Retroperitoneoscopic renal pedicle lymphatic disconnection for chyluria following abdominal surgery

Abstract  We report a rare case of chyluria following surgery for stomach cancer. A 75-year-old man underwent a partial gastrectomy with the Billroth I method and a cholecystectomy. He was referred to our department because of general fatigue, appetite loss, edema, and chyluria. His laboratory data revealed hypalbuminemia, hyponatremia, and proteinuria. Cystoscopy showed a spout of chyluria from the left ureter orifice. We performed flexible ureteroscopy and observed a spout of chyluria from a large fistula in the left lower calyx. 2.5% hydrogen peroxide solution was injected toward the hole retrogradely, but it was ineffective. Retroperitoneoscopic left renal pedicle lymphatic disconnection was performed. The patient’s hypalbuminemia, hyponatremia, proteinuria, and chyluria disappeared and his general fatigue, appetite loss, and edema improved postoperatively. By six months after the operation, he had had no recurrence of chyluria. Therefore, retroperitoneoscopic renal pedicle lymphatic disconnection is a useful and reliable treatment for intractable chyluria.

Key words  chyluria, kidney, laparoscopy, lymphatic vessels, stomach cancer

Introduction  Chyluria is a rare cause of cloudy urine. It results from an abdominal operation between the lymphatic system and the urinary tract, allowing lymph fluid to be mixed with urine. Because it is rare, chyluria might be often underdiagnosed or misdiagnosed in other doctors beside urologists. On the other hand, an early diagnosis and definitive treatment are necessary since lymph fluid into the urine leads to a loss of protein and lipids, malnutrition, weight loss, immunodeficiency, and deficiency of the fat-soluble vitamins.

We report a case of chyluria following surgery for stomach cancer. Retroperitoneoscopic renal pedicle lymphatic disconnection (RRLPD) was performed, and chyluria disappeared on postoperative day 1. At six months after the RRLPD, the patient’s chyluria had no relapse.

Clinical summary  A 75-year-old man was referred to our department because of general fatigue, appetite loss, edema, and cloudy urine. At physical examination, pitting edema was present. Laboratory investigations showed proteinuria (4.0 g/day), hypoproteinemia (4.5 g/dL), hypoalbuminemia (2.1 g/dL), and hyponatremia (126 mEq/L).

At the age of 55 years, the patient had stomach cancer and had undergone a partial gastrectomy with the Billroth I method and a cholecystectomy. Cloudy urine had been observed in his laboratory date since post operative 1 year, a urologist had not been consulted. However, he went to our department of urology because of having a history of left side flank pain and the notice of cloudy urine in the past 5 years. In Addition, he had not been to a tropical area.

Cystoscopy showed a spout of chyluria from the left ureter orifice. He was initially placed on diet restriction (e.g., low-fat diet with medium-chain triglyceride supplementation), based on a diagnosis of chyluria due to lymphorrhea at the left pelvis, which was associated with his stomach cancer surgery. However, the chyluria did not disappear and the treatment aggravated the patient’s general fatigue, appetite loss, edema, and cloudy urine.

In June 2012, flexible ureteroscopy was performed, and a spout of chyluria from a large fistula in the left lower calyx was observed (Fig. 1). We injected three times 10 ml of 2.5% hydrogen peroxide solution toward the hole retrogradely. The bubbling contracted the hole of large fistula. Chyluria was not seen from the hole during this operation, but chyluria reappeared on postoperative day 1. In July 2012, RRLPD was performed. Lymphatic vessels, which was from the upper edge of celiac artery foot to the upper edge of inferior mesenteric artery root, were disconnected by using a vessel
sealing system or were ligated by clips (Fig. 2). Chyluria disappeared on postoperative day 1. At six months after RRPLD, the patient’s proteinuria had disappeared, hypoproteinemia and hypoalbuminemia had improved, and he had had no relapse.

Discussion

Chyluria is the passage of chyle into the urine through an abnormal communication between the urinary tract and the lymphatic system. Chyluria is usually classified as either parasitic or nonparasitic. The former results from filariasis, but this form of chyluria is almost extinct in Japan. The latter is caused by tuberculosis, pregnancy, neoplasms, and idiopathic and congenital conditions; however, it can also be secondary to iatrogenic causes. Urologists should pay attention that chyluria may be a complication of radical nephrectomy, partial nephrectomy, and radiofrequency ablation of renal tumors. However, chyluria resulting from these urological operations has no clinical signs or symptoms and is coincidentally found by CT imaging: fat fluid level in bladder. Most patients only need dietary restriction to a low-fat diet to cure their chyluria. On the other hand, chyluria following abdominal surgery (except for urological operations) is very rare and intractable. To our knowledge, few similar cases have been reported. Higuchi et al reported the one case of chyluria that occurred after the patient underwent a right lobectomy with bile duct and portal vein resection and reconstruction for gallbladder cancer. Panchal et al reported two cases of chyluria: one case occurred after a total abdominal hysterectomy and the other case occurred after a radical cystectomy.

The reason for chyluria after abdominal surgery may be related to extensive lymph node dissection. It was difficult to identify the reason for chyluria of this case as whether being idiopathic or iatrogenic, but we speculated that this case resulted from iatrogenic reason of surgical operation, because chyluria of this our case appeared at post operative 1 year after abdominal surgery and was intractable to conservative treatment.

Some chyluria patients could obtain satisfactory curative effects through conservative treatments such as dietary management and retrograde renal pelvic instillation of various agents such as povidone iodine or silver nitrate. Hayashi et al reported that hydrogen peroxide was a safe and useful treatment for the recurrence of essential renal hematuria after the instillation of silver nitrate. For our chyluria patient, we selected hydrogen peroxide instillation to treat the large fistula, guided by flexible ureteroscopy; however, the treatment was ineffective. Our patient had a large fistula that resulted from the obstruction of the lymphatic system after lymph node dissection for stomach cancer. He required RRPLD as a surgical intervention. Retroperitoneoscopic renal pedicle lymphatic disconnection is a useful and minimally invasive technique to treat patients with intractable chyluria. Chyluria in our patient disappeared on postoperative day 1. His proteinuria, hypoproteinemia, hypoalbuminemia, and hyponatremia eventually improved after RRPLD.

Laparoscopic surgery is a minimally invasive treatment. It reduces blood loss, shortens the patient’s postoperative hospital stay, minimizes wound pain, and results in an earlier return to normal activity. Various operations therefore use this technique. We performed
laparoscopic renal pedicle lymphatic disconnection by using a retroperitoneal approach. This allows immediate access to the renal artery, renal vein, and renal pedicle lymphatic vessels. Zhang et al\textsuperscript{16} compared the clinical efficacy of RRPLD for treating chyluria with the clinical efficacy of open surgery, and concluded that RRPLD has the advantages of minimal invasion and rapid recovery, compared to open surgery. Wang et al\textsuperscript{15} reported the method of RRPLD for intractable chyluria caused by filariosis, lymphatic vessels around renal arteries were disconnected using ultrasonic scissors and ligated by titanium clips. Our method of RRPLD for chyluria following abdominal surgery and their method were almost same.

In conclusion, chyluria following abdominal operation is very rare and intractable. We recommend RRPLD for treating chyluria after abdominal operation.

The authors have thier self-reported conflicts of interest to disclose : No

References
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