



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Unusual giant chromophobe renal cancer totally managed with laparoscopic technique: Report of a case

Giuseppe Di Buono^{a,*}, Salvatore Buscemi^a, Giulia Bonventre^a, Elisa Maienza^a,
Leonardo Gulotta^b, Giorgio Romano^a, Antonino Agrusa^a

^a Department of Surgical, Oncological and Oral Sciences, Section of General and Urgent Surgery, University of Palermo, Italy

^b Department of Human Pathology of Adult and Evolutive Age, General Surgery Unit, University Hospital of Messina, Italy

ARTICLE INFO

Article history:

Received 30 June 2020

Accepted 3 October 2020

Available online 19 October 2020

Keywords:

Laparoscopic nephrectomy

Chromophobe carcinoma

Giant renal mass

Laparoscopy

ABSTRACT

INTRODUCTION: Chromophobe carcinoma of the kidney is a rare pathological entity generally smaller and asymptomatic than other renal cell carcinomas and with a lower risk of metastatic disease. We describe a case of a giant renal chromophobe carcinoma successfully treated by laparoscopy.

CASE REPORT: A 37-years-old Caucasian man presented at physical examination a rigid elastic mass in right upper abdominal quadrant. CT abdominal scan revealed an enhancing well-defined heterogeneous large mass measuring 17 × 15 cm and originating from the upper pole of the right kidney, with necrotic and solid areas within the lesion. Considering the young age of the patient and the absence of local invasiveness, despite the large size of the lesion, we decided to perform a laparoscopic transperitoneal right nephrectomy. The morphological and immunophenotypic characteristics (CK7+, CD10+, CD117+) confirmed the diagnosis of chromophobe renal cell carcinoma.

RESULTS: Chromophobe renal cell cancer is an unusual histological entity. The pathological diagnosis of chromophobe tumor is based on atypia with nuclear irregularities, binucleation, and nucleolar prominence. In our case reports the pathological examination showed no tumor necrosis, mitosis or sarcomatoid differentiation and perirenal tissues were free from tumor infiltration with low risk of tumor progression after surgery.

CONCLUSION: Laparoscopic approach is today considered the standard treatment for localized renal cancer. Nevertheless, the size of renal lesion represents a critical point in surgical approach because to perform a laparoscopic radical nephrectomy can be challenging even for skilled surgeons in giant renal tumors.

© 2020 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

Chromophobe carcinoma of the kidney is a rare pathological entity generally smaller and asymptomatic than other renal cell carcinomas (RCCs) and with a lower risk of metastatic disease. Their variable clinical presentation and the overlap of radiological characteristics with more common renal masses make the diagnosis difficult [1,2]. The current international guidelines consider the laparoscopic radical nephrectomy the standard of treatment for T1-T2 tumors not available for nephron-sparing surgery, but there is a lack of information about the better management of the giant lesions (> 10 cm) [3]. We describe a case of a giant renal mass

successfully treated by laparoscopy in line with the SCARE criteria [4,5].

2. Case report

A 37-years-old Caucasian man with incidental findings of blood hypertension had an ultrasound of the abdomen which revealed a large right adrenal mass. There was no flank pain or any other relevant clinical symptoms. His previous personal and family history was not significative for other diseases. At physical examination there was a rigid elastic mass in right upper abdominal quadrant. Blood tests, including adrenal hormones and liver function, such as urine analysis and chest X-ray were normal [6,7]. The patient had no comorbidity. We performed a CT abdominal scan with contrast-enhancement triphasic technique for the study of the urinary tract. Imaging revealed an enhanced well-defined heterogeneous large mass measuring 17 × 15 cm and originating from the upper pole of the right kidney, with necrotic and solid areas within the lesion (Fig. 1). The CT scan also showed no evidence

* Corresponding author at: Department of Surgical, Oncological and Oral Sciences (Di.Chir.On.S.), University of Palermo - Italy, Via L. Giuffrè, 5, 90127, Palermo, Italy.

E-mail addresses: giuseppe.dibuono@unipa.it (G. Di Buono), buscemi.salvatore@gmail.com (S. Buscemi), giulia.bonv@gmail.com (G. Bonventre), elisa.maienza@yahoo.it (E. Maienza), gulotta.leonardo@gmail.com (L. Gulotta), giorgio.romano@unipa.it (G. Romano), antonino.agrusa@unipa.it (A. Agrusa).

