Acta Scientific Gastrointestinal Disorders (ISSN: 2582-1091)

Volume 7 Issue 7 July 2024

Review Article

Chylous Ascites Post Colorectal Resections

Melissa Kyriakos Saad[1], Karam Karam[2]*, Elias Fiani[3], Charbel Fares[4], Elias Saikaly[5]

[1]*Saint George Hospital University Medical Center, Beirut, Lebanon*

[2]*Saint George Hospital University Medical Center, Beirut, Lebanon*

[3]*Department of Gastroenterology, Saint George Hospital University Medical Center, Beirut, Lebanon*

[4]*Saint George Hospital University Medical Center, Department of radiology, Beirut, Lebanon*

[5]*Saint George Hospital University Medical Center, Department of General Surgery, Beirut, Lebanon, Saint George University of Beirut, Beirut, Lebanon*

***Corresponding Author:** Karam E Karam, Saint George Hospital University Medical Center, Beirut, Lebanon.

Received: May 24, 2024

Published: June 10, 2024

Abstract

An infrequently seen and rarely reported complication after colorectal surgery is chylous ascites. It is a clinical subject of increasing significance after colorectal surgery especially that once it occurs it impacts the postoperative recovery and may lead to malnutrition, electrolytes imbalances, protein and lymphocyte loss. However, with the advent of extended lymphadenectomy and adaption of total mesocolic excision in colorectal resections, more cases of chylous ascites are being seen and reported. It is generally regarded as postoperative buildup of chyle in the peritoneal cavity, characterized by the appearance of milky fluid and elevated triglyceride levels in the surgically placed drains. Chylous ascites post colorectal surgery is considered an infrequent event, and due to its rarity the etiology, the diagnosis and management options are not well established with no universal guidelines present to guide its treatment. Having said this, the goal of this article is to review the medical literature regarding chylous ascites post colorectal surgery in order to elucidate the definition, the grading and describe its incidence, the clinical presentation, risk factors, and the management options of this complication.

Keywords: Chylous Ascites; Resections; Post Colorectal

Introduction

Chylous ascites defined by the buildup of chyle in the peritoneal cavity may be related to malignant, cirrhotic, infectious, or inflammatory conditions [2-4]. However, post-operative chylous ascites is a result of direct surgical trauma of the cisterna chyli or 1 of its major lymphatic tributaries [5,6] or due obstruction of the lymphatic system. Chylous ascites after colorectal resections is a rare entity, due to this rarity the true incidence, the natural history, etiology, diagnosis and the optimal management plan is not well established. When it occurs, chylous ascites has a substantial effect on the post-operative recovery of patients. It may lead to malnutrition, electrolytes imbalances and immunosuppression secondary to protein and lymphocyte loss [7]. Once diagnosed, accurate measurement of the daily volume drained by surgical drains will help guide the management plan. Most cases respond well to conservative management by prolonged drainage, diet modification, and parental nutrition. However, failure of conservative management and persistence of chyle leak more than fourteen days dictates either interventional radiology or surgical intervention to be considered.

Definition

There's no one universally accepted definition for chylous ascites. Grossly it's commonly characterized by postoperative accumulation of chyle in the peritoneal cavity, and appearance of milky fluid and elevated triglyceride levels in the surgical drains [1]. In fact, four different definitions have been reported [8-11] with a common base of the appearance of milky fluids in the drainage tubes and differences regarding the volume of drained fluid, the triglyceride levels, and the infectious status of the fluids (Table 1).

Grading

- Van der Gaag., *et al.* [1] graded chylous ascites into 3 grades A, B, and C.
- Grade A is persistent chyle leak for less than 7 days.
- Grade B is chylous ascites requiring therapeutic measures and resolves within 7 to 14 days.
- Grade C is chylous ascites longer than 14 days despite therapy and the requirement of surgical intervention or readmission to the hospital.

