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A Case Report: Pulmonary Hypertension in Burn Pediatric Patient

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Abstract*—Pulmonary hypertension is not only occurred in congenital heart disease patient, but also children after undergone fluid resuscitation or blood product support. This case report is managing a child that suffers with pulmonary hypertension after fluid resuscitation for burn case. It reports how to diagnose until managing perioperative complications so the patient will less likely to fall for this condition and how to prevent it to lower morbidity, shorter hospital length stay, and cost savings.*

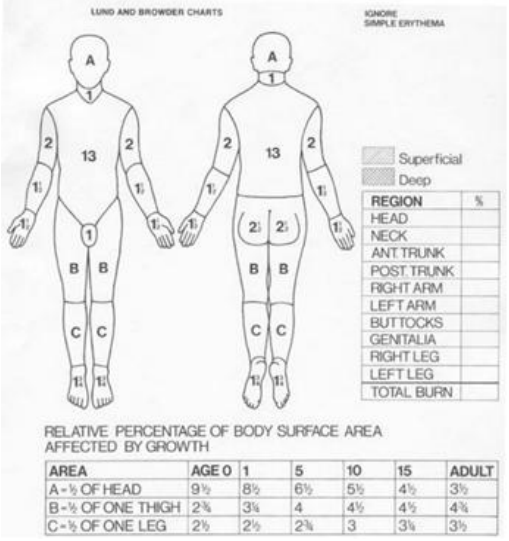
***Keywords*—** *Pediatric Anesthesia, Burn, Pulmonary Hypertension.*

I. Introduction

Severe burns trigger a cascade of systemic inflammatory and hemodynamic responses, including capillary leak, fluid shifts, and the release of pro-inflammatory mediators. These changes can compromise pulmonary function and increase pulmonary vascular resistance, ultimately predisposing patients to spontaneous pulmonary hypertension (PH). In children, the developing cardiopulmonary system is particularly vulnerable, making the impact of PH more profound compared to adults.

II. Case

A case of 4 years-old girl with 15 kg body weight came to the emergency room with severe burn grade III. Patient complaints with shortness of breathing and severe pain. Physical examination came with heart rate 120 beat per minute, respiratory rate 48 times. Patient then immediately diagnosed with 50% burn then resuscitated with Parkland formula which is 3000 ml.



RELATIVE PERCENTAGE OF BODY SURFACE AREA AFFECTED BY GROWTH

AREA	AGE 0	1	5	10	15	ADULT
A=½ OF HEAD	9½	8½	6½	5½	4½	3½
B=½ OF ONE THIGH	2¾	3¼	4	4½	4½	4¾
C=½ OF ONE LEG	2½	2½	2¾	3	3¼	3½

Fig. 1. TBSA for pediatric

Two days after debridement procedure, patient had difficulty of breathing and desaturated until 75%. Patient then intubated before gone to PICU. Patient was done echocardiography and diagnosed with pulmonary hypertension. Patient then treated with furosemide for 24 hours before beginning to get better and then extubated the day after.

Figure 2 shows maximum velocity (4.5m/sec) equivalent to the pressure gradient of 81mmHg which indicates severe pulmonary hypertension.

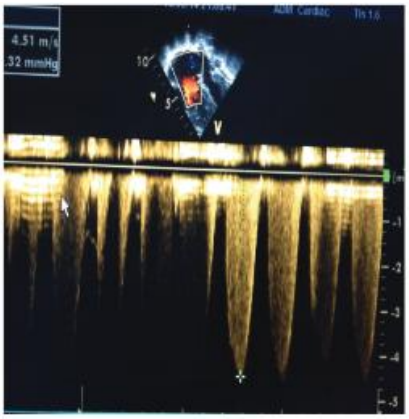


Fig. 2. Echocardiography

III. Discussion

In the burn population, several factors contribute to the development of PH, such as aggressive fluid resuscitation, inhalation injury, sepsis, and prolonged mechanical ventilation. The resulting pulmonary vascular remodelling and right ventricular strain can further exacerbate morbidity and mortality. Early recognition and prompt management of PH in pediatric burn patients are therefore critical, as delayed diagnosis may lead to right heart failure, impaired oxygenation, and poor outcomes.

IV. Conclusion

In summary, given its complex pathophysiology and the unique challenges in pediatric critical care, cardiac dysfunction post burn is mediated by several factors so it is important to understand the mechanisms, risk factors, and management strategies for PH in burn-injured children is essential for optimizing survival and long-term recovery.

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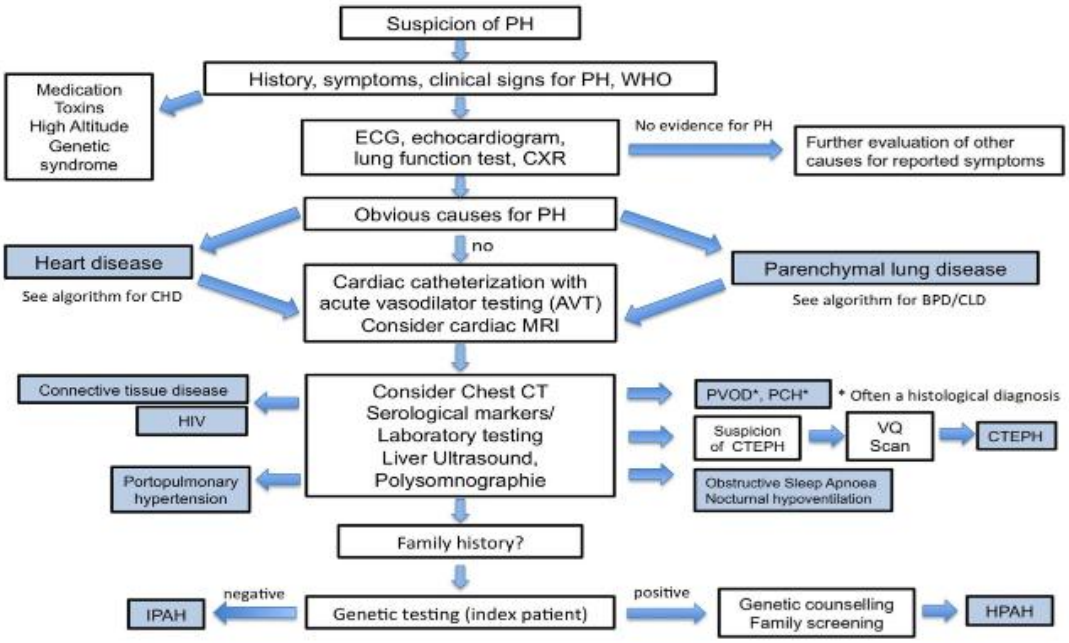

Fig. 3. Diagnostic algorithim for a child or adolescent with suspected pulmonary hypertension, CHD, congenital heart disease: CPET, cardiopulmonary exercise testing; CTEPH, chronic thromboembolic pulmonary hypertension; CXR, chest X-ray; HPAH, hereditary pulmonary arterial hypertension; IPAH, idiopathic pulmonary arterial hypertension; PCH, pulmonary capillary haemangiomarosis; PH, pulmonary hypertension; PVOD, pulmonary veno-occlusive disease; BPD, bronchopulmonary dysplasia; CLD, chronic lung disease; LFT, liver function test

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