계명의대학술지
Keimyung Medical Journal

Case Report

pISSN 2092-8335 · eISSN 2733-5380
Keimyung Med J 2025;44(1):97-100
https://doi.org/10.46308/kmj.2024.00143

Received: December 16, 2024
Revised: February 4, 2025
Accepted: February 14, 2025

Corresponding Author:
Jung Hee Hong, MD
Department of Radiology, Dongsan Medical Center, Keimyung University School of Medicine, 1035, Dalgubeol-daero, Dalseo-gu, Daegu 42601, Korea
E-mail: keke4@naver.com

© 2025 Keimyung University School of Medicine
This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (https://creativecommons.org/licenses/by-nc/4.0/) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Epipericardial Fat Necrosis with Progressive Calcification: a Case Report

Jung Hee Hong

Department of Radiology, Keimyung University School of Medicine, Daegu, Korea

Epipericardial fat necrosis is a rare, benign, self-limiting condition that can mimic the life-threatening causes of acute chest pain. Diagnosis relies primarily on chest computed tomography (CT), which typically reveals a well-defined ovoid fatty nodule at the cardiophrenic angle. Calcification in epipericardial fat necrosis is rare, with only two cases previously reported. This study reports the case of a 32-year-old female patient with persistent left-sided chest pain and progressive calcification observed on CT over two years, which was confirmed histologically. This case highlights the potential for chronic epipericardial fat necrosis to develop calcification, similar to the fat necrosis observed in the breast and epiploic appendages.

Keywords: Chest computed tomography, Fat necrosis, Pericardium

Introduction

Epipericardial fat necrosis is a rare condition that typically presents as a fat-dense mass associated with acute chest pain [1]. The clinical course is often self-limiting, and radiological findings are essential for diagnosis. Calcification in epipericardial fat necrosis is rare, with only two cases reported in the literature [2,3]. This report describes a case of epipericardial fat necrosis with calcification, providing evidence that chronic epipericardial fat necrosis, similar to fat necrosis in other organs, such as epiploic appendages, may develop dystrophic calcification over time.

Case report

A 32-year-old woman presented with acute left-sided chest pain that began one day prior. She had a history of intermittent left-sided chest pain for several years but noted that the pain had become sharp and stabbing, prompting her emergency department visit. Her height and weight were 162.0 cm and 51.8 kg, respectively. A coronary computed tomography (CT) scan performed two years earlier revealed no evidence of coronary artery disease, and her electrocardiogram showed no signs of acute coronary syndrome. Cardiac enzyme levels were unremarkable: Creatine Phosphokinase 54 U/L, Creatine Kinase-Myocardial Band 0.53 ng/mL, and Troponin I < 0.16 ng/mL. Upon presentation, chest radiography and CT were performed for further evaluation.

Chest radiography revealed no significant findings. However, chest CT revealed a 1.8 cm ovoid nodule with fat and soft tissue attenuation at the left cardiophrenic angle (Fig. 1). The nodule contained a 6 mm calcification and tiny peripheral calcifications. Compared with that observed on coronary CT performed two years earlier, no significant change was found in lesion size or 6 mm calcification (Fig. 2). However, new peripheral calcifications were ob-

