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CASE REPORT

Successful Conservative Management of Postoperative Chylothorax Following Aortic Coarctation Repair in an Infant: A Case Report

Fouzia BOUNOUA[1],Djamila Djahida BATOUCHE[1,2,3], Djilali BATOUCHE[4], Houcine SADDOK[1,2], Zaki ADDOU[1,2], Kamel ELHALIMI[1,2]

ABSTRACT

Chylothorax is a rare but potentially serious postoperative complication in pediatric cardiac surgery. We report the case of a 39-day-old infant who developed postoperative chylothorax following surgical repair of severe aortic coarctation. The patient was initially discharged on postoperative day 12 in stable hemodynamic condition but was readmitted four days later with vomiting, cyanotic episodes, and respiratory distress. Chest imaging revealed a left-sided pleural effusion. Thoracentesis yielded milky fluid with markedly elevated triglycerides (17.50 g/L) and lymphocytic predominance, confirming the diagnosis of chylothorax. Conservative management included effective pleural drainage (total of 115 cc), bowel rest, lipid-free total parenteral nutrition, albumin supplementation, intravenous antibiotics, and methylprednisolone (2 mg/kg/day). Subcutaneous somatostatin (50 µg/kg every 8 hours) was initiated on day 2 and continued for 17 days to reduce lymphatic flow and support ductal healing. A specialized formula low in long-chain triglycerides (MILUPA BASIC) was introduced on day 5. The pleural effusion resolved completely, allowing drain removal by day 14. The infant was discharged on day 27 in good clinical condition. At 1-month follow-up, the child had gained 1 kg, with a normal cardiopulmonary examination. At 19 months, the patient remained healthy and symptom-free. This case highlights the effectiveness of early, structured conservative treatment and supports somatostatin-based therapy as a safe and effective alternative to surgical intervention in postoperative chylothorax.

Keywords: chylothorax, aortic coarctation, infant, cardiac surgery, somatostatin, conservative management.

1. Service anesthesia reanimation pédiatrique – néonatale EHUO, Oran, Algérie. 2. Faculté de medecine Oran1, Algérie. 3. Laboratoire de recherche LERMER, Algérie. 4. Clinical Research Multihealth and Pharmacovigilance, Company Freelance, Paris, France

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Correspondance to: Fouzia BOUNOUA
E-mail : Bounouafouzia94@gmail.com

1. INTRODUCTION

Chylothorax is a rare but significant complication following cardiovascular surgery in infants. It typically results from either direct injury to the thoracic duct or increased lymphatic pressure due to postoperative hemodynamic changes [1,2]. The clinical presentation is often delayed and nonspecific, ranging from mild tachypnea to progressive respiratory distress [3].

Diagnosis is confirmed by pleural fluid analysis, which typically appears milky or opalescent and demonstrates elevated triglyceride levels (>110 mg/dL) and a predominance of lymphocytes [4]. Management focuses on reducing chyle flow, preventing infectious and nutritional complications, and promoting thoracic duct healing.

We report a case of postoperative chylothorax in an infant following surgical repair of aortic coarctation, which was successfully managed with a fully medical approach. This case highlights the effectiveness of early and structured conservative treatment.

Objectives

To report a rare case of chylothorax following surgical repair of aortic coarctation; to explore the likely pathophysiological mechanisms involved in this context, and to describe the components of a successful conservative medical management strategy.

2. CASE PRESENTATION

A 39-day-old neonate underwent surgical repair of a critical isthmic aortic coarctation, associated with left ventricular dysfunction, a small ventricular septal defect, a small patent ductus arteriosus (PDA), and a persistent left superior vena cava draining into the coronary sinus. The procedure consisted of aortic plasty via a left thoracotomy through the 4th intercostal space. After dissecting the descending aorta and ligating the ductus arteriosus, a modified Crafoord technique was used for resection of the coarctation and anastomosis to the descending aorta. The repair was hemostatic, with good distal pulsatility upon declamping. The thoracotomy was closed over a Redon drain. Postoperative recovery was favorable, with normalization of echocardiographic parameters. The patient was discharged on postoperative day 12 with enalapril (0.5 mg/kg twice daily) and furosemide (0.5 mg/kg/day).

Four days later, he was readmitted for vomiting and episodes of sudden cyanosis. Initially evaluated at a regional hospital, he received empirical amoxicillin and methylprednisolone. Chest X-ray revealed a left-sided pleural effusion. Thoracic CT showed an endobronchial foreign body, left upper lobe atelectasis, and aspiration pneumonia. He was transferred to the Pediatric Intensive Care Unit (PICU) for worsening respiratory distress. At PICU admission, he was conscious (GCS 15), tachypneic (RR 66/min), with SpO_2 at 96% on 5 L/min oxygen, intercostal and suprasternal retractions, and bilateral crackles (predominant on the left). Heart rate was 168 bpm, and blood pressure was 110/50 mmHg.

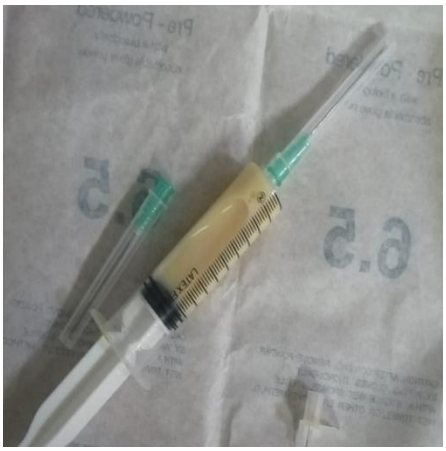

Figure 1. Milky thoracic fluid obtained on initial thoracentesis.

