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Original Research Paper

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Prevention of the second	IANAGEMENT OF CHYLE LEAK AFTER RETROPERITONE. COLLAGEN SEALANT PATCH BE AN OPTION? - A C	AL SURGERIES: CAN CASE REPORT.
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# ABSTRACT

FORR

Background: Chyle leak (CL) after retroperitoneal surgeries (RPS) is an uncommon and unwelcomed complication. Usually, it results due to the injury of major lymphatics during lymphadenectomy. CL is associated with adverse physical and psychological consequences and its management strategy also should focused on the patient's nutrition and psychological support. Conservative treatment (CT) is the initial treatment with good outcome, however selected patients require surgical interventions when CL does not stop with CT. Case report: 23 years old female who underwent radical nephrectomy with retroperitoneal lymph node dissection (RPLND) for local recurrence after initial partial nephrectomy, developed CL, which was refractory to conservative management. After futile available conservative options, patient was explored and CL finally stopped after suturing a collagen sealant patch (CSP) on the friable leak site. Conclusion: Collagen sealant patch is an effective alternative in surgical armament to control CL in unfavorable circumstances.

KEYWORDS : Retroperitoneal surgery, Lymphadenectomy, Chyle Leak, Collagen sealant patch.

# BACKGROUND

Chyle leak (CL) is a known complication after major retroperitoneal surgeries (RPS) that requires lymphadenectomy. Malignant diseases of the abdomen and congenital malformations of the lymphatic system are the most common causes [1].

Among urn-oncological procedures retroperitoneal lymphadenectomy (RPLND) done for testicular and kidney cancers is common procedure that causing CL [2].

CL after radical nephrectomy is uncommon as the regional lymphadenectomy has limited indication and tends to be less extensive [3].

Initial management of CL is conservative and multidirectional, as it causes nutritional and immunological imbalance. Surgical intervention indicated in patients who do not respond to conservative management [4,5].

We report a case of chyle leak post RPLND in renal cancer, who initially was managed conservatively and later had to be surgically repaired using collagen sealant patch (CSP).

# CASE REPORT

23 years old female had back pain and 2 episodes of painless hematuria. Computed tomography (CT) scan revealed left upper pole renal mass (4.5 x 2.8 cm size), hilar lymphadenopathy and no distant metastasis. She underwent open left partial nephrectomy with adrenalectomy and lymphadenectomy. Histopathology showed clear cell renal cell carcinoma with lymph node metastasis. The patient was kept under observation and after 6 months a follow-up CT scan showed nodal recurrence at the para-aortic region.



Figure 1. Positron Emission Tomography and contrast enhanced computed tomography (PET-CECT) Scans. (A) PET CT transverse Image: left para-aortic nodal mass with low grade FDG uptake (white arrow), (B) CT scan transverse view: 3.3 cm x 2.1 cm left paragortic nodes (black arrow) with necrosis within.

The patient came to our institute for further management. FDG PET CT (Fig. 1A and B) confirmed the para-aortic nodal recurrence with no distant metastasis. Left radical nephrectomy as intraoperative ultrasound showed a suspicious lesion in the left kidney with extended RPLND was performed. Histopathology showed metastatic lymph nodes with extra nodal extension (9/12) with no residual tumor in the kidney. On Postoperative day (POD)5, drain showed milky white color, and biochemical analysis confirmed it as chylous fluid. Dietary measures were started to reduce chyle leak with medium-chain triglyceride, and high protein, fat-free diet. CL persisted; hence Octreotide was started after which drain color became serous in 5 days and output decreased, drain removed and patient was discharged. After one-week patient came to the emergency department with abdominal distension and ultrasound and CT scan showed moderate ascites. A pigtail drain was inserted in abdomen and that chylous fluid drained. Patient managed with dietary modification, Octreotide and total parenteral nutrition. CL persisted; lymphangiography was performed which demonstrated extravasation at cisterna chyli (Fig. 2A) more lipoidal was injected, hoping for a chemical inflammation and stopping chyle leak which was ineffective. After 8 weeks of failed conservative management and persist high drain output (1150 ml/day), and deteriorating patient's nutritional status surgical repair of CL was planned. After giving butter on morning of surgery, the patient was explored. Active CL was found at multiple sites at interaortocaval region in area near chyle duct (Fig. 2B). Mass suturing was attempted but as tissue was fragile and inflamed, sutures cut through the tissue. PTFE pledged sutures were attempted, but didn't stay. Then, CSP was anchored with proline sutures to seal of the main leak. CL stopped after this maneuver, similar patches were anchored in the adjoining area (Fig. 2C and D). Vessel sealant

was spread over the whole area additionally. Omentum was brought near the area and anchored with the intent to help healing. Absence of leak was checked with Valsalva maneuver.



Figure 2. (A) Lymphangiogram showing the leak at L2 level (white arrow long) with pigtail (white arrow small), (B) Intraoperative image showing chyle leak, (C) Suturing of collagen sealant patch to site of chyle leak (white arrow), (D) No chyle leak demonstrated after suturing collagen sealant patch (white arrows).

