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Laparoscopic cytoreductive nephrectomy and adrenalectomy for metachronous RCC metastases—Case report

Bogdan Petrut^{a,b,c}, Cristina Eliza Bujoreanu^{a,*}, Vasile Vlad Hardo^a, Adrian Barbos^d, Bogdan Fetica^e^a “Prof. Dr. Ion Chiricuta” Institute of Oncology, Department of Urology, Republicii Street No. 34–36, 400015, Cluj-Napoca, Romania^b “Humanitas” Hospital, Department of Urology, Cluj-Napoca, Romania^c “Iuliu Hatieganu” University of Medicine and Pharmacy, Department of Urology, Cluj-Napoca, Romania^d “Humanitas” Hospital, Department of Anaesthesia and Intensive Care, Frunzisului Street No. 75, 400664, Cluj-Napoca, Romania^e “Prof. Dr. Ion Chiricuta” Institute of Oncology, Department of Anatomic Pathology, Republicii Street No. 34–36, 400015, Cluj-Napoca, Romania

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ABSTRACT

INTRODUCTION: We report the case of a 69 y.o. man with a left solitary kidney presenting 3 tumoral masses and suspicion of a left adrenal nodular tumor.**PRESENTATION OF CASE:** 48 months previously, the patient underwent laparoscopic right radical nephrectomy and adrenalectomy for a clear cell renal carcinoma, with a tumor free adrenal gland. 3D laparoscopic transperitoneal left cytoreductive nephrectomy and left adrenalectomy were performed within 23 min warm ischemia with no need of post operative hemodialysis. The pathology exam reported metachronous metastases on left adrenal gland and on a left multifocal tumoral solitary kidney from the contralateral clear cell renal carcinoma prior diagnosed and treated at this patient.**DISCUSSION:** Cytoreductive nephrectomy on a solitary kidney brings technical challenges for the laparoscopic approach, especially when the tumor presents as multifocal lesions. Contralateral metachronous metastases and adrenal involvement in case of renal carcinoma are scarcely presented in the literature. **CONCLUSION:** The “en bloc” excision of the tumoral masses optimized warm ischemia time and improved the technical approach, even if the endophytic presentation imposed difficulty.© 2020 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

The present work has been reported in line with the SCARE [1] and PROCESS [2] criteria.

When facing a solitary kidney and a high PADUA scoring tumor, the functional preservation in favor of radical nephrectomy brings a technically complex laparoscopic approach [3]. In case of cytoreductive nephrectomy followed by adjuvant therapy, retrospective studies show disease progression is slowed and survival improved with a median survival of 13.6 months compared to 7.8 months in case of patients following only systemic therapy and no surgical treatment [4].

We report 48 months apart clear cell renal carcinoma (CCRCC) contralateral metachronous metastases as multi-focal tumors on a left solitary kidney and a left adrenal tumor, that

were treated minimally invasive with cytoreductive nephrectomy and adrenalectomy within a 23 min warm ischemia time frame.

2. Presentation of case

2.1. Case history

A 69 y.o. male patient was referred to our department with imagistic suspicion of both left renal and left adrenal tumoral masses. He was known with a pT1bL0V0R0 CCRCC for which underwent laparoscopic right radical nephrectomy and right adrenalectomy 48 months before. No adjuvant therapy was applied as post operative oncologic follow-up (CT scan every 6 months) showed no signs of recurrence or metastases.

Regarding patient’s history, we mention right inguinal hernia repair and cholecystectomy with perforated duodenal ulcer and hyperthyroidism both medicated. The patient presented a good general condition, no low urinary tract symptoms and no significant recent weight loss, smoking 3 cigarettes daily.

* Corresponding author.

E-mail addresses: bogdan.petrut@gmail.com (B. Petrut), bujoreanucristina@yahoo.com (C.E. Bujoreanu), clubresearch1@gmail.com (V.V. Hardo), writandresearchiocn@gmail.com (B. Fetica).

2.2. Clinical findings and diagnostic assessment

The CT scan (May 2019: Fig. 1(1), (2), (3), (4)) showed 3 tumoral formations on the anterior valve of the left renal parenchyma (21/22 mm, 17/12 mm, 15/14 mm near the renal sinus). There were also 3 hypervascularized conglomerated nodular masses (27 mm) on the caudal extremity of the left adrenal gland. The rest of the examination reported no pulmonary affection with negative abdominal and pelvic lymph nodes.

