

# Concurrent Multilocular Cystic Renal Cell Carcinoma and Leiomyoma in the Same Kidney: Previously Unreported Association

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## Key Words

Renal cell carcinoma · Multilocular cystic renal cell carcinoma · Leiomyoma · Synchronous tumors

## Abstract

We present an unusual case of concurrent occurrence of a multilocular cystic renal cell carcinoma and a leiomyoma in the same kidney of a patient with no evident clinical symptoms. A 38-year-old man was found incidentally to have a cystic right renal mass on computed tomography. Laparoscopic radical nephrectomy was performed under a preoperative diagnosis of cystic renal cell carcinoma. Histology revealed a multilocular cystic renal cell carcinoma and a leiomyoma. This is the first report of this kind of presentation.

## Introduction

Macroscopically, renal cell carcinomas (RCCs) generally present as either solid or cystic mass. Among cystic RCCs, multilocular cystic RCC represents a rare entity that was recognized in 1982 [1], with a reported incidence of 1–4% of all RCCs [2]. Renal leiomyomas are benign tumors of the kidney originating from smooth muscle cells of the renal capsule, pelvis, calices, or blood vessels. Although small renal leiomyomas can be found in about 5% of autopsy specimens [3], clinical incidence of these lesions is much lower. In this report, we discuss the first case of simultaneous occurrence of a multilocular cystic RCC and a leiomyoma in the same kidney.

## Case Report

A 38-year-old man was referred for treatment of a right renal cystic mass found incidentally. Physical examination on admission revealed no palpable mass, and laboratory data were negative. Computed tomography of the abdomen showed a about 5.4 × 4.6 cm poorly enhancing cystic mass with enhancing septa in the polar area of the right kidney ([fig. 1](#)). Since multilocular cystic RCC could not be excluded, the patient underwent right laparoscopic radical nephrectomy. Macroscopically, in the mid pole, a well-circumscribed mass showing a multicystic feature with thin fibrous septa and without expansile tumor nodules was noted. A small whitish nodule was also found in the lower pole ([fig. 2](#)). The pathological diagnosis was multilocular cystic RCC and renal leiomyoma ([fig. 3](#)). Convalescence was uneventful with no evidence of recurrence during the follow-up.

## Discussion

Recent advances in imaging diagnostic procedures have facilitated the identification of cystic renal lesions. RCCs show cystic changes on imaging studies in 4–15% of cases [4, 5]. Since it is often difficult to differentiate cystic RCCs from benign cystic lesions, a definite diagnosis can in most cases only be established by histopathologic examination. Several mechanisms may explain the cystic nature of RCCs. These include: (1) intrinsic multiloculated growth; (2) intrinsic unilocular growth; (3) cystic necrosis, and (4) origin from the epithelial lining in a pre-existing cyst [4]. The prognosis of multilocular cystic RCC is excellent [6]. Because multilocular cystic RCC are more likely to be discovered incidentally, this feature may contribute to their excellent prognosis compared to that of conventional RCCs.

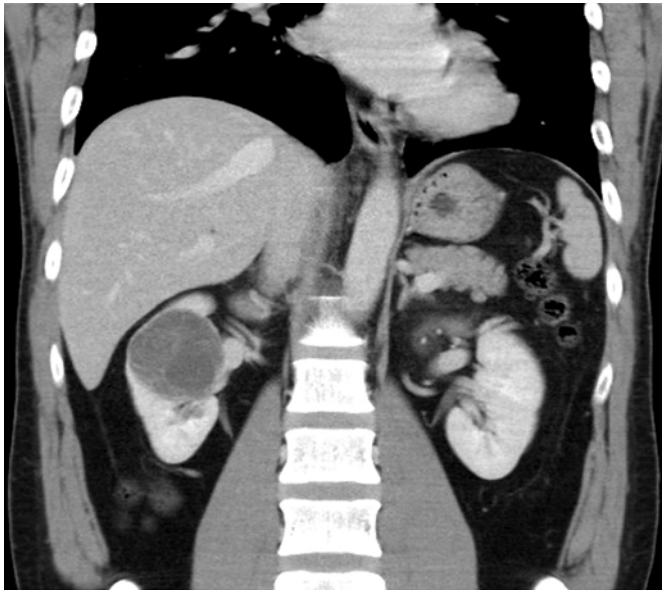
Since the majority of RCCs originate from the proximal tubules, the characteristics and/or environment of the proximal tubules are considered to play an important role in the pathogenesis of RCC. Recently, Imura et al. carried out a detailed immunohistochemical analysis of multilocular cystic RCC cases [7]. They found that in a high proportion of cases, multilocular cystic RCC reacted strongly with the distal nephron markers, but none reacted preferentially with proximal nephron markers. These results illustrate that multilocular cystic RCC originates from the distal nephron, although the precise pathogenesis of cystic formation in multilocular cystic RCC has not been elucidated clearly.