The postoperative period was uneventful with clear drain fluid, patient being discharged after 10 days. On follow up cross-sectional imaging showed no collection (**Fig. 3**).



**Figure 3.** CT image showing no evidence of intra-abdominal collection on follow up after three Months.

### DISCUSSION

During RPS an unidentified injury to the cisterna chyli or abnormal collateral of retroperitoneal lymphatics secondary to large lymphadenopathy may lead to CL [6].

The time of presentation of CL can be varied postoperatively with ranging from days to weeks with symptoms of abdominal distension and pain, nausea, vomiting, dyspnea [7].

In our case, CL was seen on 5th POD and have symptoms of abdominal fullness, pain and distension within a week after she was discharge.

CL can be diagnosed clinically by appearance of milky fluid in drain or by chemical analysis of fluid with high triglyceride levels 2–8 fold that of plasma (range 0.4–4 gm/dl) and protein content greater than 3 gm/dl with hypoalbuminemia, lymphocytopenia, and anemia secondary to protein loss and malnutrition [8].

In our patient, the CL fluid had triglyceride level of 650gm/dl. We initially evaluated with computed tomography (CT) of the abdomen which is the imaging modality of choice to evaluate intraperitoneal fluid but it's not useful for differentiating chylous ascites and ascites of other origins, as the attenuation coefficient of chyle is similar to that of water, urine, bile, or intestinal contents [1, 9].

Lymphangiography is considered the gold standard

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diagnostic modality to identify the site of CL. Lipiodol the contrast agent, is found to induce an inflammatory and granulomatous reaction on extravasation hence reduces leakage [10].

CL did not stop after lymphangiography in our case probably due to multiple areas of large leak.

As the CL is associated with physical and psychological adverse consequences, management of CL should not be focused only to decrease the chyle out-put but also on the maintenance of nutritional and correction of metabolic complications [1].

Treatment options of CL can be divided into- A) Conservative, B) Surgical.

**Conservative approach:** It is the primary modality for managing CL with a high success rate. It includes the use of both dietary measures and pharmacological agents. Dietary measures consist of intake of high-protein and low-fat diet with restriction of long-chain fatty acids and salts. Carbohydrate and medium-chain fatty acids (MCFA) are given to fulfill calories requirement. MCFA help in reducing CL as they directly enter the portal system without absorption by the mesenteric lymphatic system [1,6].

If oral dietary measures fail then prolong total parenteral nutrition (TPN) (2-6 weeks) should be given which facilitates bowel rest and helps to resolve CL in 60-100% of all cases. Upfront TPN should be initiated in patients with severe nutritional and metabolic complications [1].

Somatostatin or somatostatin analogs (such as octreotide and larazotide) can be added as they reduce the lymphatic flow, lipid absorption and triglyceride concentration in major lymphatics and thus decreasing CL output within 24-72 hours [11].

Conservative management is generally recommended for at least 4–8 weeks (11). It allows the resolution of chylous ascites in 70-90% of cases [9,11].

#### Surgical:

The indications for surgical intervention are a) failed conservative management or b) drain output more than 1 liters/day for consecutive 5 days or c) severe nutritional or metabolic complications(16).

Surgery can be performed early or late each having advantages or disadvantages (**Table 1**). However, there is no consensus about the timing of intervention [1,3].

Timing	Advantages	Disadvantages	
Early Surgical intervention	<ol> <li>Early identification and suturing of the leaking lymphatic vessel</li> <li>Metabolic and nutritional complications are avoided</li> <li>Shortens the hospital stay associated with CT.</li> </ol>	<ol> <li>Conservative management can be offered which is usually effective.</li> <li>Patient exposed to second surgery within short period may affect post op recovery.</li> <li>Sometime urine leak persists, that again requires Conservative management.</li> </ol>	
Late Surgical intervention	<ol> <li>Most of the cases conservative management is usually effective, Surgery can be avoided.</li> </ol>	<ol> <li>Repair of lymphatic leakage may be difficult and can generate important morbidity.</li> </ol>	

2)	Metabolic and nutritional status maintained.	2) 3) 4)	More expensive. Associated with longer hospital stay. Should be reserved
		-1/	only for cases refractory to conservative management.

Various surgical options are described to control CL: 1) identification and suturing of the damaged lymphatic trunk, 2) mass suturing of lymphatic tissue with non-absorbable suture in combination with a pair of Teflon felt strips with fibrin glue if identification of the damaged lymphatic vessel is not possible [12].

Peritonea-venous shunt, percutaneous transabdominal puncture and embolization of the leaking lymphatic trunk were tried with limited success in selected patients such as poor performance status who are unable to undergo major surgery to manage CL[13,14].

Few studies used CSP successfully to reduce lymphatic drainage and seroma formation after axillary and inguinal lymph node dissection [15]. In our best knowledge usefulness of CSP in managing CL has not been described in literature, and in our experience CSP found to be good alternative in unusual circumstances while managing CL surgically.

### **CONCLUSION:**

Prolonged post CL needs individualized and special care as it causes adverse psychological and physical consequences. Surgical repair is the last option. We found a new armament, the CSP, which should be considered a good option while intervening for CL to improve the surgical outcome.

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