



## Case report

## Chylous ascites and pancreatic pseudocyst on a child following blunt abdominal trauma; a case report

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## ABSTRACT

**Introduction:** Chylous ascites is the collection of milky-like fluid rich in triglycerides within the peritoneal cavity. It results from disruption of normal intestinal lymphatic flow. It is caused mainly by congenital anomalies, trauma, and malignancy. Chylous ascites following blunt abdominal injury is uncommon in pediatrics. Chyle duct and pancreatic injuries present a rare clinical sequela yet to be reported in the literature. Conservative management is the mainstay of treating chyle duct injuries, reserving invasive measures for unique circumstances.

**Case presentation:** A case of an eleven-year-old female who suffered blunt thoracoabdominal trauma and sustained injuries to the chest, pancreas, and chyle duct. She had clinical signs of peritonism and decreased air entry on the right hemithorax. While she underwent abdominal exploration, the chylous ascites eventually resolved on conservative management, and the pancreatic pseudocyst was later drained percutaneously.

**Discussion:** Chylous ascites and pancreatic pseudocyst is uncommon in pediatrics. While surgery is indicated in selected cases, a conservative approach is advocated in managing lymphatic leaks. Diet with low triglycerides and high protein is advocated to decrease lymph production. Treatment of pancreatic pseudocyst varies from conservative (watchful waiting) to drainage measures.

**Conclusion:** Although chylous ascites is not expected following trauma, has to be considered among differential free peritoneal fluid. Pancreatic injuries are common but difficult to diagnose. CT and MRCP are preferred modalities for diagnosing pancreatic injuries. While dietary modification and drainage of the chylous ascites were the mainstays in managing chyle duct injury, pancreatic pseudocyst resolved after percutaneous drainage.

## 1. Introduction

Blunt abdominal injuries are the most common injury among children and the leading cause of morbidity and mortality [1]. Chylous ascites is the accumulation of milky/creamy-like fluid within the peritoneal cavity that is rich in triglycerides and proteins. It develops from the interrupted flow of the thoracic and abdominal lymphatic channels because of trauma, malignancy, or congenital anomalies in children [2,3]. The lymphatic system provides an accessory route for fluids and protein to flow from interstitial spaces to the vascular system—a network throughout the body with a one-way valve [3]. About one-half of body lymph originates from the abdominal organs. Cisterna chyli is the main lymphatic channel in the abdominal cavity. It receives lymph from intestinal trunks, lumbar trunks, and descending channels from the thorax. Injury may manifest as chylous retroperitoneum or

chylous ascites [3]. Cisterna chyle resides in the retroperitoneal space between the abdominal aorta and inferior vena cava anterior to the first and second vertebral bodies. Chylous ascites is a rare condition following blunt abdominal trauma with an incidence of 1 in 20,000. They are caused mainly by flexion and hyperextension movements of the trunk—injury to mesenteric or intestinal structures with shear stress to fixed lymphatic channels [2,4]. Traumatic chylous ascites is rare, with a proportion of fewer than 10% in children. The majority of the cases occurred during postprandial [5].

Pancreatic injury is common following blunt abdominal trauma. It ranks fourth among the most common solid organs in blunt abdominal injuries after spleen, liver, and kidneys. Unlike other solid organs, injuries to the pancreas are challenging to diagnose during the acute phase of injury [1]. Pancreatic pseudocyst involves a collection of enzymatic fluid with walls devoid of epithelium. In trauma, major or minor ductal

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injuries are usually the cause [6,7]. Management of pancreatic pseudocyst ranges from conservative, percutaneous drainage, cyst enterostomy, and pancreatectomy depending on etiology and clinical presentation [7]. Our aim in this case report is to share rare injuries involving both chyle and pancreatic ducts. This case report has been elaborated following SCARE 2020 criteria [8].

## 2. Case report

Eleven years old girl presented with a four-day history of abdominal pain and difficulty breathing. This happened while playing with bricks, which fell on her tummy and chest. There was no head, spine, or extremities involvement during the incident. She was taken to a nearby facility and kept on conservative management for abdominal pain and chest injury. Four days later, she had worsening abdominal and respiratory symptoms, necessitating a referral to our facility. Upon examination, she had a blood pressure of 98/60 mm Hg, pulse rate of 85/min, respiratory rate of 22 cycles/min, and oxygen saturation of 90 % on room air. Initial radiological evaluation revealed a contused right lung from a chest X-ray (Fig. 1), and FAST (Focussed Assessment with Sonography for Trauma) revealed free fluid in the abdominal cavity. She was kept on tube thoracostomy and close monitoring for the abdominal symptoms. Twelve hours later, she had worsening abdominal symptoms with 110 beats per minute tachycardia and a low-grade fever of 38.00 °C. Her clinical condition led to an emergency laparotomy. Her clinical condition led to an emergency laparotomy.

