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**Case Report**

# Laparoscopic excision of a giant renal cortical cyst – size does not matter!

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## Introduction

Giant renal cysts measuring more than 15 cm in greatest diameter are uncommon (1). They present with loin or abdominal discomfort, early satiety and abdominal distension, but most are incidentally found, especially small volume cysts. Rarely, they present with hypertension. Aspiration with or without sclerosants had been tried with several complications and recurrence. Decortication is the mainstay of management and laparoscopic decortication and fenestration has become popular due to its many advantages (2).

## Case report

A 24-year old female presented with early satiety and undue upper abdominal fullness following meals. She had no other gastro-intestinal symptoms, pain, fever, loss of appetite or loss of weight. She never had haematuria or any other urinary tract symptom. On examination there was fullness on the upper abdomen with an asymmetry due to bulging towards the left side. There was dullness all over the upper abdomen but no mass was felt.

An x-ray of the abdomen showed a large soft tissue opacity covering the left hypochondrium, epigastric region and up to the L4 vertebral level (Figure 1). The ultrasound scan of the abdomen showed a large cystic lesion on the left upper quadrant, arising from the retroperitoneum, which was arising from the left kidney. The kidney was compressed by the cyst and the anterior surface was concave due to the cyst.

The contrast enhanced CT scan confirmed the renal cortical cyst which was a simple, giant, 20 cm, Bosniak II renal cortical cyst (Figure 2).

Pre-operative surface marking of the cyst was done with in-ward ultrasonography of the abdomen and she was subjected to a laparoscopic renal cyst de-doming. It was performed under general anaesthesia in the standard right lateral position. The 12 mm camera port was inserted using the open Hassen technique, taking extra precautions to avoid puncturing the cyst.

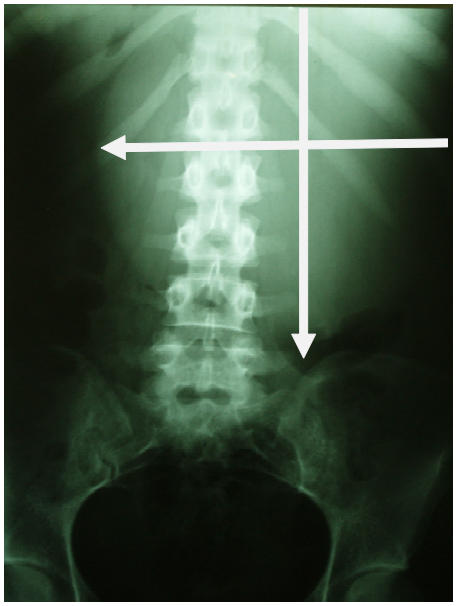

**Figure 1.** *X-ray KUB showing the soft tissue opacity of the renal cortical cyst with the arrows showing the right and lower margins of it.*

The large cyst was demonstrated with the left colon and the splenic flexure of it stretched and plastered to the cyst (Figure 3). Second and third, 12 mm and 5 mm working ports were introduced in the left iliac fossa and the epigastrium respectively.

After peritoneal survey the left colon was mobilized, starting from the sigmoid colon upwards up to the transverse colon. Then the cyst was well mobilized carefully separating the adhesions to the lateral abdominal wall. The peritoneum and the soft tissue planes were dissected until the surface of the cyst was

