Case Report

Oral metastasis of occult lung adenocarcinoma presenting as maxillary alveolar swelling: A case report

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ABSTRACT

Metastasis to the oral cavity from pulmonary malignancy is an exceptionally rare event, accounting for 1% of all oral malignancies. This report describes a unique case of a 66-year-old female in whom a destructive non-tender maxillary alveolar swelling served as a singular manifestation of an otherwise occult primary lung adenocarcinoma. The patient presented with a soft, non-tender swelling and a persistent sinus tract despite the extraction of teeth. Radiographs confirmed a 25×24×25 mm irregular mass causing complete erosion of the maxillary alveolus and floor of the right maxillary sinus. Diagnosis was established via biopsy and an immunohistochemical panel, which demonstrated co-positivity for thyroid transcription factor-1 and cytokeratin 7. This confirmed Stage IV disease, necessitating a transition to palliative care. The patient succumbed 2 months after diagnosis. This case underscores the necessity for clinicians to include distant metastasis in the diagnosis of non-healing or aggressive oral lesions, as timely identification is critical for appropriate staging and management.

Key words: Adenocarcinoma of lung, Case report, Maxillary neoplasms, Neoplasm metastasis, Thyroid transcription factor-1

Lung adenocarcinoma represents the most prevalent histological subtype of non-small cell lung cancer (NSCLC) [1] and remains a leading cause of cancer mortality globally. Although pulmonary malignancies frequently metastasize to distant sites, secondary spread to the oral cavity is extremely uncommon, accounting for approximately 1–2% of all malignant tumors of the oral cavity [2]. Lung cancer is recognized as one of the most frequent origins for oral metastasis [3]. Oral soft-tissue metastasis is of grave clinical significance, as it invariably indicates highly advanced, Stage IV systemic dissemination [4]. Cases in which the oral lesion is the single manifestation of an otherwise occult primary pulmonary tumor are particularly rare and hence pose a substantial diagnostic challenge [2].

This report highlights the clinical course, diagnostic pathway, and prognostic implications of metastatic lung adenocarcinoma presenting exclusively as a destructive maxillary alveolar swelling.

CASE REPORT

A 66-year-old female patient, with no significant past medical history or adverse personal habits, reported to the department of oral medicine and radiology with a complaint of swelling in the upper front tooth region persisting for 2 months. One month before presentation, she underwent the extraction of teeth 11 and 12 at a private facility due to the swelling, but the condition failed to resolve.

Upon intraoral examination, teeth 11, 12, 21, 22 were missing with a healed extraction socket without any ulceration of the mucosa. A soft, non-tender swelling of size 2 cm×2 cm was noted in the alveolar region with buccal vestibular obliteration, extending from the mesial aspect of 13 to the mesial aspect of 23. This swelling also extended palatally to the mid-palatine raphe region adjacent to teeth 13, 14, and 15. A sinus tract was visible in the region of 12. Segmental mobility was observed in the 13, 14, and 15 regions, and electric pulp testing confirmed that tooth 13 was non-vital. Given the history of extraction and the presence of a sinus tract, the initial clinical diagnosis included residual infection related to the previously extracted 12 region. The presence of extensive bone loss and segmental mobility broadened the differential diagnosis to include chronic suppurative osteomyelitis and malignancy (Fig. 1). Radiographic evaluation included intraoral periapical radiographs, maxillary anterior topographic occlusal radiograph, paranasal sinus view, and an orthopantomogram. Critical

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findings included an irregular bony destruction spanning the maxillary alveolar process from the mesial aspect of 13 to the mesial aspect of 23 (Fig. 2). Computed tomography scan provided further critical detail, revealing irregular destruction of the alveolus from 13 to 23. The lesion measured 25×24×25 mm in size and showed erosion of the floor of the right maxillary sinus (Fig. 3).

As the patient did not have any adverse habit-related history regarding tobacco consumption and the intraoral lesion appeared more like a swelling rather than a growth, involvement of any other organ was more likely suspected, and hence, the patient was referred to a higher cancer treatment institute.

A trucut biopsy was performed from the maxillary alveolus. Histopathology showed linear cores of atypical cells infiltrating a fibrotic stroma, forming nests, cords, and occasional glandular structures. Individual cells possessed moderate eosinophilic cytoplasm, hyperchromatic nuclei, and occasional nucleoli. The features were classified as a low-grade epithelial tumor, necessitating immunohistochemistry (IHC) for definitive typing and determination of primary origin (Fig. 4). The IHC panel (Table 1) stated that the specimen was

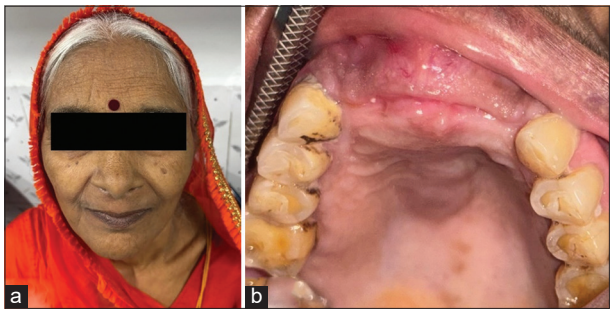

Figure 1: Extraoral profile (a) of the patient and intraoral swelling in the maxillary alveolus with sinus tract and involving hard palate (b)

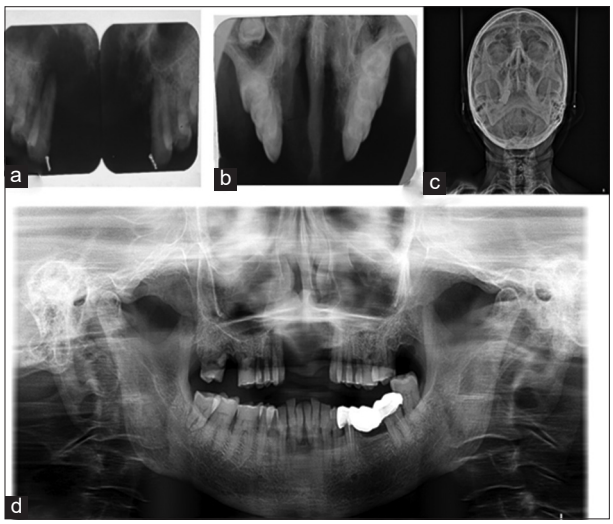

Figure 2: (a) Intraoral periapical radiographs from mesial of 14 till mesial of 24 and (b) maxillary anterior topographic occlusal radiograph showing irregular bony destruction in the maxillary anterior alveolus (c) paranasal sinus view showing haziness in the maxillary sinus (d) orthopantomogram showing irregular bony destruction of maxillary anterior alveolus

positive for thyroid transcription factor-1 (TTF-1) and cytokeratin 7 (CK7). Critically, markers for other potential primary sites were negative: CK20, PAX8, GATA-3, Synaptophysin, and P40 were all negative. The strong co-positivity for TTF-1 and CK7 and negative P40 (Table 1) provided compelling evidence, suggesting a diagnosis of metastatic adenocarcinoma with primary in the lung.

Given the highly advanced nature of the disease, confirmed by the metastatic diagnosis, curative surgical intervention was not indicated. The management strategy transitioned entirely to palliative care, coordinated with an oncology service.

The patient was diagnosed with Stage IV NSCLC (Adenocarcinoma) based on the distant metastasis to the maxilla. Considering this, no further radiographic or histopathological investigations were carried out, and the patient was advised of palliative care. The prognosis associated with oral metastasis from lung cancer is uniformly poor [5]. Oral soft-tissue metastasis signifies the late progression of the primary malignancy, which carries a 5-year survival rate of approximately 8% for distant metastatic NSCLC [4]. Historically, survival time following the diagnosis of oral metastasis is tragically short, ranging from 4 months to 1 year [5]. Despite the establishment of the diagnosis and the commencement of palliative care, the disease followed an aggressive clinical trajectory. The patient experienced a rapid decline in health and ultimately succumbed to the systemic progression of the metastatic lung adenocarcinoma, reinforcing the oral lesion as a catastrophic prognostic marker [6].

DISCUSSION

Metastasis of lung cancer to the oral cavity is rare; however, the jaw bones, being highly vascularized, are more commonly affected than the soft tissues when metastasis to the oral region occurs [7]. Currently, comparatively less literature is available in this field in terms of case reports and studies. The presentation in this case, a solitary, destructive lesion in the maxillary alveolus of a systemically asymptomatic female, was highly misleading. The failure of the lesion to resolve following tooth extraction, coupled with extensive bone destruction on imaging, reflects the diagnostic difficulty, as metastatic lesions frequently mimic common odontogenic infections or benign reactive lesions [2]. NSCLC comprises approximately 85% of all lung malignancies, with adenocarcinoma representing the most prevalent histological subtype, particularly in non-smokers and females [1]. It encompasses a heterogeneous group of tumors, primarily adenocarcinoma, squamous cell carcinoma, and large cell carcinoma, each with distinct biological behavior and molecular profiles. NSCLC is characterized by relatively slower growth compared to small cell carcinoma but demonstrates a marked tendency for early hematogenous spread to

Table 1: Immunohistochemical profile

Immunohistochemical marker	Result	Significance
Thyroid transcription factor-1 (8G7G3/1)	Positive	Highly suggestive of pulmonary or thyroid primary; strong evidence for lung adenocarcinoma.
Cytokeratin 7 (OV-TL12/30)	Positive	Positive in most lung adenocarcinomas and many other tumors.
CK20 (Ks20.8)	Negative	Rules out colorectal primary.
PAX 8 (PAX8/2774R)	Negative	Rules out renal cell or ovarian primary.
GATA-3 (L50-823)	Negative	Rules out urothelial or breast primary.
P40 (ZR8)	Negative	Rules out squamous cell carcinoma.
Synaptophysin (SP11)	Negative	Rules out neuroendocrine tumors.

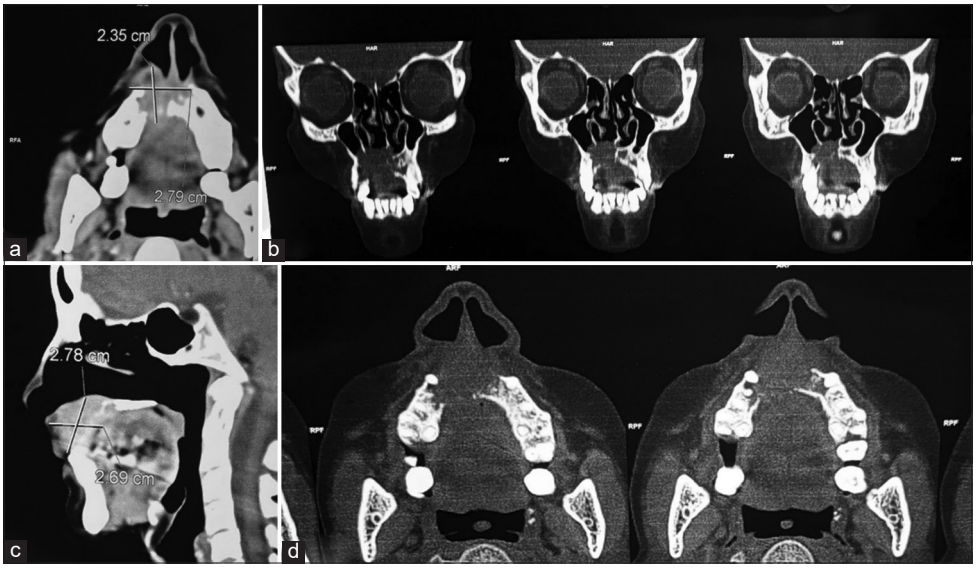

Figure 3: (a-d) Computed tomography coronal (b) axial (a and d) and sagittal (c) sections of the lesion involving the maxillary anterior alveolus and the right maxillary sinus

