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Pericardial Effusion

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Abstract

Background: Pericardial effusion is defined as the accumulation of fluid in the pericardial sac, this can lead to life-threatening cardiac complications if not promptly diagnosed and managed effectively. This radiographic case study aims to demonstrate the crucial role of imaging techniques in diagnosing pericardial effusion, providing valuable insights into its characteristics, and guiding appropriate clinical interventions.
Methods: This is a case study of a 37yr old patient with suspected cardiac failure who underwent diagnostic imaging, including chest X-rays and echocardiography. The imaging findings were analyzed to assess the extent and severity of the disease and to help in the treatment decisions.
Results: The radiographic evaluation revealed a moderate pericardial effusion with characteristic findings on chest X-rays and echocardiography. The size, location, and hemodynamic impact of the effusion were assessed, informing the clinical team's decision to proceed with pericardiocentesis for therapeutic relief.
Conclusion: This case study underscores the pivotal role of radiographic imaging, particularly echocardiography and chest X-rays, in diagnosing and characterizing pericardial effusion. Timely and accurate diagnosis is essential for appropriate management and the prevention of life-threatening complications. Radiographic imaging serves as an indispensable tool in guiding clinical decisions and improving patient outcomes.

Keywords: Pericardial effusion; radiographic imaging, echocardiography, chest X-rays, diagnostic imaging, pericardiocentesis.

Introduction

Pericardial effusion is the accumulation of fluid in the pericardial sac surrounding the heart, it can present a diagnostic challenge and carries the potential for serious cardiac complications. Radiographic imaging plays a vital role in the identification, characterization, and management of pericardial effusion. This case study explores the significance of radiographic techniques, including echocardiography and chest X-rays, in diagnosing and assessing pericardial effusion; it also highlights the critical role in guiding clinical decisions and optimizing patient care.

Case report

Case report of a 37-year-old male who sought medical attention due to progressive shortness of breath, leg swelling, chest discomfort, and fever. Physical examination raised suspicions of cardiac failure, prompting diagnostic assessments. Initially, a posterior anterior (PA) chest X-ray revealed an enlarged cardiac silhouette with a characteristic "water bottle" appearance, indicative of pericardial effusion. Subsequent transthoracic Echocardiography (TTE) revealed an echo-free

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space between the heart and the pericardium which was concentric, the depth of the echo free space correlated with the fluid accumulation, with fluid thickness of 1.5cm approximately 250ml of serous pericardial fluid. Echocardiography also revealed Compression of the right atrium and ventricle with taponade effect on heart resulting in the diastolic collapse of the right atrium and ventricle. Color Doppler interrogation of the heart revealed abnormal blood flow patterns. Emergency ultrasound guided pericardiocentesis provided immediate symptomatic relief for the patient. Fluid analysis indicated an exudative effusion, prompting further investigations to determine the underlying etiology. This case underscores the critical role of radiographic imaging, including chest X-rays and echocardiography, in diagnosing and characterizing pericardial effusion, enabling timely intervention and optimal patient care with coordination among emergency medicine, cardiology, and diagnostic imaging specialists.

