

## How fatal can untreated constipation be?

Salih Karakoyun, Yasin Haydar Yartaşı, Mehmet Cihat DEMİR, Mustafa BOĞAN\*

Emergency Department, School of Medicine, Düzce University, Düzce, Turkey.

### Abstract

This case report discusses a patient who presented with dyspnea and presyncope following the Valsalva maneuver. The patient had a history of chronic constipation and experienced difficulty defecating, leading to vigorous straining. Upon arrival at the emergency department, the patient exhibited signs of cardiac tamponade and computed tomography (CT) scan revealed high-density pericardial hemorrhagic effusion. Pericardiocentesis and surgical decompression were performed to manage the tamponade. The patient's symptoms improved and discharged in stable condition. This case highlights the potential fatal complications of constipation, emphasizing the need for a holistic approach in cardiovascular care.

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### Introduction

Pericardial effusion is defined as an increased accumulation of fluid within the pericardial cavity, either acutely or chronically. Physiologically, the amount of pericardial fluid ranges between 10-50 milliliter [1,2]. Various pathophysiological changes play a role in the increase of this fluid. Increased pericardial fluid can be attributed to pericardial inflammation [1,2], reduced reabsorption due to increased systemic venous pressure [1,2], progressive fluid accumulation as a result of surgical intervention [1-3], impairment of pericardial characteristics and thickness due to severe or recurrent inflammation [4], obstruction of venous return and ventricular diastolic filling due to compression of cardiac chambers [3,4], increased ventricular diastolic pressure [3,4], and systemic congestion [3,4]. These are known as the leading causes of pericardial effusion.

Pericardial effusion can be incidentally detected in asymptomatic individuals. However, pericardial fluid can lead to a life-threatening condition known as cardiac tamponade, which can result in death [5]. Cardiac tamponade is a clinical syndrome characterized by the accumulation of fluid in the pericardial cavity, leading to impaired ventricular

filling and cardiac output [1,3]. Pericardial effusion can cause symptoms such as dyspnea, orthopnea at advanced stages, chest pain, tachypnea, cough, dysphagia, and nausea in patients [1-4]. In cardiac tamponade, additional features may include hypotension, pulsus paradoxus, increased jugular venous pressure, and muffled heart sounds [1-4]. Physical examination may reveal Beck's triad (hypotension, muffled heart sounds, distended jugular veins), tachycardia, tachypnea, fever, and pulsus paradoxus. The diagnosis of pericardial tamponade is confirmed by echocardiography, which is complemented by electrocardiography (ECG), X-ray, and computed tomography (CT).

Pericardial effusion can occur due to inflammatory or non-inflammatory processes [5]. Inflammatory causes include viral, bacterial, fungal, protozoal, secondary to uremia, and drug hypersensitivity-related pericarditis. In the United States and Western Europe, the most common etiology of inflammation-related pericardial effusion is post-viral idiopathic pericarditis [5]. Non-inflammatory causes include malignancy, metabolic factors, trauma, and conditions associated with decreased lymphatic drainage [5]. Pericardial fluid can possess the qualities of transudate (hydropericardium),

\*Correspondence: Mustafa BOĞAN, Emergency Department, School of Medicine, Düzce University, Düzce, Turkey, Posta code: 81620; Email: [mustafabogan@hotmail.com](mailto:mustafabogan@hotmail.com); ORCID: 0000-0002-3238-1827

exudate, purulence (pyopericardium), or blood (hemopericardium) [1,3]. The most common causes of cardiac tamponade include acute pericarditis, tuberculosis, iatrogenic injury, blunt chest trauma, and malignancy [1,3]. Rare causes may include collagen vascular diseases (such as systemic lupus erythematosus, rheumatoid arthritis, scleroderma), myocardial infarction, uremia, aortic diseases, bacterial infection, and sequelae of radiotherapy [1].

