Renal Cysts - A Clinical Enigma

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The proper diagnosis and management of renal cysts mimicking neoplasms can often be a source of great consternation to the urologist. In 1960 ten renal cysts were operated upon by the staff of our Department, that number being considerably more than in past years. Two cases of apparent renal cysts, one proven malignant and the other probably benign, and each managed differently will be presented. The subject shall then be reviewed and with the information divulged, we may then have a better insight into the proper management of such cases.

Figure 1
Left retrograde pyelogram showing tumor deformity of lower pole of left kidney.

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CASE REPORTS

Case 1. (N.V.) This 59-year old WM was admitted on 12/6/57 for investigation of lower abdominal pain of one-week duration. The pain was associated with a feeling of distention and flatulence. He had no urinary complaints and gave no past history of genitourinary disease. P.E. was negative except for a ballotable and movable LUQ mass. The routine urine and blood studies were normal. A barium enema was taken which showed downward and medial displacement of the left colon. Because of this an IVP was done. The IVP suggested a tumor deformity of the lower pole of the left kidney. A left retrograde pyelogram confirmed this finding (Fig. 1). On 12/12/57 the left kidney was explored. Pre-operatively a cyst was favored. At surgery a large cyst was seen at the lower pole. However, by palpation it was firm and nodular and associated with large parasitic vessels and a nephrectomy was elected. The kidney was described grossly as showing a multiloculated cystic lesion. These cystic areas were said to contain clear yellow fluid. However, the linings were of variable thickness and irregular and showed numerous papillary areas (Fig. 2). The microscopic diagnosis was papillary adenocarcinoma of the clear cell type. The patient is alive and well today.

Case 2. (C.A.) This 76-year old Negro male was admitted on 9/30/60 for treatment of a stasic ulcer. His past history indicated he had been treated for myocardial infarction three years previously. He had no genitourinary complaints.
and gave no past history of genitourinary tract disease. P. E. was not remarkable except for the leg ulceration. No abdominal masses could be palpated. Routine blood and urine tests were normal. A chest x-ray showed considerable pulmonary fibrosis. Because of an ulcer-type history he had an upper GI series which showed a mass in the area of the left kidney. IVP's showed non-function of the left kidney and left renal mass (Fig. 3). An IV aortogram and nephrotomogram was then done and showed a patent left renal artery with some function of the kidney. Subsequently, left retrograde studies were attempted but only a bulb pyelogram could be obtained (Fig. 4). A tumor deformity of the upper pole was well demonstrated. Because of this advanced age, reluctance to submit to any surgery and suspected cardiac and pulmonary disease, needle aspiration of the mass was elected for a cyst was strongly suspected (Fig. 5). A clear serous type fluid was aspirated and contrast material was then injected visualizing a smooth contoured cystic mass. A cell block of the aspirated fluid was negative for malignant cells.

Figure 3

Intravenous pyelogram showing probably normal right kidney and non-function of left kidney with probable large left renal mass.
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Figure 4
Left bulb pyelogram showing tumor deformity of the upper pole of the left kidney with downward displacement of the kidney.

PATHOLOGY OF RENAL CYSTS

The solitary or simple renal cyst that shall be discussed should first of all be distinguished from multicystic or polycystic kidney disease. Moreover, it should also be differentiated from cystic degeneration which is not uncommon in malignant tumors. By this time hundreds of cases of renal cysts have been reported. Moreover, it is said that solitary cysts are found in 3-5% of all autopsies. Oftentimes the renal cyst will be multilocular due to the presence of fibrous septa as was reported in one of our cases. The cyst fluid is usually either serous or hemorrhagic, although some detritus may also be present. Serous cysts tend to have a smooth cuboidal lining epithelium and the thin fibrous tissue wall may show tubular remnants. In contrast the wall of the hemorrhagic cyst is thicker and rougher and shows no
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Cystic mass visualized by injecting contrast material through large spinal needle.

epithelial lining and is often covered with clotted blood. The cysts usually contain from 500 to 1000 cc of fluid and average 5 to 10 cm. in diameter, but much larger ones have been reported. The origin of these cysts is debatable, some regarding them as congenital and others as acquired. The incidence of these cysts is highest in people between 30 and 60 years old.

