

CASE REPORT

Retroperitoneoscopic approach in the treatment of symptomatic renal cysts

Lutter I, Weibl P, Daniel I, Pechan J, Pindak D

Department of Urology, Faculty of Medicine, Comenius University, Bratislava, Slovakia. pweibl@yahoo.com

Abstract

Introduction and objective: The authors present the results and follow up of patients with simple parenchymal and peripelvic cysts who underwent retroperitoneoscopic cyst decortication.

Material and methods: The records of 19 patients who underwent 3/4-port retroperitoneoscopic cyst decortication between January 1999 and January 2004 were retrospectively reviewed. All patients admitted to the hospital were symptomatic, the most common presenting symptoms were flank pain (19p) and hematuria (6p). The cyst size ranged from 8 to 15cm (mean size 10cm). 10 cysts were located on the right kidney and 9 cysts on the left kidney. The mean age of patients was 51 years. 16 patients had a simple parenchymal cyst corresponding to Bosniak type I (8 patients underwent cyst aspiration and sclerotherapy with 96 % alcohol in past), 2 patients had peripelvic cyst corresponding to Bosniak type II and 1 patient had a parenchymal cyst Bosniak type II.

Results: Retroperitoneoscopic renal cyst decortication was successfully performed in all patients, no conversion was needed. The mean operative time was 70 min (50–90 min) in patients with parenchymal and peripelvic cysts. The mean operative blood loss was 70 ml (50–130 ml) and the mean length of hospital stay was 3 days (2–5 days). The follow up ranged from 6 to 48 months and during that period were all patients asymptomatic, with no signs of recurrence.

Conclusions: Retroperitoneoscopic cyst decortication is a safe and effective operative procedure in the treatment of symptomatic renal cysts with the minimal complication rate and excellent results (*Tab. 2, Fig. 3, Ref. 30*).

Key words: retroperitoneoscopic approach, decortication, renal cysts.

Traditionally, the treatment of simple symptomatic simple parenchymal renal cyst was based on percutaneous puncture, aspiration and instillation of a sclerosant. Now, there are several surgical procedures available, such as: (1) percutaneous aspiration followed by the instillation of a sclerosant; (2) laparoscopic cyst decortication; (3) less frequent retrograde flexible ureteroscopy in smaller anterior cysts; (4) or antegrade percutaneous nephroscopy with the cyst marsupialization into the collecting system in posterior cysts (1, 2, 3).

In past, an open surgical procedure with cyst decortication was indicated for larger cysts. Peripelvic cysts are more frequently the cause of obstruction, pain, infection, urolithiasis and the treatment is more challenging. Percutaneous aspiration and instillation of a sclerosant is contraindicated, due to a risk of hilar structures injury, formation of urinary fistula into the collecting system or a stricture from potential extravasation of sclerosant (4).

In early 1990s, laparoscopy was introduced in the treatment of renal cysts. Transperitoneal and retroperitoneoscopic approach are available when the surgical intervention is indicated. Generally, transperitoneal approach is recommended in anterior cysts, retroperitoneoscopy in posteriorly located cysts. However, retroperitoneoscopy enables to treat renal cysts in any location (6). Retroperitoneoscopic approach has been adapted and preferably used in our institution.

Department of Urology, Faculty of Medicine, Comenius University, Bratislava, and IInd Department of Surgery, Faculty of Medicine, Comenius University, Bratislava, Slovakia

Address for correspondence: I. Lutter, MD, PhD, Dept of Urology, Faculty of Medicine, Comenius University, Antolska 11, SK-851 07 Bratislava 5, Slovakia.
Phone: +421.2.68671111

