Clear-Cell Renal Cell Carcinoma Metastasis into Pterygomaxillary Fossa - A Case Report

Andrea Migliorelli, Alberto Caranti, Marianna Manuelli, Chiara Bianchini, Andrea Ciorba, Stefano Pelucchi
Department of Neurosciences and Rehabilitation, ENT and Audiology Unit, University Hospital of Ferrara, Ferrara, Italy

Abstract

Rationale: The aim of this study is to describe a rare case of clear-cell renal cell carcinoma (ccRCC) metastasis to the pterygomaxillary fossa. **Patient Concerns:** A 54-year-old woman was referred to the Department of Otolaryngology due to right facial pain for the past six weeks. **Diagnosis:** ccRCC metastasis to the pterygomaxillary fossa. **Treatment:** The patient was treated by immunotherapy (Ipilimumab + Nivolumab) after multidisciplinary team evaluation. **Outcomes:** After 18 months, the patient is in good overall condition and the size of the skull base lesion has significantly reduced. **Take-Away Lessons:** ccRCC metastasis to the skull base and adjacent sites occur rarely. Most commonly, the presenting symptoms of these lesions are headache and diplopia for skull base metastases and epistaxis in case of sinusal involvement, according to the literature. When total resection of the metastasis is not feasible, tumour-targeted therapy may be used, as in the presented case. A multidisciplinary evaluation is recommended for the correct assessment and management of these patients.

Keywords: Clear-cell renal cell carcinoma, clear-cell renal cell carcinoma metastasis, head-and-neck surgery, pterygomaxillary fossa, renal cancer

Introduction

Renal cell carcinoma (RCC) is a common malignant neoplasia, that occurs more frequently in males.[1] This tumour is classified into 16 subclasses characterised by different growth rates, metastatic and spreading patterns; the clear-cell RCC (ccRCC) is the most common type.[2,3]

At first diagnosis, about 25% of patients with ccRCC have distant metastases. About 20-50% of metastases occur several months after primary tumour surgery, lungs (76%), local lymph nodes (66%), bone (42%) and liver (41%) are the most common metastatic sites.[3,4] Head-and-neck region is involved by ccRCC metastases in about 15% of cases;[5] in particular, skull base and adjacent site metastases are very rare, and only 14 cases have been reported in the literature so far with the clivus as the most frequently affected.[6-9]

The aim of this study is to describe a rare case of ccRCC metastasis to the pterygomaxillary fossa, that, to the best of our knowledge represents the first report in the English literature.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/aoms

DOI: 10.4103/ams.ams_135_22

Case Report

Patient concerns

A 54-year-old woman was referred to the Department of Otolaryngology of our university hospital. Her main complaint was right facial pain for the past six weeks. Her medical records included poorly controlled hypertension, hiatal hernia and gastroesophageal reflux. The patient did not report weight loss, fever or other symptoms.

The ENT examination disclosed a reddish, pulsating and highly vascularised mass in the right sphenoethmoidal recess during nasal endoscopy.

Address for correspondence: Dr. Andrea Migliorelli, Department of Neurosciences and Rehabilitation, ENT and Audiology Unit, University Hospital of Ferrara, Via Aldo Moro 8, Ferrara 44100, Italy.
E-mail: mglndr1@unife.it

Received: 07-07-2022 **Last Revised:** 10-09-2022
Accepted: 02-01-2023 **Published:** 27-03-2023

How to cite this article: Migliorelli A, Caranti A, Manuelli M, Bianchini C, Ciorba A, Pelucchi S. Clear-cell renal cell carcinoma metastasis into pterygomaxillary fossa - A case report. Ann Maxillofac Surg 2023;13:95-7.

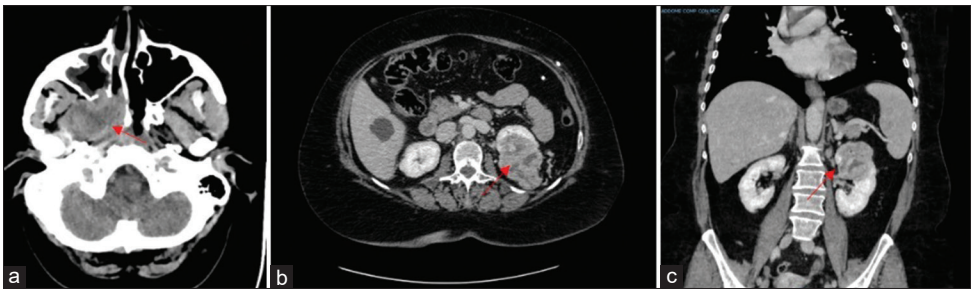

Figure 1: Skull base and abdomen contrast-enhanced CT scans. (a) Expansive process of the right pterygomaxillary fossa, extended to the right maxillary sinus and right sphenoidal sinus (red arrow). (b) Axial scans and left kidney superior pole mass (red arrow). (c) Coronal sections and left kidney superior pole tumour with renal vein thrombosis (red arrow). CT: Computed tomography

