Renal Cyst – a Benign Disease?
– Discussions Based on a Case Report –

C. Gîngu1, C. Chibelean1, A. Turcanu1, A. Dick1, C. Surcel1, S. Pătrașcoiu1, C. Mirvald1, O. Himedan1, Liliana Domnișor2, I. Constantinescu2, I. Sinescu1

1 Center of Urologic Surgery, Dialysis and Renal Transplantation, Fundeni Clinical Institute
2 ICU Department, Fundeni Clinical Institute
3 Center of Immunogenetics and Virology, Fundeni Clinical Institute

Abstract

Introduction and objective: Renal cystic formations are generally included in two categories, simple renal cysts and complicated renal cysts. The management of these two categories is completely different, and diagnostic confusions can lead to mistreatment and can impair patients’ life. Our purpose is to present the management of a cystic RCC referred to our clinic as a simple cyst and to discuss different medical aspects related to this case.

Patient, Method and Results: The patient D.I., aged 63 years, was investigated in a different unit for left flank pain and was referred to our clinic for a left simple renal cyst diagnosed through ultrasound (12 cm in diameter). The abdominal ultrasound in our department revealed a medial renal cyst with some irregularities and partially thickened walls, about 12 cm in diameter. In addition to the ultrasound, we decided a CT scan (with contrast material administered IV) was needed, which found a renal cystic mass, classified Bosniak III, without adenopathy or distant metastases. Consequently we performed a left radical nephrectomy with regional lymph node dissection by anterior transperitoneal approach. Histopathological result showed a clear cell renal carcinoma Fuhrman I. The 2 year follow-up was without regional recurrence or distant metastasis on the CT scan.

Conclusions: The ultrasound evaluation of the patients with renal cystic lesions is closely related to the investigator’s experience and the quality of the equipment available in each unit, which makes necessary the careful reassessment of the patients. Although the simple cyst could be diagnosed by ultrasound we consider mandatory to perform a contrast CT scan before the surgery. Surgical treatment of complicated cysts should be similar to that of renal tumors to avoid diagnostic errors that could lead to poor treatment and could impair the prognosis for the patient.

Key words: renal cyst, Bosniak, RCC

Correspondent: Dr. Constantin Gîngu
Center of Urologic Surgery, Dialysis and Renal Transplantation, Fundeni Clinical Institute
Șoseaua Fundeni nr. 258, Sector 2, 022328 Bucharest
Tel./Fax: 021-300.75.70; e-mail: cgingu@gmail.com
Introduction

The most common renal cystic lesion in general population is simple renal cyst, usually discovered after a routine ultrasound or CT examination for a different pathology. In general population the reported incidence of renal cysts in patients older than 50 years is higher than 27% (1.2). The number and incidence of renal cysts, tends to increase with the age of the patients (1.2). Usually the cysts present themselves as simple, round or oval unilocular cortical cysts, with clear transudate-like or straw-colored fluid.

Usually these are simple benign cysts, but they can become complicated in case of hemorrhage, infection or ischemia, making them hard to differentiate from cystic renal cell carcinoma (10% of all renal cell carcinomas) (3).

For the differential diagnosis of cystic renal masses, the gold standard is the Bosniak renal cyst classification system (4.). The Bosniak renal cyst classification was first introduced in 1986 and has been accepted by urologists and radiologists as a way of diagnosing, discussing, and determining the correct surgical approach for cystic renal masses. Using the lesion’s morphology and enhancement characteristics, each cyst can be categorized into one of five groups (categories I, II, IIF, III, and IV - table 1), with associated recommendations for the patient’s treatment (5,6).

