

## Laparoscopic Deroofing of Large Renal Simple Cysts Causing Gastric Symptoms

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### ازالة سقف اكياس كلوية كبيرة بسيطة تسبب اضطرابات في المعدة بجراحة المنظار

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**المخلص:** الاستخدام واسع الانتشار لتخطيط الصدى والتصوير المقطعي المحوسب للبطن ساعد في اكتشاف عدد كبير من آفات الكلية. أكثر هذه الحالات هي أكياس كلوية بسيطة. لا تحتاج لأي تقييم أو متابعة إلا إذا كانت تسبب أعراضاً. يمكن تشخيص أكياس الكلية البسيطة بالتأكيد إذا كان الطبيب أو الجراح منتبهاً لهذه الملامح وبهذا يمكن تخاشي إحالة الحالات و إشاعة القلق لدى المريض والأزعاج وهدر المال. لكن الأكياس التي تسبب أعراضاً وأكياس الكلية المعقدة تحتاج إلى تقييم وعلاج. نقدم هنا حالة أكياس كلوية كبيرة تسبب أعراضاً. بقيت بعد مُعالِجَة التَّصْلِيْبِ والشَّفَطِ والتي اجريت بازالة سقف الأكياس بالمنظار. تلك الطريقة أصبحت الخيار المقبول كتنديل جراحي للأكياس الكلوية التي تسبب أعراضاً بعد عملية التصليب و الشفط.

**مفتاح الكلمات:** كلية، كيسية، جراحة المنظار، تقرير حالة، عمان.

**ABSTRACT** Widespread use of ultrasonography and computerized tomography of the abdomen result in the detection of a large number of renal mass lesions. Most of these are simple renal cysts, which do not need any further evaluation or follow up unless symptomatic. Simple renal cysts can be diagnosed with certainty if the treating physician or surgeon is aware of these features and can avoid unnecessary urology referral, patient anxiety, inconvenience and expense. Symptomatic cysts and complex renal cysts need further evaluation and intervention. We present the case of large symptomatic renal cysts persisting after aspiration sclerotherapy, which were managed by deroofing the cyst laparoscopically. Laparoscopic deroofing is rapidly becoming accepted as the surgical intervention of choice for symptomatic renal cysts persisting after aspiration sclerotherapy.

**Key words:** Kidney, cystic; laparoscopy; Case report; Oman

**A** 62 YEARS-OLD GENTLEMAN PRESENTED AT Sultan Qaboos University Hospital, with left flank pain, early satiety and fullness of stomach during meals for the last 3 years. He had had an uneventful laparoscopic cholecystectomy at another hospital in 2004. He was known to have bilateral large renal cysts from that time [Figure1]. Left renal cyst aspiration and sclerotherapy was done with 3% sodium tetradecyl sulphate (STD) in October 2005 with immediate symptomatic relief, which however lasted

only one month.

The clinical examination was unremarkable. He was normotensive (BP 130/80 mm Hg). Basic investigations, including renal functions, were normal. Ultrasonography (USG) of the abdomen showed persistence of bilateral, multiple renal cysts, which were round or oval, sharply demarcated with thin smooth walls and with no internal echoes. Multiple large adjacent cysts on the left side raised the suspicion of a single septated cyst [Figure 2]. A contrast computed

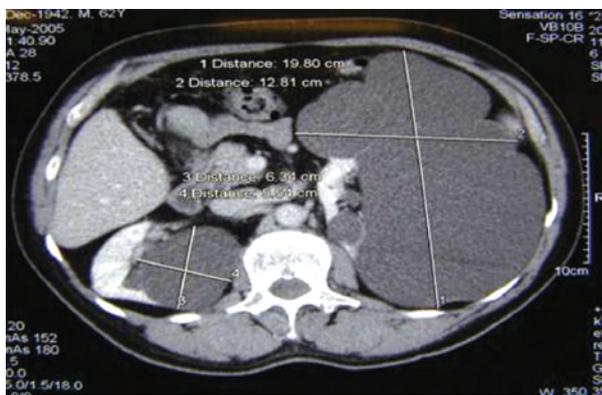
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tomography (CT) scan of the abdomen was requested to distinguish accurately whether it was simple renal cysts or a complex renal cyst, which might harbour malignancy. The largest cyst in the left kidney was 122 x 67 x 88 mms in size. There was no calcification, mural thickening or contrast enhancement confirming the diagnosis of simple renal cysts. No cysts were seen in the liver or pancreas. [Figures 3 & 4].

