OPEN ACCESS

Saudi Journal of Pathology and Microbiology
Abbreviated Key Title: Saudi J Pathol Microbiol
ISSN 2518-3362 (Print) | ISSN 2518-3370 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Case Report

Atypical Neurofibroma Masquerading an Odontogenic Cyst-A Case Report

Dr. Latha Mary Cherian[1], Dr. Rasla, P. C[2*], Dr. Sabu Paul[3], Dr. Indu, M[4], Dr. Vally, M[2]

[1]Head of the Department, Department of Oral Pathology and Microbiology, Government Dental College Kottayam, Kerala, India
[2]Junior Resident, Department of Oral Pathology and Microbiology, Government Dental College Kottayam, Kerala, India
[3]Associate Professor, Department of Oral Pathology and Microbiology, Government Dental College Kottayam, Kerala, India
[4]Assistant Professor, Department of Oral Pathology and Microbiology, Government Dental College Thrissur, Kerala, India

DOI: 10.36348/sjpm.2023.v08i12.006 | **Received:** 07.11.2023 | **Accepted:** 13.12.2023 | **Published:** 16.12.2023

***Corresponding author:** Dr. Rasla, P. C
Junior Resident, Department of Oral Pathology and Microbiology, Government Dental College Kottayam, Kerala, India

Abstract

Neurofibroma is a benign tumor characterized by perineural fibroblast proliferation. It is common in the head and neck region but rare in the oral cavity. Most of these lesions are asymptomatic but sometimes may be associated with pain and paraesthesia. Neurofibromas with atypical features are quite rare and only a few cases are reported in literature. Here is a case of a female patient presented with pain and swelling in the anterior maxilla, which was clinically diagnosed as a periapical cyst. Radiographic evaluation of the lesion revealed dilated incisive canal and a Nasopalatine duct cyst was suspected. The patient was advised to take antibiotics for one week. The symptoms were sustained in the follow-up visit and an incision biopsy was made. Microscopic examination revealed pleomorphic spindled and round cells. Immunohistochemistry was performed to identify the origin of these pleomorphic cells. Based on the histopathological examination, special staining, and immunohistochemistry, we concluded the diagnosis as neurofibroma with atypical features. The current case emphasizes the significance of clinical, radiological, histopathological, and immunohistochemical evaluation of oral lesions. The presence of atypical features in Neurofibroma must be considered cautiously as as it is more prone to progress into Malignant Peripheral Nerve Sheath Tumor (MPNST).

Keywords: Atypical neurofibroma, Immunohistochemistry, Incisive canal cyst, Malignant Peripheral Nerve Sheath Tumor, Neurofibroma.

INTRODUCTION

Neurofibroma is a benign tumor of neural origin, that commonly occurs in peripheral soft tissues. It is characterized by the proliferation of perineural fibroblasts and Schwann cells. In the oral cavity, these lesions are rare and can affect the tongue, palate, and buccal mucosa or they can be intraosseous**.** It is associated with the fifth decade and equal sex predilection**.** The majority of the cases are asymptomatic, but pain and paraesthesia are reported in some cases [1]. Atypical neurofibromas are neurofibromas with atypical histologic features. These are symptomatic, and highly cellular lesions with high risk for malignant transformation [2]. This is a case report of neurofibroma of the incisive canal with atypical features in an elderly female.

CASE PRESENTATION

A 56-year-old female reported pain and swelling of four months duration in the upper front teeth region. Pain was severe for the past 2 weeks and swelling gradually increased to the present size. The patient had no relevant medical, dental, or habit history. There was no significant facial asymmetry. Intra orally, a diffuse swelling of 2× 0.5 cm size was noted on the labial and palatal aspect of maxillary incisors. The mucosa over the swelling was erythematous. There was no bleeding or pus discharge from the swelling. Deep dentinal caries were present on both maxillary lateral incisors (Figure 1 -A & B). Traumatic occlusion and deep bite were also noted.

