



ORIGINAL RESEARCH PAPER

General Surgery

TRAUMATIC CHYLOUS ASCITES : REPORT OF A CASE AND REVIEW OF LITERATURE

KEY WORDS: Blunt abdominal trauma, chyle duct injury, chyloous ascites.

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ABSTRACT

Chyloous ascites refers to the accumulation of lipid-rich lymph in the peritoneal cavity due to disruption of the lymphatic system secondary to traumatic injury or obstruction. Forces capable of tearing the chyle duct may also injure other adjacent structures or organs. Cases of traumatic chyloous injury are rarely reported in the literature. Our aim was to report a case of traumatic chyloous injury due to blunt abdominal trauma. Here we report a case of 41 year old female who came to emergency department with history of accidental fall over stone. After evaluation patient found to have grade 3 splenic injury with hemodynamic instability for which emergency open splenectomy done. On post operative day 4 patient developed chyloous drain fluid which was evaluated and managed conservatively. This condition is generally self-limited and resolves without the necessity of any surgical interventions. However, if medical treatment is unsuccessful, the decision of diagnostic laparoscopy or exploratory laparotomy becomes inevitable.

INTRODUCTION:

Chyloous ascites (CA) is an uncommon form of ascites, defined as the leakage of the lipid-rich lymph into the peritoneal cavity. Damage or obstruction to the lymphatic system or one of its tributaries produces ascites with a turbid or milky appearance from the high triglyceride content. The lymphatic system includes lymph, lymphatic vessels, lymphatic tissues and red bone marrow. It is a one-way drainage system which allows the return of excess interstitial fluids and proteins to the vascular system. Lymph passes from lymphatic capillaries into lymphatic vessels and then through lymph nodes into lymph trunks. The thoracic duct, the main duct for the return of lymph to blood, is about 38–45cm long and begins as dilation called the cisterna chyli anterior to the second lumbar vertebra. The cisterna chyli receives lymph from the right and left lumbar trunks and from the intestinal trunk. Chyloous effusions develop when these are injured or obstructed.

Constituents of Chyle : one of the major functions of lymphatics is the maintenance of the interstitial fluid volume and composition and the transport of lipids. Lymph is composed of protein, lymphocytes, immunoglobulins, and products of digestion including lipids in the form of chylomicrons. More than 50% of the total body lymph originated in the gut and liver. In the gut, long-chain triglycerides (LCT) are converted into mono glycerides and free fatty acids (FFA) and absorbed as chylomicrons. This explains the high content of triglycerides and the milky and cloudy appearance of lymph. Short-and-medium chain triglycerides (MCT), which make up approximately one-third of dietary fat, are absorbed directly by the portal venous system. This particular fact forms the basis for the use of MCT as an oral diet in the conservative management of CA.

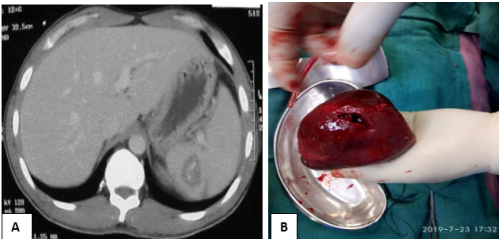
ETIOPATHOGENESIS:

Many pathological conditions can result in chyloous ascites. These conditions include congenital defects of the lymphatic system; nonspecific bacterial, parasitic, and tuberculous peritoneal infections; liver cirrhosis; malignant neoplasm; surgical injury; and blunt abdominal trauma. However, the most common cause in adults is believed to be abdominal malignancy, while congenital lymphatic abnormalities is the most common cause in the paediatric population. The incidence of chyloous ascites seems to be increasing because

of more aggressive thoracic and retroperitoneal surgeries and with the prolonged survival of patients with cancer. Examples for surgical procedures that may be associated with chyloous ascites are abdominal aortic aneurysm repair, retroperitoneal lymph node dissection, pancreaticoduodenectomy, liver transplantation, catheter placement for peritoneal dialysis, distal splenorenal shunt, inferior vena cava resection, and laparoscopic Nissen fundoplication. Progressive and painless abdominal distention is the major clinical manifestation of chyloous ascites, which occurs over the course of weeks to months, depending upon the underlying cause. Acute onset of symptoms may be observed in patients who have undergone either an abdominal or thoracic surgical intervention or had a major traumatic injury. Blunt abdominal trauma resulting in intestinal and mesenteric injury is also another important cause of chyloous ascites.

