

Outcomes of Coronary Atherectomy with and without Percutaneous Ventricular Assist Device: A Propensity Matched Analysis

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Background

The use of percutaneous ventricular assist device (PVAD) has been on the rise in the past few years with increase in complex percutaneous coronary intervention (PCI) cases, but the data on the outcomes of atherectomy in PCI with and without PVAD is limited.

Methods

We sought 2012-2014 National Inpatient Sample database to examine ≥ 18 years of age patients who had undergone atherectomy during PCI and compared the outcomes between two groups; with and without PVAD using ICD 9-CM codes. Propensity-matched analysis was performed after adjusting confounders.

Results

We found 46,095 patients undergoing coronary atherectomy (1,095 with PVAD and 45,000 without PVAD). In multivessel-PCI, the PVAD group had atherectomy performed more frequently as compared to non-PVAD group (12.4% vs. 1.9%, $p < 0.001$). Elderly male patients undergoing PVAD were more often to have atherectomy performed and had a longer length of stay (LOS) (4 ± 6 vs. 8 ± 8) and higher hospital charges ($\$255,431 \pm 156,054$ vs. $\$105,099 \pm 98,554$). Coronary artery perforation (2.7% vs. 0.8%) and cardiac tamponade (1.4% vs. 0.3%), were higher in PVAD group undergoing atherectomy, which disappeared on propensity-matched analysis. Iatrogenic cardiac complications and postoperative hemorrhage were comparable in two groups. In-hospital, all-cause mortality was higher in PVAD group undergoing atherectomy (17.8% vs. 3.0%, $p < 0.001$).

Conclusions

All-cause mortality was higher in patients undergoing atherectomy with PVAD with increased LOS and total hospital charges.

Table 1A. Coronary Atherectomy with and without Percutaneous Ventricular Assist Device (PVAD)

Variables	Without PVAD (Weighted N = 45000)	With PVAD (Weighted N = 1095)	P-value
Age (Years) Mean(\pm SD)	66 (\pm 13)	72 (\pm 12)	<0.001
Length of Stay (Days) Mean(\pm SD)	4 (\pm 6)	8 (\pm 8)	<0.001
Total charges (USD) Mean(\pm SD)	105,099 (\pm 98,554)	255,431 (\pm 156,054)	<0.001
Admission day			<0.001
Weekdays	80.2%	86.3%	
Weekend	19.8%	13.7%	
Elective versus non-elective admission			<0.001
Non-elective	81.6%	68.0%	
Elective	18.4%	32.0%	
Indicator of sex			<0.001
Male	69.8%	75.8%	
Female	30.2%	24.2%	
Primary expected payer			<0.001
Medicare	55.5%	71.2%	
Medicaid	6.4%	7.3%	
Private including HMO	29.1%	17.4%	
Median household income national quartile for patient ZIP Code			0.002
0-25 th	26.0%	30.4%	
75-100 th	24.2%	21.0%	
Location/teaching status of hospital			<0.001
Rural	3.7%	1.4%	
Urban - non teaching	33.3%	21.9%	
Urban - teaching	63.1%	76.7%	
Co-morbidities [#]			
Coronary Atherosclerosis	93.2%	91.3%	0.013
Dyslipidemia	71.0%	58.9%	<0.001
Smoking	42.7%	33.3%	<0.001
Alcohol abuse	2.9%	4.1%	0.019
Deficiency anemias	13.5%	29.2%	<0.001
Congestive heart failure	1.4%	2.7%	<0.001
Chronic pulmonary disease	17.3%	24.7%	<0.001
Coagulopathy	4.1%	16.0%	<0.001
Diabetes, uncomplicated	30.4%	37.4%	<0.001
Fluid and electrolyte disorders	15.2%	31.5%	<0.001
Obesity	15.3%	11.4%	<0.001
Peripheral vascular disorders	13.7%	22.4%	<0.001
Renal failure	16.5%	34.2%	<0.001
Valvular disease	0.4%	0.9%	0.018
Multivessel PCI	20.8%	46.6%	<0.001
Complications			
All-cause Mortality	3.0%	17.8%	<0.001
Cardiac tamponade	0.3%	1.4%	<0.001
Coronary artery rupture	0.8%	2.7%	<0.001
Iatrogenic cardiac complication	4.0%	5.0%	0.089
Postop hemorrhage requiring transfusion	0.01%	0.0%	0.727

Table 1B. Propensity Matched Analysis of Coronary Atherectomy with and without PVAD

	Without PVAD = 193	With PVAD = 219	P-value
Length of Stay (days)	4 (\pm 4)	8 (\pm 8)	<0.001
Total charges (USD)	75,142 (\pm 50,461)	255,431 (\pm 156,354)	<0.001
Congestive heart failure	0.5%	2.7%	0.082
Multi vessel PCI	17.1%	46.6%	<0.001
All-cause of Mortality	3.1%	17.8%	<0.001
Cardiac tamponade	0.5%	1.4%	0.379
Coronary artery rupture	2.1%	2.7%	0.661
Iatrogenic cardiac complication	8.3%	5.0%	0.181
Perioperative stroke	0.5%	0.0%	0.286

****THERE ARE NO DISCLOSURES****