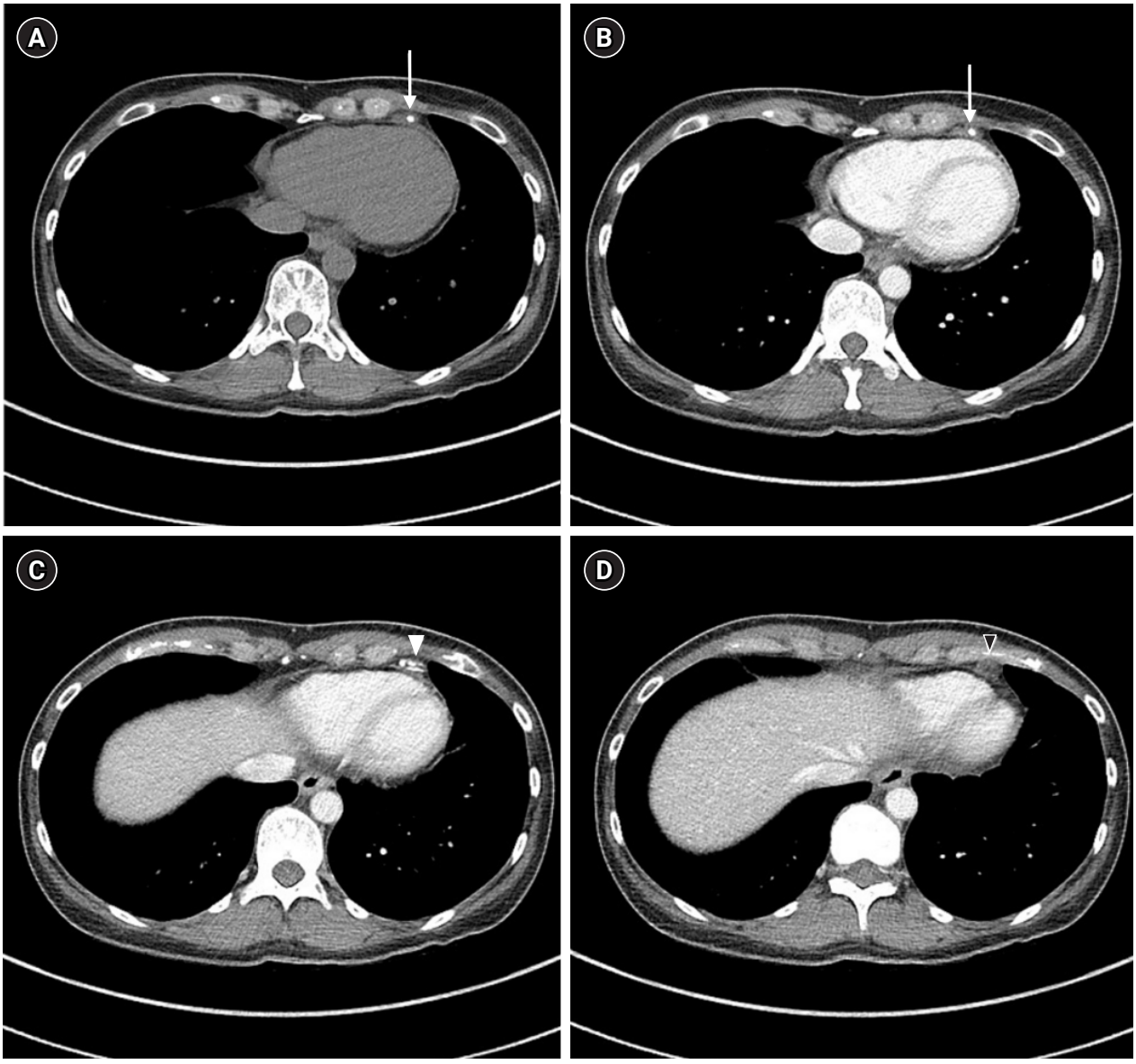

Fig. 1. A 32-year-old female patient who presented with acute chest pain one day prior to admission. (A) Non-enhanced chest computed tomography (CT) shows an ovoid soft tissue density nodule with a 6 mm calcification at the left cardiophrenic angle (white arrow). (B–D) Contrast-enhanced axial chest CT scan reveals a 6 mm calcification (white arrow) with peripheral tiny calcifications (white arrowhead) and an enhanced ovoid nodule with soft tissue and fat density (black arrowhead) at the left cardiophrenic angle.

served.

The absence of a significant change in size over two years and the well-defined margins and fat and soft tissue attenuation of the lesion strongly suggested epipericardial fat necrosis with progressive calcification. However, owing to persistent chest pain, the patient opted for surgical excision. The pericardial mass was successfully removed using video-assisted thoracoscopic surgery. Histopathological analysis confirmed a diagnosis of degenerative adipose tissue with dystrophic calcification.

