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Case Report

Cardiac Tamponade in Anorexia Nervosa: An Argument for Conservative Management

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Abstract

Pericardial effusion is a commonly encountered cardiac complication of malnutrition. Pericardial effusion can rarely progress to cardiac tamponade, a condition of cardiovascular collapse that typically requires emergent surgical intervention. Previously published case reports of cardiac tamponade in anorexia nervosa have involved surgical intervention but this case report is the first to describe conservative management with a successful outcome.

Introduction

Anorexia nervosa (AN) is a mental health disorder associated with high mortality [1] and a myriad of medical complications [2]. Bradycardia is one of the most frequently encountered complications but other cardiovascular complications can include orthostatic hypotension, mitral valve prolapse, pericardial effusion, and others [3]. Pericardial effusion, the build-up of fluid within the pericardial sac surrounding the heart, is most often an incidental finding that does not impact the clinical presentation or impede cardiac filling or contractility. However, in rare instances when a significant amount of fluid accumulates to impede cardiac filling and contractility, a condition called cardiac tamponade can develop, leading to reduced cardiac output and hypotension. Definitive treatment typically requires drainage of the pericardial fluid, which normalizes these cardiac hemodynamics. Herein we present a case of a patient with extreme AN presenting with findings suggestive of cardiac tamponade who was successfully managed with conservative treatment.

Case Presentation

A 24 year old female with a 2-year history of AN was transferred to the ACUTE Center for Eating Disorders and Severe Malnutrition (ACUTE), a unit dedicated to the medical stabilization of people with severe malnutrition of various causes. Upon admission, she weighed 29.4 kg, which calculated to a body mass index (BMI) of 10.5 kg/m^2, and she had a heart rate of 43 beats per minute with a blood pressure of 83/53 mm Hg. Exam revealed elevated jugular venous distension, no edema of the extremities, and normal cardiac sounds without an audible rub. She reported symptoms of orthopnea, dyspnea, and continuous chest discomfort. She had reported similar symptoms a year prior at an outside hospital when she was found to have a large pericardial effusion (>2 cm) requiring pericardiocentesis. The echocardiogram at that time reported findings concerning for tamponade with right ventricle diastolic collapse but no right atrial diastolic collapse, no mitral or tricuspid inflow respiratory variation, and a dilated inferior vena cava with decreased collapsibility consistent with elevated central venous pressure of 15 mm Hg. Evaluation of the pericardial fluid drained during the procedure was unremarkable for inflammatory or infectious causes. Repeat echocardiogram two days after the pericardiocentesis revealed re-accumulation of the effusion, although to a smaller degree (up to 1 cm) and without tamponade physiology.

Given her clinical complaints that were similar to her previous diagnosis of cardiac tamponade, she underwent an echocardiogram that revealed a moderate pericardial effusion

around the posterior left ventricle with equivocal findings of tamponade: septal bounce and late diastolic right ventricle chamber collapse were present although there was no respiratory transvalvular variation and the left ventricle was normal in size; the inferior vena cava was poorly visualized. It was decided to closely monitor, and a repeat echocardiogram four days later revealed a slightly larger pericardial effusion, now located anteriorly, but without tamponade physiology; the inferior vena cava was again poorly visualized. Although her heart rate was increasing from admission, with a maximum pulse of 108 beats per minute during the preceding 24 hours, it was again decided to continue conservative management as her symptoms had not clinically worsened and her blood pressure and jugular venous distension remained stable. She remained at the ACUTE unit for 51 days, for on-going weight restoration, ultimately gaining 13.5 kg from her nadir weight, achieving a BMI of 14.9 kg/m^2. Repeat echocardiogram at the time of discharge revealed a moderate, predominantly anterior pericardial effusion measuring 14 mm without tamponade physiology and without a dilated inferior vena cava. Her symptoms of orthopnea and dyspnea also gradually improved with weight restoration, and she was fully ambulatory and without limitations.

