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Rescue valve-in-valve implantations in second generation transapical transcatheter aortic valve prostheses*

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Transcatheter aortic valve implantation (T-AVI) has emerged as a standardized routine procedure to treat elderly high-risk patients suffering from severe aortic valve stenosis and the number of worldwide implantations is increasing [1–3]. The two mostly common used approaches are transapical (TA) [4] and transfemoral (TF) [5] using the Edwards SAPIEN (XT)™ and the Medtronic CoreValve® prostheses. Meanwhile several "second generation" T-AVI prostheses have entered the market either for TA or TF approach. Two CE-mark approved TA devices are the Symetis ACURATE TA™ and the JenaValve™. Both are porcine valves on a self-expandable nitinol stent with unique stepwise implantation features [6, 7].

After gaining more experience with T-AVI in native stenotic valves, the idea of implanting a T-AVI prosthesis in degenerated xenografts has been developed and also emerged to an alternative treatment option [8–14]. Furthermore, immediately valve-in-valve implantation of a second T-AVI prosthesis in a failed T-AVI prosthesis has turned out to be a rescue option to avoid sternotomy and conversion to conventional aortic valve replacement [15].

Our case report describes the first valve-in-valve implantations of an Edwards SAPIEN XT™ prosthesis in second generation T-AVI prostheses using the TA approach [16]. In both cases a severe aortic regurgitation > 2+ indicated immediate treatment. Re-ballooning did not reduce the regurgitation and the decision for rescue valve-in-valve implantation was made. Both procedures could be performed successfully without any complications. Both patients were alive at 1-year follow up with NYHA functional class I and echocardiography showed excellent hemodynamic function of the prostheses (mean gradients ≤ 10 mmHg).

In summary, valve-in-valve implantation of a SAPIEN (XT)™ prosthesis inside an ACURATE TA™ or a JenaValve™ prosthesis seems to be an adequate rescue option for severe aortic regurgitation after implantation of these second generation T-AVI prostheses.

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Comment by Dominique Himbert, MD, Bichat Hospital, Paris, France

This letter reports 2 complicated transapical TAVI cases using new-generation self-expanding prostheses. In both cases, malpositioning of the prosthesis caused severe paraprosthetic aortic regurgitation, requiring a rescue valve-in-valve implantation using a SAPIEN transcatheter valve, with a good final result and a favorable one-year outcome. This report may invite 2 comments.

1.) Second-generation prostheses have been specifically designed to be anatomically oriented, in order to facilitate their positioning and avoid paravalvular leaks. The objective was not fulfilled here, which underlines the imperative necessity

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for a careful and continued evaluation of these new devices before generalizing their utilization in routine clinical practice. More generally, most of the recent international Cardiology meetings and congresses have been marked by the presentation of a large number of novel transcatheter valves, supposed to offer substantial advantages over the currently commercialized SAPIEN and CoreValve prostheses. This traduces the vitality of research and technological innovation in this field, which of course is great and should be encouraged. However, one should keep in mind the priceless favor done by the SAPIEN and the CoreValve prostheses in more than 100,000 patients during the last decade, and that new devices have yet to prove themselves.

2.) One may be surprised by the fact that several of these new devices (including both of those used in the present report) have been designed for transapical implantation. Indeed, a major objective for the future will be to decrease the invasiveness of TAVI, which will suppose an expanded use of the transfemoral approach. Today, about 70% to 80% of potential candidates are suitable for a transfemoral access using 18 Fr sheaths. With the arrival of 14/16 Fr (perhaps 12 Fr?) sheaths, one may estimate than more than 90% of TAVI candidates could be treated transfemorally. Thus, most research efforts should be concentrated on offering a non-invasive, pure percutaneous approach to the largest number of high-risk patients with severe aortic stenosis.

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