

## Retroperitoneoscopic Management of Chyluria: Our Experience

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### Abstract

**Aims:** The aim of current study was to evaluate the efficacy of retroperitoneoscopic pyelolymphatic disconnection in the management of chyluria not responding to conservative therapy and two courses of retrograde pelvic instillation sclerotherapy (RPIS) that were considered as cases of intractable chyluria.

**Methods:** A total 21 patients of intractable chyluria underwent retroperitoneoscopic pyelolymphatic disconnection over a period of 30 months. They were then followed every three months for the history of absence or presence of milky urine. Every patient irrespective of the history of passing milky urine underwent biochemical test of urine to confirm the presence of chyle in their urine.

**Results:** Mean operation time was 123 minutes (range 93 to 156 minutes) and mean hospital stay was 3 days. One patient had persistence of chyluria until third postoperative day that was managed successfully with RPIS. Another patient developed recurrence of chyluria after three months of operation from side opposite to the operated side as evident on cystoscopic view and was also successfully managed by RPIS. Our overall success rate was 95.3%.

**Conclusions:** Retroperitoneoscopic pyelolymphatic disconnection is a safe and effective procedure in the management of intractable chyluria not responding to conservative therapy or RPIS.

**Keywords:** Chyle, Urine, Sclerotherapy, Retroperitoneoscopy

### Introduction

Chyluria is clinically manifested by passage of milky urine containing chylous material resulting from a fistulous communication between the lymphatic and the urinary systems (1). This clinical condition has been recognized since the era of Charak (300 BC). Chyluria is prevalent in filarial endemic zones like India, Japan, Southeast Asia, Africa, parts of South America and Australia.

The treatment of chyluria is usually initiated with conservative measures such as fat restricted high protein diet, antifilarial drugs, high fluid intake and use of coconut oil (containing fat with medium chain triglyceride) as cooking medium (2). The next line of management for the patients not responding to above

conservative measures is retrograde pelvic instillation sclerotherapy (RPIS) (3). Surgical option is restricted to cases with refractory to conservative management and sclerotherapy (3-5). It is known that 20% of chylurics require surgical treatment in individuals who do not respond to conservative treatment and sclerotherapy (6).

Patients not responding to even 2 courses of

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sclerotherapy are considered as cases with intractable chyluria and considered for surgical treatment (3). The principle of surgical treatment for chyluria is renal pedicle lymphatic disconnection which can be done by either open surgical method or laparoscopically.

We here present our initial experience of retroperitoneoscopic renal pedicle lymphatic disconnection in 21 patients for the treatment of intractable chyluria not responding to conservative therapy or sclerotherapy.

## Materials and Methods

From July 2004 to December 2006, 23 patients (17 males and 6 females), 19 to 51 years old (mean age 34.4 years) were surgically treated at our hospital with retroperitoneoscopic approach with a follow up from 12 to 48 months. The presenting complaints included passage of milky white urine, aggravation of symptoms after taking fatty food, flank pain and hematuria. Six of them had passage of clots along with milky white urine. Only one patient developed retention of urine requiring cystoscopic clot evacuation and catheterisation. The presence of chyle in urine was confirmed by ether test. Intravenous urograms were done routinely in all the patients showing no abnormality of the urinary tract.

Initially all of the above patients had been treated conservatively with low fat and high protein diet, increased fluid intake and a course of DEC (di-ethyl carbamazine) in a dose of 6mg/kg body weight/day in 3 divided doses for 21 days without disappearance of chyluria. Patients not responding to the above conservative measures underwent cystoscopic localization of chylous efflux and RPIS for 3 days. Patients not responding to 2 such courses of RPIS were considered as cases of intractable chyluria and planned for surgical intervention.

All the patients were operated under general anesthesia with endotracheal intubation, routine nasogastric tube placement and urethral catheterisation. The patients were placed in kidney position and an

axillary role was placed to prevent brachial plexus injury.

