Black in the Neck: Cervical Node Metastasis from a Gingivo-Buccal Mucosal Melanoma — A Cytological Diagnostic Challenge

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Abstract

Background: Primary oral mucosal melanoma (OMM) is a rare and highly aggressive neoplasm accounting for approximately 1% of all melanomas and approximately 0.5% of oral malignancies. Because of its occult location and nonspecific clinical presentation, diagnosis is frequently delayed until regional or distant metastases develop. Cervical lymph-node metastasis as the presenting manifestation is uncommon and may pose significant diagnostic challenges.

Case Presentation: A 52-year-old male presented with a progressively enlarging painless left cervical swelling of three months duration. Clinical examination revealed an 8 × 6 cm cervical lymph-node mass and an ulceroproliferative pigmented lesion involving the lower lip and left gingivo-buccal sulcus. Fine-needle aspiration cytology (FNAC) from the cervical node demonstrated malignant plasmacytoid cells with focal intracytoplasmic melanin pigment. Masson–Fontana staining confirmed melanin deposition. Cell-block preparation with immunocytochemistry showed diffuse positivity for SOX10, HMB45, and Melan-A, establishing metastatic malignant melanoma. Histopathological examination and immunohistochemistry of the oral lesion confirmed primary oral mucosal melanoma. BRAF V600E immunostaining was negative. Imaging revealed cervical nodal involvement and multiple pulmonary metastases, corresponding to AJCC Stage IVC (T4aN1M1) disease.

Conclusion: This case highlights the diagnostic value of FNAC combined with cell-block immunocytochemistry in identifying metastatic oral mucosal melanoma presenting as cervical lymphadenopathy. Careful examination of the oral cavity is essential in patients presenting with metastatic cervical nodes of unknown primary origin. Early clinicopathological correlation and multidisciplinary evaluation are crucial because of the aggressive nature and poor prognosis of oral mucosal melanoma.

Keywords: Oral mucosal melanoma; Cervical lymphadenopathy; Fine-needle aspiration cytology; Immunocytochemistry; Gingivo-buccal sulcus; SOX10

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Introduction

Oral mucosal melanoma (OMM) is an uncommon but highly aggressive malignant neoplasm arising from melanocytes of the mucosal epithelium. Unlike cutaneous melanoma, mucosal melanoma demonstrates distinct epidemiological, molecular, and biological characteristics. The oral cavity represents one of the most frequent sites of mucosal melanoma within the head and neck region, with the palate and maxillary gingiva being the most commonly involved locations.[1]

OMM predominantly affects individuals in the fifth to seventh decades of life and carries an extremely poor prognosis, with reported 5-year survival rates ranging from 10% to 25%.[2] Delayed diagnosis is common because early lesions are painless, asymptomatic, and frequently mistaken for benign pigmented

lesions. At presentation, many patients already harbor regional nodal or distant metastases.

Cervical lymph-node metastasis as the primary presenting feature poses a significant diagnostic challenge, particularly when cytological findings are poorly differentiated or amelanotic. Fine-needle aspiration cytology (FNAC), supplemented with cell-block preparation and immunocytochemistry (ICC), provides a rapid, minimally invasive, and highly informative diagnostic approach.

We report a rare case of gingivo-buccal mucosal melanoma presenting initially as metastatic cervical lymphadenopathy, emphasizing the importance of ancillary cytopathological techniques in achieving an early and accurate diagnosis.

Case Report

A 52-year-old male presented to the outpatient department with complaints of a progressively enlarging painless swelling in the left side of the neck for three months. There was no associated fever, dysphagia, odynophagia, or constitutional symptoms. The patient denied any history of tobacco chewing, smoking, or alcohol abuse.

On physical examination, a firm non-tender cervical lymph-node mass measuring approximately 8 × 6 cm was identified in the left upper cervical region. The overlying skin appeared normal, and the swelling was relatively fixed to underlying structures.

Detailed oral cavity examination revealed an ulceroproliferative pigmented lesion involving the lower lip and extending along the left gingivo-buccal sulcus. The lesion demonstrated irregular margins with focal areas of blackish discoloration.

FNAC from the cervical swelling yielded hypercellular smears composed predominantly of dispersed and loosely cohesive plasmacytoid tumor cells. The cells exhibited moderate to abundant eosinophilic cytoplasm, eccentrically placed nuclei, conspicuous nucleoli, and marked nuclear pleomorphism. Occasional multinucleated forms were identified. Fine intracytoplasmic brown-black pigment suggestive of melanin was observed in a subset of tumor cells. Background necrosis was minimal.