Diagnostic aids

Cranial magnetic resonance imaging (MRI) and computed tomography (CT) scans disclosed an expansive process of the right pterygomaxillary fossa, extending into the right maxillary sinus and the right sphenoidal sinus, eroding the cranial base without intracranial involvement. The right trigeminal nerve was involved by the lesion as well as the right internal carotid artery [Figure 1].

The lesion was biopsed endoscopically, under general anaesthesia, through the posterior wall of the maxillary sinus, after caustication of the ipsilateral sphenopalatine artery [Figure 2]. The histological examination described a poorly differentiated carcinoma with clear cells suggestive of a ccRCC metastasis. Immunohistochemical analysis showed positivity for cytokeratin CAM 5.2, epithelial membrane antigen (EMA), vimentin, PAX8, CD10 and focal and weak positivity for pancytokeratin; it was negative for RCC, CD99 and desmin [Figure 3]. Thorax and abdomen contrast CT scans [Figure 1] disclosed a left kidney superior pole mass (6 cm in diameter) with thrombosis of the ipsilateral renal vein.

Treatment

The patient underwent immunotherapy (Ipilimumab + Nivolumab) treatment for four months after multidisciplinary team evaluation (ENT surgeon, oncologist, radiotherapist, urologist and nephrologist).

Outcomes and follow-up

At the follow-up (18 months), the patient is still in good overall health and the size of the skull base lesion has significantly reduced, whereas the volume and the feature of the renal tumour are stationary.

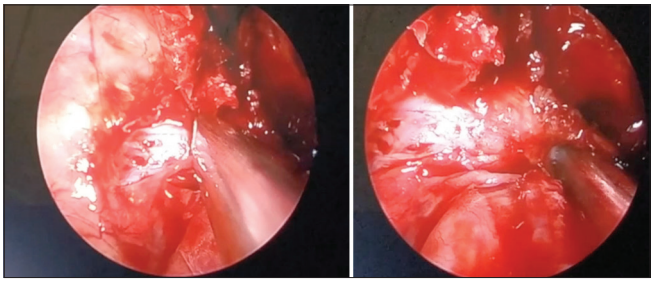

Figure 2: Endoscopic assessment disclosing a reddish, pulsating and highly vascularised mass on the posterior wall of the maxillary sinus

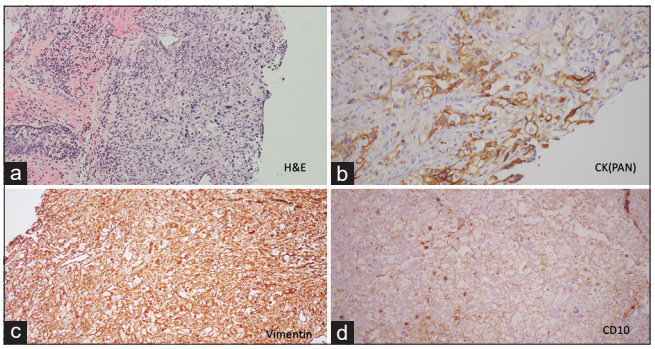

Figure 3: (a) On the right, metastatic infiltration of atypical cellular elements, some of which have clear cytoplasm; on the left, normal tissue features (H and E, ×10 magnification). (b-d) At the immunohistochemical investigation, the metastatic neoplasm was found to be positive for pancytokeratin (b, x20 magnification), vimentin (c, x20 magnification) and CD10 (d, x40 magnification). The present histological and immunohistochemical profile indicate a metastatic ccRCC. ccRCC: Clear-cell renal cell carcinoma

Discussion

RCC accounts for 2% of all cancers, and the ccRCC is the most common histotype accounting approximately for 75-80% of all RCCs.[6-9]

The loss-of-function mutation of the von Hippel–Lindau gene is observed in about 70% of ccRCCs.[7] This mutation facilitates tumour-associated angiogenesis due to the induction of high concentrations of hypoxia-inducible factor and vascular endothelial growth factor.[7]

Growth rate, timing of metastasis and spreading patterns are hardly predictable in ccRCC.[3] However, approximately one-third of patients with RCC have a metastatic disease (also to the nose and maxillary sinuses) at the time of the diagnosis.[3]

So far, in the English literature, we have identified 14 patients with skull base and adjacent sites ccRCC metastases with a mean age of 56 years and no clear gender predilection.[6-9] These metastases are very uncommon with the clivus as the most frequently reported site (10 ccRCC metastatic reported cases),[6,7] followed by the trigeminal nerve (two cases), pituitary gland and internal

carotid artery (one case each).[6-8] To the best of our knowledge, the present is the first reported case of pterygomaxillary fossa involvement by ccRCC metastasis in the English literature.

