International Journal of Research in Medical Sciences
Tele JS et al. Int J Res Med Sci. 2015 May;3(5):1288-1292
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: 10.5455/2320-6012.ijrms20150549

Case Report

A case of synchronous papillary and clear cell carcinoma in the same kidney

Jyoti Shankar Tele*, Anita Shah, Harshul Kushwaha

Department of Pathology, Saifee Hospital, Mumbai, Maharashtra, India

Received: 18 March 2015
Revised: 19 March 2015
Accepted: 13 April 2015

***Correspondence:**
Dr. Jyoti Shankar Tele,
E-mail: dr.jyoti.tele@gmail.com

ABSTRACT

Renal Cell Carcinoma (RCC) comprises 2-3% of all cancers. Bilateral coexistent benign and malignant renal tumors have been defined in many reports. However, unilateral synchronous malignant tumors of different histologic subtypes are very rare and only a few such cases have been reported. Herein we describe a 56 year old male patient with coexistent clear cell RCC and papillary RCC in his left kidney that were successfully treated with radical nephrectomy.

Keywords: Renal cell carcinoma, Multifocal, Synchronous, Nephrectomy

INTRODUCTION

Renal tumors constitute a heterogenous group of neoplasms distinguishable histologically and cytogenetically. Renal tumors account for 3% of all malignant tumors and 2% of overall cancer mortality.[1] The most common subtype of renal cell carcinoma are clear cell, papillary and chromophobe type RCC and account for approximately 80%, 10% and 5%, respectively. Renal oncocytoma, angiomyolipoma and adenomas are the benign tumors of kidney. There are few studies that define bilateral synchronous malignant renal tumors[2-4] or coexisting benign and malignant tumors arising within the same kidney.[5] The incidence of clear cell RCC and papillary RCC arising within the same kidney is very low.

In this report, we describe a case of 56 year old male who had two different histological subtypes of RCC in the same kidney.

CASE REPORT

A 56 year old male patient was admitted to our hospital with abdominal pain since three months. Ultrasonography revealed a hypoechoic mass at upper pole of left kidney. On color Doppler, the mass seemed to be vascular with capsular vascularity and a possibility of renal neoplasm was suggested. Physical examination was within normal limits. On investigating, serum creatinine was found raised to 2.75 mg/dl and hemoglobin levels were low i.e. 9.8 gm/dl. Other biochemical and hematological parameters were within normal limits. Patient had no previous medical or surgical illness. He was a smoker for past 35 years. Patient underwent left radical nephrectomy and was discharged on the fifth postoperative day without any complications.

Pathology

We received the specimen of left radical nephrectomy weighing 488gms and measuring 16.5x11x6 cm. The

kidney measured 11x5.2x3.7 cm. The ureter was 1.8 cm long. On cutting open, a partly circumscribed golden yellow tumor measuring 4.2x3.2x3 cm was noted at upper pole of the kidney. Gross tumor extensions into perinephric fat and renal sinus were not evident. The perinephric fat resection margin was 0.3 cm away from the tumor. Another tumor nodule measuring 1x0.8x0.7 cm was seen, inferior to the main tumor in the lower pole of kidney (Figure 1). The tumor nodule was intraparenchymal. The intervening renal parenchyma was grossly unremarkable. The adrenal gland measured 3x1.8x1.6 cm and was grossly unremarkable. Hilar lymph nodes were not identified grossly.

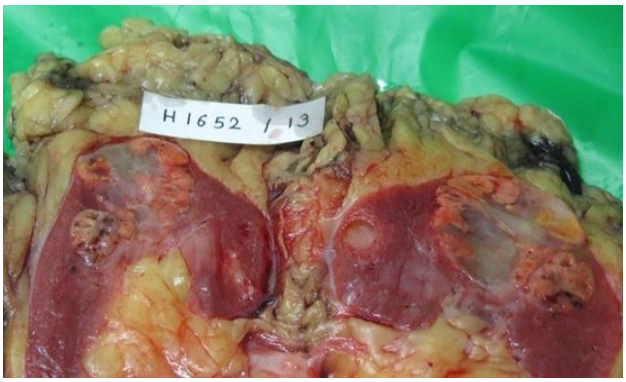

Figure 1: Macroscopic appearance of larger tumor mass and satellite tumor nodule.

