


CASE REPORT

Open Access



Low-grade oncocytic tumour of kidney (CD117-negative, cytokeratin 7-positive)

Cláudio Galeno Ramalho de Andrade Melo¹, Marcus Vinicius Nunes Xavier², Isabela Soares Pimenta³ and Daniel Abensur Athanazio^{3,4*} 

Abstract

Background: The term low-grade oncocytic tumour of kidney is an emerging entity describing CD117-negative and cytokeratin 7-positive indolent tumors with overlapping morphological features between oncocytic tumors.

Case presentation: We present herein the case of a 77-year-old female with a 3.2-cm nodule in mid pole of the left kidney. The tumor was uniformly oncocytic with solid, compact nested and trabecular growth patterns. There was common areas of transition to central zones of stromal edema with marked tumor hypocellularity and growth in cords. Some of these areas had adjacent fresh hemorrhage. Immunohistochemistry showed strong and diffuse expression of cytokeratin 7 and negativity for cKIT/CD117.

Conclusion: The proper use of this new diagnostic category avoids labeling such tumors as unclassified renal cell carcinoma – a broad category with different morphologic features and heterogenous prognosis.

Keywords: Carcinoma, Renal cell, Kidney neoplasms, Kidney

Background

In 2019, Trpkov and colleagues described an emerging entity among unclassified renal cell neoplasms. They distinguished a new category of oncocytic tumors that do not fit in existing diagnostic entities (Trpkov et al. 2019; Trpkov and Hes 2019). The term low-grade oncocytic tumour of kidney was suggested to describe CD117-negative (in contrast to expected expression in oncocytomas and chromophobe carcinomas) and cytokeratin 7-positive tumors with

overlapping morphological features between oncocytic tumors (Trpkov et al. 2019; Trpkov and Hes 2019). In the original series of 28 patients, all remained alive with no evidence of progression (median 21 months of follow up) after surgery (Trpkov et al. 2019).

Case presentation

We present herein the case of a 77-year-old female who sought medical assistance due back pain for about 12 months. Abdominal magnetic resonance imaging showed a circumscribed solid tumour in the mid pole of the left kidney (Fig. 1a-b). It was a partially exophytic mass with central area suggestive of necrosis / hypovascularity. A radical nephrectomy was performed.

* Correspondence: dathanazio@gmail.com

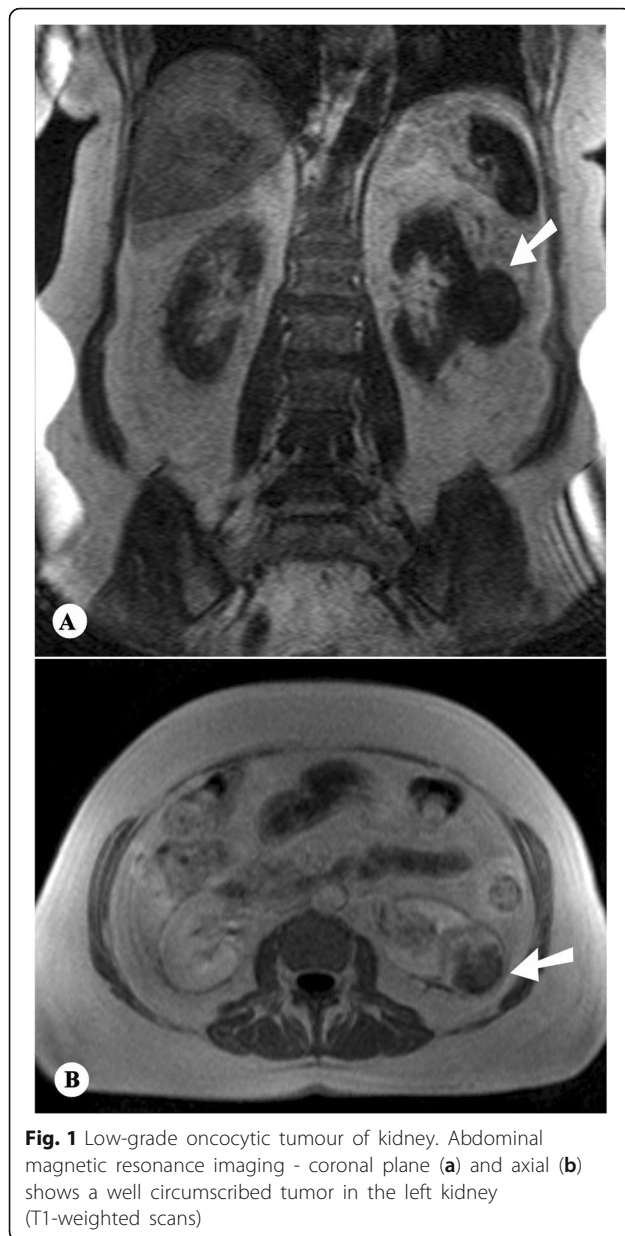
³Imagepat, Laboratory of Pathology. Avenida Jorge Teixeira, 29, Medical Center, Lojas 05 e 06, Candeias, Vitória da Conquista, BA 45028 - 050, Brazil

