Acute Chylous Peritonitis *

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THE OCCURRENCE of chylous fluid in any of the body cavities is a striking finding, but when found in acute disease of the abdomen, requiring laparotomy, it is most unusual and sufficiently rare to justify reporting such a case.

In a review of the literature by Hoffman [1] in 1954, there was a total of 23 reported cases of acute chylous peritonitis wherein a laparotomy had been performed for an acute abdominal emergency. He added a single case to that series making 24. We have been unable to find any additional reported cases since his review.

Case Report

M. L. J., a 52-year-old unmarried woman, was first seen on May 7, 1956 with complaints of approximately 24 hours duration, chief of which was generalized abdominal pain similar to a menstrual cramp. After approximately 24 hours, the major findings were located in the right lower quadrant. The symptoms began 4 hours after ingestion of a heavy meal. There was some nausea, but no diarrhea or vomiting. Approximately 6 hours following onset, the patient noted some fullness in her abdomen which progressed slowly to the time of operation. Past history was noncontributory. A tentative diagnosis of acute appendicitis was made and the patient was hospitalized. Examination revealed a temperature of 100° and pulse 100, abdominal distention with absent peristalsis, and tenderness over the entire abdomen, most marked in the right lower quadrant with rebound tenderness in this quadrant. Rectal examination revealed some tenderness on the right side. Red blood cell count on admission was 5 million with 92% hemoglobin, 12,700 white blood cells, 94 segmented and 6 lymphocytes. Urine examination was negative except for 1 to 2 white blood cells per high power field, in a voided specimen. Preparations for the operation were carried out and when the peritoneal cavity was opened through a right rectus incision, a large amount of milky fluid issued from the general peritoneal cavity. The first impression was that the patient was suffering from a ruptured appendix, with generalized peritonitis. The cecum was mobilized and found to be essentially normal, the appendix was retrocecal, and injected but not acutely involved. Further exploration revealed many plaques which looked like fibrino purulent material, but they could not be wiped from the bowel surface. There was extensive retroperitoneal extravasation of chyle, extending posteriorly and caudally up over the dome of the bladder. The mesentery of the small intestine was thickened by the chylous infiltration, and many milky, white, dilated lymphatics were noted in the mesentery and over the intestinal surfaces. Numerous small nodes in the mesentery of the small intestine were noted, one of which was removed for histologic study. The omentum was also involved in the process; and a section of this was also removed, for microscopic examination. Exploration of the entire large and small intestines revealed no other pathology. A left ovarian cyst approximately the size of a tangerine and two small uterine fibroids were noted. A search was made for any gross tear in the thoracic duct system or one of its radicals, but it was impossible to define such a break. There were no enlarged nodes about the aorta and the liver and pancreas were normal. Because of the negative exploration, save for the extensive retroperitoneal extravasation and intraperitoneal accumulation of chyle, several ounces of the chylous fluid were removed and sent to the laboratory for examination; and the appendix was removed, as well as the left ovary, which contained a simple cyst. There was considerable distention of the cecum, probably secondary to the adynamic ileus. The abdomen was closed without drainage and the postoperative course was entirely uneventful. Additional treatment consisted of lowering the food intake postoperatively, until the leak in the chyle system had sealed. The patient was discharged from the hospital on the seventh postoperative day.

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The pathologic report of the fluid removed from the peritoneal cavity was: opaque, milky fluid, having a thick, creamy appearance. When shaken with ether the fluid cleared leaving a granular, reddish precipitate and clear fluid. There were no organisms on smear and there was no growth of bacteria in 48 hours. Gross and microscopic examination of the appendix revealed it to be normal. The left ovary and cyst, were negative pathologically, save for a diagnosis of simple serous cyst. The omentum which was removed revealed areas in which the fat contained large, dilated lymphatic channels filled with amphophilic material and a few mononuclear cells. In other areas of the omentum there was edema with a few chronic inflammatory cells, chiefly lymphocytes and plasma cells. The lymph node removed was essentially negative, and consisted of small, poorly defined lymphoid nodules, and a moderate amount of reticuloendothelial tissue. There was no evidence of malignancy in the specimen. The lipid turbidity revealed 14 units, cholesterol 200 milligrams per cent, alkaline phosphatase 22 Bodansky units, acid phosphatase 0.5 Bodansky units. The Protein Bromo Iodine was 4.8 micrograms per hundred ml. of serum. Two days postoperatively, an ill-defined soft tissue fullness was noted on the right side of the neck, in the supraclavicular region, but this was evanescent in nature.[13] The first x-ray taken 2 days postoperatively, on May 9, 1956, in an effort to find a lesion which would cause a thoracic duct block, revealed a small accumulation in the posterior basal segment of the left lower lobe. This had completely cleared on May 14, 1956. The patient has been on a reduced fat diet since her operation; and save for 3 occasions in the past 14 months, when she has not adhered to this recommendation, her course has been satisfactory. On each of these 3 occasions she had ingested large meals with a high fat content, a short time previously. The discomfort was similar to the initial attack but less severe, and on each occasion her symptoms have abated within 12 hours. A detailed search has been made for some specific etiologic agent which could account for the findings at the time of the operation, but these have been totally unrewarding. We have thus felt that the etiology is unknown.

This patient was re-admitted to the hospital on February 10, 1957, for hemorrhoidectomy. Examination at that time revealed R.B.C.'s 4,920,000, hemoglobin 14 grams (97 per cent), W.B.C.'s 9,300 with a differential count of 62 segmented, 14 nonsegmented, 2 eosinophils, lymphocytes 18, monocytes 4. Urine examination as well as Kahn examination was negative, blood lipase 0.8 units, cholesterol 276 mg.%, cholesterol esters 116 mg.%.