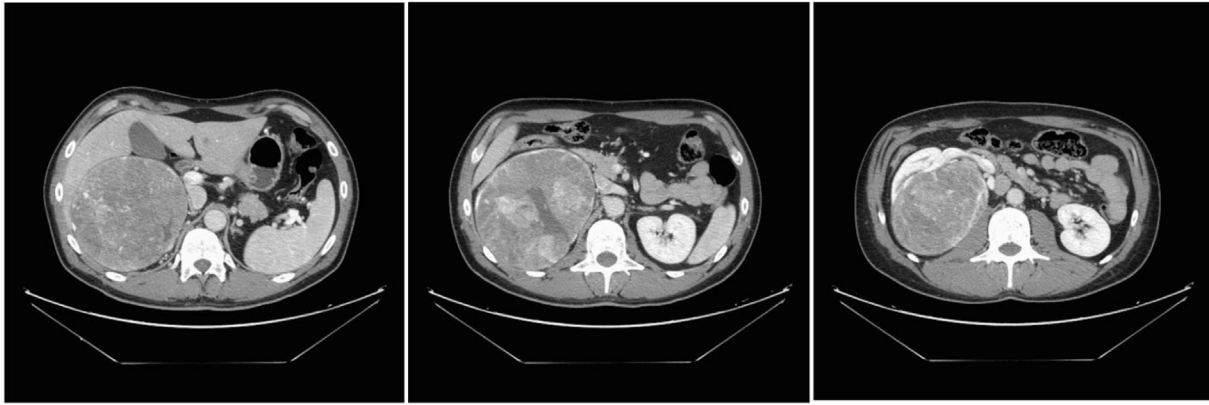


Fig. 1. CT abdominal scan with triphasic technique. Imaging revealed an enhancing well-defined heterogeneous large mass measuring originating from the upper pole of the right kidney, with necrotic and solid areas within the lesion.

