

Clear cell renal carcinoma complicated by mixed shock and fatal outcome. Case report

Carcinoma renal de células claras complicado con shock mixto y desenlace fatal. Informe de caso

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ABSTRACT

The clear cells renal carcinoma are the renal tumor of bigger worldwide incidence. His presentation oscillates in patient elders of 50 years, rare in younger patients of that age. This article presents a fatal case of renal carcinoma of clear cells in young patients. It has to do with a feminine patient of 34 elderly years that you were relieving with the use of analgesics that attends with abdominal pain in inferior left-hand hemiabdomen of great intensity, sharp, localized type and winker. Painful abdomen to the palpation and palpable mass at left-hand flank and fist painful percussion at renal homonymous grave. After confirmation and delimitation of the mass for tomography, they accomplished two weeks to him after radical nephrectomy left-hand, with analysis histopatologic of the anatomic piece of renal carcinoma of clear cells Status I. Status that the advanced die could be still further the pulmonary nodule found in tomography of abdomen, but without data of biopsy. To sorrow of his show off good prognosis, studies the posterior, post-operative and his- remaining- stay tomográficos evidenced abscesses and thrombus in the inferior vena cava, than united to clinical complications like shock hypovolemic, septic, intestinal occlusion and renal intense lesion, relapse, progression or a stadium suspected tumoral once much more the start was moved up to. You perished after 26 lay days for mixed shock despite the intensive measures. This case evidenced the peculiarity of the renal carcinoma of clear cells in a young patient, as well as his correct identification of fatal suggestive complications of advanced stadiums.

Keywords: Renal carcinoma; Intensive care; Nephrology; Oncology.

RESUMEN

El carcinoma renal de células claras es el tumor renal de mayor incidencia a nivel mundial. Su presentación oscila en pacientes mayores de 50 años, rara en pacientes menores de esa edad. Este artículo presenta un caso fatal de carcinoma renal de células claras en paciente joven. Se trata de una paciente femenina de 34 años de edad que acude con dolor abdominal en hemiabdomen inferior izquierdo de gran intensidad, tipo punzante, localizado e intermitente que aliviaba con el uso de analgésicos. Abdomen doloroso a la palpación y masa palpable en flanco izquierdo y puño percusión dolorosa en fosa renal homónima. Tras confirmación y delimitación de la masa por tomografía, se le realizó dos semanas después nefrectomía radical izquierda, con análisis histopatológico de la pieza anatómica de carcinoma renal de células claras Estadio I. Estadio que podía ser aún más avanzado dado el nódulo pulmonar encontrado en tomografía de abdomen, pero sin datos de biopsia. A pesar de su aparente buen pronóstico, estudios tomográficos posteriores, post-operatorios y de su restante estadía evidenciaron abscesos y trombo en la vena cava inferior, que unido a complicaciones clínicas como shock hipovolémico, séptico, oclusión intestinal y lesión renal aguda, sospecharon recaída, progresión o un estadio tumoral mucho más avanzado al inicio. A pesar de las medidas intensivas falleció tras 26 días de estadía por shock mixto. Este caso mostró la peculiaridad del carcinoma renal de células claras en una paciente joven, así como su correcta identificación de complicaciones fatales sugestivas de estadios avanzados.

Palabras clave: Palabras claves: Carcinoma renal; Cuidados intensivos; Nefrología; Oncología.

