

Incidental Finding of Renal Cell Carcinoma in Abdominal Ultrasound

Esilda Trushaj

Diagnostic imaging and Nuclear Medicine Resident, University Hospital Mother Theresa, Tirana, Albania.
(esildatrushaj@gmail.com)

Abstract

A 62-year-old albanian male was referred to the Emergency Department in Mother Theresa University Hospital Tirana, with right upper abdominal pain. The sonographic examination demonstrated gallbladder stones and a heterogenous mass on the left kidney with vascular flow on Color Doppler. An enhanced computed tomography was performed and it was confirmed a solid mass with pathological contrast after injection. It was diagnosed as renal cell carcinoma. Based on the staging and mass dimensions, the patient underwent partial nephrectomy. The histological examination resulted in renal cell carcinoma with clear cells. The patient was discharged in improved condition after a week. A monthly abdominal ultrasound and a six month follow up with enhanced computed tomography were requested. Our patient is in a good condition with normal kidney function tests. The first follow up scan was negative for metastases. Our article shows the importance of having abdominal ultrasound routine examination as it can reveal asymptomatic tumors that can be cancerous.

Keyword: renal cell carcinoma, renal mass, incidental finding, ultrasound detection, clear cell renal cell carcinoma, partial nephrectomy.

DOI: 10.7176/ALST/100-06

Publication date: September 30th 2024

Introduction

Renal cell carcinomas (RCCs), which originate within the renal cortex, are responsible for 80% to 85% of all primary renal neoplasms. The exact cause of RCC is unknown. Risk factors include older age, obesity, hypertension, chronic renal failure, dialysis treatment, polycystic kidney disease, African American race, sickle cell disease, and renal stones (1). Like most neoplasms, RCC is more common in men, with men accounting for about two-thirds of global cases and deaths (2). Part of this increased risk may be explained by greater rates of modifiable risk factors. Renal cell carcinomas (RCCs) usually remain asymptomatic until late in the disease and over 50% of tumors may be detected incidentally (3). The following case report demonstrates the important role of sonography in detecting renal cell carcinoma.

Case description

A 62-year-old albanian male was referred to the Emergency Department in Mother Theresa University Hospital Tirana with a sharp pain in the upper right part of the belly, nausea and vomiting. A sonographic examination was performed and revealed gallbladder stones without inflammatory reaction. During the examination the sonographer also observed right renal cysts and a heterogenous mass on the left kidney. The patient did not have other clinical symptoms. He admitted that only suffered from arterial hypertension and was under treatment. The patient was a smoker for 10 years and his family history was no significant for diseases related to kidneys. The lesion was a partially exophytic mass located on the lower pole of the kidney. The lesion measured 33 mm long and 28 mm wide. Color Doppler imaging demonstrated vascularity within the lesion. The patient had additional testing with a thorax-abdominal-pelvic contrast enhanced computed tomography that confirmed the lesion. It was described as a dishomogenous exophytic mass, 33x26mm, with smooth contours and pathological contrast enhancement mostly in arterial phase. It did not infiltrate renal pelvis or pararenal tissue and no pathological lymphnodes were found. Other findings were gallbladder stones and right renal cysts. The imaging suggested renal cell carcinoma. The patient had a partial nephrectomy and the biopsy was performed. It revealed lower pole renal cell carcinoma with clear cells GII according to Furhman with vascular invasion and infiltration of perirenal adipose tissue. The staging resulted as Pt3aNxMx. The oncologist decided a six month follow up with contrast-

enhanced abdominal and chest scan and a monthly abdominal ultrasound. After six months the scan was performed and there was no evidence of pathological lymphnodes or metastases.