CASE REPORT :

A 41 year old female came to emergency department with complaints of accidental fall over stone. H/o abdominal pain since trauma. No h/o vomiting, head injury, loss of consciousness, seizures or ENT bleed. No h/o hematuria. She is a known case of type 2 diabetes mellitus on treatment. On general examination vitals were stable. Per abdomen examination revealed tenderness in left hypochondrium and left lumbar region with guarding and abdominal distension. Digital rectal examination was normal. CECT abdomen showed grade 3 splenic injury and no evidence of free fluid. CT brain, chest, spine and pelvis were normal. On observation BP dropped from 110/70 mmHg to 90/60 mmHg, haemoglobin dropped from 10g% to 6.9g% and developed tachycardia. In view of hemodynamic instability patient planned for emergency open splenectomy and proceeded with emergency laparotomy. Intra operatively spleen found to be congested with laceration and hematoma. Multiple fibroids in uterus and bilateral ovarian cyst. Ascitic fluid found to be very minimal and turbid and sent for gene XPERT, cell count, culture and cytology. Rest of solid organs and bowel found normal and no bulging of retroperitoneum seen. Emergency open splenectomy done. Thorough lavage done and two drains placed intra abdominally in pelvis and splenic bed.



A – CECT ABDOMEN SHOWING GRADE 3 SPLENIC INJURY
B- INTRA OPERATIVE FINDING OF SPLENIC LACERATION

Post operative period was uneventful for first 2 days. Vitals were stable. Antibiotics were started and supported with intravenous fluids. Patient was Vaccinated for pneumococcus and Hib. Insulin infusion started for diabetic control. Drain fluid was 200 ml per day, serosanguinous in nature and patient progressed to liquid diet on 3rd post operative day. Once diet progressed patient developed fever. From 4th post operative day, quantity of drain fluid started increasing to 400-500 mL per day. From serosanguinous nature of discharge, colour and consistency transformed into milky white and turbid nature. For the next two days the drain fluid showed increasing trend and continued to be turbid and milky white.



MILKY WHITE AND TURBID NATURE OF DRAIN FLUID ON PHYSICAL APPEARANCE

Drain fluid triglyceride level found to be 520 mg/dL , cholesterol 34 mg/dL, amylase-76 IU/L and lipase-26 IU/L. Patient confirmed to have chylous ascites and advised for fat free diet or diet with medium or short chain triglycerides. Still drain fluid found to be milky white and turbid with elevated drain fluid triglyceride level. Drain fluid cytology was non malignant. Drain fluid gene xpert, culture and gram stain were negative. Patient advised for bowel rest from POD-8. Intravenous fluids and total parenteral nutrition started. Injection octreotide given 100microgram twice daily. Patient responded to conservative management. Decrease in quantity of drain fluid observed. Turbidity decreased. Patient planned for lymphoscintigraphy. In our case the cause of chylous ascites found to be trauma due to injured cisterna chyli. Intra abdominal drain placement helped in early identification of physical appearance of fluid. As the patient responded well to conservative management, surgical re exploration not considered. Lymphoscintigraphy helped in assessing the prognosis of conservative management. As lymphoscintigraphy showed no visualisation of active chyle leak, it confirmed spontaneous closure of lymphoperitoneal fistula. Patient progressed with high protein and fat free diet. Drain tube was removed once chylous ascites settled and patient was discharged on POD-30. Follow up USG showed no free fluid abdomen.

DISCUSSION :

Traumatic chyloperitoneum is a rare injury. Forces capable of tearing the cisterna chyli or the thoracic duct will generally also injure other structures such as the liver, spleen, duodenum, kidney, and pancreas. A detailed history should be obtained and a careful physical examination should be performed, similar to that in any patient presenting with acute onset ascites. The patient should be questioned regarding

