

## Review Article

# Chylous Ascites and Dialysis Peritoneal: A Literature Review

M. Moreno-Ramírez\*, F. Fernández Girón, E. Tarrío Herva, I. Gonzalez Gómez

Nephrology Department, Hospital Juan Ramón Jiménez, Huelva, Spain.

**\*Corresponding Author:** M. Moreno-Ramírez, Nephrology Department, Hospital Juan Ramón Jiménez, Huelva, Spain, Tel: +34 627736727; E-mail: [morenoramirez.manuela@gmail.com](mailto:morenoramirez.manuela@gmail.com)

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### Abstract

Chylous ascites (CA) is an uncommon form of ascites characterized by a milky white appearance of the dialysate due to triglycerides and chylomicrons accumulation in the peritoneal dialysate.

It can be a rare complication or finding in peritoneal dialysis (PD) patients. Although the milky-looking fluid may suggest peritonitis on a first inspection, the presence of triglycerides in the fluid and the absence of other symptoms are decisive. CA can be secondary to multiple processes, highlighting neoplasms, traumatic causes, and some infections such as tuberculosis. It should be noted that some secondary to treatment with calcium blockers have been described in patients on PD. However, in some cases it is not associated with any etiology, and it is deemed as idiopathic.

**Keywords:** Chylous Ascites; Peritoneal Dialysis; Peritonitis; Chyloperitoneum; Milky dialysate; Triglycerides

### Manuscript Body

Lymph is a milky-looking substance made from proteins, immunoglobulins, and products of lipid digestion, including chylomicrons that are produced in the small intestine and liver during the digestion of fatty foods. It is transported through the lymphatic vessels to the thoracic duct and then it is returned to circulation to be used by organism. When there is a damage or an obstruction of the lymphatic system, it cannot be transported, and it can accumulate in the peritoneal cavity and give rise to a milky-looking ascites with a high lipid content, a CA [1-4].

Its incidence is not well documented but it is estimated at 1: 20000. Although it seems to be on the rise in recent years due to the longer survival of people with cancer and the possibility of carrying out more aggressive thoracic surgeries [2-4].

CA can be a rare complication in PD. Although the milky-looking fluid may suggest peritonitis on a first inspection, the presence of triglycerides in the fluid and the absence of other symptoms are decisive.

These are wrongly treated with antibiotics on many times, with the risks that this entails [3]. However, infrequent infections such as tuberculosis (which definitively diagnosis requires a peritoneal biopsy) or filariasis (more in developing countries) should be ruled out [2,5-6].

About etiology, in this review, according to Al-Bufasi et. al, authors summarize possible etiologies, as traumatic and non-traumatic in Table 1. [1-2,4-5]

Most common etiology is neoplastic. Lymphomas represent one third of cases of CA. Tumors of abdomen and pelvis can lead to lymph nodes that also obstruct lymphatic drainage. In these cases, PD can offer us the advantage of an early diagnosis of tumor, since we will detect CA much earlier than in a patient without dialysis, in which CA will only be notable when it reaches a volume sufficient to cause symptoms [6]. Liver cirrhosis represents the second most important cause after neoplasms, and up to 1% of patients with cirrhosis CA. In these cases, CA is produced by portal hypertension that prevents proper drainage. Patients with heart failure can develop it due to an increase in the creation of lymph secondary to the pressure of the venous capillaries and defective drainage. In inflammatory causes there may be

compression of the lymphatic channels, direct damage (ex. by pancreatic enzymes in pancreatitis) or as part of anasarca in nephrotic syndrome. Treatment with calcium blockers may be triggers in patients who are already on PD. There is a deterioration of lymphatic functions in the elimination of triglycerides and an increase in ultrafiltration through the peritoneal membrane and these molecules, which are highly lipophilic (especially manidipine and lercanidipine, the most frequent associated), could easily penetrate the cell membrane and act on calcium channels of both the smooth muscle cells of the intestine and lymphatic vessels [7]. It can arise within 4 days from start of treatment with these drugs and improve after 24 hours of its removal and is more common in patients treated with these drugs for the first time or after doses increase. Some cases have been described in transplant patients in relation to sirolimus treatment. This may be interesting in patients who return to dialysis from transplant, in whom we maintain immunosuppression [1-2,4-5,8- 9].