INTRODUCTION

Clear cell renal cell carcinoma (CCR) is the most common malignant renal tumor in adults, accounting for 75–90% of all malignant renal neoplasms and approximately 2–3% of all cancers worldwide, with a predominance of presentation beginning in the sixth decade of life and a mean age of 64 years; currently, its occurrence in individuals under 40 years of age is considered rare. (1,2) Among its main histopathological subtypes, clear cell carcinoma is the most common and lethal variant, accounting for 80% of all renal carcinomas, with sarcomatoid differentiation in 5% of these cases, which results in invasive–aggressive behavior with a poor prognosis and poor therapeutic response. (3,4)

Its classic triad, characterized by hematuria, flank pain, and a palpable mass, is observed in less than 11% of cases and indicates advanced disease, whereas most cases are detected incidentally at early stages and are amenable to curative treatment via surgery. However, this probability of cure is not entirely related to the stage or degree of tumor spread, and a significant proportion of patients may experience rapid progression, tumor recurrence, and thromboembolic and infectious complications. (1,2,5,6,7)

Despite the literature supporting its prognosis and complications, clear cell renal cell carcinoma (CCRCC) presents a wide range of clinical presentations, making it challenging; therefore, academic training in these presentations is essential, as it is more difficult to manage. (1,2,5) Therefore, the main objective is to describe the presentation of fatal clear cell renal cell carcinoma in a young female patient.

CASE PRESENTATION

Initial Presentation and Tests

A 34-year-old female patient presented with a significant history of 3 cesarean sections, the last 8 years ago, an allergy to tramadol, and a smoking habit for 2 months at age 15, at a rate of 2 cigarettes per day. She began experiencing pain in the lower left quadrant of her abdomen a month and a half ago. The pain was severe—rated 10/10 on the visual analog scale (VAS)—and described as sharp, localized, and intermittent, with relief provided by analgesics. This pain was accompanied by nausea that did not progress to vomiting, with no other symptoms.

On physical examination, the following findings were noted: tenderness on superficial palpation of the left flank using bimanual maneuvers. A mass with irregular and indistinct borders was noted, firm in consistency and nonmobile, with tenderness on percussion with a fist in the renal fossa on that side.

Following admission, laboratory tests were ordered (Table 1, Column A), which revealed mild to moderate anemia, with no signs of renal failure or electrolyte abnormalities, as well as a urinalysis that showed no gross or microscopic hematuria. The following day, a plain computed tomography (CT) scan of the abdomen and chest was ordered (Figure 1), which confirmed a tumor mass in the left kidney and a single nodular lesion in the lung, suggesting metastasis.

The patient stated in her medical history that she had undergone abdominal ultrasound days earlier, which revealed a left kidney with loss of the cortex and an enlarged upper pole with a hypoechoic mass measuring 61 x 51 mm, without evidence of vascularization. This study confirmed that the loss of normal renal morphology and the presence of a solid, expansive mass were not recent onset.

Table 1. Relevant laboratory test results throughout the hospital stay.

Supplementary	Column A (on admission)	Column B Postnephrectomy (in ICU)	Column C post-ICU (predeath)
Hemoglobin	9.6 g/dL	10.3 g/dL	10.2 g/dL
Hematocrit	0.30	0.33	0.30
Platelet count	409 x 10 ⁹ /L	144 x 10 ⁹ /L	400 x 10 ⁹ /L
White blood cells	9.3 x 10 ⁹ /L	3.6 x 10 ⁹ /L	11.3 x 10 ⁹ /L

Supplementary	Column A (on admission)	Column B Postnephrectomy (in ICU)	Column C post-ICU (predeath)
Neutrophils (%)	0.71	0.69	0.89
Urea	37 mg/dL	26.7 mg/dL	210 mg/dL
Creatinine	1.2 mg/dL	2.7 mg/dL	2.4 mg/dL
Na (sodium)	139 mmol/L	139 mmol/L	-
K (potassium)	4.15 mmol/L	4.9 mmol/L	-
Cl (chlorine)	103.5 mmol/L	101 mmol/L	-
Ca (calcium)	9.6 mg/dL	8.1 mg/dL	-
P (phosphorus)	3.83 mg/dL	7 mg/dL	-
Mg (magnesium)	2.36 mg/dL	1.9 mg/dL	-
LDH	256 U/L	-	-

