

Bilateral chylothorax after blunt thoracic trauma: a case report

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Traumatic chylothorax other than iatrogenic thoracic duct injury is extremely rare in children. Chylothorax can cause cardiopulmonary abnormalities and significant nutritional, metabolic and immunologic consequences. The management of chylothorax ranges from conservative treatment to surgical intervention. We present a four-year-old boy who presented with respiratory difficulty due to multiple rib fractures and bilateral chylothorax, which developed after a blunt chest trauma. The patient was successfully treated through a conservative approach with total parenteral nutrition, nothing by mouth, and bilateral chest tube drainage. The nature of pleural effusion developed following a blunt thoracic trauma is important in the management of trauma patients.

Key words: chylothorax, blunt chest trauma, childhood.

Chylothorax due to blunt chest trauma is rarely seen in childhood¹. Because of the small number of patients in this age group, the approach to chylothorax remains unsettled in the literature. Proper management will depend on the clinical status of the patient and familiarity with the therapeutic options.

We describe a child who developed bilateral chylothorax after a blunt chest trauma and was presented with respiratory difficulty. A good outcome was achieved with conservative treatment with total parenteral nutrition, nothing by mouth and bilateral chest tube drainage.

Case Report

A four-year-old boy was referred to our hospital with dyspnea on the second day following a blunt trauma caused by a huge manufacturing pipe falling from a truck. An initial chest roentgenogram showed fractures on the posterior parts of the fourth, fifth, sixth and seventh ribs on the right side and pleural effusion on the left hemithorax (Fig. 1). He had difficulty in breathing, tachypnea, intercostal retractions, and somnolence. The computed tomography of the thorax on the day of admission to our hospital showed bilateral pleural effusions (Fig. 2).



Fig. 1. Chest X-ray shows multiple posterior rib fractures on the right side and pleural effusion on the left hemithorax.

Bilateral chest tubes were inserted under sedation with midazolam. The initial drainage obtained from right and left sides was blood-stained milky fluid of 250 and 200 ml, respectively. The lungs were fully expanded after the procedure. Evaluation of the pleural fluid revealed a high lipid content with triglycerides 399 mg/dl, cholesterol 37 mg/dl, protein 2446 mg/dl, lactate dehydrogenase (LDH) 675 IU/L, and glucose 211 mg/dl. Microscopic examination showed large numbers of white



Fig. 2. Computed tomography of the chest shows bilateral massive pleural effusions.

cells but no microorganisms. Conservative treatment for chylothorax with nothing by mouth and total parenteral nutrition (TPN) was instituted. Cranial computed tomography showed diffuse cerebral edema, which resolved following appropriate anti-edema treatment. On secondary trauma work-up, fracture of tibial epiphysis was diagnosed and managed by the orthopedic surgeon. The chest tube drainage gradually decreased from 100 ml/day to less than 20 ml/day in four days and had completely ceased on the fifth and seventh days on the right and left sides, respectively. Since then, a regular diet was initiated and thoracostomy tubes were removed. He was discharged on the 10th day uneventfully. He was doing well at the first- and sixth-month follow-up visits.

Discussion

Chylothorax is a rare disease caused by different etiological factors. It can be congenital, idiopathic, neoplastic, and traumatic (surgical or nonsurgical)^{2,3}. Nearly all chest injuries are due to blunt trauma in childhood. Nakayama et al.⁴ reported that rib fractures and pulmonary contusions have occurred with nearly equal frequency (49.5% and 53.3%, respectively), followed by pneumothorax (37.1%) and hemothorax (13.3%).

Congenital heart disease surgery has been implicated as the most common cause of traumatic chylothorax^{5,6}. Hyperextension of the spine and violent coughing or vomiting are also the main responsible factors for traumatic injuries of the duct^{2,5}. Chylothorax as a result

of blunt trauma is rare, and when it occurs, it is associated with fractures of the spine and/or posterior ribs^{7,8}. Depending on the level of injury, the chylothorax may develop on the right or left side, or bilaterally³.

The diagnosis of chylothorax is made by analysis of the pleural fluid. Triglyceride levels >110 mg/dl, presence of chylomicrons, low cholesterol level, and predominantly lymphocyte fraction (>1000 cells/ μ l) are diagnostic for chylothorax^{2,3,5}. Treatment includes tube drainage for decompressing the pleural space and thoracic lymphatics. Nothing by mouth will substantially reduce chyle flow⁷. With the use of diet that contains middle chain triglycerides, which are directly absorbed to the portal system, thoracic duct flow is minimized to promote the healing of the leak¹. If drainage continues, oral intake should be ceased and TPN should begin. It has been outlined that if the average daily loss exceeds 100 ml per year of age in children for a five-day-period, operative intervention is indicated^{2,3}. Somatostatin or octreotide has been reported as an option in the treatment of persistent chylothorax^{6,9}. It should be integrated in the management of chylothorax after the dietary measures but before surgical options. Although the proper timing is not yet defined, ligation of the thoracic duct through thoracotomy or video-assisted thoracic surgery is recommended when conservative management fails^{5,8,10}.

Our case had a blunt chest trauma that resulted in multiple right-sided posterior rib fractures and bilateral pleural effusions. The pleural fluid was chylous, and contained high triglycerides concentration and low cholesterol level. We performed a conservative approach including tube thoracostomy, nothing by mouth, and TPN, which resulted in regression of the chylous fluid and improvement of the patient.

Blunt chest trauma commonly results in lung contusion and laceration, which cause parenchymal hemorrhage sometimes accompanied by pneumothorax and/or hemothorax. Most traumatic chest injuries may be treated by rest, respiratory support and eventually intercostal drainage¹¹. The appearance and the nature of the pleural effusion following a blunt chest trauma are very important in the management of the trauma patient. Chylothorax should be kept in mind in slowly increasing fluid accumulation in

the thorax and gradually manifesting dyspnea. Chyle drainage requires diet regulation or nothing by mouth and TPN in addition to tube thoracostomy.

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