Robotic Assisted Coronary Revascularization in Obese Patients: Perioperative Outcomes

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BACKGROUND

Obesity poses technical challenges for coronary artery bypass grafting (CABG) and is often a relative contraindication for minimally invasive approaches.

Although more complex, obese patients potentially have the most benefit from minimal access surgery.

We evaluated perioperative outcomes for patients undergoing robotic assisted minimally invasive direct coronary artery bypass operations at our institution.

METHODS

A retrospective review was performed for patients undergoing robotic MIDCAB between January 2010 and December 2024.

Patients were stratified into three groups: BMI < 30kg/m^2 (not obese), BMI 30-35kg/m^2 (Class I obesity) and BMI > 35kg/m^2 (Class II obesity).

Primary outcomes focused on hospital length of stay, 30-day readmission and 30-day mortality, with secondary outcomes including additional perioperative and discharge information.

CONCLUSION

Robotic MIDCAB is increasing in popularity, but those with significant obesity are often excluded from consideration for this minimally invasive approach. These higher risk patients my benefit significantly from a minimally invasive approach, and we suggest a robotic MIDCAB can be offered to obese patients with excellent perioperative outcomes.

RESULTS: DEMOGRAPHICS

Patient Demographics Snapshot

	All Comers (n = 1516)	BMI < 30 kg/m^2 (n = 1050, 69%)	BMI 30-35 kg/m^2 (n = 304, 20%)	BMI > 30 kg/m^2 (n = 162, 11%)	p
Age (y)	66.3 ± 10.7	67.8 ± 10.4	63.0 ± 10.5	63.2 ± 10.8	<0.05
BMI	28.2 ± 5.3	25.4 ± 2.8	32.1 ± 1.5	38.8 ± 4.2	<0.05
Height	169.3 ± .98	169.1 ± 9.8	170.3 ± 9.8	168.7 ± 10.0	0.104
Weight	81.1 ± 18.0	72.9 ± 11.8	93.7 ± 11.5	110.5 ± 16.6	<0.05
Gender, male	1137 (73%)	791 (75%)	233 (77%)	113 (70%)	0.237
Ethnicity, Hispanic	225 (14%)	152 (14%)	53 (17%)	20 (12%)	0.249
EF (%)	54.8 ± 10.5	54.9 ± 10.7	54.7 ± 9.9	54.8 ± 10.6	0.952
Diabetes	79 (51%)	512 (49%)	181 (60%)	106 (65%)	<0.05
Hemoglobin A1c	6.7 ± 1.6	6.6 ± 1.6	6.8 ± 1.5	7.2 ± 1.7	<0.05
Hypertension	1415 (91%)	974 (93%)	287 (94%)	154 (95%)	0.030
Never Smoker	642 (42%)	449 (43%)	125 (41%)	78 (48%)	0.456
Dialysis	58 (4%)	44 (4%)	13 (4%)	1 (1%)	0.237
Previous MI	485 (31%)	323 (31%)	103 (34%)	59 (36%)	0.542
OSA	97 (6%)	39 (4%)	32 (11%)	26 (16%)	<0.05
Preop ASA	1284 (83%)	880 (84%)	263 (87%)	141 (87%)	0.263
Preop ADP	624 (40%)	431 (41%)	139 (46%)	54 (33%)	0.056
Preop DOAC	36 (2%)	28 (3%)	3 (1%)	5 (3%)	0.233
Preop BB	1383 (89%)	952 (91%)	282 (93%)	149 (92%)	0.582
Status					
Elective	888 (57%)	632 (60%)	173 (57%)	92 (57%)	
Urgent	627 (40%)	426 (41%)	131 (43%)	70 (43%)	0.863
Emergent	1 (0%)	0 (0%)	0 (0%)	0 (0%)	