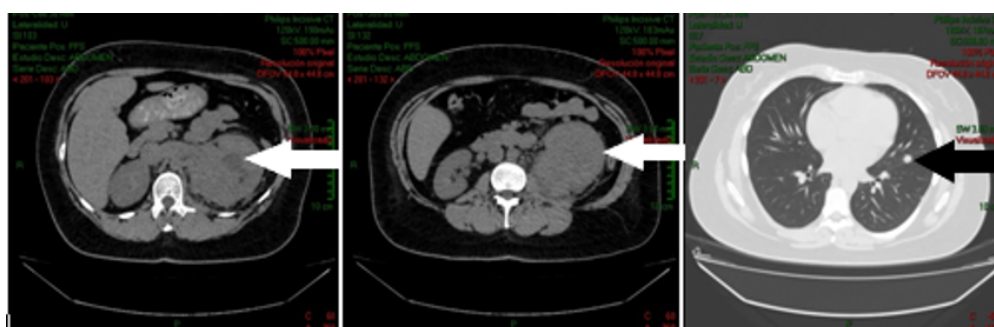


Figure 1. Left and center images: Plain abdominal CT scan. The left kidney is enlarged with tumor infiltration of the parenchyma and renal sinus, predominantly on the posterior surface, with areas of central necrosis (white arrows). Right image: Plain chest CT scan. A single hyperdense nodular lesion measuring 20 mm in diameter with irregular margins was observed; this lesion was located in the apical segment of the left lower lobe and appeared to be metastatic (black arrow).

Surgical procedure and intraoperative findings

Two weeks after the CT scan, the patient was taken to the operating room (Day 0) and underwent radical left nephrectomy with resection of the descending colon, Hartmann's pouch closure plus transverse colostomy, and placement of a left drain directed to the renal bed. A 10 x 5 cm tumor was also excised (Figure 2a) and sent to the Department of Pathology, which reported a histopathological diagnosis of unifocal clear cell renal cell carcinoma (Figure 2b).

However, no surrounding tissue was available (unknown causes), and the tumor was reported to be confined to the kidney, with no extension to the capsule or perirenal fat; additionally, the adrenal gland, lymph node dissection, artery, vein, ureter, and no lymphovascular infiltration were performed (result: stage I pT1b (7 cm, confined to the kidney), pN0, M0). The M0 report is inconsistent with the findings of a nodular mass in the lung, but no biopsy was available to rule out or confirm metastasis.



Figure 2a. Surgical specimen. Upper left and right images: Left nephrectomy measuring 15 × 8 × 8 cm and weighing 700 g, with a residual cortical segment of 1.5 cm. Lower left and right images: solitary, orange–yellow mass measuring 7 × 5 × 4 cm at the upper pole, with well-defined areas of necrosis and hemorrhage.

