

# Quiz

## CORRECT ANSWER TO THE QUIZ. CHECK YOUR DIAGNOSIS

### CLEAR CELL PAPILLARY RENAL CELL CARCINOMA

KEVA JOSEPH<sup>1</sup>, KAI-WEN LIU<sup>2</sup>, I-WEI CHANG<sup>2</sup>

<sup>1</sup>School of Medicine for International Students, I-Shou University, Kaohsiung, Taiwan

<sup>2</sup>Department of Pathology, E-DA Hospital, I-Shou University, Kaohsiung, Taiwan

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We incidentally observed a case of clear cell papillary renal cell carcinoma of an 81-year-old woman, presenting with intermittent left flank pain. It is a recently described rare renal parenchymal tumor.

**Key words:** clear cell papillary renal cell carcinoma, end-stage renal disease, kidney.

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#### Introduction

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Clear cell papillary renal cell carcinoma (CCPRCC) is a recently recognized renal neoplasm with distinct morphology as well as immunohistochemical and molecular profiles [1]. CCPRCC is a tumor composed mainly of cells with clear cytoplasm arranged in cystic and papillary patterns. Initially, the tumors were considered to arise from cases with acquired cystic disease of the kidney (ACDK) or noncystic end-stage renal disease (ESRD) [2]. CCPRCC is the second most common epithelial neoplasm in end-stage renal disease [2]. Herein, we describe an incidentally found CCPRCC case with detailed histopathological examination and immunohistochemical study.

#### Case report

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An 81-year-old Taiwanese woman presented to our hospital with intermittent left flank pain for three months. She had end-stage renal disease. She also had comorbidities of hypertension, hypertensive cardiovascular disease, gout, and duodenal ulcer. In our Urology Outpatient Department, left hydronephrosis was found on sonography. Non-contrast magnetic resonance imaging (MRI) of the abdomen

revealed left hydronephrosis with obliteration of the upper ureter (Fig. 1A). The radiologist did not pay attention to a small nodule at the lower pole of the kidney at that time (Fig. 1B). Subtle ureteral lesion could not be excluded. Left nephroureterectomy was performed under the impression of possible ureteral tumor. On bisection of the kidney, a well-demarcated and variegated solid tumor measuring 1.5 × 1.2 × 1.0 cm was incidentally found. The pelvis was markedly dilated. However, no tumor was discernible in the renal pelvis or ureter, except stenosis of the ureteropelvic junction. Microscopically, the tumor was encapsulated (Fig. 2A) and mainly composed of tubules (Fig. 2B) and focally papillae with a fibrovascular cores (Fig. 2C). The tumor cells were cuboidal with abundant clear cytoplasm and small uniform nuclei. The nuclei showed distinct polarization away from the basement membrane, creating a characteristic subnuclear vacuole resembling the cells of early secretory endometrium (Fig. 2D). The tumor was confined to the kidney without perinephric fat invasion. The urothelium of the renal pelvis and ureter revealed chronic inflammatory cell infiltration and fibrosis. In immunohistochemistry, the tumor was immunoreactive to cytokeratin 7 (CK7) (Fig. 3A), carbonic anhydrase IX (CA IX) (Fig. 3B), but not

