

Aortic Valve Replacement Using Sutureless Valve in Severe Aortic Stenosis

Sak Lee, MD, PhD

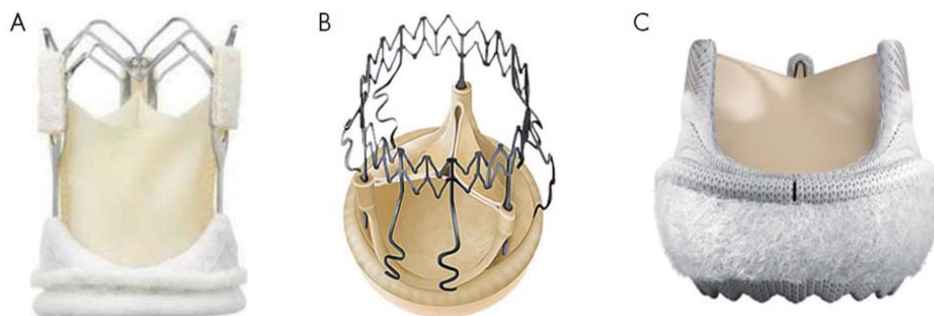
Department of Thoracic and Cardiovascular Surgery

Yonsei University College of Medicine, Seoul, Korea

The incidence of aortic stenosis is growing, a reflection of the rapid aging of the population, and is the most frequent cardiac valve pathology in the western world for individuals over the age of 75 years. Therefore, there is an increasing number of elderly patients who require aortic valve intervention who present with higher risk factors. Conventional open surgical AVR (C-AVR) is the gold standard for treatment of symptomatic severe AS, however the emergence of patients with higher risk factor profiles has driven the development of alternative less invasive techniques such as percutaneous transcatheter aortic valve implantation (TAVI) or sutureless AVR (Su-AVR).

Sutureless and rapid deployment aortic valves are biological, pericardial prostheses that anchor within the aortic annulus with no more than three sutures. Although the concept for su-AVR was first introduced approximately 50 years ago, it has been developed in the last few years based on modern experience with TAVI.

There are three commercially available prostheses, including 3F Enable (Medtronic) (A), Perceval S (Liva Nova) (B), and Intuity Elite (Edwards Lifesciences) (C) (Figure). 3F Enable and Perceval S prostheses are self-expandable devices that deploy and position the valve with no or only one guiding suture. Intuity Elite prosthesis is based on a balloon-expandable stainless steel and cloth-covered frame which is implanted with the aid of a balloon catheter delivery system and requires three guiding sutures on the aortic annulus.



The advantages of Su-AVR combine those of conventional AVR and the facility of TAVI, and includes: complete excision of the diseased valve, reduction in cross-clamp and CPB time, facilitates minimally invasive surgery, atraumatic introduction with minimal or no crimping of the valve leaflets allowing more predictable long-term durability, excellent hemodynamic outcomes (lower PVL than TAVI, and lower PPM than C-AVR). Therefore, patients who are of high risk for complications with severe calcification around their native valve or requiring a small valve prosthesis are particularly likely to benefit from Su-AVR. It is also beneficial in patients undergoing AVR in combination with other complex cardiac surgery such as CABG as it reduces the already prolonged length of ACC and CPB time.