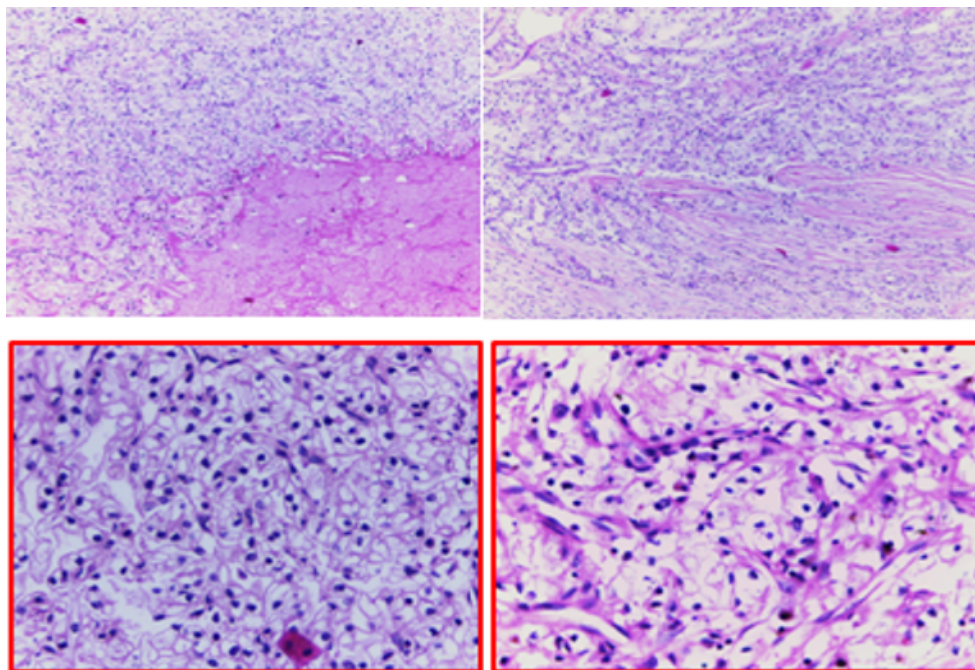


Figure 2b. Histological examination. Upper right and left images: tumor areas with zones of necrosis and hemorrhage. Lower left and right images: cells with clear, eosinophilic cytoplasm, arranged in solid nests.

Postoperative Course and Complications

During surgery, the patient lost 3000 ml of blood over the course of 280 minutes of operation; consequently, she received 4 units of packed red blood cells (PRBCs) plus 2 units of fresh frozen plasma (FFP) and vasopressor support with norepinephrine at a rate of 0.2 mcg/kg/min. During the immediate postoperative period, another unit of FFP was transfused.

Upon transfer to the ward, she was hypotensive, with blood pressure readings of 70/40 mmHg and tachycardia at 130 beats per minute. She remained on treatment with vasoactive amines, in addition to another PB. A consultation was made with the intensive care unit (ICU) because of her state of shock, and the following day (Day 1), additional laboratory tests were performed (Table 1, Column B), which revealed mild thrombocytopenia, leukopenia, and signs of acute kidney injury (AKI) of the renal type (creatinine elevated to twice its previous value, urea-to-creatinine ratio less than 10:1, mild hypocalcemia, and mild to moderate hyperphosphatemia).

The day after these tests (day 2), a CT scan was performed again (Figure 3), as the patient presented with a colostomy exhibiting very low output and bloody discharge, with an apparent abdominal infection. He was taken back to the operating room (day 3), where an exploratory laparotomy with cavity debridement, appendectomy, stoma reconstruction, and drain placement was performed. He was subsequently admitted to the ICU because of postoperative risk and remained on vasopressor support but with no evidence of hypovolemia or bleeding.

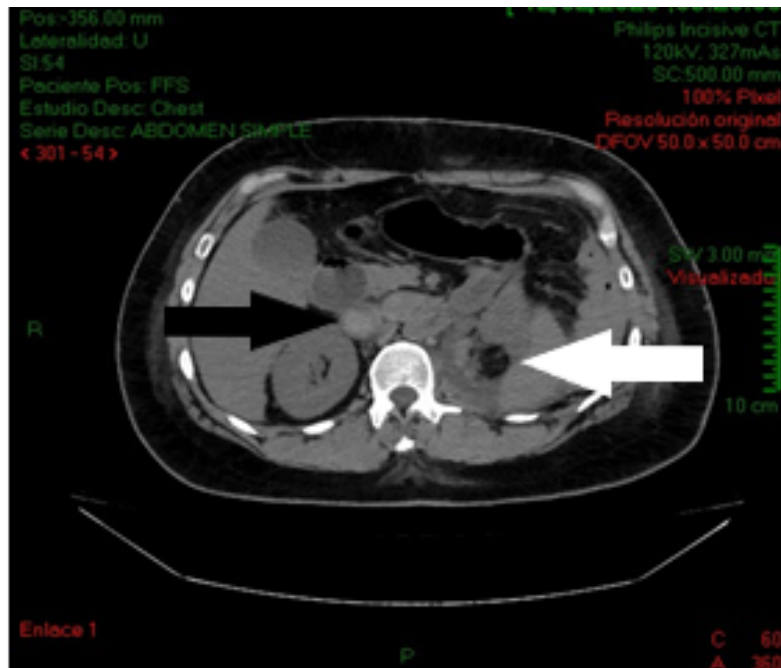


Figure 3. Plain abdominal CT scan. A collection is observed with signs of abscess formation, central cavitation containing gas, and a thick, irregular wall in the left peritoneal region at the renal bed, infiltrating the ipsilateral muscle (white arrow). The inferior vena cava was dilated with a hyperdense image within it, suggesting metastasis (black arrow).