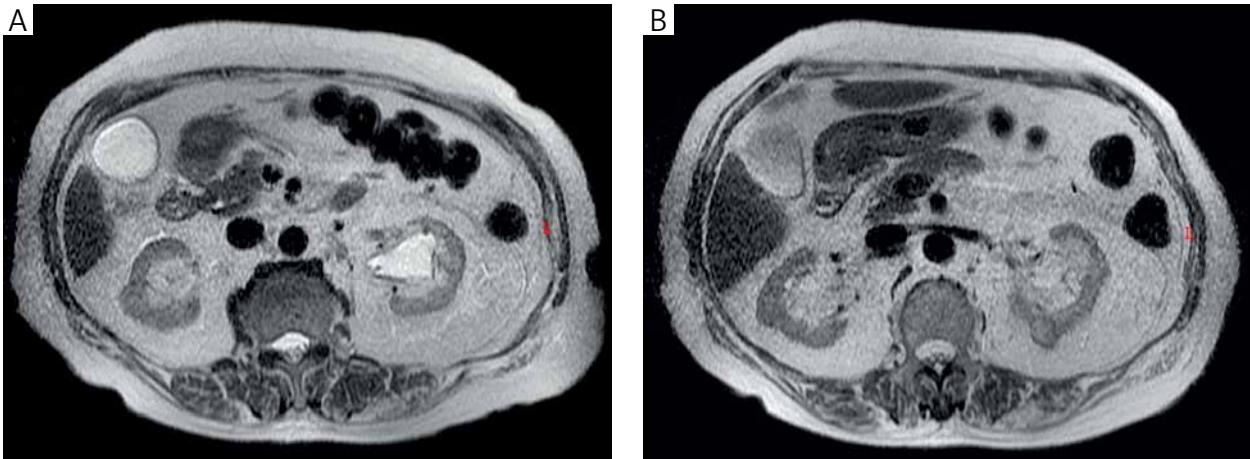


Fig. 1. Non-contrast MRI revealed A) left hydronephrosis with obliteration of upper ureter. B) A small nodule at lower pole of kidney was also found, but not noticed by radiologist before operation

alpha-methylacyl-CoA racemase (AMACR) (Fig. 3C) or CD10 (Fig. 3D). During the regular follow-up of eight months, neither recurrent nor metastatic disease was identified.

### Discussion

CCPRCC was first described by Gobbo *et al.* in 2008 [1]. Originally, it was considered to be associated with ESRD and named as “clear-cell papillary

