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Complete Response of Pazopanib Treatment in Cystic Renal Cell Carcinoma with Liver Metastasis Patient: A Case Report

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Abstract

Background: Cystic renal cell carcinoma (CRCC) is a rare renal malignancy. Complete radiologic response of metastatic CRCC with liver metastasis following pazopanib therapy is rarely reported. This case highlights a successful treatment outcome.
Objective: To describe the clinical course, diagnostic workup, treatment strategy, and complete radiologic response in a patient with cystic renal cell carcinoma (CRCC) presenting with liver metastasis and treated with pazopanib.
Methods: This case report describes a single patient diagnosed with cystic renal cell carcinoma with hepatic metastasis. Clinical, laboratory, imaging, including computed tomography (CT) and magnetic resonance imaging (MRI), and histopathologic data were collected and analyzed. The CARE guidelines for case report writing were followed.
Results: A 50-year-old woman presented with a 3-month history of weakness, decreased appetite, weight loss, and persistent anemia (Hb 8 g/dL) that was unresponsive to blood transfusion. Imaging studies revealed a large left cystic renal mass measuring 13.6 × 11.8 × 11 cm, with suspected liver metastasis in segment VIII. Following cytoreductive nephrectomy, histopathologic examination confirmed papillary renal cell carcinoma, Fuhrman grade 2, leading to a diagnosis of cystic renal cell carcinoma with hepatic metastasis. The patient subsequently received pazopanib 400 mg twice daily. After 10 months of treatment, complete radiologic disappearance of the liver metastasis was achieved.
Conclusion: This case demonstrates that pazopanib therapy, in combination with cytoreductive nephrectomy, can achieve a complete radiologic response of hepatic metastasis in CRCC. Pazopanib represents a viable and well-tolerated targeted therapy option for metastatic CRCC, warranting further clinical investigation.

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INTRODUCTION

Renal cell carcinoma (RCC) is the most common malignancy of the kidney in adults, accounting for approximately 2–3% of all adult cancers globally, with an estimated 431,000 new cases and 179,000 deaths reported worldwide in 2020 (Ongaro et al., 2026; Sung et al., 2021). Among its recognized histologic subtypes, cystic renal cell carcinoma (CRCC) represents a rare and distinct entity characterized by predominantly fluid-filled cystic masses, low nuclear grade, and a generally favorable prognosis when confined to the kidney (Hsieh et al., 2017). CRCC may arise as a multilocular cystic neoplasm, a unilocular pseudocyst following hemorrhagic necrosis of solid RCC, or from the epithelial lining of preexisting renal cysts, each carrying distinct pathologic implications (Kalita et al., 2023; Nabi et al., 2018).

Despite its relatively indolent behavior in localized disease, CRCC poses significant diagnostic challenges because its radiologic and clinical features closely resemble those of benign renal cysts, leading to frequent misclassification and delayed or missed diagnosis (Low et al., 2016). Contrast-enhanced computed tomography (CT) and magnetic resonance imaging (MRI) remain the imaging modalities of choice for characterizing cystic renal masses, facilitating staging, and detecting metastases, while histopathologic examination is essential for definitive diagnosis and treatment planning (Bellin et al., 2024; Capitanio et al., 2019; Kaur et al., 2020).

For localized CRCC, nephrectomy, either radical or nephron-sparing, remains the standard of care and is associated with excellent long-term outcomes, with reported 5-year and 10-year disease-specific survival rates of 90.3% and 97.3%, respectively (Capitanio et al., 2019). However, in the rare setting of metastatic CRCC, prognosis deteriorates markedly, and systemic targeted therapy becomes the cornerstone of management (El Hage et al., 2025). Conventional cytotoxic chemotherapy has historically shown limited efficacy in metastatic RCC, whereas the advent of tyrosine kinase inhibitors (TKIs) targeting the vascular endothelial growth factor (VEGF) pathway has substantially improved outcomes in this population (Ljungberg et al., 2022; Sharma et al., 2021). Metastatic spread in CRCC most commonly involves the lungs, followed by the liver, bones, brain, and adrenal glands, although hepatic involvement remains particularly uncommon and is associated with a more aggressive disease course (Low et al., 2016).

