

## Chylous Ascites in young infant: A cases report

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### Abstract

Chylous ascites is the extravasation of milky chyle into the peritoneal cavity. This can occur de novo as a result of trauma or obstruction of the lymphatic system. Moreover, an existing clear ascitic fluid can turn chylous as a secondary event. True chylous ascites is defined as the presence of ascitic fluid with high fat (triglyceride) content, usually higher than 110 mg/dL. A cases report was done on a 3 months infant with chylous ascitis diagnosed after ascetic fluid paracentesis at the pediatric department in Tikrit teaching hospital at 13 of March 2011. The aim of this report is to describe the clinical and biochemical features of a patient with chylous ascitis. The patient was presented with huge abdominal distention associated with scrotal swelling for the last one month. Examination shows scrotal edema with bilateral indirect inguinal hernia with positive shifting dullness and transmitted thrill signs ( which indicates presence of a fluid inside the peritoneal cavity). No umbilical hernia or peripheral edema. Abdominal ultrasound shows huge ascitis with bilateral indirect inguinal hernia and no organomegaly. Chest X-ray was normal . complete blood picture and renal function test were normal. Serum electrolyte was normal liver function test was normal except for serum albumin which was low. Paracentesis was done under full aseptic technique which revealed a milky ascetic fluid under very high pressure. The sample was divided into three parts . the first part is for biochemical analysis which revealed a high protein , triglyceride and specific gravity. The second part was sent for cytology and acid fast bacilli which shows increased cellularity with no abnormal cells) and negative test for acid fast bacilli. The third part was send for culture and sensitivity and it was negative. Abdominal CT scan was not done till this time because of the long appointment given for the patient on the waiting list at Tikrit teaching hospital . Lymphangiogram was not done because it is not available in Iraq till now. The patient was put on conservative treatment with follow up regarding the need for paracentesis if there is respiratory compromise by the ascetic fluid and for diet modification after the child starts feeding.

### استسقاء البطن اللمفي لدى طفل اقل من سنة : تقرير حالة احمد هاشم العاني

#### المستخلص

استسقاء البطن اللمفي هو تجمع السائل اللمفاوي اخل فراغ البريتون و الذي من الممكن حدوثه في حالات ضرر أو انسداد القنوات اللمفاوية كما انه من الممكن أن يحدث في حالات ثانوية أخرى. استسقاء البطن اللمفي يعرف بوجود سائل داخل فراغ البريتون يحوي كمية عالية من الدهون الثلاثية (أكثر من 110 ملغم/مل) دراسة حالة تمت على طفل عمره 3 أشهر تم تشخيصه بعد بزل البريتون تم إدخاله إلى قسم طب الاطفال في م. تكريت التعليمي في 2011/3/13 . هدف الدراسة هو وصف الحالة سريريا و كيميائيا . كان المريض يعاني من انتفاخ في البطن مع انتفاخ كيس الصفن لأكثر من شهر . فحص المريض اظهر وذمة كيس الصفن مع فتق مغبني مع وجود سائل داخل

تجفيف البريتون . لا وجود لفتق سروري أو وذمة الساق. سونار البطن اظهر وجود استسقاء البريتون مع فتق مغنبي مع عدم وجود تضخم بالكبد او الطحال . أشعة الصدر السينية كانت طبيعية . فحص صورة الدم و وظائف الكلى و الكبد كان طبيعيا مع فلة نسبة الالبومين في مصل الدم. بزل البريتون اظهر وجود سائل ليمفي تحت ضغط عالي . تم تقسيم نموذج السائل الى ثلاثة أقسام الاول تم فحصه كيميائيا وقد اظهر زيادة البروتينات والدهون الثلاثية . الجزء الثاني ارسل للفحص الخلوي و قد اظهر زيادة الخلايا مع عدم وجود خلايا غير طبيعية . الجزء الثالث ارسل الى الزرع البكتيري و كانت النتيجة سلبية . مفراس البطن لم يعمل لتأخر قائمة الانتظار كما ان فحص القنوات للمفاوية الملون لم يعمل لعدم توفره في وقت الدراسة. تم علاج المريض تحفظيا مع المتابعة المستمرة لاحتمالية احتياج المريض الى بزل جديد مع التوجيه حول نوعية الطعام بعد اكمال الطفل الشهر الرابع من العمر.