Renal leiomyomas are benign tumors arising from the mesenchymal (or connective) tissue of the kidney [8]. Tumors may be subcapsular (53%), capsular (37%), or located in the renal pelvis (10%) [9]. A variety of structural patterns have been described at imaging: solid, cystic, and both cystic and solid [9, 10]. In 1990, Steiner et al. classified renal leiomyomas into two major groups [9]. The first group comprises small cortical or subcortical neoplasms that are usually asymptomatic, less than 2 cm in size, and are often detected incidentally during autopsy or surgery. The second group consists of larger neoplasms that arise from the renal capsule or blood vessels and may be symptomatic. Unfortunately, it is almost impossible to clinically distinguish renal leiomyomas from their malignant counterparts. Because of their small size (usually less than 2 cm), these smooth muscle-containing tumors are commonly diagnosed during autopsy [9], and clinical manifestations become apparent only when they grow larger, hemorrhage, or undergo cystic or sarcomatous degeneration.

Since the finding of primary synchronous renal neoplasms is very uncommon, especially when they have a different histogenesis, up to now, only a few primary, synchronous RCCs with different histotypes have been reported. The coexistence of multilocular cystic RCC and leiomyoma has not been documented. This present case is

the first report of synchronous renal neoplasms with different histogenesis (multilocular cystic RCC and leiomyoma) in a patient without any symptoms. The significance of the relationship between multilocular cystic RCCs and leiomyomas is not well understood and needs further exploration.

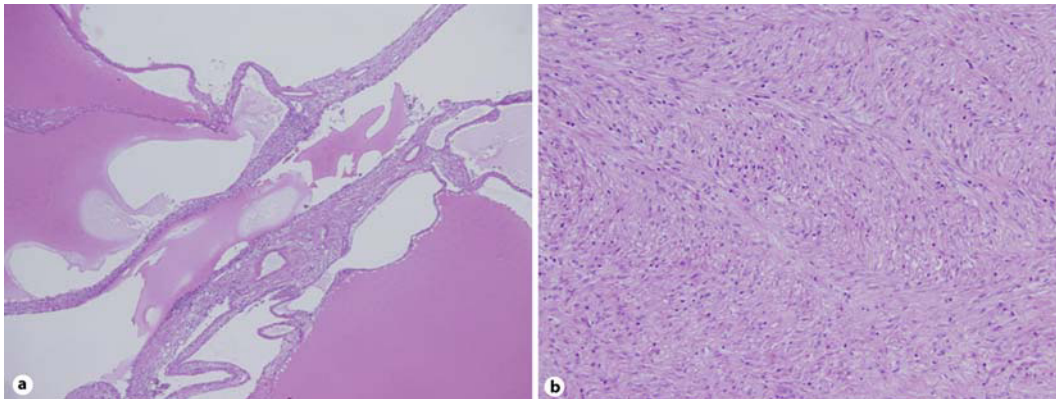
**Fig. 1.** Computed tomography of the multilocular cystic RCC showing a multiloculated cyst in the right kidney. Thin enhancement is present in the septum.



**Fig. 2.** In the mid pole, a well-circumscribed mass showing a multicystic feature with thin fibrous septa and without expansile tumor nodules is noted. A small whitish nodule is also found in the lower pole (leiomyoma).



**Fig. 3. a** Microscopic feature of the multilocular cystic RCC. The thin septa separate the cystic spaces. HE,  $\times 40$ . **b** Microscopic feature of the leiomyoma. HE,  $\times 200$ .



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