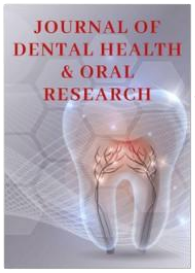

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Case Report

Metastatic Clear Cell Renal Cell Carcinoma Presenting as a Masticator Space Mass Mimicking a Benign Soft Tissue Lesion: A Case Report

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Abstract

Metastatic lesions to the oral and maxillofacial region are uncommon and often pose a diagnostic challenge because they can mimic benign odontogenic, inflammatory or soft tissue lesions. Renal Cell Carcinoma (RCC) is one of the most common infraclavicular tumors metastasizing to the head and neck region due to its rich vascular nature and hematogenous spread. We report a rare case of metastatic clear cell renal cell carcinoma presenting initially as a facial swelling in the left masticator space in a 69-year-old male patient. Initial biopsy performed at a local dental clinic suggested traumatic lipoma, leading to diagnostic ambiguity. Further evaluation at a tertiary care center with contrast-enhanced CT imaging, USG-guided trucut biopsy and abdominal imaging revealed metastatic clear cell RCC originating from the right kidney. This case highlights the importance of thorough radiological and histopathological evaluation in atypical maxillofacial swellings.

Keywords: Metastatic Renal Cell Carcinoma (RCC); Clear Cell RCC; Masticator Space Metastasis; Mandibular Metastasis; Oral Metastasis; Renal Malignancy

Introduction

Oral cavity tumors account for approximately 2% of all malignant tumors worldwide and represent the 16th most common malignancy globally [1]. Metastatic lesions to the oral cavity are uncommon, constituting nearly 1-1.5% of all oral malignancies [2-4]. Despite their rarity, metastatic tumors involving the oral and maxillofacial region are clinically significant because they frequently indicate disseminated systemic disease and may occasionally be the first manifestation of an occult primary malignancy [5-8]. Approximately 22-25% of oral metastatic lesions are diagnosed before identification of the primary tumor, making early recognition essential for prompt diagnosis and management [4,8].

Renal Cell Carcinoma Renal Cell Carcinoma (RCC) is the most common primary malignancy of the kidney and accounts for more than 90% of renal neoplasms [6,7]. RCC is characterized by aggressive biological behavior, extensive vascularity and a marked tendency for hematogenous metastasis. Common metastatic sites include the lungs, bones, liver, adrenal glands, contralateral kidney and brain [6,9]. Although metastasis to the oral cavity is rare, RCC is considered one of the most frequently reported infraclavicular primary tumors metastasizing to the oral and maxillofacial region [10-12]. The mandible is more commonly affected than the maxilla, particularly the posterior body, angle and ramus regions because of their rich marrow

content and vascularity [10,13].

Clinically, metastatic RCC lesions in the oral and maxillofacial region may mimic odontogenic infections, salivary gland neoplasms, giant cell lesions, benign mesenchymal tumors or primary malignant lesions, thereby creating considerable diagnostic difficulty [12,14]. Radiographically, these lesions often appear as aggressive osteolytic masses with cortical destruction and soft tissue extension [15]. Histopathologically, clear cell RCC demonstrates nests and sheets of polygonal clear cells separated by delicate vascular septae, although variations in morphology may occasionally complicate diagnosis [16,17].

The present report describes a rare case of metastatic clear cell RCC presenting as a painful swelling in the left masticator space with mandibular destruction, initially mimicking a benign soft tissue lesion. The case emphasizes the importance of detailed radiological evaluation, histopathological correlation and systemic investigation in elderly patients presenting with rapidly progressive maxillofacial swellings.

Case Report

A 69-year-old male patient, reported to the Department of Oral and Maxillofacial Surgery with a chief complaint of swelling over the left side of the face since 25 days. The patient was apparently asymptomatic 25 days earlier when he first noticed a swelling over the left midfacial region, which progressively increased in size. In the patient visited a local dental clinic where incisional biopsy was performed. The preliminary diagnosis was suggestive of traumatic pseudolipoma. Owing to the progressive increase in swelling and persistent pain, the patient was referred to the Department of Oral and Maxillofacial Surgery at a tertiary care center for further evaluation and management.

