A case of primary chylous ascites resolved within 4 months by exclusive breast-feeding

Zafer Kurugöl, Özgür Çoğulu, Kaan Kavaklı

Department of Pediatrics, Ege University Faculty of Medicine, İzmir, Turkey

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Chylous ascites is a rare disease in infancy. A two-month-old male infant was admitted to the Department of Pediatrics with chylous ascites. No cause was found throughout the investigation period. The baby recovered spontaneously through breast-feeding without any specific treatment and chylous ascites disappeared at the age of six months.

Key words: chylous ascites, infant, human milk, medium-chain triglycerides, breast-feeding.

Ascites is an accumulation of fluid within the peritoneal cavity. If milky ascitic fluid is obtained via paracentesis after a fat-containing feeding, it is called chylous ascites. Chyloùs ascites is a rare and sometimes subclinical condition in infants[1]. It can result from a congenital abnormality, which is classified as primary chylous ascites. Secondary reasons such as aortic surgery, penetrating abdominal trauma, and malignancy or obstruction of the intraabdominal portion of the thoracic duct can cause chylous ascites. Treatment includes a low-fat diet supplemented with medium-chain triglycerides, diuretics, total parenteral nutrition, surgical exploration and intestinal shunting[2]. Paracentesis should be repeated if abdominal distension causes respiratory distress. Here we present an infant with chylous ascites who healed without any treatment schedule by being exclusively breast-fed.

Case Report

A two-month-old boy was referred to our department with a history of abdominal distension and decrease in diuresis. His birth weight was 3800 g and length was 52 cm. He was the second child of non-consanguineous parents. There was no history of tuberculosis in the family. This patient was noted to have abdominal distension, bilateral inguinal hernia and hydrocele when he was 25 days old and abdominal ultrasonography demonstrated ascites. Gross ascites was demonstrated in abdominal computed tomography.

When the patient was two months old, his weight was 5050 g (50th percentile), length was 58 cm (50th percentile) and head circumference was 39 cm (50th percentile). Abdominal circumference was 47.5 cm (Table I). Pallor, abdominal distension, bilateral inguinal hernia and hydrocele were determined. Tuberculin skin test was negative.

Table I. Some Findings of Our Patient on Admission and After 2 and 4 Months

	On admission (2 months of age)	After 2 months (4 months of age)	After 4 months (6 months of age)
Weight (g)	5050	6000	7550
Length (cm)	58	62	65
Abdominal circum ference (cm)	47.5	45	43
Hb (g/dl)	10.2	10	9.4
Hct (%)	28.9	31	29.6
MCV (fl)	71.4	70	60.9
AFP (ng/ml)	630.7	180	32.5
Ferritin (ng/ml)	448	130	19
Ultrasonography	Gross ascites	Minimal ascites	Normal
Lymphoscintigraphy	Lymph accumulation	Normal accumulation	—

Hb Hemoglobin; MCV: Mean corpuscular volume, Hct: Hematocrit, AFP: α-fetoprotein.

Complete blood count was normal except for hemoglobin and mean corpuscular volume (Table I). Blood biochemical (Na, K, Ca, P, Mg, glucose, uric acid), renal and liver function tests (urea, creatinine, aspartate aminotransferase, alanine aminotransferase, gamma-gultamyl-transpeptidase, total bilirubin, total protein, albumin, prothrombin time), lactate dehydrogenase and vanilmandelic acid were in normal range. Alpha-fetoprotein (AFP) and ferritin levels were 630.7 ng/ml and 448 ng/ml, respectively.

Abdominal paracentesis revealed the presence of chylous fluid (Table II). Cytological and microbiological analysis of chylous fluid did not show any abnormal result.

Table II. Chylous Ascites Fluid Analysis

Total lipid (mg/dl)	1950
Triglycerides (mg/dl)	921
Cholesterol (mg/dl)	652
Protein (g/dl)	3.08
Lymphocytes (mm^3)	3080
Atypical cell	(-)

Serologic tests for cytomegalovirus, rubella, hepatitis A virus, hepatitis B virus, hepatitis C virus, Epstein-Barr virus, and parvovirus were negative.