Intraoperative, she had hemolyzed blood of 200 ml, contused greater curvature of the stomach, contused greater omentum and pancreas. The pediatric surgeon was consulted intraoperative, and re-inspection was done. Conservative management opted for pancreatic trauma. Abdominal lavage with normal saline was done. A drain was inserted into the pelvic cavity. She was then taken to the pediatric ward. Four days later, she had a milky yellowish fluid discharge per drain site, clinical signs of peritonism, and a fever of 39.0 OC. She was again taken to the theatre for a second look surgery, where an innocent peritoneal cavity and its organs were encountered (Fig. 2).

Three days later, she had another yellowish milky fluid coming out per drain. Evaluation of the fluid confirmed it to be sterile chylous, with higher triglyceride levels than serum levels (Fig. 3). An average of 100 ml/24 h. She had elevated serum lipase of 1497 U/l and average serum glucose. She was kept on a diet with low fat and high protein, which led



Fig. 1. Erect chest X-ray in PA view with a right lung contusion.



Fig. 2. Innocent viscera's and peritoneal cavity encountered during a second surgery.



Fig. 3. Chyle from abdominal drain.

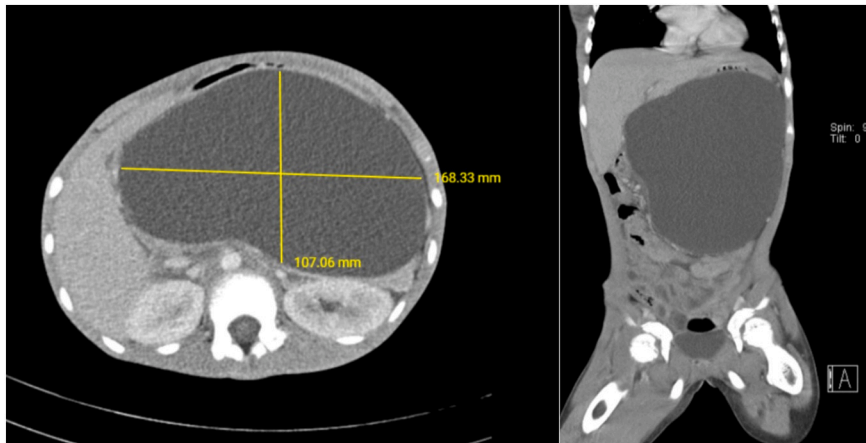
to the resolution of chyle leaks. She was then discharged.

A month later, she had a grossly distended abdomen with clinical signs and symptoms of gastric outlet obstruction. Her CT images revealed a substantial pancreatic cyst of 168 mm by 107 mm in its maximum dimension (Fig. 4). Through ultrasonography, two liters were drained percutaneously, and her symptoms resolved. During a four-month follow-up, it was uneventful.

## 3. Discussion

Co-occurrence of chyle duct and pancreatic injuries following blunt abdominal trauma is rare. Neither the less in children. Intuitively this can happen as both structures are in the retroperitoneal area. Our patient had two negative laparotomies. During the first encounter, she had contused greater curvature of the stomach, greater omentum, and pancreas—minimal hemorrhage and swollen pancreas, mainly at the head and body, with elevated serum lipase. There was no pancreatic tissue loss or laceration.

We postulate that she had a high energy impact with hyperextension and flexion of the vertebral column and trunk from falling bricks. This



**Fig. 4.** Axial (left) and coronal CT images showing a substantial pancreatic cyst with mechanical compression of the adjacent structures.

had a deleterious shear force on the abdominal organs of the left upper quadrant. Causing injury to the pancreatic duct and lymphatic duct. She was kept on a low-fat and high-protein diet. Chylous ascites resolved on day five post-operative. Due to financial constraints, further radiological evaluation was not feasible. A CT (computed tomography) or MRCP (magnetic resonance cholangiopancreatography) would have given an insight into the parenchymal and ductal injury. Pancreatic pseudocyst was diagnosed a month later and managed by ultrasound-guided percutaneous drainage.

#### 4. Conclusion

Blunt abdominal trauma causing synchronous injuries to the chyle duct and the pancreas is a rare pathology. Our patient required further radiological (CT/MRCP) evaluation to describe injuries to the retroperitoneal organs. Chylous ascites management is primarily conservative with dietary modification and low-fat and high-protein meals. Surgical intervention is reserved for severe cases with significant nutritional and metabolic derangements. Pancreatic injuries remain a challenge in diagnosis and management. While chylous ascites resolved on conservative treatment, pancreatic pseudocyst was drained percutaneously.

#### Consent

The patient provided an ascent. Written informed consent was obtained from her parents for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Ethical approval

Not applicable.

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#### Guarantor

All authors in the article accept full responsibility for the work, have access to the patient's information, and decision to publish.

#### Research registration number

Not applicable.

#### CRedit authorship contribution statement

Dr. Kennedy Misso: Participated in both surgeries, drafted and approved the final article.

Dr. Bahati Robert: Perioperative care of our patient, participated in article draft and its final approval.

Dr. Joachim Magoma: Perioperative care. Drafted and approved the final article.

Dr. Tendai Joylene: Participated in both surgeries and drafted and approved the final article.

Dr. David Msuya: Consulted during both surgeries. Participated in drafting and approval of the final article.

#### Declaration of competing interest

The authors report no declaration of interest.

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