Pericardial Hematoma With Chest Pain and Tamponade in the Late Postoperative Period of Cardiac Surgery

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Introduction

Pericardial effusion and mediastinal bleeding are common complications in the postoperative period following cardiac surgery. These conditions typically present within the first few days after the procedure and necessitate additional surgical intervention in a minority of cases.[1]

This report describes an atypical presentation of pericardial hematoma, which manifested as severe chest pain on the 23rd postoperative day and rapidly progressed to hemodynamic instability. Echocardiography was instrumental in both diagnosing and managing the case, ultimately contributing to a favorable outcome.

Case Report

A 61-year-old female patient with rheumatic mitral and aortic insufficiency underwent double valve replacement surgery utilizing biological prostheses. The procedure and subsequent postoperative period in the Cardiology Intensive Care Unit (ICU) were successful and uneventful. Drains were removed on the second postoperative day, and the epicardial pacemaker wires were removed on the third day. The patient was discharged nine days after surgery, with anticoagulation therapy initiated using Rivaroxaban due to the presence of a mitral biological prosthesis.

The patient returned to the hospital four days after discharge, presenting with decompensated heart failure and atrial fibrillation. Transesophageal echocardiogram (TEE) performed for electrical cardioversion did not reveal intracavitary thrombi but showed filamentous and mobile images attached to the mitral prosthesis, consistent with vegetation. The prostheses were functioning normally, with no evidence of complications. Anticoagulation was adjusted to Enoxaparin, and despite antibiotic therapy, the patient developed periprosthetic mitral regurgitation on the 16th postoperative day while maintaining clinical and hemodynamic stability, without the need for vasoactive drugs. A follow-up TEE on the 21st postoperative day demonstrated a reduction in the size of the vegetations, with persistent moderate periprosthetic regurgitation.

On the 23rd postoperative day, the patient presented with sudden and intense chest pain that was refractory to analgesics, along with atrial fibrillation exhibiting a high ventricular response. While the patient initially remained hemodynamically stable, significant clinical deterioration occurred later that evening, accompanied by worsening respiratory status and hemodynamic instability, necessitating vasopressor support. An emergency transthoracic echocardiogram (TTE) revealed a decline in ventricular function and an unclear image posterior to the right atrium, which suggested significant extrinsic compression. Despite the time elapsed since surgery, the possibility of pericardial bleeding was considered, leading to the decision for emergency surgical intervention.

A subsequent TEE performed in the surgical center revealed a large hematoma in the pericardial space, compressing the right atrium and obstructing flow from the superior vena cava and through the tricuspid valve (Figure 1). At this stage, the patient was in shock, exhibiting biventricular systolic dysfunction despite receiving high doses of vasopressors and inotropes. The pericardium was promptly evacuated, resulting in the removal of a significant volume of clotted blood. There was no active bleeding, nor was the source of the bleeding identified. The patient demonstrated rapid clinical and hemodynamic improvement, leading to the decision to proceed with mitral valve replacement using a new biological prosthesis due to endocarditis associated with significant periprosthetic regurgitation.

The new postoperative course was uneventful. The patient was extubated the following morning, and the drains were removed just over 24 hours later. Anticoagulation therapy was resumed eight days after the second surgery, and the patient was discharged to continue treatment under a home care regimen on the 13th postoperative day.

Discussion

Bedside echocardiography is the primary tool for confirming suspected diagnoses of pericardial effusion and tamponade. However, the postoperative context presents challenges for this assessment, as the presence of dressings and drains, along with often limited acoustic windows, can hinder the acquisition of adequate images. While computed tomography may be useful, TEE remains the preferred modality, particularly when hemodynamic instability precludes safe transport.[1,2]

Keywords

Heart surgery; echocardiography; pericardial hematoma.