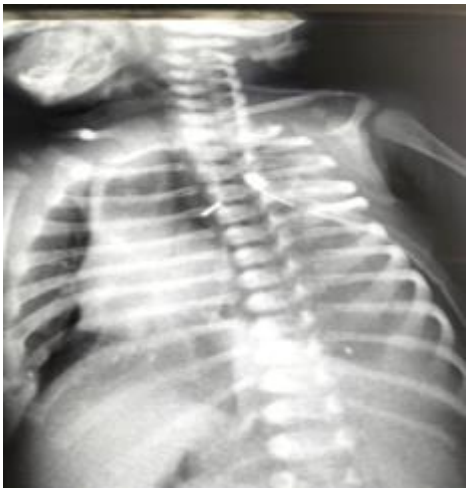

Figure 2. Pleural drain placed in the second left intercostal space, showing lactescent drainage.

Echocardiography was unremarkable. Pleural ultrasound confirmed a moderate left-sided effusion. A diagnostic thoracentesis yielded 8 mL of milky fluid (Figure 1), followed by pleural drainage producing 95 mL of white, lactescent fluid (Figure 2). Cytobacteriological analysis of the pleural fluid revealed: cellularity: 2000 WBC/mm³ with 100% lymphocytes; biochemistry: triglycerides 17.50g/L, glucose 1.39 g/L, amylase 7 U/L, total proteins 28.88 g/L; bacteriology: Negative. These findings confirmed the diagnosis of postoperative chylothorax.

Initial management included effective pleural drainage totaling 115 mLover 5 days, bowel rest with fat-free total parenteral nutrition (TPN), and albumin supplementation of 1 g/kg for 5 days. Intravenous methylprednisolone (2 mg/kg/day) was used to reduce inflammation. Subcutaneous somatostatin was initiated on day 2 of hospitalization at 50 µg/kg every 8 hours for 17 days to reduce lymphatic flow and promote ductal healing. On day 4, a complete blood count showed: WBC = 13,000/µL, RBC = 4.1 million/µL, hemoglobin = 10 g/dL, hematocrit = 31%, and platelets = 346,000/µL.

The patient was treated empirically with IV antibiotics: cefotaxime (100 mg/kg/day in 3 doses), vancomycin (50 mg/kg/day), and amikacin (15 mg/kg/day) for 7 days. On day 5, enteral nutrition was gradually reintroduced using Milupa Basic, a formula low in long-chain triglycerides to minimize chyle production. Clinical condition improved progressively, with complete resolution of the pleural effusion and removal of the chest drain by day 14.

Clinical and biological evolution were favorable. The patient was discharged on day 27 and referred to a pediatric cardiologist. At the one-month follow-up, the infant had gained 1 kg, and both cardiac and respiratory clinical examinations were unremarkable. At 19 months post-discharge, he was seen again in consultation and found to be in excellent health.

3. DISCUSSION

Chylothorax is a rare yet potentially serious complication after pediatric cardiovascular surgery. In this case, multiple factors likely contributed to its onset. Although no intraoperative complication was reported during aortic coarctation repair, inadvertent injury to the thoracic duct remains a plausible mechanism due to its anatomical proximity to the aorta and ductus arteriosus [1,2]. Furthermore, the child developed vomiting, cyanosis, and aspiration pneumonia prior to chylothorax onset. These conditions could have led to increased intrathoracic pressure due to labored breathing, a well-known factor in elevating central lymphatic pressure and compromising the thoracic duct, especially when surgically fragile [3,4]. Additionally, local inflammation from pulmonary infection may have impaired lymphatic flow, further facilitating chyle leakage [5]. Thus, in this infant, chylothorax appears to have resulted from a multifactorial mechanism involving anatomical vulnerability, respiratory distress, and infectious injury to the lymphatic system.

Initial treatment of pediatric chylothorax is primarily conservative. It includes minimizing chyle production through dietary restriction or TPN, preventing protein and lymphocyte losses, and supporting thoracic duct healing [1,6,7]. Pharmacologic agents like somatostatin or octreotide have demonstrated efficacy in reducing lymphatic output, with success rates exceeding 80% in moderate-to-large effusions [1, 8,9]. Surgical options, including thoracic duct ligation or pleurodesis, are reserved for refractory cases after 10–14 days of failed conservative management [10,11].

In our patient, early implementation of a structured conservative protocol resulted in full resolution of the chylothorax, avoiding the need for surgical intervention.

4. CONCLUSION

Chylothorax should be suspected in any infant presenting with pleural effusion and respiratory deterioration after cardiac surgery. Early diagnosis and comprehensive conservative management, including pleural drainage, dietary modification, somatostatin therapy, and infection prevention, can lead to full recovery without surgical intervention in most cases.

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Conflict of interest: The authors declare no conflict of interest

Institutional review board statement: the study was carried out at the university hospital 1st November, in october 2023. The infant's anonymity is respected; parents sign consent for all treatment and care on the hospitalization form

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