

## Renal oncocytoma

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*The first case of renal oncocytoma observed in the Department of Surgery, Chulalongkorn Hospital, is described in a 35-year-old woman who presented with hematuria and a long history of palpable abdominal mass. An excretory urogram showed poor excretory function of the left kidney and a tumor at the lower pole. An ultrasonogram and CT scan also disclosed a well-marginated lesion in the same region. Upon surgery, a mahogany-colored cut surface and abundant granular cytoplasm were observed. These were the pathological characteristics of the lesion. The nature of the tumor cells was verified by immunohistochemical and electron microscopic findings.*

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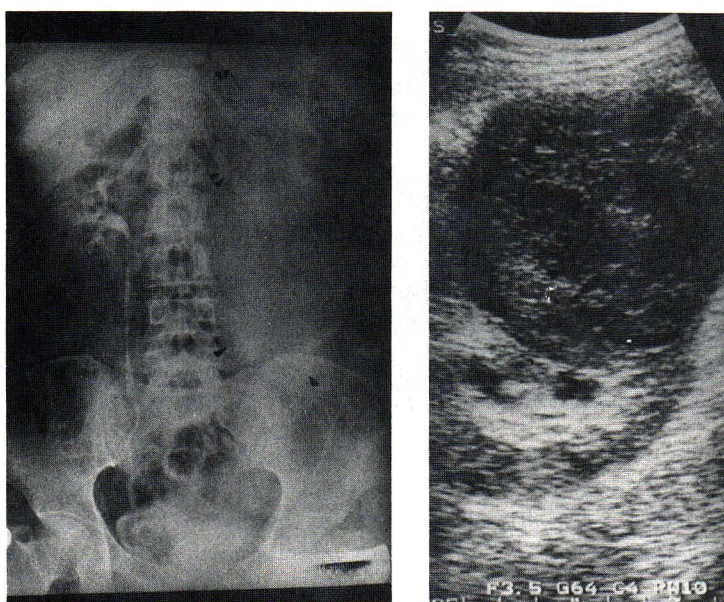
ได้รายงานเนื้องอกชนิดออนโคไซท์ของไตรายแรก ในคณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย  
ผู้ป่วยหญิงอายุ 35 ปี มาด้วยอาการถ่ายปัสสาวะเป็นเลือดมา 2 สัปดาห์ และคลำได้ก้อนที่ท้องด้านซ้ายมา  
4-5 ปี การตรวจทางห้องปฏิบัติการ การถ่ายภาพของไต พบว่าไตข้างซ้ายมีการขยับย่นลงอย่างมาก และ  
พบก้อนเนื้องอกอยู่บริเวณด้านข้างของส่วนล่างของไตด้านซ้าย Ultrasonogram และ CT scan ตรวจพบ  
ก้อนเนื้องอกที่บริเวณดังกล่าวมีขอบเขตชัดเจน พยาธิสภาพของก้อนเนื้องอกมีเนื้อเยื่อเกี่ยวพันเป็นผนังล้อมรอบ  
ตัวก้อนเนื้องอกมีสีน้ำตาลสม่ำเสมอแตกต่างจากมะเร็งชนิดที่พบทั่ว ๆ ไปของไต ลักษณะทางกล้องจุลทรรศน์  
การศึกษาทางเคมี อิมมูโนเคมีและทางกล้องจุลทรรศน์อิเล็กตรอนของเซลล์เนื้องอก สนับสนุนว่าเป็นเนื้องอก  
ของไตชนิดออนโคไซท์.

Renal oncocytoma was classified formerly as a type of renal cell carcinoma. The first reported case was described in 1942;<sup>(1)</sup> many other cases have been recorded since.<sup>(2,3)</sup> Recently however, the tumor is considered as behaving in a benign fashion regardless of its size, although a malignant lesion has been documented.<sup>(4)</sup> Grossly, the tumor is often a discrete encapsulated mass with a light brown or mahogany colored cut surface. Histologically, the oncocytic tumor cells are uniformly polygonal and have abundant granular acidophilic cytoplasm. The nuclei are round to oval in shape with mild pleomorphism. Ultrastructurally, these neoplastic cells possess abundant mitochondria although there is a paucity of other organelles and lipids.<sup>(5)</sup> We present herein a case of renal oncocytoma which we think is the first instance of this type of tumor to be found in the Department of Surgery, Chulalongkorn Hospital.

