

MISDIAGNOSIS OF ACUTE PERICARDITIS PRESENTING WITH CORONARY ARTERY DISEASE: A CASE REPORT

Titi Fadhilah Dukomalamo, Yonatan Esli Alexander Tidja, Dela Intan
Permatasari, Muhammad Bagas Pratista, Chindy Paniati Goutama Lay, Yeniar
Fitrianingrum, Fikri
Tidore General Hospital, Indonesia
Email: titifadhilah97@gmail.com

Abstract

Pericarditis is a common disorder that might present in various settings, including primary-care and emergency department. However, the clinical features in some cases did not match with the written theory, which could lead to a misdiagnosis. We reported a 34-year-old female presented to the emergency room with progressive tightness chest pain in the past 3 days, that got worse with a change in position and penetrated to the back. Based on clinical chest pain with history of stable coronary artery disease, no changes electrocardiograph (ECG) and normal laboratory evaluation, the patient was diagnosed with NSTEMI-ACS, treated based on guideline therapy but did not showed clinical improvement. Clinical re-examination and echocardiography evaluation showed a pathognomonic finding of pericarditis feature. Combination therapy of colchicine was given for 3 months and aspirin for 2 weeks. Follow-up evaluation showed normal ECG and echocardiography result without any remainder symptoms. Acute pericarditis does not always show typical clinical findings. Therefore, clinician must always aware with other differential diagnosis of chest pain and ECG variation of acute pericarditis even though the patient has a history of coronary artery disease.

**Keywords: Acute pericarditis, coronary artery disease, thickened and
hyperechoic pericardium, colchicine**

INTRODUCTION

Acute pericarditis is still a diagnosis that is missed when a person complains of chest pain. Chest pain due to pericarditis is about 5% of the total chest pain that often occurs (LeWinter, 2014). The study of Gouriet F et al showed 197 cases of 933 cases of acute pericarditis as post cardiac injury syndrome, although the other 55% cases are idiopathic (Gouriet et al., 2015). In developing countries, the causes of acute pericarditis are still idiopathic and accompanied by a viral infection, inflammation of the pericardium causes constriction syndrome due to increased rigidity and causes accumulation of effusion in the pericardial layer followed by pain in acute pericarditis arising from innervation by branches of the sympathetic trunk in the visceral

pericardial layer following the distribution of the heart. Typical chest pain that is often complained of is chest pain that pierces the retrosternal area, worsens during inspiration, lying down, standing or sitting. Distinguishing chest pain due to acute pericarditis and ischemic heart disease is still very difficult if symptoms are atypical (Ismail, 2020).

The normal ECG in this patient is in stark contrast to the early-phase ECG seen in acute pericarditis in general, PR depression in inferior leads (II,III, aVF) or precordial leads V2-V6 or ST segment elevation which must also be distinguished from myocardial infarction (Imazio et al., 2015). In this report, the patient with acute pericarditis has a history of congestive heart failure due to hypertensive heart disease who is routinely undergoing treatment, although in this patient the exact source of infection that may accompany it is not known, so a detailed diagnosis is the key to distinguish it from other diagnoses with similar complaint.