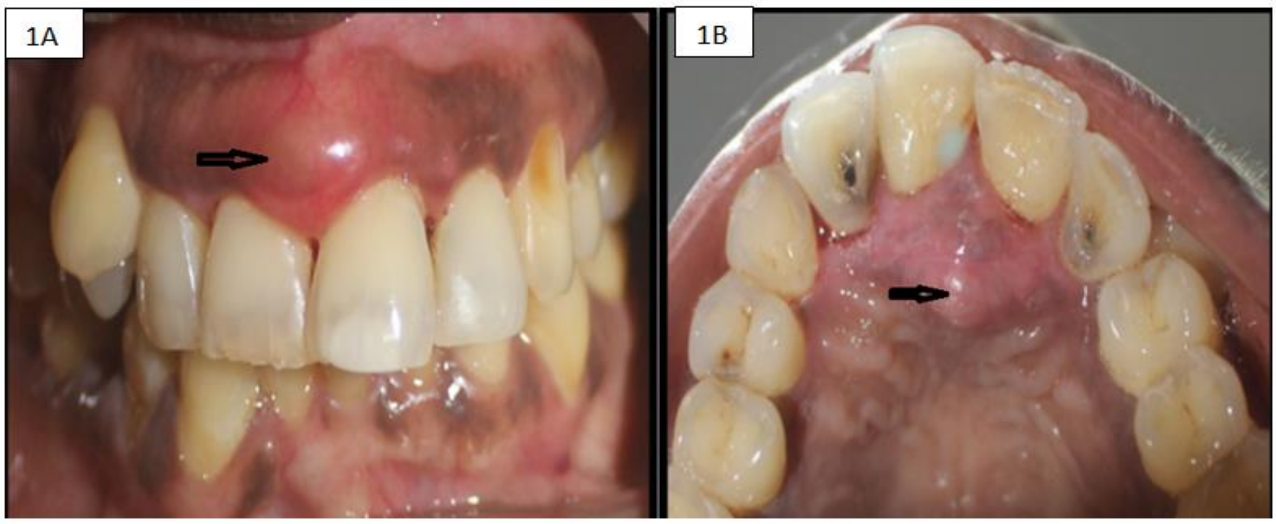

Figure 1: Clinical photograph shows a diffuse swelling on labial (A) and Palatal (B) aspects of maxillary central incisors (Black arrows) and deep dentinal caries in the palatal aspect of maxillary lateral incisors

On palpation, the swelling was soft, non-tender, non-pulsatile, and non-fluctuant. Based on the clinical findings, a provisional diagnosis of periapical abscess was given. Antibiotics were given and the patient was reviewed after one week. The swelling persisted during the follow-up visit. CBCT was taken and it revealed a dilated incisive canal (Figure 2). Based on the radiographic findings, a diagnosis of Nasopalatine duct cyst was given, and the patient was sent for a biopsy.

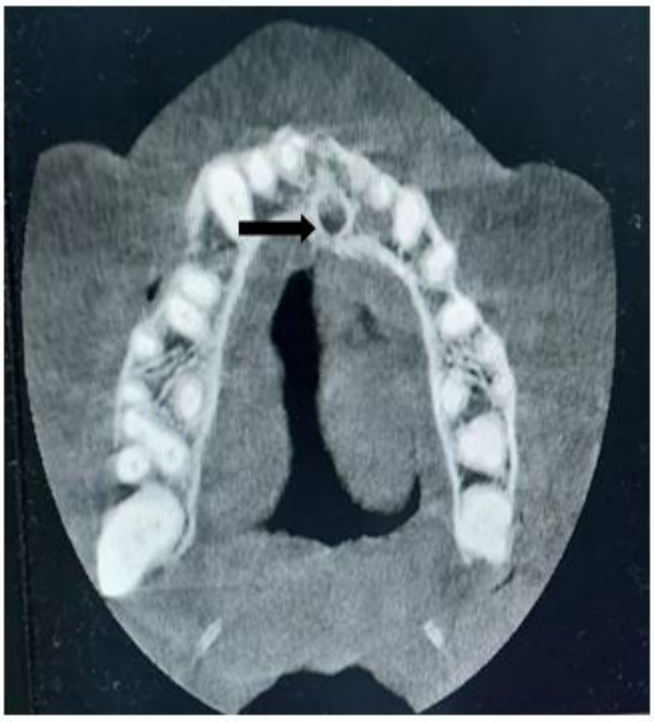

Figure 2: CBCT shows dilated incisive canal (Black arrow)

Microscopic examination of the biopsied specimen revealed a non-encapsulated, diffuse collection of spindled and round-to-ovoid pleomorphic tumor cells with hyperchromatic nuclei and inconspicuous nucleoli in a moderately collagenous connective tissue stroma. Few of the cells presented with wavy nuclei and vesicular nuclei (Figure 3A & B). A large number of scattered, toludene blue-positive mast cells are also present. The possibilities of tumor of neural origin, vascular origin, or round cell origin were considered.

