Journal of Case Reports and Medical History

(ISSN: 2831-7416) *Open Access*

Case Report Volume 5 – Issue 1

Unraveling the Enigmaquick Disappearance of a Cardiac Clot in a Patient Undergoing Treatment for Breast Cancer a Case Report

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Received date: 27 Dec, 2024 | **Accepted date:** 09 Jan, 2025 | **Published date:** 17 Jan, 2025

Citation: Mounssif A, Khaldi M, Zagdane S, Haboub M and Habbal R. (2025) Unraveling the Enigmaquick Disappearance of a Cardiac Clot in a Patient Undergoing Treatment for Breast Cancer a Case Report. J Case Rep Med Hist 5(1): doi https://doi.org/10.54289/JCRMH2500102

Abstract

Introduction: Large intracardiac thrombi generally require surgical removal, yet some cases have shown a favorable response to anticoagulation therapy alone. This report highlights a case involving substantial left ventricular thrombi, which posed a significant risk of systemic embolization but unexpectedly resolved completely with standard heparin anticoagulation.

Case Report: A 50-year-old woman receiving vinorelbine and trastuzumab for metastatic breast cancer was admitted with symptoms of right-sided heart failure. Transthoracic echocardiography identified two highly mobile echogenic masses attached to the left ventricular wall, consistent with thrombi. The patient was started on low-molecularweight heparin alongside standard heart failure treatment. Remarkably, follow-up echocardiography within 48 hours demonstrated complete resolution of the thrombi.

Discussion: Left ventricular thrombi are frequently associated with ischemic heart disease or severe ventricular dysfunction and present unique management challenges. Current guidelines recommend anticoagulation and, in certain cases, surgical intervention. However, the rapid dissolution of thrombi observed in this patient underscores the nuanced interplay of coagulation mechanisms, especially in the context of malignancy. Cancer's impact on coagulation, paired with the potential immunomodulatory and prothrombotic effects of oncologic therapies, highlights the need for further study.

Conclusion: This case illustrates an unusually swift resolution of left ventricular thrombi following heparin therapy, revealing a novel therapeutic response in a complex oncologic and cardiovascular scenario. Future research could shed light on the mechanisms behind such outcomes, contributing to better management strategies for thrombotic complications in cancer patients with heart failure.

Keywords: Left Ventricular Thrombus, Anticoagulation Therapy, Cancer-Associated Thrombosis, Metastatic Breast Cancer, Case Report

Abbreviations: OAC: Oral Anti-Coagulant, VKA: Vitamine K Antagonist, NOAC: Novel Oral Anticoagulant, LMWH: Low-Molecular-Weight Heparin, TTE: Transthoracic Echocardiogram, LV: Left Ventricle, LVEF: Left Ventricular Ejection Fraction, BP: Blood Pressure, C-TAP: CT Pulmonary Angiogram, HIV: Human Immunodeficiency Virus

Introduction

Intracardiac thrombi, particularly large and mobile ones, are often treated with surgical thrombectomy. However, certain cases involving soft, hypo-echoic thrombi have responded well to anticoagulation therapy, albeit requiring more than a week for resolution. This report presents a unique case where large left ventricular thrombi, posing a high risk of systemic embolization, dissolved rapidly following conventional heparin anticoagulation.

Although the exact mechanisms behind this rapid thrombus resolution remain elusive, recent insights suggest a complex interplay of factors. These include the anticoagulant properties of heparin, oncogenic signaling pathways, and altered endothelial dynamics. Additionally, breast cancer-associated immunomodulatory effects may significantly influence coagulation processes, potentially contributing to the observed accelerated clot resolution.

Case report

A 50-year old female was admitted to the cardiology department for right-sided heart failure. She is being treated for hypertension and diabetes mellitus for 10 years . She also has a history of breast cancer metastatic to lung, bone and brain under palliative treatment based on vinorelbine and trastuzumab. Clinical examination at admission revealed a dyspneic patient, with oedema of the lower limbs extending to the knees. BP was 130/80 mmHg, pulse regular at 80/min, and temperature normal. The electrocardiogram showed sinus rhythm with negative T waves in anterior territory. TTE demonstrated a non dilated left ventricle with severely compromised function and two mobile echogenic masses attached to the left ventricular wall measuring respectively (15*9mm) and (5*7mm). Dilated right atrium and a laminar tricuspid regurgitation was noted.

In view of the impaired LVEF, apical akinesia and the patient's neoplastic background, we concluded that the diagnosis was intraventricular thrombi.

