

Transcarotid transcatheter aortic valve implantation with a novel balloon expandable Myval[®] THV under the local anesthesia

Hüseyin Ayhan^{1,✉}, Bilge Duran Karaduman¹, Telat Keles², Emrah Uğuz³, Emre Boysan⁴, Engin Bozkurt⁵

1. Department of Cardiology, Medicana International Ankara Hospital, Atilim University, Ankara, Turkey; 2. Department of Cardiology, Ankara City Hospital, Ankara Yıldırım Beyazıt University, Ankara, Turkey; 3. Department of Cardiovascular Surgery, Ankara City Hospital, Ankara Yıldırım Beyazıt University, Ankara, Turkey; 4. Department of Cardiovascular Surgery, Medicana International Ankara Hospital, Ankara, Turkey; 5. Department of Cardiology, Medicana International Ankara Hospital, Ankara, Turkey

✉ Correspondence to: huseyinayhan44@yahoo.com

<https://doi.org/10.11909/j.issn.1671-5411.2022.07.006>

Since it was first acquainted to us in 2002, transcatheter aortic valve implantation (TAVI) was rapidly applied and earned worldwide approval. TAVI is the standard of care for patients with symptomatic severe aortic stenosis (AS), at intermediate to high-risk and in some low-risk patients in light of the recent data, principally if it can be performed transfemoral approach.^[1] Although many studies have shown that transfemoral TAVI (TF-TAVI) is better than other alternative approaches in terms of morbidity and mortality, it has been shown that alternative routes, transapical, trans-subclavian-axillary, or transcarotid routes, are used successfully in patients in whom transfemoral access is not possible.^[2,3] We presented transcarotid TAVI (TC-TAVI) with a novel balloon-expandable-Myval transcatheter heart valve (THV) system in patients with a prohibitive abdominal aortic disease, which is the first in the literature.

A 77-year-old female patient with a history of coronary artery bypass grafting presented with exertional dyspnea (New York Heart Association Class III). She referred to our center due to the not suitable for TF-TAVI. Transthoracic echocardiography confirmed severe AS with a mean gradient of 54 mmHg and an aortic valve area 0.57 cm² with 50% left ventricular ejection fraction. Multi-slice computed tomography (MSCT) was revealed bilateral circumferential calcification with 5.5 mm luminal diameter in abdominal aorta below the renal arteries. A heavily

calcified left subclavian artery was noted with stenotic proximal segment, and the proximal of the right subclavian artery was much angulated. The right common carotid artery (CCA) has no critical stenosis, but the left CCA originating from the arcus aorta (bovine arch) is 8.7 mm, and the internal carotid artery (ICA) is occluded (Figure 1). The patient was evaluated with the heart team, and it was decided to perform TAVI as a cut-down from the left CCA since the right carotid is essential for the brain and the left ICA is occluded. Written informed consent was obtained from the patient for the procedure.

Under local anesthesia, right femoral access was achieved following an uneasy crossing through the tight abdominal aorta with a hydrophilic 0.35 guidewire, a pigtail catheter positioned into the aortic arch. Afterward, a 6F sheath was placed to the below carotid bifurcation surgically exposed left CCA using the Seldinger technique. An intravenous bolus of 5000 IU of heparin was given to reach an activated clotting time of 250-300 s. After the 6F AL2 catheter was passed through the aortic valve with a 0.38 flat-tipped guidewire, the Safari stiff guidewire was placed in the left ventricle and the 14Fr Expandable Introducer Sheath was inserted from the CCA to the ascending aorta over Safari wire (Video 1-2, Figure 2). The 23 mm Myval THV system (Meril Life Sciences Pvt. Ltd., Vapi, Gujarat, India) was implanted under rapid ventricular pacing (Video 3). Final aortography revealed mild paravalvular leak, mean

