Laparoscopic Treatment of Simple Renal Cyst

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Received 7 April 2014  Accepted 6 May 2014

Abstract

Introduction. Renal cysts are a very common condition that can occur at any age from newborn to the elderly. Simple renal cysts are generally diagnosed incidentally on sonography, computed tomography (CT) scans, or intravenous urography performed for urinary tract or other abdominal problems.

Patients and Method. During the period of Nov 2011 to Oct 2012, 30 patients (mean age 60 years; range 42–77 years; 17 men and 13 women) with symptomatic, voluminous renal cysts were encountered in this study. The size of the cyst was ranging between 10-17 mm (mean 14mm).

All patients were studied with ultrasound, excretory urography, and contrast enhanced CT scans. In this series, all cysts were of type I according to the Bosniak classification. Transperitoneal laparoscopic deroofing technique was used.

Results. The operation was successfully completed laparoscopically in all cases with no conversion to open surgery. There were no major perioperative complications. Two cases only developed ileus postoperatively and stayed for 3 days, this was due to some colonic adhesions that required more dissection. Hospital stay was 2 days (range, 1-3 days).

After 12 months period of follow up, clinical improvement (disappearance of symptoms) was observed in 25 patients (84.4%). There were 4 patients who continued had lumbar pain post operatively and this could be due to that the patient’s symptom already due to backache and not related to the cyst. Only 1 patient had increased hydronephrosis that required percutaneous nephrostomy.

Conclusions. Laparoscopic deroofing of large simple renal cysts is an efficacious, safe and less invasive method of treatment and is recommended as a primary treatment for symptomatic simple renal cysts.
**Introduction**

With the increased use of imaging modalities such as ultrasonography (US), computed tomography (CT), and magnetic resonance imaging (MRI), a corresponding increase in the number of incidentally detected renal masses has been noted, renal cysts comprise the majority of such renal masses.\[1,2\]

Renal cysts are a very common condition that can occur in anyone from newborns to the elderly. \[3\] Their incidence from birth to 18 years ranges 0.1%–0.45%, with an average incidence of 0.22%.[3]In adults, their incidence gradually increases with age, and by age 40, is about 20%, while at age 60, it rises to 33%.[4]

Simple renal cysts are generally diagnosed incidentally on sonography, computed tomography (CT) scans, or intravenous urography performed for urinary tract or other abdominal problems. [5]

However, some (large) renal cysts can cause symptoms such as flank pain, palpable lumps in the abdomen, hematuria, hypertension, or urinary tract obstruction. [6-8]

The treatment options for symptomatic cysts include aspiration, aspiration and instillation of sclerosing agents, percutaneous marsupialization, and open or laparoscopic unroofing.[9, 10]

In the era of the minimally invasive surgery, laparoscopic surgery has attracted many urologists' attention and has been progressively applied to manage a wide range of urological disorders. [11]

Laparoscopic renal cyst decortication is an alternative to open surgery and has proven to be similarly effective but less invasive compared to its counterpart. [11]

**Patients and Method**

During the period of Nov 2011 to Oct 2012, thirty patients (mean age 60 years; range 42–77 years; 17 men and 13 women) with symptomatic, voluminous renal cysts were encountered in this study.

All patients were studied with ultrasound, excretory urography, contrast enhanced CT scans and renal function tests. In this series, all cysts were of type I according to the Bosniak classification.

Preoperatively a simple diagnostic aspiration test and cystography were done in all patients to check the communication between a cyst and the pelvicaliceal collecting system, which may potentially lead to development of a retroperitoneal urinoma or urinary ascites if laparoscopic deroofing was used alone.

**Operative technique**

All patients were managed by transperitoneal laparoscopic deroofing using a three-port technique.

Under general anesthesia, patients were positioned in the lateral position (with side containing the cyst up); transperitoneal access was established using veress needle. A pneumoperitoneum is created by insufflation of carbon dioxide to a pressure of 13 mm Hg. The first port (10 mm) was inserted on the lateral border of rectus abdominis muscle opposite the umbilicus. Another two working ports (5 mm) were inserted after establishment of pneumoperitoneum on the anterior axillary line: One just below the costal margin and the other just above anterior superior iliac spine.
Longitudinal incision was done in the posterior peritoneum on the line of Toldt followed by medialization of ascending or descending colon using scissor and Maryland dissector. Aspiration of the cyst was done using aspiration needle under laparoscopic guidance. Excision of the cyst wall (deroofing) was then done using laparoscopic scissor. Cauterization of the edges was then done using laparoscopic electro cautery and tube drain is left. Removal of ports and closure of port sites were performed.

**Results**

The mean age of the patients included in this study was 60 years; range 42–77 years. The patients were divided in to 17 men and 13 women. The diameter of the cyst was ranging between 10 - 17 cm (mean 14cm). Table No. 1

<table>
<thead>
<tr>
<th>Table No. 1 Clinical data of the patients.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>Cyst diameter(cm)</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Total number</td>
</tr>
</tbody>
</table>

The indications for surgical intervention were continuous lumbar pain in 20 patients (66.6 %), renal colic without evidence of other urologic disease in 2 patients (6.6 %), hypertension in 2 patients (6.6 %), and simple cyst causing pelvicaliceal obstruction in 6 patients (20 %). Table No 2

<table>
<thead>
<tr>
<th>Table No.2 Indications for surgical intervention.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical presentation</strong></td>
</tr>
<tr>
<td>Dull Pain</td>
</tr>
<tr>
<td>Acute renal colic</td>
</tr>
<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>Dilated pelvicaliceal system</td>
</tr>
</tbody>
</table>

The operation was successfully completed laparoscopically in all cases with no conversion to open surgery. Post operatively all patients received injectable antibiotic and analgesia in day zero converted to oral form in day one postoperatively in 28 patients.
Most of patients (28 patients) started oral feeding within 24 hours and two cases only developed ileus postoperatively and stayed for 3 days, this was due to some colonic adhesions that required more dissection.

