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Case Report

Acute Postpartum Heart Failure Diagnosed by Point-of-Care Echocardiography

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Abstract: Point-of-care ultrasound (POCUS) has become a key diagnostic tool in resource-limited settings. We report a case of severe left ventricular (LV) systolic dysfunction in the immediate postpartum period in a patient with severe pre-eclampsia and progressive dyspnoea at the end of pregnancy. In a setting with limited access to specialised cardiac imaging, POCUS enabled rapid diagnostic orientation towards peripartum cardiomyopathy and guided initial management. This case underscores the essential role of POCUS in emergency and critical care medicine in sub-Saharan Africa.

Keywords: Point-Of-Care Ultrasound, Peripartum Cardiomyopathy, Left Ventricular Dysfunction, Pre-Eclampsia.

INTRODUCTION

Sub-Saharan Africa faces an increasing burden of cardiovascular disease, often within health systems that are insufficiently equipped [1, 2]. Access to advanced cardiac imaging, particularly conventional transthoracic echocardiography, remains constrained by cost, specialist availability, and technical infrastructure [3]. In this context, point-of-care ultrasound (POCUS) has emerged as an accessible, reproducible modality that can be seamlessly integrated at the patient's bedside, providing crucial information for triage, diagnosis, and therapeutic decision-making [4]. Postpartum cardiovascular complications, including peripartum cardiomyopathy, represent a major clinical challenge, particularly among patients with pre-eclampsia, in whom cardiovascular risk is heightened [5–7]. We report a case that highlights the relevance of POCUS in this high-risk clinical setting.

CASE PRESENTATION

The patient was a 42-year-old multiparous woman, on postoperative day 1 following an emergency caesarean section for severe pre-eclampsia at 35 weeks and 4 days of gestation, who was assessed in the immediate postpartum period for dyspnea. She had no known cardiovascular history, was not under follow-up for metabolic disorders, and reported no exposure to cardiotoxic substances. During the third trimester, she had experienced progressive exertional dyspnea, with intolerance to stair climbing and the need to pause during routine daily activities, symptoms initially attributed to physiological pregnancy-related volume overload and pre-eclampsia. In the immediate postoperative period, the patient exhibited moderate dyspnea at rest, sinus tachycardia at 112/min, blood pressure of 154/92 mmHg, and oxygen saturation of 93% on room air, without chest pain. Physical examination revealed mild bilateral crepitant rales, with no peripheral signs of shock or significant oedema. Renal function was preserved, and estimated intraoperative blood loss was 450 mL.

Given the persistence of unexplained tachycardia and dyspnoea, a bedside cardiac evaluation using point-of-care ultrasound (POCUS) was performed in a semi-recumbent supine position under intensive care

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conditions, utilising parasternal long- and short-axis, apical four-chamber, and subcostal windows. Image quality was satisfactory, allowing reliable functional assessment of cardiac chambers and the inferior vena cava (IVC). POCUS revealed severe global left ventricular (LV) systolic dysfunction, with a visually estimated LV ejection fraction of 30–35% (figure 1).

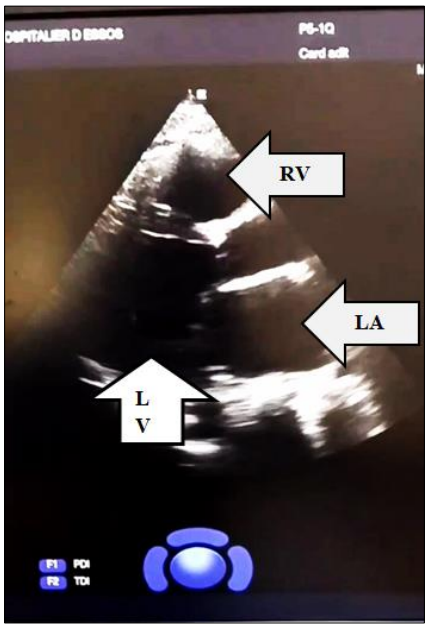

Figure 1: Parasternal long-axis view

Segmental wall motion analysis demonstrated diffuse hypokinesis, predominantly affecting the anterolateral and inferoseptal walls, without true segmental akinesis, arguing against an acute transmural myocardial infarction. The LV was moderately dilated (figure 2), suggesting a process evolving over several weeks. The right ventricle (RV) was of normal size with preserved systolic function (visual TAPSE >16 mm). No evidence of right-sided overload, such as RV dilation, septal deviation, or acute pulmonary hypertension, was observed. The mitral, aortic, and tricuspid valves were structurally normal, without prolapse or calcification. Mild functional mitral regurgitation was present, consistent with altered LV geometry, while there was no significant tricuspid regurgitation. The left atrium was moderately dilated, reflecting elevated left ventricular end-diastolic pressures, whereas the right atrium was normal. No pericardial effusion was detected.

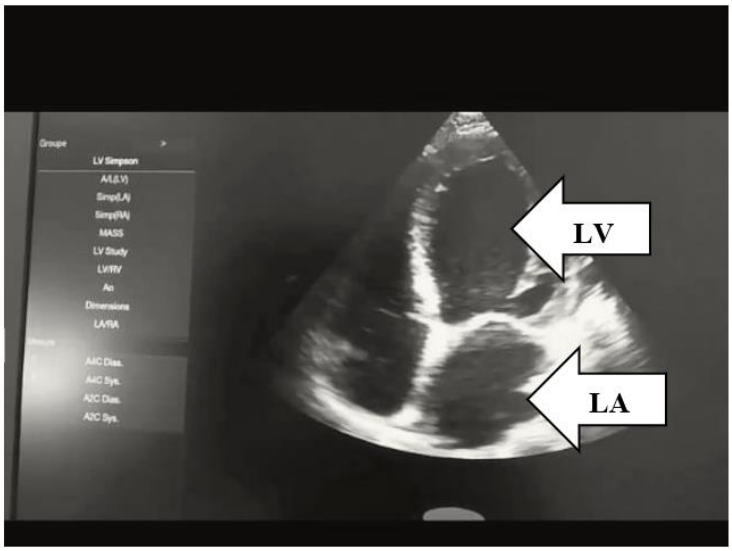

Figure 2: Apical four-chamber view (left heart chamber dilatation)

The inferior veina cava (IVC) had a normal calibre with <50% collapsibility, suggestive of moderate systemic congestion in the context of stable intrathoracic pressures (figure 3).