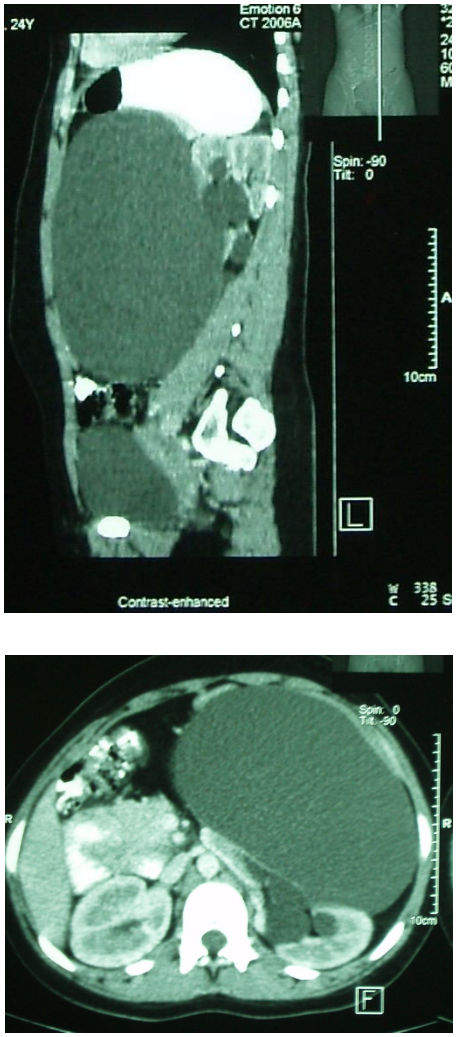


**Figure 2.** *Vertical reconstruction and the cross section of the CT scan of abdomen showing the large renal cortical cyst on left kidney.*

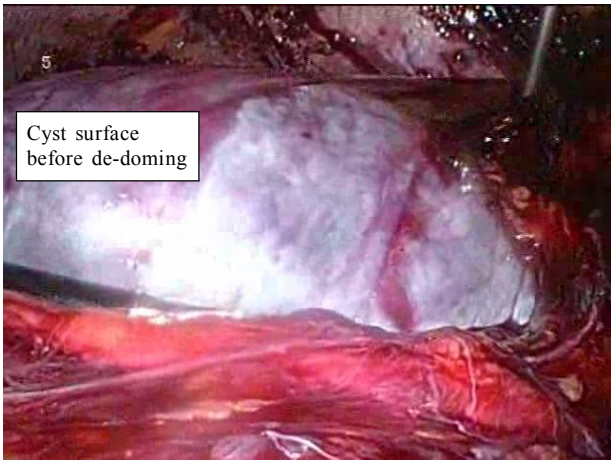


**Figure 3.** *Laparoscopic view of the large left renal cyst.*

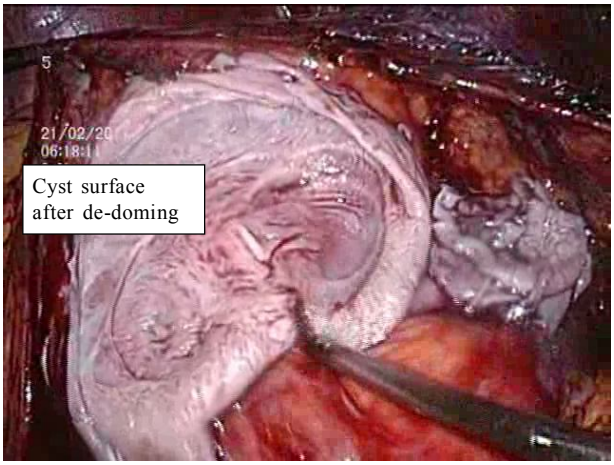


**Figure 4.** *After de-doming of the cyst wall showing the cyst parenchymal margin with the suction instrument.*

well demonstrated. Medially the cyst was dissected until part of renal parenchyma was seen. Then the cyst was punctured and aspirated with the laparoscopic suction device. Once the cyst was empty the cyst wall was excised up to the cyst parenchymal demarcation (Figure 4). The cyst cavity was filled by introducing the mobilized omentum which was clipped to the cyst wall cut edge. A drain was placed close to the kidney and the excised cyst wall was delivered. The decorticated cyst wall was sent for histological analysis. The port closure was done in the standard manner.

There was no drain output within the 1st post operative day and the drain and the catheter were removed. She was well mobilized on the immediate post operative day and was discharged on the second day without any complication. During follow up, there were no complications and the ultrasound scans did not show any cysts on the left kidney.

## Discussion

Simple renal cysts occur with an incidence of 20% by 40 years of age and 33% by 60 years (3). However, giant renal cysts measuring more than 15 cm are uncommon (1).

