

# Isolated Acute Right-Sided Heart Failure in Pediatric Septic Shock: A Case Report

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## INTRODUCTION

Septic shock is a significant cause of morbidity and mortality in children, often involving myocardial dysfunction, typically of the left ventricle. However, isolated right ventricular (RV) failure is rare and underrecognized. Early identification of RV failure is crucial, as its management differs significantly from that of left ventricular dysfunction. We present a rare case of a pediatric patient with septic shock and isolated RV failure, highlighting the diagnostic and therapeutic challenges involved.

## CASE DESCRIPTION

A 9-year-old boy presented with two days history of vomiting, lethargy and rapid breathing. On arrival, he was lethargic with sluggish pupillary reflexes. He was hypotensive (BP 86/52 mmHg), tachycardic (HR 116 bpm), tachypneic (RR 60/min) and hypoxemic (SpO<sub>2</sub> 85%, improving with oxygen). He exhibited cool extremities and prolonged capillary refill. Bedside ultrasound revealed a hyperdynamic LV, a dilated RV with reduced systolic function and high inferior vena cava (IVC) collapsibility index. Initial labs showed severe metabolic and lactic acidosis (pH 7.17/ PCO<sub>2</sub> 12.1/ lactate 13.3/ BE -24/ HCO<sub>3</sub> 9.7). He received aggressive resuscitation with 60 mL/kg fluid boluses, broad-spectrum antibiotics and maximum inotropic support. He was intubated for respiratory failure but further deteriorated and succumbed to death.

## DISCUSSION

Sepsis-induced hypoxemia and inflammation raise pulmonary vascular resistance (PVR), increasing RV afterload and precipitating RV dysfunction [1,2]. Children cannot mount sufficient RV adaptation or hypertrophy, leading to acute RV failure [2].

Point-of-care ultrasound (POCUS) was essential for detecting RV dilation, septal shift, and reduced RV wall motion. The "D-sign" on parasternal short-axis suggested RV pressure overload [3]. Echocardiographic assessment in septic shock enables the differentiation of isolated RV failure from typical biventricular or LV dysfunction [3].

Excessive fluids may exacerbate RV dysfunction despite being standard in sepsis management [2]. Early vasopressor use, cautious fluid strategy, and targeted PVR reduction with agents like inhaled nitric oxide or prostaglandin E1 are preferred approaches [1,2]. ECMO may be considered for refractory shock, though it is higher risks in the context of sepsis.



Figure 1 : RV dilatation on parasternal long axis view



Figure 2 : RV dilatation on 4 chambers view

## CONCLUSION

Isolated RV failure is a life-threatening complication in pediatric septic shock. POCUS is essential for early diagnosis and individualized treatment to improve outcomes.

## REFERENCE

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