The treatment of pericardial effusion primarily focuses on addressing the underlying cause. The primary approach is to remove and halt the accumulation of pericardial fluid that contributes to the patient's clinical presentation and symptoms. Pericardiocentesis and drainage are methods used to accomplish this, with pericardiotomy and pericardiectomy being options in cases where pericardiocentesis and drainage are insufficient or for patients with recurrent effusion [1]. In cases of isolated pericardial effusion, additional medical therapy is not necessary; however, if systemic inflammation is present, conditions such as acute pericarditis should be treated. This may involve the use of aspirin, non-steroidal anti-inflammatory drugs, and colchicine [1,3]. Here, we describe a patient who presented with cardiac tamponade following Valsalva maneuver due to chronic constipation.

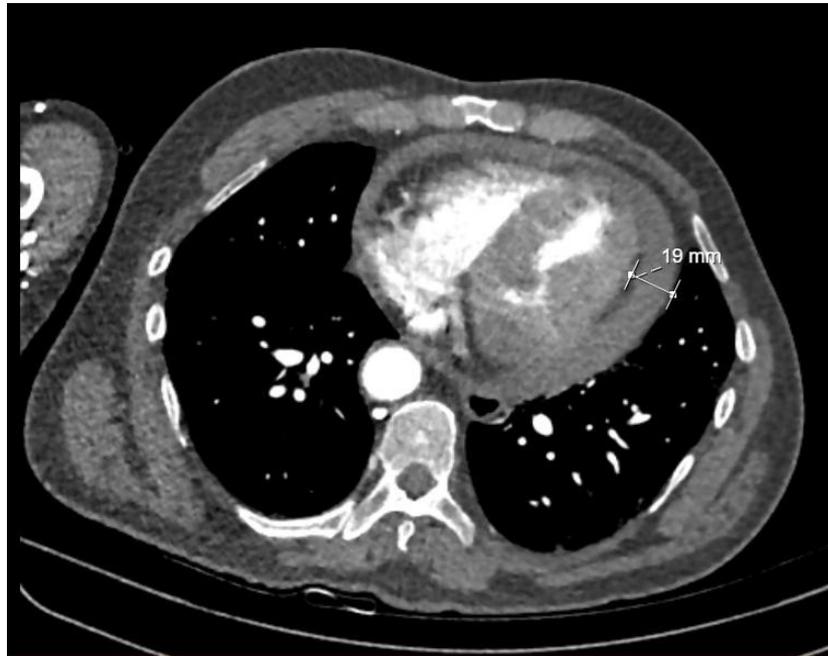
### Case Presentation

A 53-year-old male patient was brought to the Emergency Service (ES) by ambulance. It was learned that the patient had excessive difficulty defecating in the early hours of the morning and inserted his finger into the rectum because he could not remove the stool. Subsequently, he experienced lightheadedness, blurred vision, dyspnea, and numbness radiating to his left arm, prompting him to call for an ambulance. Upon arrival at the emergency department, the patient's general condition was moderate, agitated but oriented and cooperative. Vital signs were as follows: blood pressure 69/39 mm Hg, heart rate 130 beats/min, respiratory rate 22 breaths/min, oxygen saturation 82%, and body temperature 36.8°C. Physical examination revealed cachexia and jugular venous distension. Neurological examination

was unremarkable, and abdominal examination showed no pathology. No murmurs were heard on cardiac examination, and both lungs had equal breath sounds. The patient had no known medical history other than hypertension and chronic constipation. The ECG taken during the emergency department visit showed 1.5 mm ST depressions in leads D2, D3, AVF, V3, and V6, and 1 mm ST elevation in leads AVR and V1. Despite hydration, the patient continued to have hypotension, and intravenous norepinephrine support was initiated. To exclude possible cardiovascular and aortic pathologies, thoracoabdominal aorta CT angiography was performed. No pathology related to the aorta was detected, but a high-density hemorrhagic effusion measuring 19 mm in the thickest part of the pericardial cavity was observed (Figure-1).