Pazopanib, an oral TKI that selectively inhibits vascular endothelial growth factor receptors 1, 2, and 3 (VEGFR-1, VEGFR-2, and VEGFR-3), platelet-derived growth factor receptors (PDGFRs), and fibroblast growth factor receptors (FGFRs), is approved for the first-line treatment of advanced or metastatic RCC. In the pivotal phase III trial by Sternberg (2010), pazopanib demonstrated a significant progression-free survival benefit over placebo, and subsequent data from the COMPARZ trial confirmed its noninferiority to sunitinib, with a more favorable tolerability profile (Motzer et al., 2013). Despite these advances, evidence regarding the efficacy of pazopanib specifically in CRCC, particularly in the rare subset with hepatic metastasis, remains extremely limited. A systematic search of the published literature reveals only isolated case reports describing CRCC with liver metastasis and none documenting the complete radiologic disappearance of hepatic lesions following pazopanib therapy (Hsieh et al., 2017). This significant gap in the literature underscores the need for further documentation of clinical outcomes in this rare entity.

Herein, we report the case of a 50-year-old woman with papillary-type CRCC and synchronous hepatic metastasis who achieved a complete radiologic response of liver metastasis following cytoreductive nephrectomy and pazopanib therapy administered for 10 months. To our knowledge, this represents one of the very few documented cases of complete disappearance of hepatic metastasis in CRCC following pazopanib treatment, contributing novel clinical evidence to the sparse literature on this rare oncologic entity. The objective of this report is to describe the clinical presentation, diagnostic workup, therapeutic decision-making, and complete radiologic response in this patient, with the aim of informing future management strategies for metastatic CRCC.

METHOD

This case report describes a 50-year-old woman with cystic renal cell carcinoma (CRCC) and hepatic metastasis, prepared in accordance with the CARE (CAse REport) guidelines. Data were obtained through a comprehensive review of the patient's medical records, including clinical history, physical examination findings, laboratory results, imaging studies, including abdominal computed tomography (CT) and contrast-enhanced magnetic resonance imaging (MRI), and histopathological reports. The diagnostic workup included ultrasonography, contrast-enhanced abdominal CT, and abdominal MRI. Therapeutic follow-up was documented through serial laboratory investigations and repeat imaging. Ethical considerations were maintained, and written informed consent was obtained from the patient for publication of this case report.

RESULTS AND DISCUSSION

Results

Case Report

A 50-year-old woman presented with a chief complaint of persistent weakness for the past 3 months. She had a history of persistently low hemoglobin (Hb) level of 8 g/dL. A blood transfusion had been performed; however, the Hb level remained persistently around 8 g/dL. She had been examined by an internal medicine specialist and was suspected of having thalassemia because she also complained of a lump in the upper left abdomen for the previous 3 months, which she felt was progressively enlarging. A bone marrow examination had been performed, and the results were normal. Ultrasonography showed an enlarged left kidney. The patient also had decreased appetite, with no known history of weight loss. She was then referred to a urology specialist. The patient had a history of uncontrolled diabetes mellitus for the past 5 years.

Physical examination revealed a good general condition, with a Glasgow Coma Scale (GCS) score of E4V5M6, blood pressure of 110/80 mmHg, pulse rate of 92 beats/minute, and respiratory rate of 20 breaths/minute. In general, the patient appeared anemic. Urological examination showed positive costovertebral angle (CVA) tenderness on the left side. A flank mass was found in the left region, approaching the midline of the abdomen, with a diameter of 15 cm. The mass was mobile and hard in consistency. The urinary bladder was not palpable. The female genitalia and external urethral meatus were within normal limits. Urine output was 1,500 cc/24 hours, with clear yellow urine.

