International Journal of Research in Medical Sciences
Mulla A et al. Int J Res Med Sci. 2026 May;14(5):2109-2112
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20261358

Case Report

Aggressive NUT carcinoma presenting as a nasal mass: a rare case report

Arsala Mulla, Preeti Jain, Pallavi Waghmare*, Pradeep Rajendran

Department of Pathology, BDBA Hospital, Kandivali(W), Mumbai, Maharashtra, India

Received: 20 February 2026
Revised: 18 March 2026
Accepted: 25 March 2026

***Correspondence:**
Dr. Pallavi Waghmare,
E-mail: waghmarepallavi240@gmai.com

ABSTRACT

Nuclear protein in testis (NUT) carcinoma is an exceptionally uncommon and highly aggressive carcinoma, refractory to treatment and has a devastating clinical course. NUT gene is expressed in non-germ cell tissues along with chromosomal rearrangement of the NUT gene on chromosome 15. These tumors are most commonly located in midline and near midline areas of the upper aero digestive tract and the mediastinum and can affect patients across a broad age range, including children. However, due to its low incidence, this is often misdiagnosed by the clinicians and pathologists. Here, we present a case report of NUT carcinoma in a 45- year- old female coming with chief complaints of nasal bleeding and nasal obstruction. This case report emphasizes the critical role of histopathological examination, supplemented by immunohistochemical analysis, in establishing a definitive diagnosis and underscores the diagnostic challenges posed by sinonasal undifferentiated tumors.

Keywords: NUT carcinoma, Undifferentiated carcinoma, Nasal, Sinonasal

INTRODUCTION

NUT (nuclear protein in testis) carcinoma is an aggressive, poorly differentiated or undifferentiated malignancy driven by chromosomal rearrangement of the nuclear protein in testis (NUT) gene (also known as NUTM1).[1] It is extremely rare, representing 0.06 % of all solid tumors.[2] NUT carcinoma typically shows a somatic translocation t(15;19), where NUTM1 gene on chromosome 15 becomes fused with the BRD4 gene on chromosome 19, producing the BRD4-NUT Fusion oncogene. In less common instances, the NUTM1 gene partners with other genes such as BRD3, NSD3 or other NUT related variants.[3] Most cases were found in the median plane of the body, such as the head, neck and thorax. Currently it is recognized that the paranasal sinuses and nose are most commonly involved.[4] The prevalence is unknown as until recently only molecular methods were able to properly define it. NUT carcinomas are often mistakenly identified as squamous cell carcinoma, poorly differentiated carcinoma and sinonasal undifferentiated carcinoma.[5] It has a dismal prognosis due to high proliferative activity and increased chances of metastasis.[2] Despite multimodality approach of combining surgery, radiotherapy and chemotherapy, prognosis remains poor due to its rapidly progressive and metastasizing nature.[4]

CASE REPORT

A 45-year-old female presented with a 1-month history of left nasal obstruction, and recurrent episodes of epistaxis. She had no history of smoking; tobacco use or alcohol addiction. Clinical examination revealed firm, palpable lesion in the left nasal cavity. Sinus CT examination revealed appearance of 46x52 mm of size contrast enhancing soft tissue density lesion in left nasal cavity causing erosion of bones (medial wall of left maxillary sinus, nasal septum and ethmoid bone), extending into left

maxillary sinus likely neoplastic aetiology with mild deviated nasal septum towards right side.

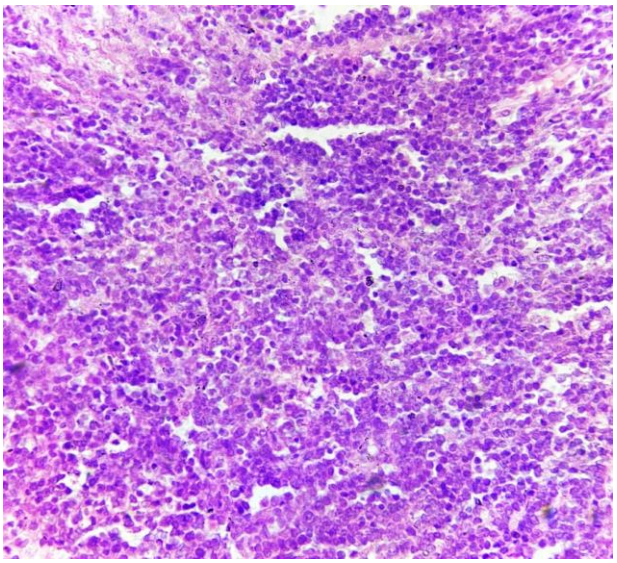

Figure 1: Round monomorphic tumour cells arranged in sheets.

Following an initial incisional biopsy of the mass, interpreted as feature suggestive of malignant tumor left nasal mass, patient underwent surgical resection.