Blood tests revealed elevated levels of conventional troponin (2.41 ng/ml; reference range: 0-0.16) and CRP (7.44 mg/dl; reference range: 0-0.5), while liver and kidney function tests were normal. Coronary angiography was performed to evaluate acute coronary syndrome as a possible etiology of cardiac tamponade. But, coronary angiography did not reveal any vascular contrast leakage. As a result, the patient was diagnosed as a case of cardiac tamponade with pericardial effusion on the CT scan, and the patient was referred to the cardiology department for consultation. Attempted therapeutic pericardiocentesis by the cardiology team was unsuccessful because the aspirated fluid had a dense clotting property. Due to the patient's unstable vital signs, indicating the need for surgical decompression of tamponade, the case was transferred to cardiovascular surgery (CVS). Diagnostic and therapeutic total median sternotomy was performed by the CVS team. During the procedure, organized encapsulated clotting material was observed within the pericardium and was removed. No significant macroscopic pathology causing hemopericardium was detected. Based on the above, the patient was finally diagnosed as a case of cardiac tamponade due to hemopericardium following straining (Valsalva) during defecation for chronic constipation.

The patient's clinical and vital signs remained normal during the follow-up, and the symptoms improved. The patient was discharged in stable condition after three days.



**Figure-1:** CT angiograph showing high-density hemorrhagic effusion in the pericardial cavity

### Discussion

ST segment elevation/depression on an ECG can be seen due to various causes. These include acute myocardial infarction, early repolarization, coronary vasospasm (Prinzmetal's angina), pericarditis, left bundle branch block, left ventricular hypertrophy, ventricular aneurysm, Brugada syndrome, increased intracranial pressure, Takotsubo cardiomyopathy, pulmonary thromboembolism, pneumothorax, cardiac contusion, hypothermia, and hyperkalemia, etc [6-9]. In our case, acute coronary syndrome was ruled out, and no significant pathology was observed apart from hemopericardium. Hemopericardium can be caused by trauma, misplaced central catheter, bleeding diathesis, ventricular rupture following myocardial infarction, chest trauma, over dose of anticoagulants, rupture of sinus of Valsalva aneurysm, and rupture of aortic arch aneurysms, among others [10-12]. In this case, no significant pathology was present that could cause the observed hemopericardium.

The main factor worsening the patient's clinical condition in this case was the Valsalva maneuver, which occurred primarily as a result of expiratory

effort against a closed airway, following increased intrathoracic and intra-abdominal pressure [13]. The side effects and complications of the Valsalva maneuver are actually quite rare [13]. In patients, especially those with a history of coronary artery or cerebrovascular disease - chest pain, syncope, arrhythmia, and cerebral stroke may occur after the maneuver [13]. Temporary ventricular arrest and even sudden death have been reported due to decreased left ventricular stroke volume and inadequate autonomic regulation [13]. Headache, dizziness, nausea, altered mental status, and increased intraocular pressure leading to retinal or macular hemorrhage are also reported side effects [13]. Although these side effects have been reported in various case series, no complications were encountered in autonomic testing studies, including 20,000 Valsalva maneuvers conducted by Low in 1993, and studies conducted by the American Academy of Neurology in 1996 [14, 15]. Constipation, due to its disruption of the gut flora, can lead to increased atherosclerosis and elevated blood pressure, exacerbating the course of cardiovascular events [16]. Straining behavior raises blood pressure and can trigger cardiovascular events such as arrhythmia,

congestive heart failure, acute coronary syndrome, aortic dissection, and stroke [16]. In this patient, excessive straining due to constipation led to cardiac tamponade following development of hemopericardium.

### Conclusion

Physicians tend to focus solely on resolving the pathology that concerns them during the treatment and follow-up process of pericardial effusion. In our case, where the patient progressed to cardiac tamponade after straining, this becomes even more strikingly dramatic. It is true that with advancing technology, we have made ground breaking achievements in scientific endeavors. Specialization in every field has led to remarkable successes. However, there is something we have forgotten: the holistic approach. This case serves as a reminder that cardiovascular pathologies can develop or worsen following constipation.

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### Informed consent

Written consent was obtained from the patient.

### Human rights

Authors declare that human rights were respected according to Declaration of Helsinki.

