

KORELASI ANTARA *CALCIUM SCORE* PADA KATUP AORTA BERDASARKAN PEMERIKSAAN CT DENGAN KEPARAHAN *AORTIC STENOSIS* BERDASARKAN PEMERIKSAAN *ECHOCARDIOGRAPHY*

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INTISARI

Latar Belakang: *Aortic stenosis* (AS) merupakan penyakit katup jantung tersering yang ditandai oleh kalsifikasi progresif yang membatasi pembukaan katup. Pemeriksaan *echocardiography* masih menjadi baku emas dalam menilai derajat keparahan AS, namun sering ditemukan ketidaksesuaian antarparameter hemodinamik terutama pada kasus *low-flow low-gradient*. *Computed tomography* (CT) jantung menawarkan pendekatan kuantitatif melalui pengukuran *aortic valve calcium score* (AVCS) yang berpotensi berkorelasi dengan derajat keparahan AS.

Metode: Penelitian ini merupakan penelitian analitik observasional dengan desain *cross sectional*. Pengambilan data dilakukan secara retrospektif pada 50 pasien *aortic stenosis* yang menjalani CT jantung non-kontras dan *echocardiography* di RSUP Dr. Sardjito Yogyakarta periode Januari 2021–September 2025. Nilai AVCS dihitung menggunakan metode Agatston, sedangkan derajat AS ditentukan dari parameter *echocardiography*. Analisis korelasi antara AVCS dan parameter *echocardiography* dilakukan dengan uji korelasi Spearman.

Hasil: Median AVCS adalah 3.029,3 Agatston unit (rentang 20,6–7.967,6 AU). Terdapat korelasi negatif sedang antara AVCS dengan *Aortic Valve Area* ($r = -0,478$; $p < 0,001$), serta positif sedang antara AVCS dengan *Vmax* ($r = 0,552$; $p < 0,001$), *Mean Pressure Gradient* ($r = 0,594$; $p < 0,001$), dan derajat keparahan AS ($r = 0,570$; $p < 0,001$). Analisis subkelompok menunjukkan bahwa korelasi antara *calcium score* dan derajat keparahan AS bermakna pada pasien berusia <65 tahun, etiologi degeneratif, serta *left ventricle ejection fraction* (LVEF) normal.

Kesimpulan: Terdapat korelasi yang signifikan dengan arah positif antara nilai *calcium score* katup aorta dengan parameter *echocardiography* terhadap keparahan AS pada CT jantung non-kontras. Pemeriksaan CT jantung non-kontras dengan kuantifikasi *aortic valve calcium score* berpotensi menjadi alat bantu objektif untuk menegaskan derajat keparahan *aortic stenosis*.

Kata kunci: *Aortic stenosis*, *calcium score*, *echocardiography*

CORRELATION BETWEEN AORTIC VALVE CALCIUM SCORE ASSESSED BY CT AND SEVERITY OF AORTIC STENOSIS DETERMINED BY ECHOCARDIOGRAPHY

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ABSTRACT

Background: Aortic stenosis (AS) is the most common heart valve disease characterized by progressive calcification that limits valve opening. Echocardiography remains the gold standard for assessing the severity of AS, but discrepancies between hemodynamic parameters are common, especially in low-flow, low-gradient cases. Cardiac computed tomography (CT) offers a quantitative approach through measuring the aortic valve calcium score (AVCS), which has the potential to correlate with AS severity.

Methods: This is an observational analytical study with a cross-sectional design. Data were collected retrospectively from 50 patients with aortic stenosis who underwent non-contrast cardiac CT and echocardiography at Dr. Sardjito General Hospital, Yogyakarta, from January 2021 to September 2025. The AVCS score was calculated using the Agatston method, while the degree of AS was determined from echocardiographic parameters. Correlation analysis between AVCS and echocardiographic parameters was performed using the Spearman correlation test.

Results: The median AVCS was 3,029.3 Agatston units (range 20.6–7,967.6 AU). There was a moderate negative correlation between AVCS and Aortic Valve Area ($r = -0.478$; $p < 0.001$), and a moderate positive correlation between AVCS and Vmax ($r = 0.552$; $p < 0.001$), Mean Pressure Gradient ($r = 0.594$; $p < 0.001$), and AS severity ($r = 0.570$; $p < 0.001$). Subgroup analysis showed a significant correlation between calcium score and AS severity in patients aged <65 years, with degenerative etiology, and with a normal left ventricular ejection fraction (LVEF).

Conclusion: There was a significant positive correlation between aortic valve calcium score and echocardiographic parameters and AS severity on non-contrast cardiac CT. Non-contrast cardiac CT examination with quantification of aortic valve calcium score has the potential to be an objective tool to confirm the severity of aortic stenosis.

Keywords: Aortic stenosis, calcium score, echocardiography