

## MULTIPLE COMPLICATED CYSTS AS A INCIDENTAL FINDING - CASE REPORT

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### Abstract

Renal cysts are a common finding in the kidneys. A cystic lesion in the kidney that deviates from the typical "simple" cyst appearance should be viewed with suspicion and may warrant further imaging to exclude other renal cystic lesions, particularly variants of renal carcinoma. Findings common to all "simple" renal cysts are well-marginated, thin walls with no enhancement of the cyst. Rarely, simple cysts are complicated with hemorrhage, infection, inflammation, or ischemia. In these cases, there is a host reparative response that includes inflammatory cells, granulation tissue, and neovascularity.

CT remains the major method of imaging and characterizing cystic renal lesions.

Keywords: renal cysts, complicated cysts, CT method

### 1. Introduction

Renal cysts are a common finding on routine radiological studies. As such, patients are often referred to urologists for their opinion regarding potential intervention and follow-up.[3]

Renal cysts, in general, may be classified as "simple" or "complex." "Simple" cysts are best defined using sonographic criteria. These include:

- absence of internal echoes,
- posterior enhancement,
- round/oval shape,
- thin walls.

When all of the criteria are met, the cyst is benign and no follow-up is required. Ultrasonography is helpful for simple cyst identification, but provides limited information with increasingly complex renal cysts and solid masses. Therefore, clinicians need to rely on a rapid, safe and accurate system to identify benign versus malignant masses and ultimately have the guidance on nonsurgical or surgical treatment options. [1,11]

The Bosniak renal cyst classification system was initially reported in 1986, using CT scan findings.[1] Although other imaging modalities are frequently used in the evaluation of renal masses, such as ultrasound and magnetic resonance imaging (MRI), CT scan (with and without contrast enhancement), remains the primary diagnostic technique.

Bosniak classification system is the only preoperative diagnostic tool that has proven its efficiency in the management of complex renal cystic masses. However, it is reader dependent, despite its clear definition of each category. [12]

Identifying fatty components in renal lesions is very important because in angiomyolipoma they are almost always present. CT is excellent for tumor detection. [8,9]

Rarely, simple cysts are complicated with hemorrhage, infection, inflammation, or ischemia. In these cases, there is a host reparative response that includes inflammatory cells, granulation tissue and neovascularity. As a result of this response, the complicated cyst may demonstrate calcification, hemorrhage, septations, wall thickening. [2]

A change of less than 10 HU from pre- to postcontrast images is usually considered typical of a benign cyst [10]. This criterion was suggested by Bosniak [12]. Very rarely, the solid component of a renal cystic tumor may enhance less than 10 HU. In contradistinction, a change within the solid portion of a cystic renal lesion of more than 15 HU is almost always indicative of a pathologic process although not always a malignancy, as cystic angiomyolipomas, oncocytomas, and infections may enhance.

A change in attenuation between 10 and 15 HU after intravenous administration of contrast material is considered suspicious but not diagnostic for a neoplasm. For instance, could the change be due to volume averaging, imperfect placement of the region of interest, motion, or streak artifacts.

Furthermore, are there overriding anatomic features such as a nodule or wall thickening that make the lesion suspicious even without definitive enhancement? Could US or MR imaging be performed to confirm the finding? After these options are considered, if it is still thought that the lesion is enhancing between 10 and 20 HU, this finding is considered highly suspicious for a neoplasm. In general, papillary cancers enhance less intensely than other cell types and account for these minimally enhancing lesions [3]. These lesions accumulate contrast material more slowly, so delayed images may be helpful in confirming enhancement.

## 2. Clinical report

Below is presented a case of 51-year-old woman who is with multiple cysts on the left kidney by ultrasound examination. The patient is without any complaints. She was hospitalized in the Urological clinic for diagnostics. The laboratory results were normal. CT was performed both as a non-enhanced study and after injection of intravenous contrast.

The unenhanced CT showed a hyperdense areas of 80 HU in the left kidney, which after contrast injection do not enhance.



**Figure 1.** Unenhanced CT showed a hyperdense areas in the left kidney - upper pole



**Figure 2.** Unenhanced CT showed a hyperdense area in the left kidney



**Figure 3.** CT showed arterial phase after contrast enhancement



**Figure 4.** CT showed 10 min after contrast enhancement



**Figure 5.** CT showed delayed scans in sagittal reconstruction

The imaging observations were characteristic of category II of the Bosniak classification of renal cystic disease: Malignant risk less than 3%; no follow-up required. Cystic lesion with some abnormal radiological features:

- <1 mm septations (hairline thin)
- fine calcifications within the septum or wall
- <3 cm in diameter
- hyperdense cysts (>20 Hounsfield units)

The difficulty arises when cysts do not meet the rigid characteristics of the “simple” definition.

### 3. Conclusions

Any fluid-filled renal mass not fulfilling the radiologic criteria for a simple, uncomplicated cyst should be considered a cystic lesion. In all cases, management decisions should consider the pretest probability as well as the patient’s ability to tolerate uncertainty.

Follow-up CT studies are an effective way of managing patients with moderately complex cystic lesions of the kidney (Bosniak category II, IIF) because the absence of change supports benignity and progression indicates neoplasm.

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