The main diagnosis was a left renal tumor with left adrenal synchronous metastases, but also the possibility of metastatic tumors from the right CCRCC previously known and treated was taken into consideration. The surgical strategy was to perform a cytoreductive nephrectomy with the “en-bloc” excision of the tumoral masses followed by left adrenalectomy, using a 3D transperitoneal laparoscopic approach, obtaining negative surgical margins in safe oncologic conditions with optimal warm ischemic time frame.

2.3. Surgical intervention

The surgical treatment was performed (July 2019) with the patient placed in standard flank position using a transperitoneal approach with 3 trocars. After intraperitoneal adhesiolysis, the laterocolic parietal peritoneum was incised with the descending colon being mobilized medially until the spleen angle was released. The plane between the soft tissue covering the psoas muscle and Gerota's fascia was bluntly exposed and the left ureter was identified, the left kidney and the aorta, respectively vena cava. The left renal pedicle was dissected exposing the common trunk of the renal arteries and the renal vein until it reached the vena cava, identifying the gonadal and adrenal veins. The kidney was dissected (Fig. 1(5)) from the adjacent tissue, respectively Gerota's fascia, except the peritumoral adipose tissue. The common trunk of the renal arteries was clamped with a vascular laparoscopic clamp and the “en-bloc” excision of the tumoral piece was performed (Fig. 1(6)) with safety macroscopic oncologic margins, the excision piece being placed in an Endobag. The excision was performed cognitively guided by the CT scan performed prior to the surgery, correlated with the intra-operative aspect, as the tumors were amputating the cortex. The reconstruction of the renal parenchyma (Fig. 1(7)) was performed using a 2-0 absorbable Vicryl continuous suture in 2 layers, reinforced with Hem-o-lock clips to reduce the risk of tissue cutting when tightening the renorrhaphy (Fig. 1(8)). The renal artery was unclamped after 23 min of warm ischemia. Hemostasis control was performed and the peritumoral adipose tissue from the resection margins was excised separately. The surgery continued with the dissection of the left periadrenal fat, the adrenal vessels being identified, clipped and sectioned with Ligasure sealing device. The 3D laparoscopic left adrenalectomy was performed and each of the two adrenal nodular masses (Fig. 1(9), (10)) were placed in the Endobag. Hemostasis control was performed and the 3 excision pieces were exteriorized in the Endobag and sent for histopathologic analysis. The intra-abdominal gas was evacuated, a drainage tube was placed in Douglas pouch and the trocar entry points were sutured.

An attached video completes the description of the operative steps.

2.4. Surgical outcomes

The evolution of the case was favorable (grade II Clavien–Dindo complications) with post operative steroids supplementation. The Douglas drainage was suppressed in the 5th day post operative and the patient discharged in the 6th day in good general status. No post operative hemodialysis was imposed and it remains so until present date.

The histopathologic and immunohistochemical exams of the excised tissues showed metachronous metastases as multi-focal tumors on a left solitary kidney and a left adrenal tumor of the contralateral CCRCC that was prior diagnosed and treated 48 months before.

2.5. Follow-up

The patient received endocrinologic evaluation, oncologic and urologic follow-up for local and distant tumor recurrences with a CT/ MRI scan performed every 6 months. At present date (last CT scan in June 2020), the patient presents good general status with no imaging signs of disease recurrence or metastases.

3. Discussion

Renal cell carcinoma (RCC) can metastasize to almost every organ, with venous involvement not representing an important prognostic factor. Adrenal involvement is rarely diagnosed in patients with ipsilateral adrenal metastasis after a mean time of 5.2 years from the initial nephrectomy and isolated contralateral adrenal metastasis in 2.5 % of autopsy cases [5]. Bilateral RCC is an uncommon clinical entity, affecting 3–6 % of patients with localized RCC. Metachronous occurrence of RCC in the contralateral kidney is associated with unfavorable prognosis and it has been reported at a mean time interval from the first surgery of 99.3 months, for cases of CCRCC [6].