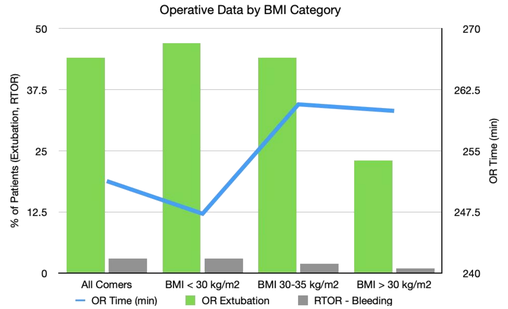
STS PREDICTED MORBIDITY / MORTALITY

	All Comers (n = 1516)	BMI < 30 kg/m^2 (n = 1050, 69%)	BMI 30-35 kg/m^2 (n = 304, 20%)	BMI > 30 kg/m^2 (n = 162, 11%)	p
STS Predicted Mortality	1.58 ± 2.9	1.75 ± 3.3	1.10 ± 1.5	1.34 ± 1.8	<0.05
STS Predicted Stroke	1.12 ± 0.9	1.20 ± 1.0	0.94 ± 0.8	0.88 ± 0.6	<0.05
STS Predicted Renal Failure	2.0 ± 3.7	1.9 ± 3.6	2.0 ± 3.6	2.61 ± 4.3	0.063
STS Predicted Morbidity / Mortality	10.4 ± 8.8	10.5 ± 9.1	9.8 ± 8.0	10.9 ± 7.7	0.365

RESULTS: OPERATIVE DATA

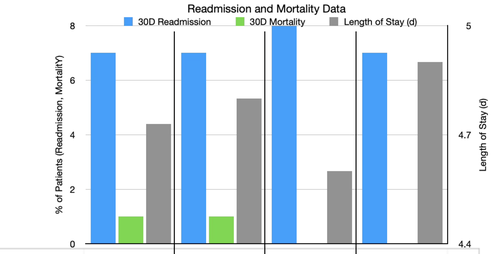
Table 2: Operative Data Snapshot

	All Comers (n = 1516)	BMI < 30 kg/m^2 (n = 1050, 69%)	BMI 30-35 kg/m^2 (n = 304, 20%)	BMI > 30 kg/m^2 (n = 162, 11%)	p
OR Time (min)	251.3 ± 66.4	247.3 ± 51.7	260.7 ± 106.4	259.9 ± 49.0	<0.05
OR Extubation	664 (44%)	492 (47%)	134 (44%)	38 (23%)	<0.05
RTOR - Bleeding	41 (3%)	34 (3%)	6 (2%)	1 (1%)	0.109



RESULTS: DISCHARGE DATA

	All Comers (n = 1516)	BMI < 30 kg/m^2 (n = 1050, 69%)	BMI 30-35 kg/m^2 (n = 304, 20%)	BMI > 30 kg/m^2 (n = 162, 11%)	p
Discharge Location					
Home	1438 (95%)	989 (94%)	291 (96%)	158 (98%)	
Rehab	64 (4%)	51 (5%)	9 (3%)	4 (2%)	0.088
Nursing Home	3 (0%)	1 (0%)	2 (1%)	0 (0%)	
ASA at Discharge	1445 (95%)	991 (94%)	295 (97%)	159 (98%)	0.152
ADP at Discharge	1302 (86%)	897 (85%)	28 (9%)	22 (14%)	0.292
DOAC at Discharge	132 (9%)	85 (8%)	27 (9%)	20 (12%)	0.395
Amiodarone at Discharge	189 (12%)	130 (12%)	36 (12%)	23 (14%)	0.063
BB at Discharge	1432 (94%)	979 (93%)	298 (98%)	155 (96%)	0.068
Statin at Discharge	1293 (85%)	874 (83%)	259 (85%)	160 (99%)	0.313



	All Comers (n = 1516)	BMI < 30 kg/m^2 (n = 1050, 69%)	BMI 30-35 kg/m^2 (n = 304, 20%)	BMI > 30 kg/m^2 (n = 162, 11%)	p
30D Readmission	111 (7%)	76 (7%)	23 (8%)	12 (7%)	0.667
30D Mortality	10 (1%)	9 (1%)	1 (0%)	0 (0%)	0.504
Length of Stay (d)	4.73 ± 3.6	4.8 ± 4.1	4.6 ± 2.3	4.9 ± 1.9	0.567

DISCLOSURES

A Luckert: Intuitive Surgical Solutions (Consultant)

DR Brinster: Cook Medical (Consultant), Terumo Aortic (Consultant), Artivion (Consultant)

NC Patel: Intuitive Surgical Solutions (Consultant)

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