Anticoagulant therapy based of low-molecular-weight heparin was started, and treatment for heart failure (ramipril, bisoprolol, spironolactone and furosemide) was commenced. Remarkably, repeat echocardiography after 48 hours showed complete resolution of the thrombi. A CT pulmonary angiogram (C-TPA) ruled out systemic embolism, confirming no significant changes compared to prior imaging. The patient remained asymptomatic throughout her hospital stay.

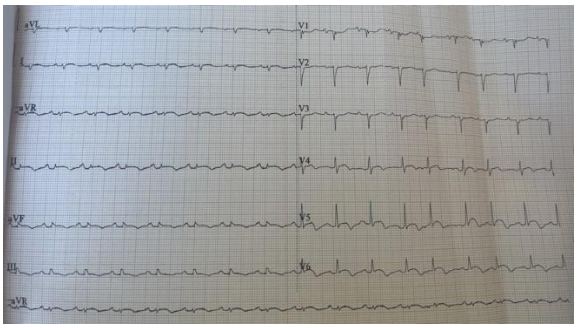

Figure 1 : EKG showing negative T waves in lateral leads with peripheral microvoltage

Figure 2-3: showing the TTE of the patient before and after 48h of receiving anticoagulation

Discussion

In this case, the diagnosis of left ventricular thrombi was supported by the patient's ischemic cardiac history, left ventricular dysfunction, and akinetic zones near the thrombi. Left ventricular thrombi most commonly arise from ischemic heart disease (84%) or dilated cardiomyopathy, **[1]** with less frequent associations including myocarditis, hypercoagulable states (e.g., protein C or S deficiency, antiphospholipid syndrome), **[2]** and neoplastic conditions. The underlying mechanism is often explained by Virchow's triad: endothelial damage, stasis from ventricular dysfunction, and hypercoagulability **[3]**.

Current ESC guidelines (2023) **[4]** for managing left ventricular thrombi recommend oral anticoagulation with vitamin K antagonists (VKAs) or direct oral anticoagulants (DOACs) for 3–6 months, guided by follow-up imaging with TTE or cardiac MRI **[5]**. Surgical thrombectomy is reserved for cases with large, mobile thrombi or failure of anticoagulation therapy **[6,7]**. Case series have also reported the use of LMWH, with one study showing thrombus resolution in 73% of patients within an average of 13 days without increased morbidity or mortality **[8]**.

In a study involving 26 patients, Meurin reported that thrombi resolved in 73% of cases within an average duration of 13 days, without any associated increase in morbidity or mortality **[9]**.

Prior studies also highlight that less severe apical asynergy and the absence of apical dyskinesis are predictors of thrombus resolution. Miller et al. **[10]** have documented cases of silent emboli in acute myocardial infarction, while Fletcher and Pises et al. reported thrombus resolution due to enhanced fibrinolysis **[11]**.

The phenomenon of rapid thrombus resolution, as seen here, is rare and warrants consideration of two primary explanations:

1. **Silent Embolization:** This involves thrombi migrating to systemic organs such as the brain, kidneys, or spleen. However, in this case, CT imaging ruled out embolic events.
2. **Resolution with Anticoagulation:** Rapid dissolution may occur in patients with coagulopathies or cancer-associated hypercoagulable states. Cancer is known to dysregulate hemostasis, leading to both prothrombotic and fibrinolytic tendencies. Literature suggests increased spontaneous fibrinolysis in oncology patients, potentially explaining the rapid thrombus disappearance observed here. Bensaid in 1982 described a case of complete resolution after 5 days of anticoagulant treatment at a patient presenting with hepatopathy **[12]**. Cancer is known to induce hemostatic disorders with potential activation in both prothrombotic and antithrombotic directions **[13,14]**.

Conclusion

Left ventricular thrombi represent a severe complication of cardiac disorders, carrying risks of systemic embolism. Early recognition and treatment are critical for preventing adverse outcomes. Although standard management involves anticoagulation or surgical intervention, this case underscores the potential for rapid thrombus resolution under LMWH therapy in oncology patients. Further research is needed to elucidate the mechanistic underpinnings of this phenomenon and optimize thrombus management in cancer-associated cardiovascular complications.

Declarations

Consent to participate: All participants provided written informed consent during the study.

Ethics approval: The study was conducted ethically in accordance with the World Medical Association

Declaration of Helsinki, 1975. The Ethical Committee of Faculty of Medicine, Hassan II University approved the study.

Consent for publication: Not applicable

Clinical trial number: Not applicable

Funding: Not applicable

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