Of note, this is the second case of a patient admitted to ACUTE who was found to have clinical and radiologic signs of impending cardiac tamponade but who was successfully managed with conservative treatment. Briefly, a 43 year old male presented at a BMI of 12.56 kg/m^2 without cardiopulmonary complaints. Echocardiogram revealed a moderate pericardial effusion with late diastolic restriction to filling and without frank collapse of the right ventricle. A follow up echocardiogram obtained two days later revealed some diastolic atrial collapse with mild flow variation across the right ventricle with respiration and a small collapsible inferior vena cava (1.4 cm) with a hyperdynamic right ventricle. A repeat echocardiogram the following day revealed enlargement of the effusion but without findings suggestive of cardiac tamponade; blood pressure at this time revealed a narrow pulse pressure (110/99 mm Hg), although the patient remained asymptomatic. Ultimately, the pericardial effusion was managed conservatively with the patient gaining 19.3 kg as part of the nutritional rehabilitation plan. An echocardiogram at the time of discharge showed a trivial to small pericardial effusion without hemodynamic compromise.

Discussion

Pericardial effusion is a medical complication estimated to develop in about 25% of individuals with AN [4]. One potential hypothesis for development of the excessive pericardial fluid suggests that an enlarged pericardial space develops due to reduced pericardial fat and myocyte atrophy as a result of the weight loss which characterizes AN, which is then occupied by this fluid. Another hypothesis relates to low triiodothyronine (T3) hormone [5,6,7], which commonly is seen in patients with AN, although not all studies find this association with low thyroid hormone [8]. Regardless of the etiology, it seems that most patients with AN who are found to have a pericardial effusion only develop mild to moderate effusions, with large effusions being a much less commonly reported occurrence [5,8,9]. There are only a very few case reports describing cardiac tamponade in people with AN [10,11,12]. In each of these cases, the patient underwent pericardiocentesis or pericardial window. Table 1 summarizes the clinical and echocardiographic findings of the four previously published cases of cardiac tamponade in patients with AN along with the two cases described herein.

	Case 1[11]	Case 2[10]	Case 3[10]	Case 4[12]	Case 5 (Current case report)	Case 6 (Current case report)
Age (years)	45	14	14	15	24	43
Gender	Female	Female	Female	Female	Female	Male
Admit BMI	14.8 kg/m^2	13.22 kg/m^2	9.65 kg/m^2	11.83 kg/m^2	10.5 kg/m^2	12.56 kg/m^2
Heart Rate	N/A	49 bpm	62 bpm	54 bpm	43 bpm	63 bpm
Blood pressure	N/A	110/70 mm Hg	80/60 mm Hg	90/60 mm Hg	83/53 mm Hg	110/99 mm Hg
Pertinent physical exam findings	JVD, pulsus paradoxus (10 mm Hg)	None	None	None	JVD	None
Echocardiogram Results	Persistent pericardial effusion with new, subtle late diastolic collapse of the RV free wall, enhanced ventricular interdependence, and an increased IVC diameter (2.3 cm) with decreased inspiratory collapse	Diffuse pericardial effusion around the anterior and lateral wall, with diastolic collapse of the right atrial and ventricular walls	Diffuse pericardial effusion around the anterior and lateral wall and with diastolic collapse of the right atrial and ventricular walls	Maximum anterior leaflet separation of 2.8 cm and initial hemodynamic repercussions, as shown by slight RV collapse and absence of respiratory excursion of the superior vena cava	Moderate pericardial effusion around the posterior left ventricle with septal bounce and late diastolic RV chamber collapse	Moderate pericardial effusion with some diastolic atrial collapse with mild flow variation across the RV with respiration and a small collapsible IVC (1.4 cm)
Management	Pericardial window	Pericardio-centesis	Pericardio-centesis	Pericardio-centesis	Conservative	Conservative
Abbreviations: bpm: beats per minute, JVD: jugular venous distension; RV: right ventricle; IVC: inferior vena cava						

Table 1: Cases of cardiac tamponade in patients with anorexia nervosa.

Conclusion

Although pericardial effusions are a common finding in people with AN that require no intervention aside from weight restoration, previously published cases of cardiac tamponade in people with AN describe individuals who have undergone surgical intervention. This case report is the first to describe the successful conservative management of a person with AN and cardiac tamponade. Close monitoring of these patients with serial echocardiograms must be instituted given the frailty of these patients with extreme AN. Similar conservative approaches have been successfully applied to cases of pneumothorax [13], pneumatosis intestinalis [14], and severe neutropenia in patients with extreme AN.

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