



Impact of Aorta No-touch Total Arterial Minimally Invasive Coronary Artery Bypass Grafting

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BACKGROUND: The **aorta no-touch total arterial minimally invasive coronary artery bypass grafting (MICS CABG)** operation performed via a small thoracotomy (**Figure 1**) has not previously been examined in a direct comparison to MICS CABG with aortic manipulation.

METHODS: We **matched**, according to age, gender, left ventricular function, and number of disease vessels, **100 patients** who underwent **aorta no-touch MICS CABG** via small left thoracotomy, and 100 patients who received **MICS CABG with aortic manipulation** (**Figure2**). **Table 1** shows preoperative patient's Characteristics.

Figure 1

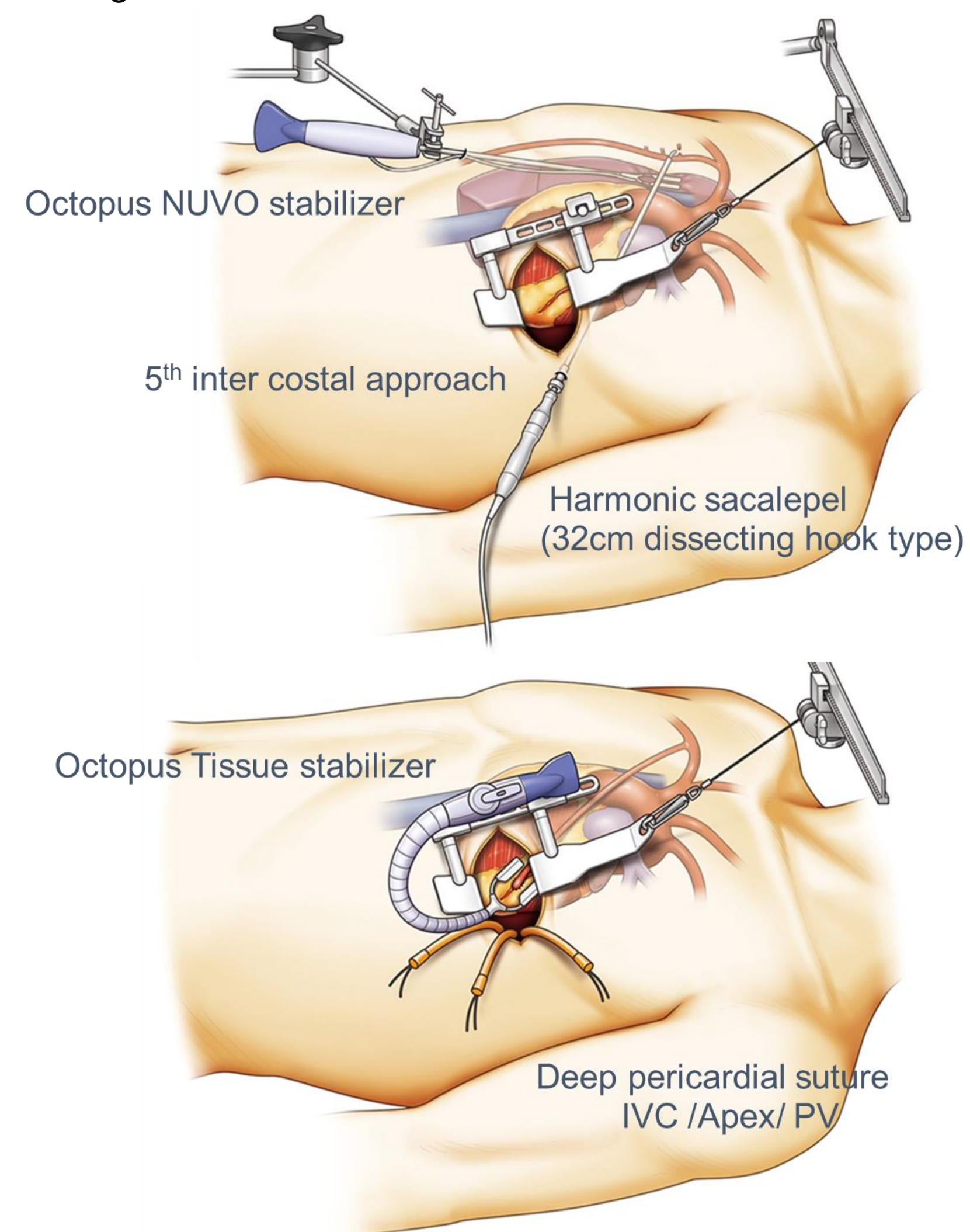


Figure 2

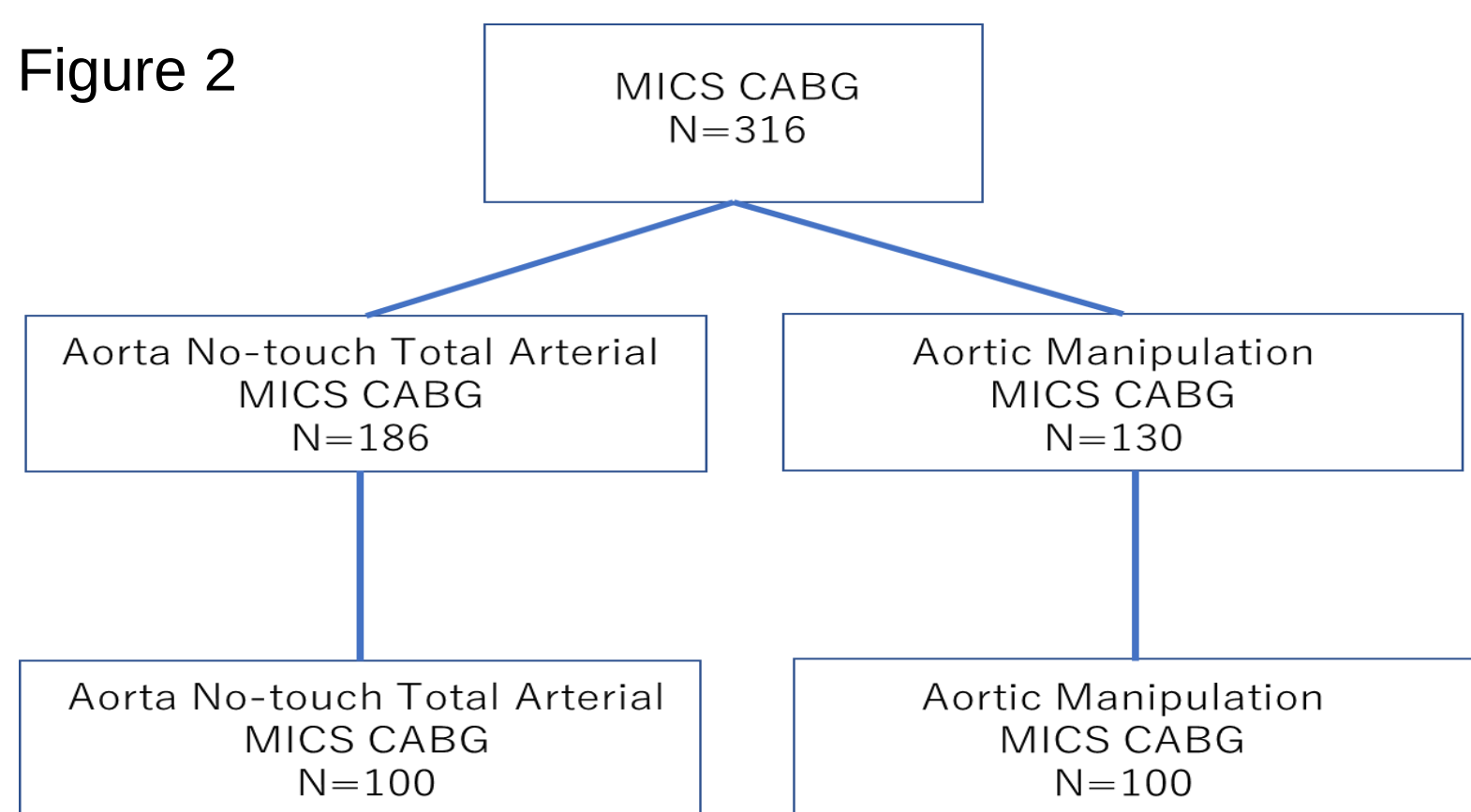


Table 1	Aorta no-touch (n=100)	Partial clamp (n=100)	p Value
Age, y	65.4	66.4	0.55
Female	14 (14%)	18 (18%)	0.44
Height, cm	164.4	162.7	0.36
Weight, kg	68.4	65.3	0.28
Stable angina	80	65	0.02
Unstable angina	20 (20%)	35 (35%)	0.02
Acute MI	0 (0%)	0 (0%)	1.00
Left ventricular dysfunction	24 (24%)	20 (20%)	0.50
1-vessel disease	0 (0%)	0 (0%)	1.00
2-vessel disease	33 (33%)	28 (28%)	0.44
3-vessel disease	67 (67%)	72 (72%)	0.44
Left main trunk	23 (23%)	26 (26%)	0.62
Diabetes mellitus	52 (52%)	50 (50%)	0.78
Hypertension	81 (81%)	76 (76%)	0.39
Smoking history	42 (42%)	30 (30%)	0.08
Chronic pulmonary disease	2 (2%)	7 (7%)	0.09
Chronic renal insufficiency	17 (17%)	20 (20%)	0.59
