Bicuspid Aortic Valve and Coronary Artery Stenosis in the Cardiac CT

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A 62-year-old Japanese man with a systolic heart murmur and dyspnea on effort visited our clinic in March 2011. He had not been previously treated for hypertension, diabetes mellitus or dyslipidemia. The cardiac-thoracic ratio was 65% on the chest X-ray. The resting electrocardiography showed the ST-segment depression in leads I, aVL and V 4 to V 6. The transthoracic echocardiography showed a moderate aortic valve stenosis (AS), with a suspected bicuspid aortic valve and 3.8 m/s in trans-aortic peak velocity, with a mild left ventricular hypertrophy. However, the details of the aortic valve morphology were unknown. We performed the 64-slice multi-detector-row cardiac computed tomography (MDCT). We reconstructed the two kinds of the CT images to make the coronary artery image at the diastolic phase and the aortic valve image at the systolic phase during the whole cardiac cycles. The MDCT showed AS with a calcified and bicuspid aortic valve and 25-50% stenosis in the left anterior-descending coronary artery (LAD) (Figs. 1 and 2). The aortic valve area (AVA) estimated by utilizing the MDCT was 1.11 cm². The transesophageal echocardiography (TEE) and coronary angiography (CAG) were performed at the Kumamoto University

Hospital. The TEE confirmed AS with a bicuspid aortic valve (Fig. 3). The AVA estimated by utilizing TEE was 1.01 cm². The CAG showed 25% stenosis in LAD (Figs. 4 and 5). MDCT is widely used to detect both the coronary artery stenosis and plaque burden.¹⁾²⁾ In the present case, the assessment of the aortic valve and the coronary artery stenosis by utilizing MDCT were well-correlated with those by TEE and CAG. The MDCT can simultaneously provide the useful information on both of the aortic valve and the coronary artery.

References

1. Leber AW, Knez A, von Ziegler F, et al. Quantification of obstructive and nonobstructive coronary lesions by 64-slice computed tomography: a comparative study with quantitative coronary angiography and intravascular ultrasound. *J Am Coll Cardiol* 2005;46:147-54.
2. Fayad ZA, Fuster V, Nikolaou K, Becker C. Computed tomography and magnetic resonance imaging for noninvasive coronary angiography and plaque imaging: current and potential future concepts. *Circulation* 2002;106:2026-34.

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Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.