

The Importance of Early Diagnosis and Treatment for Pericardial Effusion and Cardiac Tamponade

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Editorial referring to the article: Pericardial effusion and cardiac tamponade: etiology and evolution in the contemporary

Pericardial effusion has several etiologies, such as primary pericardial diseases, cardiac surgery, trauma and systemic conditions, including hypothyroidism, renal failure, chronic neoplastic infiltration, autoimmune inflammation, systemic lupus erythematosus, and rheumatoid arthritis. Queiroz et al.,² published an interesting paper on 254 patients with pericardial effusion at a quaternary institution, 40.4% with severe pericardial effusion and 44.1% with cardiac tamponade. Retrospective cohorts of critically ill patients are rare in the literature. The most frequent etiology was idiopathic, but postoperative, neoplasia, and postinterventional procedures were also common. Although the main etiology is idiopathic in developed countries, infectious causes are prominent in developing countries, such as tuberculosis, which reaches a frequency above 60%.³ During the current COVID-19 pandemic, SARS-CoV-2 is of great importance in etiological investigation.

In Queiroz et al.,² pericardial effusion was diagnosed by echocardiography, a widely available and inexpensive method that can be performed at bedside. In addition to clinical and epidemiological aspects, Doppler echocardiography, magnetic resonance imaging, nuclear medicine tests, and laboratory analysis of the pericardial fluid could provide additional information about the etiology. However, the gold standard diagnostic exam is pericardial biopsy, which is indicated for diagnostic investigation in patients with persistent pericarditis refractory to clinical treatment and no definitive diagnosis.

Keywords

Pericardium/ abnormalities; Pericardial Effusion/ therapy; Cardiac Tamponade/ therapy; Echocardiography/ methods.

Cardiac tamponade is the most serious and potentially lethal spectrum of pericardial effusion. It is defined as a significant accumulation of fluid that exceeds the distension capacity of the pericardial fibroelastic tissue, leading to progressive compression of all cardiac chambers due to increased intrapericardial pressure, reduced cardiac filling volume and greater ventricular interdependence.⁴ Its development depends on the speed of accumulation and the causal factor: acute cardiac tamponade occurs within minutes, resulting in cardiogenic shock, while subacute cardiac tamponade occurs over days or weeks. Regional cardiac tamponade occurs when a localized effusion or hematoma produces regional compression in a single chamber.⁵

Clinical diagnosis of cardiac tamponade is based on Beck's triad (arterial hypotension, jugular distension, and muffled heart sounds) and the presence of paradoxical arterial pulse. Doppler echocardiography shows changes that appear prior to the clinical syndrome. These changes include cava dilation with little respiratory variation, diastolic collapse of the right ventricle free wall, right atrium, left atrium, and, rarely, the left ventricle, increased tricuspid flow and reduced mitral flow during inspiration, and the opposite at expiration. Right atrial collapse is a more sensitive sign, while right ventricle collapse is the more specific.⁶

In Queiroz et al.,² the patients were followed-up for 2.22 years and, as expected, the tamponade group had a worse prognosis. Cardiac tamponade treatment consists of draining the pericardial fluid to reduce intrapericardial pressure and, thus, improve patient hemodynamics. Pericardial drainage can be performed through a percutaneous puncture and placement of a drainage catheter, through open surgical drainage with

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or without pericardiectomy, or through video-assisted pericardioscopy.^{7,8} Catheter drainage may require a few days and the catheter should not be removed until the drainage falls below 20-30 ml/24 h. The advantage of surgical drainage is that it allows pericardial biopsy, which is recommended in cases of recurrence after catheter drainage, as well as in cases of clots or effusions inaccessible by the percutaneous route.⁹ A recent study

proposed a prediction score consisting of systolic blood pressure < 100 mmHg (1.5 points), effusion diameter [1-2 cm (0 points), 2-3 cm (1.5 points), > 3 cm (2 points)], right ventricular diastolic collapse (2 points), and mitral inflow velocity variation > 25% (1 point). The need for pericardial drainage was high in patients with scores ≥ 4 .¹⁰ These four variables can be easily obtained at bedside and facilitate the difficult decisions required to improve patient outcomes.

References

1. Ristic A, Imazio M, Yehuda A, Anastasakis A, Badano LP, Brucato A, et al. Triage strategy for urgent management of cardiac tamponade. *Eu Heart J*. 2014;35(34):2279-84.
2. Queiroz CM, Cardoso J, Ramires F, Ianni B, Hotta VT, Mady C, et al. Pericardial Effusion and Cardiac Tamponade: Etiology and Evolution in the Contemporary Era. *Int J Cardiovasc Sci*. 2021; 34(5Supl.1):24-31.
3. Khandaker MH, Espinosa RE, Nishimura RA, Sinak LJ, Hayes NS, Melduni RM, et al. Pericardial disease: diagnosis and management. *Mayo Clin Proc*. 2010;85(6):572-93.
4. Sagristà-Sauleda J, Angel J, Sambola A, Alguersuari J, Permanyer-Miralda G, Soler-Soler J. Low-pressure cardiac tamponade: clinical and hemodynamic profile. *Circulation*. 2006;114(9):945-52.
5. Libby P, Zipes D, Bonow R. Braunwald's heart disease: a textbook of cardiovascular disease. 8th ed. Philadelphia; Elsevier; 2007.
6. Little WC, Freeman GL. Pericardial disease. *Circulation*. 2006;113(12):1622-32.
7. Maisch B, Ristic AD, Seferovic PM. New directions in diagnosis and treatment of pericardial disease: a project of the Taskforce on Pericardial Disease of the World Heart Federation. *Herz*. 2000;25(8):769-80.
8. Uramoto H, Hanagiri T. Video-assisted thoracoscopic pericardiectomy for malignant pericardial effusion. *Anticancer Res*. 2010;30(11):4691-4.
9. Ling LH, Oh JK, Breen JF, Schaff HV, Danielson GK, Mahoney DW, et al. Calcific constrictive pericarditis: is it still with us? *Ann Intern Med*. 2000;132(6):444-50.
10. Duanmu Y, Choi DS, Tracy S, Harris OM, Schleifer JI, Dadabhoy FZ, et al. Development and validation of a novel prediction score for cardiac tamponade in emergency department patients with pericardial effusion. *Eur Heart J Acute Cardiovasc Care*. 2021;10(5):542-9.

