An Exceptional Case of Frame Underexpansion With a Self-Expandable Transcatheter Heart Valve Despite Predilation

Jan-Malte Sinning, MD, Mariuca Vasa-Nicotera, MD, Alexander Ghanem, MD, Eberhard Grube, MD, Georg Nickenig, MD, Nikos Werner, MD

Bonn, Germany

An 86-year-old female patient with symptomatic, severe aortic stenosis at high surgical risk was referred for transcatheter aortic valve implantation. After balloon valvuloplasty (BAV) with a 22-mm Nucleus balloon valvuloplasty catheter (NuMED, Baylis Medical, Montreal, Quebec, Canada), we implanted a self-expandable CoreValve 29-mm bioprosthesis (Medtronic, Minneapolis, Minne-
sota). After final release of the prosthesis, we encountered severe paravalvular aortic regurgitation (AR), a remaining gradient of 15 mm Hg, and determined a highly pathological AR index (1) with pressure equalization between the aorta and left ventricle (AR index = 5.0) (Fig. 1A), although the valve was deployed with proper implantation depth. However, we noticed an atypical vertical line in the form of the CoreValve prosthesis suggesting that the stent frame had not expanded properly (Fig. 1B). In orthogonal fluoroscopy of the CoreValve prosthesis (right anterior oblique: 82°, cranial: 40°), a severe underexpansion of the prosthesis with inversion of the stent frame (Fig. 1C) as reason for the suboptimal implantation result became obvious (Online Videos 1 and 2). By post-dilation with a 28-mm balloon, we managed to properly expand the CoreValve frame and to unbend the inversion (Online Video 3). After this countermeasure, the AR Index increased considerably to 33.7 (Fig. 1D), the prosthesis frame expanded properly (Fig. 1E), the inflow tract was finally round shaped (Fig. 1F), and only mild paravalvular AR was found in the final angiogram (Online Videos 4 and 5).

In rare cases, an inversion of the stent frame might be the reason for severe paravalvular leakage after deployment of self-expanding transcatheter heart valves—despite predilation with BAV—and might be resolved by post-dilation.

Reprint requests and correspondence: Dr. Jan-Malte Sinning, Medizinische Klinik und Poliklinik II, Universitätsklinikum Bonn, Rheinische Friedrich-Wilhelms-Universität Bonn, Sigmund-Freud-Straße 25, 53105 Bonn, Germany. E-mail: jan-malte.sinning@ukb.uni-bonn.de.

REFERENCE