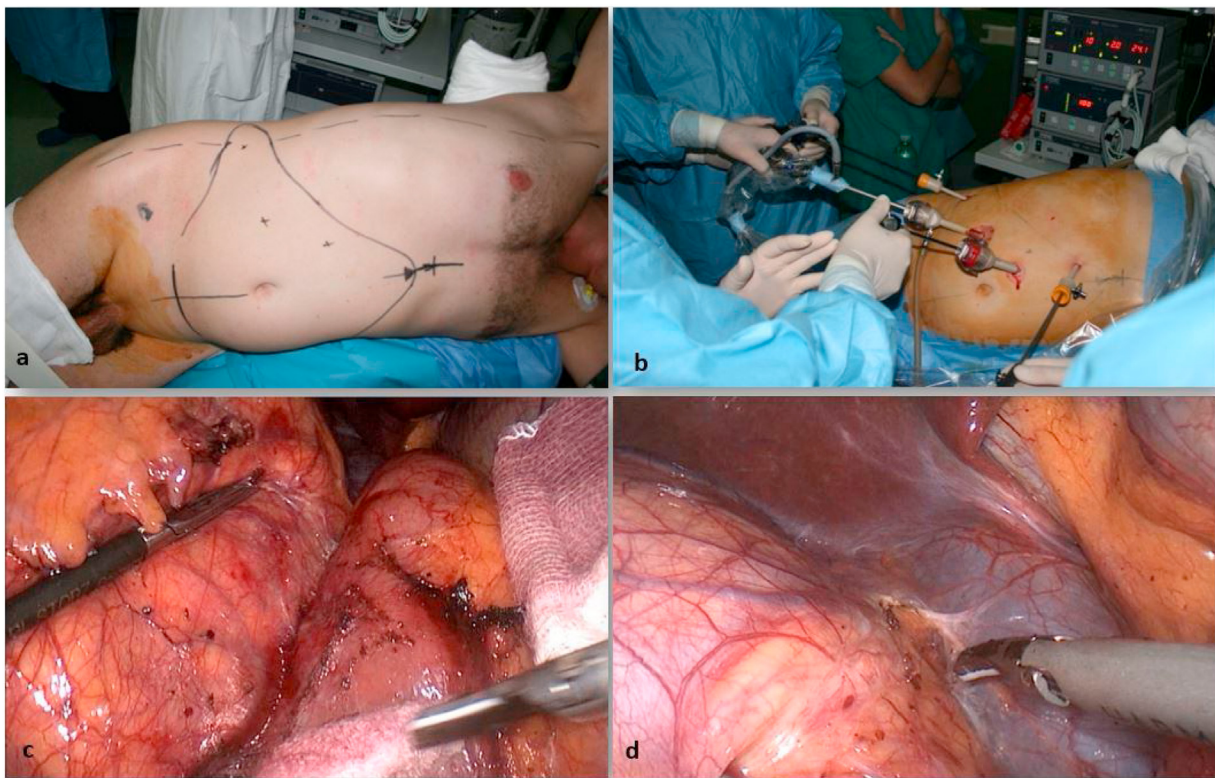


Fig. 2. Details of surgical procedure: a) The patient was placed in left lateral decubitus position with an inclination of 50–60° relative to the operating table; b) trocars position in the right subcostal region; c) details of Kocher's maneuver to access the retroperitoneum; d) right side of the inferior caval vein.

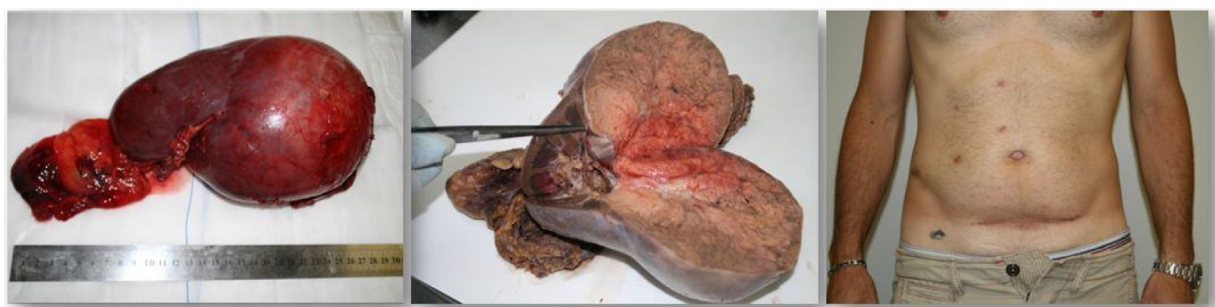


Fig. 3. surgical specimen and functional and aesthetic results after surgery.

of renal vein or caval thrombus or embolus. So, with diagnosis of renal malignancy we decided to carry out a radical right nephrectomy with en bloc resection of adrenal gland [8]. Considering the young age of the patient and the absence of local tumoral invasion, despite the large size of the lesion, we decided to do a laparoscopic transperitoneal approach [9]. The patient was placed in left lateral decubitus position with an inclination of 50–60° relative to the operating table which was broken to extend the space between the last rib and the iliac crest and increased surgical field (Fig. 2a) [10,11]. We used a Veress needle to induce pneumoperitoneum and four trocars in the right subcostal region (Fig. 2b). Careful exploration of abdominal cavity did not show secondary lesions of the peritoneal organs. Considering size of lesion the duodenum was medially mobilized (Kocher's maneuver) to access the retroperitoneum on the right side of the caval vein and to reach the adrenal and renal space (Fig. 2c–d) We found a well-capsulated renal mass dislocating ascending colon and liver. The dissection was done with Harmonic scalpel™ (Ethicon Endo Surgery INC - Johnson & Johnson, NJ, USA) and we performed a radical right nephrectomy with en bloc resection of adrenal gland and paracaval lymph nodes dissection. Accurate hemostasis was made through a bipolar forceps and further application of fibrin glue in the renal loggia to obtain a correct repositioning of the liver and duodenum. We left a tubular drainage in Morrison space. At the end of laparoscopic procedure we did a sovrapubic minilaparotomy for extraction of surgical specimen. Operative time was 260 min. In postoperative period hemoglobin values were stable and were not required blood transfusion. The abdominal drain was removed during the third postoperative day and the patient was discharged without complications. The specimen weighed 1650 g and macroscopically was 21 × 12 × 13 cm in size with a smooth capsulated renal mass (Fig. 3). The morphological and immunophenotypic characteristics (CK7+, CD10+, CD117+) confirmed the diagnosis of chromophobe renal cell carcinoma. Retroperitoneal adipose tissue, the ureter, the adrenal gland and the lymph nodes showed no neoplastic infiltration (tumor stage: pT2N0M0 with AJCC classification, 7th edition). The patient did not perform chemotherapy and on the last follow-up control (5 years later) he was in good general condition and without clinical and radiologic evidence of tumor recurrence.