Supporting laboratory examinations showed an Hb level of 8.3 g/dL, leukocyte count of $7.7 \times 10^3/\mu L$, and platelet count of $171 \times 10^3/\mu L$. Blood glucose examination showed a level of 249 mg/dL, HbA1c of 11.1%, triglycerides of 264 mg/dL, and low-density lipoprotein (LDL) cholesterol of 120.8 mg/dL.

Based on the supporting examinations, an abdominal CT scan performed on March 13, 2019, showed that the left kidney measured 13.6 × 6 cm, with normal cortical density and no dilatation of the pelvicalyceal system. There was a solid mass with a cystic component in the middle, showing exophytic anterocranial enlargement extending medially and cranially. The mass was well defined, with an irregularly lobulated inner surface that was thickest on the posterior side. The mass in the left kidney measured approximately 13.6 cm craniocaudally × 11.8 cm anteroposteriorly × 11 cm transversely. After contrast administration, pathological enhancement in all phases was observed in the solid component. The mass received arterial supply from a branch of the left renal artery.

The right kidney measured 11.7 × 5.8 cm, with normal cortical density. The pelvicalyceal system was not dilated, and no nodules or stones were observed. The right and left ureters were visualized distally and were not dilated.

The liver showed mild enlargement, with a craniocaudal length of approximately 21 cm, smooth margins, and a smooth surface. The vascular and biliary systems were normal. In the arterial phase, two isodense nodules with slightly hyperdense margins were observed in segment 8, measuring approximately 2.7 cm and 3 cm in diameter, respectively.

The uterus appeared anteflexed and measured approximately 10 × 9.4 × 8.8 cm. An intracavitary nodule appeared to originate from the left posterolateral wall and measured 3 × 2.2 cm. No pathological contrast enhancement was observed. Therefore, the findings were concluded to indicate left cystic renal cell carcinoma measuring 13.6 × 11.8 × 11 cm, with suspected hypovascular metastatic lesions in segment 8 of the liver, corresponding to T2aN0M1, as well as a left posterolateral wall submucous myoma uteri measuring 3 × 2.2 cm and bilateral pleural effusions.

