

Totally Endoscopic Aortic Valve Replacement With The Dafodil™ Bioprosthesis

Fotios Mitropoulos, Michail D. Tsimpinos, Christos Apostolides, konstantinos Koukovinos, Ilias Skaltsiotis, Argyris Krommydas.
Mitera General Hospital, Maroussi, Greece.

BACKGROUND: The expansion of transcatheter aortic valve replacement (TAVR) into lower-risk and younger populations has renewed interest in durable, less invasive surgical alternatives. Current guidelines continue to favor surgical aortic valve replacement (SAVR) for low-risk patients, particularly those under 65 years. Totally endoscopic SAVR with a bioprosthesis with favorable hemodynamics might be an alternative to TAVI as well as conventional SAVR. We report our 5-year single center experience with endoscopic SAVR (endo- SAVR) with the use of the Dafodil™ pericardial bioprosthesis. Between 2020 and 2025, 245 patients underwent SAVR of which 99 were totally endoscopic.

METHODS: We report a 5-year single-center experience with minimally invasive and totally endoscopic SAVR, on outcomes with the Dafodil™ pericardial bioprosthesis. Between 2020 and 2025, 245 patients underwent SAVR, including 99 totally endoscopic and 146 mini-sternotomy procedures. Mean age was 71.5 years and 69% were male. Cardiopulmonary bypass was established by right femoral vessels. Access to the right hemithorax was through the 3rd intercostal space via an overlying 4-5cm skin incision bilateral to the midclavicular line. Perioperative outcomes, postoperative recovery, and intermediate term valve performance were analyzed.

RESULTS: Overall operative mortality was 1.5 %, with a permanent pacemaker implantation rate of 1% and no significant paravalvular leak. Mean cardiopulmonary bypass time was 145 minutes, ICU stay 2 days, and hospital stay 5 days. Transfusion rates were 42%. Totally endoscopic AVR demonstrated excellent postoperative recovery and superior cosmetic results. Hemodynamic assessment showed favorable effective orifice areas and low transvalvular gradients. (Pressure gradient 11.37mmHg and effective area 1.72 cm²). Sustained improvement in NYHA functional class was observed up to 5 years. No cases of structural or non-structural valve deterioration, valve thrombosis, or myocardial infarction were identified during follow-up.

CONCLUSIONS: Totally endoscopic SAVR using the Dafodil™ bioprosthesis is safe, reproducible, and associated with excellent clinical and hemodynamic outcomes. This approach represents a compelling surgical alternative to TAVR for selected low-risk and younger patients, addressing limitations related to durability, paravalvular leak, and pacemaker dependency. The intermediate term results are encouraging, while long term results are needed.