RESEARCH METHODS

A 34-year-old female being hospitalized to emergency room with progressive tightness chest pain for 3 days ago. The typical chest pain was radiating to the neck and left arm, got worse with a change in position and penetrated to the back, lasting 5-10 minutes. Chest pain does not improve when the patient rests, accompanied by nausea. She felt short of breath when she was doing strenuous activities or walking long distances. She had been diagnosed with stable coronary artery disease (CAD) seven month ago because she felt radiating chest pain and got worse when activity and improve when resting, finding of the slight ST depression on lead V1-V4 on Electrocardiograph (ECG). She had received the medication for coronary artery disease due to previous history; isosorbide dinitrate 5 mg if the complaint of chest pain appears, clopidogrel 75 mg once daily, aspirin 80 mg once daily, spironolactone 25 mg once daily, furosemide 20 mg once daily, captopril 12,5 mg twice daily, amlodipine 10 mg once daily. She only took medicine for 3 months and did not comply to routine check-up because she felt better until she was brought to emergency room due to current complaint. Her vital sign showed an axillary temperature of 36,6° Celcius ,blood pressure of 135/90 mmHg, heart rate 115 beats/minute, respiratory rate 28x/minute. Haematologic evaluation of complete blood count was within the normal limit. We could not check the CKMB, C-reactive protein and troponin marker because limited laboratory equipment in remote islands hospital. Based on clinical findings with history of stable coronary artery disease, we suspect that the plaque has ruptured, the patient diagnosed with Non ST Elevation-Acute Coronary Syndrome (NSTE-ACS). Isosorbide dinitrate and dual antiplatelet (clopidogrel 300 mg and aspilet 320 mg) but didn't show a significant progress. The next day while being treated at the hospital, we did the echocardiography examination. The Parasternal Long-Axis (PLAX) Echocardiogram view showed a thickened pericardium in the lateral left ventricle accompanied by hyperechoic (Figure 1a) and confirmed from the parasternal short-axis (PSAX) view, a thickened and hyperechoic pericardium appears in the inferolateral area of the left ventricle (Figure 1b). Based on additional findings, the patient was diagnosed with acute pericarditis, previous therapies isosorbide dinitrate 5 mg clopidogrel, spironolactone, captopril, and spironolactone were stopped, the additional therapy for this patient was 2 mg colchicine as loading dose, she continued receiving 1mg colchicine once daily. The patient showed a favourable response well with the

treatment. After hospital discharge, the patient was continued oral medication for 3 months. Follow-up evaluation showed normal sinus rhythm and reduction of thickening pericardial layers on TTE without any existing symptoms.

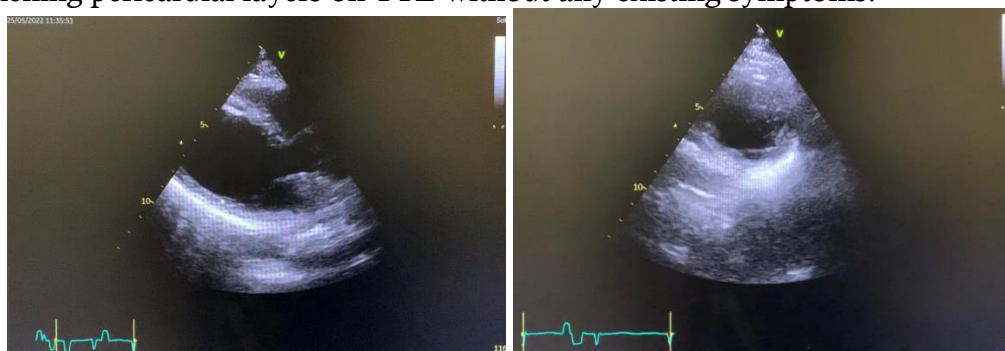


Figure 1. Transthoracic echocardiography evaluation results:a) from Parasternal Long-Axis (PLAX) Echocardiogram view showed a thickened pericardium in the lateral left ventricle accompanied by hyperechoic;b) the parasternal short-axis (PSAX) view showed a thickened and hyperechoic pericardium appears in the inferolateral area of the left ventricle.

RESULTS AND DISCUSSION

There had not been any gold standard criteria established to diagnose acute pericarditis. Patients with pericarditis are currently evaluated using physical auscultation, ECG, TTE, markers of inflammation, myocardial lesion, and chest X-ray. Additional diagnostic tests needed are depended on the aetiology of the disease (Imazio, Spodick, Brucato, Trincherio, Markel, et al., 2010). It is suggested that at least two of the following four criteria should be present: 1) pericardial chest pain, 2) Finding of a pericardial rub on auscultation, 3) discovery of ECG changes (widespread ST-elevation or PR depression), and 4) Detection of Pericardial effusion (new or worsening).