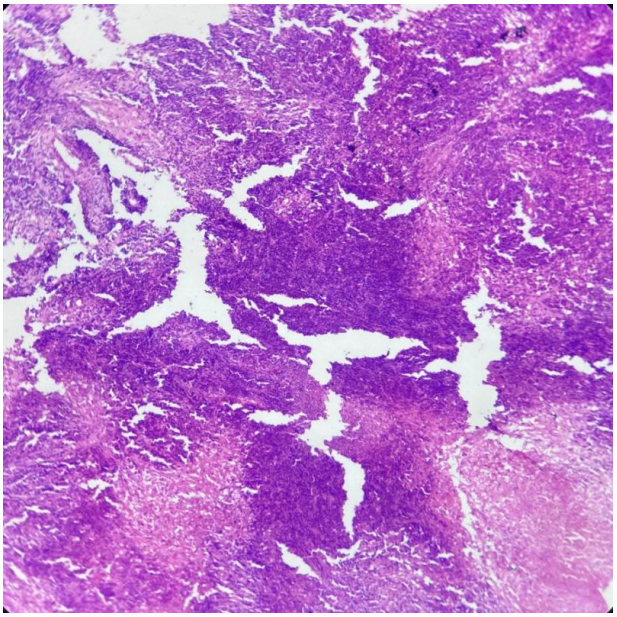

Figure 2: Large areas of necrosis in between sheets of tumor cells.

The resection specimen grossly consists of multiple grey brown tissue bits aggregating to 4x3x1.5 cm, cut surface it was brownish white. Microscopic examination revealed sheets and nests of small to medium sized monomorphic cells (Figure 1). The cells were characterized with round monotonous nuclei, vesicular chromatin, inconspicuous to prominent nucleoli and scant to moderate cytoplasm. Focal area of abrupt keratinization noted (Figure 3). The tumor also showed dense acute inflammatory infiltrate and areas of intratumoral necrosis (Figure 2). The tumor cells were immunoreactive for CK (AE1 and AE3), p63 and speckled nuclear positivity for NUT protein. The morphologic and immunoreactive features were indicative of a NUT carcinoma.

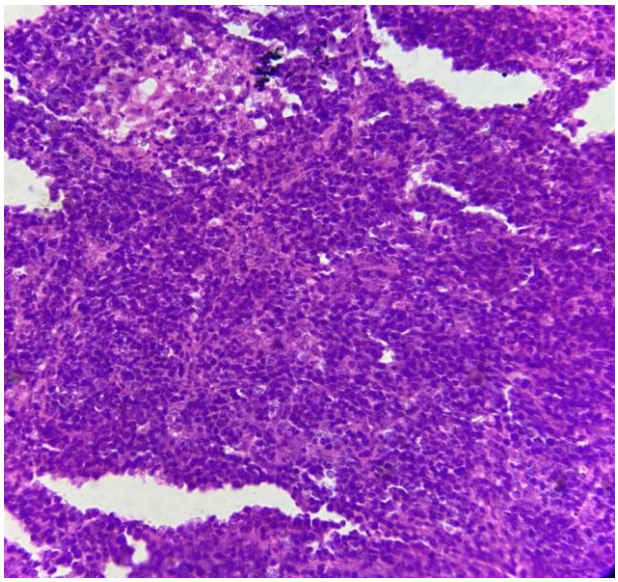

Figure 3: Tumour showing areas of abrupt keratinization.

Thus, final diagnosis of NUT Carcinoma was given. The patient was advised adjuvant radiotherapy with concurrent chemotherapy for locoregional disease control, RT dose technique 66-70Gy/30-33 fractions/6 weeks. Patient did not tolerate the treatment well and she finally succumbed 6 months after diagnosis.

DISCUSSION

NUT carcinoma is a relatively new malignancy, the term coined after the specific BRD4-NUT fusion oncogene in 2003.[6] World Health Organization (WHO) gave official name NUT carcinoma to reflect that the cancer can occur anywhere in the body, not exclusively in midline structures. This update was included in the WHO classification tumours of the pleura, lung, heart and thymus [7] (2015). NUT carcinoma is often underdiagnosed because of its rarity, overlapping morphology and resemblance to other poorly differentiated tumours.

The median time to correct diagnosis is often delayed, which worsens outcomes. Lee et al reported NUT carcinoma constitutes of 2.9% of poorly or undifferentiated carcinomas arising in the head and neck and 12.5% of those occurring in sinonasal region.[8] Diagnosis is extremely challenging solely on haematoxylin and eosin staining, due to lack of disease specific features. The findings range from completely undifferentiated carcinoma to squamous differentiation

with focal or abrupt keratinisation.[9] Histomorpholgically, tumour is composed of cells showing blue round cell morphology, typically arranged in sheets, cells show eosinophilic cytoplasm of scant to moderate volume. Thus, this poorly differentiated carcinoma may easily be misdiagnosed as small lung cancer, lymphoma, thymic carcinoma, SMARCB1 (INI-1) deficient sinonasal carcinoma, acute leukaemia or Ewing's sarcoma.[2] All these tumours can be distinguished from NUT carcinoma with the use of immunohistochemistry. Sinonasal undifferentiated carcinomas also share morphologic features with NUT carcinoma but lack squamous differentiation and show limited or no reactivity to p63, while NUT Carcinomas show p63 immunoreactivity.

Table 1: Immunohistochemical differentiation of sinonasal malignant tumours.

