Transcatheter aortic valve implantation (TAVI) is an emerging technology used to treat high-risk patients with severe aortic stenosis. During TAVI with the CoreValve ReValving System, a balloon is used for the reduction of paravalvular regurgitation. However, in this paper, we describe the “balloon withdrawal” technique through which the positioning of a second valve can be avoided in case of initial malpositioning. The result of the technique was rather encouraging, which the positioning of a second valve can be avoided in case of initial malpositioning. The balloon withdrawal technique is derived from two bioprostheses — one balloon-expandable (SAPIEN; Edwards Lifesciences, Inc) and one self-expandable (CoreValve; Medtronic, Inc). Bioprosthetic devices are mainly introduced through a femoral artery, converting TAVI into a truly percutaneous procedure. During TAVI with the CoreValve ReValving System, the balloon may be used for the reduction of paravalvular leak. However, in this paper, we describe a technique of “balloon withdrawal” through which we can avoid using a second valve in case of initial low positioning of the first valve.

Discussion
TAVI is an innovative technique to treat high-risk patients with degenerative severe aortic valve stenosis. Therefore, proper valve positioning is rather crucial in order to avoid moderate or severe paravalvular leak. The balloon withdrawal technique arose because TAVI is a laborious procedure that can be accompanied by a variety of complications. Despite all the precautions, malpositioning of the bioprosthesis may occur and has consequences for the patient. Identification of optimal placement and application of repositioning techniques for prostheses with unacceptable functionality have been described. Implantation of a second valve within the first, application of withdrawal force with a “snare,” or “removal and re-insertion” of a semi-deployed prosthesis have been proposed. To the best of our knowledge, this is the first time that the balloon withdrawal technique has been reported. We believe that improvement of valve functionality was achieved due to (1) modification of the prosthesis orientation; (2) withdrawal of the prosthesis (by a few millimeters); and (3) better expansion of the CoreValve frame by balloon inflation. However, we emphasize the fact that the operator should be cautious during the application of the withdrawal force, which should be constant but gentle. Friction caused by tortuosity and/or calcification of the arterial tree must be
taken into consideration and not mislead the operator. It is clear that an extreme withdrawal force could potentially result in dreadful complications. Moreover, simultaneous fluoroscopy is crucial to ensure the interventionalist has full control of the whole procedure. However, since the devices used for TAVI are not designed to be repositioned, we believe that such manipulations are not always feasible and should only be used as bail-out techniques. Therefore, the balloon withdrawal technique might be a useful alternative to correct prosthesis malposition and treat paravalvular aortic regurgitation during TAVI.

References