Microscopy revealed two different patterns in the two tumors respectively. The larger tumor had a pattern of clear cell RCC with Fuhrman nuclear grade 2 (Figure 2 and 3). The smaller tumor nodule was a papillary RCC, type 1 with Fuhrman nuclear grade 2 (Figure 4 and 5). Both the tumors were limited to kidney and there was no perirenal or perihilar invasion. Tumor necrosis and sarcomatoid features were not seen in both tumors. The intervening renal parenchyma was unremarkable. There was no invasion of blood and lymph vessels. Adrenal gland was unremarkable microscopically.

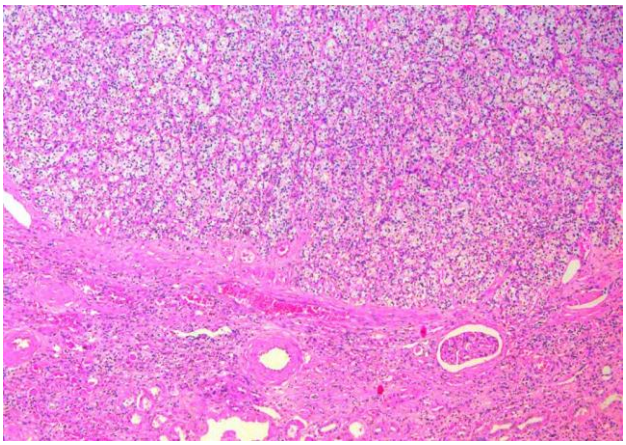

Figure 2: Larger tumor mass microscopically revealing clear cell RCC pattern.

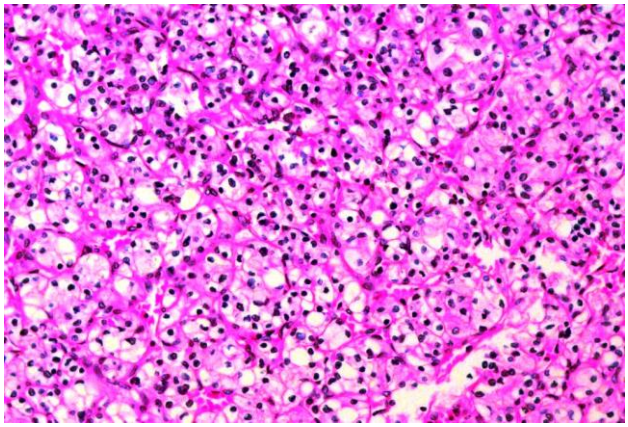

Figure 3: Clear cell RCC, Fuhrman nuclear grade 2.

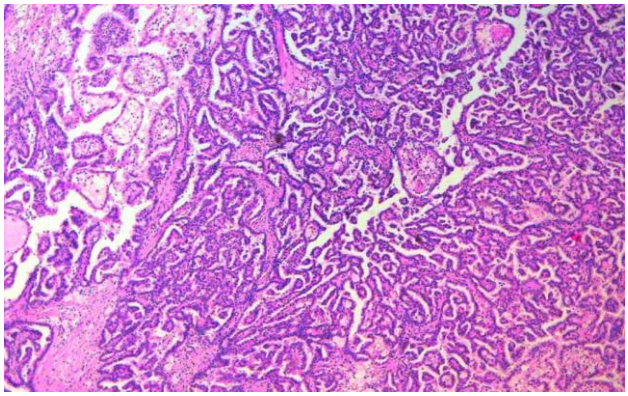

Figure 4: Satellite tumor nodule revealing papillary RCC pattern.

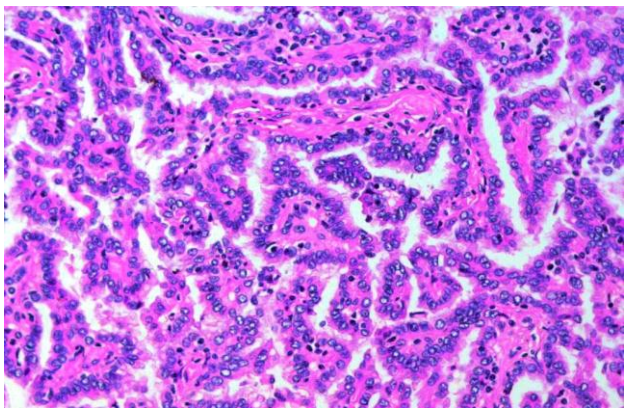

Figure 5: Papillary RCC, type 1 with Fuhrman nuclear grade 2.

