



Solitary Simple Renal Cyst: A Case Report

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ABSTRACT

Solitary simple renal cyst is a cystic disease of kidney, incidentally found during routine abdominal imaging, dissection and autopsy without clinical significance. The prevalence of solitary renal cyst is increasing progressively with age, especially in the elderly population. These are asymptomatic but clinical features may result from rupture, haemorrhage or due to infection. Approximately 6% of solitary cysts are complicated by haemorrhage. Early diagnosis and careful follow-up prevents complications. Cystic diseases of kidney are common, since many of these have effect on renal function, careful documentation is necessary. We describe cases of solitary renal cysts observed in a 70year old female and 55year male cadavers during routine dissection in the department of Anatomy.

KEYWORD: Solitary, Simple renal cyst, Complications, Diagnosis

INTRODUCTION

Kidneys are bean shaped, reddish paired organ, located in the posterior abdominal wall. The main function includes filtering of blood and restoring selected amount of water along with regulation of blood volume, pH, blood pressure and synthesis of vitamin D. [1]Renal anomalies are common, though variable in many syndromes. Since many of these have effect on health. Renal diseases can be attributed to a wide variety of causes. Cystic lesions of kidney are referred to as fluid filled sac present on or in kidneys and may be hereditary or acquired. Simple renal cyst is a non-neoplastic cystic disease, found in elderly population during abdominal imaging. They are usually solitary but may be multiple, frequently seen in lower pole of kidney than the upper pole. The

size of solitary cyst varies from a few millimeters to 10cm in diameter. These are asymptomatic and have no special significance except in the differential diagnosis of renal tumours. However, symptoms may result from rupture, haemorrhage or infection. Approximately 6% of solitary renal cysts are complicated by haemorrhage. [2,3] Blood stained fluid in a solitary renal cyst suggests the co-existence of carcinoma in kidneys. Sometimes they may be associated with systemic disorders such as hypertension. [4]These diseases are common and often present diagnostic problems for clinicians, radiologists, and pathologists. [5]

CASE REPORT:

CASE -1:

A Solitary Simple Renal Cyst observed in a 70 years old female cadaver during routine dissection in the department of Anatomy at SDM college of Ayurveda and Hospital, Hassan. The Cadaver belongs to south India, Karnataka region obtained through voluntary body donation programme and was formalin fixed for routine dissection. During routine dissection of abdomen as the kidneys were exposed in posterior abdominal wall, noted a fluid filled sac on the anterior surface of left kidney near to upper pole. The cyst was measured about 3x2cms. No other remarkable abnormalities were noted.

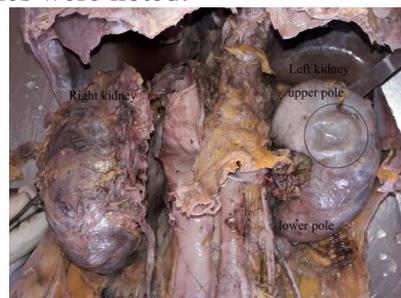




Figure 1: solitary renal cyst near upper pole of left kidney.

CASE 02:

This is a case of Solitary renal cyst observed in 55-year-old male cadaver during routine dissection in the department of Anatomy at SDM college of Ayurveda and Hospital, Hassan. The cyst was located at lower pole of right kidney. Measurement of the cyst was performed directly and measured as 0.5x0.2cm. No other remarkable abnormalities were noted.

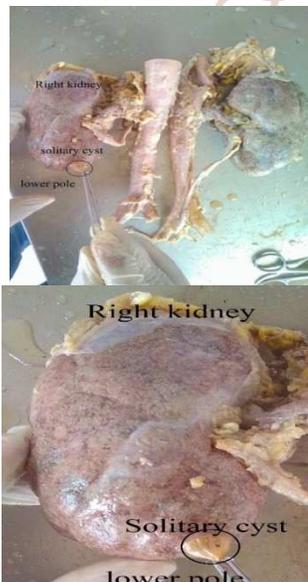


Figure 2: Solitary cyst on lower pole of the Right kidney

DISCUSSION:

Cyst is a fluid-filled sac; it may be true cyst or false. True cyst contains serous or mucoid fluid and wall of sac is lined by epithelial layer. The fluid accumulation is due to secretion of lining epithelium. The false one does not have any epithelial lining.^[6] Renal cyst is defined as presence of liquid or semisolid fluid in an enclosed sac in or on the kidneys. Cystic diseases of kidney are hereditary, developmental or acquired. Simple renal cyst is a non-neoplastic cystic kidney disease, presented unilaterally. These are incidentally found during routine abdominal imaging, dissection and autopsy studies. They are usually solitary but may be multiple, frequently seen in lower pole of kidney than the upper pole.^[7,8] Simple renal cyst may be present at birth but resolved after birth.^[9]

The prevalence of cyst is increasing progressively with age, though rare in children.^[10] It is estimated that 25% people of 40 years and 50% people of 50 years have simple renal cysts.^[11] The occurrence of cyst relatively equal in both gender, but C.C. Chang, et.al (2007) reported that the incidence was higher in males compared to females.^[12] In present cases, the location and size of solitary cyst was variant. In the first case solitary cyst was located near the upper pole of the kidney, which was uncommon. The size was bigger may be due to early development and progressed with age. In second case cyst was at lower pole and small in size. It suggests that location of solitary cyst was uncertain and the size increases with age. The exact etiology of cyst is not known. Some theories were proposed to justify the cause. It is thought to originate from diverticulae in the distal convoluted tubule, but this concept is disproved.^[13] The accepted hypothesis is that segmental ischemia of kidney and an intra-renal calyceal obstruction are considered to be main factors in pathogenesis.^[14]