Masson–Fontana stain demonstrated positivity for melanin pigment. Considering the cytomorphological features, a provisional diagnosis of metastatic malignant melanoma was rendered.

Cell-block sections prepared from aspirated material revealed sheets of atypical epithelioid cells with focal melanin pigmentation. Immunocytochemistry demonstrated strong nuclear positivity for SOX10 and diffuse cytoplasmic positivity for HMB45 and Melan-A. These findings confirmed melanocytic differentiation.

Subsequent biopsy from the intraoral lesion showed infiltrating malignant melanocytic cells involving the mucosal epithelium and submucosa. Immunohistochemistry findings were concordant with the cytological diagnosis. BRAF V600E immunostaining was negative.

Contrast-enhanced computed tomography (CECT) of the thorax revealed multiple pulmonary metastatic nodules. Based on clinicopathological and radiological findings, a final diagnosis of primary oral mucosal melanoma with cervical nodal and pulmonary metastases was established. The tumor was staged as T4aN1M1 (Stage IVC) according to the AJCC 8th Edition staging system for mucosal melanoma of the head and neck.

Following multidisciplinary tumor board evaluation, the patient was deemed to have advanced metastatic disease. He was referred to the Medical Oncology service for systemic therapy and palliative management. Immunotherapy was considered in view of disseminated disease. At the most recent follow-up (three months after diagnosis), the patient remained alive with persistent disease and was receiving oncological treatment.

Histopathological and Special Stain Findings:

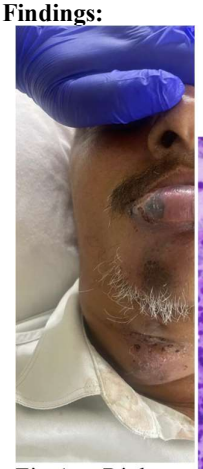


Fig-1: Right-sided neck mass of size 6x5 cm, which was firm to hard, tender with pus-like discharge.

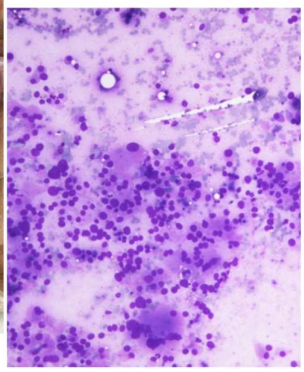
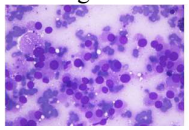


Fig-2: FNAC revealed a hypercellular tumour (LNG, 40x).



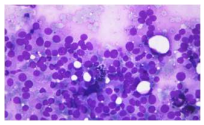


Fig-3: Smears comprise mostly dispersed singly tumour cells (LNG, 100x)

Fig-4: Smears exhibit medium to large size, eccentrically pushed coarse nuclei, abundant cytoplasm with some of them showing intra-cytoplasmic blackish pigment within it (LNG, 400 x)

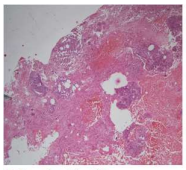


Fig-5:Cell block revealed a hypercellular tumour with areas of hemorrhage (H&E, 40x)

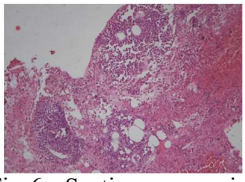


Fig-6: Sections comprise mostly dispersed singly tumour cells (H&E, 100x).

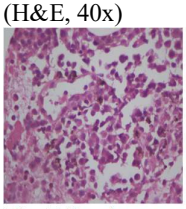


Fig-7:Sections exhibit eccentrically pushed coarse nuclei, abundant cytoplasm (H&E, 400x)

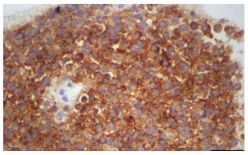


Fig-8: IHC shows abundant cytoplasmic granular HMB45 positivity (IHC, 400x)

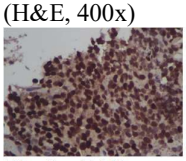
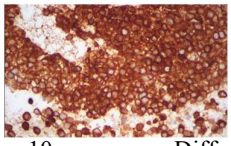


