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Outcomes of Transcatheter Aortic Valve Replacement in Patients with History of Coronary Artery Bypass Graft Surgery

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BACKGROUND Transcatheter aortic valve replacement (TAVR) has emerged as an alternative therapy for moderate to severe aortic stenosis. It is unknown if prior history of coronary artery bypass surgery has influence on procedural characteristics or hospital outcomes in patients undergoing TAVR.

METHODS Study population was extracted from The National Readmission Data (NRD) 2014 using International Classification of Diseases ninth (ICD-9) codes for TAVR, coronary artery bypass graft (CABG) and periprocedural complications. Propensity matching was used to extract a matched control group of TAVR patients without history of CABG (TAVR-C) to the TAVR group with history of CABG (TAVR-CABG). Both groups were comparable in terms of baseline characteristics and co-morbidities. Study endpoints included all-cause in-hospital mortality, acute myocardial infarction (AMI), complications of heart valve prosthesis (including paravalvular leak and valve dislodgement), vascular access complications (VAC), the need for new pacemaker implantation (PPM) and 30-day readmission rates.

RESULTS A total of 2253 patients were identified in each group. Mean age was 80.2 years, and 48.5% were male. There was no significant difference between both groups in terms of all-cause in-hospital mortality (3.1% versus 4.0%, p=0.09), AMI (3.2% versus 3.3%, p=0.93), mechanical complications of heart valve prosthesis (3.0% versus 3.1%, p=0.93), VAC (0.5% versus 0.9%, p=0.12), PPM (0.4% versus 0.5%, p=0.83) or 30-day readmission rates (16.5% versus 18.2%, p=0.19).

CONCLUSION When compared to TAVR-C, TAVR-CABG was associated with similar rates of all-cause in-hospital mortality, LOS, AMI, AKI, mechanical complications of heart valve prosthesis, VAC, PPM or 30-day readmission rates.

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Echocardiography Predictors of 1-Year Mortality After TAVR

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BACKGROUND Transaortic flow, maximum velocity (V_{max}), mean gradient (MG), Ejection Fraction (EF), Aortic valve area (AVA) and dimensional index (DI) are important determinant of prognosis in patients with severe aortic stenosis (AS).

HYPOTHESIS The specific role of these echocardiography-derived values plays in predicting the prognosis of severe aortic stenosis patients undergoing Transcatheter aortic valve replacement (TAVR) is less defined.

METHODS We identified all severe AS patients who underwent TAVR between 01/2012 to 6/2016. The baseline characteristics, clinical, procedural and follow-up data of all patients that underwent TAVR were obtained and followed for up at least one year post-procedure. Hierarchical logistic regression was used to assess predictors of 1-year mortality after 1 TAVR. Normal flow (NF) was defined as having stroke volume index (SVI) of $\geq$ 35 ml/m^2; while low Flow (LF) was defined as SVI<35. High gradient (HG) was define as mean gradient of $\geq$ 40 mmHg; while low gradient (LG) was defined as < 40 mmHg.

RESULTS A total of 399 patients were included in the analysis with a 1-year follow up. At baseline there was no significant difference in baseline characteristics in regards of age, race, gender, or baseline characteristics including hypertension, hyperlipidemia, diabetes or coronary artery disease. EF of 35% was found to be the strongest predictor of 1-year mortality (17.6% EF <35% vs. 8.9% EF$\geq$ 35; RR=2.19; CI 1.05 to 4.54; P=0.03). There was no difference in 1-year mortality outcomes after TAVR in relation to gradient (10.9% LG vs. 8.9% HG; RR=1.26; CI 0.56 to 2.79; P=0.57), transaortic flow (11.2% LF vs. 8.1% NF; RR=1.47; CI 0.63 to 3.41; P=0.36), DI (11.7% DI>0.25 vs. 7.1% DI< 0.25; RR=1.69; CI 0.64 to 4.41; P=0.28); V_{max} (11.6% $V_{max} \geq 4$ vs. 11.6% $V_{max} < 4$ m/s; RR=1.67; CI 0.67 to 4.11; P=0.26) or AVA (10.8% AVA<0.6 vs. 9.7% AVA $\geq$ 0.6 Cm^2; RR=1.23; CI 0.35 to 4.36; P=0.73).

CONCLUSIONS Low EF <35% remains the strongest predictor of 1-year mortality after TAVR. TAVR seems to help improving the prognosis of severe aortic stenosis regardless of transaortic flow, gradient, V_{max} or AVA.

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Transcatheter Aortic Valve Replacement in Patients with Symptomatic Severe Aortic Stenosis and Prior External Chest Radiation

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BACKGROUND In patients with symptomatic severe aortic stenosis (AS) and prior chest radiation, surgical aortic valve replacement (SAVR) is associated with poorer short- and long-term outcomes. Our objective was to study the characteristics of these patients and to explore the clinical impact of chest radiation in patients undergoing transcatheter aortic valve replacement (TAVR).

METHODS From our institutional TAVR database, between January 2003 to January 2017, we identified 44/1197 TAVR patients with prior chest radiation. Baseline demographic and clinical characteristics, procedural details, and clinical outcomes were prospectively collected.

RESULTS Baseline characteristics, procedural details, and clinical outcomes are summarized in Table 1. Median STS score for chest irradiated patients was 7.4±4.4, compared to 8.2 ±4.9 in those without prior chest radiation. There was no difference between the type of access and the choice of the valve between the two groups. There was a trend towards longer length of ICU stay in chest irradiated patients without a significant difference in 30-day or 1-year mortality.

CONCLUSION In our study, patients with prior chest radiation were predominantly younger and women compared with the general TAVR population. Despite a trend towards longer length of ICU and hospital length of stay, there was no significant difference in 30-day or 12-month survival. Thus, TAVR appears to be a safe treatment option for patients with symptomatic severe AS and prior chest radiation.

Table1. Baseline Characteristics of the Patients

	Prior Chest radiation(n=44)	No Prior Chest radiation(n=1153)	P value
Age – year (Mean ±SD)	76±13	82 ±8	0.002
Male sex – no. (%)	10(22.7%)	586(50.8%)	<.001
NYHA Class III or IV	32(82.1%)	78.8% (835)	0.63
Prior cardiac surgery-no (%)	8(20.5%)	321(30%)	0.21
Echocardiographic data			
LVEF (%)	53.5±11.4	52.6 ± 13.7	0.67
Aortic valve area(cm^2)	0.67±0.13	0.68 ± 0.15	0.67
Porcelain aorta	7(17.5%)	59(5.4%)	0.007
Paravalvular leak(≥moderate)	1(3.1%)	26(2.8%)	0.6
Type of TAVR valve			
Self expanding—no (%)	10(22.7%)	318(28.6%)	0.4
Balloon expandable—no (%)	31(70.5%)	756(68.1%)	0.74
Access			
Transfemoral—no(%)	37(84.1%)	947(82.3%)	0.77
Non-transfemoral—no(%)	7(15.9%)	206(17.7%)	
Need for PPM— no. (%)	4(10.3%)	102(9.3%)	0.78
Lengths of ICU stay— no. (%)	5.5±9.1	3.8 ± 6.8	0.25
In-hospital death from any cause — no. (%)	2(4.5%)	44(3.8%)	0.7
30-day mortality— no. (%)	3(6.8%)	64(5.5%)	0.73
1-year mortality — no. (%)	11(29%)	198(18.7%)	0.11

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The RAS AKI Study: The Renal Artery Stenosis and Acute Kidney Injury Study in Patients Undergoing Transcatheter Aortic Valve Replacement

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