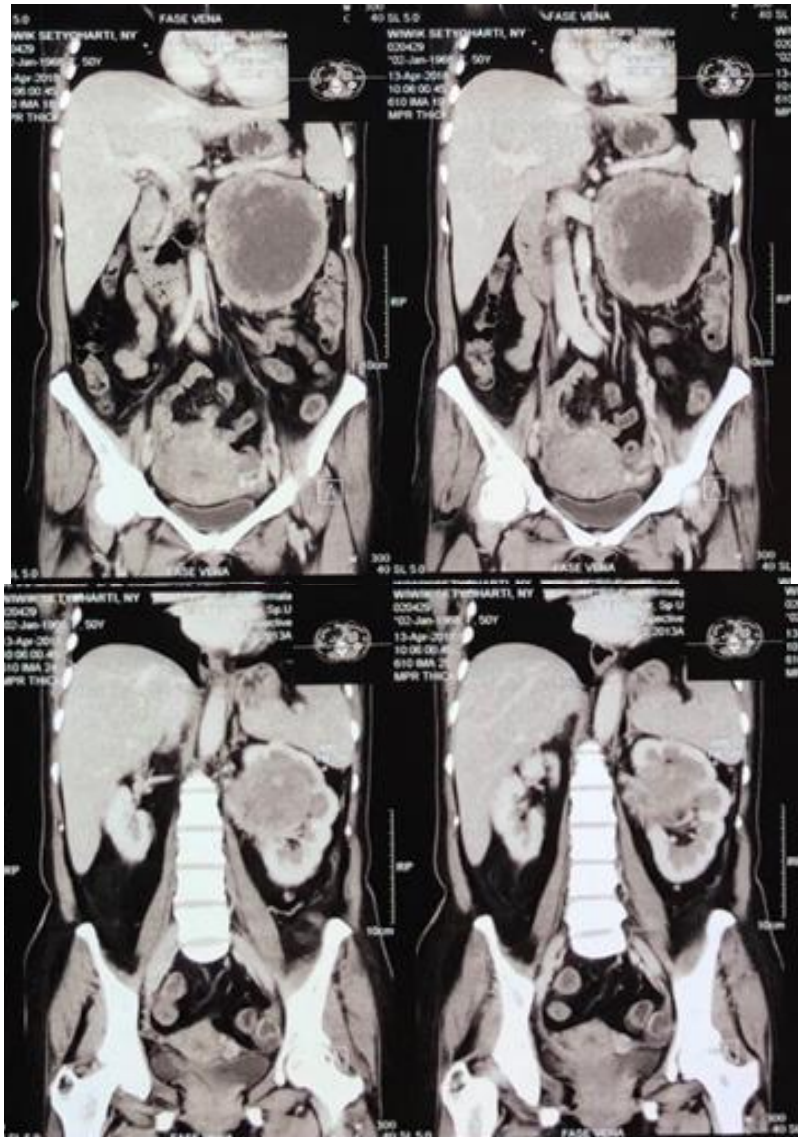


Figure 1. The results of a non-contrast abdominal CT scan shows enlarged left ren and a cranio-caudal enlargement of the liver.

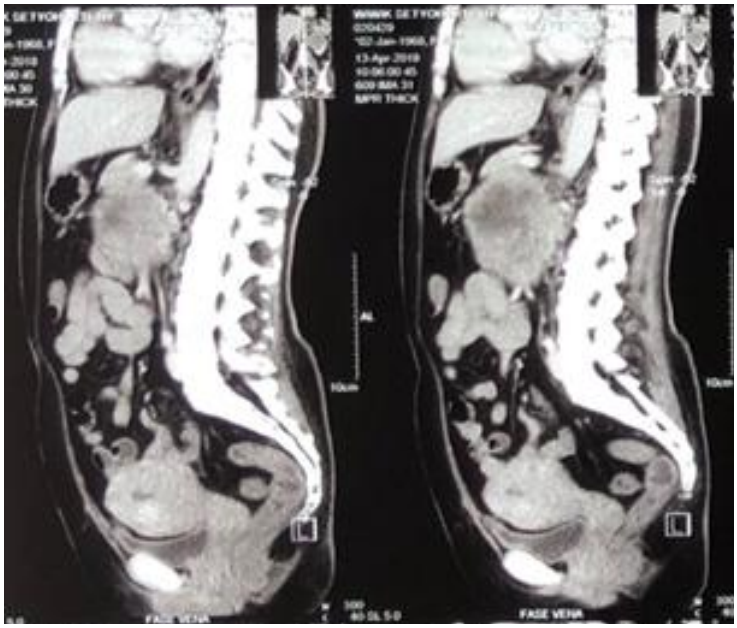


Figure 2. A CT scan of the abdomen shows an anteflexed uterus.

On histopathological examination, a cytoreductive nephrectomy was conducted on April 5, 2018, per laparotomy incision. Microscopically, the pieces of kidney tissue consisted of a proliferation of cells with pleomorphic, hyperchromatic, partially vacuolated, papillary structures, partially solid, infiltration between the connective tissue, and the distribution of lymphocytic inflammatory cells. The distance between the tumor cells coincided with the capsule. The proximal end of the ureteral surgical incision did not reveal malignant cell infiltration. For the conclusion, it was found Renal cell carcinoma papillary type (Fuhrman Grade 2). The tumor size was approximately 12 cm, the distance of the tumor cells coincided with the capsule, the proximal end of the ureteral surgical incision was tumor-free.