### Renal cortical cysts

Renal cysts can be developmental, inherited or acquired. Developmental renal cysts occur due to a developmental defect of the kidney and they can present as early as 15 weeks of gestation (4). Inherited renal cysts consists of autosomal dominant polycystic kidney disease (ADPKD), autosomal recessive (ARPKD) entity and juvenile nephronophthisis (JNPHP) and medullary cystic kidney disease (MCKD). Genetic testing and ultrasonography can detect these patients early and relatives screening and follow up is recommended. They have associated hepatic cysts and intracranial aneurysms

which need to be investigated. There are systemic diseases with associated renal cysts such as tuberous sclerosis and Von Hippel-Lindau syndrome (VHLS).

The acquired renal cysts consist of the simple renal cortical cysts, acquired renal cystic disease, medullary sponge kidney (MSK) and malignancy (renal cell carcinoma) related cysts.

When a patient presents with a renal cyst, especially acquired, the most important aspect of management is to exclude or confirm malignancy. The patient may need to be followed up by performing annual ultrasonography or CT scans depending on the initial findings. Management of acquired renal cysts can be done according to the Bosniak classification of the renal cysts. Bosniak has described a classification scheme for renal cysts based on CT scan findings (5).

- Category I (simple cyst) – Thin wall without septa, calcifications, or solid components; measures water density (<20 HU) and does not enhance (<2% chance of malignancy).
- Category II (minimally complex cyst) – Thin wall (<1 mm) and no enhancement; may contain 1 or 2 hairline-thin septa, fine calcification, or short segment of slightly thickened calcification; includes high-attenuation lesions that are smaller than 3 cm (malignancy rates in series range from 0-14%. Series with higher malignancy rates include IIF lesions).
- Category IIF (indeterminate) – Minimal enhancement and/or thickening of a hairline-thin smooth septum or wall; mildly thickened or nodular calcification; no enhancing soft-tissue components; includes non enhancing high-attenuation lesions that are 3 cm or larger (approximately 20% likelihood of malignancy).
- Category III (suspicious indeterminate) – Multi-locular lesion with multiple enhancing septae, uniform wall thickening, nodularity, or thick or irregular calcification (30-60% likelihood of malignancy).
- Category IV (malignant) – Contains enhancing (>10 HU) large nodules or clearly solid components (>90% likelihood of malignancy).

Discussing management of all the types of cysts are beyond the scope of this article and we will be briefing only the management of the simple renal cysts. No specific medical therapies are available for the renal cysts themselves. Complications of cystic renal diseases, such as hypertension, infection, and pain, are treated with standard medical therapy. Most of the treatment aims at prevention of developing complications and symptomatic relief.

Surgical management is offered to de-dome or de-roof the cyst and to offer nephrectomy when indicated. Aspiration with or without alcohol infiltration, endoscopic opening of the cyst into the pelvi-calyceal system are some of the minimally invasive methods. Laparoscopic de-doming or fenestration are the others with promising results. Presently laparoscopic de-doming is considered as the procedure of choice for large simple renal cysts (Bosniak I and II) which needs intervention.

Bosniak grade I and II renal cysts need intervention only when they are large with symptoms and when complicated. Otherwise, the grade needs to be confirmed with CT scan or MRI and followed up at regular intervals to rule out or detect malignancy early. Bosniak grade III cysts needs to be investigated in-order to exclude malignancy with US or CT guided aspiration or/and biopsy. However, even the biopsy becomes negative the trend is more towards a radical nephrectomy. The recent nephron sparing concept has introduced partial nephrectomy for this grade depending on the size, location and other factors. Bosniak IV is considered as malignant and radical nephrectomy is the treatment of choice.

Managing our patient, though we planned an in-ward ultrasound guided pre operative aspiration we did not embark on that. And careful dissection at the first (camera port) troca insertion enabled us to gain adequate access for the procedure without puncturing the cyst prematurely. This avoided spilling fluid into the peritoneal cavity avoiding its consequences.

Laparoscopic approach to fenestrate or de-dome simple renal cyst had been used widely with good results (2). This procedure not only effectively reduces pain in some patients but also improves hypertension and stabilizes renal function, delaying renal replacement therapy (6). There had been no reported cases in Sri Lanka. This is the largest reported renal cyst which had been treated using laparoscopy successfully in Sri Lanka. The laparoscopic approach had the major advantage of avoiding a large loin incision of an open procedure and quick post operative recovery. The size alone should not be a factor to avoid laparoscopic renal surgery.

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