Hemodialysis	11 (11%)	9 (9%)	0.62
Prior PCI	24 (24%)	20 (20%)	0.50

RESULTS: **Table 2** shows the **intraoperative outcomes**. The average distal anastomosis was 2.8 in no-touch group and 3.3 in manipulation group (p<0.01). The use of bilateral internal thoracic artery was 81 (81%) in no-touch group and 41 (41%) in manipulation group (p<0.01). Total arterial revascularization underwent in 100% of no-touch group and in none of manipulation group. **Table 3** shows the **postoperative outcomes**. There was **no perioperative mortality** (0/200). There are **1 (1%) stroke in no-touch group**, that was developed in late postoperative days, and 0 (0%) in manipulation group. In the manipulation group, conversion to on-pump occurred in 2/100 (2.0%) patients. There were two (2.0%) reoperations for bleeding in aorta no-touch group. **One (1.0%) anastomotic revision in aorta no-touch group** was less than **seven (7.0%) in manipulation group** significantly (p=0.03). The median length of ICU stay was 2 days for aorta no-touch group (average 2.6), and 3 days for manipulation group (average 3.3) (P= 0.04). New-onset atrial fibrillation occurred in 8 (8.0%) both groups. Wound infection occurred 4 (4.0%) with both groups. A self-limiting left pleural effusion developed in 34 (34%) no-touch group and in 42 (42%) manipulation group. The **median time to return to full physical activity** was **11 days in no-touch group** versus **13 days in manipulation group**.

Table 2	Aorta no-touch (n=100)	Aorta manipulation (n=100)	pValue
No. of grafts	2.8 ± 0.80	3.3 ± 0.95	<0.01