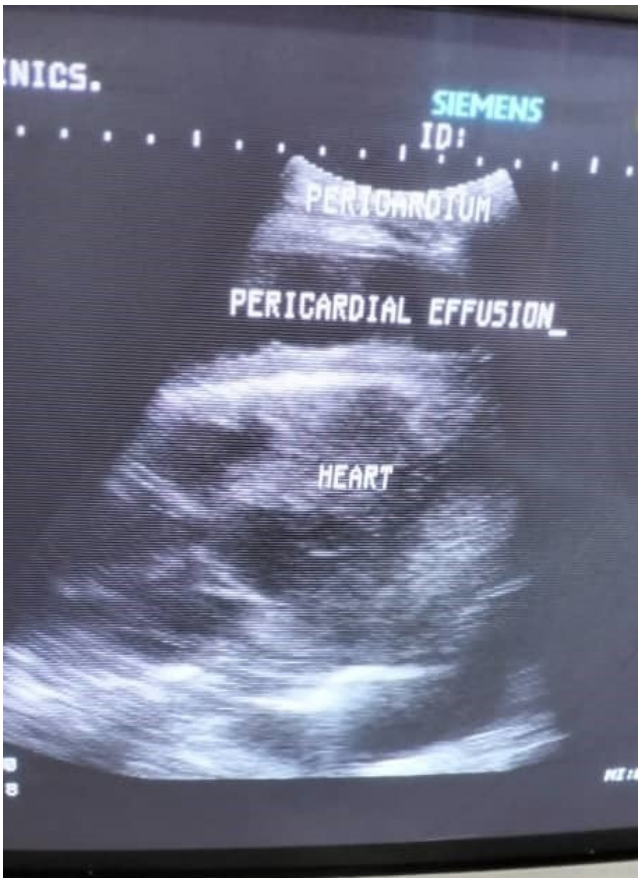

Fig 1. Transthoracic echocardiography of Pericardial Effusion

Fig 2. Ultrasounds scan of Pericardial Effusion

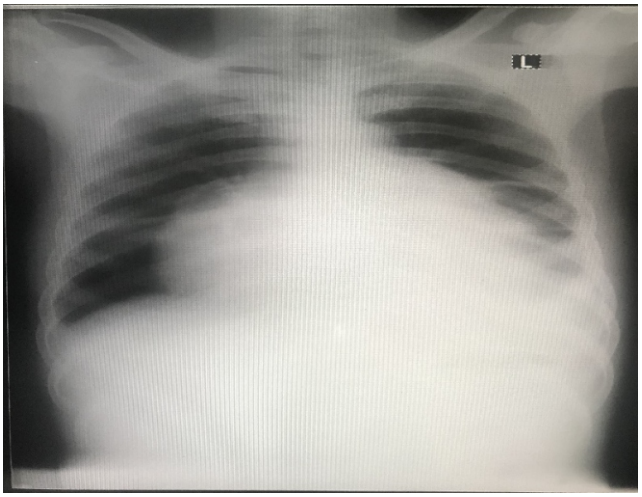

Fig 3. Chest x-ray of the pericardial effusion

Discussion

Pericardial effusion, characterized by the accumulation of fluid within the pericardial sac surrounding the heart, can present a diagnostic challenge and pose life-threatening complications. most common causes of pericardial effusion are infections (viruses, bacteria, especially Mycobacterium tuberculosis), malignant tumors, connective tissue diseases, pericardial injury syndrome (e.g. post-acute myocardial infarction, post-traumatic pericarditis), metabolic diseases (e.g. hypothyroidism), myocardial pericardial disease (pericarditis, myocarditis, and heart failure), uremia, and idiopathic pericardial effusion. Tuberculosis is considered to be a major cause of pericardial effusion in developing countries.5 Laboratory analysis of the pericardial effusion can facilitate the diagnosis of infectious and neoplastic

pericardial effusions. In this case report no known cause of the pericardial effusion was detected in the laboratory test (complete blood count was normal, serological test revealed no organism, pericardial fluid analysis was unremarkable).

This case highlighted the significance of radiographic imaging, specifically chest X-rays and echocardiography, in the prompt diagnosis and assessment of pericardial effusion, ultimately leading to effective intervention and management.

The chest X-ray findings in this case demonstrated an enlarged cardiac silhouette with the classic "water bottle" appearance, a well-known radiographic sign associated with pericardial effusion.[1] This silhouette enlargement occurs due to the accumulation of fluid in the pericardial space, leading to increased cardiac waist size and characteristic imaging features.[2]

Echocardiography, a valuable diagnostic tool, provided a more detailed assessment of the pericardial effusion. Transthoracic echocardiography (TTE) revealed a moderate effusion, with an estimated fluid thickness of 1.5 cm. importantly; it indicated tamponade physiology, demonstrated by diastolic collapse of the right atrium and ventricle, underscoring the urgency of intervention.[3]

Prompt pericardiocentesis, guided by these radiographic findings, alleviated the patient's symptoms and offered a therapeutic benefit. The aspirated fluid analysis, showing an exudative effusion, raised further questions regarding the underlying cause, necessitating additional investigations.[5]

This case reinforces the pivotal role of radiographic imaging in the diagnosis and characterization of pericardial effusion, highlighting the importance of integrating clinical assessment with radiological findings. Timely recognition and intervention are essential in managing this potentially life-threatening condition. Moreover, the case exemplifies the collaborative approach among emergency medicine, cardiology, and diagnostic imaging specialists, ensuring optimal patient care.

References

1. Spodick DH. Acute cardiac tamponade. N Engl J Med. 2003;349(7):684-690.
2. Rajiah P. Cardiac tamponade: what every radiologist needs to know. Cardiovasc Diagn Ther. 2018;8(5):634-641.
3. Picard MH, Adams D, Bierig SM, et al. American Society of Echocardiography recommendations for quality echocardiography laboratory operations. J Am Soc Echocardiogr. 2011;24(1):1-10.
4. Maisch B, Seferović PM, Ristić AD, et al. Guidelines on the diagnosis and management of pericardial diseases executive summary; the task force on the diagnosis and management of pericardial diseases of the European Society of Cardiology. Eur Heart J. 2004; 25(7):587-610.
5. Ying-shuo H, Jian-xiong Z, Ying S. Chronic massive pericardial effusion: a case report and literature vie; journal of international medical research. 2020 Nov; 48(11): 0300060520973091.