Comment

The lymphatic system develops from six lymph spaces; which occur as paired jugular sacs, paired sciatic sacs, a single retroperitoneal sac, and the sac later known as the cisterna chyli. From these sacs, buds appear as sprouts which progress toward the periphery. These sprouts later connect and form the network of lymphatics, which acquires communication with the various veins.[16, 20]

The three main causes for the leakage of chyle from the thoracic duct are as follows: (1) Trauma which is external in nature either to the abdomen, or following hyperextension injuries of the spine, paroxysms of coughing with elevation of the intrathoracic pressure producing a rupture of the thoracic duct. (2) Enlargement of the lymph nodes from infection or by tumors which secondarily encroach upon and erode the thoracic duct with extravasation of chyle into the peritoneal or pleural cavities. (3) We have chosen to call "internal trauma," results from overloading of the chyle system following the ingestion of a heavy or fat rich meal. Presumably, this additional load thrown on the digestive system, and secondarily on the chyle circulation, has been sufficient in some of the cases,[8, 9] as well as the one we are reporting, to produce an extravasation of chyle following rupture of one or more of the vessels in the chyle system at some vulnerable point. The flow of lymph in the mammal may reach a rate of 200 cc. per hour, and is always greater after a fatty meal.[18] When a break occurs at such a time, the accumulation of chyle may occur rather rapidly.

It seems necessary to postulate the existence of some pathology involving the lymphatics which would decrease their strength. Blalock[21, 22] and McGregor[23] both have demonstrated that occlusion of the thoracic duct by ligation anywhere in its course is entirely safe and not followed by

distal rupture of the lymphatic system. The supra-clavicular swelling that our patient experienced, which felt cystic on examination and disappeared spontaneously, has not recurred. It is interesting to speculate that this may have been a cystic hygroma, or a cavernous lymphangioma. If such a lesion existed, it is possible that the source of the chylous ascites was a ruptured retroperitoneal chylangioma, or lymphangioma; for this area, as well as the cervical region, are two of the more frequent sites for the occurrence of such lesions.[15] Any congenital or acquired anomaly of the lymphatic system, in which weakened areas were unable to withstand the additional load of a fat or heavy meal, might explain the findings in this patient. It is of interest to note that in the reported cases, including the case presented in this article, the greatest number (44%) occurred without any known etiology.[1-9]

In seven of these the operation was carried out for a preoperative diagnosis of appendicitis. The typical findings were a normal or slightly enlarged appendix, in association with varying amounts of free chyle which, initially, was interpreted as purulent peritonitis. Further examination of the subserosal plaques in the bowel wall suggested a possible perforated peptic ulcer. In this group the symptoms followed more or less directly upon the ingestion of a heavy or excessively fatty meal. Why this condition does not occur more frequently following overeating is difficult to explain.

The acuteness of the symptoms presented by these patients is to be explained by the irritating qualities of chyle occurring in the peritoneal cavity; and by acute distention of the chyle system, with secondary rupture due to an overloading of the system. The right lower quadrant tenderness noted in our patient was probably secondary to the peritonitis and also the distended cecum.

Because the thoracic duct carries most of the lymphocytes to the blood stream, any rupture with extravasation of chyle would necessarily be followed by a reduced lymphocyte count. This was the finding in our patient, who on admission had six lymphocytes in the peripheral blood on the differential count. This, however, may have been in part a physiologic lymphopenia occurring in the presence of a leucocytosis. The absence of bacteria in the free chyle found in the peritoneal cavity may have been due to the bacteriostatic quality of chyle.[18] It has been demonstrated by Frazer [19] that fat reaches the blood stream by two routes. Split-fats products pass from the intestinal tract and are carried to the liver by the portal vein, then into the general circulation. Unsplit fats, which make up the greater part of ingested fat, reach the blood stream via the intestinal lacteals, cisterna chyli, and thoracic duct, and then into the blood stream.

TABLE I. *Etiology (Revised from Ref. 1)*

Unknown	11
Trauma (external)	4
Thoracic duct obstruction	3
Strangulated scrotal hernia	2
Intestinal obstruction	3
Mesenteric adenitis	1
Ruptured chylous cyst	1
Total cases	25

It is important to classify the type of chylous ascites, for the treatment and prognosis varies accordingly. There are two main types: Acute chylous peritonitis which occurs with rapid onset, and is best treated by the removal of most of the irritating chyle with reduction of food intake during the postoperative period, thus allowing any lymphatic leak to seal and any temporary obstruction to subside. This was particularly true in cases where the etiology was unknown. Drainage did not affect the outcome in the reported cases nor did the accompanying appendectomy, when carried out, influence the morbidity or mortality rate. Of the 25 reported cases of acute chyle peritonitis, all with the exception of one patient survived.

The second type is the true, or progressive, chylous ascites. In this group are included those cases in which the cysterna chyli and its tributaries became obstructed by neoplasms, tuberculous adenitis, filariasis,[11] or mesenteric cysts. Also included are cases of abdominal tumor resulting from mesenteric thickening, seen in lipodystrophy (Whipple's disease[12]). This second group of cases, with the exception of those with mesenteric cysts and recently cases of Whipple's disease treated with corticosteroids, do poorly, and are usually reported as ending fatally.

Conclusion

1. A case of idiopathic chylous ascites is presented, which clinically simulated acute appendicitis.

2. A brief review of the literature is presented, with pertinent data regarding treatment and prognosis in this group of cases.

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