<b>Traumatic</b>	<b>Non-Traumatic</b>
Surgical Abdominal or thoracic surgery	Neoplastic Lymphoma Metastatic lymph node from another tumor Lymphangioliomyomatosis Solid organ malignancy
Radiotherapy	Congenital Diseases Lymphangioma Battered child syndrome Yellow nail syndrome Klippel-Trenaunay syndrome
Trauma Trauma or penetrating wounds of abdomen or chest	Hepatic Disease Cirrhosis Portal / splenic vein thrombosis
Idiopathic	Infections Tuberculosis Filariasis
	Cardiac Congestive heart failure Constrictive pericarditis Superior vena cava syndrome
	Inflammatory
	Nephrotic syndrome Pancreatitis Sarcoidosis Lupus with mesenteric involvement Retroperitoneal fibrosis Whipple's disease
	Drugs Calcium blockers dihydropyridine and non dihydropyridine Direct Renin inhibitor (aliskiren)( 9) Sirolimus(8)

**Table 1:** Etiologies of CA [1-2,4-5,8-9]

In traumatic causes, there is mechanical damage, direct (surgery, open trauma) or indirect (radiation therapy), on the thoracic duct or the lymphatic system. Although uncommon, CA represents approximately 0.5% of acute complications during placement of a PD catheter, due to inadvertent damage of thoracic duct during insertion, more common using a laparoscopic technique. In these patients, the time in relation to the insertion of the catheter is decisive because when it appears in relation to placement, it is most likely in a traumatic cause and when not, we have to rule out another underlying cause [1,2,5,10]. Lymphogammagraphy or lymphangiography can be useful to detect the damaged spot or small lymphatic nodules, or even laparoscopy or laparotomy to tackle the problem in the same act, although these techniques are not exempt risky [2,4,12].

In children, incidence is even lower and is mainly due to congenital diseases and traumatic causes, such as placement of a catheter for PD. In these, it can have a recurrent course and be prolonged, leading to nutritional and immunological complications [11].

Some idiopathic cases have also been reported in which a triggering cause could not be found after exhaustive discarding those previously described [2,4].

Diagnosis is relatively simple in DP patients, since it is only necessary to look at the color of the effluent, but it is essential to distinguish it from peritonitis. The absence of other clinical data, such as fever or pain, should orient us and an analysis of the characteristics of the liquid is essential. It is milky and cloudy, triglyceride level is above 200mg

/ dL, cell count is above 500 (predominance of lymphocytes), total proteins between 2.5-7g / dL, serum ascites albumin gradient below 1.1g / dL, cholesterol low, LDH 110 - 200 IU / L, culture positive in tuberculosis, cytology positive in malignancy, amylase elevated in cases of pancreatitis, glucose below 100mg / dL [2,4]. ADA level (adenosine deaminase activity) should be determined in cases where tuberculosis is suspected, in which it is elevated [1-4].

Treatment must address the triggering cause. Regarding symptomatic treatment, the first line includes a diet low in fat, low in salt and high in protein, with supplements of light chain fatty acids. It can be useful decreasing the formation of lymph and in cases where possible, intestinal rest and paraenteral nutrition. In traumatic cases, its usefulness is limited and about 50% of patients with responded and generally take several months or even years to fully heal [10]. In this period complications can appear. Hypogammaglobulinemia and poor fat absorption can predispose to malnutrition and infections long-term [7]. Consequently, treatment with some drugs, octeotride, somatostatin, ethylephrine, or orlistat, which decrease fat absorption, has been used as adjuvants. These help to shorten the intestinal rest time and therefore to avoid complications without serious side effects [5, 10].

In traumatic causes, severe malignancies or congenital causes, surgery may be first option and is generally reserved for cases where the flow is greater than 1 litre/day or there is no improvement after 5 days of conservative treatment [4,5]. Peritoneal rest and transfer of the patient to hemodialysis for a time may help in some cases

with surgical treatment, although in general it should be maintained, since evacuated paracentesis is indicated in patients who are not on dialysis and the technique offers us this option in itself [6, 12].

Prognosis depends on the etiology of CA and can associate a mortality of 40-70%. It is worse in non-surgical cases than in surgical cases [4].

## Conclusion

CA is a rare pathology that can appear in DP patients as a complication or as a finding. In these cases, PD offers advantages of early diagnosis and continuous evacuating paracentesis that helps treatment. Due to DP, prognosis could be better in DP patients than in other cases due to the nature of the continuous drainage of the technique.

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