Areas of clear cell RCC were characterised by solid nests and sheets of carcinoma cells interspersed by prominent network of delicate blood vessels. Tumor cells had water clear cytoplasm surrounded by a distinct cell membrane. The Fuhrman nuclear grade was 2 as nuclei possessed granular chromatin and small nucleoli that were not discernible on 10X magnification. The nodule of papillary RCC was characterised by tightly packed tubulopapillary structures and nuclear morphology was consistent with Fuhrman grade 2.

Immunohistochemistry was performed and the tumor nodule with papillary RCC histology, revealed cytokeratin 7 positivity (Figure 6).

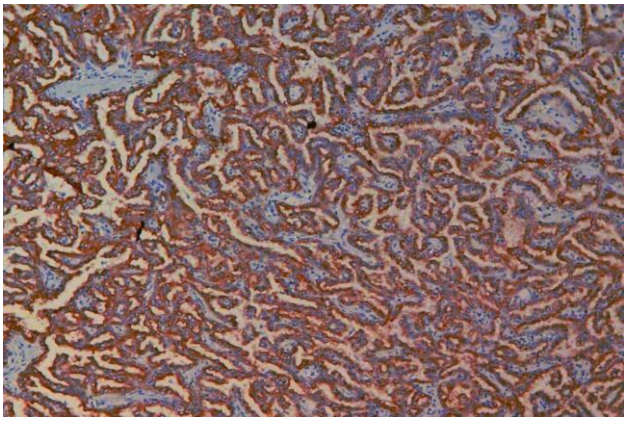

Figure 6: Immunostain cytokeratin 7 positivity in papillary RCC (satellite tumor nodule).

DISCUSSION

Renal tumors constitute a heterogenous group of neoplasms distinguishable histologically and cytogenetically. Renal tumors account for 3% of all malignant tumors and 2% of overall cancer mortality.[1] The incidence of pure papillary RCC is 11-20% of all RCCs.[6,7] While the exact cause of renal cancer remains unknown, documented risk factors include cigarette smoking, obesity, hypertension, diabetes, oestrogen therapy, occupational exposure to petroleum products, heavy metals, asbestos, chronic dialysis and renal failure.[8]

Smoking is clearly implicated in the etiology of RCC, with a strong dose-dependent increase in risk associated with numbers of cigarettes smoked per day and substantial reduction in risk for long-term former smokers. Smoking men who had smoked 1-9, 10-20, or 21 or more cigarettes/day had a Relative Risk (RR) of 1.60 (95% CI = 1.21-2.12), 1.83 (95% CI = 1.30-2.57), and 2.03 (95% CI = 1.51-2.74), respectively. And the advantages of smoking cessation were confirmed by a reduction in RR for those who had quit smoking for >10 years as compared to those who had quit for 1-10 years.[9] Among the documented etiologic factors described above, smoking was the only etiologic factor in our case. There was a 40-year history of smoking and a 2.03 RR of kidney cancer for this case.

The widespread use of abdominal ultrasound and CT scan as investigative tools for many non-urological complaints led to a dramatic increase in detection of small asymptomatic incidental renal masses.[10] In general, renal tumors are in solid or cystic character according to the imaging findings. In our case the smaller tumor nodule was not detected on imaging studies. Currently, better understanding of molecular genetics has resulted in some exciting progress in the management of renal neoplasms. Surgical excision (partial or radical nephrectomy) is recommended for all localised RCCs.[11]

A detailed and meticulous histopathological examination of tumor nephrectomy specimens is essential to establish histologic type and to record accepted histopathological prognostic determinants i.e. tumor size, histologic subtype, nuclear grade and stage in case of malignant renal neoplasms. Histopathologically, clear cell RCC has clear cytoplasm with solid, tubular or cystic growth pattern. Two different papillary RCC subtypes are defined: type 1 with small cells and pale cytoplasm and type 2 with large cells and eosinophilic cytoplasm. Both clear cell and papillary RCC originate from proximal tubules.