ICU Management and Outcomes

During her stay in the ICU, without the need for assisted ventilation, she began experiencing fever spikes and seroachocolatic discharge. Five days later (day 8), a contrast-enhanced CT scan of the chest and abdomen was performed again (Figures 4a and b). After evaluation by the angiography service, she was deemed ineligible for surgical treatment because of a high risk of pulmonary embolism. Moreover, medical treatment was initiated with sodium heparin at a dosage of 60–80 U/kg as an intravenous bolus, followed by 14–18 U/kg/h via an infusion pump.

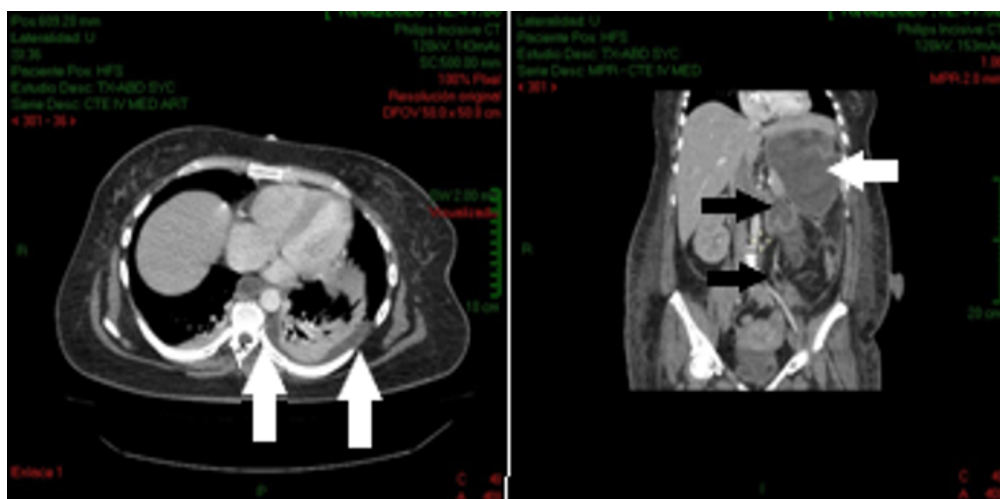


Figure 4. Left image: Contrast-enhanced CT scan of the chest. Bilateral reactions, inflammatory lesions, and a small amount of left pleural effusion are observed (white arrows delineating it). Right image: Multiplanar coronal reconstruction. Gastric dilatation with fluid retention (white arrow) and a large left retroperitoneal abscess (black arrows delineating it) are observed.

After two days in the ICU (day 10), she was discharged for maximum benefit, and during her stay in the ward, she presented with sluggish progress and, once again, febrile spikes and laboratory results (Table 1 C predeath), indicating infection with marked leukocytosis with a predominance of neutrophils, as well as elevated urea levels with worsening renal acute kidney injury (AKI) plus a prerenal component. Antimicrobial therapy was initiated with meropenem at a dosage of 500 mg every 8 hours, and the benefits against the risks of low excretion and/or worsening renal function were weighed.

Two days later (day 12), she underwent surgery again for mechanical intestinal obstruction and complicated intra-abdominal infection, during which blood loss of 200 ml was reported, and she received a transfusion of 1 unit of packed red blood cells plus 3 units of fresh frozen plasma. Despite all therapeutic measures, the following afternoon (day 13), she was pronounced dead after a 26-day hospital stay, with a clinical diagnosis of mixed shock (hypovolemic shock + septic shock). The family did not provide consent for an autopsy.