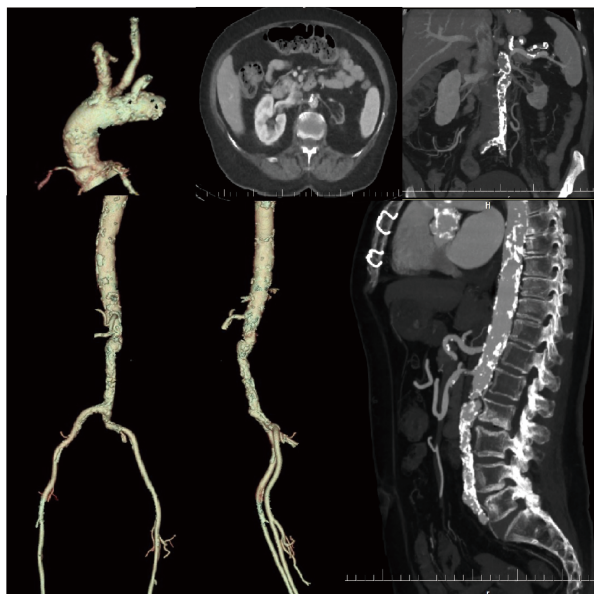


Figure 1 Multi-slice computed tomography and 3D reconstruction demonstrating abdominal aorta heavily calcified, total left internal carotid artery, angulated right subclavian artery and left subclavian artery with critical stenosis.

gradient 11 mmHg and the procedure was finished (Figure 3, Video 4). No neurological, bleeding, vascular, and rhythm complications were observed in the coronary intensive care follow-up after the procedure. The patient was discharged home after 48 h on Clopidogrel 75 mg daily.

Although transapical TAVI was initially performed in some patients, as a result of data from subsequent studies, guidelines preferred TF-TAVI. However, according to the recent literature, 10% to 15% of patients are still inappropriate for transfemoral access, notwithstanding technical improvements in valve

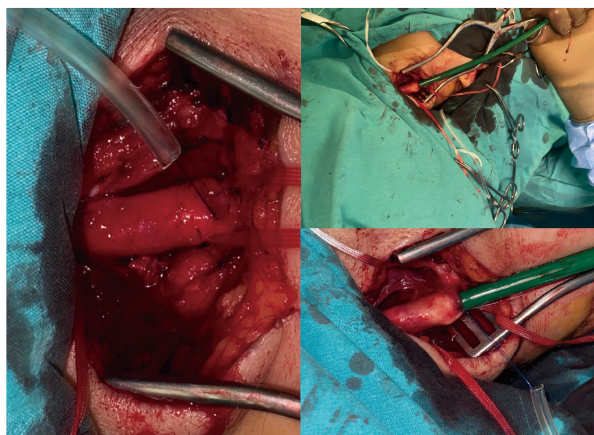


Figure 2 Surgical cut down and left common carotid artery exposed surgically and inserted 14 Fr expandable introducer sheath.

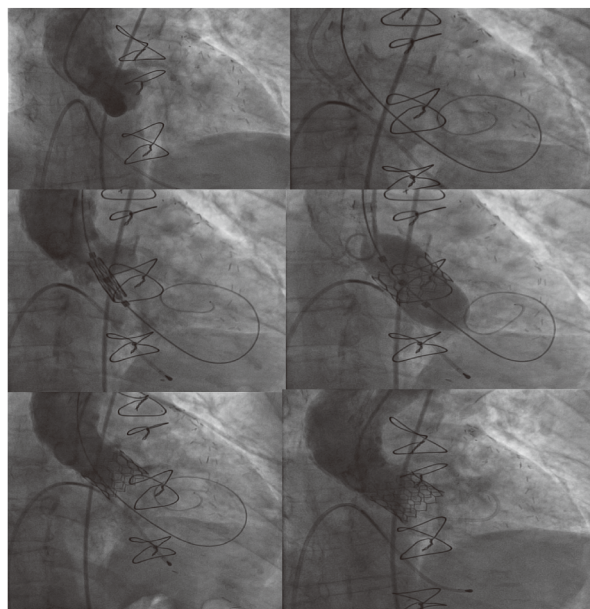


Figure 3 Angiographic image shows implantation of Myval and final aortography after implantation.