### Case report

A 35-year-old Thai woman was admitted to Chulalongkorn Hospital in April 1990 with hematuria of two weeks, duration. Her illness could be traced back to a period lasting more than four years. Initially, the patient noticed a progressively slow-growing mass about the size of a "lemon" in the left side of her abdomen. She developed

occasional back pain and lost 4 kg. of weight in the previous two months. Physical examination revealed a thin woman with normal vital signs and good alertness. A 15-cm firm mass with smooth surface was found in the left upper quadrant fixed to the posterior abdominal wall. Routine laboratory examination revealed hemoglobin of 10.2 gm%, hematocrit of 34%, white cell count of 8,900 cells/mm<sup>3</sup> with 19% segmented neutrophils, 35% eosinophils, 44% lymphocytes and 2% monocytes. The morphology of the red cells was normal and platelets were adequate. Urine, stool and blood chemistry as well as tests for limited liver function were unremarkable. However, an excretory urogram showed poor excretory function in the left kidney. A large mass was found in the left lower pole (Fig.1 Left). An abdominal sonogram revealed a large solid mass with central poor-echo area (Fig.1 Right). Non-contrast CT scan showed a well-defined lesion with an attenuation value similar to that of the normal renal parenchyma. A streak of less attenuation in the central portion of the mass was observed (Fig.2). The mass had a lesser degree of enhancement than the renal tissue. The central streak was highly enhanced (Fig.3). Radical nephrectomy was performed. The post-operative course was uneventful.

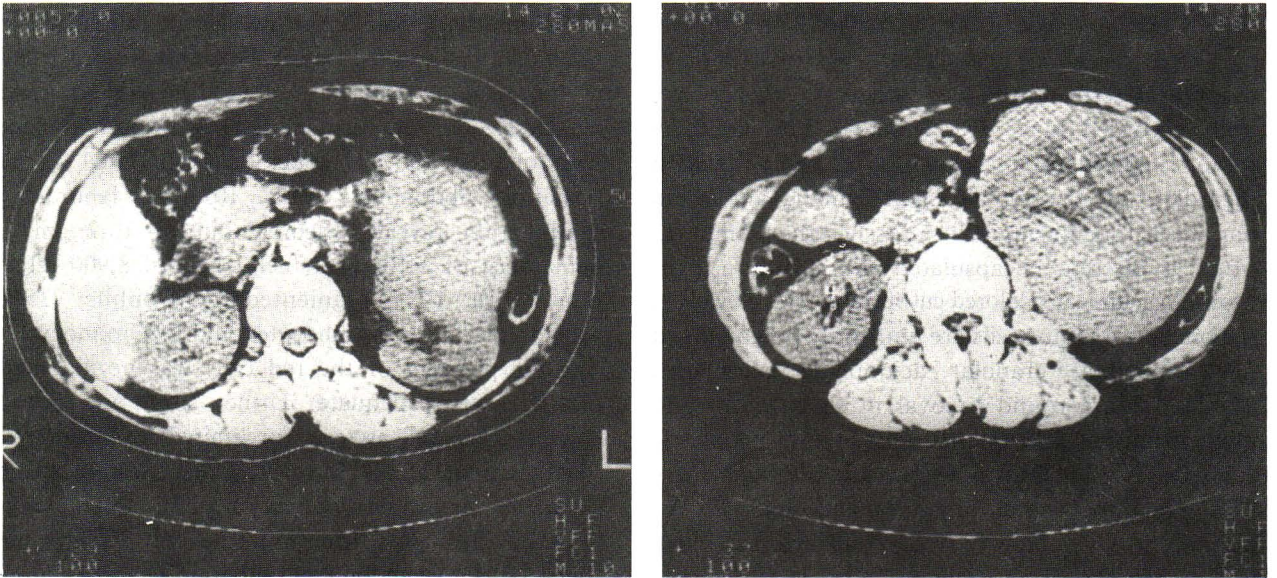


**Figure 1.**

**Left.** This excretory urogram reveals a well-defined large soft tissue mass (arrows) in the lower pole of the left kidney (double arrows) extending inferiorly. Faint opacified upper pole calyces may be observed.