Abdominal Doppler ultrasonography and computed tomography demonstrated massive ascites but no enlarged lymph nodes or mass. Thorax volume was decreased because of gross ascites in X-ray examination. Voiding cystoureterography was normal. There was abnormal finding in double contrast barium meal. Lymphoscintigraphy revealed the presence of chyle accumulation.

Paracentesis was performed only twice. No diet therapy was given and the patient was fed only with breast milk. When the patient was four months old, abdominal circumference had receded from 47.5 cm to 45 cm (Table I). Abdominal ultrasonographic examination demonstrated minimal ascites and lymphoscintigraphy was normal.

The patient was clinically normal, and his abdominal circumference was 43 cm when reviewed at six months of age. His growth was normal. No ascites was noted with abdominal ultrasonographic examination. Alpha-fetoprotein (AFP) and ferritin levels were 32.5 ng/ml and 19 ng/ml respectively, when the patient was six months old.

Discussion

Chylous ascites is an uncommon problem in children. The incidence is between 1/50,000 and 1/100,000 hospital admissions[3]. Abdominal distension occurred in 83% percent of chylous ascites cases[4]. Our case was admitted to the hospital when he was two months old because of abdominal distension. Other symptoms and signs such as inguinal hernia, hydrocele and respiratory insufficiency are secondary to abdominal distension as in our case, whose first sign was abdominal distension noticed at the age of 25 days.

The diagnosis of chylous ascites depends on the character of the fluid. When it is diagnosed, differential diagnosis should be made to assess other possible reasons for this cliical problem. The reasons for chylous ascites are neoplasms, abdominal lymphatic vessels, infections, cirrhosis, mesenteric adenitis and congenital abnormalities[5,6]. While abdominal neoplasms comprise the majority of adult cases, congenital lymphatic abnormalities are more common in children. Unger et al.[4] classified the causes of chylous ascites in infants and children, and the majority of the cases were congenital and idiopathic (43%), followed by leaking lymphatics (12%), and lymphangioma and mesenteric cyst (10%). Among the others were: lymphadenopathy, obstructive lesion of mesentery, trauma, appendicitis, liver disease, incarcerated hernia and tuberculosis.

Since malignancy is an extremely rare cause of chylous ascites in children, it may be disregarded after blood and cytological analyses. There was no atypical cell line in the cytological examination of the fluid in our patient. Abdominal ultrasonography and computed tomography scan did not show any mass in the abdomen. VMA for neuroblastoma, LDH and ferritin as tumor markers were in normal ranges. Alpha-fetoprotein (AFP) level was higher than normal as is expected in ascites and, as ascites disappeared, AFP level decreased to the normal level (Table I). There was no history of aortic surgery or penetrating abdominal trauma.

Tuberculosis has been reported as a prominent cause of chylous ascites in children[3]. PPD skin test in our patient was negative and there was no history of tuberculosis in the family. Acid-fast bacilli were not found in the direct examination of the ascites fluid and cultures of the fluid were negative.

Hepatic enzyme levels, computed tomography (CT) scanning, and abdominal ultrasonography gave no clue for a hepatic origin.

Congenital defects of the lymphatic system such as lymphoperitoneal fistula and leaking bowel are primary causes of chylous ascites. Browse et al.[1] proposed three principal mechanisms for chylous ascites: direct leakage of chyle through a lymphoperitoneal fistula, exudation through the walls of retroperitoneal megalymphatics and exudation from the bowel. The mechanism of chylous ascites formation is usually caused by obstruction in the mesenteric or thoracic lymph nodes. Abdominal ultrasonography and computerized tomographic scanning did not show any mass lesion in our case. There was no pathologic finding in voiding cystoureterography. Barium meal revealed no remarkable result which might explain the cause of chylous ascites. Lymphangiography is claimed to be the most important diagnostic and prognostic tool before surgery[1]. However, lymphoscintigraphy can also be used in these patients as a diagnostic procedure, and in the case of our patient detected chyle accumulation.