Discussion

Fat necrosis is an uncommon condition observed in various body parts, including the breast, pancreas, and epiploic appendages [4,5]. Epipericardial fat necrosis is a rare, benign, self-limiting disorder. Despite its benign nature, epipericardial fat necrosis can present with acute pleuritic chest pain mimicking myocardial infarction or pulmonary embolism, often leading to emergency room visits. Obesity is considered a predisposing factor, although it can also occur in non-obese

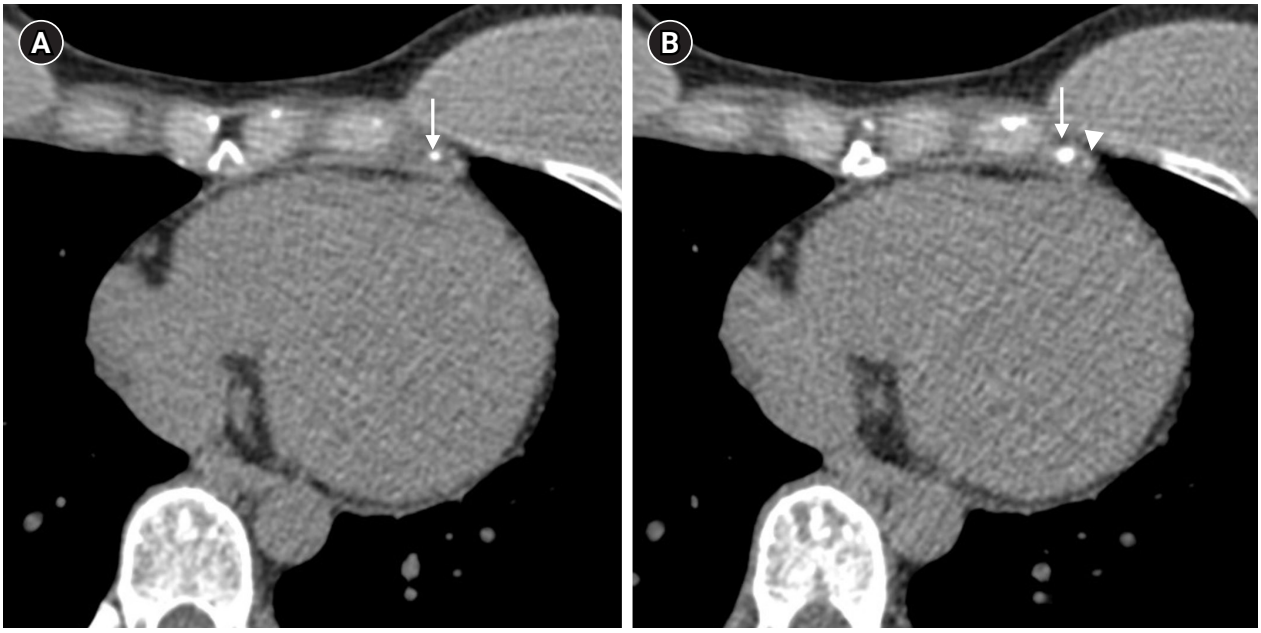

Fig. 2. Coronary computed tomography (CT) taken two years prior to admission. Non-enhanced axial CT images demonstrate a dense calcification (arrow) with soft tissue and fat density ovoid nodule, similar to the findings in Fig. 1. However, the peripheral tiny calcifications observed in Fig. 1 are absent, and only the fat and soft tissue lesion is seen, appearing ovoid (white arrowhead).

individuals, as in this case [1].

Given its non-specific clinical presentation, imaging, particularly chest CT, is critical in diagnosing epipericardial fat necrosis. Typically, epipericardial fat necrosis appears on CT as a well-defined ovoid fatty lesion located at the cardiophrenic angle and is frequently accompanied by adjacent inflammatory changes. It is more commonly observed on the left side [2,6]. However, its rarity and lack of specific clinical features pose diagnostic challenges.