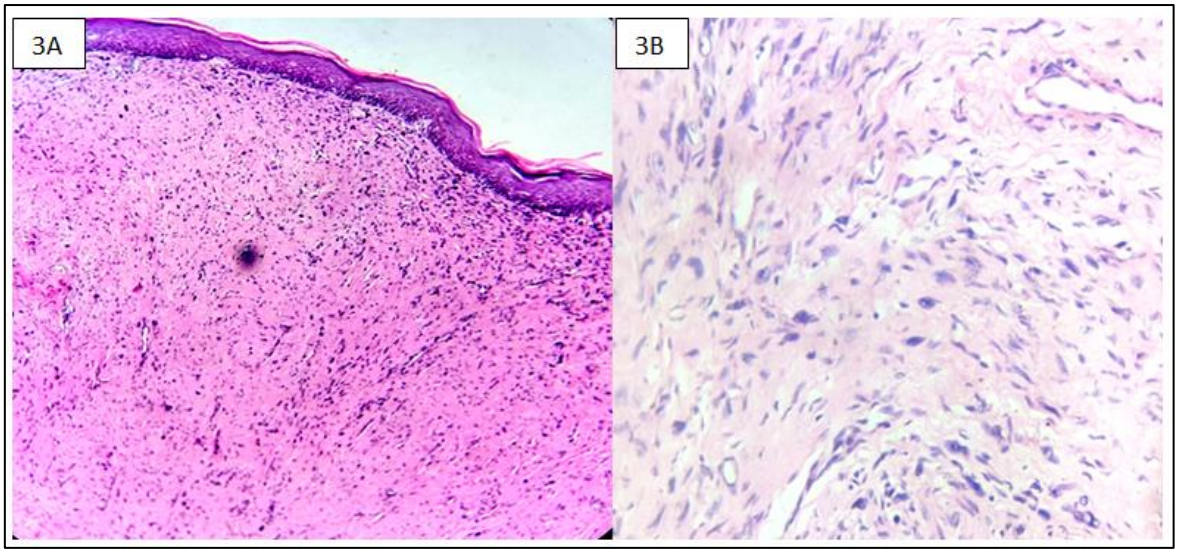

Figure 3 A: Haematoxylin and Eosin-stained sections show atrophic epithelium with underlying cellular connective tissue stroma (20x), Figure 3B: Haematoxylin and Eosin-stained sections show ovoid and spindled tumor cells scattered with a shredded carrot appearance (40x)

Immunohistochemical examination was done with Cytokeratin, Vimentin, Actin, CD68, S100, CD34, HMB 45, and Ki-67 primary antibodies. The lesion was positive for Vimentin and S100 and negative for all other markers which indicated the neural origin of the lesion (Figure 4A &B). Ki67 expression was low. This led to the diagnosis of neurofibroma with atypical features. The lesion was excised completely, and a complete systemic evaluation of the patient revealed no signs of Neurofibromatosis. The patient is still under follow-up care.