**Right.** This real-time sonogram of the left kidney reveals a large heterogeneously solid mass, with the presence of a central echo-poor area corresponding to a cleft or scar.

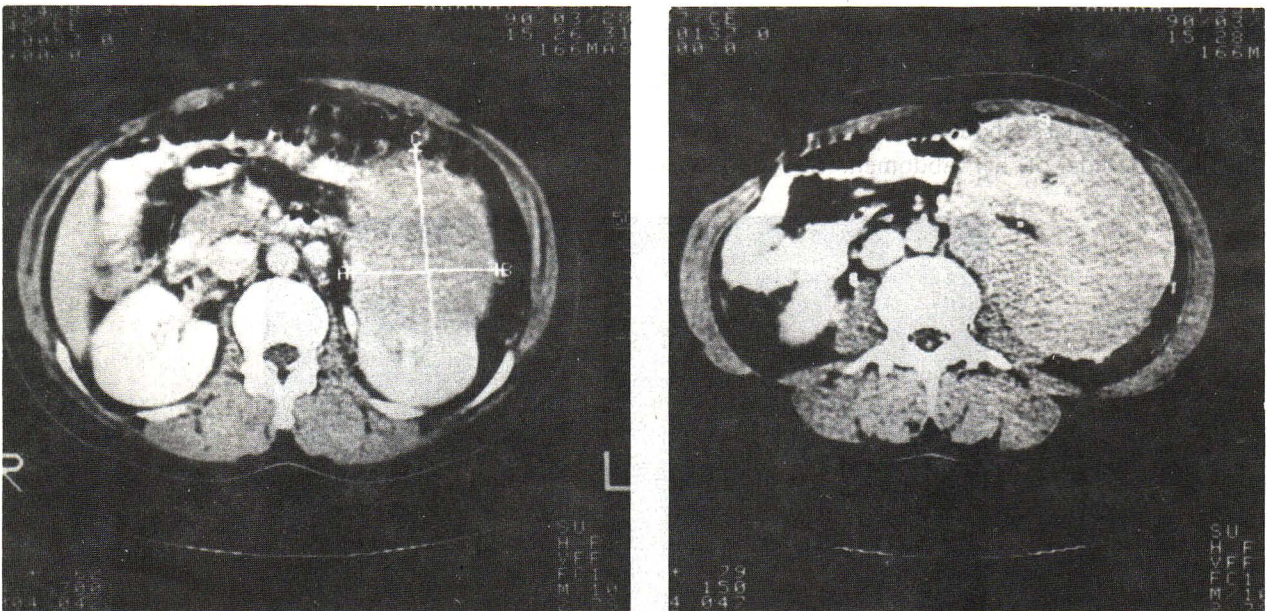




**Figure 2.**

**Left.** This non-contrast CT scan shows a well-margined mass in the lower pole of the left kidney. The attenuation value of the mass is similar to the adjacent normal renal parenchyma.

**Right.** Note a streak of lower attenuation in the central portion of the mass.



**Figure 3.**

**Left.** This contrast-enhanced CT scan shows that the degree of enhancement is less than that of the normal renal tissue. The low attenuation cleft on the plain CT scan becomes highly enhanced.

**Right.** There is no evidence of renal vein thrombosis or para-aortic lymphadenopathy.

An encapsulated mass measuring  $13 \times 10 \times 6$  cm. was noted in the left lower pole of the kidney. The cut surface was a homogenous mahogany-brown color with a small area of hemorrhage (Fig.4). The adjacent renal tissue was not remarkable. Microscopically, the tumor was composed of

monotonous large polygonal cells which were arranged in small solid nests separated from each other by thin fibrovascular stroma (Fig.5). The neoplastic cells had abundant granular eosinophilic cytoplasm and oval or round small nuclei. Occasionally they showed a paucity of PAS-positive