In this case, the patients met three criteria, which were pericardial chest pain, pericardial rub on auscultation and thickening of pericardial layers. We have been mistaken by diagnosing this patient with NSTEMI-ACS because of the symptoms and non-specific finding from the ECG evaluation. Retrosternal and sharp pain is present in 95% of cases which are similar with other disorders. Radiation pain of pericarditis could be indistinguishable to other disorders, and specific such as pleuritic, influenced by swallowing movements and changes in posture, usually relieved by a change in position to relieve pressure on the parietal pericardium such as leaning forward or sitting in an upright position (not relieved by nitrates). These characteristics can be a differentiator from the variety of pain that occurs in coronary artery disease which is very diverse, ranging from asymptomatic, stable chest pain, to chest pain in unstable angina, NSTEMI, STEMI. Mid-sternal pain without or with pressure, pain radiating to the left arm, neck, or penetrating to the back, anxiety and worsening with activity which is a marker of increased oxygen demand. At this early stage, we can think more specifically about possible diagnoses, although we still need other tools, even though in this patient the complaints of chest pain that appear are not specific (Regmi & Siccardi, 2019).

Despite being an important tool, the picture is not pathognomonic and varies in almost 40% of those diagnosed with acute pericarditis,8 including in this patient,

the onset of chest pain was 3 days and the ECG was normal. These features do not match the pathognomonic ECG changes. ECG changes only occurred 7 months after the diagnosis of acute pericarditis by echocardiography. Findings slight ST depression on lead V1-V4 on ECG treated as coronary artery disease, accompanied by patients who did not complied with routine check-ups at risk of causing misdiagnosis. In the early phase acute pericarditis with onset hours to days, PR segment depression is seen with ST segment elevation. The second phase of the ECG began to normalize with a general onset in the first week, early transitional J points were still found at baseline before the T wave began to flatten. The third phase of the inverted T wave which continues to normalize in phase 4. In the third phase, ECG changes are generally accompanied by clinical pleuritic chest pain and auscultation of high pitched pericardial rub (Chiabrando et al., 2020).

The thickness and hyperechogenicity of the pericardial layers, the presence or absence of pericardial effusion, its volume, and the concomitant haemodynamic effects (tamponade, restriction), are all provided by the TTE (Imazio et al., 2013) (Bhardwaj et al., 2013). In 60% of pericarditis cases, pericardial effusion was found, either new appearing or getting worse, mostly mild. In this patient not found the pericardial effusion but there was the thickening and hyperechogenicity of pericardial layers. Regrettably, TTE may have a disadvantages, including inadequate acoustic window brought on by obesity or chronic obstructive pulmonary disease (COPD), limited tissue characterization, and a disproportionately high reliance on the operator (Imazio, Spodick, Brucato, Trincherro, & Adler, 2010). We need several other imaging techniques have assisted in the diagnostic workup of patients with pericarditis.

Based on guidelines, the treatment for acute pericarditis is aspirin or NSAID and most patients respond completely without the need for further treatment (Lilly, 2013). Drug of choice for pericarditis should be depends on the patient's history, comorbidities of the patients, and physician preference (Seidenberg & Haynes, 2006). Colchicine could be given as combination therapy, may require supplementary narcotic analgesics. Aspirin 80 mg once daily for 2 weeks and Colchicine 0,5 mg once daily for 3 months were given to this patient and showed the good evaluation from symptoms, ECG and TTE.

Each drug's discontinuation results in potential recurrences. Tapering off should not be done unless the CRP is normal and the symptoms are absent (Pelliccia et al., 2006). Prognosis is generally benign, we could assess from predictor of poor prognostic outcome, that is divided into mayor and minor criteria. Mayor criteria are fever $>38^{\circ}\text{C}$, subacute onset, severe pericardial effusion ($>20\text{mm}$ on echocardiography), cardiac tamponade, no respon to aspirin or NSAID after at least 1 week of therapy, and the minor criteria are myopericarditis, immunodepression, trauma, oral anticoagulant therapy (Adler et al., 2015). The rate of complications are related to the aetiology rather than the number of recurrences. Nevertheless, patient with repeated recurrences, subacute or incessant pericarditis and glucocorticoid dependence will severely affect their quality of life (Imazio et al., 2009). Both major and minor predictors were absent in our patient.