Surgery is not advised as a primary therapy for chylous ascites unless it is secondary to an incarcerated hernia, appendicitis, or intussusception. Some authors in the treatment of chylous ascites suggest low-fat, high-protein diets and repetitive paracentesis. Cure was achieved within one month of commencing therapy, hence, at least one month of nonoperative therapy is suggested for all patients to stop the accumulation of chyle in the peritoneum[4].

In light of the investigations done for the presented case, primary chylous ascites was thought to be the only explanation, caused by a lymphatic leakage from the small bowel or mesenteric lymph nodes. No specific treatment was given to our patient and he was fed only with human milk. Paracentesis was performed only twice. Ascites gradually subsided and disappeared in four months. Abdominal circumference receded from 47.5 to 43 cm within that time. The patient was clinically normal when reviewed at six months of age. Substituting medium-chain triglycerides (MCT) for a usual diet has been suggested by some authors because medium-chain fatty acids are absorbed directly into the portal venous blood and delivered to the target tissues more quickly[7,8]. However, the intestinal absorption of medium-chain fatty acids is affected by the structure and by the type of fat in the diet. It was suggested that intestinal absorption was enhanced by the administration to rats of medium-chain fatty acids in a mixture of MCT containing molecules of C:8 fatty acids and long-chain triglycerides containing molecules of C:18 fatty acids[9]. Human milk contains 98-99% percent of its lipid composition in the form of triglycerides. Although the triglycerides in human milk are composed of 167 different fatty acids, 10 of them, with 8 to 18 carbons present, are found in larger quantities than the others[10]. Therefore, triglycerides in human milk are more readily absorbed by the intestine. Cure without using any treatment schedule in our patient may be related to the better absorption of MCT in human milk. Furthermore, complete substitution of MCT for all fat in the diet exposes the patient to the hazards of essential fatty acid deficiency[4]. For this reason, the hazards of essential fatty acid deficiency can be avoided and appropriate nutrition provided by breast-feeding. In conclusion, we point out the importance of breast-feeding as not only essential for normal infants but also as useful in the management of infants with primary chylous ascites for which mortality rates of 8 to 24 percent have been reported in children by some authors[3,7,11].

REFERENCES

1. Browse NL, Wilson NM, Russo M, Al-Hasan H, Allen DR. Aetiology and treatment of chylous ascites. Br J Surg 1992; 79: 1145-1150.
2. Rector FE, Whittlesey G. Effective control of chylous ascites: an alternative approach. J Ped Surg 1993; 28: 76-77.
3. Vasko JS, Tapper RI. The surgical significance of chylous ascites. Arch Surg 1967; 95: 355-368.
4. Unger SW, Chandler JG. Chylous ascites in infants and children. Surgery 1983; 93: 455-461.
5. Press OW, Ottman Press N, Kaufman SD. Evaluation and management of chylous ascites. Ann Intern Med 1982; 96: 358-364.
6. Hyams JS. Ascites. In: Behrman RE, Kliegman RM, Arvin AM (eds). Nelson Textbook of Pediatrics (15th ed). Philadelphia: WB Saunders Company; 1996: 1159.
7. Chye JK, Lim CT, Van der Heuvel M. Neonatal chylous ascites-report of three cases and review of the literature. Pediatr Surg Int 1997; 12: 296-298.
8. Borum PR. Medium-chain triglycerides. Annales Nestle 1997; 55: 73-78.
9. Jensen MM, Christensen MS, Hoy CE. Intestinal absorption of octanoic, decanoic, linolenic acids: effect of triglyceride structure. Ann Nutr Metab 1994; 38: 104-116.
10. Özalp I. Besleyici olarak anne sütü. Katkı Pediatri Dergisi 1991; 12: 510-520.
11. Man DW, Spitz L. The management of chylous ascites in children. J Ped Surgery 1985; 20: 72-75.