## Introduction

Chylous ascites can result from an anomaly, injury, or obstruction of the intra-abdominal portion of the thoracic duct. Although uncommon, it can occur at any age. Causes include congenital malformations, peritoneal bands, generalized lymphangiomatosis, chronic inflammatory processes of the bowel, tumors, enlarged lymph nodes, previous abdominal surgery, and trauma (1). In neonates, rapidly progressing abdominal distention is noted along with poor weight gain and loose stools. Peripheral edema is common. Massive chylous ascites may result in scrotal edema, inguinal and umbilical herniation, and respiratory embarrassment. Diagnosis of chylous ascites depends on the demonstration of milky ascitic fluid obtained via paracentesis after a fat-containing feeding (2). Fluid analysis will reveal a high protein content, elevated triglycerides, and lymphocytosis. If the patient has had nothing by mouth, the fluid will appear serous. Hypoalbuminemia, hypogammaglobulinemia, and lymphopenia are common. *Treatment* includes the provision of a high-protein, low-fat diet supplemented with medium-chain triglycerides that are absorbed directly into the portal circulation. Parenteral alimentation may be necessary if nutrition remains impaired

on oral feedings and also in order to decrease lymph flow to facilitate sealing at the point of lymph leakage. Paracentesis should be repeated only if abdominal distention causes respiratory distress. Laparotomy may be indicated to search for the site of the leak if a trial of dietary management has been unsuccessful (3).

## The case characteristics

A cases report was done on a 3 months infant with chylous ascitis diagnosed after ascitic fluid paracentesis at the pediatric department in Tikrit teaching hospital The patient was presented with huge abdominal distention associated with scrotal swelling for the last one month. Examination shows scrotal edema with bilateral indirect inguinal hernia with positive shifting dullness and transmitted thrill signs ( which indicates presence of a fluid inside the peritoneal cavity). No umbilical hernia or peripheral edema. The patient was put on conservative treatment with follow up regarding the need for paracentesis if there is respiratory compromise by the ascitic fluid and for diet modification after the child starts feeding.

## Results

Abdominal ultrasound shows huge ascitis with bilateral indirect inguinal

hernia and no organomegaly. Chest X-ray was normal . complete blood picture and renal function test were normal. Serum electrolyte was normal . Liver function test was normal ( including SGOT,SGPT , serum bilirubin level, and prothrombin andpartial thromboplastin

time) except for seum albumin which was low. Paracentesis ( means aspiration of ascitic fluid by a needle under aseptic technique)was done under full aseptic technique which revealed a milky ascitic fluid under very high pressure. (picture 1 and 2).



**Picture (1) : the site of paracentesis with chyluos in the tube.**



**Picture (2) : ascitic fluid ( chylous milky appearance ) in 2 tubes.**

The sample of the ascitic fluid (chylous) was divided into three parts .:

the first part is for biochemical analysis which revealed a high protein , fat and specific gravity.

Color usually is milky under very high pressure.

Total protein content 1.9 g/dL, ( high for control)

triglyceride level 140 mg/dL. ( high for control)

Glucose 50 mg/dl . ( normal for control)

Specific gravity is 1.010-1.060. ( high for control)

The second part of the sample was sent for cytology and acid fast bacilli which shows increased cellularity with no abnormal cells (Leukocyte count generally is high, from 250cells/mm<sup>3</sup>, lymphocyte mainly) and negative test for acid fast bacilli. Culture and sensitivity of the ascitic fluid (third part of the sample) was done and the results was negative. Abdominal CT scan was not done till this time because of the long appointment given for the patient on the waiting list at Tikrit teaching hospital . Lymphangiogram was not done because it is not available in Iraq till now.