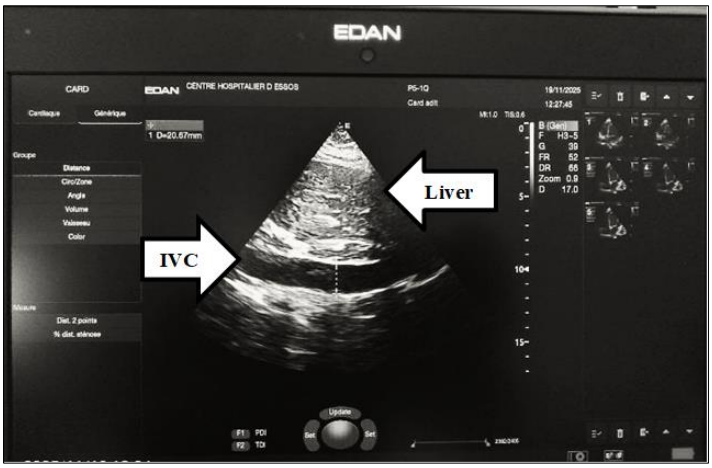

Figure 3: Subcostal view of IVC

Integrated into the clinical context, POCUS supported a diagnosis of severe LV systolic dysfunction, consistent with likely early-stage peripartum cardiomyopathy precipitated by the caesarean section and immediate postpartum haemodynamic changes. This was associated with moderate cardiac congestion without signs of right-sided pulmonary hypertension, in the absence of organic valvular disease, pericardial effusion, or evidence of massive pulmonary embolism.

The patient was admitted to the intensive care unit for targeted management. Therapy included cautious fluid restriction (1 litre/day), titrated intravenous diuretics (furosemide 20 mg IV every 12 hours), and strict blood pressure control (target systolic 120-140 mmHg, diastolic 70–90 mmHg) using appropriate antihypertensives, including continuous intravenous nicardipine at 3mg/h. Haemodynamic monitoring included continuous ECG, oxygen saturation, non-invasive blood pressure, and hourly urine output assessment. Mobilisation was gradual and supervised, and care was coordinated by a multidisciplinary team comprising cardiologists, anaesthetist-intensivists, and obstetricians. POCUS was used daily to reassess LV ejection fraction, pulmonary congestion, and intravascular volume status, enabling dynamic adjustment of therapy. After 48 hours of satisfactory evolution in the intensive care unit, the patient was transferred back to the obstetrics department for continuation of care.

DISCUSSION

Peripartum cardiomyopathy (PPCM) is a rare but severe cause of acute heart failure in women during late pregnancy or the immediate postpartum period, with an estimated incidence ranging from 1 in 1,000 to 1 in 4,000 pregnancies, varying according to geographic region and maternal risk factors [8, 9]. Clinical manifestations are often subtle or attributed to physiological adaptations of pregnancy, including exertional dyspnoea, fatigue, and occasionally peripheral oedema, making clinical diagnosis challenging, particularly in resource-limited settings where timely access to comprehensive cardiac imaging may be restricted [10].

In our case, the progressive dyspnoea in the third trimester and postpartum tachycardia were clarified through the use of cardiac POCUS, which enabled early diagnosis of severe systolic heart failure with a visually estimated LV ejection fraction of 30–35%, diffuse hypokinesis, and moderate LV dilation, in the absence of right-sided overload or significant valvular abnormalities. This rapid bedside assessment allowed immediate therapeutic guidance, avoiding critical diagnostic delays associated with transfer for conventional echocardiography.

Cardiac POCUS is particularly valuable in sub-Saharan Africa and other resource-limited environments, as it provides functional, dynamic, and repeatable evaluation of ventricular function, volume status, and congestion, with direct impact on therapeutic management [11-13]. In this case, POCUS guided precise titration of intravenous diuretics, fluid restriction, and blood pressure control with intravenous nicardipine, while enabling real-time monitoring of haemodynamic evolution, demonstrating its role in optimising ventricular recovery and reducing maternal morbidity and mortality.

Beyond diagnosis, repeated POCUS assessments allowed individualised monitoring and rapid adjustment of interventions, essential in PPCM, which may follow an unpredictable course and be complicated by cardiogenic shock or arrhythmias [14]. Several studies have shown that integrating POCUS into the management of cardiovascular emergencies significantly shortens diagnostic delays, improves patient safety, and enhances the relevance of interventions, particularly where access to standard echocardiography is limited [15, 16].

Finally, this case illustrates the transformative role of POCUS in critical obstetric care in resource-

limited settings, enabling rapid diagnosis, reliable volume assessment, and dynamic therapy adjustment. It also underscores the importance of training local practitioners in point-of-care ultrasound to strengthen the capacity to respond to maternal cardiovascular emergencies, thereby improving the quality and safety of care [17].

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Contributions of the Authors:

All authors made substantial contributions to the preparation of this case report. They were involved in case identification, data acquisition and analysis, drafting of the manuscript, and critical revision for important intellectual content. All authors approved the final version and take full responsibility for the accuracy and integrity of the work.

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