Clinical Examination

On inspection, gross facial asymmetry was noted due to a swelling involving the left midfacial region. The swelling extended superoinferiorly from approximately 1 cm below the outer helix of the ear to the lower border of the mandible and anteroposteriorly from 1 cm posterior to the corner of the mouth to the posterior border of the mandible. Elevation of the ear lobule was noted. No evidence of facial nerve paralysis was observed. On palpation, the swelling was nontender, solitary, mobile, and firm in consistency and was not fixed to the underlying skin. A solitary left level Ib lymph node was palpable, which was firm, mobile, and non-tender. No paresthesia was elicited. Intraoral examination revealed a swelling extending from the upper vestibular region to the lower alveolar region. Anteroposteriorly, the swelling extended from approximately 2 cm posterior to the corner of the mouth up to 1 cm posterior to the faucial pillars. Obliteration of the upper buccal vestibule was noted. The surface texture appeared smooth and irregular. The mandibular arch was edentulous, while teeth 13–23 were present. On bimanual palpation, the swelling was firm, nodular, solitary, fixed to the mucosa, and non-tender in nature (Fig. 1).

Figure 1: Patient clinical examination.

On Radiographic Evaluation

Contrast-Enhanced multidetector Computed Tomography (CECT) revealed a well-defined heterogeneously enhancing lesion epicentered in the left masticator space causing erosion of the ramus and condylar process of the mandible. Superiorly, the lesion extended into the infratemporal fossa with infiltration of the temporalis muscle and superolateral extension. Laterally, it infiltrated and compressed the masseter muscle, while medially it abutted and displaced the medial and lateral pterygoid muscles. The lesion measured approximately 5 × 4.8 × 8 cm and demonstrated multiple non-enhancing necrotic areas within. A subcentimetric left level Ib lymph node was also noted.

The radiological impression suggested a neoplastic etiology with differential diagnosis favoring soft tissue sarcoma. USG-guided biopsy was advised for further evaluation (Fig. 2).

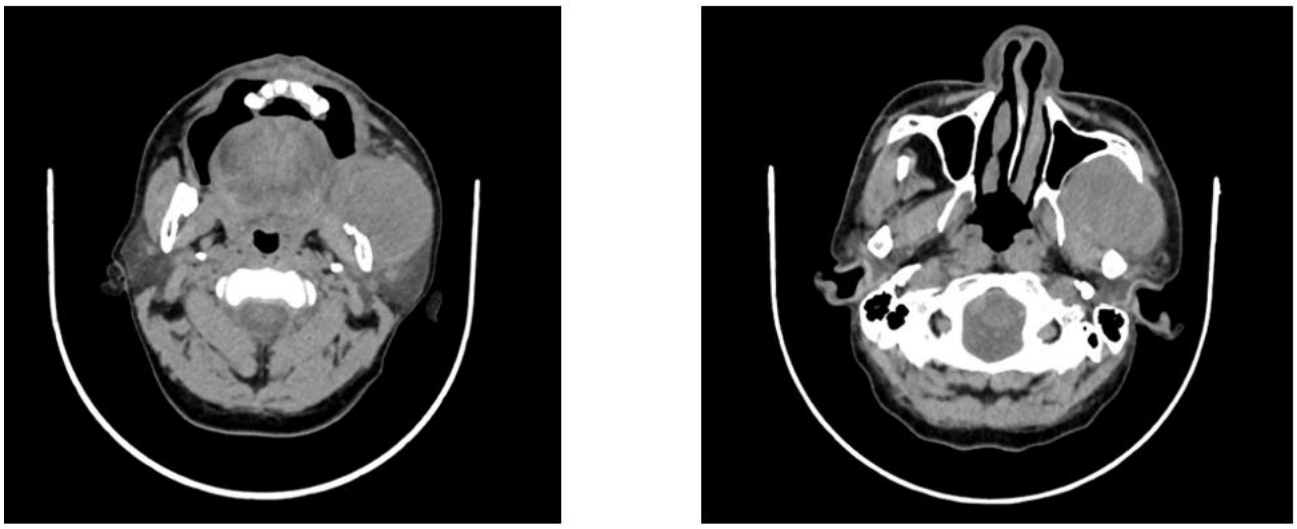

Figure 2: Patient radiographic evaluation.

Histopathological Examination

USG-guided trucut biopsy specimens from the left facial lesion were submitted for histopathological examination. Microscopic examination revealed tiny linear tissue cores with extensive areas of necrosis. The viable areas showed fibrocollagenous tissue infiltrated by nests and diffuse sheets of neoplastic cells. These tumor cells demonstrated mild to moderate anisonucleosis with moderate clear to pale eosinophilic cytoplasm. Focally, spindle-shaped tumor cells were also observed. Thin vascular septae interspersed among the tumor cells along with mild lymphocytic infiltrates were noted. Adjacent foci of necrosis were present. No normal mucosal or salivary gland tissue was identified (Fig. 3,4).