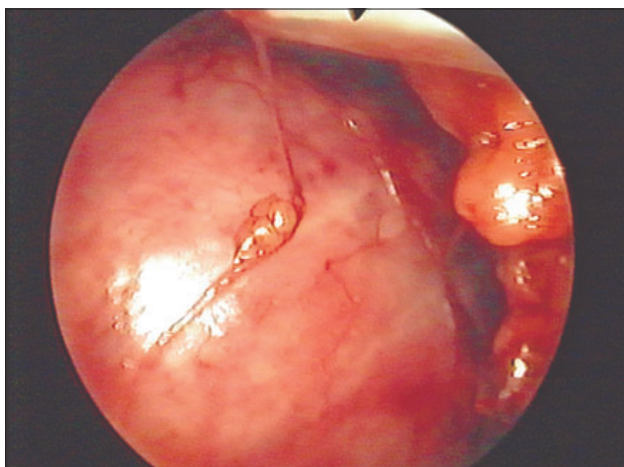


Fig. 1. The wall of the cyst which is completely mobilized.

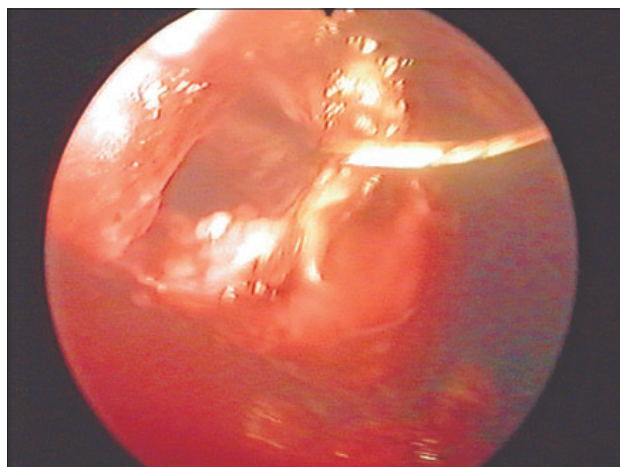


Fig. 2. Cyst decortication using electrocautery scissors „un-roofing“.

Material and methods

The records of 19 patients (pts) who underwent $\frac{3}{4}$ port retroperitoneoscopic cyst decortication from January 1999 to January 2004 were retrospectively analysed. Analysis was focused on presenting symptoms, number of cysts and their features, complications and postoperative follow up. 16 pts had simple solitary parenchymal cyst corresponding to Bosniak type I (8 pts underwent percutaneous aspiration with instillation of sclerosant – 96 % alcohol in past; however cysts had recurred, 8 pts had a simple symptomatic renal cyst more than 8 cm in diameter). 2 pts had a peripelvic renal cyst corresponding to Bosniak type II with thick and calcified wall, 1 pt had parenchymal cyst corresponding to Bosniak type I. The diagnosis of the renal cyst was established using ultrasound and CT examination. Each patient underwent an i.v. urography (IVU) in order to exclude a possible communication with the collecting system. Patients underwent $\frac{3}{4}$ port retroperitoneoscopic renal cyst decortication. The follow up was based on imaging techniques (ultrasound) and clinical status.

Technique (retroperitoneal approach)

Before the surgical intervention, all patients underwent routine laboratory tests, such as serum creatinine, hematocrit and urine culture. A proved contralateral renal function is mandatory in cases with a risk of nephrectomy, such as complex cystic disease. The patient should be informed on the possibility of conversion to an open procedure or the need of a nephrectomy in case of complications. After anesthesia induction, a bladder catheter is inserted. In patients with peripelvic cysts or deep parenchymal cysts with a risk of the collecting system injury, an open ureteral catheter is inserted at the beginning of intervention (for a retrograde instillation of methylene blue to identify an inadvertent collecting system injury). For the retroperitoneal approach a full flank position is utilized. After placing an axillary roll, the lower arm is positioned on an arm board and the

