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REVIEWER'S REPORT

Manuscript No.: IJAR- 57771

Title: Chylothorax Following Bidirectional Cavopulmonary Shunt (Glenn Procedure) in an Infant with Complex Congenital Heart Disease: A Case Report

Recommendation:
Accept after minor revision

Rating	Excel.	Good	Fair	Poor
Originality		✔,		
Techn. Quality		✔,		
Clarity	✔,			
Significance	✔,			

Reviewer Name: Dr. Bilqees Hamza

Detailed Reviewer's Report

The manuscript titled **"Chylothorax Following Bidirectional Cavopulmonary Shunt (Glenn Procedure) in an Infant with Complex Congenital Heart Disease: A Case Report"** presents a highly relevant, detailed clinical look into pediatric cardiothoracic care. The study focuses on a 17-month-old male infant with a complex, single-ventricle anatomy who developed a recurrent, massive left-sided pleural effusion following a bidirectional cavopulmonary shunt (the Glenn procedure).

The scope of this case report is well-defined, addressing a significant and known complication of single-ventricle palliation. The Glenn procedure creates a non-pulsatile, passive pulmonary circulation by connecting the superior vena cava directly to the pulmonary arteries. While this path is necessary, it inherently raises central venous and lymphatic system pressures, predisposing up to 17% of single-ventricle patients to chylothorax. By detailing the diagnostic challenges and successful conservative management of this patient, the manuscript provides practical insights into handling this complex postoperative condition.

As a clinical case report, the methodology follows a retrospective narrative framework that traces the patient's course from initial presentation to intensive care management and eventual stabilization. The patient had a complex cardiac history including a single ventricle, mitral valve atresia, right-sided aorta, sub-valvular and valvular pulmonary stenosis, and a 7 mm interatrial communication. One month after an initially uneventful Glenn procedure, the infant developed progressive, afebrile respiratory distress caused by a large left-sided pleural effusion.

The key clinical and diagnostic findings include:

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- **Advanced Hypoxemia:** Upon admission to the Pediatric Intensive Care Unit (PICU), the infant was in severe distress, presenting with tachycardia (154 bpm), tachypnea (40 cycles/min), peripheral cyanosis, intercostal retractions, and a critical oxygen saturation (SpO_2) of 65% on supplemental oxygen.
- **Atypical Fluid Appearance:** Prior to PICU admission, a second thoracocentesis drained approximately 600 mL of fluid that appeared "purulent," which could easily have been mistaken for an infectious empyema without further testing.
- **Definitive Biochemical Confirmation:** Pleural fluid analysis revealed an exudative profile with a total protein content of 46 g/L. The diagnosis of chylothorax was confirmed by a triglyceride level of 2.68 mmol/L (~237 mg/dL), well above the standard diagnostic threshold of $\ge$1.24 mmol/L (110 mg/dL). A sterile cytobacteriological culture ruled out secondary bacterial infection.
- **Successful Conservative Treatment:** The patient was successfully stabilized using a combination of continuous chest tube drainage, furosemide (1 mg/kg every 6 hours) to lower systemic venous pressure, and aspirin (20 mg/kg/day) to maintain cavopulmonary flow stability. This approach allowed for significant clinical improvement and a safe transfer to a non-intensive care ward.

The manuscript provides good analytical depth by connecting the physical fluid findings to the unique pressures of single-ventricle physiology. The author highlights an important diagnostic pitfall: chylous fluid can look milky or purulent, meaning it can be easily misidentified if clinicians do not routinely perform biochemical triglyceride testing on recurrent post-Glenn effusions.

The paper offers a helpful addition to pediatric cardiology literature by demonstrating that a well-coordinated conservative protocol—combining targeted diuresis, anti-platelet therapy, and continuous drainage—can achieve complete resolution without needing more invasive surgical options or costly medications like octreotide or somatostatin analogues.

Suggestions for Improvement

- **Include Detailed Pre- and Post-Treatment Laboratory Metrics:** Expand Table 1 to display complete blood counts, electrolyte levels, and kidney function parameters over the course of treatment, rather than just showing the values at PICU admission. This will let readers track the patient's metabolic and fluid balance during aggressive diuretic therapy.
- **Incorporate a Clear Timeline Diagram:** Introduce a visual clinical timeline tracking the case from the initial Glenn procedure, to the onset of symptoms at day 15, the initial drainage

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procedures, the PICU admission, and the final resolution. This would make the sequence of events much easier to follow.

- **Elaborate on Specific Dietary Interventions:** While the discussion notes that a specialized medium-chain triglyceride (MCT) or total parenteral nutrition (TPN) diet is a cornerstone of chylothorax management, the case description does not explicitly state the patient's nutritional plan. Clarify the exact dietary or feeding adjustments implemented for this infant during his recovery.
- **Integrate Representative Imaging:** Include a figure showing the patient's chest X-rays, demonstrating the massive left-sided fluid accumulation at admission alongside the subsequent lung expansion after successful chest tube drainage.
- **Clarify Post-Discharge Follow-Up Outcomes:** Provide details on the patient's long-term management after leaving the intensive care unit. State how long the chest tube remained in place, when the diuretic doses were reduced, and whether any fluid returned during outpatient check-ups.
- **Expand the Pathophysiological Discussion:** Deepen the discussion section by reviewing the exact structural anatomy of the thoracic duct and explaining how surgical trauma or high pressures in the superior vena cava can cause chylous fluid to leak into the left pleural space.
- **Address Potential Complications of Fluid and Protein Loss:** Discuss the clinical risks associated with draining large volumes of chylous fluid (such as the 600 mL removed initially). Address how losing large amounts of proteins, immunoglobulins, and lymphocytes can place an infant at risk for malnutrition or a weakened immune system.
- **Clean up Minor Formatting and Spacing Slips:** Conduct a brief editing pass to correct minor text errors and duplicate words. For example, fix the duplicate keyword **"Pleural Pleural Effusion"** on page 1, correct the typographical fragment **"mediate"** to "immediate", and fix the spacing error in **"Modelusing FIKR"** if any related baseline text frameworks were referenced during drafting.
- **Standardize In-Text Reference Formats:** Ensure all in-text citations follow a consistent style guide. On page 1, references are formatted as **"[2.3]"** using periods, whereas standard international formats use commas (e.g., [2, 3]). Uniformly update these throughout the manuscript.
- **Verify and Standardize the Bibliography:** Review the reference list to ensure every citation matches an in-text mention and follows a single style guide, such as APA 7th edition or

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Vancouver. Make sure all entries include complete publication metadata, including volume numbers, issue numbers, page ranges, and active DOIs.

Recommendation for Publication

I recommend this manuscript for **publication with minor revision**. The case report is well-constructed and covers a highly relevant clinical challenge in pediatric cardiosurgery, emphasizing a valuable lesson about the appearance and biochemical diagnosis of chylous fluid. The treatment timeline shows a successful conservative approach that aligns well with current pediatric intensive care standards. Once the author adds details regarding the nutritional plan, includes a visual case timeline, and updates the minor formatting and reference inconsistencies, this paper will be a strong and highly informative addition to journals focusing on pediatric intensive care, thoracic surgery, or pediatric cardiology.