weight loss or gain, symptoms of malignancy, family history, underlying liver or kidney disease, travel, recent abdominal surgery, and abdominal trauma. Chylous leak after non-penetrating trauma, which constitutes the pathogenesis of traumatic chylous ascites, is generally attributed to hyperflexion-extension of the vertebral column with shearing of tethered lymphatics. Alternatively, sudden compression of the lipemic and engorged mesenteric lymphatics, adjacent nodes, and lower thoracic duct aggravated by deformations associated with stretching and tearing motions may also directly disrupt chyle containing lymphatics. It is important to remember that chyle leaks slowly into the peritoneal cavity through lymphatic fistulas or by back-pressure on the intestinal lymphatics, and significant quantities of chylous ascites may take some time to accumulate. Abdominal paracentesis is generally the most important diagnostic tool in evaluating and managing patients with ascites, and this issue is valid for chylous ascites as well. Typically, chyle has a cloudy and turbid appearance, in contrast to the straw-coloured and transparent appearance of ascites caused by cirrhosis or portal hypertension. Ascitic fluid should be sent for the analysis of the cell count and culture; Gram staining; total protein concentration; albumin, glucose, LDH, amylase, and triglyceride levels; and cytology. The total protein content in chylous ascites varies depending on the underlying cause and ranges between 2.5 and 7.0 g/dL. The triglyceride levels in the ascitic fluid are critical in defining chylous ascites. Triglyceride values are typically found to be above 200 mg/dL, although some authors use a cut-off value of 110 mg/dL. Lymphangiography is an imaging modality for investigating chyluria, chyloperitoneum, and chylothorax. It is useful for detecting abnormal retroperitoneal lymph nodes, leakage from dilated lymphatics, lymphoperitoneal and lymphaticopelvic fistulization, skipping of lymphatic chain, patency of thoracic duct, and abnormal leg lymphatics. However, it requires tedious cannulation of lymphatics. It can also result in local tissue necrosis, fat embolism to the lungs, hypersensitivity reaction, and exacerbation of lymphedema by the contrast material. Lymphoscintigraphy can be performed to acquire information about the localization of the injury using 99mTc sulfurmicrocolloid, antimony sulphide colloid, stannous phytate, rhenium sulfur colloid, human serum albumin, or dextran. It delineates the pattern of lymphatic drainage, is fast and non-traumatic, and does not have major side-effects.

Somatostatin or octreotide have been used successfully to treat chylous effusions in patients with the yellow nail syndrome and lymphatic leakage due to abdominal and thoracic surgery. The exact mechanisms of somatostatin on drying lymphatic fistulas are not completely understood. It has been previously shown to decrease the intestinal absorption of fats, lower triglyceride concentration in the thoracic duct, and attenuate lymph flow in the major lymphatic channels. In addition, it also decreases gastric, pancreatic, and intestinal secretions; inhibits motor activity of the intestine; slows the process of intestinal absorption; and decreases splanchnic blood flow, which may further contribute to decreased lymph production. Total parenteral nutrition allows the bowel to rest and decreases the production and flow of the lymph. Somatostatin along with TPN can close the lymphatic leakage or relieve the symptoms effectively and rapidly compared with that of conventional regimens.

In cases of chylous injury, a high-protein and low-fat diet with medium-chain triglycerides (MCT) is the best dietary choice. Dietary restriction of long-chain triglycerides (LCT) avoids their conversion into mono glycerides and free fatty acids (FFA), which are transported as chylomicrons to the intestinal lymph ducts. In contrast, MCTs are absorbed directly into intestinal cells and transported as FFA and glycerol directly to the liver via the portal vein. Thus, a low-fat diet with MCT supplementation reduces the production and flow of the

chyle. We preferred a low-fat diet with MCT for our patient as well, and the amount of chyle decreased dramatically.

In patients with chyloperitoneum, if ascites does not respond to conservative management in 2 weeks, surgical exploration should be performed. When surgical treatment is indicated, exploratory laparotomy necessitates a formal exploration to rule out any concomitant injuries of the intra abdominal organ or structures. The surgeon must carefully inspect the mesentery, beneath the diaphragm, around the aorta and pancreas. Maurer et al. reported that if the retroperitoneum is intact and retroperitoneal space is found to be bulging from the mesenteric root to the bifurcation of the aorta with a cream-like fluid collection without the presence of any chylous ascites intra operatively, it is not recommended to open the retroperitoneum to avoid the formation of chylous ascites and to maintain the retroperitoneal compression. However, if chylous ascites and retroperitoneal rupture is present at laparotomy, the retroperitoneal space should be explored and the ruptured lymphatics must be ligated to stop chyle leakage.

CONCLUSION :

A detailed history and a thorough physical examination accompanied with appropriate imaging modalities and paracentesis are the most important points in the diagnosis and treatment of chylous injury due to blunt abdominal trauma. The condition is generally self-limited and resolves without the necessity of any surgical interventions. However, if the dietary management and medical treatment is unsuccessful, the decision of diagnostic laparoscopy or exploratory laparotomy becomes inevitable.

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