The left renal cysts were symptomatic, causing flank pain due to renal capsular stretching, and fullness of stomach due to direct compression by the cyst on the stomach. The large size of the left renal cysts increased the potential for complications like rupture, haematuria, infection, hypertension and obstruction hence a decision was made for surgical intervention.

The patient underwent laparoscopic deroofing (decortication/marsupialization) of the left renal cysts under general anaesthetic. A prophylactic antibiotic was given and a nasogastric tube was inserted for gastric decompression. The left renal cysts were approached transperitoneally [Figure 5] after mobilizing the colon. The cysts were punctured with a needle to aspirate clear straw coloured fluid and the anterior cyst walls were excised [Figure 6]. The remaining cyst walls were inspected to ensure absence of any irregularity. Haemostasis was achieved with cautery. Cytology of the aspirated cyst fluid showed no malignant cells. The histology of the excised cyst wall was consistent with a simple renal cyst. The post-operative period was uneventful and the patient was discharged on the second post-operative day. He returned to work after 3 days. On follow up at 3 and 9 months, he reported being pain free and enjoying full meals.



**Figures 1:** Contrast Computed Tomography scan showing bilateral renal cysts prior to sclerotherapy. Note the thin wall without any mural thickening and absence of contrast enhancement

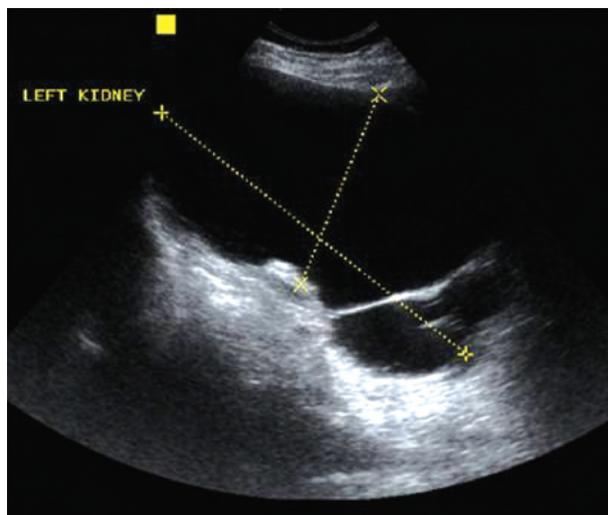
## DISCUSSION

Simple cysts are very common in normal kidneys. They account for 70% of renal masses.<sup>1</sup> They may be single/multiple or unilateral/bilateral.<sup>2</sup> The prevalence of simple renal cysts varies with the population studied and the imaging modality utilised. There is a significant increase in the number and size of cysts with age. Cysts grow more rapidly in patients with younger age, multiple cysts and bilateral cysts.

A Japanese study of 14,314 individuals, participating in a multiphasic health screening programme, found at least one renal cyst on ultrasonography in 1,700 individuals (11.9% percent) with a male to female ratio of 2:1. A seven-fold increase in prevalence was noted from the fourth to the eighth decade of life (5.1% to 36.1%). The majority of cysts increased in number and size over time (2.82 mm per year). The average increase in size and the rate of enlargement were 2.82 mm and 6.3% yearly, respectively. Multiloculated cysts progressed more rapidly than simple cysts (6.93 mm versus 2.18 mm yearly).<sup>3</sup> A major discrepancy previously existed between autopsy prevalence of renal cysts (50% in persons older than 50 years) and the prevalence as reported by CT or sonography studies. Use of newer spiral CT machines has generated prevalence data closer to post-mortem findings.

Simple renal cysts are acquired lesions. When cysts are bilateral, multiple and appear early, it is prudent to think of genetic conditions such as polycystic kidney disease, Von Hippel-Lindau syndrome and tuberous sclerosis.