The histopathological impression was suggestive of carcinoma with clear cell morphology involving the left side of the face. Following the histopathological suspicion of metastatic RCC, ultrasonography and contrast-enhanced CT scan of the abdomen and pelvis were performed.

CECT abdomen revealed a large well-defined exophytic lobulated heterogeneously enhancing soft tissue lesion arising from the lower pole of the right kidney measuring approximately 7 × 5.5 × 7.2 cm. The lesion extended toward the pelvicalyceal system and crossed the interpolar region without complete infiltration.

Posterior extension into the posterior pararenal space was observed without infiltration into the posterior musculature. The lesion demonstrated imaging characteristics suggestive of renal malignancy with nephrometric score 7 indicating moderate complexity (Fig. 5).

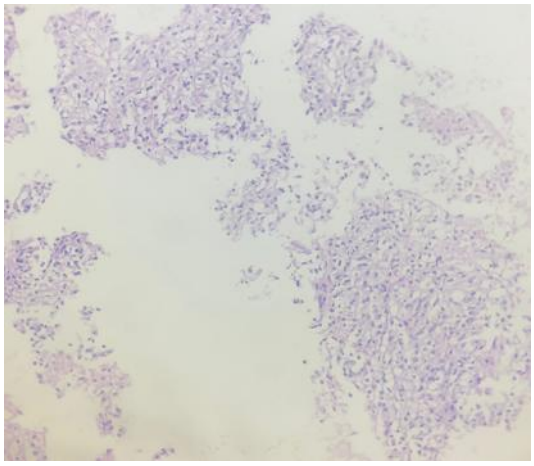

Figure 3: HPE depicting clear cell as spindle-shaped morphology with mild to moderate nuclear pleomorphism.

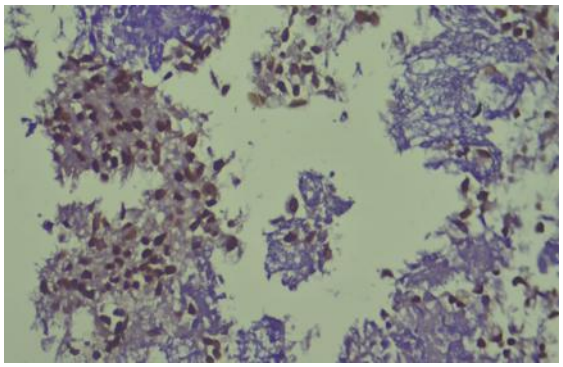

Figure 4: IHC: PAX8: Tumour cells showing nuclear positivity for PAX8.

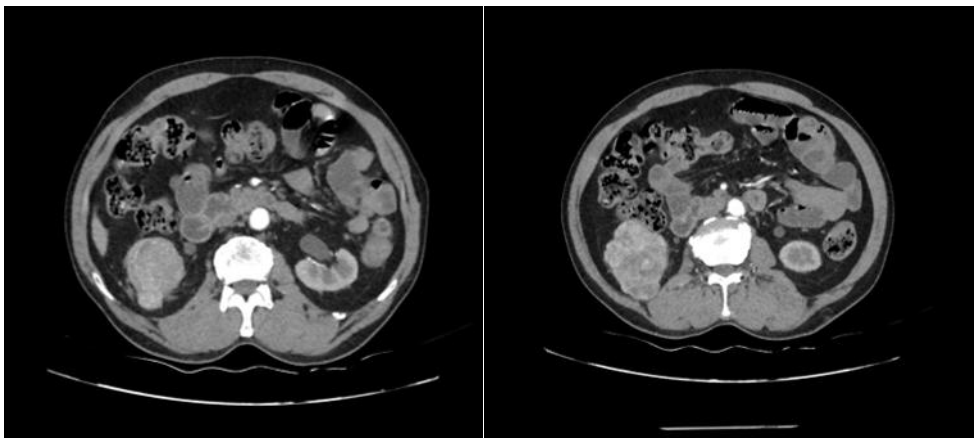

Figure 5: Patient radiographic evaluation.