The hereby case was diagnosed as metachronous contralateral kidney and adrenal gland metastases, considering the 48 months from the initial surgery with no signs of tumor recurrence at the imaging follow-up. Also, the reported histologic characteristics from both surgeries, along with immunohistochemistry analysis, supported the diagnosis [7].

Even if Sunitinib has been reported to downstage primary tumors, including in a case of recurrent RCC on a solitary kidney, enough to allow nephron sparing surgery [8], neither adjuvant nor neoadjuvant therapy were used before the hereby presented surgery.

In cases of oligometastatic metachronous disease, a cytoreductive surgery is preferable before adjuvant therapy for better prognosis, but requires a good surgical technique especially with minimal invasive approaches. The hereby presented case presented a tumor with PADUA score 10 with cytoreductive surgery being performed within 23 min of warm ischemia. Several aspects required a well thought surgical technique. The tumoral formations were mainly endophytic and an intra-operative cognitive guidance after the imaging was used for safe oncologic excision, as the tumors were amputating the renal cortex close to the renal pedicle. Additional intra-operative ultrasound examination would have risked functional outcomes due to prolonged warm ischemia. There were multiple formations that had to be excised “en-bloc” due to their vicinity; the excision of the tumoral formations and the renorrhaphy involved the urinary collecting system. Also, the renal masses were on the superior pole of the kidney complicating the excision part of the surgery, especially when the ipsilateral adrenal gland presented also tumoral nodular formations. Besides the nephrological management of a cytoreductive surgery on a solitary kidney, the adrenalectomy required more attentive peri and post operative management regarding endocrinologic involvement.

In a previously referred study, the incidence of local recurrence after partial nephrectomy was reported higher in the metachronous RCC in the contralateral kidney group compared to the synchronous group or the unilateral RCC patients. Even if after the initial surgery there was no difference regarding patient survival between these groups, survival after the second surgery in