Immunohistochemistry has the potential to differentiate between different subtypes of primary renal neoplasms. Antibodies like CA IX, CK 7, C Kit, racemose and CD 10 have optimal efficacy. Clear cell RCC is characterised by the loss of genetic material of the short arm of chromosome 3 and mutations in VHL gene.[12] Papillary RCC show frequent loss of chromosome Y (93% of cases), trisomy 7 and 17 (75% and 80% of cases respectively) and it has a characteristic pattern of genetic abnormalities that differ from those of other renal neoplasms.[13] Papillary RCC has a significantly better prognosis than clear cell RCC.[14]

There are some literatures that define the synchronous benign and malignant tumors in the same kidney. Billings et al.[5] defined an 86 year old woman with a coexisting clear cell RCC and angiomyolipoma. They also stated pertinent literature of 31 cases that had angiomyolipoma and RCC in the same kidney. Besides these, oncocytoma has been defined with malignant tumors arising within the same kidney.[15]

In addition to coexisting benign and malignant tumors in the same kidney, there have been described some reports that define the coexisting two different types of RCCs. Kuroda et al[16] reported a case of two different types of clear cell RCC: conventional clear cell RCC and clear cell papillary type RCC. After the genetic evaluation, they concluded that clear cell papillary type RCC is different from conventional RCC or papillary RCC. Kang et al.[17] reported coexistent clear cell RCC, chromophobe RCC and multiple angiomyolipomas within the same kidney. Richstone et al.[18] retrospectively analysed 1071 patients who underwent radical nephrectomy due to renal tumors in terms of multifocality. 57 (5.3%) cases were of multifocality and 6 of them were bilateral synchronous tumors. Among these multifocal cases, 74% of the cases had same histologic subtypes. They found that papillary subtype was observed in 11.4% of RCC patients, while in 37% in multifocal group. Thus papillary RCC had a distinct association with multifocality. They also reported that 9 of 57 patients had pathologic discordance between primary and satellite tumors with a clear cell RCC and

papillary RCC. Similar to their result, papillary type RCC is one of the components of multifocal tumors in our case.

Also, literature search lead us to three articles that have reported synchronous clear cell RCC and papillary RCC in the same kidney, similar to our case.[19-21] Simhan et al.[19] reported a data of 97 patients who had multifocal renal tumors. They reported 8 patients who had mixed papillary and clear cell RCC, all of which were treated with partial nephrectomy. Capaccio et al.[20] found 7 patients with unilateral synchronous tumors with different histologic subtypes. 3 cases in this study had synchronous papillary and clear cell RCC and were treated by radical nephrectomy. Ustuner et al.[21] reported a case of 67 year old male who had clear cell and papillary RCC in right kidney, that were successfully treated with radical nephrectomy.

There is insufficient data to compare the different types of RCCs in the same kidney with bilateral multifocal or unifocal tumors of the kidney in terms of survival or oncologic survey.

In conclusion, we present an additional case of synchronous clear cell and papillary type RCC in the same kidney, which is a rare occurrence. However, this synchronous presence of different types of RCCs in the same kidney should not change the management of the case (i.e. nephrectomy).

