ARCHIVES OF THE
TURKISH SOCIETY
OF CARDIOLOGY

Official journal of the
TURKISH
SOCIETY OF
CARDIOLOGY

The Incremental Diagnostic Value of Computed Tomography Attenuation in the Differential Diagnosis of Malignant Pericardial Effusion: A Retrospective Observational Study

Bilgisayarlı Tomografi Attenüasyonunun Malign Perikardiyal Efüzyonun Ayırıcı Tanısındaki Artımlı Tanısal Değeri: Retrospektif Gözlemsel Bir Çalışma

LETTER TO THE EDITOR
EDİTÖRE MEKTUP

To the Editor,

I read with great interest the valuable study by İnan et al.,[1] published in the *Turkish Archives of Cardiology*, which investigated the value of computed tomography (CT) attenuation in the differential diagnosis of malignant pericardial effusion (MPE). The authors deserve commendation for addressing a topic of high clinical importance. However, I would like to draw attention to certain methodological limitations underlying the use of CT attenuation as a standalone biomarker.

The main finding of the study is that CT attenuation is an independent predictor of MPE.[1] However, the most significant weakness of this biomarker is the absence of a universally accepted Hounsfield Unit (HU) threshold in the literature. The proposed cutoff value of 16.45 HU by İnan et al.[1] conflicts with other studies. For instance, one study reported a much lower threshold of 4.7 HU for exudative pericardial effusions.[2] This inconsistency, combined with technical variability arising from different CT scanners and protocols, severely limits the generalizability of a single HU value.[3] Furthermore, the study's retrospective design and the selected patient population from a tertiary care center may have artificially inflated the diagnostic accuracy of the results.

The most critical diagnostic challenge is distinguishing MPE from non-malignant effusions in the "gray zone," which can exhibit similarly high attenuation values, such as tuberculous or hemorrhagic pericarditis. It has been demonstrated that HU values in this "gray zone" overlap significantly, weakening the standalone discriminatory power of attenuation.[4]

I believe the future of MPE diagnosis lies in the integration of a multiparametric approach, moving beyond reliance on a single parameter. Instead of a crude measure like the mean HU value, more sophisticated models are needed, such as:

1. Advanced Imaging Analysis: Radiomics and texture analysis offer superior potential for distinguishing malignant effusions by capturing their intrinsic heterogeneity, differentiating them from inflammatory effusions, which may have similar attenuation values but are more homogeneous.
2. Liquid Biomarkers and Pathology: Given the known limitations of cytology, methods such as immunohistochemistry (IHC) are crucial for confirming the malignant origin of atypical cells in pericardial fluid and determining their cell lineage.[5]

In conclusion, while the study by İnan et al.[1] has initiated an important discussion, I argue that the use of CT attenuation, in its current state, is premature for routine clinical implementation. Progress in this field will be achieved through multiparametric studies that are prospectively designed, standardized, and integrate radiomics with advanced pathological analyses.

Muhammet Geneş

Department of Cardiology, Sincan Training and Research Hospital, Ankara, Türkiye

Corresponding author:
Muhammet Geneş
✉ muhammedgenes7@gmail.com

Received: July 22, 2025
Accepted: July 30, 2025

Cite this article as: Geneş M. The Incremental Diagnostic Value of Computed Tomography Attenuation in the Differential Diagnosis of Malignant Pericardial Effusion: A Retrospective Observational Study. *Turk Kardiyol Dern Ars.* 2025;53(0):000-000.

DOI: 10.5543/tkda.2025.77427

Conflict of Interest: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study received no financial support.

References

1. İnan D, Demirtola Mammadli Aİ, Gençol Akçay G, Tekin AF, Mammadli A. Incremental Diagnostic Value of Computed Tomography Attenuation in Differentiating Malignant Pericardial Effusion: A Retrospective Observational Study. *Turk Kardiyol Dern Ars*. 2025;53(5):304-311. [CrossRef]
2. Çetin MS, Özcan Çetin EH, Özdemir M, et al. Effectiveness of computed tomography attenuation values in characterization of pericardial effusion. *Anatol J Cardiol*. 2017;17(4):322-327. [CrossRef]
3. Parakh A, Lennartz S, An C, et al. Dual-Energy CT Images: Pearls and Pitfalls. *Radiographics*. 2021;41(1):98-119. [CrossRef]
4. Xing ZC, Guo HZ, Hou ZL, Ziang HX, Zhang S. The value of computed tomography-based radiomics for predicting malignant pleural effusions. *Front Oncol*. 2024;14:1419343. [CrossRef]
5. Dermawan JKT, Policarpio-Nicolas ML. Malignancies in Pleural, Peritoneal, and Pericardial Effusions. *Arch Pathol Lab Med*. 2020;144(9):1086-1091. [CrossRef]