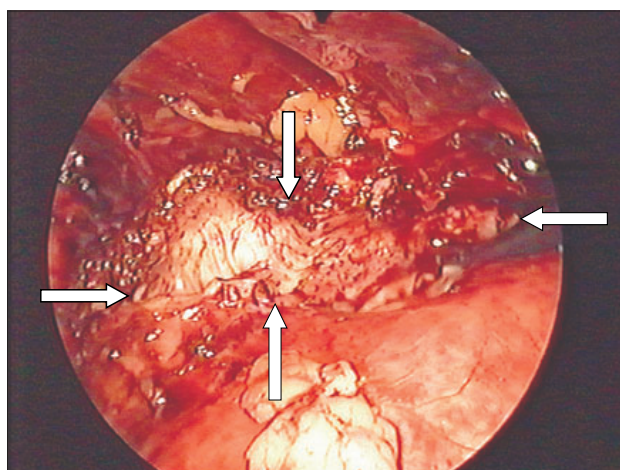


Fig. 3. Base of the cyst.

upper arm is flexed and fixed across the elevated support. The table is flexed and a kidney bridge is elevated.

A 2 cm horizontal skin incision below the 12th rib is made in the posterior axillary line at the superior lumbar triangle. Using a blunt finger dissection (with index finger) a space is created anteriorly to the psoas muscle and outside Gerota's fascia. Usually two and occasionally three secondary ports are inserted. During port placement, a care must be taken to avoid pleural, peritoneal, visceral or vascular injury. Ports must be placed in a way to prevent the frustrating intraoperative "clushing of swords", occurring when the trocars are placed too close. A second 12 mm trocar is placed under laparoscopic vision along the anterior axillary line in line with the first trocar. A 5 mm trocar is placed a few fingerbreadths posterior to the second trocar in the anterior axillary line. The initial wound is closed around the port using a suture to prevent gas leakage.

After trocars placement, pneumoretroperitoneum is created up to 12–15 mmHg. Under the optical vision of laparoscope, blunt dissection of the retroperitoneal space is made. The perinephric fat is mobilized. Once the cyst is identified and cleared

from overlying fat (Fig. 1), the cyst fluid is aspirated, wall is grasped and electrocautery scissors (or harmonic scalpel) are used to excise the wall until it is flush with the renal capsule (Fig. 2).

The specimen is sent for a histopathological evaluation. The base of the cyst is carefully inspected for areas needed to be biopsied (Fig. 3). Hemostasis is obtained by the electrocautery. Routine coagulation of the base of the cyst is not recommended due to the risk of collecting system injury.

In patients with peripelvic cysts, we have instilled methylen blue via ureteral catheter (Ch 6) to exclude possible collecting system injury (leak of methylen blue was not observed in any patient). Redon drain is left in the bedside for 1 or 2 days. Ureteral and bladder catheter were extracted next day after the surgical intervention (Tab. 1).

Results

Retroperitoneoscopic cyst decortication was successful in all 19 patients, with a mean operative time 70 minutes (50–90 min) for parenchymal and peripelvic cysts. Mean blood loss was 70 ml (50–130 ml) and a mean duration of hospital stay was 3 days (2–5 days). No perioperative and postoperative complications were observed. No blood substitution and no conversion to open procedure were needed. Patients were discharged from the hospital when they have passed flatus, tolerated oral diet and when their postoperative pain was controlled by oral analgesics. Patients returned to normal daily life within 14 days, they were all asymptomatic. Patients were followed using a ultrasound on 1/10 postoperative day and at 3/6 months intervals thereafter. The mean follow was 42 months, no recurrence of pain or cyst was observed (Tab. 2).

Discussion

The incidence of renal cysts tends to increase with age; in patients over 50 it is 33 % (7–10). Simple renal cysts are commonly revealed by ultrasonography, more complicated lesions require CT/MRI.

For clinical purposes, renal cysts are commonly referred to as either simple or complex. The vast majority of renal cysts are simple, thin and smooth walled with no calcification, septation or enhancement after contrast studies – corresponding to Bosniak category I. Most of them are asymptomatic incidental findings and of no clinical consequence. An intervention is needed when clinical symptoms are present or when patient has a radiographic finding of a complex renal cyst Bosniak type III/IV. However, a small proportion of simple renal cysts may be associated with symptoms such as an increased abdominal pressure, bloating, early satiety and gastroesophageal reflux. Besides, a massive enlargement of the renal cysts may compress the collecting system or cause stretching of the renal capsule both leading to acute or chronic flank pain. Peripelvic cysts often cause the obstruction of the pelvicalyceal system. Other presenting symptoms are haematuria secondary due to the cyst rupture into the collecting system, recurrent urinary infection, urolithiasis and recalcitrant hypertension secondary due to segmental ischemia.

