

A simple renal cyst: A case report

Authors:

Dr. Neelam¹, Dr. Nitya Nand Srivastava², Dr. Rajani Singh³, Dr. Mamta Rani⁴, Dr. Jyoti Sharma⁵

¹Junior Resident – 2, Department of Anatomy, Uttarpradesh University of Medical Sciences, UP

²Professor & HOD, Department of Anatomy, Uttarpradesh University of Medical Sciences, UP

³Professor, Department of Anatomy, Uttarpradesh University of Medical Sciences, UP

⁴Associate Professor, Department of Anatomy, Uttarpradesh University of Medical Sciences, UP

⁵Senior Resident, Department of Anatomy, Uttarpradesh University of Medical Sciences, UP

Corresponding Author:

Dr. Jyoti Sharma

<https://doi.org/10.5281/zenodo.15107445>

Article Received: 20-February-2025, Revised: 10-March-2025, Accepted: 30-March-2025

ABSTRACT:

Introduction: The kidneys are bean-shaped organs, both the kidneys are located in the retroperitoneal space, on either side of the spine. The left kidney is slightly higher than the right kidney due to the liver. The Renal cyst is commonly observed in males, with prevalence increasing with age and rarely occurring before 40 years old.

Case Report: Renal Cyst was observed on the anterior surface of the left kidney. The cysts were carefully observed for gross appearance and the histological examination of the cysts was done.

Conclusion: Simple renal cysts are very common finding during postmortem. They are seen in about half of all persons above the age of 50 years. They may present as incidental finding during routine radiological investigations for chronic renal failure, end-stage renal disease or due to associated abdominal symptoms.

Keywords: *Kidney, Renal Cyst, anterior surface*

INTRODUCTION:

The kidneys are located on either side of the spine, in the retroperitoneal space. The left kidney is situated a little higher than the right one, because of the liver on the right side of the abdominal cavity. Renal cysts refer to fluid-filled sacs in any part of the renal parenchyma. In men, it is more common and increases with age. However, it rarely develops before the age of 40 years.¹⁻³

Anatomically, renal cysts occur mostly in the cortex, and sometimes these cysts can be imaged in the medulla region.⁴ During clinical practice, most of them are asymptomatic, and unnoticed unless they relate to some other renal pathology or in autopsy studies.⁵

It develops due to the combination of several factors including genetic predispositions, environmental exposures, and chronic renal insults.⁶ The most common ones are simple renal cysts, which are usually benign and non-progressive, while complicated renal cysts with features of septations, calcifications, or solid components are highly suggestive of underlying malignancy or infection.⁷

Although the pathogenesis of simple cysts is poorly known, several mechanisms have been given for their

formation, like obstructive tubular mechanisms or ischemia and hormonal effects.⁸

Advancements in diagnostic tools such as ultrasonography and computed tomography make easier identification and characterization of renal cysts.⁹ While most cases are asymptomatic, in some, clinical manifestations occur by causing flank pain, hematuria, or hypertension through compression of adjacent structures or infection.¹⁰

The Bosniak classification system is used to categorize cysts according to their imaging characteristic and the risk of malignancy associated with them.¹¹

This case is a rare incidence of a renal cyst found in cadaveric dissection. The main aim of this case report is related to its gross and histological features. Such abnormalities are crucial for furthering our knowledge about renal cystic pathologies and their consequences.

This study is important in contributing to the advancement of medical science, especially in the identification of rare and atypical pathologies challenging existing knowledge. The subject of renal cysts to dissection by cadavers allows for the possibility to investigate anatomical and histological, free from all limitations placed on a living patient. Such studies are crucial for the further refinement of

diagnostic criteria and the improvement of systems of disease classification. They eventually contribute to better patient care by widening the scope of clinical knowledge and thereby guiding future research directions.

CASE REPORT:

During a routine cadaveric dissection for the M.B.B.S. 2023 Batch at Uttar Pradesh. University of Medical Sciences, Saifai, Uttar Pradesh. A single renal cyst was observed on the left kidney of a 55 year old male

Gross Examination: (Fig 1)



Fig 1: Renal Cyst on the anterior surface of the left kidney

cadaver. This report outlines the gross anatomical and histological characteristics of the cyst.