Table 1. Bosniak renal cyst classification system

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td>I</td>
<td>A benign simple cyst with a hairline thin wall that does not contain septa, calcifications, or solid components. It measures water density and does not enhance.</td>
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<tr>
<td>II</td>
<td>A benign cyst that may contain a few hairline thin septa in which “perceived” enhancement may be present. Fine calcification or a short segment of slightly thickened calcification may be present in the wall or septa. Uniformly high attenuation lesions &lt; 3 cm (so-called high-density cysts) that are well marginated and do not enhance are included in this group. Cysts in this category do not require further evaluation.</td>
</tr>
<tr>
<td>IIF (F for follow-up)</td>
<td>Cysts that may contain multiple hairline thin septa or minimal smooth thickening of the wall or septa. Perceived enhancement of their septa or wall may be present. Their wall or septa may contain calcification that may be thick and nodular, but no measurable contrast enhancement is present. These lesions are generally well marginated. Totally intrarenal nonenhancing high-attenuation renal lesions &gt; 3 cm are also included in this category. These lesions require follow-up studies to prove benignity.</td>
</tr>
<tr>
<td>III</td>
<td>“Indeterminate” cystic masses that have thickened irregular or smooth walls or septa in which measurable enhancement is present. These are surgical lesions, although some will prove to be benign (hemorrhagic cysts, chronic infected cysts, and multiloculated cystic nephroma), some will be malignant (cystic renal cell carcinoma and multiloculated cystic renal cell carcinoma).</td>
</tr>
<tr>
<td>IV</td>
<td>These are clearly malignant cystic masses that can have all the criteria of category III, but also contain enhancing soft-tissue components adjacent to, but independent of the wall or septum. These lesions include cystic carcinomas and require surgical removal.</td>
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Since the only radical treatment for renal cell carcinoma is surgical ablation (7.), we need to recognize these cystic renal cell carcinomas.

Patient, Method and Results

We are going to present the case of a male patient referred to our clinic with the initial ultrasound diagnosis of left simple renal cyst about 12 cm in diameter.

Physical examination revealed no abnormalities. Blood pressure was normal and body temperature was 37°C. Laboratory investigations revealed no anomalies.

Not knowing the experience of the first ultrasound investigator, we decided to repeat the ultrasound in our clinic. It revealed a mediorenal cyst 12 cm diameter, with small irregularities and thick wall (image 1). Given the result of the ultrasound (thick walls and small irregularities) and the possibility of a complicated cyst, we decided to investigate the matter further, and programmed the patient for an enhanced abdominal computer tomography with IV contrast.

![Image 1. Ultrasound image of the cyst (thick wall and small irregularities)](image_url)
The enhanced CT images revealed a left kidney cystic mass, with a 12 cm diameter, thick irregular walls with contrast enhancement, hyperdens content, and no pathological lymph nodes or distant metastases. The diagnosis was a Bosniak III complicated cyst. Consequently instead of a cyst decortication we performed a left radical nephrectomy with regional lymph node dissection by anterior transperitoneal approach as is the normal treatment for renal cell carcinoma.

Results

Surgical recovery was brief, the patient being discharged after 5 days, with per primam healing of the wound, no fever, and normal laboratory findings on serum creatinine and urea. Macroscopically the removed kidney presented a mediorenal cyst with serohaematic content, thick walls and tumoral nodes (Image 3).

The histopathological result was: clear cell renal carcinoma Fuhrman I (Image 4).

The 2 year follow-up was without regional recurrence or distant metastasis on the CT scan (Image 6).

Discussions

Most renal cysts are benign and pose no diagnostic problems on imaging studies. Usually the ultrasound is enough to differentiate a simple cystic lesion from a complex one, using the ultrasound criteria for the diagnosis of a simple renal cyst: spherical or ovoidal shape; absence of internal echoes; presence of a thin, smooth wall that is separated from the surrounding parenchyma; enhancement of the posterior wall, indicating ultrasound transmission through the water-filled cyst.
But the evaluation is closely related to the investigator’s experience and the quality of the equipment available in each unit.

Numerous patients are referred to our clinic with different over, under or misdiagnosed urologic afflictions. Consequently a close reassessment of the patients is mandatory, especially for the ones programmed to undergo surgery.

The surgical treatment of a simple renal cyst (decorticication) is radically different from that of a cystic renal cell carcinoma (partial or radical nephrectomy).

When surgery for a cystic lesion is planned we consider mandatory to perform an enhanced CT for the correct diagnosis, in order to aid in the decisional process of therapeutic conduct (radical or nephron sparing surgery).

Surgical treatment of complicated cysts should be similar to that of renal tumors to avoid altering the long term prognosis of a patient. Performing a renal cyst decortication on an complicated cyst, that may prove malignant, can lead to tumor spreading with severe consequences on the patient’s survival.

Conclusions

The ultrasound evaluation of the patients with renal cystic lesions is closely related to the investigator’s experience and the quality of the equipment available in each unit, which makes necessary the careful reassessment of the patients.

Although the simple cyst could be diagnosed by ultrasound we consider mandatory to perform a contrast CT scan before the surgery.

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