Historically, epipericardial fat necrosis was managed surgically. However, a 2005 report by Pineda et al. [1] described a non-invasive diagnosis using CT with successful conservative management using oral analgesics. The patient's symptoms resolved within days, and a follow-up CT after two months confirmed the complete resolution of the lesion. Since then, non-invasive imaging-based diagnosis and conservative treatment have become the preferred management approaches, emphasizing the importance of imaging in avoiding unnecessary surgical procedures.

However, the exact etiology of epipericardial fat necrosis remains unclear. Acute pedicle torsion causing ischemic necrosis is one hypothesis, while abrupt intravascular pressure changes during a Valsalva maneuver may lead to hemorrhagic necrosis in the pericardial fat [7]. Structural abnormalities such as lipomas or lipomatosis may also predispose pericardial fat to mechanical stress from the beating heart and diaphragm [8].

Fat necrosis in other organs, such as the breast and epiploic appendages, may progress to chronic forms with fibrotic or calcified nodules [5]. In the breast, fat necrosis often begins with hemorrhage and degenerative changes in adipocytes, which progress to fibrosis and calcification. Advanced stages may result in fibrosis with calcification or cystic degeneration of the oily material [4]. However, calcification in epipericardial fat necrosis is rare, with only two cases previously documented. In this case, the patient presented with persistent left-sided chest pain that worsened, prompting an emergency visit. The chronic nature of the symptoms aligns with that of previously reported cases of calcified epipericardial fat necrosis, which also involved prolonged symptoms [2]. Additionally, we observed the progression of calcification within the epipericardial fat necrosis on CT compared with images taken two years earlier. Based on these findings, we propose that epipericardial fat necrosis, such as fat necrosis in the breast and epiploic appendages, may progress to aseptic chronic fat necrosis with calcification.

In conclusion, epipericardial fat necrosis is a rare but self-limiting condition that does not require surgical intervention [1]. Diagnosis can be achieved using chest CT, which typically reveals a well-defined nodule with fat and soft tissue

attenuation at the cardiophrenic angle. Although rare, cases with chronic progression, as demonstrated here, may develop calcification similar to fat necrosis in the breast and epiploic appendages.

Acknowledgements

During the preparation of this work, the authors used ChatGPT for English translation and polishing. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Ethics approval

This case report was reviewed and approved by the Institutional Review Board (IRB) of Keimyung University Dongsan Hospital (2024-12-003). The requirement for informed consent was waived by the IRB.

Conflict of interest

The author has nothing to disclose.

Funding

None.

ORCID

Jung Hee Hong, https://orcid.org/0000-0002-4299-6411

References

1. Pineda V, Cáceres J, Andreu J, Vilar J, Domingo ML. Epipericardial fat necrosis: radiologic diagnosis and follow-up. AJR Am J Roentgenol. 2005;185:1234–6.
2. Lee BY, Song KS. Calcified chronic pericardial fat necrosis in localized lipomatosis of pericardium. AJR Am J Roentgenol. 2007;188:W21–4.
3. Nestelberger T, Lange R, Kühne M, Haaf P. Calcified epicardial fat necrosis causing epicardial constriction. Eur Heart J. 2019;40:3698.
4. Taboada JL, Stephens TW, Krishnamurthy S, Brandt KR, Whitman GJ. The many faces of fat necrosis in the breast. AJR Am J Roentgenol. 2009;192:815–25.
5. Giambelluca D, Cannella R, Caruana G, Salvaggio L, Grassedonio E, Galia M, et al. CT imaging findings of epiploic appendagitis: an unusual cause of abdominal pain. Insights Imaging. 2019;10:26.
6. Lee HH, Ryu DS, Jung SS, Jung SM, Choi SJ, Shin DH. MRI findings of pericardial fat necrosis: case report. Korean J Radiol. 2011;12:390–4.
7. Inoue S, Fujino S, Tezuka N, Sawai S, Kontani K, Hanaoka J, et al. Encapsulated pericardial fat necrosis treated by video-assisted thoracic surgery: report of a case. Surg Today. 2000;30:739–43.
8. Chipman CD, Aikens RL, Nonamaker EP. Pericardial fat necrosis. Can Med Assoc J. 1962;86:237–9.