

# Unequal quadricuspid aortic valve stenosis treated with transcatheter aortic valve replacement

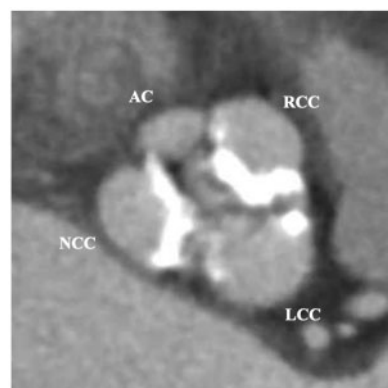
Tomoki Fukui <sup>1\*</sup>, Katsukiyo Kitabayashi<sup>2</sup>, Nobuyuki Ogasawara<sup>1</sup>, and Shinji Hasegawa <sup>1</sup>

<sup>1</sup>Department of Cardiology, Japan Community Healthcare Organization Osaka Hospital, 4-2-78, Fukushima, Fukushima-Ku, Osaka City, Osaka 553-0003, Japan; and <sup>2</sup>Department of Cardiovascular Surgery, Japan Community Healthcare Organization Osaka Hospital, 4-2-78, Fukushima, Fukushima-Ku, Osaka City, Osaka 553-0003, Japan

Received 26 June 2020; first decision 17 July 2020; accepted 12 August 2020; online publish-ahead-of-print 15 September 2020

A 74-year-old woman presented with progressive dyspnoea. Transthoracic echocardiography showed severe aortic stenosis with peak velocity of 4.6 m/s, mean pressure gradient (MPG) of 44 mmHg, and aortic valve area of 0.63 cm<sup>2</sup>, with moderate regurgitation. Multidetector computed tomography revealed quadricuspid aortic valve (QAV) with a small accessory cusp located between the right and non-coronary cusps (Figures 1 and 2 and [Supplementary material online, Figure S1](#)). The calculated EuroSCORE II was 7.1%. However, our heart team determined that she was a suitable candidate for transcatheter aortic valve replacement (TAVR) because of higher bleeding risk with a recent gastrointestinal bleeding. She successfully underwent transfemoral TAVR with a 23-mm Edwards Sapien 3 transcatheter heart valve (Edwards Lifesciences, Irvine, CA, USA). Postoperative aortic MPG decreased to 19 mmHg with mild perivalvular leakage ([Supplementary material online, Figure S2](#)). No cardiac events were noticed during a three-month follow-up with single-antiplatelet therapy.

QAV is a rare congenital heart disease with an incidence of 0.006%, and often associated with aortic regurgitation, whereas stenosis is uncommon.<sup>1</sup> Although TAVR has become a widespread treatment of tricuspid and bicuspid aortic stenosis, few reports of TAVR for stenotic QAV exist.<sup>2,3</sup> Previously reported cases were of relatively equal QAVs. To our knowledge, this is the first report of unequal QAV treated with a balloon-expandable valve. In decision-making for TAVR, the QAV anatomy and possible coexisting congenital abnormalities such as intracardiac shunts, coronary anomalies, aortic dilatation, and other valve disorders should be carefully assessed.<sup>1</sup> Some stenotic QAVs would be suitable for surgery. During TAVR for QAVs, interventional cardiologists should particularly recognize the detailed anatomic relationships among the four cusps and aberrant



**Figure 1** Multidetector computed tomography showing a quadricuspid aortic valve with a small accessory cusp located between the right coronary cusp and the non-coronary cusp. LCC, left coronary cusp.

coronary artery origin to avoid inappropriate transcatheter valve deployment or coronary complications. Regarding our patient, the accessory cusp was too small to affect valve deployment or cause coronary complications. TAVR could be an optimal treatment of stenotic unequal QAV.

## Supplementary material

[Supplementary material](#) is available at *European Heart Journal - Case Reports* online.

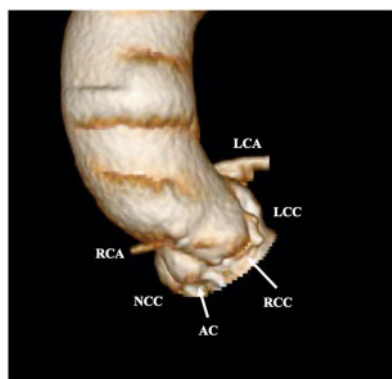
\*Corresponding author. Tel: +81 6 6445 0275, Fax: +81 6 6455 8900, Email: [tomoki.fukui@gmail.com](mailto:tomoki.fukui@gmail.com)

Handling Editor: Luigi Biasco

Peer-reviewers: Rudzinski Piotr Nikodem; Chiara De Biase

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**Figure 2** Three-dimensional reconstruction imaging of computed tomography aortogram showing four separated cusps. Right coronary artery arose from the right coronary cusp. Left coronary artery arose from the left coronary cusp. AC, accessory cusp; NCC, non-coronary cusp.

## Acknowledgements

The authors would like to thank Rt. Toda for technical assistance with the experiments.

**Consent:** The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

**Conflict of interest:** none declared.

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