Point-of-Care Ultrasound (POCUS) Guided Convergence: Unveiling the Intricacies of a Complex Case of Undifferentiated Shock

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INTRODUCTION

Although a well-defined treatment protocol exists for septic shock, an overreliance on this approach can result in unfavorable outcomes. Here, we present a complex case that encompasses both septic and cardiogenic elements within the context of undifferentiated shock.

CASE DETAILS

•Patient Information:
- Age: 37 years old Female
- Medical history: No significant past medical history
- Recent event: Post cesarean section (G2P2L2) with an iatrogenic bladder injury, 4 weeks postpartum

•Clinical Presentation:
- Sudden onset high-grade fever: 101.4°F with persistent flank pain
- Imaging: Mild-to-moderate right-sided hydronephrosis and hydroureter

•Initial Diagnosis and Treatment:
- Diagnosed as Urinary tract infection (UTI) and started on cephalexin outpatient
- Condition worsened within two days, admitted to ICU

•ICU Admission Events:
- Respiratory rate: 36b/min, Heart rate: 130/min, Blood pressure: 60/40 mmHg, Fever: 104°F
- Disoriented along with severe bandemia and leukopenia on labs
- Hemoglobin levels dropped from 10.4 to 7.4 in two hours
- Immediate transfusion of two units of packed red blood cells (PRBCs)

•Diagnostic Imaging and Intervention:
- CT angiogram ruled out intra-abdominal bleeding
- Confirmed persistence of hydronephrosis and hydroureter
- Urgent stent placement to alleviate obstruction
- CT urogram showed no evidence of kidney stones
- Started on clindamycin, cefepime, and vancomycin for broad spectrum coverage.

•Hemodynamic Support:
- Persistently hypotensive
- Norepinephrine infusion initiated
- Vasopressin and stress-dose steroids added to treatment due to non improvement

•Cardiac Evaluation and Management:
- Point-of-care ultrasound (POCUS) showed:
  - Severely reduced left ventricular ejection fraction (LVEF)
  - Enlarged left ventricle (LV) (Figure 1, A)
- Dobutamine infusion initiated
- Swan-Ganz catheter inserted for hemodynamic monitoring
- Improvement in cardiac function within 24 hours (Figure 1, B)

•Causative Agent Confirmation:
- Blood and urine cultures confirmed Escherichia coli (E. coli) infection
- Initiation of targeted antibiotic therapy

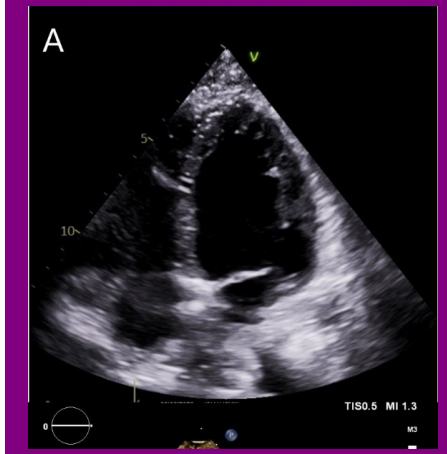

Figure 1, A

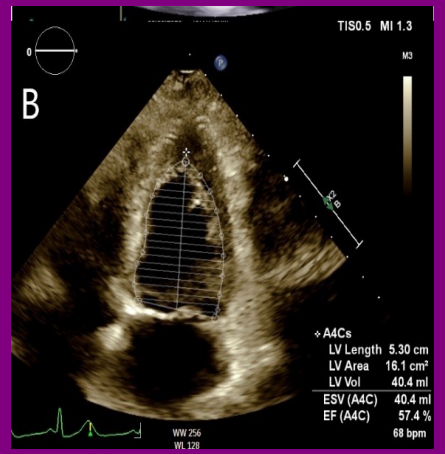

Figure 1, B

DISCUSSION

In this case the patient's presentation post partum raised suspicion of peripartum cardiomyopathy, a diagnosis of exclusion. However, with sepsis as a major contributing factor to the clinical picture, we leaned more towards septic cardiomyopathy as the diagnosis. Notably, studies indicate that concurrent myocarditis is found in as many as 78% of such cases[(1)]. Despite the absence of a singular causative factor, we adopted a systematic approach which proved crucial in saving the patients life.

CONCLUSION

In critical cases characterized by shock, a comprehensive evaluation becomes indispensable. The evaluation should thus encompass, potential factors such as hypovolemia, vasoplegia, and cardiac dysfunction[(2)] .Cardiomyopathy in the setting of sepsis presents an intricate clinical challenge, especially when we direct treatment anchoring to sepsis, which was the initial presentation here. A highly specialized approach involves the utilization of Point-of-Care Ultrasound (POCUS) as a diagnostic aid, along with continuous hemodynamic monitoring with tools such as the Swan-Ganz catheter. These along with an in-depth evaluation of the entire clinical picture is crucial for management of such cases.

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