Tab. 1. Patients and their presenting symptoms.

Patients (pt)		Symptoms	
Number (No)	19		
Gender Male/Female	10/9	a/ pain	19
Mean age	51	b/ haematuria	6
No of cysts per pt	1	c/ recurrent UTI	2
Localisation		d/ urolithiasis	0
a - upper segment	4	Bosniak clasiffication	I 17
b - mid segment	6		II 2
c - lower segment	7		
d - peripelvic	2		
e - right kidney	10		
d - left kidney	9		
Mean cyst diameter	12		

Tab. 2. Results.

Operative and postoperative parameters	
Mean operative time (min)	70
Mean blood loss (ml)	70
Mean hospitalisation (days)	3
Complication rate	0
Mean follow-up (months)	42
Recurrence	0

Conservative management has very often only a temporal benefit (antibiotics, NSA agents and analgesics). Up till now, there is no specific medication for the treatment of renal cysts, thus the medication is usually indicated for symptoms such as arterial hypertension, infection and pain. In the meantime, ACEI, Ca blockers, ATB, thiazid diuretics and analgesics are used most frequently.

Minimally invasive surgical techniques are more frequently used in the treatment of various urological conditions. A trend for the treatment of simple renal cyst consists of percutaneous aspiration with/ or without instillation of a sclerosing agent, or of an open surgical procedure – decortication. Previous aspiration of a simple cyst resulted in cyst recurrence in 90 % of cases, after an introduction of sclerosants this percentage decreased to 30–78 %, which was consistent with our experience (5, 11, 12). Sclerosants are used to improve the efficacy – after the aspiration to injure the cyst wall cells which is responsible for the fluid production. However sclerosis is contraindicated in peripelvic cysts, due to a risk of stricture from sclerosant extravasation, following the formation of fistula to the collecting system or due to a risk of hilum injury. Additionally, a risk of bowel injury in large anterior cysts may limit the application of this technique. A significant number of complications (obstruction of UPJ, absces, fever and pain) after the sclerotherapy have reduced the number of indications for the cyst puncture. On the other hand, many authors have reported the success of this method after a single or repeat instillation of sclerosant (12–17). A higher rate of success has been reported in multiple-session ethanol instillation treatment (16). In cer-

tain cases such as a suspected infection is the puncture a treatment of choice, because it allows not only therapeutic but also diagnostic effect.

On the other hand, laparoscopic treatment is an attractive alternative combining the advantages of minimally invasive procedure with the effectivity of cyst ablation achieved by open surgery. Hulbert et al (18) have demonstrated for the first time the success of laparoscopic decortication in treatment of symptomatic renal cysts. Laparoscopic decortication of symptomatic and complex renal cysts proved to be safe, reliable and efficacious (4, 5, 19–27). Transperitoneal approach is generally proposed for the treatment of anterior cysts and retroperitoneoscopic approach for posterior cysts (5, 6, 28).

In early 90s, retroperitoneoscopic approach was less popular than transperitoneal approach, primary due to smaller working space and unfamiliarity of surgeons with this technique. Retroperitoneoscopy can be performed by a “gaseous” retroperitoneoscopy with a pneumoretroperitoneum (GR) or by “gasless” technique (GLRA) (27). We have adapted GR in our institution as a safe and comfortable surgical technique after first 12 cases. Some authors do not recommend retroperitoneoscopy for the beginners in laparoscopy (29), we can recommend ablation of larger renal cyst for “novics”.

Contraindications for laparoscopic surgery include a severe cardiopulmonary compromise, manifest coagulopathy and abdominal sepsis. Specific is the presence of intense perirenal fibrosis secondary to xanthogranulomatous pyelonephritis, genitourinary tuberculosis or recent open surgery in the retroperitoneum (6, 29).