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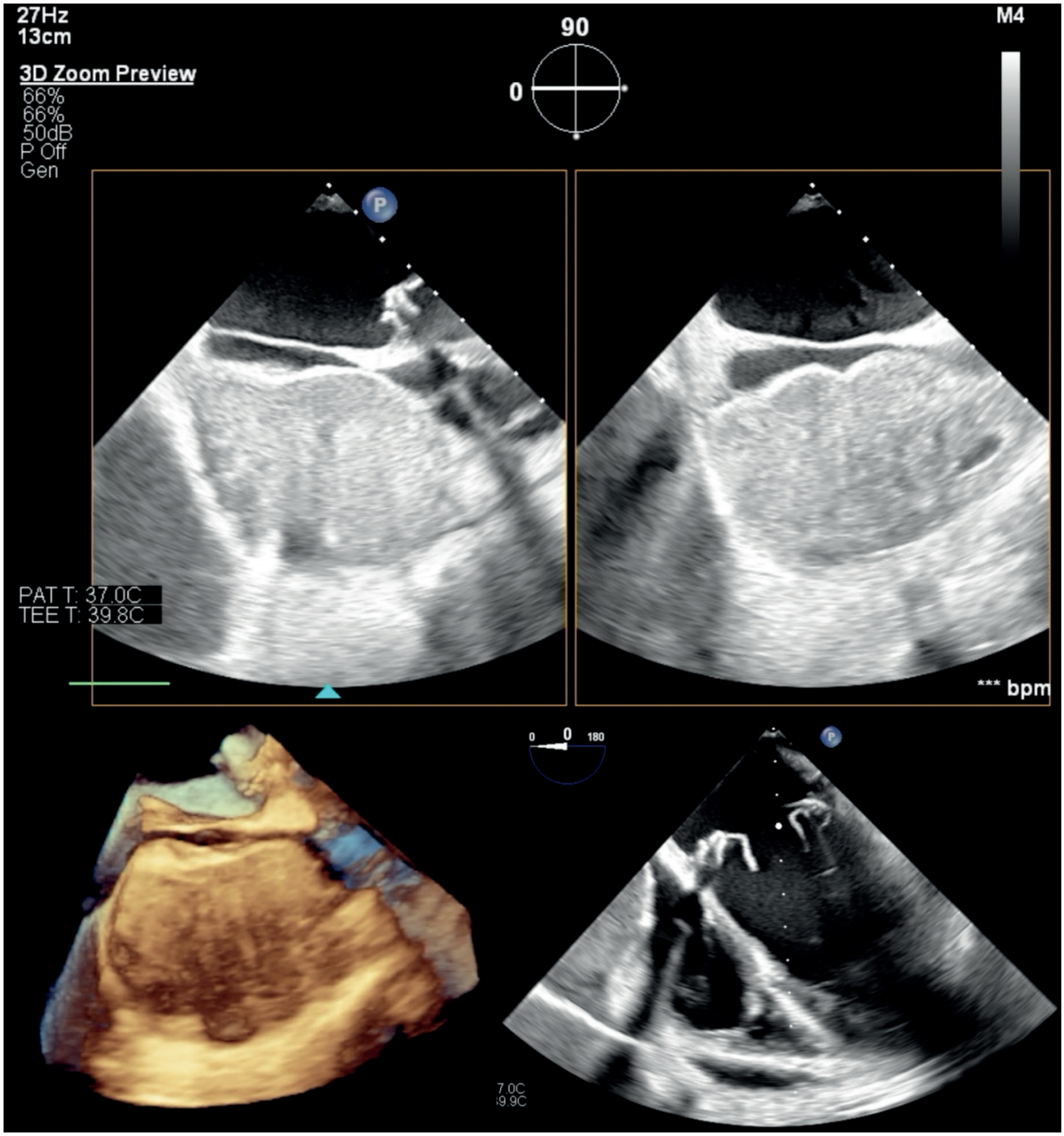

Figure 1 – *Three-dimensional Transesophageal Echocardiography reveals significant extrinsic compression of the right atrium caused by a large pericardial hematoma. In the top image, a biplane view at 0° and 90° in the mid-esophagus is shown. In the lower-left corner, the three-dimensional reconstruction highlights compression of the right atrium, restricting flow from the superior vena cava. On the right, a four-chamber view at 0° in the mid-esophagus demonstrates compression of the right atrium just above the tricuspid valve.*

This report describes an atypical and late presentation of a potentially lethal complication following cardiac surgery. The patient had been on anticoagulation since the first week post-surgery, and several echocardiograms were performed during hospitalization due to a diagnosis of mitral prosthetic endocarditis. Unlike other cases reported in the literature, radiological documentation indicated that the hematoma was not present even two days prior to the clinical onset of chest pain and hemodynamic instability, which occurred during the last TEE before the change in clinical status. The sudden appearance of a hematoma compressing the right atrium was observed 23 days after the initial procedure, with no temporal relationship to the initiation of anticoagulation. In light of the new hemodynamic instability, TTE proved to be a rapid and effective tool in suggesting

the etiological diagnosis, which was subsequently confirmed by the echocardiogram performed in the surgical center.

The diagnosis of hemopericardium is more straightforward in diffuse or circumferential presentations. In contrast, localized effusions or hematomas are not always easily identified on TTE and can lead to hemodynamic collapse more rapidly, even with smaller volumes.[3] In this context, the right atrium is typically the most commonly affected chamber;[4-7] however, there are reports of compression involving the left atrium[8] and ventricles,[7,9] as well as the great vessels.[10,11]

Late presentation of cardiac tamponade is rare,[12,13] with only a few cases documented in the literature. Pericardial hematoma, when identified in patients more than 30 days post-surgery, may be asymptomatic[9,14] or present with symptoms similar to constrictive pericarditis,[15] often without evidence of instability, despite potential hemodynamic repercussions. While echocardiography remains the primary diagnostic modality, multimodal evaluation becomes increasingly important in these cases.

In conclusion, this case underscores the critical role of echocardiography in the prompt diagnosis of complications in the postoperative period following cardiac surgery. It also emphasizes the necessity of maintaining a high degree of suspicion for hemorrhagic complications, even beyond the initial days post-surgery.

Author Contributions

Conception and design of the research and critical revision of the manuscript for intellectual content: Oliveira FC, Kawaoka JR, Leite BF, Azevedo DFC, Fernandes RM, Noya-Rabelo MM; acquisition of data: Oliveira FC, Fernandes RM; analysis and interpretation of the data: Oliveira FC, Fernandes RM, Noya-Rabelo MM; writing of the manuscript: Oliveira FC.

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No potential conflict of interest relevant to this article was reported.

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Ethics Approval and Consent to Participate

This article does not contain any studies with human participants or animals performed by any of the authors.

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