

## Chyle Leak Following Laparoscopic Cholecystectomy For Gall Stone Disease: A Rare Case Report

Bhanu teja A P<sup>1</sup>, Yaswanth kumar G<sup>1</sup>, Nagamuneiah S<sup>1</sup>, Madhu S Kammineni<sup>1</sup>,  
Prakash G V<sup>1</sup>, Shariff S A<sup>1</sup>

<sup>1</sup>. Department of General Surgery, Sree Venkateswara Medical college, Tirupati.

Corresponding Author: Bhanu teja A P

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### Abstract:

**Background:** Laparoscopic Cholecystectomy is the gold standard surgical procedure for gall stone disease. Chylous leak following Laparoscopic Cholecystectomy is an infrequent complication. There are to our knowledge only 5 reported cases of post laparoscopic cholecystectomy chylous leak and 1 reported case of post open cholecystectomy chylous leakage.

### Case Report:

We present a 60-year-old woman with a history of Acute calculous cholecystitis 6 weeks prior. She was electively admitted for Laparoscopic Cholecystectomy, and the procedure was done with some difficulty due to adhesions. A closed, non-suction drain was placed intraoperatively draining serosanguinous fluid. Two days postoperatively the draining fluid changed to a milky color fluid about 150ml with a high triglyceride level. The chylous leak was confirmed clinically as the patient was on nil by mouth, and by fluid analysis - Triglyceride level 638mg/dL. The patient was managed conservatively. She was kept on Octreotide and nil by mouth for 7days. Chylous leak gradually decreased and resolved entirely by 11th postoperative day. So the drain was removed, and the patient was discharged. On follow-up, there were no complaints, and the patient is healthy.

### Conclusion:

This case illustrates the rare complication of Laparoscopic Cholecystectomy. Even though uncommon, knowledge about this complication is vital in managing the case effectively and preventing the deleterious complications of chylous ascites.

**Keywords:** Chyle leak, Post laparoscopic cholecystectomy, Lap cholecystectomy complications

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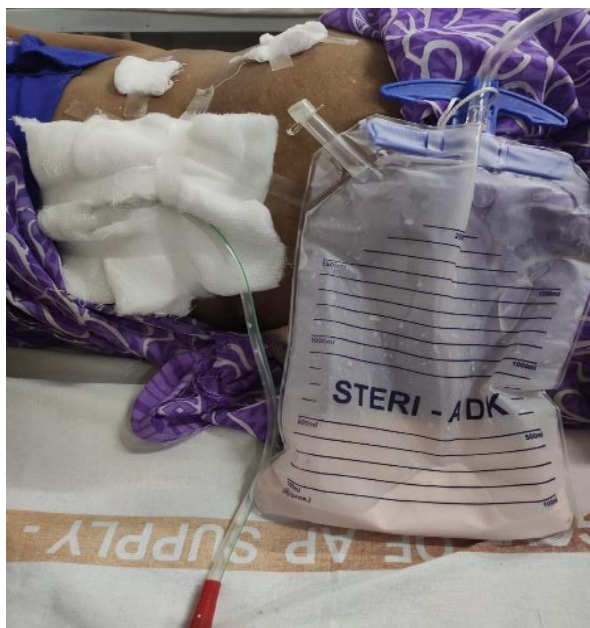
## I. Introduction

Gall stone disease is a widespread disease in clinical practice. Nowadays, it is treated by laparoscopic cholecystectomy very safely with minimal trauma, discomfort, and short hospital stay. A chylous leak is an uncommon complication following laparoscopic cholecystectomy. There are only six reported cases in the literature to our knowledge. Among the 6 cases, five were post-Laparoscopic cholecystectomy, and one case was post-open cholecystectomy. It is a rare post-operative complication, especially in cholecystectomy, where major lymphatics are unlikely to be damaged.