Ethical considerations: Informed consent was obtained from the patient while she was still alive for the presentation of her case. Similarly, the statistics of the Second Declaration of Helsinki were considered, and the patient's rights were preserved.

DISCUSSION

The scientific literature has traditionally reported favorable outcomes for patients with clear cell renal cell carcinoma (CCRCC) in localized stages. However, substantial heterogeneity in the presentation and course of this neoplasm can lead to paradoxical outcomes even when the pathological stage suggests a good prognosis. Although most SCCs are detected incidentally at early stages and are amenable to curative treatment via surgery, between 20% and 40% of these tumors may present with locoregional recurrence or progression to metastatic disease. This phenomenon is particularly striking in young patients, in whom CRC is considered a rare presentation, accounting for only 8.7% of all diagnosed cases. (2,8)

In this context, Almeida Esquivel et al. (4) reported the case of a 59-year-old patient with clear-cell RCC who, despite renal-ileal invasion, had favorable clinical and surgical outcomes following radical nephrectomy. Similarly, López Romero et al. (2) described a 37-year-old patient with a 10-cm infiltrating CRCC and extensive areas of necrosis who also had an uneventful postoperative course and was discharged early without complications or evidence of relapse at six months of follow-up.

These cases contrast sharply with the poor outcomes observed in other patients, such as those reported by Baez et al. (7), in which a 63-year-old man with sarcomatoid chromophobe carcinoma and a thrombus in the inferior vena cava (IVC) died 15 days after pulmonary embolism, sepsis, and multiple organ failure. This discrepancy underscores the unpredictable nature of CRC, even in early stages.

One of the most relevant and paradoxical findings in the course of some patients with localized CRCC is the development of central venous thrombosis, particularly in the IVC. The incidence of IVC thrombosis in stage I CRCC is exceptionally rare and is estimated to be less than 1% in a series of nephrectomies for tumors ≤ 7 cm. Its presence in the absence of direct tumor invasion or distant metastasis raises the hypothesis that such thrombosis may constitute a postoperative complication mediated by perioperative factors rather than by the tumor stage per se. (9,10,11)

In the same vein, the case reported by Roberts et al. (11) emphasizes that intraoperative embolization of the thrombus during IVC thrombectomy is a lethal complication requiring emergency management with cardiopulmonary bypass, although the authors note that this event is rare when appropriate surgical techniques are applied.

The pathophysiological mechanisms underlying this cascade of serious complications in patients with localized RCC may be multiple and synergistic. First, massive intraoperative hemorrhage, such as that described by Duvarci et al. (12), in their series of laparoscopic nephrectomies, where blood loss was significantly lower and no serious postoperative complications were observed, induces a state of coagulopathy due to dilution and consumption, activates the coagulation cascade through tissue exposure and endothelial damage, and generates a paradoxical prothrombotic state during the immediate postoperative period. (9,10,13)

This context favors the formation of central venous thrombi without the need for direct tumor invasion. Kowal et al. (14) reported that the consistency of the venous thrombus, assessable through radiomic analysis of computed tomography, is a critical predictor of overall survival, with friable thrombi posing the highest risk of perioperative detachment and pulmonary embolism.