3. Discussion

Chromophobe renal cell cancer is an unusual histological variant that represents about 1,8–6% of all renal tumors in adult patients [12]. The pathological diagnosis of chromophobe tumor is based on atypia with nuclear irregularities, binucleation, and nucleolar prominence. Generally these atypia are associated with higher grade in Fuhrman classification but several clinical reports demonstrates that chromophobe tumors have uncertain biology in oncological outcomes. Ohashi R et al. [13] suggest a different stratification for these tumors based on geographic nuclear crowding, nuclear size and additional variants like tumor necrosis, presence of mitosis and sarcomatoid differentiation that are related to wider risk of tumor progression. In our case report the pathological examination showed no tumor necrosis, mitosis or sarcomatoid differentiation and perirenal tissues were free from tumor infiltration with low risk of tumor progression after surgery. Laparoscopic approach, when it is possible, is today considered the standard treatment for localized renal cell cancer [3]. Several studies compare oncological outcomes of open and laparoscopic radical nephrectomy with similar results but with many advantages of laparoscopy in terms of lower morbidity, shorter hospital stay and faster return to daily activities [*]. Nevertheless, the size of renal lesion represents a critical point in surgical approach because to perform a laparoscopic radical nephrectomy and/or adrenalectomy

can be challenging even for skilled surgeons in giant renal tumors. In our case we decided to use a lateral transperitoneal laparoscopic approach for several reasons: to provide a full exploration of abdominal cavity, to obtain a wide mobilization of hepatic flexure and a complete medialization of duodenum, to achieve an optimal visualization of renal vessels. We considered retroperitoneoscopic technique disadvantageous because of smaller surgical field and need for a large laparotomy for specimen extraction [14]. However, laparoscopic radical nephrectomy in these unusual clinical cases remains a challenge procedure. the use of 3D laparoscopy in these complex renal masses facilitates surgical maneuvers improving the surgeon's performance and reducing operating times [15,16] In a recent study Cochetti G. et al. [17] suggest the use of preoperative renal artery embolization (PRAE) not only for locally advanced tumors or in patients unfit for surgery, but also in management of complex renal masses in order to induce tumor infarction and to facilitate surgical resection.

4. Conclusion

Chromophobe renal cell carcinoma is a rare tumor with different oncological behaviour and prognosis after radical surgery depends on histological characteristics. Laparoscopic treatment can represent a difficult challenge in large renal lesions but in our opinion is a safe and feasible technique when performed by experienced oncologic and laparoscopic surgical team [18,19].

Conflict of interest

Di Buono Giuseppe and other co-authors have no conflict of interest

Funding

Di Buono Giuseppe and other co-authors have no study sponsor.

Ethical approval

Ethical Approval was not necessary for this study.
We obtained written patient consent to publication.

Consent

We obtained written patient consent to publication.

Author contribution

Di Buono Giuseppe: study design, data collections, data analysis and writing
Buscemi Salvatore: data collections
Bonventre Giulia: data collections
Maienza Elisa: data collection
Gulotta Leonardo: data collection
Romano Giorgio: study design, data collections, data analysis and writing
Agrusa Antonino: study design, data collections, data analysis and writing

Registration of research studies

Not applicable.

Guarantor

Di Buono Giuseppe

Agrusa Antonino

Provenance and peer review

Not commissioned, externally peer-reviewed.

Declaration of Competing Interest

The authors report no declarations of interest.

Acknowledgements

This article is part of a supplement entitled Case reports from Italian young surgeons, published with support from the Department of Surgical, Oncological and Oral Sciences – University of Palermo.