The majority of simple renal cysts are asymptomat-



**Figures 2:** Ultrasonography showing persistence of large left renal cysts after sclerotherapy

**Table 1: Updated Bosniak renal cyst classification**

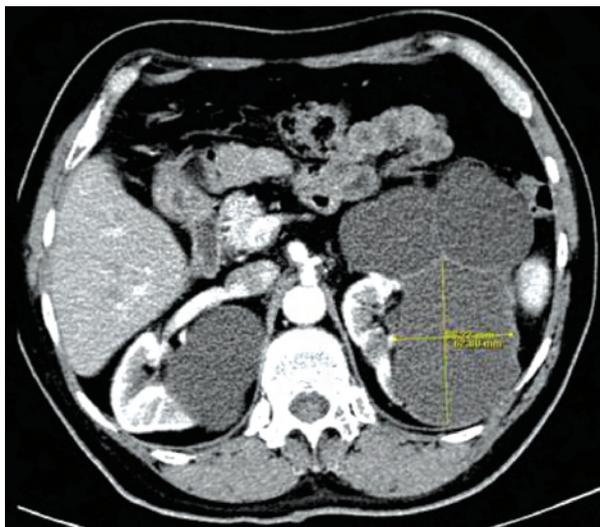
Category I	Thin wall without septa, calcification, solid components or enhancement
Category II	Thin wall and no enhancement but with thin septa or fine calcification
Category IIF	Smooth thick wall or nodular calcification
Category III	Thickened irregular wall or septa with measurable contrast enhancement
Category IV	Enhancing soft tissue component

F = follow up

ic and have little clinical significance. Rarely, however, they may present with abdominal mass, pain, rupture hemorrhage, haematuria, infection, hypertension or renal obstruction.<sup>4, 5, 6</sup>

The initial imaging study that detects renal cysts is commonly ultrasonography, which may be performed for reasons unrelated to the urinary tract. If basic ultrasonography criteria for a benign simple cyst (round or oval cyst with thin wall, no internal echoes, good posterior enhancement) are met, further investigations are not required in asymptomatic patients.<sup>7</sup> In certain instances, repeat ultrasonography at 6 to 12 months may be considered to assure stability and a correct diagnosis.

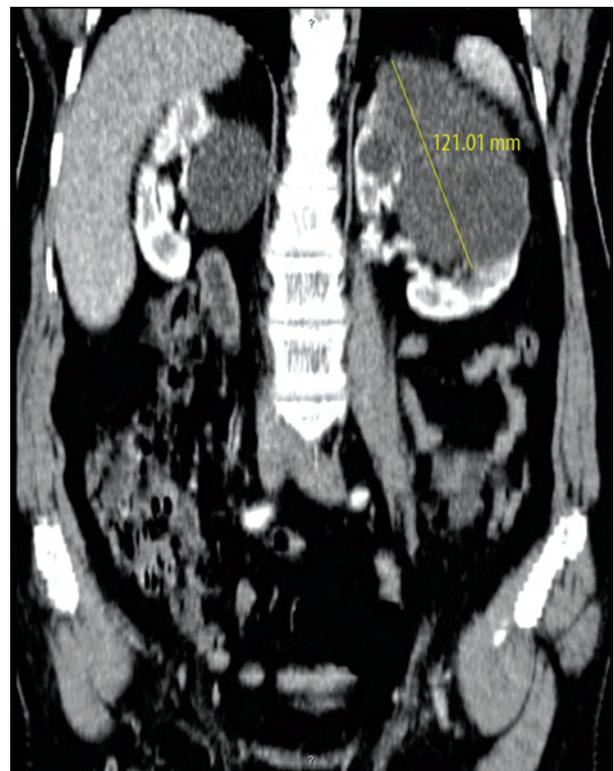
Computed tomography (CT) scans with and without contrast should be performed if the ultrasonogram is equivocal, if calcifications or septae are seen, or if multiple cysts are clustered in a pattern that could mask an underlying carcinoma.<sup>8</sup>



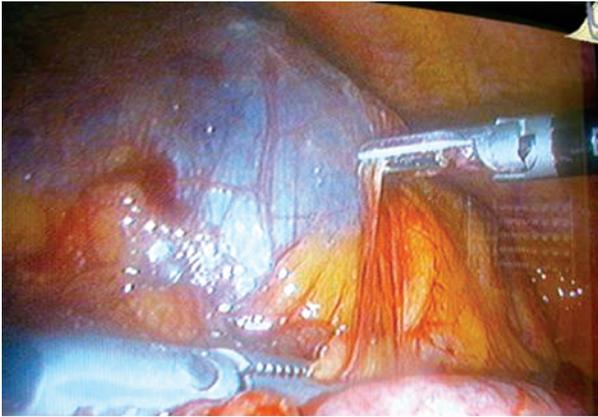
**Figures 3: Contrast CT scan showing bilateral renal cysts on axial view. Some reduction in the size of left posterior cyst after sclerotherapy is evident.**

The principal clinical concern is to differentiate simple renal cysts from complex cysts that may harbor neoplastic masses. CT and magnetic resonance imaging (MRI) with and without contrast are the most appropriate investigations for the same.<sup>9</sup> The Bosniak renal cyst classification, first introduced in 1986 and last updated in 2005, has proven to be useful for urologists and radiologists in diagnosing and formulating a management approach to cystic renal masses.<sup>10</sup> Based upon morphologic and enhancement characteristics with CT scanning, cystic renal masses are placed into one of five different categories. The simple cyst is placed into Category I and is characterized by a thin wall without septa, calcifications, or solid components, having the density of water and no enhancement with contrast. The presence of true contrast enhancement of more than 10 Hounsfield units (HU is a measure of radiodensity in CT) in the lesion is the most important characteristic separating categories III and IV, which are associated with malignancy in 40 to 90% of cases, from the categories I, II, and IIF, which are essentially benign.