Table No. 3 Operative and postoperative data.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative time</td>
<td>60 minute</td>
<td>45 – 75 minute</td>
</tr>
<tr>
<td>Hospital stay</td>
<td>48 hours</td>
<td>24 - 72 hours</td>
</tr>
<tr>
<td>Oral feeding</td>
<td>27.2 hours</td>
<td>24- 72 hours</td>
</tr>
<tr>
<td>Drain removal</td>
<td>36 hours</td>
<td>24 - 72 hours</td>
</tr>
</tbody>
</table>

After 12 months period of follow up, clinical improvement (disappearance of symptoms) was observed in 16 patients (80 %) of patients presented with dull loin pain. There were 4 patients who continued had lumber pain post operatively and this could be due to that the patient's symptom already was due to backache and not related to the cyst. All patients presented with acute renal colic and all those with hypertension have got complete clinical improvement (disappearance of symptoms).

Follow up shows that 5 patients(84 %) of those presented with dilated collecting system get clinical and radiological evidence of improvement (no increment in hydronephrosis), while only 1 patient had increased hydronephrosis that required percutaneous nephrostomy. Table No. 4.

After 12 months follow up period none of our patients get recurrence of the cyst.

Table No.4 clinical improvement.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>No.</th>
<th>Clinical improvement</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dull Pain</td>
<td>20</td>
<td>16</td>
<td>80</td>
</tr>
<tr>
<td>Acute renal colic</td>
<td>2</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Hypertension</td>
<td>2</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Dilated pelvicaliceal system</td>
<td>6</td>
<td>5</td>
<td>84.4</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>25</td>
<td>84.4</td>
</tr>
</tbody>
</table>

Discussion
Renal cysts are mostly asymptomatic and only rarely can regress spontaneously[12]. Large or multiple cysts may become clinically evident because of the compression of the renal pelvis or adjacent organs. Symptoms include abdominal discomfort or pain, hypertension secondary to vascular compression, and, rarely, renal failure[13]. Only symptomatic cysts, larger than 10 cm, are usually treated.
Several techniques have been proposed for the treatment of symptomatic simple renal cyst\[14\]. Open surgical decompression of renal cysts was first reported by Rovsing in 1911\[14\]. Twenty years later\[15-17\], several reports showed that surgical deroofing of large renal cysts seemed to benefit preservation of the renal parenchyma and control pain. While this modality has been popular, high costs and morbidity associated with open surgery have speeded up the development of less-invasive therapeutic alternatives.\[18\]

Nowadays, the laparoscopic approach is regarded as the treatment of choice in patients with symptomatic cysts with success rates exceeding 90\%.\[23\] Nearly all studies of the laparoscopic approach have demonstrated great satisfaction compared to other modalities in terms of efficacy, minimal complications, operative time, minimal blood loss, hospital stay, convalescence, and cosmeses.\[24\] Recent advancements in laparoscopic instruments have further simplified procedures, and laparoscopic cyst ablation procedures have been refined and are performed widespread.\[24\]

Our study showed that symptom control was 84.4 %, ( 4 patients continue having dull loin pain and one patient getting increment in hydronephrosis) after 12 months follow up period. As mentioned the persistent loin pain is mostly unrelated to the cyst and could be musculoskeletal in origin, the patient that had got increased hydronephrosis was due to prolong pressure on the pelvicaliceal system causing fibrosis and obstruction.

Our results were lower than that obtained by Hulbert J C\[20\] who found that all 7 patients treated with laparoscopic deroofing were pain-free at a mean follow-up of 18 months.

In another studies done by Shiraishi K, et al, for laparoscopic deroofing in patients with symptomatic simple renal cysts (155 patients in total), the proportion of patients who were symptom-free ranged from 91% (41/45) after a mean follow-up of 52 months to 100% (20/20) after a mean follow-up of 6 months. \[22\]

The present study showed that the rate of cyst recurrence was 0 %, this was comparable to another study done by Atug F, et al who reported rate of cyst recurrence as 0% (0/13) after 6 months, whereas Shiraishi K, et alfound rate of recurrence of 13% (3/23) after 34 months, this higher recurrence rate may be due to longer period of follow up.

Our study reported no major intra or postoperative complications apart of 2 cases (6.6 %) of prolonged ileus that were managed conservatively. Dunn MD, reported rate of haemorrhage(4%), prolonged ileus(11%), wound infection in 8% of patients and urine leakage in 4%.\[24\]

The results of present study regarding hospital stay, oral feeding and drain removal were comparable to a study done by Dunn MD. \[24\]

**Conclusions**

Laparoscopic decortication of large simple renal cysts is an efficacious, safe and less invasive method of treatment and is recommended as a primary treatment for symptomatic simple renal cysts.

**References**


from one institution. BJU Int 2006;98(2):405-8.