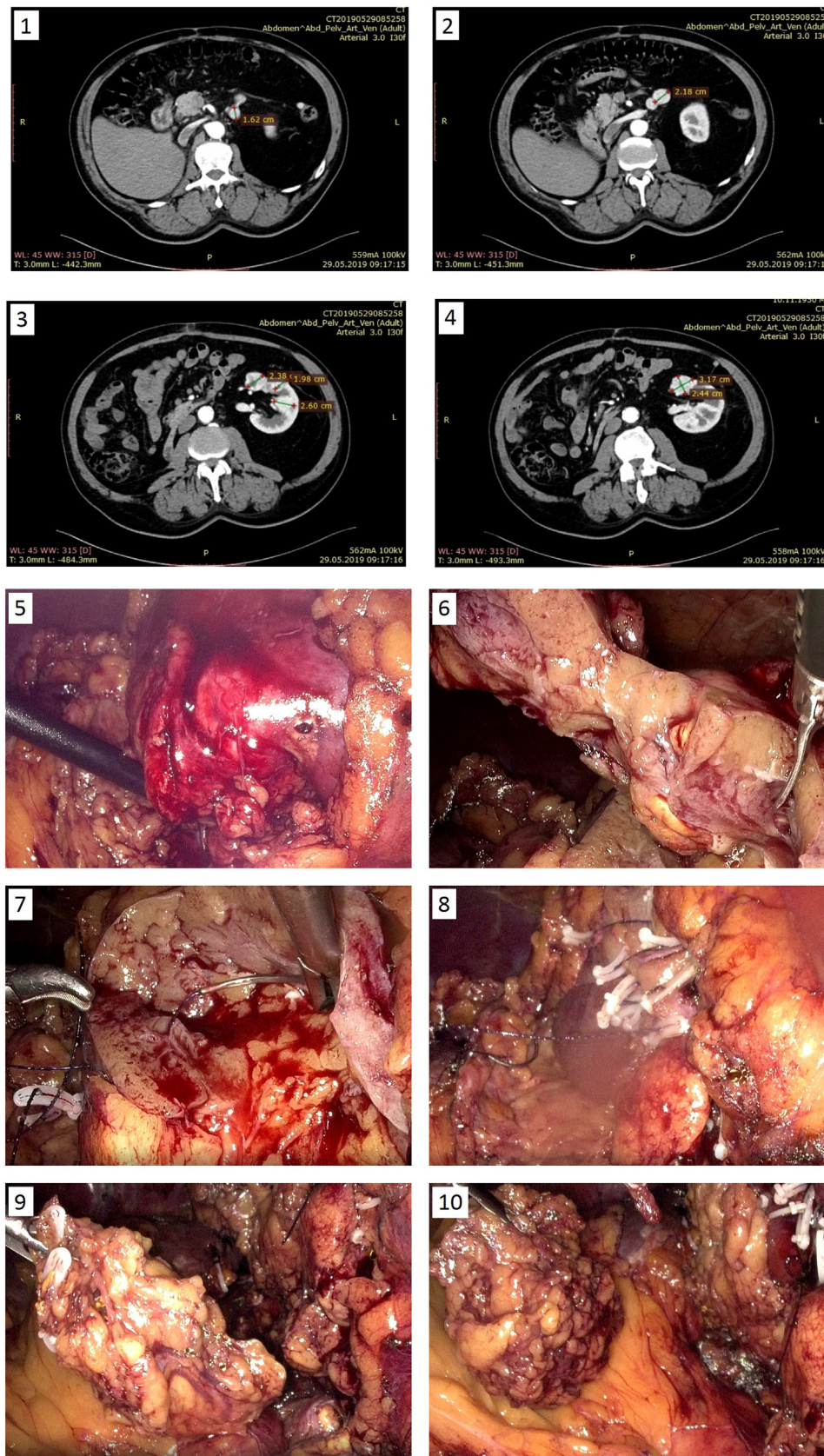


Fig. 1. Collage of computed tomography and intra operative images.

- 1.1, 1.2, 1.3, 1.4: CT scan- arterial phase, axial sections.
- 1.5: tumoral kidney is exposed.
- 1.6: the “en-bloc” excision of the renal tumors.
- 1.7: the renorrhaphy.
- 1.8: after the renorrhaphy.
- 1.9, 1.10: left adrenalectomy.

the metachronous group was significantly lower than that after the first surgery and that in the synchronous group [6]. Regarding the histologic subtype, multifocality incidence is reported bigger for papillary RCC than for clear cell or chromophobe RCC and patients with multifocal clear cell RCC were more likely to develop a contralateral recurrence. Anyhow, multifocality had no impact on long term survival after radical nephrectomy [9]. For the hereby presented case a vigilant oncologic, urologic and endocrinologic follow-up is performed.

4. Conclusion

The 48 months until metastases occurred, the ISUP grade 2 of the carcinoma, the good performance status of the patient, the absence of other local or distant metastases, lifelong strict follow-up along with the prior reported cases of cytoreductive surgery followed by adjuvant therapy in the literature, come in favor of a hopeful survival outcome for our patient [10]. The “en bloc” excision of the renal tumoral masses optimized warm ischemia time and improved the technical approach, even if the endophytic presentation imposed difficulty. Nevertheless, as targeted therapies evolve, the results of cytoreductive surgery need to be studied more with prospective studies on sub-group analysis [11].

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Ethical approval

The study is exempt from ethical approval.

Consent

Consent has been obtained from our patient and no identifying details are presented in the manuscript.

Author contribution

Cristina Eliza Bujoreanu: writing the manuscript- original draft, review and editing.

Vasile Vlad Hardo: part of the surgical team, data acquisition.

Bogdan Fetica: diagnosis management, resources acquisition.

Adrian Barbos: anaesthesiology and intensive care management.

Bogdan Petrut: main operator, conceptualization, overview of the final manuscript.

Registration of research studies

The present manuscript consists in presenting a challenging surgical technique (3D laparoscopic approach) on contralateral metachronous metastases of renal cell carcinoma – involvement of solitary kidney and adrenal gland (scarce in the literature). The rights of the patient have been respected, consent was obtained and surgical treatment followed respecting the ethics of surgery.

- 1 Name of the registry:
- 2 Unique identifying number or registration ID:
- 3 Hyperlink to your specific registration (must be publicly accessible and will be checked):

Guarantor

Cristina Eliza BUJOREANU (manuscript drafting).

Bogdan PETRUT (main operator, supervisor).

Provenance and peer review

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Declaration of Competing Interest

The authors report no declarations of interest.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ijscr.2020.08.046>.

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