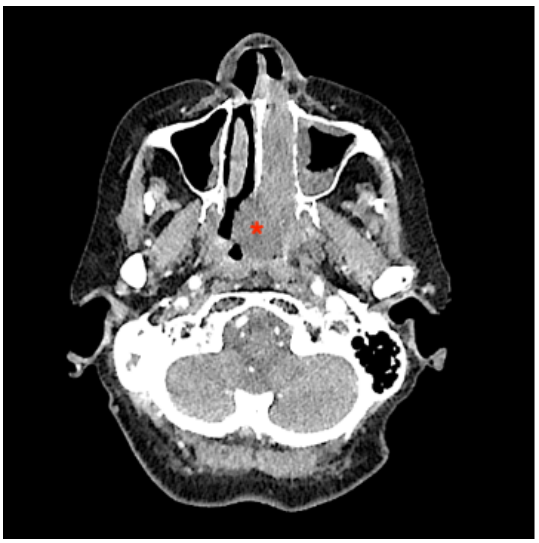

Figure 4 (a)

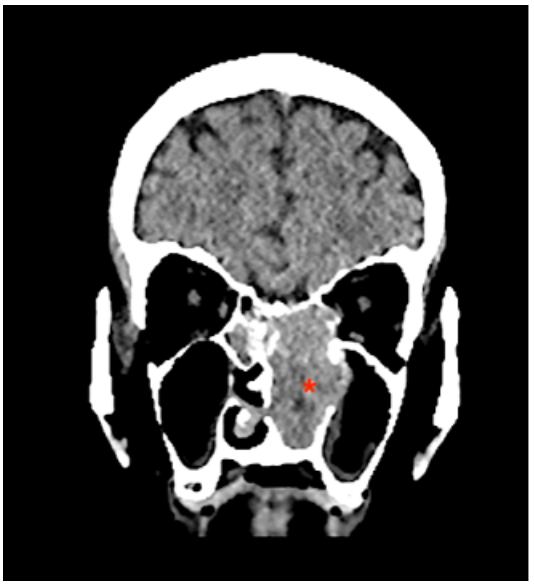

Figure 4 (b)

Discussion

Radiation-induced sarcomas (RIS) are rare but devastating late complications of radiotherapy. Mutiple case reports have shown their occurrence post nasopharyngeal carcinoma (NPC) radiotherapy highlighting their aggressive nature and poor prognosis (1,2). The incidence of RIS following radiotherapy for head and neck malignancies ranges from approximately 0.03% to 0.8%.(3,4) The latency period of a radiation induced malignancy typically averages 9–14 years, although a wide range of 3 to 37 years has been described in other studies.(3,5) Our case demonstrates a prolonged latency period of 23 years, which remains within the recognised spectrum of RIS.(1,3)

The pathogenesis of RIS is likely due to radiation-induced DNA damage, leading to chromosomal instability, somatic mutations, and disruption of normal cellular regulatory mechanisms in irradiated mesenchymal stem cells.(3,5,6) Several risk factors have identified with RIS development, including higher radiation doses during primary cancer treatment, larger irradiated fields, younger age of radiation exposure, and the type of primary malignancy.(3,5) In the present case, the patient received External Beam Radiotherapy (EBRT), which is less conformal than the currently preferred Intensity-Modulated Radiotherapy (IMRT), potentially leading to increased radiation exposure to surrounding normal tissues.(7)

Clinically, RIS may present as a new or enlarging mass within a previously irradiated field and may initially mimic tumour recurrence or post-radiation fibrosis thus making early diagnosis challenging.(2,6) Among NPC survivors, RIS most commonly arises in the sinonasal tract, maxillary sinus, or cervical region, while primary involvement of the nasopharynx remains relatively uncommon.(3,8) In our patient, the presence of multiple cranial nerve palsies, intracranial extension, and a friable fungating nasopharyngeal mass reflected advanced locoregional disease at presentation, consistent with previously reported imaging and clinical features of nasopharyngeal leiomyosarcoma.(2,9)