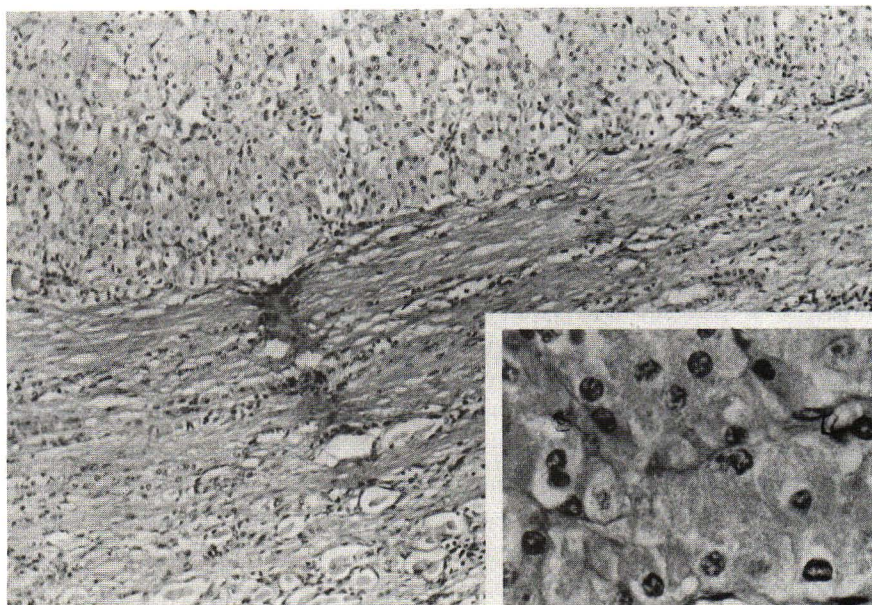


granules and were negative for mucicarmine and fat. There were scattered foci of pleomorphic cells. The tumor cells showed reactivity to keratin (Pan and monoclonal low molecular weight) and alpha-1

antitrypsin as well as lysozyme, but were negative to vimentin (Fig. 6). With electron microscopy, the tumor showed packing of mitochondrias in the cytoplasm.