References

- [1] M. Galia, D. Albano, A. Bruno, A. Agrusa, G. Romano, G. Di Buono, F. Agnello, G. Salvaggio, L. La Grutta, M. Midiri, R. Lagalla, Imaging features of solid renal masses, *Br. J. Radiol.* 90 (August (1077)) (2017) 20170077, <http://dx.doi.org/10.1259/bjr.20170077>, Epub 2017 Jul 13. Review.
- [2] D. Albano, F. Agnello, F. Midiri, G. Pecoraro, A. Bruno, P. Alongi, P. Toia, G. Di Buono, A. Agrusa, L.M. Sconfienza, S. Pardo, L. La Grutta, M. Midiri, M. Galia, Imaging features of adrenal masses, *Insights Imaging* 10 (January (1)) (2019) 1, <http://dx.doi.org/10.1186/s13244-019-0688-8>, Review.
- [3] B. Ljungberg, K. Bensalah, S. Canfield, S. Dabestani, F. Hofmann, M. Hora, M.A. Kuczyk, T. Lam, L. Marconi, A.S. Merseburger, P. Mulders, T. Powles, M. Staehler, A. Volpe, A. Bex, EAU guidelines on renal cell carcinoma: 2014 update, *Eur. Urol.* 67 (May (5)) (2015) 913–924, <http://dx.doi.org/10.1016/j.eururo.2015.01.005>, Epub 2015 Jan 21.
- [4] R.A. Agha, A.J. Fowler, A. Saetta, I. Barai, S. Rajmohan, D.P. Orgill, for the SCARE Group, The SCARE statement: consensus-based surgical case report guidelines, *Int. J. Surg.* 34 (2016) 180–186.
- [5] R.A. Agha, M.R. Borrelli, R. Farwana, K. Koshy, A. Fowler, D.P. Orgill, For the SCARE Group, The SCARE 2018 statement: updating consensus surgical CARE Report (SCARE) guidelines, *Int. J. Surg.* (60) (2018) 132–136.
- [6] G. Novo, E. Corrado, E. Tortorici, A. Novo, A. Agrusa, V. Saladino, I. Marturana, R. Lentini, M. Ferrandes, C. Visconti, F. Massenti, M. D'Arienzo, F. Vitale, G. Gulotta, Novo S, Cardiac risk stratification in elective non-cardiac surgery: role of NT-proBNP, *Int. Angiol.* 30 (January (3)) (2011) 242–246.
- [7] G. Di Buono, S. Buscemi, A.I. Lo Monte, G. Geraci, V. Sorce, R. Citarrella, E. Gulotta, V.D. Palumbo, S. Fazzotta, L. Gulotta, D. Albano, M. Galia, G. Romano, A. Agrusa, Laparoscopic adrenalectomy: preoperative data, surgical technique and clinical outcomes, *BMC Surg.* 18 (April (Suppl 1)) (2019) 128, <http://dx.doi.org/10.1186/s12893-018-0456-6>.
- [8] A. Agrusa, G. Di Buono, S. Buscemi, B. Randisi, L. Gulotta, V. Sorce, G. Badalamenti, D. Albano, M. Galia, G. Romano, G. Gulotta, Dedifferentiated retroperitoneal large liposarcoma and laparoscopic treatment: is it possible and safe? The first literature case report, *Int. J. Surg. Case Rep.* 57 (2019) 113–117, <http://dx.doi.org/10.1016/j.ijscr.2019.03.023>, Epub 2019 Mar 26.
- [9] A. Agrusa, G. Romano, L.J. Dominguez, G. Amato, R. Citarrella, L. Vernuccio, G. Di Buono, V. Sorce, L. Gulotta, M. Galia, P. Mansueto, G. Gulotta, Adrenal cavernous hemangioma: which correct decision making process? *Acta Medica Mediterranea* 32 (2016) 385–389.
- [10] G. Romano, A. Agrusa, D. Chianetta, G. Frazzetta, V. Sorce, G. Di Buono, G. Gulotta, Laparoscopic management of adrenal tumors: a four-years experience in a single center, *Minerva Chir.* 69 (2014) 125–129.