## **Discussion**

Chylous ascitis is the accumulation of lymphatic fluid (chyle) in the peritoneal cavity. It can be the result of congenital defects of the lymphatic system, inflammatory processes, malignancy, and trauma—surgical or otherwise. The development of chylous ascites following retroperitoneal surgery is a rare but potentially devastating complication with significant morbidity.

Particularly in the post surgical setting, the mechanical, nutritional, and immunologic consequences of chylous ascites can be debilitating and difficult to treat.(1) The rarity of chylous ascites in clinical practice can be judged by the fact that only 28 cases were identified at Massachusetts General Hospital over a period of 20 years. Of these 28 patients, 4 were children. The mean age at detection in adults was 54.3 years (1) . An understanding of the mechanism of chylous ascitis requires a basic familiarity with retroperitoneal lymphatic anatomy. The ascending lumbar lymphatic trunks coalesce from the common iliac lymphatics, draining the lower extremities, genitalia and pelvis (2) .They travel along the great vessels and receive tributaries draining the abdominal and retroperitoneal organs. They fuse at the L1 or L2 level, medial to the aorta and posterior to the left diaphragmatic crus, to form the CISTERNA CHYLI. This structure continues into the chest as the thoracic duct and empties into the venous system at the junction of the left jugular and subclavian veins. Approximately 50-90% of the lymph flow in the cisterna chyli derives from the intestine and liver and contains absorbed dietary fat in the form of chylomicrons. Consequently, lymph flow can increase from a baseline of less than 1 ml/min to over 200 ml/min after ingestion of a fatty meal (3). The current case presented at the age of 3 months with more than one month history of huge abdominal distention which signify a congenital leakage of the lymphatic fluid from the lymphatic ducts or congenital obstruction to the lymphatic or the thoracic ducts. Chylous ascitis is a rare disease especially in neonates and small infants with no risk factors for damage for the lymphatic

ducts or the thoracic duct by trauma or surgery. Abdominal aortic surgery is the procedure that most commonly results in chylous complications, via injury to retroperitoneal lymphatics and, in particular, the cisterna chyli. Although lymphatic leaks account for only 1% of all complications after aortic surgery, this procedure is implicated in over 80% of the cases of post surgical chylous ascites.(3) For urologic procedures, chylous ascites has been described after retroperitoneal lymphadenectomy for testes and renal neoplasms, as well as after nephrectomy.(1,2) . Previous study (4) reported chylous ascites in 1.2% of 1,520 cases of retroperitoneal lymphadenectomy for testes cancer and the incidence after post chemotherapy retroperitoneal lymphadenectomy can be even higher. The current case presented with huge abdominal distention with positive shifting dullness and transmitted thrills. The patient was not dyspneic. The presenting signs and symptoms of chylous ascites mirror the accumulation of intra-peritoneal fluid, and include weight gain, increasing abdominal girth, and a sensation of abdominal fullness. In severe cases, patients sometimes complain of dyspnea related to restriction of diaphragmatic movement and can manifest signs of malnutrition or hypoproteinemia (2). The patient also have bilateral indirect inguinal hernia which is a usual association because huge fluid amount in the peritoneal cavity specially if it is present before closure of the inguinal canal might prevent the normal closure of the canal leaving enough space for fluid as well as for intestine to pass through the inguinal canal into the scrotal sac. The patient was sent for abdominal ultra sound which revealed huge ascitis . the cases of ascitis could be either transudate or