Tumors	SNUC	SMARCB1/INI-1 deficient sinonasal carcinoma	NUT carcinoma
PAN CK	Positive	Positive	Positive
P63	Variable	Positive	Positive
SMARCB1/INI-1	Retained	Complete Loss	Retained
NUT protein	Negative	Negative	Positive

Native NUT expression is limited to the testis and oocytes, because of its restricted expression, aberrant expression of NUT in the nuclei of non-germ cell tumours is theoretically diagnostic of NUT carcinoma.[5] Moreover, it is not feasible to perform the gene chromosomal testing for all cancer cases as it requires quite a time to obtain the results. FISH test to identify a NUT rearrangement has not been commercialized, so it's not widely available.[2] The availability of commercially produced antibody for NUT protein by immunohistochemistry has made diagnosing NUT carcinoma easier, offering cost effective and reliable way to differentiate it from other poorly differentiated carcinomas.[10]

So the immunohistochemical diagnosis using monoclonal antibody is a useful alternative to chromosomal testing. This NUT antibody can diagnose disease with notable precision: sensitivity 87%, specificity 100%, negative predictive value 99%, and positive predictive value 100%.[11] All poorly differentiated carcinomas arising in the head and neck or chest or lacking glandular differentiation should be considered immunostaining for NUT expression.[12] Staining with other epithelial markers like cytokeratin (CK) and carcinoembryonic antigen (CEA) is variable. And staining with chromogranin and synaptophysin is always negative in the case of NUT carcinoma.[13]

Multimodality protocols including aggressive complete surgical resection followed by postoperative radiotherapy and chemotherapy are advocated.[4] Despite these, outcome is very unfavourable and resulting in death within 6-7 months.[2] Emerging therapies like BET inhibitors (bromodain inhibitors such as OTX015, birabresib) and HDAC inhibitors are under clinical trials.[14] While not yet standard of care, these represent the most promising targeted options, especially in advanced disease. Reporting such rare cases is important for building awareness, particularly in India where published experience is limited. Greater recognition of this entity will enable timely diagnosis, accurate prognostication and potential enrolment in clinical trials exploring novel therapies.

CONCLUSION

NUT carcinoma is an uncommon neoplasm characterized by marked aggressiveness presenting in midline, Para midline head, neck and lung region. The number of reported cases is small because of underdiagnosis and underreporting because of lack of awareness and lack of clear morphological features. Tests for NUT expression using IHC should be implemented in all suspicious midline poorly differentiated carcinoma.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. French CA. NUT Carcinoma: Clinicopathologic features, pathogenesis, and treatment. Pathol Int. 2018;68(11):583-95.
2. Chau NG, Ma C, Danga K, Al-Sayegh H, Nardi V, Barrette R, et al. An anatomical site and genetic-based prognostic model for patients with nuclear protein in testis (NUT) midline carcinoma: analysis of 124 patients. JNCI Cancer Spectr. 2019;4(1):pkz094.
3. Wang L, Zhu Z, Wang W, Zha Y, Wang X, Surita A, et al. Sinonasal NUT carcinoma: a retrospective case series from a single institution. Front Surg. 2023;10:1098704.
4. El-Naggar AK, Chan JKC, Grandis JR, Takata T, Slootweg PJ. WHO classification of head and neck tumors. Lyon: International Agency for Research on Cancer. 2017.
5. Davis BN, Karabakhtsian RG, Pettigrew AL, Arnold SM, French CA, Brill YM. Nuclear protein in testis midline carcinomas: a lethal and underrecognized entity. Arch Pathol Lab Med. 2011;135(1):149-54.
6. Lauer UM, Hinterleitner M, Horger M, Ohnesorge PV, Zender L. NUT Carcinoma-An underdiagnosed Malignancy. Front Oncol. 2022;12:914031.
7. Travis WD, Brambilla E, Burke AP, Marx A, Nicholson AG. WHO classification of tumours of the

lung, pleura, thymus and heart. Lyon: International Agency for Research on Cancer. 2015.
8. Lee T, Cho J, Baek CH, Choi JS, Park HY, Lee Y, et al. Prevalence of NUT carcinoma in head and neck: analysis of 362 cases with literature review. Head Neck. 2020;42(5):924-38.
9. French C, Bishop JA, Lewis JS, Muller S, Westra WH. NUT carcinoma. WHO Classification of Head and Neck Tumors. Lyon: IARC Press. 2017;20-1.
10. Kakkar A, Antony VM, Irugu DVK, Adhikari N, Jain D. NUT midline carcinoma: A series of five cases, including one with unusual clinical course. Head Neck Pathol. 2018;12(2):230-6.
11. Haack H, Johnson LA, Fry CJ, Crosby K, Polakiewicz RD, Stelow EB, et al. Diagnosis of NUT midline carcinoma using a NUT-specific monoclonal antibody. Am J Surg Pathol. 2009;33(7):984-91.

Cite this article as: Mulla A, Jain P, Waghmare P, Rajendran P. Aggressive NUT carcinoma presenting as a nasal mass- a rare case report. Int J Res Med Sci 2026;14:2109-12.