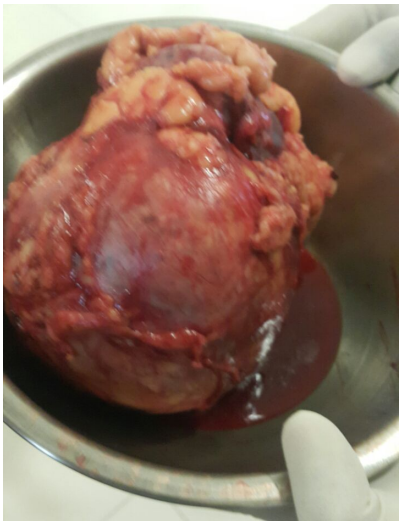
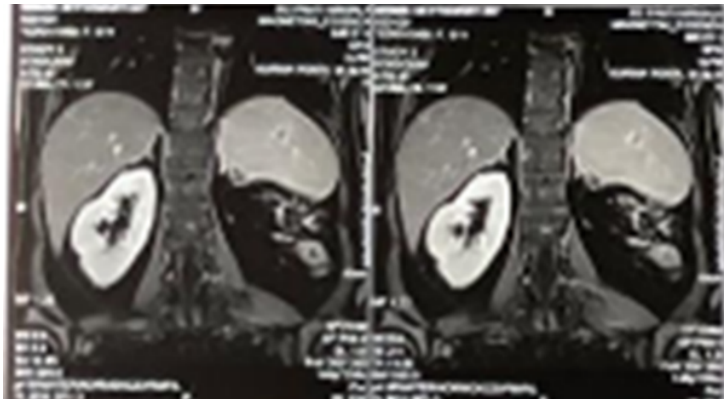


Figure 3. Macroscopic images of CRCC post cytoreductive nephrectomy.

Based on the histopathological results, it was decided to continue with targeted therapy using Sorafenib 2x400 mg. From the evaluation results obtained side effects of the drug in the form of hair loss, pain in the joints, skin blisters on the soles of the feet. Furthermore, the drug dose was reduced, but the complaints were still felt, thus, the drug was replaced.

Subsequently, the drug was replaced with Pazopanib (Votrient) at a dose of 2x400 mg. The administration of this drug did not find any significant side effects. The skin becomes whiter and body hair returns but is white. The patient has been taking the drug since August 2018 until now. There was an improvement in the condition and other complaints improved, there was one episode of decrease in Hb to 8.5 mg/dL but the patient did not wish to have a blood transfusion so she was administered an injection of erythropietin.

The results of the abdominal MRI examination with contrast on March 7, 2019, concluded that after left renal surgery, there was no residual mass, and currently, no intra-abdominal metastases were seen.



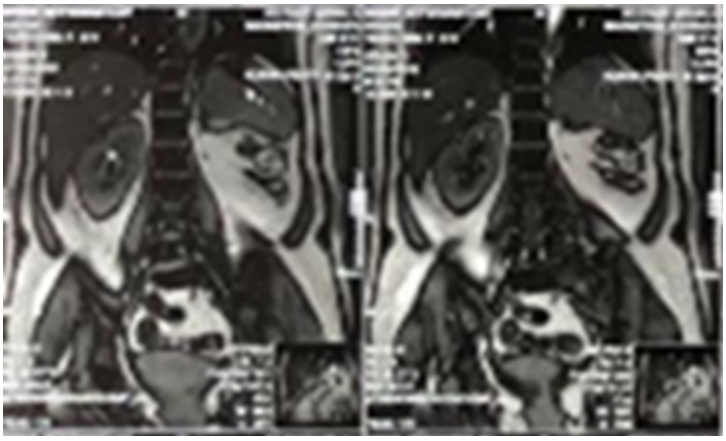


Figure 4. Abdominal MRI with contrast showed no residual mass and intra-abdominal metastases.

In the latest laboratory results on April 9, 2020, the Temporary Blood Sugar was 269 mg/dL, GD2PP 283 mg/dL, and HbA1C 10.6%. Meanwhile, on May 8, 2020, the results were Hb 15.3 g/dL, leukocytes 7.7x103/µL, platelets 171x103/µL, HbA1C 11.1%, triglycerides 264 mg/dL, and LDL 120.8 mg/dL.