⁴Hospital Universitário Professor Edgard Santos / Federal University of Bahia, Salvador, Bahia, Brazil

Full list of author information is available at the end of the article



© The Author(s). 2020 **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.



At gross examination, a 3.2-cm brown nodule was observed in mid pole. Cut surface showed central fresh hemorrhage. Tumor was grossly and microscopically confined to the kidney. The tumor cells were uniformly oncocytic with solid, compact nested and trabecular growth patterns. Oncocytic cells shared abundant eosinophilic cytoplasm and nuclei with occasional nucleoli (ISUP grades 1–2) without irregular contours such as “raisinoid”-shaped nuclei of chromophobe carcinomas. These solid areas showed common areas of transition to central zones of stromal edema with marked tumor hypocellularity and growth in

cords (Fig. 2a–b). Some of these areas had adjacent fresh hemorrhage (Fig. 2c–d). Necrosis was not observed. Immunohistochemistry showed strong and diffuse expression of cytokeratin 7 (Fig. 2e) and negativity for cKIT/CD117 (Fig. 2f) in different blocks. Additional reactions showed positivity for PAX8 and absent expression of alpha-methylacyl-CoA racemase.

Discussion

The case presented herein fits in the description of this new entity. In the original series of 28 patients by Trpkov and colleagues, median age at diagnosis was 66 years and there was a slight female predominance 1.8: 1. Median tumor size was 3.0 cm and 68% of the tumors measured <4.0 cm and were staged as pT1a (Trpkov et al. 2019). In addition to the proper immunoprofile, the case presented herein showed the described typical findings of coexistent fresh hemorrhage with transition to edematous stromal and growth pattern in cords.

The main differential diagnoses in this context are other oncocytic tumors of the kidney. Oncocytoma may have a broad spectrum of morphologic features (Trpkov et al. 2010). Oncocytomas are, however, typically CD117-positive and show a particular pattern of cytokeratin 7 expression – either entirely negative or predominantly negative with strong staining of isolated tumor cells or small tumor cell clusters. The feature of fresh hemorrhage and growth in cords intermixed in a edematous stroma (characteristic of low grade oncocytic tumour of kidney) is different from the insular growth of oncocytic cells in nests embedded in a fibrous or myxoid stroma (prototypical morphology of renal oncocytoma). High grade oncocytic tumor of the kidney is also an emerging and recently described entity in kidney neoplasia. The morphology and immunophenotype are similar to oncocytoma. In contrast, both oncocytoma and low grade oncocytic tumour of kidney lack the conspicuous finding of high grade ISUP 3 nuclear features (nucleolar prominence) (He et al. 2018). Renal cell carcinoma of chromophobe type could be ruled out in this case due to absence of CD117 expression and characteristic nuclear irregularities (“raisinoid nuclei”). Hybrid oncocytic chromophobe tumor is currently defined as a variant of chromophobe carcinoma. It may occur in sporadic form or related to oncocytomatosis and Birt-Hogg-Dubé syndrome. CD117 is invariably positive in these tumors and - even if raisinoid nuclei may not be detected (or only focally) -, oncocytic cells may show binucleation and perinuclear halos (Srigley et al. 2013).