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Eble JN. Neoplasms. Diseases of the urogenital and reproductive system. In: Damjanov I, Linder J, eds. Anderson's Pathology. 10th ed. US: Mosby; 1996: 2138-2142.
2. Rothman J, Crispen PL, Wong Y, Al-Saleem T, Fox E, Uzzo RG. Pathologic concordance of sporadic synchronous bilateral renal masses. Urology. 2008;72(1):138-42.
3. Patel MI, Simmons R, Kattan MW, Motzer RJ, Reuter VE, Russo P. Long-term follow-up of bilateral sporadic renal tumors. Urology. 2003;61(5):921-5.
4. Klatte T, Wunderlich H, Patard JJ, Kleid MD, Lam JS, Junker K, et al. Clinicopathological features and prognosis of synchronous bilateral renal cell carcinoma: an international multicentre experience. BJU Int. 2007 Jul;100(1):21-5.
5. Billings B, Hamrick LC, Bueschen AJ, Kenney PJ. Coexisting angiomyolipoma and renal cell carcinoma in a kidney of an elderly woman: case report and review of the literature. Sci World J. 2004;4(1):27-30.
6. Kovacs G, Wilkens L, Papp T, de Riese W. Differentiation between papillary and non-papillary renal cell carcinomas by DNA analysis. J Natl cancer Inst. 1989;81:527-30.
7. Kovacs G. Papillary renal cell carcinoma. A morphologic and cytogenetic study of 11 cases. Am J Pathol. 1989;134:27-34.
8. Setiwan VW, Stream DO, Nomura AM, Kolonel LN, Henderson BE. Risk factors for renal cell cancer: the multiethnic cohort. Am J Epidemol. 2007;166(8):932-40.
9. Hunt JD, van derHel OL, McMillan GP, Boffetta P, Brennan P. Renal cell carcinoma in relation to cigarette smoking: meta-analysis of 24 studies. Int J Cancer. 2005;114(1):101-8.
10. Ali MY, Muir CS, Malignant renal neoplasms in Singapore (survey of incidence, mortality and pathological features). Br J Urol. 1964;36:463-81.
11. Ljungberg B, Cowan NC, Hanbury DC, Hora M, Kuczyk MA, Merseburger AS, et al. EAU guidelines on renal cell carcinoma: the 2010 update. Eur Urol. 2010 Sep;58(3):398-406.
12. Argani P, Beckwith JB. Renal neoplasms of childhood. In: Mills SE, Carter D, Greenson JK, Reuter VE, Stoler MH, eds. Sternberg's Diagnostic Surgical Pathology. 5th ed. Philadelphia: Lippincott Williams and Wilkins; 2010: 1799-1828.
13. Thoens W, Rumpelt HJ, Störkel S. Classification of renal cell carcinoma and their relationship to nephron-collecting tubules system. Klin Wochenschr. 1990;68(22):1102-11.
14. Kuroda N, Toi M, Hiroi M, Enzan H. Review of papillary renal cell carcinoma with focus on clinical and pathobiological aspects. Histol Histopathol. 2003;18:487-94.
15. Licht MR, Novick AC, Tubbs RR, Klein EA, Levin HS, Streem SB. Renal oncocytoma: clinical and biological correlates. J Urol. 1993;150(5):1380-3.
16. Kuroda N, Shiotsu T, Kawada C, Shuin T, Hes O, Michal M, et al. Clear cell papillary renal cell carcinoma and clear cell renal cell carcinoma arising in acquired cystic disease of the kidney: an immunohistochemical and genetic study. Ann Diagn Pathol. 2011 Aug;15(4):282-5.
17. Kang SG, Ko YH, Kang SH, Kim J, Kim CH, Park HS, et al. Two different renal cell carcinomas and multiple angiomyolipomas in a patient with tuberous sclerosis. Korean J Urol. 2010 Oct;51(10):729-32.
18. Richstone L, Scherr DS, Reuter VR, Snyder ME, Rabbani F, Kattan MW, et al. Multifocal renal cortical tumors: frequency, associated clinicopathological features and impact on survival. J Urol. 2004 Feb;171(2 Pt 1):615-20.
19. Simhan J, Canter DJ, Sterious SN, Smaldone MC, Tsai KJ, Li T, et al. Pathological concordance and surgical outcomes of sporadic synchronous unilateral multifocal renal masses treated with partial nephrectomy. J Urol. 2013 Jan;189(1):43-7.

20. Capaccio E, Varca V, Simonato A, Toncini C, Carmignani G, Derchi LE. Synchronous parenchymal renal tumors of different histology in the same kidney. Acta Radiologica. 2009;50(10):1187-92.
21. Ustuner M, Yaprak B, Teke K, Ciftci S, Kart M, Yildiz K, et al. Coexisting papillary and clear renal cell carcinoma in the same kidney. Case Rep Urol. 2014;2014:575181.

DOI: 10.5455/2320-6012.ijrms20150549
Cite this article as: Tele JS, Shah A, Kushwaha H. A case of synchronous papillary and clear cell carcinoma in the same kidney. Int J Res Med Sci 2015;3:1288-92.