Postoperative sepsis is a well-recognized complication of complex oncologic surgeries, particularly in patients who have undergone multiple organ resections or who have experienced massive bleeding, according to the guidelines of the Latin American Cooperative Oncology Group (LACOG) and the Latin American Renal Cancer Group (LARCG). (13,15) Additional activation of coagulation via the tissue factor pathway inhibits fibrinolysis by increasing plasminogen activator inhibitor-1 (PAI-1), leading to microthrombosis and multiorgan dysfunction. Moreover, the interaction between systemic inflammation and thrombosis is particularly relevant in CRCC, given that this tumor is known for its ability to secrete proinflammatory cytokines such as interleukin-6 (IL-6), tumor necrosis factor alpha (TNF- α), and vascular endothelial growth factor (VEGF), which establish a baseline prothrombotic state. Prolonged surgical stress, massive hemorrhage, and postoperative infection act as triggers that amplify this systemic inflammatory response, perpetuating thrombosis and organ failure even in the absence of residual tumor or demonstrated metastasis. (7,9,10)

The spectrum of metastatic presentations of CRC is extremely broad and often unpredictable. Gasque Rodrigo et al. (16) reported the presence of vesicular metastases in a 78-year-old female patient two years after nephrectomy for stage II CRC, with a favorable outcome following cholecystectomy. Similarly, García García et al. (17) described thyroid metastasis as the initial presentation of CRCC, and O'Farril Anzures et al. (1) reported that metastasis to sacral soft tissue occurred 8 years after primary nephrectomy. Even García Molina et al. (18) reported an exceptional case of parotid metastasis from a CRCC with a concurrent arterial pseudoaneurysm.

These late recurrences at atypical sites demonstrate that CRC may have indolent biological behavior for years but respond favorably to salvage surgery. Moreover, the presence of metastases in unusual sites, such as the inferior vena cava, sepsis, and massive hemorrhage, is consistently associated with severe outcomes and more advanced stages than suggested by the initial histology. (7,13,15)

Based on the experience gained from this case, the following modifications are recommended:

- In the presence of a solitary pulmonary nodule without a biopsy, complete the work up with a positron emission tomography (PET) scan or lung biopsy to determine whether surgery should be curative or cytoreductive.

- In the presence of a large renal mass with necrosis and visible bleeding, plan for selective preoperative embolization and ensure ample availability of blood products.

- In cases of massive postoperative blood loss, D-dimer, fibrinogen, and coagulation times should be monitored, and venous Doppler and contrast-enhanced CT should be performed within the first 3–5 days to rule out inferior vena cava thrombosis or pulmonary embolism, especially if infection or organ failure develops.

Among the limitations of this case is that a postmortem examination was not performed because of the family's refusal, which could have confirmed occult tumor spread, lymphovascular microinvasion, or vascular wall infiltration. Furthermore, a sarcomatoid component (focal or within the thrombus) could not be ruled out because of the absence of immunohistochemistry and a second pathological review. As this is a single-case report, it cannot be generalized, but it does allow for the formulation of hypotheses.

Among the practical lessons learned is that stage I clear cell renal cell carcinoma is not synonymous with postoperative benignity. The triple association of massive hemorrhage, abdominal infection, and central venous thrombosis can trigger mixed shock and death without confirmed metastases. Extreme vigilance for thromboembolism is warranted following massive bleeding, and serial imaging studies should be ordered. In cases of sepsis without a clear focus, retroperitoneal abscesses or septic vena cava thrombosis are suspected. Finally, an autopsy is insisted upon, as its absence severely limits diagnostic feedback.

CONCLUSIONS

Stage I clear cell renal cell carcinoma does not rule out the possibility of serious postoperative complications typically associated with advanced disease, such as inferior vena cava thrombosis, retroperitoneal abscesses, and mixed shock. In young patients, the presence of massive intraoperative hemorrhage and multivisceral resection should raise suspicion of a prothrombotic and inflammatory state that may persist even in the absence of confirmed metastases. The absence of an autopsy and a complete immunohistochemical study limits the ability to rule out occult sarcomatoid components. In these cases, exercising extreme vigilance for central venous thrombosis during the postoperative period and considering early serial imaging studies are recommended.

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CONFLICT OF INTEREST

None

AUTHORSHIP CONTRIBUTIONS

NRBF: Methodology, project management, visualization, validation, writing–review and editing.

JGCR: Conceptualization, research, methodology, project management, visualization, validation, supervision, writing–review and editing.

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