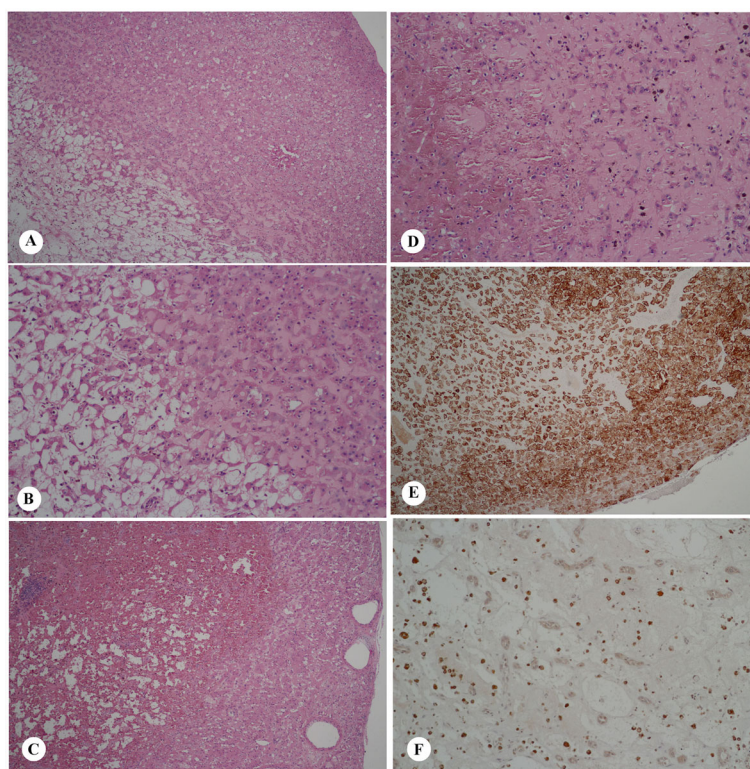


Fig. 2 Low-grade oncocytic tumour of kidney. HE stain shows the transition between a solid oncocytic area with cords of tumor cells in edematous stromal (**a**, 40x; and **b**, 100x). HE stain also shows zones of fresh hemorrhage (**c**, 40x; and **d**, 100x). Stromal edematous areas show frequent hemosiderin-laden macrophages. Immunohistochemistry shows strong and diffuse expression of cytokeratin 7 (**e**, 40x) and absence of c-KIT expression (**f**, 100x). Again, hemosiderin-laden macrophages show brown pigment in edematous stroma

Conclusion

It is important to recognize additional cases of this emerging entity. The proper use of this new diagnostic category avoids labeling such tumors as unclassified renal cell carcinoma – a broad category with different morphologic features and heterogeneous prognosis. At this time, low grade oncocytic tumour of kidney is recognized as an indolent neoplasm with no adverse clinical outcomes reported.

Abbreviations

HE: Hematoxylin and eosin stain; ISUP: International Society of Urological Pathology; PAX8: Paired box gene 8

Acknowledgements

Not applicable.

Authors' contributions

DAA conceived the idea. DAA was the major contributor to the writing of the manuscript. DAA and ISP diagnosed the case. ISP, CGRAM and MVNX were major contributors for critically revising the manuscript for important intellectual content. The authors read and approved the final manuscript.

Funding

This study had no funding resources.

Availability of data and materials

Not applicable.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Written informed consent was obtained from the patient for participation in the study.

Competing interests

The authors declare that they have no competing interests.

Author details

¹Federal University of Bahia/ Campus Anísio Teixeira, Vitória da Conquista, Bahia, Brazil. ²Uroday Hospital, Vitória da Conquista, Bahia, Brazil. ³Imagepat, Laboratory of Pathology. Avenida Jorge Teixeira, 29, Medical Center, Lojas 05 e 06, Candeias, Vitória da Conquista, BA 45028 - 050, Brazil. ⁴Hospital Universitário Professor Edgard Santos / Federal University of Bahia, Salvador, Bahia, Brazil.

Received: 30 July 2020 Accepted: 27 August 2020

Published online: 01 October 2020

References

- He H, Trpkov K, Martinek P, Isikci OT, Maggi-Galuzzi C, Alaghebandan R et al (2018) "high-grade oncocytic renal tumor": morphologic, immunohistochemical, and molecular genetic study of 14 cases. *Virchows Arch* 473(6):725–738
- Srigley JR, Delahunt B, Eble JN, Egevad L, Epstein JI, Grignon D et al (2013) The International Society of Urological Pathology (ISUP) Vancouver classification of renal Neoplasia. *Am J Surg Pathol* 37(10):1469–1489
- Trpkov K, Hes O (2019) New and emerging renal entities: a perspective post-WHO 2016 classification. *Histopathology* 74(1):31–59

Trpkov K, Williamson SR, Gao Y, Martinek P, Cheng L, Sangoi AR et al (2019) Low-grade oncocytic tumour of kidney (CD117-negative, cytokeratin 7-positive): a distinct entity? *Histopathology* 75(2):174–184

Trpkov K, Yilmaz A, Uzer D, Dishongh KM, Quick CM, Bismar TA et al (2010) Renal oncocytoma revisited: a clinicopathological study of 109 cases with emphasis on problematic diagnostic features. *Histopathology* 57(6):893–906

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions

