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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 *Archives of Turkish Society 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.

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