Recurrence of Chyluria after Surgery: Erythromycin Solution Sclerotherapy and a Review of Literature

Ao Xu, Xiang Li, Jinhan Zou, Shuai Ruan, Xi Guo

Department of Urology,The First Affiliated Hospital of Hunan Normal University ,Hunan Provincial People's Hospital, Changsha 410005, Hunan, China

DOI: 10.32629/jcmr.v5i4.3133

Abstract: Chyluria refers to the appearance of milky white urine mixed with chylous fluid or lymph, which is usually caused by lymphatic obstruction caused by a variety of diseases. A case of recurrent chyluria after retroperitoneal laparoscopic renal pedicle lymphatic disconnection was reported. The patient developed chyluria again 8 months after operation and was cured after sclerotherapy with erythromycin solution.

***Keywords*:** chyluria; laparoscopic renal pedicle lymphatic disconnection; sclerotherapy; erythromycin

1. Introduction

Chyluria is a common urological disease. The characteristic clinical manifestation of chyluria is the milky color of urine mixed with albumin, emulsified adipose tissue and fibrin. The cause appears to be a rupture of retroperitoneal lymphatic vessels into the collecting system giving urine a milky appearances. This communication is caused by the obstruction of lymphatic drainage proximal to intestinal lacteals, resulting in dilatation pf distal lymphatics and the eventual rupture of lymphatic vessels into the urinary collecting system. If left untreated, it can lead to serious complications such as recurrent renal colic, blood chyluria and hypoproteinemia. Chyluria can be classified as mild, moderate, and severe. Depending on the severity of the disease, different treatment options are used, including conservative treatment, sclerotherapy, and surgical treatment. We report an experience of using erythromycin solution as a sclerosing agent to treat recurrent chyluria after surgery.

2. Case description

The patient, male, 86 years old, was admitted to hospital on May 11, 2023 because of "milky white urine with blood clot ". He had dysuria and urinary retention once. He may have been infected with filariasis because of his forest farm working history. The patient was thin and tall and was diagnosed with hypoproteinemia. No obvious structural abnormality of urinary system was found in CTU (Figure 1). Cystoscopy showed a large number of chyle lumps and a small amount of blood clots in the bladder, milky white urine was intermittently sprayed at the left ureteral orifice (Figure 2), and bilateral renal pelvis urine was collected by indwelling bilateral F6 ureteral catheters. the results showed that the left urinary chyle test was positive and the right urinary chyle test was negative. The patient underwent retroperitoneal laparoscopic renal pedicle lymphatic ligation on May 23, 2023. The perirenal drainage tube was removed 3 days after operation. There were no complications such as chyle leakage and nephroptosis. After reexamination, the urine chyle test was negative and no recurrence was found after 6 months follow-up. The patient was admitted to hospital for the second time on March 26, 2024 because of "milky white urine". The cystoscopy showed that milky white urine was intermittently sprayed at the left ureteral orifice, which was evaluated as mild chyluria. Then use erythromycin solution as sclerosing agent for treatment. The injection method was as follows: retrograde catheterization of ureteral catheter F6 into the left renal pelvis under ureteroscope, injection of 1% lidocaine 5ml for renal pelvic mucosa anesthesia, dissolving erythromycin 0.6g-0.9g in 10ml normal saline, pushing the solution into the renal pelvis within 20 seconds, and washing the renal pelvis with normal saline once after 2min. In the same way, erythromycin was perfused twice, and the ureteral catheter was pulled out after lavage. The chyle test was still positive within 1 week and turned negative after reperfusion treatment, and the patient was discharged after recovery. There was no recurrence after 3 months of follow-up.