## II. Case Report

A 52-year-old female presented with a 2days history of nausea, vomiting, and pain in the right hypochondrium. She had no other surgical or medical problems. On examination, all other observations were within normal limits. Her abdomen was mildly tender in the right hypochondrium without any palpable masses or evidence of peritonitis. Laboratory data showed elevated Total Leukocyte Count  $16.2 \times 10^9/L$  (normal:  $4.0-11 \times 10^9/L$ ), Bilirubin, alkaline phosphatase, alanine transaminase, LDH and serum amylase and lipase are within normal limits. Ultrasound abdomen revealed a thickened gallbladder wall containing gallstones. Computed tomography(CT) of the abdomen was performed, which showed the presence of calculous cholecystitis. An interval Laparoscopic cholecystectomy was performed on an elective setting after 6weeks. Intra-operative finding showed thick adhesions and contracted Gallbladder. A closed, silastic, non-suction drain was placed in the right sub-hepatic space. The patient tolerated the procedure well and resumed oral intake later on the day of surgery. Antibiotic coverage and other supportive treatment were given after the operation. Post-operative pathology revealed acute cholecystitis with cholelithiasis. The patient recovered well, tolerating diet, and the drain was draining minimal serosanguinous fluid. However, on post-operative day 2, there was an acute increase in the volume in the drain, from 50 mL to 250 mL in 24 hours, and the fluid drained changed to a milky

white color. The patient was clinically well throughout, and vitals were stable. The inflammatory markers and liver function tests, white cell count remained stable. We had a suspicion if chyle leak following cholecystectomy. Analysis of drain fluid showed a triglyceride of 13.1 mmol/L (reference range: 0-1.7 mmol/L) and no microbial growth, which confirmed Chyle leak. A fat-free diet was formulated, and somatostatin analog (Inj. Octreotide 100mcg od) were given. Drain quantity decreased to 120ml on third post-operative day, confirming the clinical impression of chyle leak.



**Fig. 1:** Chyle collected in the drain bag (250ml), on post-operative day 2

The patient is treated conservatively with fluid management, electrolyte replenishment, antibiotic prophylaxis, and Somatostatin analog (**Inj. Octreotide**). The drain output was 250 ml/day initially (**Fig. 1**) and decreased gradually once a fat-free diet was provided, diminishing to 20ml over the next 7 days. The drain was removed 14th post-operative day. The patient well-tolerated oral low-fat diet and was discharged after 3 weeks post-surgery with no further symptoms during the 3-month follow-up.

### III. Discussion

Chylous ascites is a rare post-operative complication with only 6 cases reported. Lymph travels in lymphatics, which returns interstitial fluid to the circulation. Lymphatics from the intestinal tract merge with those draining the lower limbs to form the saccular cisterna chyli at the level of L1 and L2, which joins the thoracic duct in the thorax. <sup>(1)</sup> These vessels are vulnerable to damage along their course, especially at the cisterna resulting in chylous ascites. Surgery related chylous ascites is rare and occur during extensive retroperitoneal dissection where the cisterna is vulnerable. However, damage to major lymphatics during cholecystectomy resulting in chylous ascites is rare. It is difficult to explain how major lymphatic leak can occur during cholecystectomy. Usually, minor lymphatic channels are encountered. We postulate that the degree of injury to lymphatics during cholecystectomy is small and a prior derangement of anatomy should exist, making it more vulnerable to the development of chylous ascites.

Jensen et al. <sup>(2)</sup> have reported chyle leakage after Laparoscopic Cholecystectomy for the first time in 2006. Initial management was conservative, and the patient was on total parenteral nutrition. However, the drain continued at 1000 to 1500ml per day of milky-white fluid. Lymphoscintigraphy revealed a collection at the level of the gallbladder fossa. On Laparoscopic reexploration, an active chyle leak was noted from the base of the gallbladder fossa, directly from the liver bed. A single suture was placed in figure-of-eight fashion encompassing the area of leak, and fibrin glue was applied. Drain output diminished rapidly and was removed after several days.

Huang et al. <sup>(3)</sup> reported another case of chyle leakage after Lap Cholecystectomy for acute biliary pancreatitis in 2009 and treated conservatively. Drainage gradually decreased and vanished 3 weeks post-operative.

Gogalniceanu et al. <sup>(4)</sup> reported the third case of chyle leakage after Lap Cholecystectomy for acute biliary pancreatitis in 2010. The milky effluent output was 340ml/day initially, which on conservative management diminished to zero over the next 7 days.

Cherry X Cheung et al. <sup>(1)</sup> presented a case of Chylous ascites post open cholecystectomy After Severe Pancreatitis. Initially, the patient was managed for severe pancreatitis with percutaneous image-guided pancreatic bed drainage and antibiotics. Followed by endoscopic retrograde cholangiopancreatography (ERCP) revealed sludge in the common bile duct, which was cleared, and sphincterotomy was performed. Drain removed at 9 months and was admitted for elective open cholecystectomy at 10th month. The patient developed chyle leak on 2nd post-operative day which subsided by conservative management by the next 7days. The drain was removed on the 14th day, and the patient was discharged.