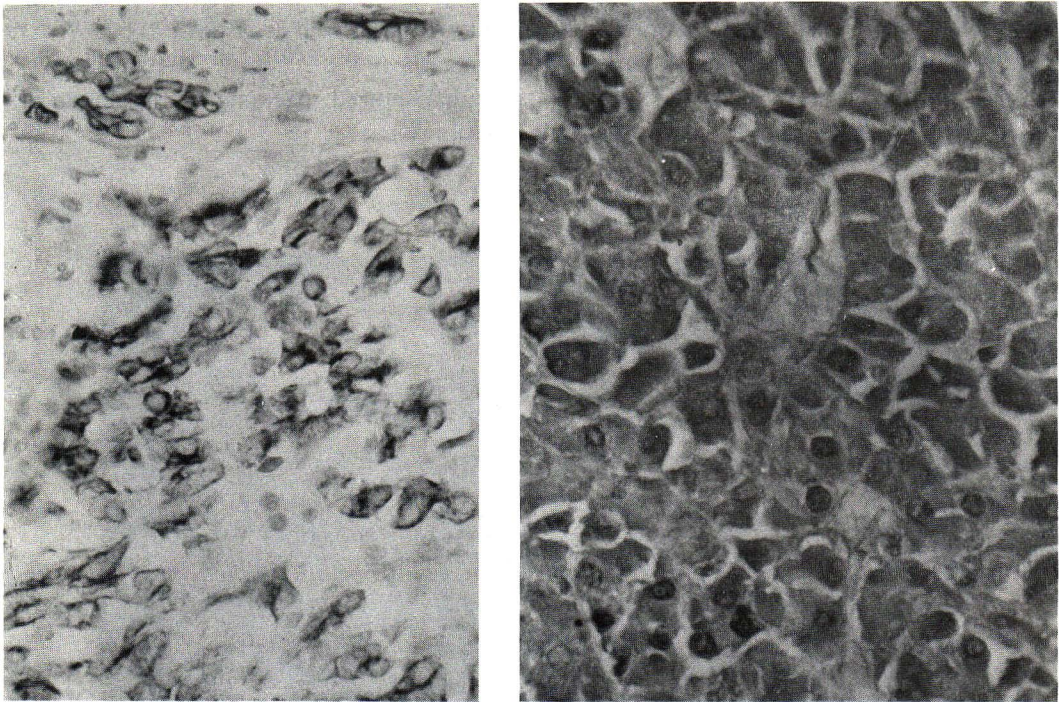


**Figure 4.** Note the recent hemorrhage (arrow) in the well-defined brownish mass at the lower pole of the kidney.



**Figure 5.** A fibrous capsule surrounds the tumor (middle) H & E X100. Inset is a tumor cell with abundant granular acidophilic cytoplasm and a small and round nucleus.





**Figure 6.** Immunostains

**Left.** Keratin positivity in tumor cells (lower field) and normal renal tubules in capsule (sepper left) X 400.

**Right.** Tumor cells are reactive to alpha-1 antitrypsin. (X400).

## Discussion

In the present case, the history of the renal tumor was one of slowly progressive growth over a period of years, although a few weeks before admission, the signs and symptoms changed to those of a rapidly growing tumor. Clinically, renal cell carcinoma was suspected. However, the urogram, sonogram and CT scans disclosed a large renal mass with well-defined margin. Such findings along with the pathologic features of a well-defined mass with a homogenous brown colored cut surface would be considered as evidence against the presence of renal cell carcinoma. The detailed structures of the lesion, based on light microscopic findings, were similar to those of a granular cell type of renal cell carcinoma. The absence of mucin production and fat in the tumor cells is not consistent with the latter type of neoplasm. The immunostains, which showed reactivity to keratin, alpha-1 antitrypsin and lysozyme, but not vimentin, suggested the diagnosis of oncocytoma in our case. However, the demonstration of numerous mitochondria in the tumor cells provided even more convincing verification of oncocytoma than the use of the chemical dyes. The monotonous and benign-looking cells indicated its benign nature. A long

clinical history of a slowly growing abdominal mass supported its non-malignant behavior.

Renal oncocytomas occur predominantly in men and are usually found in persons in the sixth to eighth decades of life.<sup>(3)</sup> Over half of the reported cases have been discovered incidentally.<sup>(3)</sup> Hence it is difficult to distinguish oncocytoma from renal cell carcinoma in pre-operative diagnosis, particularly when a patient presents with hematuria and progressive tumor growth as noted in our case.<sup>(6)</sup> About one third of the cases have the aforementioned clinical features as well as pain and mass.<sup>(3,7)</sup>

Concerning roentgenographic findings, an angiogram may show a spoke-wheel pattern in oncocytoma.<sup>(8)</sup> Ultrasonography typically discloses a well-defined homogenous solid mass.<sup>(9-11)</sup>

In contrast, our case had a non-homogenous appearance. Central necrosis, calcification or scarring may be observed in a minority of cases.<sup>(9)</sup> Although the appearance of renal oncocytoma on ultrasonography is characteristic, it is not pathognomonic. CT often shows homogenous enhancement.<sup>(11)</sup> The combination of nephrogram, ultrasonography and CT thus can be helpful in the pre-operative

investigation of this tumor. However, tissue examination remains essential to establish the diagnosis and distinguish the tumor from renal cell carcinoma.

According to Lieber et al. The tumor may be categorized in four grades depending on pleomorphism, mitosis and necrosis.<sup>(4)</sup> Mitosis and necrosis are absent in grades 1 and 2, but such a cytologic appearance is seen in grades 3 and 4. Various degrees from mild to severe, of pleomorphism are noted in grade 1 to grade 4, respectively. Grade 1 is considered as having a low malignant potential whereas grade 2 shows a more aggressive nature.<sup>(4,12)</sup> It should be noted that grades 2 and higher are less common than grade 1.<sup>(13)</sup> The lesion in the current example had only a mild degree of pleomorphism, but lacked necrosis and mitosis. It was thus reasonable to predict that our case would have a good prognosis.

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