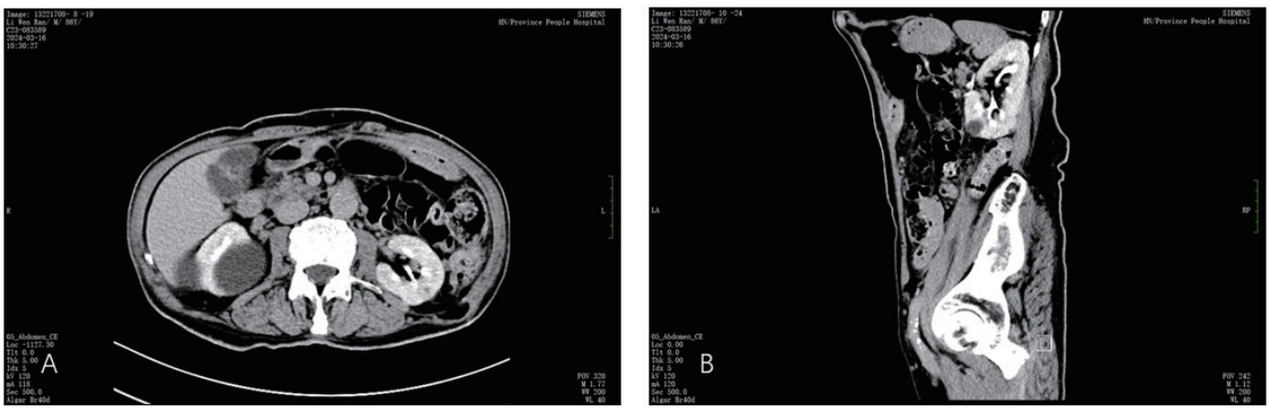

Figure 1. No obvious structural abnormality of urinary system was found in CTU

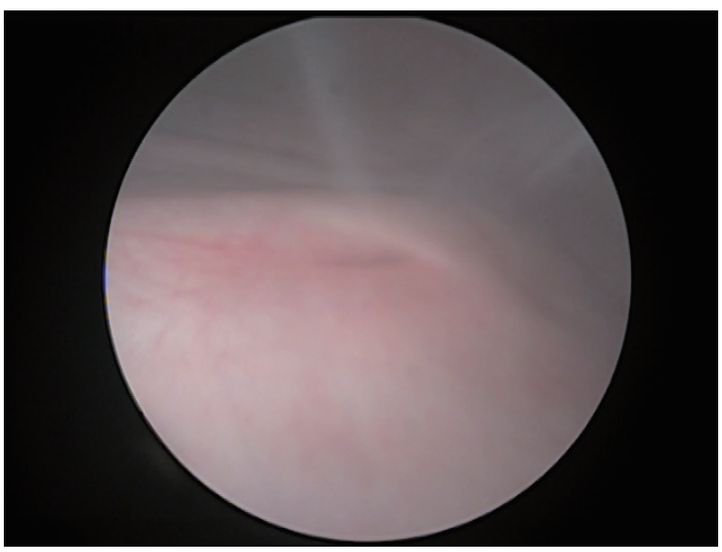

Figure 2. Cystoscopy images showing efflux of milky urine

3. Discussion

Chyluria is divided into parasitic and non-parasitic. Parasitic chyluria is common in subtropical and tropical countries where filaria parasitic infection is prevalent. 120 million people are infected worldwide. In China, chyluria is mostly caused by wuchereria bancrofti and brugia malayi[1]. The brugia malayi is mainly parasitic in the superficial lymphatic system of the upper and lower extremities; in addition to the superficial lymphatic system, the wuchereria bancrofti is mostly parasitic in the deep lymphatic system, such as scrotum, spermatic cord, renal pelvis and so on[2]. Filariasis infects the retroperitoneal lymphatic system. Mechanical and inflammatory injuries cause rupture of lymphatic vessels and valves and varicose lymphatic vessels. The lymphatic fluid flows back into the renal lymphatic vessel and mixes with the urine through the rupture near the renal papilla to form chyluria. When male and female worms mate, the female produces microfilariae, which enter the blood circulation from the lymphatic system and generally remain in the capillaries of the lungs and other organs during the day and begin to appear in the surrounding blood at night. However, microfilariae can not be found in the serum of most patients. Therefore, chyluria is clinically considered as a late complication of filariasis. The pathogenesis of non-parasitic chyluria, such as congenital abnormalities, tumors, tuberculosis, abscess formation, postoperative trauma, etc., widely accumulate retroperitoneal lymphatic system leading to reflux destruction. The incidence of the disease in males (86%) was significantly higher than that in females (14%), and left chyluria was more common[3]. In this case, the forest farm where the patient works is located in the central mountainous area of Hunan Province, which belongs to the endemic area of filariasis[4]. The patient had a long history of living in endemic areas and clinical manifestations of chyluria, so we think he was infected with filariasis.

Chyluria was divided into three degrees according to the severity of Guttilla[5]. In mild patients, only one renal calyx was involved, chyluria occurred intermittently and no chyme clot was found in mild patients, more than 2 renal calyces were

involved in moderate patients, chyluria occurred intermittently, with or without chyme clots, and in severe patients, most of the renal calices were involved, continuous chyluria, at least once urinary retention, bloody chyluria, weight loss and other symptoms.