introducer size reduction.^[4] In patients with unsuitable femoral routes, trans-subclavian-axillary or trans-carotid rather than transapical and direct aortic access has become more common.^[5] We also had a very good number (3.7%) of trans-subclavian-axillary intervention experiences in our series.^[6] The transcarotid route affords a comparatively direct pathway from the carotid artery to the aortic valve and bypasses the challenges of the aorta-iliofemoral arteries. Previously implanted via carotid artery access, the CoreValve[®] Evolut[™] (Medtronic, Minneapolis, MN, USA) and SAPIEN 3 (Edwards Lifesciences, Irvine, CA, USA) have been validated for non-femoral routes. Some novel THV systems, such as the ACURATE neo[™] aortic valve (Boston Scientific, MA, USA), have been used at the case report level.^[7] Myval[™] THV, which has not yet been performed to TC-TAVI in the literature, is a novel, balloon-expandable TAVI device with innovations that promote proper positioning of the bioprosthetic valve and pleasant procedural and clinical consequences. The first trans-axillary artery route experience with Myval implantation in Turkey was also performed by us.^[8] As we have shown in this case, using multimodality imaging and good preparation before the procedure, during the procedure anesthetist, cardiovascular surgeon, and interventional cardiologist can successfully conclude the procedure with coordination.

In conclusion, we present the first successful implantation of Myval THV under local anesthesia with no short-term complications via carotid artery access.

REFERENCES

- [1] Vahanian A, Beyersdorf F, Praz F, *et al*; ESC/EACTS Scientific Document Group. 2021 ESC/EACTS Guidelines for the management of valvular heart disease. *Eur Heart J* 2021; ehab395.
- [2] Li X, Kong M, Jiang D, Dong A. Comparison 30-day clinical complications between transfemoral versus transapical aortic valve replacement for aortic stenosis: a meta-analysis review. *J Cardiothorac Surg* 2013; 8: 168.
- [3] Auffret V, Lefevre T, Van Belle E, *et al*; FRANCE TAVI Investigators. Temporal trends in transcatheter aortic valve replacement in France: FRANCE 2 to FRANCE TAVI. *J Am Coll Cardiol* 2017; 70: 42–55.
- [4] Overtchouk P, Modine T. Alternate access for TAVI: stay clear of the chest. *Interv Cardiol Rev* 2018; 13: 145–150.
- [5] Sharma SP, Chaudhary R, Ghuneim A, *et al*. Carotid access for transcatheter aortic valve replacement: A meta-analysis. *Catheter Cardiovasc Interv* 2021; 97: 723–733.
- [6] Duran Karaduman B, Ayhan H, Keleş T, Bozkurt E. Evaluation of procedural and clinical outcomes of transcatheter aortic valve implantation: A single-center experience. *Anatol J Cardiol* 2020; 23: 288–296.
- [7] Aludaat C, Canville A, Landolff Q, *et al*. ACURATE neo™ aortic valve implantation via carotid artery access: first case report. *J Cardiothorac Surg* 2021; 16: 160.
- [8] Keleş T, Özcan Çelebi Ö, Uğuz E, *et al*. Transcatheter aortic valve implantation via the left axillary artery route in a patient with a permanent pacemaker: the first transaxillary artery route experience with a Meril's Myval™ transaortic valve in Turkey. *Anatol J Cardiol* 2021; 25: 517–519.

Please cite this article as: Ayhan H, Karaduman B D, Keleş T, Uğuz E, Boysan E, Bozkurt E. Transcarotid transcatheter aortic valve implantation with a novel balloon expandable Myval® THV under the local anesthesia. *J Geriatr Cardiol* 2022; 19(7): 562–564. DOI: 10.11909/j.issn.1671-5411.2022.07.006