Morphologically, individual solitary simple renal cyst is oval to round in shape and size varies from a few millimetres to 10cm in diameter.^[15] The cyst size increases in approximately one fourth of cases with age and an estimated rate is 1.6mm per year. It may double the original size over 10 years.^[16] Solitary simple renal cysts are unilateral, filled with serous fluid enclosed by sac and present in the surrounding renal parenchyma. They are confined to the cortex and lined by single layer of cuboidal or flattened cuboidal epithelium. The wall of cyst is characteristically yellowish-white and translucent. The cyst usually contains clear straw-coloured fluid, it may become rust-coloured due to haemorrhage.^[17]

Numerous classifications of renal cysts are proposed to get reasonable clinico-pathological correlation based on morphological patterns, radiographic appearance and vasculature, genetic analysis, and clinical evaluation of renal function. Most of classifications distinguish general strategies, which are continued till today.^[18] Bosniak (1986) introduced new classification system depending on the morphological appearance and enhancement of renal cysts on CT and revised in 2003. The Updated Bosniak renal cyst classification was accepted by urologists and radiologists for the diagnosis and management of cystic lesions shown in Table.1.^[19]

Table.1.The updated Bosniak renal cyst classification.

Stage	Cyst wall	Septa	Calcification	Enhancement	Management
I	Hairline thin	No	No	No	No follow-up
II	Minimal regular thickening	Few, hairline thin	Smooth, hairline thin	No	No follow-up
IIF ^a	Minimal regular thickening	Multiple, minimal smooth thickening	Thick, nodular	No	CT: 3, 6, 12 monthly then annual
III ^b	Irregular thickening	Measurably thick, irregular	Thick, nodular, irregular	Yes	As IIF or surgical
IV	Gross, irregular thickening	Irregular gross thickening	Thick, nodular, irregular	yes, tissue and cyst	Surgical

IIF^a : Denotes follow-up. Cyst size of diameter of 3 cm is also an indication for follow-up.

III^b: indeterminate Stage III should be managed as IIF, while definitive Stage III should be managed surgically.

The above classification will give an idea of different cases into non-surgical (category I and II), and surgical (category III and IV).

Solitary simple renal cysts are usually asymptomatic.

In some cases, however, pain may occur between the ribs and hips, when cyst enlarges and press on other underlying structures.^[20] The large cyst may appear as lump in loin or back. If patient complains pain in loin with malaise and fever, it suggests infected cyst. Severe loin pain with mild haematuria symptoms may develop from haemorrhagic cyst. Cyst on hilum of kidney or pelviureteric junction causes urinary symptoms. A large solitary cyst may produce renal insufficiency and uraemia by damaging renal tissue.

^[21] Solitary cyst do not affect the renal function, but one study found an association between the presence of cyst and reduced renal function in hospitalized people younger than 60 years of age.^[22] C.T. Lee et al (2013) found a positive relationship between solitary renal cysts and prehypertension as well as hypertension.^[23]

A study by Pedersen et al (1993) showed that mean arterial blood pressure was significantly higher in individuals with simple renal cysts.^[24] Zerem et al (2009) reported that aspiration of cysts resulted in a reduction of hypertension. However, this relationship is not well understood.^[25]

N.Terada et al (2004) reported old age, male gender, renal dysfunction, and hypertension were considered to be risk factors for solitary renal cysts.^[26] C.C. Chang et al (2007) expressed same as above and also found renal stones, serum creatinine, and smoking are other risk factors.^[27] Approximately 6% of simple cysts are complicated by haemorrhage. Blood stained

fluid in a solitary cyst suggests towards the co-existence of carcinoma. Occasionally, renal adenoma or papillary adenocarcinoma arises in the walls of the simple renal cysts.^[28]

The accurate diagnosis helps in differentiating renal tumours and appropriate management. Straight x-ray may show some portion of kidney expansion with streaks of calcium on the cyst wall. The Excretory urography will show displacement of upper part of ureter, when a large cyst at lower pole.^[29] Ultrasonography defines a simple cyst with well-transmitted sound waves and absence of any echoes. Any complexity that deviates from this should be further evaluated by CT. Computed Tomography helps in accurate diagnosis along with differentiating renal cyst from tumour. It confirms complexity of the cyst with presence of calcification, septae, loculation, wall thickening or nodularity and helps to evaluate the associated risk for malignancy. Magnetic resonance imaging has better contrast resolution than CT. It is useful to determine type II and III stage of cyst, but not necessary for routine evaluation.^[30]

Solitary renal cysts are asymptomatic, until unless infected or ruptured.^[31] Symptomatic cysts can be managed with a variety of surgical and percutaneous methods including percutaneous aspiration (with or without a sclerosing agent), percutaneous marsupialization, open and laparoscopic cyst unroofing. The Simple drainage without sclerotherapy is associated with recurrence; by using a sclerotic agent provides more satisfactory results than aspiration alone. Percutaneous drainage with single or multiple-session sclerotherapy has been successfully performed with high success rates. Several authors reported, multiple-session sclerotherapy has better

results in preventing the reoccurrence of cyst. [32] Kirwin's operation (a portion of cyst wall removed and cavity is filled with perinephric fat then suture with corrugated drain) is curative method in which reoccurrence is impossible. [33] Occasionally, the complicated solitary cyst located on one of the pole needs partial nephrectomy. [34]

CONCLUSION:

Simple renal cyst is a cystic disease of kidney, incidentally found during routine abdominal imaging, dissection and autopsy with no clinical significance. The prevalence and size increases progressively with advancing age. The presence of solitary renal cysts in a potential kidney donor is not a barrier to renal transplantation but long-term follow up is needed. An awareness of such a presence is valuable for the surgeons and radiologists in differential diagnosis of other cystic diseases of kidney and Renal tumours.

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