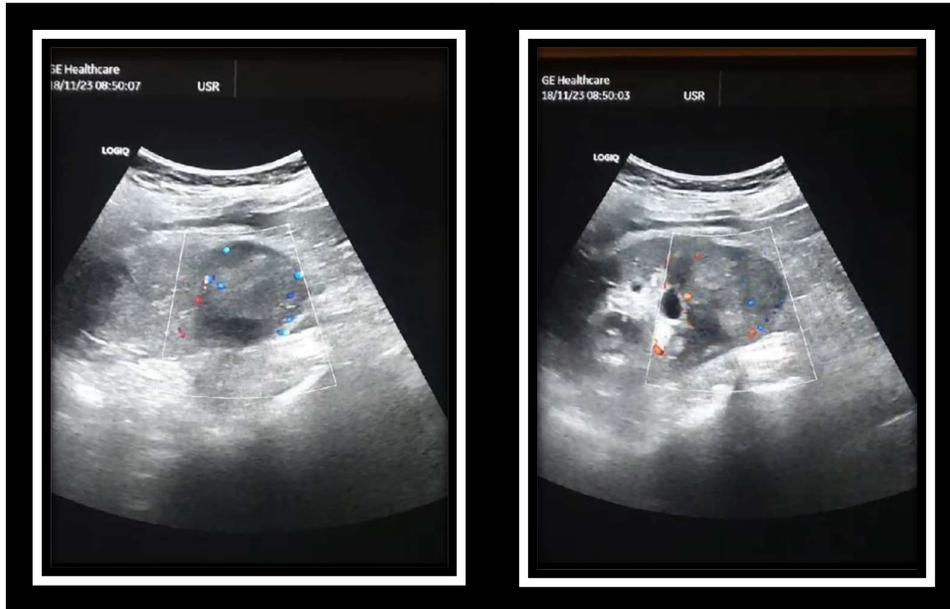


Figure 1.2. Transverse view of the heterogenous mass on the lower pole of the left kidney

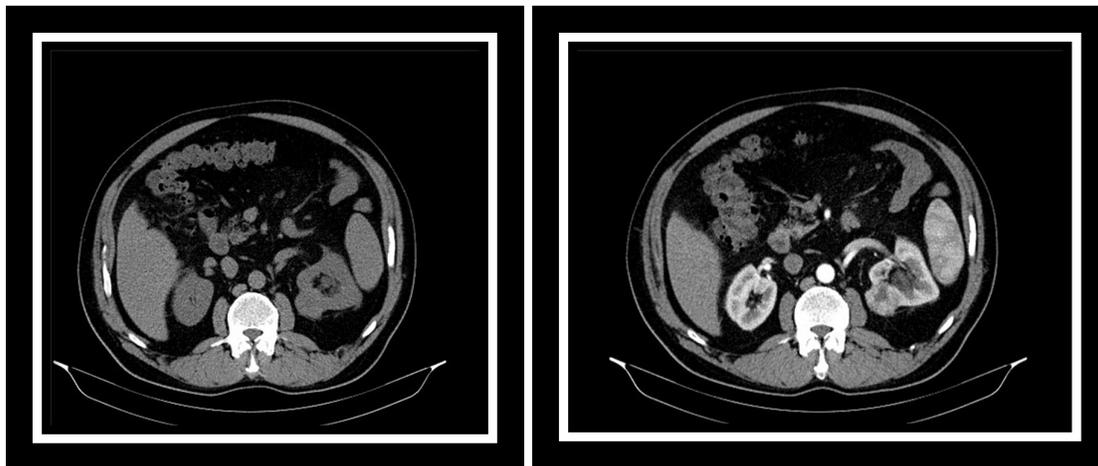


Figure 3.4. Cross sectional computed tomography image showing the mass on the left kidney

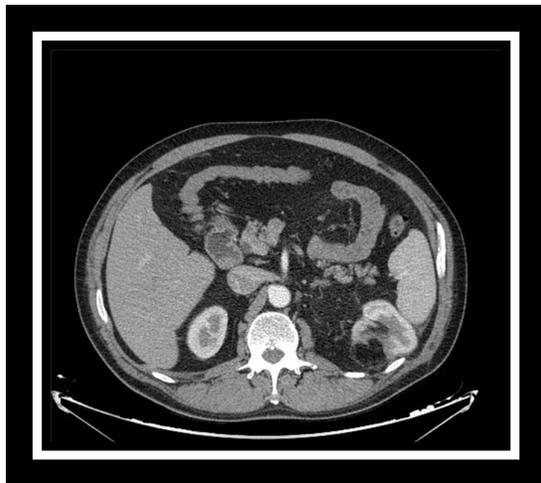


Figure 5. Cross sectional computed tomography image six months after partial nephrectomy

Discussion

Renal cell carcinoma (rcc) represents 2-3% of all adult cancers and the eighth most common malignancy affecting the adults. Our patient was asymptomatic and renal cell carcinoma was an incidental finding. Based on recent studies, there has been a steady increase in the incidental detection of small renal masses in the last several decades, at least in part due to the increased use of abdominal imaging (4).