Based on the clinical, radiological, and histopathological findings, a final diagnosis of metastatic clear cell renal cell carcinoma involving the left masticator space and mandible was established.

Discussion

Metastatic tumors involving the oral and maxillofacial region are rare and usually indicate disseminated systemic disease [3–5]. Among the infraclavicular malignancies metastasizing to the head and neck region, Renal Cell Carcinoma (RCC) is one of the most frequently reported because of its rich vascularity and tendency for hematogenous dissemination through Batson's vertebral venous plexus [6,19]. Although the lungs, liver, bones, adrenal glands and brain are the most common metastatic sites, metastasis to the oral cavity accounts for only approximately 1% of all oral malignancies [1,5]. Metastatic involvement of the masticator space with erosion of the mandibular ramus and condyle is exceptionally uncommon and can create significant diagnostic confusion because of its nonspecific presentation [12].

In the present case, the patient presented with a rapidly enlarging painful swelling involving the left midfacial and masticator region associated with extensive destruction of the mandibular ramus and condyle. Clinically, the lesion initially mimicked a benign soft tissue pathology because it was mobile, firm and not associated with facial nerve paralysis or paresthesia. Furthermore, incional biopsy performed at a local dental clinic suggested traumatic lipoma, which delayed definitive diagnosis. Similar diagnostic difficulties have been reported in previous studies where metastatic RCC lesions clinically resembled odontogenic infections, salivary gland neoplasms, benign mesenchymal lesions, giant cell lesions or soft tissue sarcomas [2,7,8,14]. This highlights the limitations of cytological diagnosis alone in deeply situated vascular lesions and emphasizes the importance of correlating clinical, radiological and histopathological findings in atypical maxillofacial swellings.

Radiographically, metastatic RCC commonly presents as a hypervascular osteolytic lesion with cortical destruction and soft tissue extension [12,15]. In the present case, contrast-enhanced CT imaging revealed a heterogeneously enhancing lesion centered within the left masticator space with destruction of the mandibular ramus and condylar process, extension into the infratemporal fossa and infiltration of adjacent muscles of mastication. Multiple necrotic areas were also identified within the lesion. These aggressive radiological features initially raised suspicion for soft tissue sarcoma; however, the extensive vascularity and destructive nature were also consistent with metastatic RCC described in previous literature [10].

Histopathologically, clear cell RCC characteristically demonstrates nests and sheets of polygonal cells with abundant clear to pale eosinophilic cytoplasm separated by delicate vascular septae [16,17]. Areas of necrosis, hemorrhage and focal spindle cell morphology may also be observed in aggressive lesions [18]. Similar microscopic features were identified in the present case, where biopsy specimens revealed clear cell neoplastic proliferation with thin vascular septae and extensive necrosis. The subsequent abdominal imaging demonstrated a heterogeneously enhancing exophytic lesion arising from the lower pole of the right kidney, thereby confirming the diagnosis of metastatic clear cell RCC.

Oral and maxillofacial metastasis may occasionally represent the first clinical manifestation of occult renal malignancy [4,8]. Previous studies have demonstrated that a considerable number of oral metastatic lesions are diagnosed before detection of the primary tumor [5,10]. Therefore, rapidly progressive facial swellings associated with destructive bony lesions in elderly patients should always raise suspicion for metastatic disease, especially when the clinical presentation is atypical or inconclusive.

Management of metastatic RCC depends on the extent of disease, metastatic burden and patient condition. Treatment options include nephrectomy, surgical excision of metastatic lesions, targeted therapy, immunotherapy, radiotherapy and palliative management [6,20]. However, prognosis generally remains poor because oral metastasis frequently represents advanced disseminated disease [5,11]. Early recognition through comprehensive clinical examination, advanced imaging and histopathological evaluation is therefore essential for timely diagnosis and appropriate multidisciplinary management.

Conclusion

Metastatic renal cell carcinoma to the maxillofacial region is rare and may clinically mimic benign soft tissue lesions or primary maxillofacial neoplasms. Early recognition through careful clinical examination, advanced imaging and histopathological correlation is essential for timely diagnosis and management. This case emphasizes the importance of considering metastatic malignancy in elderly patients presenting with rapidly progressive facial swellings and destructive jaw lesions.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Statement

The project did not meet the definition of human subject research under the purview of the IRB according to federal regulations and therefore was exempt.

Informed Consent Statement

Not applicable.

Authors' Contributions

All authors contributed equally to this paper.

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