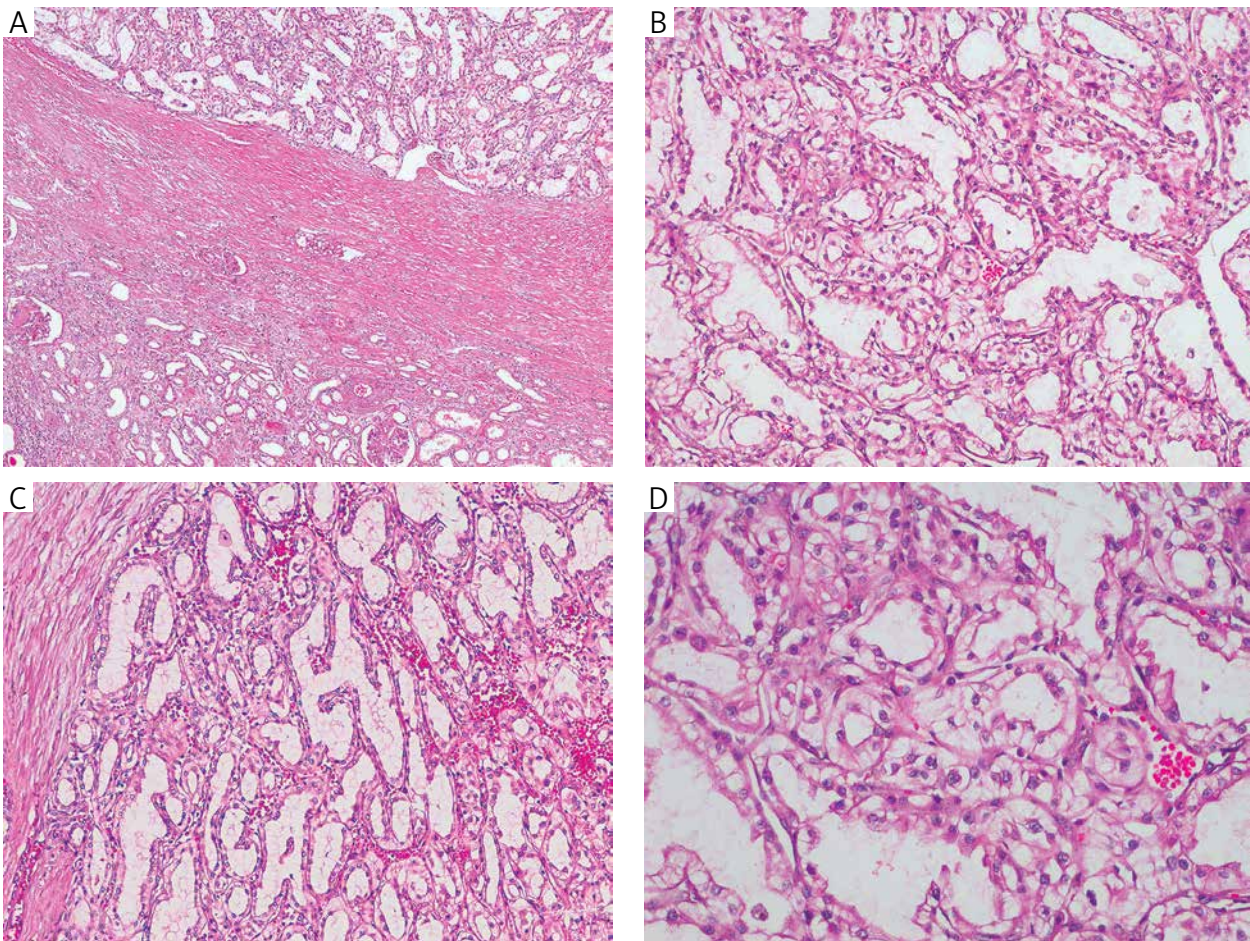


Fig. 2. Microscopic findings. The tumor was A) well-encapsulated and composed of B) mainly tubules and C) focally delicate papillae. D) The characteristic nuclear feature of polarization away from the basement membrane, forming subnuclear vacuoles, was discernible (A: HE, magnification 40×; B, C: HE, magnification 100×; D: HE, magnification 200×)