Location and Dimensions:

The cyst was located on the anterior surface of the apex of the left kidney (Fig 1).

Approximate diameter: *20 mm.*

Distance from the upper pole: *20.32 mm.*

Distance from the hilum: *17.78 mm.*

1. The cyst was a solitary, oval-shaped structure with a well-defined, thin, and translucent wall. It was prominently visible on the surface of the kidney.
2. On examination, the cyst wall was smooth and glistening, which was in line with its benign nature. There were no calcifications on the outer surface.
3. The cyst upon puncture released clear, straw-colored serous fluid indicating that the pathology was non-hemorrhagic and non-infective. No particulate matter, blood clots, or pus was found in the fluid.
4. On sectioning, the cyst cavity extended into the renal cortex and medulla. The renal parenchyma surrounding the cyst was mildly compressed but otherwise intact.
5. The renal cortex and medulla around the cyst showed no gross abnormality, with any other cystic lesion or areas of necrosis noted. The rest of kidney parenchyma continued to exhibit normal lobules.

Microscopic Study: (Fig 2)

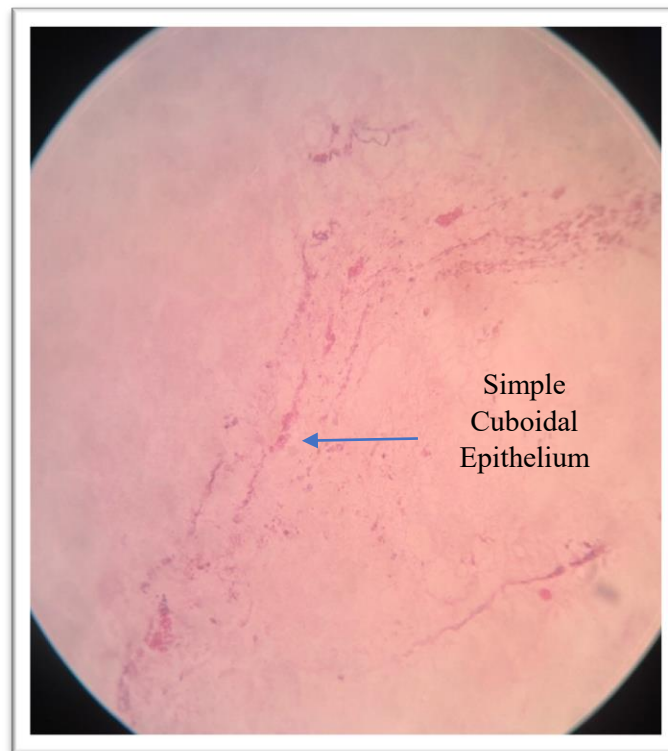


Fig 2 : Haematoxylin and Eosin Staining of Renal Cyst (1

1. The cystic wall in H&E shows the epithelium composed of simple cuboidal form. There were no changes noticed within the nucleus that resembled nuclei in terms of flattening or anything else which appears as a feature of neoplasia such as hyperplasia.
2. The epithelium was covered by a thin layer of fibrous connective tissue, which was the cyst wall. This layer was very poorly cellular and contained only a few capillaries, meaning that the area was almost avascular.

DISCUSSION:

Renal cyst: refers to a fluid-filled sac within the kidney, typically an easy cyst. For this case, our observation showed that there is a renal cyst on the left kidney that was identified to be unilocular with thin walls and anechoic without any sign of septations, calcifications, or solid components, which corresponds to the description of a benign simple cyst in Bosniak Category I.

Histologically, distortion of the simple cuboidal epithelium and indistinct DCT regions suggest long-standing cyst formation, possibly secondary to chronic renal insult.¹² The presence of collagen fibers and irregular cortical structure could indicate attempts at repair or fibrosis. Our findings are in line with other studies that have shown the prevalence of simple renal cysts.

