Clinical experience

A comparison of retroperitoneoscopic and open surgical renal pedicle lymphatic disconnection for the treatment of serious filarial chyluria

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Currently the most effective clinical management for serious intractable chyluria is renal pedicle lymphatic disconnection, which generally consists of nephrolympholysis, renal hilar lymphatic vessel stripping and ureterolympholysis. In most conventional open surgical procedures, a lumbar incision is used and perinephrium and adipose capsule of kidney cut open, resulting in a heavy injury and long interval of postoperative recovery. The laparoscopic technique, with minimal invasion, less complications and rapid postoperative recovery, is being utilized more and more as the alternative surgical technique for urological disease.

From April 2003 to March 2005, we treated 17 patients with serious filarial chyluria via retroperitoneoscopic or open surgical renal pedicle lymphatic disconnection. In this paper, we describe our clinical experience and compare the two procedures.

CLINICAL DATA

Patients
Seventeen patients (13 men and 4 women) from filarial epidemic areas of Chongqing, China were admitted to our hospital. The mean age of the patients was 47.6 years (range 27 to 62). All had suffered from the disease for 1.5 to 10.0 years and had typical manifestations including milky urine, weight loss, fatigue and anaemia. Nearly all patients were previously diagnosed filariasis with chyluria and treated unsuccessfully with conservative therapy, such as low fat diet and renal pelvic instillation of silver nitrate. Urine chyle test using Sudan III staining was positive in all patients. Cystoscopic examination and retrograde pyelography were performed to confirm the diagnosis and to determine which side of ureter the chyluria was from, 7 cases from left ureter, 9 from right ureter and 1 from the both ureters.

Nine patients underwent retroperitoneoscopic or open surgical procedures of renal pedicle lymphatic disconnection, respectively. No significant difference was found between the two group in mean age (49.0 and 46.2 years), gender (both with 7 men and 2 women) and number of illness in left/right sides (4/6 and 5/4). The patient with chyluria from both ureters, who had undergone a right side open surgical renal pedicle lymphatic disconnection plus left side inguinal lymph node/great saphenous vein anastomosis, was treated with one more operation of left side renal pedicle lymphatic disconnection via retroperitoneoscopic procedure due to the first operation’s failure in controlling chyluria from left ureter.

Surgical procedures

Open surgery
Under general or epidural anaesthesia, an incision was made in the 11th intercostal region. The perinephrium and adipose capsule were cut open and the kidney was isolated from its surrounding tissues to expose the renal pedicle clearly. Then the lymphatic vessels and fibrous tissues around the renal pelvis, renal hilus and upper ureter were stripped and ligated completely.

Retroperitoneoscopic procedure
The procedure was performed as we described previously. Briefly, general anaesthesia and the lateral decubitus position were used. Firstly, a 2-cm incision was made between the 12th subcostal margin and posterior axillary line (Port A). The muscular layer and the lumbodorsal fascia were divided bluntly and the retroperitoneal space was separated using a finger. After that a balloon dilator was inserted into the space and 600 ml to 1000 ml sterilized normal saline was infused into the balloon to maintain the dilation of retroperitoneal space for 5 minutes. The second and third skin incisions were made at Port B (2 cm away from superior border of iliac crest in midaxillary line) and Port C (between the 11th subcostal margin and posterior axillary line, 8 cm away posterior axillary line). A 5 mm or 10 mm trocar (through Port B) and a 10 mm trocar (through Port C) were guided by the surgeon’s left forefinger through the incisions. Finally, a 10 mm trocar was placed at Port A and the skin incision was sutured closely preventing air...
leakage. Generally, Ports A and B were working ports for surgical manipulation, while Port C was camera port for laparoscopic observation and CO2 insufflation to maintain a peritoneal pressure of 13–15 mmHg.

The lymphatic disconnection was similar to traditional open surgery: ① The dorsal Gerota’s fascia of the kidney was incised longitudinally close to the greater psoas muscle and adipose capsule of the kidney was separated from renal parenchymal surface using an ultrasonic knife. Then adipose tissues on the upper and lower poles and the surface of the kidney were stripped and ligated. ② Renal hilar lymphatic vessel stripping. The renal hilus was clearly exposed and the dilated perihilar lymphatic vessels were completely stripped. Disconnection of lymphatic vessels around renal arteries was started from dorsum through the incisions of the blood vessels. Loose connective tissues containing lymphatic vessels around renal arteries were separated and ligated and then the vagina vasonum on the surface of renal arteries was incised using ultrasonic knife and ligated by titanium clips. Disconnection of lymphatic vessels around renal arteries was relatively easier because renal veins without obvious vaso vasonum. Lymphatic vessels were separated using suction of the surface of renal veins and then ligation by titanium clips. ③ Ureterolympholysis: the ureter was isolated downward to the fork of iliac artery and lymphatic vessels around upper ureter were completely stripped.

**Outcome measures and statistical analysis**

The clinical observational indexes were the operative efficacy, the operation time, intraoperative blood loss, postoperative gastrointestinal recovery time, retroperitoneal draining time and postoperative hospital stay.

Data were expressed mean ± standard deviation (SD) and compared by two tailed t test using SPSS12.0. *P* value less than 0.05 was considered statistical significance.