Study	Volume	Nature of fluid	Infection	Triglyceride level
Matsuda., *et al*. (8)	Not reported	White Milky	Not reported	> 150 mg/dL
Nishigori., *et al*. (9)	Not reported	Milky	Noninfectious	Not reported
Baek., *et al*. (10)	> 200 mL/day	Milky, Creamy	Noninfectious	> 100 mg/dL
Lee., *et al*. (11)	> 200 mL/day	Milky	Noninfectious	Not reported

Table 1: Different definitions of chylous ascites.

Incidence

Chylous ascites after colorectal surgery is a relatively rare complication with an incidence estimated to range between 1% and 6.5% [8,9]. With most data regarding the incidence of chylous ascites being reported from pancreatic surgery. In fact, only scarce reports have incorporated patients who underwent colorectal surgery [5,12]. For instance, Baek., *et al*. in their report included 779 colorectal cancer operations and reported an incidence of 6.6% [10]. Furthermore, 1 percent incidence of chylous ascites was reported by Nishigori., *et al.* [5] and a 3.6% incidence was reported by Lu., *et al.* [13]. The incidence of chylous ascites is reported to be as 1 per 20,000 admissions and this was exemplified by a study conducted at a large university medical center over a two-decade period [9]. The incidence has been soaring due to a lengthier longevity of cancer patients and an extensive employment of both abdominal and cardiothoracic aggressive interventions [7,9].

Clinical presentation

Knowing that most surgeons in Western centers are no more adopting routine drainage of peritoneal cavity by surgical drains after uncomplicated right and left sided colectomies [14] will lead to two clinical presentations of chylous ascites mainly depending on the timing of presentation after surgery, as the absence of surgical drain will delay the diagnosis of chylous ascites. On the contrary, if a surgical drain is placed the majority of cases will be detected during the same inpatient stay through typical drain appearance and increased volume.

The clinical presentation of chylous ascites in patients with surgically placed drain will be the appearance of milky non-purulent fluid in the drain after initiating enteral feeding. On the other hand, in patients where no surgical drains were placed, the presentation will be delayed and the patient present in the outpatient setting, mainly with abdominal distention [15-18] where a computerized tomography CT abdomen and pelvis will be useful to exclude other possible complications after colorectal resections such as abscess formation, anastomotic leak or hematoma.

Risk factors

Reviewing the English medical literature have identified the risk factors for developing post-operative chylous ascites. Among the risk factors are increasing age, surgeon approach in ligating lymphatic channels [19], number of lymph nodes removed [15,20] increased intraoperative blood loss [16] right-sided hemi colectomy [10] low preoperative albumin [20].

Management

Different therapeutic approaches has been described for treatment chylous ascites, including conservative management, interventional radiology approach and surgical approach.

Conservative treatment include total parental nutrition (TPN), or medium chain triglyceride diet (MCT), and subcutaneous octreotide or octreotide analogues injections. In fact, TPN alone achieves complete resolution of chylous ascites in 77% to 100% of the cases with [16,21-23]. On the other hand, a 75 percent success rate was achieved with MCT diet [2]. Furthermore, the addition of octreotide to MCT diet or TPN approaches a 100 percent success rate [21,24]. In fact, the use of somatostatin was proven to decrease lymphatic leakage after 24-72h [25].

Failure of the above-mentioned conservative measures gets the patient to another line of treatment which is bipedal lymphangiography with lipiodol, with success rate ranging between 35% and 70% [26-28]. For example, Matsumoto., *et al*. [29] reported resolution of chyle leak after lymphangiography in eight of nine patients diagnosed with chylous ascites. Furthermore, an occlusion rate of 70 percent was reported by Alejandre-Lafont., *et al*. [26].

After failure of conservative treatment and failure of radiological intervention surgical intervention becomes an option either through open surgical ligation [30] of the leaking vessels or the implantation of a peritoneovenous shunt [2,16,18,19,23]. However, it may be difficult to detect the source of chylous leakage in the reoperation [31].

Conclusion

Chylous ascites after colorectal surgery is a rare complication, however, with the advent of extended lymphadenectomy and adaption of total mesocolic excision in colorectal resections, more cases of chylous ascites will be seen and reported. While the majority of cases resolve with conservative management, meticulous dissection and clipping of lymphatic vessels are essential to prevent this complication.

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