

## Case Report

# “Ménage à Trois”: Use of 2 Supplemental Buddy Wires During TAVI

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### ABSTRACT

We herein present clinical images illustrating a transcatheter aortic valve implantation within an extremely calcified aortic valve, which posed considerable difficulty in crossing the aortic annulus. To gain maximum support, we used 2 buddy wires to allow a balloon predilatation and then a successful crossing of the transcatheter heart valve. This technique provides additional support for those performing this procedure and may be included in the armamentarium of transcatheter aortic valve specialists.

### RÉSUMÉ

Nous présentons ici des images cliniques illustrant un remplacement valvulaire aortique percutané au sein d'une valve aortique native extrêmement calcifiée, ce qui rendait très difficile la traversée de l'anneau aortique. Pour obtenir un soutien maximal, nous avons utilisé 2 fils-guides pour permettre une prédilatation par ballonnet, puis un passage réussi de la valve percutanée. Cette technique apporte un soutien supplémentaire à ceux qui pratiquent cette intervention et peut être ajoutée à l'arsenal thérapeutique des spécialistes de l'implantation de valves aortiques percutanées.

An 87-year-old man was referred to our institution with severe symptomatic aortic stenosis. His past medical history was significant for stable coronary artery disease, peripheral arterial disease, hypertension, and a prior transient ischemic attack. Transthoracic echocardiography revealed severe degenerative and extremely calcified aortic stenosis, with an area of 0.5 cm<sup>2</sup> and a mean aortic gradient of 49 mm Hg. The left ventricular ejection fraction was normal. His chest computed tomography showed an annulus aortic area of 504 mm<sup>2</sup> (Fig. 1A), with an aortic valve calcification score of 8450 using the Agatston method. Following the heart team evaluation, transcatheter aortic valve implantation (TAVI) was proposed as the best treatment option (Fig. 1, B and C). Considering the significant calcification and the local experience with balloon expandable valves, the heart team elected to implant a SAPIEN 3 Ultra (Edwards Lifesciences Inc., Irvine, CA). The procedure was performed under conscious sedation, using fluoroscopic guidance, via the right femoral artery. The right radial artery was used as a secondary access. The aortic valve was first crossed with an Argon 0.035” straight guide wire

(Argon Medical Devices Inc., Athens, TX), which was then exchanged for a 260-cm Confida Brecker Curve 0.0035” guide wire (Medtronic, Minneapolis, MN). Given the annulus calcifications, an aortic valve predilatation was not performed, as this creates a high risk of inducing a cerebrovascular accident. However, despite several attempts, a single Confida wire did not provide enough support to cross the aortic valve with a 26-mm SAPIEN 3 Ultra balloon expandable valve. The problem seemed to be a combination of a severely calcified valve and the somewhat horizontal orientation of the guidewire in the left ventricle. Because we could not retrieve the transcatheter heart valve, we opted for a bailout technique. We thus used the radial introducer sheath to position a second Confida Brecker Curve 0.0035” guide wire within the left ventricular cavity. Unfortunately, this “buddy wire” technique was still not sufficient to forcefully push the transcatheter heart valve across the valve. We therefore punctured the left common femoral artery, placed a 14-F introducer, and positioned a third Confida Brecker Curve 0.0035” guide wire within the left ventricle (Fig. 1D). Using the 2 buddy wires, after an aortic valvuloplasty with a 23-mm Z-Med balloon (NuMED, Inc.Hopkinton, NY) (Fig. 1E), the 26-mm Edwards finally crossed the aortic annulus (Video 1 , view video online). After the valve was correctly positioned, the 2 buddy wires were withdrawn and the prosthesis was deployed with a good final result (Fig. 1F). Only mild paravalvular regurgitation was seen on transthoracic echocardiography performed immediately after deployment and the day after the procedure.

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**Ethics Statement:** Informed consent was obtained from the patient.

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See page 1404 for disclosure information.

**Novel Teaching Point**

- The use of by 2 buddy wires during TAVI provides additional support in extremely calcified and narrowed aortic valves.