**Retroperitoneoscopic procedure:** A 1.5 to 2 cm. incision was made between the costovertebral angle and the outer margin of psoas major muscle. The flank muscle layer and lumbodorsal fascia were progressively dissected. Upon entering the retroperitoneal space, the index finger was used to sweep the peritoneum antero-medially developing a space between the Gerota's fascia and psoas major muscle. A homemade ballon was inserted through the incision. We made the ballon using a double glove finger (placing one over the other so to obtain greater resistance against rupture), tied with a silk thread to an 18 Fr. Red rubber catheter. We injected normal saline through the lumen of the red rubber catheter to expand the ballon, thereby increasing the retroperitoneal space to 800 to 1000 ml capacity and the ballon was kept inflated in the retroperitoneal space for 5 minutes facilitating hemostasis. One trocar was introduced through this incision point. Then, under index finger guidance, 2 trocars were introduced at the midaxillary line 2 cm. away from the iliac crest and at the front axillary line 2 cm. below the costal margin. The pneumoperitoneum was created to 12-15mm Hg with CO<sub>2</sub> gas.

The extraperitoneal adipose tissue was dissected from Gerota's fascia which was then divided longitudinally close to the psoas major muscle. Four procedures were done including nephrolympholysis, ureterolympolysis, hilar stripping and nephropexy. The fat, areolar tissue and superficial lymphatic plexus were dissected and stripped from the kidney surface. The renal pelvis and upper ureter up to the level of bifurcation of common iliac vessels (3) were similarly stripped of the areolar tissue and lymphatic vessels, thus the kidney was completely mobilized from all around. Similarly, the renal vessels were stripped of the lymphatics. All visible lymphatic vessels were ligated and divided carefully. If the kidney, free within the retroperitoneal space was found to be hypermobile, nephropexy was done to

prevent nephroptosis and torsion of the renal vessels (3). Only three patients required nephropexy. During nephropexy, we used nonabsorbable suture to fix the renal capsule at upper, middle and lower pole to the psoas major muscle.

**Follow up:** The patients were followed up every three months with history taking whether he or she is passing milky urine and urine chyle test was done in every patient irrespective of history of milky urine.

## Results

Mean operating time was 123 minutes (range 93-156 min) and mean hospital stay 3 days. Chyluria stopped immediately in all of the patients except one with chyluria persisting until third post-operative day, who then underwent RIPS for 3 days with disappearance of chyluria. Each patient was allowed oral diet from the first post-operative day. The drain was removed after 48 hours of surgery except in two patients in whom drain was removed on the fourth post-operative day due to high drain output (more than 100 ml in 24 hours). The patients were discharged on the day following removal of the drain. One patient developed operative wound infection that was then managed by changing the antibiotic.

One patient developed recurrence after three months of surgery with passage of milky white urine in whom recurrence of chyluria was confirmed by biochemical test of urine. On cystoscopic assessment, chylous efflux was found on the side opposite to the operated side. This patient was managed successfully with RIPS.

## Discussion

Recent lymphangiographic studies revealed that the underlying lymphangiectasia is due to chronic lymphatic obstruction resulting a high intralymphatic pressure that causes the rupture of lymphatic varix into the urinary collecting system and passage of chyle in urine (3).

In tropical countries, filariasis caused by the *Wuchereria bancrofti* infection is the most common cause of chyluria unless proved otherwise (7). In endemic zone, up to 10% of the population may be infected by *Wuchereria bancrofti* and chyluria occurs in 2% of the patients with filariasis.

