

THORACIC DUCT LYMPH IN A PATIENT WITH CHYLOUS ASCITES AND A CARCINOID TUMOR

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ABSTRACT

An adult patient with both intraabdominal carcinoid tumor and chylous ascites underwent thoracic duct drainage in an attempt to relieve accumulation of intraabdominal fluid. After cannulation of the left cervical thoracic duct, lymph flow rate was normal (1.4ml/min) and 24 hours of drainage was without effect on the ascites. In contrast to the chylous nature of the ascitic fluid, however, thoracic duct lymph was non-chylous and its protein content was lower than that of the ascitic fluid. The administration of secretin intravenously increased both the flow and amylase content of thoracic duct lymph. These observations signify that the chylous ascitic fluid neither leaked from nor had access to thoracic duct lymph but originated instead from obstructed mesenteric lacteals.

Carcinoid tumors and chylous ascites are uncommon disorders but a recent report (1) documents their possible association in five previously described (2-6) and three additional patients. The clinical findings in another such patient are briefly considered here. Although this adult patient was first seen in 1960 and some important details are missing from the medical record, the information that is still available including observations on the flow and composition of thoracic duct lymph suggest that the chylous intraperitoneal effusion neither leaked from nor had access to the thoracic duct.

Case history

A 60-year-old man initially complained in January 1960 of increasing abdominal distension, anorexia, weakness, constipation, and dull abdominal pain. He had no flushing or diarrhea. Examination disclosed tense ascites with lower abdominal tenderness and borborygmi. A plain x-ray of the abdomen and barium contrast enema were unremarkable. Laparotomy disclosed milky ascitic fluid and an intense desmoplastic reaction diffusely involving the serosal surface of the small intestine, the loops of which were densely adherent to one another forming a ball-shaped mass. White patches covered the surface of the abdominal viscera including the liver. A palpably thickened appendix was removed and ascitic fluid was sampled. Histology of the appendix showed a carcinoid tumor and the milky ascitic fluid on chemical analysis was consistent with chyle. Postoperatively the ascitic fluid reaccumulated rapidly and in April 1960 the patient was admitted to Bellevue Hospital. An abdominal paracentesis disclosed milky fluid which contained 4.3gm/dl of total protein with an A/G ratio of 2.5/1.7. With the patients informed consent the thoracic duct was cannulated in the left neck in an attempt to reduce the accumulation of ascitic fluid and avoid repeated abdominal paracenteses. The thoracic duct lymph (TDL) was straw-colored and notably non-chylous. Lymph flow was normal (1.4ml/min) and con-

tained 3.7gm/dl of protein with an A/G ratio of 2.7/1. Plasma sampled at the same time contained 5.8gm/dl of total protein with an A/G ratio of 3.3/2.5. After the administration of 1 ampoule of secretin (Lilly) containing 100 clinical units thoracic duct lymph flow increased to 2.6ml/min in 30 minutes and the amylase level rose from 64 to 130 units/dl. TDL drainage was continued for 24 hours without alteration in abdominal girth. The cannula was thereafter removed with no further drainage. The patient was eventually lost to follow up.

Comment

Chylomicrons as well as proteins, other large molecules, bacteria, and formed blood elements are all absorbed into lymph from the peritoneal cavity via respiration-induced gaps between adjacent mesothelial cells on the peritoneal surface of the diaphragm (8-10). From the diaphragm, lymph is transported to blood via both the thoracic duct and the right lymph duct, the proportions varying from species to species.

This lymphatic pathway of absorption from the peritoneal cavity appears to have been disrupted in the patient described as evidenced by the following: the ascitic fluid was milky whereas the TDL was straw-colored; both the total protein content and the A/G ratio of these two extracellular fluids differed markedly. Moreover, in contrast to patients with "cirrhotic" ascites (11), external drainage of thoracic duct lymph was without notable effect on the ascites (i.e., abdominal girth). That the block to diaphragmatic absorption was due to involvement of the peritoneal surface of the diaphragm by the same tumor-desmoplastic reaction noted on other peritoneal surfaces seems likely. To attribute chylous ascites solely to this specific derangement, however, is misguided as studies in experimental animals demonstrate that total obliteration of the diaphragmatic drainage pathway does not promote either chylous or any other form of ascites (12).

The fact that TDL flowed normally

and that TDL flow and its amylase level increased following the intravenous administration of secretin (13) suggests that lymphatics were structurally intact from the point at which pancreatic lymph vessels enter the cisterna chyli to the thoracic duct-venous junction in the neck. On this basis, it is reasonable to deduce that the leak of chyle derived from lacteals in the small bowel mesentery was likely due to obstruction of lymph drainage near the root of the small bowel mesentery by extensive tumor-fibrosis.

Release of serotonin has been implicated in the pathogenesis of the diffuse fibrosis of the peritoneum and other tissues (1,14,15) in patients with carcinoid tumors. The underlying mechanism is still obscure but may relate to the ability of serotonin to increase capillary permeability to plasma protein (16), a property which may account for the unusually high protein levels in the ascitic fluid of our patient (74% of plasma) and others with intraabdominal carcinoid.

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