Antegrade approach to cross a native aortic valve

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Transcatheter aortic valve implantation (TAVI) has become a well-established treatment for patients with high and intermediate surgical risk symptomatic severe aortic stenosis (AS)\(^1\,^2\). With the widening of the indications for TAVI, the incidence of bicuspid valve in the TAVI cohort is now increasing\(^3\). Sometimes we encounter difficulty in crossing a bicuspid aortic valve, due to its anomalous anatomy, severe calcification, and enlarged ascending aorta. It is important to have a bail-out solution for cases where there is difficulty in crossing a native aortic valve in order to accomplish transfemoral TAVI successfully.

In this issue of AsiaIntervention, Tay et al report a novel technique for crossing a Sievers type 0 bicuspid stenotic aortic valve\(^4\). Multiple attempts were performed with various catheters and wires; however, it remained difficult to cross the aortic valve. Therefore, the authors performed a transseptal puncture and guided the wire and the catheter to the left ventricle, crossing the aortic valve to the aorta via the antegrade approach. After externalisation of the wire to the sheath in the femoral artery, the valve was finally implanted via the retrograde transfemoral approach.

The antegrade approach has been used for percutaneous mitral commissurotomy\(^5\) since 1982 using the Inoue Balloon™ (Toray Industries, Inc., Tokyo, Japan), and is also predominantly used in antegrade balloon aortic valvuloplasty in Japan\(^6\). Furthermore, this approach was also used in the first TAVI case\(^7\) by Cribier et al. Therefore, using this approach it is easy to cross a stenotic calcified aortic valve and natural to use it for TAVI. This antegrade transseptal approach is also used for some mitral procedures such as percutaneous mitral valve repair (MitraClip™ [Abbott Vascular, Santa Clara, CA, USA], etc.)\(^8\), and for left appendage closure devices\(^9\). Therefore, in the current era, it is of the utmost importance for interventional cardiologists to learn this technique for the future development of this field.

Despite the advent of smaller-profile sheaths in the current era, the transfemoral approach still has some limitations, namely difficulty in crossing a severely calcified aortic valve, and the potential to cause vascular complications\(^10\). The TAVI devices currently available cannot be used via the antegrade approach, because they are designed only for the retrograde transfemoral approach and the rigidity of the devices hinders their antegrade use. To solve the current limitations of the transfemoral approach, TAVI devices more compatible with the antegrade approach, with softer, more flexible, and lower profiles, may be developed in future. This case report has not only provided us...
with a useful bail-out technique that we should keep in our toolbox, but has also given us a glimpse into the future in terms of the development of ideal TAVI devices.

References