Initially, chyluria is treated conservatively with bed rest, fat restricted high protein diet, use of fat containing medium chain triglycerides and oral DEC. If the conservative treatment failed, sclerotherapy is the next option. However RPIS may cause significant flank pain, nausea, vomiting, hematuria, acute tubular necrosis, urinary tract infection and acute necrotizing ureteritis and acute renal failure (8, 9). Sclerotherapy has a variable success rate and may have a high recurrence (10, 11). Recently, povidone iodine (0.2%) alone or with 50% dextrose solution is being used as sclerosant for RPIS with variable success rate (7, 10, 11). Although, direct fulguration via flexible ureterorenoscopy showed good results in a small series, it is technically demanding (12).

Patients with persistent chyluria not responding to conservative measures and sclerotherapy should be planned for surgical intervention. Lymphaticovenous anastomosis is the most physiological method (10). But technically it is difficult to identify the fragile lymphatics yielding poor result (9).

Various other methods of surgical management have been reported in literature which includes surgical disconnection of pyelolymphatic communication (13, 14), lymphaticovenous microsurgical anastomosis (15), renal capsulectomy (16), renal autotransplantation (17) and simple nephrectomy (18).

Renal pedicle lymphatic disconnection is the definite surgical treatment for chyluria with satisfactory result. The operation can be done via open or laparoscopic approach. Conventional open surgical method has several disadvantages such as long lumbar incision, longer hospital stay, post-operative pain and other morbidity. With the introduction of laparoscopy, the procedure is being performed laparoscopically via transperitoneoscopic or retroperitoneoscopic

approach with good results.

The success rate following open surgical treatment has been reported as 98% by Punekar *et al* with a follow-up of 15 years (15). On the other hand, in retroperitoneoscopic management of chyluria, success rate has been reported from 98.1% to 100% (3, 13). In our series, success rate was 95.3% which is comparable with the above studies. Regarding the persistence of chyluria in the single case after surgery, the cause may be incomplete stripping of lymphatic vessels.

Recently Zhang *et al* have compared between the open and retroperitoneoscopic method for the clinical efficiency of renal pedicle disconnection in the treatment of chyluria (13). They reported that retroperitoneoscopic method has the advantages of minimal invasion, shorter hospital stay and rapid recovery compared with the open surgery. In their study, during retroperitoneoscopy, the single patient faced inferior vena cava (IVC) injury during separation of dense fibrotic adhesion and it was successfully repaired laparoscopically. Late recurrence of chyluria may result from incomplete stripping, chyle leakage from contralateral renal unit or reappearance of lymphatic fistulous communication in the operated renal unit (13).

Retroperitoneoscopic procedure is also not 100% safe. Due to the pneumoperitoneum, CO<sub>2</sub> embolism might occur. Undue excess tension on the renal vessels during the dissection procedure might cause injury to its endothelium leading to renal artery thrombosis and subsequent ischemic atrophy of the kidney. Injury to the great vessels may also occur in a new hand, needing sufficient expertise to repair the vessel laparoscopically.

Although, it is not a novel or pioneer work on the retroperitoneoscopic management of chyluria, in this series, sufficient number of cases were included and the surgical outcome is comparable with other studies in the literature (13, 14). Our study again established that retroperitoneoscopic management of chyluria is a safe and efficient, and minimally invasive procedure

where the objectives of open surgery can be achieved avoiding the complications and morbidity of the open surgical procedure. The additional advantages of this procedure includes minimal morbidity, shorter hospital stay, excellent cosmesis, magnified view for better identification of finer lymphatic structures and early return to work.

## Conclusions

Chyluria is predominantly a disease prevalent in tropical countries. Therefore, very few words on chyluria have been spent in standard text books. Most of the studies on chyluria mentioned in English literature are from tropical countries.

Patients of intractable chyluria do not respond to conservative treatment or RPIS and invariably require surgical intervention. Retroperitoneoscopic pyelolymphatic disconnection of such cases allows direct access to the kidney without transgression of the peritoneal cavity and mobilization of intraperitoneal organs. The objectives of conventional open surgery can be achieved through this technique. It is effective, efficient, durable and safe with minimum morbidity, with good cosmesis and early return to work. Although our study is not a new one and retroperitoneoscopic management of chyluria is already an established procedure, however, our experience is from a country where filaria is endemic. So, we are sure that our study will have significant contribution in the field of chyluria.