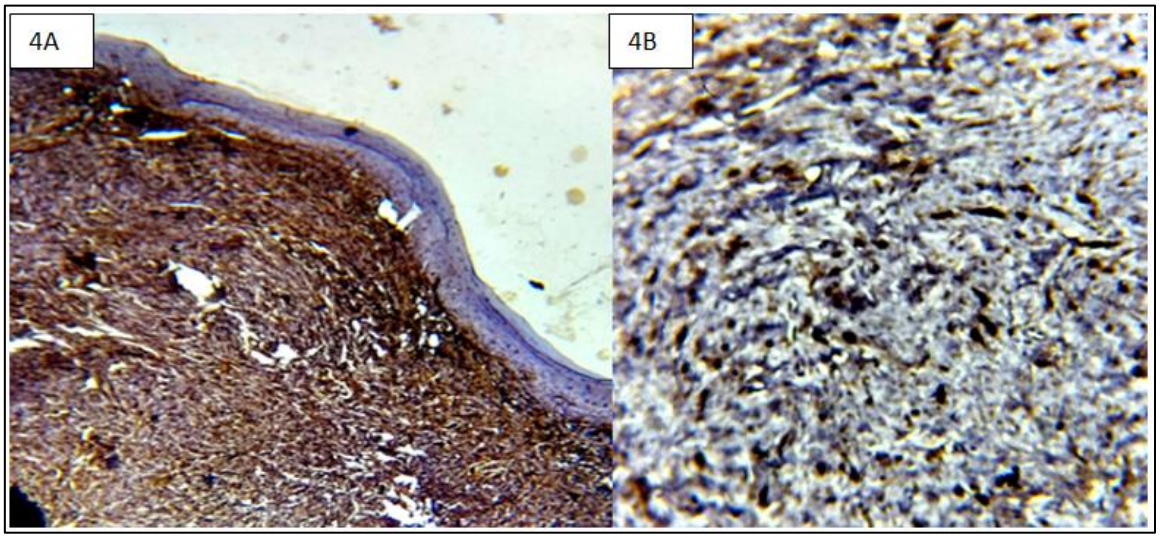

Figure 4A: Photomicrograph of tumor cells with intense uniform positivity of anti-vimentin antibody (20x), Figure 4B: Photomicrograph of tumor cells showing anti-S100 antibody positivity (40X)

DISCUSSION

Bruce originally described neurofibroma, a benign tumour originating from nerve fibers, in 1954 [3]. It might be solitary or multiple, intraosseous or extraosseous. The head and neck regions are frequently affected due to the extensive innervation of these areas. Trigeminal and upper cervical nerve involvements are reported in oral cavity lesions. Neurofibromas of the oral cavity commonly occur in the buccal mucosa and tongue, often presented as sessile pedunculated asymptomatic masses. The intra-osseous lesions are rare and shows a slight predilection for the mandibular posterior region. According to the literature, neurofibromas commonly occur in the fifth decades of life without any gender predilection, but Gosavi et al reported a mean age of thirty years and slight female predominance based on their retrospective study [4].

The majority of intra-osseous NFs do not initially manifest any symptoms. Later on, the affected

side might develop pain and numbness. The radiographic findings can vary from bony erosions to Jaw deformities like overgrowth of the mandibular body, ramus, condyle, and hypoplasia of the maxillary tuberosity, depending on the age of the patient and nature of lesion [5]. It appears as a well-defined or ill-defined radiolucency on a radiograph [6]. In our case, it was presented as a well-defined radiolucency involving incisive canal, initially diagnosed as an incisive canal cyst.

Neurofibromas are non-encapsulated lesions consisting of the proliferation of perineural cells, schwann cells, and endoneural fibroblasts in various forms creating microscopic heterogeneity. These cells have spindle shape with wavy or coma-shaped nuclei within a myxoid matrix along with scattered mast cells. The neuroblastoma cells secrete secrete chemotactic factor which is believed to be responsible for the high percentage of mast cells in neurofibroma. Histological variants of localized neurofibromas are epithelioid, granular, cellular, and atypical neurofibromas [7].

Atypical neurofibroma is characterized by increased cellularity, cytological atypia, hyperchromatism, pleomorphism, and atypical nuclei. In 2011, it was reported as a precursor lesion of malignant peripheral nerve sheath tumor (MPNST). It is associated with loss of CDKN2A at 9p21.3 locus, similar to that in MPNST. Typical neurofibromas lack this mutation [2]. Because of the presence of atypical features, the diagnosis of the present case was given as neurofibroma with atypical features.

Differential diagnosis of NF includes other spindle cell lesions like traumatic neuroma, neurilemmoma, desmoplastic melanotic melanoma, spindle cell carcinoma, benign fibrous histiocytoma, amelanotic melanoma, etc. The absence of verrocay bodies and lack of encapsulation can differentiate neurilemmoma from neurofibroma. A lack of trauma history is a useful indicator in differentiating this lesion from traumatic neuroma [6].

Immunohistochemistry plays an important role in the differentiation of neurofibroma from other spindle cell lesions. Since it is a mesenchymal tumor arising from neuronal cells, vimentin and S100 are positive, whereas CK, EMA, HMB45, and vascular markers like CD34, and CD65 will be negative [8]. We obtained positive immune staining for Vimentin and S100, and negative for CK, HMB45, actin, CD34, and CD68.

