CHYLOUS ASCITES AND GUT MALROTATION

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Chylous ascites was diagnosed in a female neonate. Following the administration of a gastrografin enema, which showed the presence of gut malrotation, she was operated. This led to a complete recovery and optimal weight gain. For evaluation of chylous ascites in neonates, gut malrotation should be considered in order to prevent volvolus and further complications.

Keywords: Chylous ascites • gut malrotation • volvolus

Introduction

Chylous ascites is the most common cause of neonatal ascites due to a congenital failure of the lymphatic channels and rupture or transudation of the lymphatic system. Initial paracentesis may yield clear fluid but after enteral feeding, subsequent paracenteses yield a milky fluid or a rise in triglyceride content without milky appearance. Chylous ascites may accompany intestinal malrotation and incomplete volvolus, so appropriate imaging should be done to diagnose and treat the patient by urgent surgery.

Case Report

A 21-year-old primigravida at 37 weeks of gestation, gave birth by cesarean section to a female neonate with abdominal enlargement. There were no complications during the pregnancy and labor. The neonate weighed 2,550 g and the Apgar scores were 3, 7, and 8 at 1, 5, and 10 minutes after birth, respectively. She was resuscitated by bag and mask ventilation.

After her admission to the NICU, the baby had a moderate respiratory distress with ascites and shifting abdominal dullness, normal bowel sounds, and no edema in the body. Ascitic fluid aspiration was performed to relieve the respiratory distress. The fluid had a clear yellow appearance with a negative cytology, WBC of 60/mm³, RBC of 20/mm³, 22% degenerated cells, and no fungal organisms. The culture was negative. Biochemical analysis of the fluid showed a specific gravity of 1.031, amylase level of 2 U/L, albumin of 3.7 g/dL, glucose of 1.06 g/dL, triglyceride of 52 mg/dL, total bilirubin of 3.11 mg/dL, and a direct bilirubin of 0.43 mg/dL. On the second day of birth, oral feeding was begun and on the fourth day the second ascitic aspiration was carried out. The ascitic fluid was yellow and cloudy, but not milky. It had a triglyceride level of 290 mg/dL, albumin of 3.4 g/dL, glucose of 0.99 g/dL, total bilirubin of 4.93 mg/dL, and a direct bilirubin of 0.02 mg/dL. Culture and cytologic examinations were negative and it showed a WBC of 45/mm³, with 17% PMNs and 83% lymphocytes, and an RBC of 240/mm³. Serum levels of creatinine, BUN, calcium, electrolytes, albumin, amylase, triglyceride, Torch antibodies, CBC, urinalysis, and urine culture were all within the normal limits. Abdominal ultrasonography showed the presence of a normal pancreas, hepatobiliary, renal, and urinary tract systems and ovaries. Due to a rise in triglyceride level in the ascitic fluid after feeding, chylous ascites was suspected. A gastrografin enema was performed, which revealed gut malrotation (Figures 1 and 2). The baby underwent a

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laparotomy on the tenth day of life. Exploration of the abdomen showed that the cecum and appendix were located in the right upper quadrant, whereas the small intestine with an edematous appearance was observed on the right and the colon on the left side of the abdomen. There were multiple adhesion sites on the colon, which were released following appendectomy and fixation of the colon. She had a satisfactory recovery after the operation. After a short period of total parenteral feeding, she was put on oral feeding with medium-chain triglyceride (MCT) milk for one month because she had mild diarrhea and steatorrhea, and then commercial milk was begun. She is now 5 years old, with good growth and development.

Discussion

A neonate with chylous ascites was found out to have gut malrotation and intestinal perforation. Generalized abdominal enlargement may be due to intestinal distention, hepatomegaly, presence of tumors, peritonitis, or ascites. Imaging techniques like radiology, ultrasonography, and computerized tomography scanning could be used to determine the presence of abdominal masses and ascites. On the other hand, paracentesis may yield peritoneal fluid for laboratory analysis, which could provide additional clues as to the cause and type of ascites. The most common cause of neonatal ascites is chylous ascites, which occurs more often in males. In the newborn, chylous ascites is usually due to a congenital failure of the lymphatic channels to communicate, which leads to lymphatic hypertension and rupture or transudation of the lymphatic system. The initial paracentesis may yield a clear fluid, but after the initiation of enteral feeding, subsequent paracenteses yield a milky fluid which is high in triglyceride content. It should be noted that this is not a set rule and the fluid may turn yellow and never become milky. Leukocyte count may be elevated and protein content is variable. Because chylous ascites may accompany intestinal malrotation and incomplete volvolus, appropriate imaging should be done to rule out the presence of intestinal malrotation.

Gut malrotation is found in 1/6000 of live births. In order to comprehend malrotation, it is helpful to understand the embryologic events leading to this fascinating but dangerous condition. There are three stages of bowel rotation and, therefore, anomalies of rotation are associated with each of these stages.

The majority of anomalies, especially gut malrotation as it is used clinically, occur in stage II, in which the bowel returns to the abdomen. The cecum is usually fixed to the right lateral abdominal wall in stage III and bands to the lateral abdominal wall are formed. However, because the malrotated cecum is abnormally positioned superiorly in the abdomen, these fixating bands (Ladd’s bands) cross the duodenum, causing obstruction. The mesentery of the small bowel is
normally fixed to the left upper quadrant, at the ligament of Treitz and the right lower quadrant of cecum. With malrotation, the mesentery lacks this posterior fixation and can easily twist, creating a volvolus. Malrotation, which is the lack of bowel rotation (omphalocele) or a partial rotation of the bowel, could be present with duodenal obstruction, volvolus, or chronic symptoms of obstruction, or could be asymptomatic. The diagnosis of malrotation could be established, based on abdominal radiograph using an abnormal air pattern, the presence of an orogastric tube in a malrotated duodenum, or duodenal obstruction (double bubble sign). The method of choice to diagnose malrotation is a limited gastrointestinal contrast study, with just enough contrast material given to visualize the duodenum. Complete duodenal obstruction does not rule out malrotation, because there is an association of duodenal atresia with malrotation.\textsuperscript{4,5} Although barium enema could show a displaced cecum, due to the variability of cecal fixation and rotation, this is not as reliable as assessing the position of the duodenum. In the case of a volvolus, an obstruction may be identified at the level of the transverse colon.\textsuperscript{5}

In the case presented, gastrografin enema showed malrotation and although the initial ascitic fluid was not milky, after feeding there was a rise in triglyceride content, so chylous ascites and gut malrotation were the right diagnosis.

Gut malrotation should be ruled out in cases of neonatal chylous ascites, since it is a true surgical emergency. The surgical procedure to correct malrotation not only relieves the duodenal obstruction (if present), but also strives to decrease the risk of future volvolus as well.

**References**