## Conflict of interest

None declared.

## References

1. Akisada M, Tavi S. Filariasis chyluria in Japan. Lymphography, etiology and treatment of 30 cases. *Radiology*. 1968;90:311-13.
2. Hashim SA, Roholt HB, Babayan VK, Vanitallie TB. Treatment of Chyluria and Chylothorax with Medium-Chain Triglyceride. *N Engl J Med*.

- 1964;270:756-61.
3. Hemal AK, Gupta NP. Retroperitoneoscopic lymphatic management of intractable chyluria. *J Urol.* 2002;167:2473-6.
  4. Dalela D, Gupta VP, Goel A, Singh KM. Omental wrap around the renal pedicle: an adjunctive step to minimize morbidity and recurrence after lymphorenal disconnection for chyluria. *BJU Int.* 2004;94:673-4.
  5. Hemal AK, Kumar M, Wadhwa SN. Retroperitoneoscopic nephrolympholysis and ureterolysis for management of intractable filarial chyluria. *J Endourol.* 1999;13:507-11.
  6. Karanjavala DK. Technique of clearance (or disconnection) of dilated lymphatics in the renal hilum and lower ureter and bladder in cases of intractable chyluria or haemochyluria. *Br J Urol.* 1979;51:440-2.
  7. Goel S, Mandhani A, Srivastava A, et al. Is povidone iodine an alternative to silver nitrate for renal pelvic instillation sclerotherapy in chyluria? *BJU Int.* 2004;94:1082-5.
  8. Dash SC, Bhargav Y, Saxena S, Agarwal SK, Tiwari SC, Dinda A. Acute renal failure and renal papillary necrosis following instillation of silver nitrate for treatment of chyluria. *Nephrol Dial Transplant.* 1996;11:1841-2.
  9. Mandhani A, Kapoor R, Gupta RK, Rao HS. Can silver nitrate instillation for the treatment of chyluria be fatal? *Br J Urol.* 1998;82:926-7.
  10. Shanmugam TV, Prakash JV, Sivashankar G. Povidone iodine used as a sclerosing agent in the treatment of chyluria. *Br J Urol.* 1998;82:587.
  11. Nandy PR, Dwivedi US, Vyas N, Prasad M, Dutta B, Singh PB. Povidone iodine and dextrose solution combination sclerotherapy in chyluria. *Urology.* 2004;64:1107-9; discussion 10.
  12. Yagi S, Goto T, Kawamoto K, et al. Endoscopic treatment of refractory filarial chyluria: a preliminary report. *J Urol.* 1998;159:1615-8.
  13. Zhang X, Zhu QG, Ma X, et al. Renal pedicle lymphatic disconnection for chyluria via retroperitoneoscopy and open surgery: report of 53 cases with followup. *J Urol.* 2005;174:1828-31.
  14. Zhang X, Ye ZQ, Chen Z, et al. Comparison of open surgery versus retroperitoneoscopic approach to chyluria. *J Urol.* 2003;169:991-3.
  15. Punekar SV, Kelkar AR, Prem AR, Deshmukh HL, Gavomde PM. Surgical disconnection of lymphorenal communication for chyluria: a 15 year experience. *Br J Urol.* 1997;80:858-63.
  16. Brunkwall J, Simonsen O, Bergqvist D, Jonsson K, Bergentz SE. Chyluria treated with renal autotransplantation: a case report. *J Urol.* 1990;143:793-6.
  17. Chang CY, Lue YB, Lapidus J. Surgical treatment for chyluria. *J Urol.* 1973;109:299-301.
  18. Yamuchi S. Chyluria: clinical laboratory and statistical study of 45 cases observed in Hawaii. *J Urol.* 1945;54:318-20.