- [11] A. Agrusa, G. Romano, G. Frazzetta, D. Chianetta, V. Sorce, G. Di Buono, G. Gulotta, Laparoscopic adrenalectomy for large adrenal masses: single team experience, *Int. J. Surg.* 12 (Suppl 1) (2014) S72–4, <http://dx.doi.org/10.1016/j.ijso.2014.05.050>, Epub 2014 May 23.
- [12] M.B. Amin, G.P. Paner, I. Alvarado-Cabrero, A.N. Young, H.J. Stricker, R.H. Lyles, H. Moch, Chromophobe renal cell carcinoma: histomorphologic characteristics and evaluation of conventional pathologic prognostic parameters in 145 cases, *Am. J. Surg. Pathol.* 32 (2008) 1822–1834.
- [13] R. Ohashi, G. Martignoni, A. Hartmann, A. Caliò, D. Segala, C. Stöhr, S. Wach, F. Erlmeier, W. Weichert, M. Autenrieth, P. Schraml, N.J. Rupp, C. Ohe, Y. Otsuki, T. Kawasaki, H. Kobayashi, K. Kobayashi, T. Miyazaki, H. Shibuya, H. Usuda, H. Umezū, F. Fujishima, B. Furusato, M. Osakabe, T. Sugai, N. Kuroda, T. Tsuzuki, Y. Nagashima, Y. Ajioka, H. Moch, Multi-institutional re-evaluation of prognostic factors in chromophobe renal cell carcinoma: proposal of a novel two-tiered grading scheme, *Virchows Arch.* 476 (March (3)) (2020) 419–422, <http://dx.doi.org/10.1007/s00428-020-02786-9>.
- [14] A. Agrusa, G. Romano, G. Navarra, G. Conzo, G. Pantuso, G.D. Buono, R. Citarrella, M. Galia, A.L. Monte, G. Cucinella, G. Gulotta, Innovation in endocrine surgery: robotic versus laparoscopic adrenalectomy. Meta-analysis and systematic literature review, *Oncotarget* 8 (October (60)) (2017) 102392–102400, <http://dx.doi.org/10.18632/oncotarget.22059>, eCollection 2017 Nov 24.
- [15] A. Agrusa, G. di Buono, D. Chianetta, V. Sorce, R. Citarrella, M. Galia, L. Vernuccio, G. Romano, G. Gulotta, Three-dimensional (3D) versus two-dimensional (2D) laparoscopic adrenalectomy: a case-control study, *Int. J. Surg.* 28 (Suppl 1) (2016) S114–7, <http://dx.doi.org/10.1016/j.ijso.2015.12.055>.
- [16] A. Agrusa, G. Di Buono, S. Buscemi, G. Cucinella, G. Romano, G. Gulotta, 3D laparoscopic surgery: a prospective clinical trial, *Oncotarget* 9 (April (25)) (2018) 17325–17333, <http://dx.doi.org/10.18632/oncotarget.24669>, eCollection 2018 Apr 3.
- [17] G. Cochetti, M.D. Zingaro, A. Boni, M. Allegritti, J.A.R. de Vermandois, A. Paladini, M.G. Egidi, G. Poli, P. Ursi, R. Cirocchi, E. Mearini, Renal artery embolization before radical nephrectomy for complex renal tumour: which are the true advantages? *Open Med. Wars. (Wars)* 7 (November (4)) (2019) 797–804, <http://dx.doi.org/10.1515/med-2019-0095>, eCollection 2019.
- [18] A. Agrusa, G. Frazzetta, D. Chianetta, S. Di Giovanni, L. Gulotta, G. Di Buno, V. Sorce, G. Romano, G. Gulotta, “Relaparoscopic” management of surgical complications: the experience of an Emergency Center, *Surg. Endosc.* 30 (2016) 2804–2810.
- [19] G. Cucinella, A. Perino, G. Romano, G. Di Buono, G. Calagna, V. Sorce, L. Gulotta, M. Triolo, V. Billone, G. Gulotta, A. Agrusa, Endometrial cancer: robotic versus laparoscopic treatment. Preliminary report, *GIOG* 37 (November–December (6)) (2015), 283–273.

Open Access

This article is published Open Access at [sciencedirect.com](https://www.sciencedirect.com). It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.