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IMAGES IN CARDIOVASCULAR INTERVENTION

The brand-new Inoue balloon for retrograde approach: first experience in Japan

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In transcatheter aortic valve implantation (TAVI), balloon aortic valvuloplasty (BAV) is generally performed before the deployment of the transcatheter heart valve (THV). However, there are several concerns about retrograde BAV: ventricular fibrillation and hemodynamic collapse induced by rapid ventricular pacing (RVP) [1, 2], vascular or ventricular injury by a slipped balloon, and requirement of multiple balloons for multiple targeted diameters. We utilized the newly invented Inoue balloon (Toray, Chuo-ku, Japan) for retrograde BAV (Fig. 1a).

An 85-year-old female with calcified aortic stenosis was admitted to our hospital due to heart failure. Considering high age, frailty and reduced cardiac function (ejection fraction 30%), we decided to perform transfemoral TAVI using the new Inoue balloon. We performed retrograde BAV using a 20-mm Inoue balloon without RVP (Fig. 1c, d; Supplementary Movie 1). The aortic valve was optimally expanded by a single inflation, and blood pressure recovered within 3 s (Fig. 1b). We smoothly delivered a 29-mm CoreValve Evolut R (Medtronic, Minneapolis, MN, USA), and deployed it at the appropriate position (Fig. 1e).

Retrograde BAV is an established procedure before the deployment of THV. Compared with the conventional Inoue balloon used in antegrade BAV, the new one has longer and thinner shaft, which is compatible for a 0.035-in. guidewire, and the tip of balloon is in elliptical shape matched for stiff-guidewire and calcified valve. The brand-new Inoue balloon has various advantages including no need for RVP, stable fixation, and multi-stage dilatation. The new Inoue balloon should be an excellent device for retrograde BAV.

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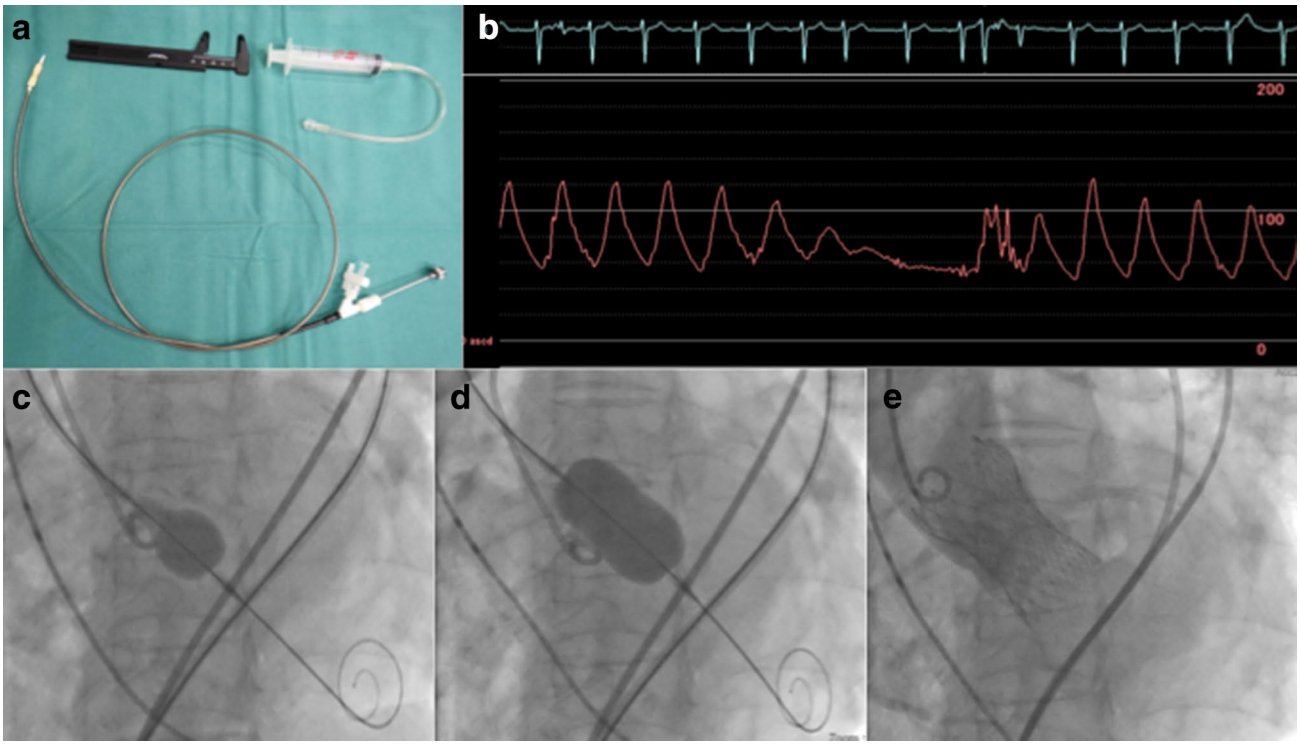

Fig. 1 The new Inoue balloon for retrograde approach. **a** Inoue balloon and accessories (caliper and syringe). **b** Aortic pressure during Inoue balloon inflation. The pressure recovered to the baseline level 3 s after inflation. **c** Inflated proximal portion of the Inoue balloon. **d** Fully inflated Inoue balloon. **e** Aortography following deployment of the prosthetic valve

Compliance with ethical standards

Conflict of interest Dr. Tobaru is the proctor for Edwards Lifesciences and Medtronic. The other authors have no potential conflict of interest relevant to this article.

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