For patients with early mild chyluria, conservative treatment options such as low-fat, high-protein diet and bed rest are feasible, but the recurrence rate is high. Sclerotherapy refers to retrograde infusion of sclerosing agent through ureteral stent. The common sclerosing agent is 1%~2% silver nitrate, tetracycline, 10%povidone-iodine, 35% compound meglumine diatrizoate[6-9]. The mechanism of drug sclerotherapy in the treatment of chyluria is that the drug enters the lymphatic vessels at the eminence of the renal dome under certain pressure, which induces chemical lymphangitis and lymphatic edema, resulting in lymphatic obstruction, and then closes the communicating branches of the lymphatic vessels in the collecting system[10]. It is reported in the literature that the above sclerosing agents have the advantages of good curative effect, low recurrence rate and repeated treatment, but there are also severe local reactions, even serious complications such as acute renal failure, shock, myocardial infarction, hemolysis and so on. According to the characteristic that erythromycin solution is easy to cause mucosal inflammatory reaction, we used high concentration erythromycin solution to infuse renal pelvis for many times and achieved obvious results[11].

Surgical treatment was performed for patients with ineffective conservative treatment, severe symptoms and long medical history. Surgical treatment includes lymphatic vein anastomosis and renal pedicle lymphatic disconnection. With the development and wide application of endoscopic technology, clinical practice has proved that laparoscopic renal pedicle lymphatic ligation is currently recognized as the most effective method for the treatment of chyluria[12]. The patient in this case is an elderly male with thin physique, relatively less retroperitoneal and perirenal fat, large retroperitoneal space, and less interference to the intestinal tract, which is beneficial to the recovery of intestinal function after operation. therefore, retroperitoneal laparoscopic renal pedicle lymphatic ligation was chosen for the first operation.

This disease is rare , and the recurrence rate of chyluria after laparoscopic ligation of renal pedicle lymphatic vessels is very low, and there are few reports. Through this case, we summarize as follows: (1) retroperitoneal laparoscopic renal pedicle lymphatic ligation is difficult and requires high technical requirements for operators. it is necessary to separate the thicker lymphatic vessels, the perirenal loose tissue containing a large number of lymphatic vessels, and the fine lymphatic vessels around the renal vessels and the upper ureter. The chyluria after recurrence was significantly less than that at the first hospitalization, so the recurrence in this case may also be caused by the leakage of small lymphatic vessels between the renal pedicle. (2) Ureteral catheter should be inserted into the renal pelvis to anaesthetize the mucosa of the renal pelvis and calyceal, so that the mucosa is fully exposed to erythromycin solution. This method has no obvious pain, safe operation and few complications. Erythromycin is commom,inexpensive and readily available, so it is a safe and effective method.

4. Conclusion

The best treatment plan should be selected according to the severity of chyluria. Sclerotherapy using erythromycin solution as the sclerosing agent was effective and safe for the management of a patient with mild chyluria.

Consent

This study was approved by the committee and informed consent was obtained.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

All authors declare no conflict of interest.

References

[1] Major achievements and experience in filariasis control in the People's Republic of China. National Technical Steering Group for Filariasis Control and Research [J]. Chin Med J (Engl), 1991,104(6): 446-453.

[2] Lymphatic filariasis [J]. Wkly Epidemiol Rec, 2001,76(20): 149-154.

[3] Singh H, Singla A, Jain A. Chyluria-a review of literature and a modified sclerotherapy regimen [J]. Turk J Urol, 2019,45(Supp. 1): S174-s177.

[4] De-Jian S, Xu-Li D, Ji-Hui D. The history of the elimination of lymphatic filariasis in China [J]. Infect Dis Poverty, 2013,2(1): 30.
[5] Guttilla A, Beltrami P, Bettin L, et al. Chyluria: the state of the art [J]. Urologia, 2017,84(2): 65-70.
[6] Dhabalia JV, Pujari NR, Kumar V, et al. Silver nitrate sclerotherapy for chyluria: evaluation for the optimal instillation regime [J]. Urol Int, 2010,85(1): 56-59.
[7] Guttilla A, Beltrami P, Bettin L, et al. Non-Parasitic Chyluria: Our Experience With Sclerotherapy With Solution of Povidone-Iodine and Destrose and A Review of the Literature [J]. Urol Case Rep, 2016,8: 28-30.
[8] Nandy PR, Dwivedi US, Vyas N, et al. Povidone iodine and dextrose solution combination sclerotherapy in chyluria [J]. Urology, 2004,64(6): 1107-1109; discussion 1110.
[9] Shanmugam TV, Prakash JV, Sivashankar G. Povidone iodine used as a sclerosing agent in the treatment of chyluria [J]. Br J Urol, 1998,82(4): 587.
[10] Tada I. Pathogenesis and treatment of chronic symptoms with emphasis on chyluria and elephantiasis [J]. Trop Med Health, 2011,39(1 Suppl 2): 47-50.
[11] Zhang RuJi ZR, Zhang YongHai ZY, Xu QingChun XQ, et al. Efficacy of tetracycline, erythromycin, meglumine diatrizoate, and silver nitrate in the treatment of patients with chylous urine [J]. 2006.
[12] 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]. J Urol, 2005,174(5): 1828-1831.