1034 A case of challenging percutaneous coronary intervention following surgical placement of sutureless aortic bioprosthesis

Introduction:

Coronary artery disease (CAD) is often present with aortic stenosis (AS). Hybrid strategy, which is combination of percutaneous coronary intervention (PCI) and transcatheter aortic valve implantation (TAVI) or minimally invasive surgical aortic valve replacement using sutureless valve (sutureless AVR), can be alternative to traditional surgical method. Several clinical reports disclosed some technical difficulties of PCI after TAVI, and many challenging techniques and evidences were already accumulated. However, technical feasibility and safety of PCI following sutureless AVR still remain unclear, because of fewer experiences than those following TAVI. Perceval valve (LivaNova, London, UK) is a sutureless bioprosthesis with self-expanding open-cell designed nitinol frame. Despite a supra-annular design of the valve, the access to the coronary ostia through the nitinol frame is easier than that after TAVI, due to its unique frame design. However, only a few cases are reported regarding PCI following Perceval implantation. Hereby, we report a challenging case of subsequent PCI to Perceval implantation.

Case:

A 71-year-old man, who had a previous history of PCI to right coronary artery (RCA) with a bare metal stent, was referred to our hospital for treatment of a symptomatic severe AS (aortic valve area: 0.61cm2, peak aortic velocity: 4.0m/sec, mean pressure gradient: 31mmHg) with preserved ejection fraction (left-ventricular ejection fraction: 52%, stroke volume index: 36ml/m2). As a result of several examinations, we concluded that he met a class IIa indication for AVR for stage D4 severe AS. Preoperative coronary angiography demonstrated 75% in-stent restenosis (ISR) and 90% de novo stenosis in proximal RCA. Predicted operative mortality for AVR and coronary artery bypass grafting was 3.04% in Euro SCORE, and 8.49% in STS. After the discussion with heart team, the decision was made to proceed with isolated sutureless AVR (with a Perceval valve) followed by PCI to the RCA.

Sutureless AVR with an M-size Perceval valve was successfully undergone without any complications. Seven weeks later, staged PCI to the RCA was conducted with 6Fr. system via transradial approach. However, any conventional RCA - dedicated guiding catheter (GC) was not successfully inserted to the RCA ostium. It was supposed that the ostium of RCA was jailed by the stent strut of the Perceval valve. We finally concluded that it seemed impossible to engage the GC with conventional catheterization technique. Therefore, we tried to engage a relatively low-profiled 4Fr. JR4.0 diagnostic catheter. Finally, the 4Fr. JR4.0 diagnostic catheter was partially engaged. A 0.014inch guidewire (GW), SION (Asahi Intecc., Aichi, Japan) was advanced into the RCA through the proximal stenosis, with back-up support of a Mizuki microcatheter (Kaneka Medix Corp., Osaka Japan). The SION was exchanged to a support type GW, Grand Slam 300cm (Asahi Intecc., Aichi, Japan), that provided us relatively strong back-up force than conventional 0.014inch GWs. The JR 4.0 diagnostic catheter and the Mizuki were retrieved and a 6-Fr. Heartrail JR4.0 GC (Terumo, Tokyo, Japan) was inserted instead. To fill a huge size gap between the 0.014inch GW and the 6Fr. GC, a 5Fr. 120cm inner-sheath (Medikit, Tokyo, Japan) and a 2.6Fr. Corsair Pro 150cm microcatheter (Asahi Intecc., Aichi, Japan) was coaxially inserted followed by the 0.014inch Grand Slam GW. The system seemed like a “Mother-and-Child” system (In this procedure, we needed an additional “Grandchild” microcatheter.). Finally, due to the strong back-up force provided by the 0.014inch Grand Slam GW and gradually tapered “Mother (the 6Fr. GC), Child (the 5Fr. inner-sheath) and Grandchild (the 2.6Fr. Corsair pro microcatheter)” system, we were able to engage the 6Fr. GC into

the jailed RCA. An intravascular ultrasound (IVUS) and fluoroscopic image showed that the RCA ostium was jailed partially by the Perceval strut. The stenotic lesion and Percival strut were dilated with 2.5x15mm scoring and 3.0x12mm non-compliant balloons. The ISR lesion was treated with a drug coating balloon (SeQuent Please 2.75-26mm, NIPRO, Osaka, Japan). A 3.0mm drug eluting stent (Resolute Onyx 3.0-30mm, Medtronic, Minneapolis, MN, USA) was implanted to the RCA ostium, beyond the Perceval strut. Post dilatation with a 3.5mm non-compliant balloon was performed at last. Final angiography and IVUS findings showed perfect treatment of the lesions.

Conclusion:
Subsequent PCI to sutureless AVR may be feasible, but not always easy. The accumulation of experiences in “challenging procedure and technique” may be urgent needs in latest clinical settings.