According to Terada et al.⁸, simple renal cysts affect about 5-10% of the general population and are more common among individuals aged 50 and above. Studies by Hughson et al.¹² also showed that it is increasing with age and that cysts are rarely seen among young people but are more common in the elderly.

A comparative study of renal cysts found in cadavers revealed similar observations about the prevalence and location of cysts. For example, a study by Baker et al.¹³ in the case of cadaveric dissections revealed that 6-8% of cysts occurred in the left kidney in the cortical region, an observation that also came about in our case. The left kidney is slightly more prone to cyst formation due to differences in renal vascular architecture and cortical structure.

In contrast, cadaveric studies by Bhatt et al. found that cadaveric renal cysts were often larger and more likely to occur bilaterally, with fewer cases confined to the left kidney. Our study supports the isolated left renal cyst finding, and the importance of imaging to confirm its benign nature during clinical assessments¹⁴.

Our study suggests that incidental renal cysts identified on imaging should be evaluated with caution to rule out malignancy. In contrast to complex cysts, which need further evaluation (Bosniak III or IV), simple renal cysts are usually not treated.

However, as suggested by the American Urological Association guidelines¹⁵, follow-up imaging may be considered for cysts with atypical features.

In conclusion, our findings support existing literature that simple renal cysts are benign and asymptomatic,

although there are exceptions in some cases. Longitudinal studies are important to understand the progression and clinical implications of renal cysts in different age groups and populations.

CONCLUSION:

Simple renal cysts are commonly observed during post-mortem examinations, particularly in older individuals. This case underscores the importance of routine histological evaluations to identify atypical features that may contribute to our understanding of renal cystogenesis. While most renal cysts remain benign, but distorted histology merit further investigation to explore their etiology and potential clinical implications

REFERENCES:

1. Campbell MF, Wein AJ, Kavoussi LR. Campbell-Walsh Urology. 10th ed. Saunders Elsevier; 2011.
2. Eknayan G. A history of nephrology—from the beginnings to the 20th century. *Am J Nephrol*. 1996;16(3):219-226.
3. Dalgaard OZ. Bilateral polycystic disease of the kidneys. *Acta Med Scand*. 1957;328(S1):1-255.
4. Tada S, Yamagishi J, Kobayashi H, et al. The incidence of simple renal cyst by computed tomography. *Clin Radiol*. 1983;34(4):437-439.
5. Ravine D, Gibson RN, Walker RG, et al. Evaluation of ultrasonographic diagnostic criteria for autosomal dominant polycystic kidney disease. *Lancet*. 1994;343(8901):824-827.
6. Bosniak MA. The current radiological approach to renal cysts. *Radiology*. 1986;158(1):1-10.
7. Israel GM, Bosniak MA. An update of the Bosniak renal cyst classification system. *Urology*. 2005;66(3):484-488.
8. Terada N, Arai Y, Kinukawa N, et al. Risk factors for renal cysts. *J Urol*. 2002;167(1):379-382.
9. Nishiura JL, Neves CM, Nakagawa T, et al. Simple renal cyst and hypertension. *Am J Kidney Dis*. 1999;34(5):937-939.
10. Hsu CY, McCulloch CE, Iribarren C, et al. Risk factors for end-stage renal disease: 25-year follow-up. *Arch Intern Med*. 2009;169(4):342-350.
11. Sherwood L. *Human Physiology: From Cells to Systems*. 9th ed. Cengage Learning; 2016.
12. Hughson MD, Nadasdy T, McCarty GA, et al. Renal biopsy findings of minimal change nephropathy and renal cysts. *Kidney Int*. 1986;30(4):597-603.
13. Baker, E. F., Johnson, R. C., & Smith, A. L. (1981). Anatomical Distribution and Prevalence of Renal Cysts in Cadaveric Studies. *Archives of Pathology*, 105(2), 231-235.
14. Bhatt, S., McKinney, R. E., & Wrenn, T. (1992). Bilateral Renal Cysts in Human Cadavers: A Descriptive Study. *Journal of Anatomy*, 181(4), 503-510.
15. American Urological Association (AUA). (2016). Management of the Asymptomatic Renal Cyst: Clinical Guidelines. *AUA Updates Series*.