

Massive Multichamber Intracardiac Thrombi in Young Postpartum Women with Chemotherapy-Induced Dilated Cardiomyopathy: A Fatal Case Report

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Abstract: Intracardiac thrombus formation is a recognized complication of severe dilated cardiomyopathy due to blood stasis, endothelial dysfunction, and hypercoagulability. The coexistence of thrombi in multiple cardiac chambers is uncommon and is associated with a high risk of systemic embolization and mortality. We report a 23-year-old postpartum female with a history of osteosarcoma treated with chemotherapy who developed dilated cardiomyopathy and severe biventricular dysfunction. Echocardiography revealed multiple intracardiac thrombi involving the left ventricle, left atrium, and right ventricle. Despite intensive treatment with anticoagulation, antibiotics, ventilatory support, and inotropic therapy, the patient developed progressive cardiogenic shock and succumbed to her illness. This case highlights the synergistic contribution of postpartum hypercoagulability, malignancy, chemotherapy-induced cardiomyopathy, and severe ventricular dysfunction to extensive intracardiac thrombosis.¹⁻⁴

Keywords: Dilated cardiomyopathy, intracardiac thrombus, osteosarcoma, postpartum state, chemotherapy-induced cardiomyopathy, heart failure

1. Introduction

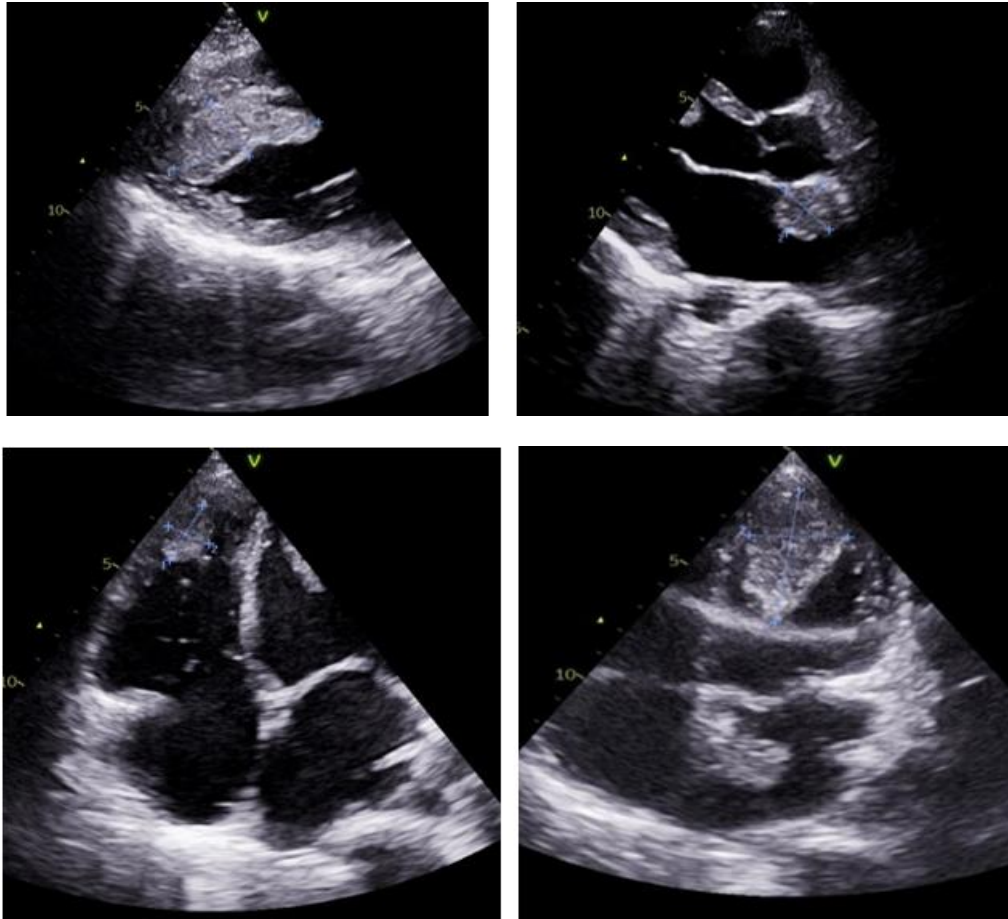
Dilated cardiomyopathy (DCM) is characterized by ventricular dilatation and impaired systolic function in the absence of abnormal loading conditions or significant coronary artery disease sufficient to explain the myocardial dysfunction.¹ Patients with severe left ventricular dysfunction are predisposed to intracardiac thrombus formation because of blood stasis, endothelial injury, and activation of coagulation pathways.² Intracardiac thrombus most commonly involve single chamber particularly left ventricle following anterior myocardial infarction or left atrium in atrial fibrillation. Single left ventricular thrombi seen in 10-25% of severe heart failure and myocardial infarction. In contrast, simultaneous massive thrombus involving multiple chambers are exceedingly rare. The postpartum period is associated with a physiological hypercoagulable state that may persist for several weeks after delivery and further increases the risk of thromboembolic events.³ Malignancy and exposure to cardiotoxic chemotherapeutic agents are additional risk factors for both cardiac dysfunction and thrombosis.⁴ The simultaneous occurrence of thrombi in multiple cardiac chambers is rare and carries a poor prognosis.⁵

2. Case Presentation

A 23-year-old female presented to the emergency department with complaints of progressive breathlessness and cough of 4 days duration. She had delivered a healthy

baby girl five months before presentation. Patient had past history of osteosarcoma of the right knee for which she had previously received chemotherapy. Following chemotherapy, she was diagnosed with dilated cardiomyopathy with a documented left ventricular ejection fraction of 30%. She remained on regular follow-up throughout pregnancy during which she is kept on diuretics and other supportive care and patient failed to follow-up post-delivery. At presentation, she was tachypneic with respiratory rate 32cpm with oxygen saturation of approximately 98% on supplemental oxygen. Blood pressure was not recordable initially and 90/60 mmHg on inotropic support and pulse rate was 88 beats/minute. Electrocardiography demonstrated T-wave inversion in the precordial leads.