Discussion

Cystic renal cell carcinoma (CRCC) is an uncommon and clinically distinct subtype of RCC, characterized by predominantly cystic architecture, low Fuhrman nuclear grade, and generally indolent behavior in localized disease (Kuthi, 2020; Skenderi, 2021). However, as demonstrated in this case, CRCC can occasionally present with distant metastases, including hepatic involvement, a scenario associated with a markedly worse prognosis and considerable therapeutic complexity. The present case is noteworthy because complete radiographic disappearance of hepatic metastasis was achieved following cytoreductive nephrectomy combined with pazopanib therapy, a response that has rarely been documented in the literature for this specific histological subtype (Hsieh et al., 2017).

The diagnostic journey in this patient illustrates the well-recognized challenge of identifying CRCC in clinical practice. The patient initially presented with a three-month history of persistent anemia, an abdominal mass, and systemic symptoms, including weight loss and fatigue, a clinical picture that led to an initial suspicion of thalassemia and prompted bone marrow examination before a renal origin was considered. This delayed recognition is consistent with reported patterns in the literature, as CRCC lacks pathognomonic clinical features and its radiological appearance closely overlaps with that of benign renal cysts (Low et al., 2016). A contrast-enhanced CT scan performed in March 2018 ultimately identified the characteristic findings: a large left renal cystic mass measuring 13.6 × 11.8 × 11 cm, with enhancement in the solid component, and two hypodense nodules in hepatic segment 8, consistent with hypovascular metastases. This multimodality imaging approach, corroborated by subsequent MRI, reflects current guideline recommendations for the evaluation of complex cystic renal masses (Ljungberg et al., 2022). Histopathological examination confirmed papillary-type RCC with Fuhrman Grade 2 nuclear morphology, which, in the context of predominant cystic architecture, is classified as CRCC, a distinction carrying prognostic significance given the low-grade nature of the lesion (Capitanio et al., 2019).

The presence of synchronous hepatic metastasis at presentation placed this patient in the metastatic CRCC category, for which cytoreductive nephrectomy followed by systemic targeted therapy represents the recommended approach in eligible patients (Ljungberg et al., 2022). Cytoreductive nephrectomy was performed as the initial intervention, consistent with evidence supporting its role in reducing tumor burden and potentially enhancing the efficacy of subsequent targeted therapy by relieving immunosuppressive tumor microenvironment signals (Hsieh et al., 2017). Following nephrectomy, sorafenib was initiated at 2 × 400 mg; however, the patient developed intolerable adverse effects, including hand-foot syndrome, arthralgia, and alopecia, necessitating dose reduction and ultimately drug discontinuation. This clinical course is

consistent with the known tolerability profile of sorafenib, particularly the high incidence of cutaneous and musculoskeletal toxicities reported in comparative studies (Motzer et al., 2013).

Pazopanib was subsequently selected as the second-line targeted agent at a dose of 800 mg/day (2 × 400 mg). As an oral multitarget tyrosine kinase inhibitor (TKI), pazopanib selectively inhibits VEGFR-1, VEGFR-2, and VEGFR-3, as well as PDGFR and FGFR, thereby suppressing tumor angiogenesis through multiple convergent pathways (Sternberg et al., 2010). The molecular basis for its efficacy in metastatic RCC is well established: elevated expression of HIF-2α in RCC upregulates VEGF transcription, which drives angiogenic signaling through VEGFR-2 and downstream activation of the AKT–mTOR pathway; pazopanib interrupts this cascade at the receptor level (Akbani et al., 2014; Darwish et al., 2013). In a study of 63 patients with metastatic RCC by Yurmazov (2016), pazopanib induced partial tumor regression in 26.9% of cases and stable disease in 61.5%, with concurrent reductions in HIF-2α mRNA and angiogenic transcription factor expression, findings that parallel the favorable response observed in our patient. The pivotal COMPARZ trial further established pazopanib as a preferred first-line option in metastatic RCC, demonstrating noninferiority to sunitinib with a significantly better tolerability profile, particularly with respect to fatigue, hand-foot syndrome, and quality of life (Ismail, 2024; Motzer et al., 2013). The switch from sorafenib to pazopanib in this case was therefore clinically justified by toxicity and supported by evidence of comparable or superior tolerability and efficacy.