Management of Intraoral neurofibroma depends on the patient's age, location, size, extent, and nature (simple or plexiform) of the tumor, functional impairments, and the malignant transformation potential. Complete tumor resection with tumor-free margins is the treatment of choice for solitary neurofibromas, which is a better prognostic indicator. Malignant transformation of solitary neurofibromas is extremely rare compared to that of neurofibromatosis. The reported malignant transformation rate of neurofibromas to MPNST is 2.4% to 16.5%, whereas plexiform NF is associated with high malignant transformation of 10% to 15%. Radiographic findings of Irregular widening of the nerve canals, ill-defined and irregular radiolucency, and irregular loss of lamina dura around teeth are indicators of malignancy in NF. In addition to this, a higher Ki-67 index (>10%) may support MPNST arising in a neurofibroma [9].

CONCLUSION

Neurofibroma is a benign tumor with low malignant transformation potential. However, the presence of atypical features in NF must be considered cautiously as it is more prone to progress into MPNST. It necessitates thorough follow-up of the patient. The present case was diagnosed as neurofibroma with atypical features after histopathological and immunohistochemical examinations. It points towards the importance of immunohistochemistry as a valuable tool in the diagnosis of this kind of lesion.

Acknowledgments: Nil

The authord do not have any conflicts of interest to disclose.
The authors did not receive any funding for this case study.
Informed and written consent was taken from the patient to publish the photographs.

REFERENCES

1. Kamalakaran, A., Jayaraman, B., Raghavendran, S., Thirunavukkarasu, R., Ayyappan, M., & Syed, J. B. A. B. (2021). Intraosseous Neurofibroma of Mandible in a 5-Year-Old: A Rare Case Report and Review of Literature. *Journal of Maxillofacial and Oral Surgery*, 1-7.
2. Higham, C. S., Dombi, E., Rogiers, A., Bhaumik, S., Pans, S., Connor, S. E., ... & Ferner, R. E. (2018). The characteristics of 76 atypical neurofibromas as precursors to neurofibromatosis 1 associated malignant peripheral nerve sheath tumors. *Neuro-oncology*, *20*(6), 818-825.
3. Bruce, K. W. (1954). Solitary neurofibroma (neurilemmoma, schwannoma) of the oral cavity. *Oral Surgery, Oral Medicine, Oral Pathology*, *7*(11), 1150-1159.
4. Gosavi, S. R., Jain, R. S., & Datarkar, A. (2021). Prevalence of oral neurofibroma in Central Indian population: A retrospective study of 20 years. *Journal of Oral and Maxillofacial Pathology: JOMFP*, *25*(1), 25.
5. Visnapuu, V., Peltonen, S., Tammisalo, T., Peltonen, J., & Happonen, R. P. (2012). Radiographic findings in the jaws of patients with neurofibromatosis 1. *Journal of oral and maxillofacial surgery*, *70*(6), 1351-1357.

6. Narang, B. R., Palaskar, S. J., Bartake, A. R., Pawar, R. B., & Rongte, S. (2017). Intraosseous neurofibroma of the mandible: a case report and review of literature. *Journal of Clinical and Diagnostic Research: JCDR*, *11*(2), ZD06.
7. Venkataswamy, A. R., Ranganath, S. P., Challapalli, S. M., & Mohanthy, L. (2016). Nonsyndromic solitary neurofibromas in the oral cavity: Case series and literature review. *Journal of Indian Academy of Oral Medicine and Radiology*, *28*(1), 52-56.
8. Miettinen, M. M., Antonescu, C. R., Fletcher, C. D., Kim, A., Lazar, A. J., Quezado, M. M., ... & Perry, A. (2017). Histopathologic evaluation of atypical neurofibromatous tumors and their transformation into malignant peripheral nerve sheath tumor in patients with neurofibromatosis 1—a consensus overview. *Human pathology*, *67*, 1-10.
9. Yin, J., Wang, S., & Zheng, M. (2021). Malignant transformation of neurofibromatosis-1 into low-grade malignant peripheral nerve sheath tumor: a case report. *International Journal of Clinical and Experimental Pathology*, *14*(10), 1056.