Compared to transperitoneal laparoscopic approach, retroperitoneoscopy is associated with a sharper learning curve (6). Retroperitoneoscopy has several theoretical and practical advantages such as early exposure of the renal hilum, and the risk of paralytic ileus, visceral and vascular injury is minimised as the intervention is performed outside the peritoneal cavity. The risk of hypercapnia is also minimised, however published data are not clear (29).

A statistically significant difference in some parameters was found in patient with peripelvic cysts: (a) longer operative time; (b) higher blood loss and (c) complication rate – compared to patients with parenchymal cysts (4, 21, 26). The operative technique is more challenging due to the cyst’s intimate location in the hilum. In our study, we have detected a significantly longer operative time in patients with peripelvic cysts. Now we can safely conclude that there are no doubts about the effectivity of laparoscopic treatment of symptomatic simple renal cysts, started at early 90s.

Laparoscopic treatment was proposed as the primary treatment in renal cysts more than 6 cm in diameter (30). Gubta et al (3) recommend laparoscopic approach for the cyst more than 8 cm in diameter or in difficult access. Yoder and Wolf indicated laparoscopic ablation as the first line treatment for the cysts from 10 cm in diameter (21). Laparoscopic approach should be considered as the first line treatment in larger cysts or after previous failure of cyst aspiration and sclerotherapy (28, 30).

Conclusions

At present, the majority of symptomatic renal cysts can be managed in minimally invasive fashion. The cost of laparoscopy is much higher compared to the percutaneous aspiration and sclerosant instillation; however the duration of hospital stay and convalescence is comparable. The number of recurrences is significantly lower in laparoscopic cyst decortication. Laparoscopic decortication of symptomatic renal cysts is effective, with minimal complication rates and excellent results. It is recommended as a first line treatment in symptomatic peripelvic cysts, where aspiration and instillation of sclerosant is contraindicated or unsuccessful. It can be also considered in larger or giant renal cysts. We are using the retroperitoneoscopic approach in the treatment of renal cysts in different location. Up till now we can safely conclude, that all patients were symptoms free, with no signs of obstruction, short convalescence and faster return to normal life.

References

1. Kavoussi LR, Clayman RV, Mikkelsen DJ et al. Ureteronephroscopic marsupialization of obstructing peripelvic renal cyst. *J Urol* 1991; 146 (2): 411–414.
2. Korth K. Percutaneous, intrarenal marsupialization of renal cysts. *Percutaneous Surgery of Kidney stones: Techniques and Tactics*. Berlin: Springer-Verlag, 1984.
3. Young Kang, Mantu Gubta. The benefits of endoscopic management of symptomatic renal cysts. *Contemp Urol* 2001; 13: 45–51.
4. Roberts WW, Langner RB, Boyle KE, Jarret TW, Kavoussi LR. Laparoscopic ablation of symptomatic parenchymal and peripelvic renal cysts. *Adult Urology* 2001; 58 (2): 165–169.
5. Okeke AA, Mitchelmore AE, Keely Jr FX, Timoney AG. A comparison of aspiration and sclerotherapy with laparoscopic de-roofing in the management of symptomatic simple renal cysts. *Brit J Urol Int* 2003; 92: 610–613.
6. Gill IS, Rassweiler JJ. Retroperitoneoscopic renal surgery: our approach. *Urology* 1999; 54 (4).
7. Tada S, Yamagishi J, Kobari T et al. The incidence of simple renal cysts by computed tomography. *Clin Radiol* 1983; 34: 437.
8. Laucks SP, McLachlan MSF. Aging and simple cysts of the kidney. *Brit J Radiol* 1981; 54: 12–14.
9. Arai Y, Yoshimura K, Okubo K et al. The natural history of simple renal cysts. *J Urol* 2002; 167 (1): 21–23.
10. Ravine D, Gibson RN, Sheffield LJ et al. An ultrasound renal cyst prevalence survey: specificity data for inherited renal cystic disease. *Amer J Kidney Dis* 1993; 22: 803.
11. Hanna RM, Dahniya MH. Aspiration and sclerotherapy of symptomatic simple renal cysts: value of two injections of sclerosing agent. *Amer J Roentgenol* 1996; 167: 781–783.
12. Bean WJ. Renal cysts: treatment with alcohol. *Radiology* 1986; 138: 329–331.
13. Ozgur S, Cetin S, Ilker Y. Percutaneous renal cyst aspiration and treatment with alcohol. *In Urol Nephrol* 1988; 20: 481–484.
14. Paananen I, Hellstrom P, Leinonen S et al. Treatment of renal cysts with single-session percutaneous drainage and ethanol sclerotherapy: Long term outcome. *Urology* 2000; 57: 30–33.