Following ten months of pazopanib therapy, repeat contrast-enhanced abdominal MRI performed in March 2019 demonstrated complete disappearance of the previously identified hepatic metastases, with no residual intra-abdominal disease. This outcome, complete radiographic response of hepatic metastasis in CRCC, is exceptionally rare and, to our knowledge, has not been previously documented with pazopanib in this specific histological context. The side effects observed during pazopanib therapy in this patient, namely progressive skin depigmentation and whitening of body hair, are recognized class effects of VEGFR inhibitors. These manifestations reflect the VEGFR dependence of melanocyte survival and migration, and their presence is considered an indirect biomarker of adequate systemic drug exposure and target inhibition (Motzer et al., 2013). The absence of severe adverse effects enabled sustained drug administration over ten months, which likely contributed to the depth of response achieved.

From a prognostic standpoint, CRCC in localized disease carries an excellent outlook, with 10-year disease-specific survival reaching 97.3% (Capitanio et al., 2019). However, metastatic CRCC, particularly with visceral involvement such as hepatic metastases, represents a markedly different clinical entity, for which standard prognostic models derived from clear-cell RCC populations may not be directly applicable. The favorable response in this patient suggests that, despite histological subtype differences, the VEGF-driven angiogenic pathway remains a therapeutically actionable target in metastatic CRCC with hepatic involvement and that complete response is achievable with sustained TKI therapy.

This case is not without limitations. As a single-patient report, the findings cannot be generalized to the broader population of patients with metastatic CRCC. The absence of controlled data specific to this subtype, compounded by the rarity of CRCC with hepatic metastasis, means that no evidence-based treatment algorithm currently exists for this presentation. Additionally, the long-term durability of the complete response observed here remains unknown, as sustained follow-up data beyond the documented MRI at ten months are not available in this report. Future prospective registries and multicenter collaborative studies are warranted to characterize optimal treatment sequencing, response duration, and predictive biomarkers in metastatic CRCC. Nevertheless, this case contributes meaningful clinical evidence supporting pazopanib as an effective and well-tolerated option in metastatic CRCC with hepatic involvement and highlights the potential for complete visceral response even in this high-risk subset.

CONCLUSION

Cystic renal cell carcinoma (CRCC) is a rare subtype of renal cell carcinoma that can, albeit uncommonly, present with distant metastases. This case demonstrates that a multimodal approach combining cytoreductive nephrectomy with pazopanib-targeted therapy can achieve complete radiologic remission of hepatic metastasis in CRCC within 10 months of treatment. The favorable tolerability of pazopanib compared with sorafenib, as evidenced by this patient's clinical

course, supports its selection in patients with metastatic CRCC who experience sorafenib-related toxicity. The limitations of this report as a single-case study are acknowledged; therefore, the findings may not be generalizable to all patients with metastatic CRCC. Nevertheless, this case contributes valuable clinical insight to the limited body of evidence on CRCC with hepatic metastasis and supports the need for further prospective research and registry-based studies to establish standardized treatment protocols for this rare entity.

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AUTHOR CONTRIBUTION STATEMENT

Muhammad Firas Balafif contributed to conceptualization, patient management, data collection, formal analysis, investigation, and writing of the original manuscript. Kurnia Penta Seputra contributed to methodology development, clinical interpretation, supervision, and validation of the study findings. Medianto contributed to supervision, project administration, data validation, and final approval of the manuscript. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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