CONCLUSION

Typical symptoms are not always found on acute pericarditis, mainly for the symptoms and ECG features, and can mimic other diagnoses similar with CAD.

Clinicians must be alert to differential diagnoses of the chest pain and ECG variations of acute pericarditis. The thickness of pericardial layers, hyperechogenicity, and the presence of effusion are needed to be evaluated using TTE to diagnose acute pericarditis.

BIBLIOGRAPHY

- Adler, Y. ... Lionis, C. (2015). 2015 ESC Guidelines For The Diagnosis And Management Of Pericardial Diseases. *Kardiologia Polska (Polish Heart Journal)*, 73(11), 1028–1091.
- Bhardwaj, R. ... Hobbs, G. (2013). Differential Diagnosis Of Acute Pericarditis From Normal Variant Early Repolarization And Left Ventricular Hypertrophy With Early Repolarization: An Electrocardiographic Study. *The American Journal Of The Medical Sciences*, 345(1), 28–32.
- Chiabrando, J. G. ... Brucato, A. (2020). Management Of Acute And Recurrent Pericarditis: JACC State-Of-The-Art Review. *Journal Of The American College Of Cardiology*, 75(1), 76–92.
- Gouriet, F. ... Habib, G. (2015). Etiology Of Pericarditis In A Prospective Cohort Of 1162 Cases. *The American Journal Of Medicine*, 128(7), 784-E1.
- Imazio, M. ... Adler, Y. (2009). Aetiological Diagnosis In Acute And Recurrent Pericarditis: When And How. *Journal Of Cardiovascular Medicine*, 10(3), 217–230.
- Imazio, M. ... Adler, Y. (2010). Controversial Issues In The Management Of Pericardial Diseases. *Circulation*, 121(7), 916–928.
- Imazio, M. ... Adler, Y. (2010). Diagnostic Issues In The Clinical Management Of Pericarditis. *International Journal Of Clinical Practice*, 64(10), 1384–1392.
- Imazio, M. ... Bonomi, F. (2013). Good Prognosis For Pericarditis With And Without Myocardial Involvement: Results From A Multicenter, Prospective Cohort Study. *Circulation*, 128(1), 42–49.
- Imazio, M. ... Lewinter, M. (2015). Evaluation And Treatment Of Pericarditis: A Systematic Review. *Jama*, 314(14), 1498–1506.
- Ismail, T. F. (2020). Acute Pericarditis: Update On Diagnosis And Management. *Clinical Medicine*, 20(1), 48.
- Lewinter, M. M. (2014). Acute Pericarditis. *New England Journal Of Medicine*, 371(25), 2410–2416.
- Lilly, L. S. (2013). Treatment Of Acute And Recurrent Idiopathic Pericarditis. *Circulation*, 127(16), 1723–1726.
- Pelliccia, A. ... Priori, S. (2006). Recommendations For Participation In Competitive Sport And Leisure-Time Physical Activity In Individuals With Cardiomyopathies, Myocarditis And Pericarditis. *European Journal Of Preventive Cardiology*, 13(6), 876–885.
- Regmi, M., & Siccardi, M. A. (2019). Coronary Artery Disease Prevention.
- Seidenberg, P. H., & Haynes, J. (2006). Pericarditis: Diagnosis, Management, And Return To Play. *Current Sports Medicine Reports*, 5, 74–79.

Copyright holders:

**Titi Fadhilah Dukomalamo, Yonatan Esli Alexander Tidja, Dela Intan Permatasari,
Muhammad Bagas Pratista, Chindy Paniati Goutama Lay, Yeni Fitrianingrum, Fikri
(2023)**

First publication right:

AJHS - Asian Journal of Healthy and Science



This article is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-sa/4.0/)