**Clinical outcomes**

The median followup was 21 months (range 8 to 32). Chyluria in all patients disappeared completely and no gross chyluria reappeared within the maximum followup. Urine chyle tests were negative and body weight, haemoglobin and blood albumin gradually rebounded to the normal levels, suggesting that no recurrence occurred and nutritional status was improved.

Postoperatively mild gross haematuria happened in 4 patients but disappeared in 1–2 days. Subcutaneous dropsy around laparoscopic ports occurred in 3 patients in retroperitoneoscopic group and vanished in 3–4 days. Chyle leakage from incisions was not found in either group. The patient who had chyluria from both ureters initially underwent a right side open surgical renal pedicle lymphatic disconnection plus left side inguinal lymph node/great saphenous vein anastomosis with the persistent but palliative chyluria postoperatively. Cystoscopy showed chyluria from left ureter; simultaneously computed tomography indicated a small right side retroperitoneal haematoma, which spontaneously organized later. Thus, a left side renal pedicle lymphatic disconnection was performed via retroperitoneoscopic approach 7 months later.

Perioperative data of the two groups were collected for comparison by statistical analysis. The *t* test showed that retroperitoneoscopic surgical had many advantages over open surgical: shorter operation time, less intraoperative blood loss, much quicker postoperative gastrointestinal function recovery and shorter retroperitoneal drainage time and hospital stay (Table).

### Table. Clinical outcomes between the open and retroperitoneoscopic groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Operation time (minutes)</th>
<th>Intraoperative blood loss (ml)</th>
<th>Gastrointestinal recovery time (hours)</th>
<th>Extubation time (hours)</th>
<th>Postoperative hospital stay (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>178±62</td>
<td>130±52</td>
<td>56±16</td>
<td>37±9</td>
<td>9±3</td>
</tr>
<tr>
<td>Retroperitoneoscopic</td>
<td>77±24*</td>
<td>46±17*</td>
<td>31±8*</td>
<td>27±5*</td>
<td>6±1*</td>
</tr>
</tbody>
</table>

*P*<0.01 compared with the open surgical group.

**DISCUSSION**

The aetiological factors of chyluria are mainly classified as parasitic and nonparasitic, filarial infestation is the most frequent. The mechanism of filarial chyluria might be the mechanical and inflammatory injuries resulted from the filarial adult worms’ colonization in human retroperitoneal lymphatic system which injure lymph vessels and their valves leading to obstruction of lymph vessels, lymphostasis, lymphoedema and lymph leakage. This usually happens in the perirenal lymph vessels and allows chyle to leak out and mix with urine, forming chyluria.\(^3\) Chyluria may lead to massive loss of fat and protein via urine, resulting in anaemia, hypoproteinaemia, general fatigue, body weight loss, systemic oedema and immunodeficiency.

Conservative treatments adapt to most filariasis patients with mild chyluria only, including low fat and high protein diet and renal pelvic instillation of sclerosing agents, such as povidone iodine, silver nitrate and sodium iodide.\(^4,5\) Antifilarial drugs are considered useless for improving symptoms, since chyluria is the advanced-stage manifestation of filariasis.

Surgical applies to serious cases of filarial chyluria. The procedures include inguinal lymph node/great saphenous vein anastomosis, renal pedicle lymphatic disconnection, nephrectomy and renal capsulectomy.\(^6\) Among these,
renal pedicle lymphatic disconnection is the most effective for chyluria. In 1997, Punekar et al reported a total achievement ratio of 98%. In 2003, Zhang et al reported a 100% cure rate of renal pedicle lymphatic disconnection for chyluria via both open surgery and retroperitoneoscopic approach.

The disadvantages of traditional open renal pedicle lymphatic disconnection are mainly due to the heavy injury: skin, subcutaneous tissue and muscular layers are cut open, and renal blood supply is affected in the course of exposing the kidney, thereby prolonging the postoperative hospital stay. Meanwhile, the application of laparoscopic technique for chyluria for more than a decade has shown that patients cure and recover well without recurrence and serious short- and long-term complications. Retroperitoneoscopic procedures are as effective as open surgery. Furthermore, they have the advantages of minimal injury, relatively shorter operation time, less blood loss and more rapid postoperative recovery compared with open surgery.

In all 9 patients who underwent retroperitoneoscopic procedures, gross chyluria disappeared immediately after operation without obvious intra- or post-operative complications and recurrence within the followup. We also gain the following experience from our practice: retroperitoneoscopic disconnection of renal pedicle lymphatics should be more thorough and safer, because in a retroperitoneoscopic view, local structures appear magnified, the fine lymph vessels around the renal blood vessels and upper ureter can be clearly observed, stripped and ligated.

To sum up, retroperitoneoscopic renal pedicle lymphatic disconnection can achieve at least the same clinical efficacy as open surgery and is superior in terms of minimal invasion, more rapid postoperative recovery, shorter hospital stay and less pain to patients. We recommend the retroperitoneoscopic procedure as the alternative surgical treatment except the traditional open surgical renal pedicle lymphatic disconnection for serious chyluria.

REFERENCES


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