On ultrasound rcc it appears differently in echogenicity. The majority of tumors are isoechoic (86%), and a small number are hypoechoic. Smaller tumors often appear hyperechoic. (5). Rcc may have cystic components and calcifications. On color Doppler it shows within mass vascularity.

Computed tomography is the main imaging modality used for the evaluation of renal tumors and can detect RCC with a sensitivity of 95% to 100% and specificity of 88% to 95% with a dedicated renal ct protocol 6: precontrast, corticomedullary (40-60 seconds delay), nephrographic (80-90 seconds delay), and excretory (180-300 seconds delay). (6) Currently our patient is on six month follow up with contrast-enhanced abdominal and chest.

In adults, clear cells RCC is the most common type of kidney cancer, and makes up about 80% of all renal cell carcinoma cases. In our case based on staging partial nephrectomy was performed. Local recurrence in the nephrectomy bed occurs in approximately 20% to 40% of patients, typically in the first five years after nephrectomy. The risks are highest when the resection margins are incomplete- (7)

Partial nephrectomy is considered with better results in a smaller decrease in renal function and a decreased risk of developing chronic renal failure when compared with renal nephrectomy. In a study by Huang including 647 patients, only 2.9% who underwent PN had new-onset of glomerular filtration rate (GFR) <45 mL/min/1.73 m² postoperatively compared with 35.8% who underwent RN. (8)

Conclusions

Sonography can play an important role in the early detection of lifethreatening diseases. It is considerable to know that RCC is asymptomatic and can go undetected for years. Ultrasound as a non-invasive, widely use and low cost examination is sufficient to classify renal lesions as simple cysts or heterogenous mass. These findings contribute to increased longevity of the patient.

Acknowledgement

We would like to acknowledge and thank T.K., the patient presented in this case, for providing us with permission to use images to help educate future radiologists.

Human Ethics

Consent was obtained by the patient in this study.

Conflicts of interest

There are no conflicts of interest.

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

References

1. Garfield K, LaGrange CA. Renal Cell Cancer. 2023 Jul 31. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. PMID: 29261992.
2. Luciani LG, Cestari R, Tallarigo C. Incidental renal cell carcinoma-age and stage characterization and clinical implications: study of 1092 patients (1982-1997). *Urology*. 2000 Jul;56(1):58-62
3. Padala SA, Barsouk A, Thandra KC, Saginala K, Mohammed A, Vakiti A, Rawla P, Barsouk A. Epidemiology of Renal Cell Carcinoma. *World J Oncol*. 2020 Jun;11(3):79-87. doi: 10.14740/wjon1279. Epub 2020 May 14. PMID: 32494314; PMCID: PMC7239575.
4. Roussel E, Campi R, Amparore D, Bertolo R, Carbonara U, Erdem S, Ingels A, Kara Ö, Marandino L, Marchioni M, Muselaers S, Pavan N, Pecoraro A, Beuselinck B, Pedrosa I, Fetzter D, Albersen M, On Behalf Of The European Association Of Urology Eau Young Academic Urologists Yau Renal Cancer Working Group. Expanding the Role of Ultrasound for the Characterization of Renal Masses. *J Clin Med*. 2022 Feb 19;11(4):1112. doi: 10.3390/jcm11041112. PMID: 35207384; PMCID: PMC8876198.
5. Incidental Finding of Renal Cell Carcinoma: Detected by a Thrombus in the Inferior Vena Cava .Nancy L. Bellman, RDMS1 *Journal of Diagnostic Medical Sonography* 2015, Vol. 31(2) 118–121
6. Morshid A, Duran ES, Choi WJ, Duran C. A Concise Review of the Multimodality Imaging Features of Renal Cell Carcinoma. *Cureus*. 2021 Feb 8;13(2):e13231. doi: 10.7759/cureus.13231. PMID: 33728180; PMCID: PMC7946646.
7. Rail E, Stormo J. Sonographic Evaluation of Clear Cell Renal Cell Carcinoma. *Journal of Diagnostic Medical Sonography*. 2019;35(2):147-151. doi:10.1177/8756479318821062
8. Mason RJ, Rendon RA. Partial nephrectomy for T1b renal cell carcinoma: A safe and superior treatment option. *Can Urol Assoc J*. 2012 Apr;6(2):128-30. doi: 10.5489/cuaj.12056. PMID: 22511421; PMCID: PMC3328554.