The matter of chief clinical concern is the question how often is malignancy found in these cysts? It is felt that malignancy is found in 7% of all cases of renal cystic disease. It should be pointed out, moreover, that the malignancy may not necessarily be within the cyst, but can be found in another part of the kidney, or adjacent to the cyst. Gibson, in his review of renal cysts and tumors, expresses the opinion that the frequent association is due, not to tumor arising from the
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cyst wall itself, but rather to the fact that a tumor arising in the parenchyma causes a cyst to form peripherally. This cyst later engulfs the tumor and creates the deceptive appearance. Hepler\(^2\) was able to reproduce experimentally large renal cysts by a combination of tubular block and vascular occlusion. Gibson feels renal tumors reproduce this phenomenon clinically and postulates combined tubular and vascular block was the responsible mechanism in his report of three cases of renal cysts with malignancy.

While only 2% of serous cysts have been found to contain tumor, the incidence in hemorrhagic cysts is much higher, averaging about 25% in most series. When malignancy is found, it is always present in that portion of the cyst which is in contact with kidney tissue. The tumor may vary from a small nodule or surface irregularity to a large mass. Microscopically, the tumor is usually papillary adenocarcinoma of the clear cell type as was our first case. However, Wilm's tumor is not uncommonly reported in these malignant cysts.

**SYMPTOMS OF RENAL CYSTS**

Renal cysts if symptomatic, as indeed often they are not as was one of our cases and probably both, commonly cause pain in the region of the kidney. There may be recurrent attacks of pain that come with increasing frequency. If infection is present, fever and chills may accompany the pain. Not infrequently, the cyst may present itself as a palpable abdominal mass. Cholecystitis may be mimicked by upper pole cysts of the right kidney. Hematuria, gross or microscopic, may be another sign. Lower pole cysts usually act as retroperitoneal tumors producing organ displacement and compression.

**DIAGNOSIS OF RENAL CYSTS**

Radiography, although certainly not infallible, affords us the best clues as to the proper diagnosis of renal cysts. The flat plate will show a change in the outline of the kidney with a smooth, usually globular, shadow at the top, middle or bottom of the kidney. The pyelographic deformity depends of course upon the size and location of the cyst. The calyces may be altered in shape with compression or clubbing, and the pelvis may be enlarged. A change in the position of the normal axis of the kidney or partial rotation may also be produced. Some authors even feel that they can distinguish cysts from tumors with conviction radiographically. They cite the evenly contoured circular shadow and smooth crescentic calyceal compression associated with a clear line of demarcation between the mass and cortex as being characteristic of a cyst. Also these authors point out that cysts show a decreased density compared with the surrounding renal tissue and calcification may be present in the wall. However, it should be cautioned that these findings may be found in malignant tumors too.

**MANAGEMENT OF THE RENAL CYST**

It seems most prudent considering the available knowledge to advise surgical exploration in all such cases. The alternative offered to this approach, and especially advocated by Ainsworth and Vest\(^3\) has been needle aspiration. The procedure
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consists of needle aspiration of the mass and withdrawal of 30 to 50cc of fluid and subsequent injection of a similar amount of contrast medium. It is also suggested that the fluid be sent for cell block. Ainsworth and Vest cite the obtaining of clear fluid accompanied by a smooth contour of the renal cystogram as evidence of benignity. This procedure can usually be performed with great ease and little risk to the patient. However, several authors have tried to call our attention to the malignant potential of such cysts. Indeed, Lowsley*, in reporting two such cases, asks for recognition of the term 'malignant cyst of the kidney'.

When surgical exploration is done, the ultimate procedure depends, of course, on the operative findings. If clear fluid is obtained from the cyst, and the internal surface is smooth, then the free cyst wall is removed and the margins sutured. Some surgeons apply phenol and alcohol to the part of the cyst wall adherent to the renal parenchyma. Nephrectomy is advised if the cyst has destroyed the kidney and the opposite kidney is normal. Moreover, it should be emphasized that nephrectomy is indicated in all cases of cysts which contain tumor or bloody or turbid fluid, or which present an irregular or roughened interior surface with detritus. It is also interesting to note that tumors associated with cysts appear to be slow growing so that the prognosis is somewhat more favorable than with the more common renal tumors.

SUMMARY

Renal cysts are not necessarily benign and this is especially true in those with hemorrhagic fluid. Surgical exploration is the treatment of choice. Whenever possible it obviates the missing of tumor either within the cyst or another part of the kidney. In poor risk patients, needle aspiration can be a useful and safe diagnostic procedure. Two case histories of renal cysts — one of which had proven tumor — have been reviewed.

It is only hoped that the preceding material will instill a sense of gravity into a situation in which surgery, and the obtaining of histologic confirmation, can offer the only real assurance and potential cure.

REFERENCES


