

Letter to the Editor

Editöre Mektup

Coronary artery calcium score: Gated or non-gated?

Dear Editor,

I have recently read with great interest the article by Altıntaş et al.^[1] entitled “Assessment of epicardial adipose tissue thickness and total calcium score in sarcoidosis patients”. The authors found that there was no significant difference between groups in the total coronary artery calcium (CAC) score with quantitative values. CAC score plays an important role in cardiovascular risk stratification and shows a significant association with medium- or long-term occurrence of major cardiovascular events. CAC score was initially studied by electron beam computed tomography (CT); however, multidetector CT subsequently became the modality of choice for CAC evaluation. Determination of CAC score by CT is based on axial slices with a thickness of 3 mm, without overlapping or gaps, limited to the cardiac region, acquired prospectively gated with electrocardiogram (ECG) at a predetermined moment in the R-R interval, without the intravenous contrast agent.^[2]

The most common method for quantification of CAC has been introduced by Agatston et al.^[3] In this method, the extent of CAC is calculated by multiplying the area of lesions with a density of ≥ 130 Hounsfield units (HU) with a density factor derived from the maximum density of each lesion (1 for 130–199 HU, 2 for 200–299 HU, 3 for 300–399 HU, and 4 for ≥ 400 HU). The total score is determined by summing up the scores of each lesion. In contrast, CAC can also be detected and semi-quantified on non-gated thorax CT examinations. CAC scoring of non-gated examinations has been shown to correlate well with scores obtained from traditional ECG-gated scans. Ordinal scoring based on semi-quantitative analysis has correlated well with CAD outcomes.^[4]

I would like to learn which method they used, gated or non-gated? The references that are given for the assessment of CAC score are for ECG-gated cardiac CT. However, we know that thorax CT is non-gated and has a different slice thickness from cardiac CT. Is this a discrepancy? Can they explain the method of CAC scoring that they used in detail?

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Author's reply

2009 yılından beri hastanemizde toraks BT 1 mm kalınlığında 0,5 mm aralık bırakılarak EKG bağlanmadan çekilmektedir. Kalsiyum skrolama için kontrastsız BT ise EKG bağımlı 3 mm kalınlığında çekilmektedir. Sarkoidoz ve kontrol grubu hastalarının toraks BT standart kesit kalınlığı 1 mm olup kontrastsız olarak görüntüler elde olunmuştur. Sarkoidoz ve kontrol grubundaki hastalara yeniden tomografi çekip radyasyona maruz bırakılmak üzere yayınlarda da belirtildiği gibi kontrastsız ince kesit toraks BT'ler iş istasyonuna yüklenerek software aracılığıyla otomatik hesaplanmıştır.^[1] Görüntülerin hepsi kalsiyum skrolamada kullanılan Toshiba Aquilion versiyon 4.1 (Otawara, Japan), iş istasyonuna yüklenip 1 mm kesit kalınlığında incelenmiştir. İş istasyonundaki soft-

ware kalsiyum skorlamada 130 HU ve yukarı plakları otomatik olarak işaretlemiş ve skoru hesaplamıştır.^[2] Artefaklı görüntüler çalışmaya alınmamıştır.

Since 2009, thorax computed tomography (CT) in our hospital has been taken without an electrocardiogram (ECG) with a 1-mm thickness, 0.5-mm gap. Unenhanced CT for calcium scoring is performed with ECG-dependent 3-mm thickness. Thoracic CT standard slice thickness of patients with sarcoidosis and that of control groups were 1 mm, and images without contrast were obtained. Instead of rescanning patients in the sarcoidosis and control groups and exposing them to radiation, as stated in publications, noncontrast thin-section thorax CTs were loaded into the workstation and calculated automatically through the software.^[1] All images were loaded into the worksta-

tion Toshiba Aquilion, version 4.1 (Otagawa, Japan), used for calcium scoring and analyzed at 1-mm slice thickness. The software on the workstation automatically marked 130 HU and above plaques in calcium scoring and calculated the score.^[2] Artifactual images were not included in the study.

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