Bansal A et al. <sup>(5)</sup> presented a case of spontaneous chylous ascites after laparoscopic cholecystectomy. After 72 hours at the time of discharge of the patient, during dressing, leakage was seen from the sutures of cholecystectomy. MRI revealed fluid in the peritoneal cavity with free air under the diaphragm. On relaparoscopic surgery showed milky fluid in the peritoneal cavity present in the subhepatic, intestinal, and pelvic area. 1400ml of milky fluid was removed by suction, and drain was placed insitu. The exact site of chyle leak could not be identified. Then the patient was managed conservatively with continuous drainage, antibiotic coverage, and IV fluids. The patient had hypersensitive reactions to somatostatin analog and total parenteral nutrition(TPN). Drain effluent diminished gradually by the 16th day of re-laparoscopy. Drain removed on the 19th day and was on a regular follow-up, which was uneventful.

Bao Z. Yao et al. <sup>(6)</sup> published a case of refractory chyle leakage after laparoscopic cholecystectomy for gallstone disease in 2017. The initial output of the effluent was about 500mL per day, but increased day by day, to the seventh day post-operative, it began to rise to and maintained 8000 to 9000mL per day. CT scan revealed significant ascites. Even after a week of conservative management, the output from the drain did not diminish. On laparoscopic reexploration, an active chyle leak was identified from the base of the gallbladder fossa, emanating directly from the parenchyma of the liver bed. However, there was no evidence of injury to the bowel, lymphatic vessels, or structures within the portahepatis. 3-0 prolene suture was placed in a figure of eight fashion encompassing the area of leakage, and fibrin glue were placed. Drain output decreased to 5000ml in the immediate post-operative day, and after 7 months of conservative management, drain output diminished to zero.

As of the present situation, the real reason for chyle leakage post-Lap Cholecystectomy is still unclear or has no exact diagnostic criteria. Current consensus advocates that early aggressive management is necessary to decrease the morbidity and decrease the duration of hospital stay. Early detection of chyle leak requires a high index of suspicion and prior knowledge of the literature. Lymphoscintigraphy is a minimally invasive procedure without any contrast related complications. It can be applied to the diagnosis of the post-operative lymphatic leak, reoperative localization, and post-operative prognosis evaluation to some extent.

After the diagnosis of chyle leakage is made, treatment should be initiated. It can be either conservative or surgical management. Patency of the drainage tube is made sure. The existence of a chyle leakage represents a significant complication with severe metabolic, nutritional, and immunologic implications. Therefore, the initial treatment is conservative, aimed at the reduction of enteral lymphatic flow and replenishing the nutritional loss. <sup>(7)</sup> Patients should be provided total parenteral nutrition (TPN) or low-fat, high protein-based diet. <sup>(8)</sup> Furthermore, a low-fat enteral diet that is deficient in long-chain triglycerides is advocated in order to reduce enteral lymphatic flow. Some suggest that although the chyle leakage is cured, maintenance of a low-fat, MCTs diet also should be provided for several months to prevent a recurrence. The use of pancreatic lipase inhibitors (e.g., Orlistat) and synthetic somatostatin analogs (e.g., Octreotide) has also been recommended in order to decrease triglyceride absorption and chyle flow. <sup>(9)</sup>

General guidelines for the surgical management of chyle leaks after LC are lacking. Nevertheless, surgical intervention has been recommended in the presence of high-volume leaks (> 500 ml/day), sustained output, or in the presence of nutritional compromise. Huang et al. also argued that chyle leaks after Laparoscopic Cholecystectomy detected by lymphoscintigraphy are significant enough not to resolve by conservative therapy, requiring surgical intervention.

In this case, we describe chyle leak post laparoscopic cholecystectomy, which began to increase from the second post-operative day. After further study into the literature, we decided to go with conservative management. The drain output quantity decreased gradually, and the quality of the effluent changed from milky white to serous over the next 7days. The drain was removed after two weeks from the surgery. Patient was discharged and was kept on a regular follow-up, which showed to be uneventful.

#### **IV. Conclusion**

Chyle leakage is an extremely rare complication after Laparoscopic cholecystectomy. To our knowledge, this is the second case report of such complication in India. The good clinical evolution and the decreasing drain output advocated a conservative approach to management, which yielded good results. Conservative management with chyle drainage and dietary manipulation might be the preferred approach, with lymphoscintigraphy and surgical interventions being reserved for persistent, high volume leaks.

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