### References

- Adler Y, Charron P, Imazio M, Badano L, Barón-Esquivias G, Bogaert J, Brucato A, Gueret P, Klingel K, Lionis C, Maisch B, Mayosi B, Pavie A, Ristic AD, Sabaté Tenas M, Seferovic P, Swedberg K, Tomkowski W; ESC Scientific Document Group. 2015 ESC Guidelines for the diagnosis and management of pericardial diseases: The Task Force for the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology (ESC) Endorsed by: The European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J*. 2015 Nov 7; **36**(42): 2921-2964. doi: 10.1093/eurheartj/ehv318.
- Imazio M, Adler Y. Management of pericardial effusion. *Eur Heart J*. 2013 Apr; **34**(16): 1186-1197.
- Seferović PM, Ristić AD, Maksimović R, Simeunović DS, Milinković I, Seferović Mitrović JP, et al. Pericardial syndromes: an update after the ESC guidelines 2004. *Heart Fail Rev*. 2013 May; **18**(3): 255-266. doi: 10.1007/s10741-012-9335-x.
- Khandaker MH, Espinosa RE, Nishimura RA, Sinak LJ, Hayes SN, Melduni RM, Oh JK.. Pericardial disease: diagnosis and management. *Mayo Clin Proc*. 2010 Jun; **85**(6): 572-593. doi: 10.4065/mcp.2010.0046.
- Vakamudi S, Ho N, Cremer PC. Pericardial Effusions: Causes, diagnosis, and management. *Prog Cardiovasc Dis*. 2017 Jul-Aug; **59**(1): 380-388. doi: 10.1016/j.pcad.2016.12.009.
- Edhouse J, Brady WJ, Morris F. ABC of clinical electrocardiography: Acute myocardial infarction-Part II. *BMJ*. 2002 Apr 20; **324**(7343): 963-966. doi: 10.1136/bmj.324.7343.963.
- Smith SW. T/QRS ratio best distinguishes ventricular aneurysm from anterior myocardial infarction. *Am J Emerg Med*. 2005 May; **23**(3): 279-287. doi: 10.1016/j.ajem.2005.01.003.
- Kashou AH, Basit H, Malik A. ST Segment. [Updated 2022 Aug 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-.
- Karakoyun S, Boran M, Saritaş A, Boran E. ECG evaluation in patients with pneumothorax admitted to the emergency department: a three years analysis. *Konuralp Medical Journal*. 2021; **13**(3): 634-639.
- Krejci CS, Blackmore CC, Nathens A. Hemopericardium: an emergent finding in a

- case of blunt cardiac injury. *AJR Am J Roentgenol.* 2000 Jul; **175**(1): 250.  
doi: 10.2214/ajr.175.1.1750250.
11. Katis P. Atraumatic hemopericardium in a patient receiving warfarin therapy for a pulmonary embolus. *Can J Emerg Med.* 2005 May; **7**(3): 168-170.  
doi: 10.1017/s148180350001321
12. Hong YC, Chen YG, Hsiao CT, Kuan JT, Chiu TF, Chen JC. Cardiac tamponade secondary to haemopericardium in a patient on warfarin. *Emerg Med J.* 2007 Sep; **24**(9): 679-680.  
doi: 10.1136/emj.2007.049643.
13. Pstras L, Thomaseth K, Waniewski J, Balzani I, Bellavere F. The Valsalva manoeuvre: physiology and clinical examples. *Acta Physiol (Oxf).* 2016 Feb; **217**(2): 103-119.  
doi: 10.1111/apha.12639.
14. Low PA. Autonomic nervous system function. *J Clin Neurophysiol.* 1993 Jan; **10**(1): 14-27.  
doi: 10.1097/00004691-199301000-00003.
15. American Academy of Neurology. Assessment: clinical autonomic testing report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. *Neurology.* 1996 Mar; **46**(3): 873-880.
16. Ishiyama Y, Hoshida S, Mizuno H, Kario K. Constipation-induced pressor effects as triggers for cardiovascular events. *J Clin Hypertens (Greenwich).* 2019 Mar; **21**(3): 421-425.  
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