15. **El-Diasty TA, Shokeir AA, Tawfeek HA et al.** Ethanol sclerotherapy for symptomatic simple renal cysts. *J Endourol* 1995; 9: 273–276.
16. **Chung BH, Kim JH, Hong CH, Yang, Lee MS.** Comparison of single and multiple sessions of percutaneous sclerotherapy for simple cyst. *Brit J Urol Int* 2000; 85: 626–627.
17. **Delakas D, Karyotis I, Loumbakis P, Daskalopoulos G et al.** Long-term results after percutaneous minimally invasive procedure treatment of symptomatic simple renal cysts. *Int Urol Nephrol* 2001; 32 (3): 321–326.
18. **Hulbert JC, Shepard TG, Evans RM.** Laparoscopic surgery for renal cystic disease. *J Urol* 1992; 147: 149A.
19. **Hoening DM, McDougall EM, Shalhav AL, Elbahnasy AD, Clayman RV.** Laparoscopic ablation of peripelvic renal cysts. *J Urol* 1997; 158 (4): 1345–1348.
20. **Mimata H, Mizoguchi H, Ohno H, Tasaki Y, Hnada T, Nomura Y.** Three approaches for laparoscopic unroofing of simple and complicated renal cysts. *Int J Urol* 1997; 4: 212–217.
21. **Yoder BM, Wolf JS Jr.** Long term outcome of laparoscopic decortication of peripheral and peripelvic renal and adrenal cysts. *J Urol* 2004; 171 (2 Pt 1): 583–587.
22. **Guazzoni G, Montorsi F, Bergamaschi F et al.** Laparoscopic unroofing of simple renal cysts. *Urology* 1994 Feb; 43 (2): 154–159.
23. **Limb J, Santiago L, Kaswick J, Bellman GC.** Laparoscopic evaluation of indeterminate renal cysts: Long-term follow up. *J Endourol* 2002; 16 (2): 79–82.
24. **Santiago L, Zamaguchi R, Kaswick J, Bellman G.** Laparoscopic management of indeterminate renal cysts. *Urology* 1998; 52 (3): 379–383.
25. **Rasweiler JJ, Seemann O, Frede T, Henkel TO, Alken P.** Retroperitoneoscopy: experience with 200 cases. *J Urol* 1998; 160: 1265–1269.
26. **Hemal AK, Aron M, Gubta NP, Seth A, Wadhwa SN.** The role of retroperitoneoscopy in the management of renal and adrenal pathology. *Brit J Urol Int* 1999; 83: 929–936.
27. **Ou Y-Ch et al.** The clinical experience of gaseous retroperitoneoscopic and gasless retroperitoneoscopy-assisted unroofing of renal cyst. *Chi Med J (Taipei)* 1997; 59: 232–239.
28. **Nakada SY et al.** *Essential Urologic Laparoscopy, The Complete Clinical Guide 59-78*, Humana Press Inc. 2003.
29. **Keeley FX Jr, Tooley DA.** Retroperitoneal laparoscopy. *Brit J Urol Int* 1999; 89: 212–215.
30. **Abhay Rane.** Laparoscopic management of symptomatic simple renal cysts. *Int Urol and Nephrol* 2003; 36 (1): 5–9.

Received September 18, 2005.

Accepted October 27, 2005.