Successful Conservative Management of High Output Chylothorax in a Case of Polytrauma

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Case Report

ABSTRACT
Chylothorax, an accumulation of chyle in the pleural cavity is a rare complication of pediatric blunt trauma. It could result from damage to or obstruction of thoracic duct. Though rare in incidence chylothorax can lead to significant morbidity and mortality. We report a case of traumatic high output chylothorax following blunt chest trauma in an eleven-year-old boy with h/o fall of ceiling at school. On admission GCS 7/15 with decompensated shock and bilateral hydropneumothorax for which child was intubated, started on inotropes and bilateral ICD placed. On further evaluation was found to have pulmonary contusions, bilateral multiple rib fractures, T4 & T5 vertebral fracture with grade 3 liver laceration. On day 3 child developed high output drain (>1L per day) and was confirmed as chyle on biochemical analysis, which was managed conservatively. The chest tube was removed after drain was completely stopped, he made a full recovery. Initial management of high output chylothorax is thoracic duct ligation or embolization which is typically needed early often within the first few days after diagnosis since conservative strategies are more likely to fail but our case shows that pediatric traumatic high output chylothorax can be successfully managed conservatively.

Key words: Chylothorax, High output chyle, Conservative Management

Introduction
Chylothorax is the accumulation of chyle in the pleural space. Several etiologies being congenital, traumatic and non-traumatic, among traumatic cases iatrogenic injury is most frequent consequent to neck, thorax and abdominal surgeries. Incidence of thoracic duct injury (TDI) due to traumatic cause or closed trauma to thorax after an accident is 0.2 - 3%.1

Case Report
An 11-year-old boy was brought to our emergency department with alleged h/o trauma, fall of ceiling at school, he was initially found to have pulmonary contusions, bilateral rib fractures, T4 & T5 vertebral fracture, right shaft & left intertrocantric fracture of femur with grade 3 liver laceration. On initial examination GCS7/15, child in decompensatory shock with vitals HR: 146/min, BP not recordable, saturation 88%, GRBS 352 mg/dl. On systemic examination, peripheral pulses were feeble, right side air entry absent, left side air entry decreased, subcutaneous emphysema on right side anterior and infra axillary part of chest. On palpation, crepitus over right anterior thorax and tenderness in right hypochondrial region. Child was intubated, fluid resuscitation was done, and inotropes were started. Chest x-ray revealed bilateral hydropneumothorax, ultrasound thorax and abdomen were done suggestive of gross right pleural effusion and left moderate pleural effusion with grade 3 liver laceration for which bilateral emergency tube thoracotomy (ICD) was done which drained 760 ml of hemorrhagic fluid on right side and 40 ml hemorrhagic fluid on left side. Child was shifted to pediatric intensive care unit was monitored, and investigations were suggestive of deranged liver function test with hypoalbuminemia for which liver team was consulted and advised conservative management with albumin transfusion. On day 2 inotropes were weaned off, child was extubated and was hemodynamically stable. On day 3 right ICD drain increased to 2200ml which was serosanguineous to chyle. Therefore child was started on octreotide 50mcg s/c 8th hourly. However, child continued to have high output drain which was serosanguineous to chyle. Therefore child

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was put nil by mouth and total parenteral nutrition was started along with octreotide. On day 11 clear fluids were started and was observed that drainage was serosanguineous and volume reduced. On day 12 child was shifted to fat free liquid diet and repeat biochemical analysis of pleural fluid showed decreased triglycerides (triglyceride: 120 mg/dl). On day 14 fat free soft diet was started and TPN titrated accordingly and stopped. On day 15 & 16 drain was nil and octreotide was stopped, on day 17th ICD was removed. Child was observed for 3 days on fat free diet and was discharged with advice to continue for 4 weeks. On follow up lipid profile was monitored and after 4 weeks normal diet was gradually introduced and revealed no complications.

Discussion

Traumatic chylothorax is a rare complication following chest trauma and can take days to develop and to become clinically apparent. It is therefore important to be vigilant for potential late complications in blunt chest trauma in children, especially if there are extensive rib fractures, a sign of major transmission of force to the thorax. Often a latency period of 2–7 days exists between the time of injury and presentation of chylothorax.

Thoracic duct transports chyle and lymph from intestine, liver, abdominal wall and lower extremity into central venous system. Trauma to the thoracic duct is the commonest cause of chylothorax. The risk of injury to terminal thoracic duct may be influenced by anatomical variations. Majority of TDI occur on left side (75 - 92 %) as terminal segment of thoracic duct drains into neck veins. Without treatment, mortality can be up to 50%, hence early intervention is indicated. Loss of chyle and lymph into pleural space can lead to loss of essential proteins, immunoglobulins, fats, vitamins, electrolytes and water with drastic consequences. Our case, TDI was diagnosed based on biochemical analysis of drain fluid which had high triglyceride level. Diagnosis should be suspected when milky pleural fluid drains on thoracocentesis or pleural drainage. A laboratory examination of the chylothorax should include a quantitative analysis of the fluid chemistry. Pleural effusions with triglyceride values estimated at more than 110 mg/dL have a 99% probability of being indicative of chylothorax.

Patients are considered to have low output chylothorax if the estimated or known volume of drainage or accumulation is less than 1 L chyle per day. Many patients with medical reasons for their chylothorax and postoperative patients with chyle leak due to minor trauma to the thoracic duct (eg, trauma of a small thoracic duct tributary) fall into this category. High output chylothoraces (estimated or known volume >1 L chyle per day) are most commonly seen in postsurgical patients and those with liver cirrhosis. In such patients, thoracic duct ligation or embolization are typically needed early (often within the first few days after diagnosis) since conservative strategies are more likely to fail in this population.

General approach to TDI varies as some prefer early surgical intervention while others follow conservative approach to the problem. Conservative treatment is expensive and may fail in high output CHT. The conservative approach is usually attempted first. Pleural cavity should be drained followed by fat free diet with addition of medium chain triglycerides or nil...
by mouth with total parenteral nutrition. Somatostatin is an important adjuvant to conservative management of chyle leak. Though our case had high output chylothorax we tried to manage conservatively as success rate of surgical intervention was less and chances of complications is high and may require more than one surgical attempt for the desired outcome.7

**Conclusion**

Chylothorax is a rare consequence of thoracic trauma. The immediate management of a pleural fluid collection causing physiologic derangements after trauma relies on rapid identification and drainage. Although blood is the most common finding on thoracostomy tube placement, chyle is a possibility that should be considered. Chylothorax management is primarily non-operative, adequate drainage must be assured to accurately track daily output. Dietary adjustments and medications are aimed at limiting chyle flow to promote healing even in high output chylothorax before resorting to surgical intervention.

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**References**