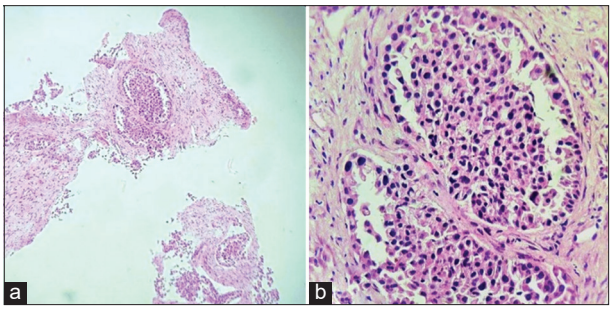

Figure 4: (a) Trucut biopsy shows tumor cells arranged in nests, cords and occasional glands infiltrating into the surrounding fibrotic stroma (Hematoxylin and Eosin [H&E], ×100) (b) Individual tumor cells have moderate amount of eosinophilic cytoplasm with hyperchromatic nuclei (H&E, ×400)

distant organs such as bone, brain, adrenal glands, and, rarely, the oral cavity [5,7].

Definitive diagnosis hinged on histopathology combined with a detailed IHC panel to distinguish the metastatic tumor from a primary oral malignancy, which can include a polymorphous adenocarcinoma of the minor salivary glands [7], a primary intestinal-type adenocarcinoma of the buccal mucosa [2], or cribriform adenocarcinoma of the minor salivary glands [3]. The differential diagnosis must also consider metastasis from other distant sites, such as pancreatic adenocarcinoma presenting in the mandible [4]. The critical step is ruling out these primary and secondary origins.

In contrast to most primary oral malignancies, the positive nuclear staining for TTF-1 (in combination with CK7 positivity and P40 negativity) is highly specific for a primary pulmonary adenocarcinoma [8,9]. This established the pulmonary origin of the tumor and confirmed the Stage IV metastatic disease, immediately altering the management from local treatment to urgent systemic oncology assessment.

A systematic review analyzing 122 cases demonstrated that oral soft-tissue metastases from lung cancer are uncommon but frequently manifest as painless swellings that clinically mimic benign or inflammatory lesions, often leading to initial misdiagnosis, findings that closely parallel the present case [10]. Similarly, another report emphasized that metastatic adenocarcinomas to the oral cavity, irrespective of the primary site, often represent late-stage disease and may exhibit rapid progression with poor prognosis, underscoring the aggressive clinical course observed in our patient [11]. Furthermore, a recent case highlighted the role of advanced histopathological and immunohistochemical profiling in establishing the primary origin, particularly in cases where the oral lesion is the first clinical manifestation [12]. The finding of oral metastasis is universally recognized as an indicator of an advanced, aggressive disease state [1]. Survival following diagnosis of metastasis is consistently reported to be poor, ranging from a few weeks to approximately 1 year [7]. While the advent of targeted therapies (e.g.,

targeted therapy for *EGFR* or *ALK* mutations) has improved survival for some Stage IV NSCLC patients, the occurrence of oral soft-tissue metastasis typically signifies a biologically aggressive phenotype as seen in this case [3].

Suspecting a metastatic lesion in cases of a non-habit induced oral carcinoma that clinically presents not as an ulceroproliferative growth but as an inflammatory lesion is one of the most critical steps of diagnosing lesions like this. It is highly necessary to consider the malignant possibility of such non-healing lesions of the oral cavity.

CONCLUSION

Metastasis of primary lung adenocarcinoma to the maxillary alveolus, particularly as the initial and only presenting symptom, is a profoundly rare and diagnostically challenging. The failure of the lesion to resolve following tooth extraction, coupled with extensive bone destruction on imaging, should raise high suspicion for underlying malignancy. The definitive diagnosis relies on advanced pathological techniques, wherein the co-expression of TTF-1 and CK7 confirms the tumor's pulmonary lineage. Given that this kind of metastasis denotes Stage IV, systemic disease, this finding dictates urgent systemic workup and palliative care, emphasizing the critical role of the oral clinician in timely diagnosis of the disease.

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