1 graft	1 (1%)	0 (0%)	0.32
2 grafts	38 (38%)	17 (17%)	<0.01
3 grafts	41 (41%)	50 (50%)	0.20
4 grafts	18 (18%)	24 (24%)	0.30
Use of BITA	81 (81%)	41 (41%)	<0.01
Sequential bypass	43 (43%)	48 (48%)	0.48
Average distal anastomosis	2.82	3.29	<0.01
Total arterial revascularization	100 (100%)	0 (0%)	<0.01
Use of cardiopulmonary bypass	0 (0%)	0 (0%)	1.00
Conversion to sternotomy	0 (0%)	0 (0%)	1.00
Hybrid coronary revascularization	6 (6%)	0 (0%)	0.03
Procedure time (min)	344	318	0.65
Transfusion	22 (22%)	24 (24%)	0.74
GEA	41 (41%)	1 (1%)	<0.01
On-pump conversion	0 (0%)	2 (2%)	0.16

Table 3	Aorta no-touch (n=100)	Aorta manipulation (n=100)	p Value
In-hospital mortality	0 (0%)	0 (0%)	1.00
Stroke	1 (1%)	0 (0%)	0.32
Reoperation for bleeding	2 (2%)	0 (0%)	0.16
Perioperative transfusion	22 (22%)	24 (24%)	0.74
Respiratory insufficiency	2 (2%)	2 (2%)	1.00
New-onset atrial fibrillation	8 (8%)	8 (8%)	1.00
New-onset renal failure	1 (1%)	0 (0%)	0.32
Pleural effusion	34 (34%)	42 (42%)	0.24
Surgical site infection	4 (4%)	4 (4%)	1.00
Mean days of full physical activities	13.3	14.7	0.19
Extubation in OR	31 (31%)	23 (23%)	0.20
Revision	1 (1%)	7 (7%)	0.03
Mean days of ICU stay	2.6	3.3	0.04

CONCLUSIONS: Aorta no-touch total arterial MICS CABG is a valuable alternative for patients in need of multivessel CABG. The operation appears at least as safe as MICS CABG with aorta manipulation, and associated with shorter length of ICU stay, less anastomotic revision, and faster postoperative recovery than MICS CABG with aortic manipulation.