exudates . the transudate is usually due to systemic illness like liver failure , renal failure heart failure and undernutrition (3). The first three causes were excluded by the normal liver function ,renal function and CXR respectively. Under nutrition is a disease of young infants and older ( usually after the age of 4 months) due to decrease intake and depleted storage of the macro and micronutrients by the affected patient which is not the case in our current report because the age of presentation is two month only which is not enough for the patient develop signs of malnutrition. Yet , the reason why serum albumin was low in the current case may be due to the protein leakage from the lymphatic ducts into the peritoneal cavity or the poor feeding by the baby that leads to decrease it level in the serum . on the other hand exudates is usually due to local irritation by infection ( peritonitis or tuberculosis) or malignancy . All the three causes were excluded by negative culture, negative acid fast bacilli and no abnormal cells on cytology respectively (4). The diagnosis was established by ascitic fluid examination which reveals high triglyceride and protein. Chylous ascites is an accumulation of lymph in the abdominal cavity. The diagnosis is established when the concentration of triglycerides in plasma is greater than in ascitic fluid over a level of 200 mg/dl. The current results was similar to that found by other study (5) in which the clinical and biochemical characteristics of 22 patients with chylous ascitis (11 cirrhotics and 11 non cirrhotics) were studied in order to assess differences between patients with and without hepatic cirrhosis. The cirrhotic patients with chylous ascites showed lower protein (1.3 +/- 0.74 mg/dl, p = 0.002)

and cholesterol concentration (46.0 +/- 45.2 mg/dl,  $p = 0.02$ ) in ascitic fluid than non cirrhotic patients (3.1 +/- 1.09 mg/dl, and 100.85 +/- 41.7 mg/dl, respectively). In addition, the cellularity in the ascitic fluid was also lower in cirrhotic patients (209.09 +/- 113.96 cel/mm<sup>3</sup>) versus (831.8 +/- 945.08 cel/mm<sup>3</sup>;  $p < 0.05$ ). Computerized Tomography scan and lymphangiogram was not done because it was not available at time of the study. CT scan, lymph node biopsy, and laparotomy carry the highest yield of diagnostic information. The role of MRI is not well defined. Lymphangiography can transiently worsen chylous ascites due to the oily contrast medium used for the test. A clinical suspicion of ascites can be confirmed by CT or MRI. The density of chylous fluid on CT is essentially the same as water, so it is indistinguishable from simple ascites or urine (6). Bipedal lymphangiography is the imaging modality traditionally used to identify lymphatic leaks and chylous ascites, although CT scanning has largely supplanted this method for initial diagnosis in the majority of cases. Lymphoscintigraphy is a less invasive alternative to bipedal lymphangiography and can confirm an active lymphatic leak into the peritoneal cavity and provide rough localization information (7). The current cases was treated conservatively with enhance feeding and tonics with regular follow up for development of respiratory embasement by the huge amount of fluid ( necessitating paracentesis ) and long term diet modification. Because chylous ascitis is a manifestation rather than a disease by itself, the prognosis depends on the treatment of the underlying disease or cause. Supportive measures can relieve the symptoms. These measures include repeated paracentesis, diuretic therapy,

salt and water restriction, elevation of legs with use of supportive stockings, and dietary measures. A low-fat diet with medium-chain triglyceride supplementation can reduce the flow of chyle into the lymphatics. Typically, medium-chain triglyceride oil is administered orally at a dose of 15 mL 3 times per day at meals. However, this approach is frequently not successful. One recent case report described the successful use of orlistat (Xenical) in a patient who had difficulty complying with a low-fat diet (8). Paracentesis can result in immediate symptom relief; however, reaccumulation of fluid usually follows, and patients may require repeated paracentesis. Some authorities have advocated large-volume paracentesis. Morbidity from a single tap is usually low, but complications, such as peritonitis and hemorrhage, can occur. Transfusion of albumin and/or RBCs during paracentesis may help prevent hypovolemia in patients with hypoalbuminemia or anemia (9). Sepsis is the most common complication, and sudden death has been reported in patients with chylous ascites. The prognosis in adult patients with chylous ascites is poor due to its association with malignancy and severe liver disease. However, pediatric patients and adult patients with post surgical and posttraumatic chylous ascites have a favorable prognosis. Spontaneous healing of a chylous leak has been noted after lymphangiography performed to identify a lymph leak prior to a planned surgical therapy (3).

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