Fig-9: Diffuse nuclear SOX10 positivity (IHC, 400x)'



Fog-10: Diffuse membranous MelanA positivity (IHC, 400x)

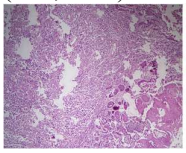


Fig-11: HPE revealed a subepithelial stroma diffusely infiltrated by tumour cells (H&E, 40x)

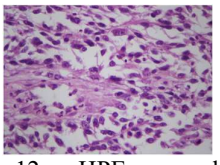
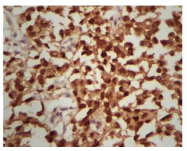


Fig-12: HPE revealed sheets of spindle to polygonal cells with vesicular nuclei, prominent nucleoli, and brisk mitosis (22-24 per 10 HPFs). (H&E, 400x)



Gig-13: IHC shows diffuse nuclear SOX10 positivity (IHC, 400x)

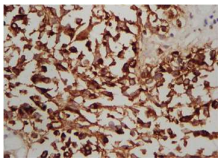


Fig-14: Cytoplasmic granular HMB45 positivity (IHC, 400x)

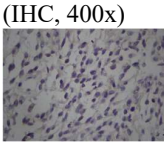


Fig-15: BRAFV600E negative (IHC, 400x)

Discussion

Mucosal melanomas account for approximately 1% of all melanomas and exhibit substantially more aggressive behavior than their cutaneous counterparts.[3] The head and neck region accounts for nearly 50% of mucosal melanomas, with the oral cavity being among the least common sites.[4]

The etiopathogenesis of OMM remains poorly understood. Unlike cutaneous melanoma, ultraviolet radiation is not implicated. Molecular studies suggest alterations involving KIT, NRAS, and less frequently BRAF mutations.[5] BRAF mutations are uncommon in mucosal melanoma, consistent with the negative BRAF V600E immunostaining observed in the present case.

Clinically, OMM may present as macular, nodular, or ulcerative lesions with variable pigmentation. Advanced lesions frequently exhibit bleeding, ulceration, tooth mobility, or regional metastasis. Cervical lymph-node metastasis at initial presentation is associated with poor prognosis and advanced-stage disease.

Cytologically, metastatic melanoma demonstrates considerable morphological heterogeneity. Tumor cells may appear epithelioid, spindle-shaped, plasmacytoid, or pleomorphic. Presence of intracytoplasmic melanin pigment strongly suggests melanocytic origin; however, amelanotic variants pose substantial diagnostic difficulty.[6]

Differential diagnoses include:

- Poorly differentiated squamous-cell carcinoma
- Large-cell lymphoma
- Plasmacytoma
- Metastatic poorly differentiated carcinoma

- Sarcoma

Ancillary studies play a pivotal role in establishing the diagnosis. SOX10 is a highly sensitive melanocytic marker with strong nuclear staining. HMB45 and Melan-A provide excellent specificity for melanocytic differentiation.[7]

Cell-block preparation significantly enhances diagnostic accuracy by allowing architectural assessment and facilitating ICC studies. In resource-limited settings, FNAC combined with cell-block immunocytochemistry offers a rapid and cost-effective diagnostic modality.

Therapeutic options for OMM include wide surgical excision, neck dissection, radiotherapy, chemotherapy, targeted therapy, and immunotherapy. However, prognosis remains poor because of early hematogenous dissemination and high recurrence rates.[8]

Conclusion

Oral mucosal melanoma is a rare and highly aggressive malignancy frequently diagnosed at an advanced stage. Cervical lymph-node metastasis may be the first clinical presentation, necessitating meticulous evaluation of the oral cavity in cases of metastatic cervical adenopathy of unknown primary origin.

FNAC supplemented by cell-block preparation and immunocytochemistry provides a rapid, reliable, and minimally invasive diagnostic strategy. Early diagnosis through integrated clinicopathological correlation is essential for timely therapeutic intervention and prognostic assessment. Reporting such uncommon presentations contributes to increased awareness among cytopathologists and clinicians, facilitating earlier diagnosis and improved patient management.

Declarations

Patient Consent

Appropriate informed consent was obtained from the patient for publication of clinical details and images.

Financial Support and Sponsorship

Nil.

Conflicts of Interest

The authors declare no conflicts of interest.

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