Transthoracic echocardiography revealed severe global left ventricular hypokinesia with an ejection fraction of 15%. The left ventricle was markedly dilated. All four cardiac chambers were enlarged. Right ventricular systolic dysfunction was present. Moderate tricuspid regurgitation was noted. Pulmonary artery systolic pressure was 28 mmHg. Multiple intracardiac masses suggestive of thrombi were identified. A large thrombus measuring approximately 5 × 2.5 cm was visualized within the left ventricle. An additional thrombus measuring approximately 2 × 2 cm was noted in the left atrium attached to interatrial septum. Another thrombus measuring approximately 2.1 × 1.4 cm was seen within the right ventricle



Lab Parameter	Day 1	Day 3
Hemoglobin	13.4	13.2
Total leucocyte count	13000	18420
Platelets	166000	90000
Serum creatinine	1.94	2.11
Serum potassium	6.3	4.02

C reactive protein	170
Serum procalcitonin	15.75
Troponin I	0.06
BNP	2000
D-dimer	8655
Serum lactate	117
INR	1.96

Laboratory investigations demonstrated severe metabolic acidosis and hyperkalemia. The clinical picture was further complicated by sepsis. The patient developed worsening respiratory distress and was initially managed with non-invasive ventilatory support. She was treated with anticoagulation using unfractionated heparin, broad-spectrum antibiotics, inotropic support, and intensive care monitoring. Despite therapy, her respiratory status deteriorated with worsening hypoxemia and tachypnea. She subsequently required endotracheal intubation and invasive mechanical ventilation. Progressive hemodynamic instability necessitated escalation of inotropic support. During the hospital course, she developed bradycardia followed by cardiac arrest. Advanced cardiopulmonary resuscitation was performed and return of spontaneous circulation was briefly achieved. However, despite maximal supportive treatment, the patient experienced refractory circulatory collapse and was declared deceased.

3. Discussion

Intracardiac thrombus formation is a well-recognized complication of severe left ventricular systolic dysfunction. The incidence is highest in patients with markedly reduced ejection fraction because stagnant intracavitary blood flow promotes thrombogenesis.²

This patient possessed multiple independent prothrombotic risk factors including severe dilated cardiomyopathy, postpartum status, malignancy, and systemic inflammation secondary to sepsis.³⁻⁶ Cancer is associated with activation of coagulation pathways through tumor-mediated release of procoagulant substances and inflammatory cytokines, significantly increasing thrombotic risk. Chemotherapeutic agents, particularly anthracyclines, are known to cause dose-dependent cardiotoxicity leading to dilated cardiomyopathy and heart failure.⁷

The presence of thrombi in both left- and right-sided cardiac chambers is uncommon and generally reflects severe cardiac dysfunction with profound blood stasis.⁵ Patients with intracardiac thrombi are at risk for devastating complications including systemic embolization, pulmonary embolism, stroke, and sudden cardiac death.² Current heart failure guidelines recommend systemic anticoagulation when intracardiac thrombi are identified, although evidence for management of extensive multichamber thrombi remains limited.¹

The coexistence of postpartum hypercoagulability, chemotherapy-related cardiomyopathy, and malignancy

likely contributed to the unusually extensive thrombotic burden observed in this patient. The fatal outcome underscores the aggressive nature of multichamber intracardiac thrombosis occurring in the setting of severe ventricular dysfunction.

4. Conclusion

This case highlights a rare presentation of extensive multichamber intracardiac thrombosis involving the left ventricle, left atrium, and right ventricle in a young postpartum woman with chemotherapy-induced dilated cardiomyopathy and osteosarcoma. The coexistence of severe systolic dysfunction, malignancy, postpartum hypercoagulability, and sepsis likely contributed to thrombus formation. Early recognition of intracardiac thrombi and prompt initiation of anticoagulation are crucial, although prognosis remains poor in patients with advanced heart failure and extensive thrombotic burden.

References

- [1] 2023 ESC Guidelines for the Management of Cardiomyopathies. *European Heart Journal*. 2023; 44: 3503–3626.
- [2] 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure. *Circulation*. 2022; 145: e895-e1032.
- [3] Reducing the Risk of Venous Thromboembolism During Pregnancy and the Puerperium. Royal College of Obstetricians and Gynaecologists. 2015.
- [4] 2022 ESC Guidelines on Cardio-Oncology. *European Heart Journal*. 2022; 43: 4229-4361.
- [5] Choudhury A, Lip GYH. Lip GYH. Left ventricular thrombus and thromboembolism in dilated cardiomyopathy. *Heart*. 2004; 90: 699-704.
- [6] Trousseau Syndrome. Varki A. Trousseau's syndrome: multiple definitions and multiple mechanisms. *Blood*. 2007; 110: 1723–1729.
- [7] ESC Position Paper on Cancer Treatments and Cardiovascular Toxicity. *European Heart Journal*. 2016; 37: 2768-280