In numerous studies, TAVI without predilation has been shown to be safe and effective. Indeed, no predilation is associated with fewer pacemaker requirements, less early safety endpoints, and fewer vascular complications.<sup>1</sup> The main potential pitfall of this approach is that the native aortic valve cannot be crossed with the bulky transcatheter heart valve. This case illustrates how the double-buddy wire technique provides additional support in performing this procedure in an extremely calcified and narrowed aortic valve. The utilization of the buddy-wire technique during TAVI has already been described,<sup>2,3</sup> along with the buddy balloon alternative.<sup>4</sup> Nonetheless, to our knowledge, this case is the first to describe

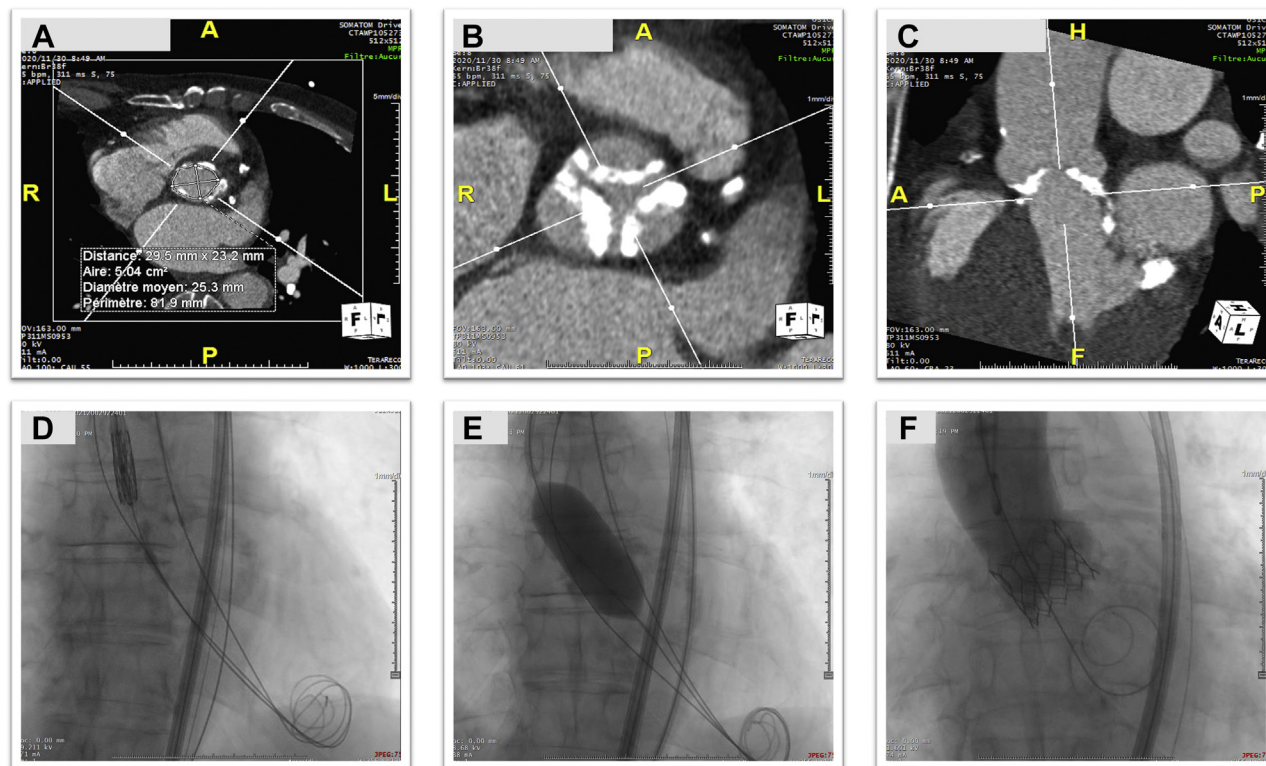
the utilization of a third wire. This technique seems to provide additional support and may be included in the armamentarium of TAVI specialists faced with the difficulties involved in placing a transcatheter heart valve across a calcified stenotic valve.

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**Figure 1.** Native aortic valve visualization and procedure presentation: (A) aortic annulus measurements; (B) massive aortic calcifications in transverse view; (C) massive aortic calcifications in sagittal view; (D) 3 wires positioned into the left ventricle; (E) predilation of the native aortic valve using a 23-mm balloon; and (F) position of the prosthesis after deployment.

## References

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## Supplementary Material

To access the supplementary material accompanying this article, visit *CJC Open* at <https://www.cjcopen.ca/> and at <https://doi.org/10.1016/j.cjco.2021.06.016>.