

Sutureless Aortic Valve Replacement In High-risk Concomitant Bypass And Valvular Surgery

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Objectives

Sutureless Aortic Valve Replacement (SU-AVR) has become an alternative to the standard one. We aimed to: evaluate our experience with this valve in isolated high risk patients and when concomitant with other surgical cardiac procedure(s)

Introduction

Despite recent innovations in transcatheter valve technology, surgical aortic valve replacement (AVR) remains the standard therapy for valve replacement. AVR is usually performed by means of sutured mechanical or tissue valves, but usefulness of the sutureless and rapid-deployment prostheses in various settings as high risk and complicated cases has been reported (1).

Nowadays, sutureless aortic valve (SU-AVR) is a good substitute for standard aortic valve replacement (AVR) in high-risk and complicated surgical patients as it shortens the operation time and simplifies the surgical procedure (2,3). However, the presence of additional valvular pathology, primarily the mitral valve, considered as an unfavorable approach for sutureless AVR, as there is a chance of interference between the two valves at the aorto-mitral continuity level (4). Moreover, in the setting of bicuspid aortic valve (BAV) and quadricuspid aortic valve, these advantageous are less clear.

There are few studies that demonstrate the feasibility and safety of SU-AVR with concomitant valvular and CABG patients (5). Furthermore, some studies suggest that SU-AVR may increase the risk of paravalvular regurgitation and/or possible dislocation associated to Bicuspid/ quadricuspid aortic root asymmetry, despite other reports showing positive clinical outcomes (6-8).

Our early experience with the Perceval SU-AVR with Bicuspid/ quadricuspid aortic valve and with concomitant valvular surgery, with or without bypass surgery will be reviewed to evaluate the feasibility and outcome of suturless aortic valve replacement in such patients.

Methods

Retrospective inclusion and analysis of all isolated high- risk patients underwent SU AVR and when concomitant with other valvular and/or CABG done in our SBCC center, From February 2013 to December 2023. Isolated simple low risk SU-AVR cases were excluded. The primary outcome will be 30-day mortality. The secondary outcomes will be early peri operative complications, Hospital stay and 30d surgical re-admission. Intra-operative tips and tricks with a focus on the risk of paravalvular leak associated with native abnormal anatomy (Bicuspid-BAV/ quadricuspid aortic valve-QAV) and with concomitant other valve surgery causing root asymmetry – Fig. 1 and 2. ,Tab. 1 and 2 , Scan QRcode for OP tips and tricks of SU-AVR in QAV.

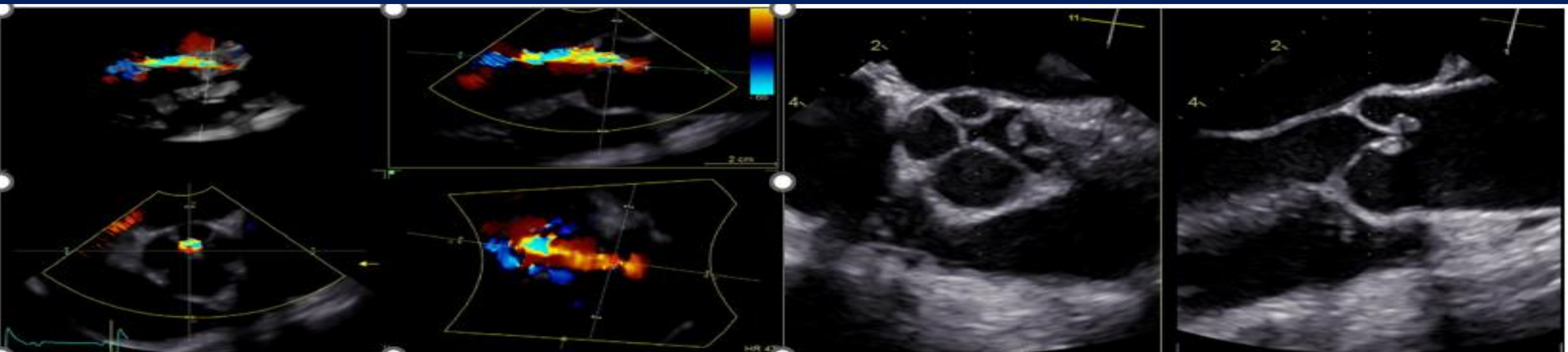


Fig. 1 PRE-OPERATIVE ECHO OF QAV

Patients Characteristics

Patients	Sex	Age (years)	Comorbidities	Symptoms	Function al status of aortic valve	Quadricuspid type (Hurwitz and Roberts classification)	LVEF	NYHA FC	Coronary angiography	HTM
Patient 1	male	44	CKD,HTN,DMT2 with retinopathy HFrEF, Old CVA	chest pain, palpitation, SOB	Severe AVR	Type A (four equal-sized cusps)	35-40%	III	Positive MVD	SAVR
Patient 2	Female	44	G6PD Rheumatic disease	Chest pain	Severe AVR	Type C (two equal large cusps and two smaller cusps)	40-50%	III	negative	SAVR

Results

Total of 70 high risk isolated and/or combined surgical patients were reviewed. Mean logistic Euro-Score of the study cohort was (11.3 +/- 5.6). Concomitant procedures consisted of mitral valve (n=39,55.71%) (repair n=14,20% and replacement n=25,35.71%), tricuspid valve repair (n=5, 7.14%), and cryoablation for atrial fibrillation (n =9,12.86%). CABG, performed in (n=42,70%). Mean Cardio-pulmonary By-paas Time (CPBT) and Cross Clamp Time (CCT) was (82.6 +/- 24.3min and 51.6 +/- 32.8 min) respectively. Median SU AV size was 25 mm (large size). Two patients (n=2,2.87%) had intraoperative supra-annular mal positioning of the aortic prosthesis, which was safely removed and reimplanted in both cases. Three patients (n=3,4.28%) showed intra-operative



Fig. 2 POS-TOPERATIVE ECHO OF QAV REPLACEMENT USING SU-AVR

Cases	Procedure	Sternotomy	ST-annular Ratio	Perceval Valve Size	CBP time	Cross-clamp time	Post bypass ECHO	F/u Echo
Patient 1	Concomitant CABG +SAVR	Median sternotomy	1.3	X-Large	99	53	Well seated AV- NO PVL	One year Trivial PVL
Patient 2	SAVR	J-shaped sternotomy	1.3	Large	94	72	Well seated AV- NO PVL	One month NO PVL

Conclusion

SU-AVR is a technically feasible and safe procedure in isolated high risk patients and when combined with other valve +/- coronary by-pass grafting even in the setting of abnormal native aortic valve anatomy or aggressive pathology. It simplifies the surgical procedure and shortens the operative time.

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