Patient management based only on the Bosniak renal cyst classification has pitfalls. It does not take into account the clinical factors of the case like patient



**Figures 4: Contrast enhanced coronal reconstructed image showing the large posterior cyst**



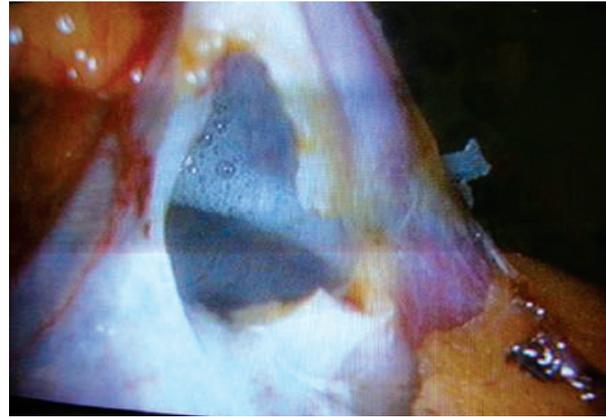
**Figures 5:** *Transperitoneal laparoscopic view showing only part of huge cyst in left kidney*

age, co-morbidity, history of infection, trauma, previous imaging studies, renal function or mass location. There can be inter-observer variations in the assignment of the Bosniak category.<sup>11</sup> In the end, each case must be treated individually according to the various clinical factors, imaging findings and the experience and skills of the urologist. Certainly, there can be more than one correct way to manage some of these cases.

Symptomatic renal cysts can be managed with analgesic medication, percutaneous ultrasound guided needle aspiration, with or without sclerotherapy, and laparoscopic or open surgical cyst deroofing. 95% ethanol, 1-3% sodium tetradecyl sulphate, 50% acetic acid, 10% ethanolamine oleate and bismuth phosphate are the sclerosants usually used. Laparoscopic deroofing of simple renal cysts may be performed using a retroperitoneal or a transperitoneal approach.

Current evidence on the safety and efficacy of laparoscopic deroofing of simple renal cysts is adequate to support the use of this procedure. Clinicians should take steps to predict whether deroofing is likely to relieve symptoms, usually by observing the effect of cyst aspiration. Adverse outcomes include haematuria, urinary tract infection, port site infection, urine leakage (from a parapelvic cyst), intraoperative bleeding, conversion to open surgery or nephrectomy and injury to other internal organs or major blood vessels.

In a non-randomised controlled trial of patients with symptomatic simple renal cysts, who had recurrence of symptoms after initial response to simple aspiration, pain recurred in all five patients treated with cyst aspiration and sclerotherapy at a mean follow-up of 17 months, whereas all seven patients treated with laparoscopic deroofing were pain-free at a mean fol-



**Figures 6:** *Laparoscopic view of the renal cyst deroofing.*

*Note the thin cyst wall and clear fluid content.*

low-up of 17.7 months.<sup>12</sup>

In another comparative study of patients with symptomatic simple renal cyst, 52 patients underwent ultrasound guided percutaneous aspiration sclerotherapy and 20 patients underwent laparoscopic deroofing of simple renal cysts. Laparoscopic deroofing of renal cysts demonstrated only a 5% recurrence rate compared with an 82% recurrence rate for sclerotherapy. No major complication was recorded with either of the techniques.<sup>13</sup>

In contrast to the above results, it is interesting that most case series on aspiration sclerotherapy claim high success rate.

## CONCLUSION

More than 70% of renal mass lesions are simple cysts. If all the USG features are suggestive of a simple cyst (Bosniak I), no further evaluation is needed. Contrast CT and MRI are the most appropriate investigations for the evaluation of complex cysts. The treatment of simple cysts is needed only for symptoms and complications. Complications are rare with cysts smaller than 5cm in diameter. Aspiration and sclerotherapy is the initial treatment. Laparoscopic renal cyst deroofing is very effective and current evidence on the safety and efficacy of laparoscopic deroofing of simple renal cysts is adequate to support the use of this procedure.

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