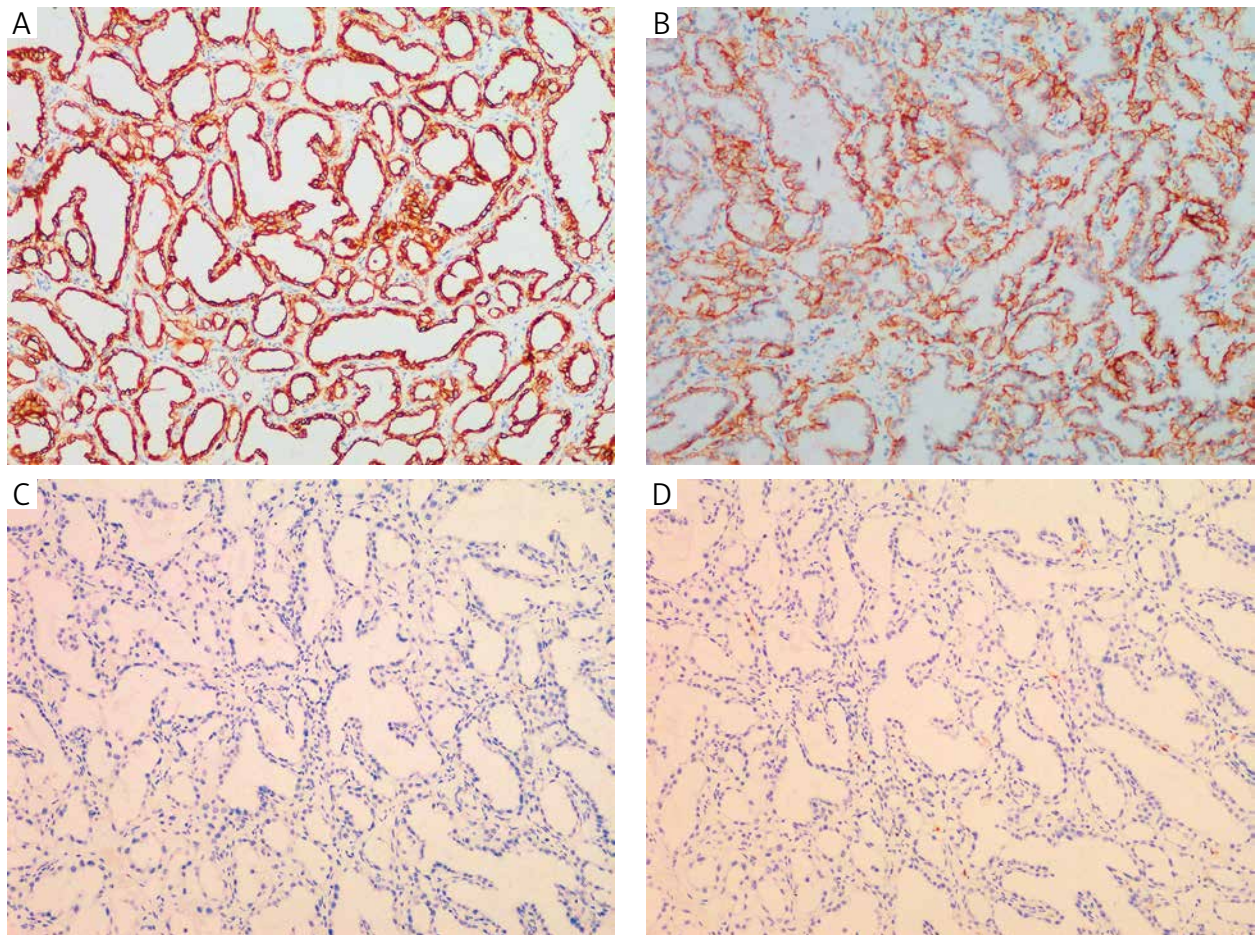


Fig. 3. Immunohistochemical study. The tumor cells demonstrated strongly positive immunostaining for A) CK7 and B) CA IX, but negative for C) AMACR and D) CD10 (A-D: Immunostain, magnification 100 $\times$ )

Table I. Summary of immunohistochemical profile of CCPRCC, CCRCC and PRCC

	CCPRCC	CCRCC	PRCC
CK7	+	-	+
CA IX	+	+	+/-
AMACR	-	-	+
CD10	-	+	+/-

AMACR – *alpha-methylacyl-CoA racemase*; CA IX – *carbonic anhydrase IX*; CCPRCC – *clear cell papillary renal cell carcinoma*; CCRCC – *clear cell renal cell carcinoma*; CK7 – *cytokeratin 7*; PRCC – *papillary renal cell carcinoma*

renal cell carcinoma of the end-stage kidneys” [1]. However, CCPRCCs were found to occur in healthy kidney in later investigations [2, 3]. These tumors exhibit variable proportions of mixed tubulocystic and papillary architecture. Most importantly, the characteristic feature is the distinct cytomorphology of the tumor cells with nuclear arrangement away from the basement membranes, producing subnuclear vacuoles in the cytoplasm [1, 2]. The differential diagnoses of CCPRCC include clear cell renal cell carcinoma (CCRCC) and papillary renal cell carcinoma (PRCC), which share some of the morphologic features of CCPRCC, such as clear cytoplasm and papillary structures. Nevertheless, CCPRCC has not only distinct histopathologic and cytomorphologic features but also different immunohistochemical profile and molecular genetic characteristics [1, 3]. CCPRCC usually strongly immunostains positive for CK7 and CA IX, but negative for AMACR and CD10. CCRCC characteristically exhibits strong positive immunostaining for CD10 and CA IX, but negative for CK7 and AMACR. PRCC usually shows positive immunostaining for CK7 and AMACR, but less frequently for CD10 and/or CA IX [2, 3]. The different immunohistochemical profiles of these three renal cell carcinomas are summarized in Table I. Furthermore, CCPRCC has different molecular features from CCRCC or PRCC. By fluorescence in situ hybridization analysis, neither deletion of 3p, a common genetic feature of CCRCC, nor gains of chromosome 7 and losses of chromosome Y, typical genetic aberration of PRCC, were detected [1]. The behavior of CCPRCC is usually indolent, with a low tumor stage [1-3]. The tumors are almost always cured after excision without recurrence or metastasis [1-3].

In summary, we have reported a rare case of the recently described renal epithelial neoplasm with typical histopathologic features, cytomorphology and immunohistochemical stains.

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*The authors declare no conflict of interest.*

*This study was partially supported by a grant from E-DA Hospital (grant number EDAH104014).*

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## Address for correspondence

I-Wei Chang MD  
Department of Pathology  
E-DA Hospital  
No. 1, Yi-Da Road, Jiao-Su Village, Yan-Chao District  
Kaohsiung City 824, Taiwan  
tel. +886-7-615-0011 ext. 2620  
fax +886-7-615-0974  
e-mail: ed106242@edah.org.tw

THE AUTHOR OF CORRECT DIAGNOSIS IS:

Dr Michal Zámečník

Medicyt, s. r. o., Department of Surgical Pathology, Laboratory Trencin, Legionarska 28, 91171 Trencin, Slovakia