Complete surgical resection with clear margins remains the only potentially curative treatment modality for RIS.(3,5,6) However, due to the frequent proximity of these tumours to critical anatomical structures such as the skull base, cranial nerves, and major vascular channels, complete excision is often impractical and technically unachievable.(5,8) Some case reports have demonstrated significantly improved outcomes in patients undergoing curative resection, with reported 5-year survival rates of up to 65%, compared to negligible survival rates in patients managed conservatively.(5)

The role of chemotherapy and re-irradiation in RIS is limited. Most patients have already received maximal radiation doses, rendering further radiotherapy unsuitable.(3,6) Although palliative chemotherapy is offered for symptom control in unresectable cases, the impact on overall survival among these patients still remain minimal, as illustrated in previously reported NPC-associated RIS cases and in the present patient.(1,2)

Overall, the prognosis of RIS is significantly poorer than that of sporadic soft tissue sarcomas. Reported 5-year survival rates range from 17% to 58%, with a median survival of approximately 2–3 years among patients who are not candidates for surgical resection.(3,5,6). The Malaysian Clinical Practice Guideline (CPG) recommends a graduated, long-term follow-up schedule for patients treated for NPC. After five years, lifelong surveillance is advised, with follow-up visits every 6 to 12 months, to monitor for late recurrence and long-term sequelae of treatment. (7)

Conclusion

Radiation-induced sarcoma, although rare, should be considered in patients with a history of radiotherapy presenting with new head and neck masses years after treatment. Clinicians should be aware of RIS as a late and lethal complication of radiotherapy.

This case signifies the necessity of lifelong surveillance in NPC survivors and emphasises the importance of prompt evaluation of new or progressive symptoms arising within previously irradiated fields.

Patient Consent

Written informed consent was obtained however all identifying information has been anonymized.

Reffrennces

1. Lim SW, Tengku MI. Radiation-induced sarcoma post radiotherapy treatment of nasopharyngeal carcinoma. Int J Health Sci Res. 2021;11(1):111–113.

2. Su WH, Lee WY, Chang SL. Nasopharyngeal Radiation-Induced Sarcoma: A Case Report. Ear Nose Throat J. 2022;103(10):NP584–NP586.

3. Xi M, Liu MZ, Wang HX, et al. Radiation-induced sarcoma in patients with nasopharyngeal carcinoma. Cancer. 2010;116:5479–5486.

4. Fawzi N, Jaafar R, Yahaya Z, et al. Head and Neck Radiation-Induced Sarcoma: Report of Two Cases. Egypt J ENT Allied Sci. 2019;20(1):35–37.

5. Mark RJ, Poen J, Tran LM, Fu YS, Selch MT, Parker RG. Postirradiation sarcomas. A single-institution study and review of the literature. Cancer. 1994 May 15;73(10):2653–62.

6. Giannini L, Incandela F, Fiore M, Gronchi A, Stacchiotti S, Sangalli C, et al. Radiation-Induced Sarcoma of the Head and Neck: A Review of the Literature. Frontiers in oncology [Internet]. 2018 [cited 2019 Oct 14];8:449. Available from: https://www.ncbi.nlm.nih.gov/pubmed/30386739

7. Ministry of Health, Malaysia. Clinical Practice Guidelines: Management of Nasopharyngeal Carcinoma. 2016

8. Yang Q, Mo Y, Zhao Q, Ban X, He M, Cai P, et al. Radiation-induced sarcomas of the head and neck in post-radiation nasopharyngeal carcinoma. La radiologia medica. 2016 Oct 13;122(1):53–60.

9. R. Kuo, J.K. Huang, K.S. Lee, B.F. Chen, F.S. Yang. Leiomyosarcoma in the Nasopharynx: MR Imaging Findings. American Journal of Neuroradiology Aug 2007, 28 (7) 1373-1374; DOI: 10.3174/ajnr.A0560