The most common presenting symptoms of these rare lesions are headache and diplopia for skull base metastases and epistaxis in case of sinusal involvement.[6,7,9] Endoscopically, they appear as reddish, polyploid and hyperaemic masses,[9] showing as soft tissue density lesions with particular enhancement at the CT scan, while at the MRI, they result hyperintense in T2 and isointense in T1.[6,7,9]

Furthermore, skull base and adjacent site metastases have no pathognomonic radiological features and radiological imaging alone does not allow to discriminate metastases from primary tumours.[7]

Endoscopic biopsy of the lesion is mandatory for a correct diagnosis. Differential diagnosis includes clivus and anterior skull base primary tumours (which are very rare, such as chordoma, meningioma, lymphoma, pituitary adenoma and nasopharyngeal carcinoma).[6,7]

According to the literature, total local resection, if possible, represents the first-line treatment for the metastatic tumour.[6,7] Since ccRCC is often resistant to chemotherapy and radiotherapy, tumour-targeted therapy may be used, when metastases are unresectable.[6,7] The present case was treated by immunotherapy, combining a PD-1 inhibitor (nivolumab) and a cytotoxic T lymphocyte-associated protein 4 (ipilimumab). This treatment was selected according to the International Metastatic RCC Database Consortium, which recommends nivolumab and ipilimumab as the standard first-line treatment of nonsurgical ccRCC.[10] In the present case, this combination treatment offered, so far, a good tumour progression control.

Conclusion

In conclusion, skull base and adjacent sites metastasis of ccRCC are very rare. it should be considered in the differential diagnoses of this tumour. A multidisciplinary evaluation is recommended for the appropriate assessment and management of these patients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

Acknowledgements

The authors would like to thank Dr. Massimo Pedriali for his assistance for the histopathologic images.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Medina-Rico M, Ramos HL, Lobo M, Romo J, Prada JG. Epidemiology of renal cancer in developing countries: Review of the literature. Can Urol Assoc J 2018;12:E154-62.
2. Moch H, Cubilla AL, Humphrey PA, Reuter VE, Ulbright TM. The 2016 WHO classification of tumours of the urinary system and male genital organs-part A: Renal, penile, and testicular tumours. Eur Urol 2016;70:93-105.
3. Simo R, Sykes AJ, Hargreaves SP, Axon PR, Birzgalis AR, Slevin NJ, *et al.* Metastatic renal cell carcinoma to the nose and paranasal sinuses. Head Neck 2000;22:722-7.
4. Kovačić M, Krvavica A, Rudić M. Renal cell carcinoma metastasis to the sinonasal cavity: Case report. Acta Clin Croat 2015;54:223-6.
5. Ralli M, Altissimi G, Turchetta R, Rigante M. Metastatic renal cell carcinoma presenting as a paranasal sinus mass: The importance of differential diagnosis. Case Rep Otolaryngol 2017;2017:1-5.
6. Golinelli G, Toso A, Rosa MS, Valletti PA, Pia F. Skull base metastasis from occult renal cell carcinoma. J Craniofac Surg 2018;29:e331-3.
7. Zhang WQ, Bao Y, Qiu B, Wang Y, Li ZP, Wang YB. Clival metastasis of renal clear cell carcinoma: Case report and literature review. World J Clin Cases 2018;6:301-7.
8. Salaud C, Roualdes V, Thillays F, Martin SA, Buffenoir K. Trigeminal ganglion metastasis of renal clear cell carcinoma: Cases report and review of the literature. World Neurosurg 2019;128:541-6.
9. Lee SM, Kim YM, Kim BM. Epistaxis as the first manifestation of silent renal cell carcinoma: A case report with relevant literature review. Iran J Radiol 2016;13:e31208.
10. Zhang S, Xu X, Chen J, Zhang Z, Liu F. Efficacy and safety of nivolumab for advanced renal cell carcinoma: A systematic review and meta-analysis. J Oncol 2022;2022:1-5.