

Keita KIKUCHI¹, Kunihiro YOSHINO¹, Ryota HARA¹, Ryota NAKAMURA¹, McAndrew Merlini¹, Hiroki SAKAI¹, Yousyun SAI¹, Kaito MASUDA¹, Akihiko YAMAUCHI², Joji ITO¹.

1. Department of Cardiovascular Surgery, Tokyo bay Urayasu Ichikawa medical center, Chiba, Japan. 2. Department of Cardiac Surgery, Yuuai medical Center, Tomishiro, Japan

OBJECTIVE

We have started MICS CABG program from 2012 and have expanded the indication of MICS CABG for low cardiac function case after learning curve. So, we would like to share our results of MICS CABG in low cardiac function case.

METHODS

From February 2012 to September 2022, consecutive 222 patients who underwent MICS CABG, of whom low cardiac function case (EF<40%) were reviewed retrospectively. A statistical comparison was made between patients with low cardiac function (group L, n =11) and those with normal cardiac function (group N, n =211).

We have performed MICS CABG without cardio-pulmonary bypass (CPB) via left small thoracotomy under direct vision. Our strategy of MICS CABG are complete revascularization, multi arterial grafting based on BITA. Contra-indication of MICS CABG are emergency case with hemodynamic instability, EF<30%, severe. All data were processed statistically.

RESULTS

The number of OMI, and HD/DM cases were significantly higher in Group L.

	All	Group L (EF<40)	Group N (EF≥40)	p value
n	222	11 (5.0%)	211 (95%)	
age	65.9 (11.4)	59.6 (11.7)	66.2 (11.3)	0.061
female	42	41	1	-
BMI	23.9 (4.7)	27.8 (3.8)	23.9 (4.6)	0.031
OMI	76 (36%)	10 (91%)	66 (31.2%)	0.000115
RMI	8 (4%)	1 (9%)	7 (3%)	0.339
AMI	1 (0.5%)	0 (0%)	1 (0.5%)	1
EAP	150 (67.6%)	6 (55%)	144 (68%)	0.341
UAP	72 (32%)	4 (36%)	68 (32%)	0.751
Emergency	4 (2%)	0 (0%)	4 (2%)	1
Post PCI	45 (20%)	5 (45%)	40 (19%)	0.0486
EF	57 (9.6)	35 (3.0)	58 (8.3)	-
LVDd	50 (6.3)	55 (7.8)	49 (6.1)	0.00248
LMT	57 (26%)	1 (9%)	56 (37%)	0.297
SVD	34 (15%)	1 (9%)	33 (16%)	1
DVD	58 (26%)	1 (9%)	57 (27%)	0.296
TVD	129 (58%)	9 (82%)	120 (57%)	0.126
Dyslipidemia	135 (60.8%)	4 (36%)	131 (62.1%)	0.115
Hypertension	164 (73.9%)	8 (73%)	156 (73.9%)	1
Diabetes mellitus	99 (45%)	10 (91%)	89 (42%)	0.00285
COPD	6 (3%)	1 (9%)	5 (2%)	0.265
Hemodialysis	13 (6%)	4 (36%)	9 (4%)	0.00189
Old cerebral infarction	42 (19%)	2 (18%)	40 (19%)	1
OP.results				
Single bypass	31 (14%)	1 (9%)	30 (14%)	1
Multiple bypass	191 (86%)	10 (91%)	181 (85.8%)	-
Target anastomosis	3 [2-3]	3 [3-4]	3 [2-3]	0.14
Number of anastomosis	4 [2.25-5]	4 [3.5-5]	4 [2-5]	0.445
Blood transfusion	44 (20%)	1 (9%)	43 (20%)	0.697
Operative time	267.5 [204.25-267.5]	297 [267.5-351.5]	264 [204-317.5]	0.101
on pump conversion	2 (0.9%)	0 (0%)	2 (0.9%)	1
Outcome				
PMI	4 (2%)	0 (0%)	4 (1.9%)	1
ICUstay	2 [2-4]	3 [1.5-3]	2 [2-4]	0.98
Hospital stay	11 [9-14.]	12 [6.5-16.5]	11 [9-14]	0.518
AF	36 (16%)	2 (18%)	34 (16%)	1
Re opening for hemostasis	7 (3%)	0 (0%)	7 (3%)	1
Re-intubation	4 (2%)	1 (9%)	3 (1%)	0.186
SSI	6 (3%)	0 (0%)	6 (3%)	1
Stroke	1 (0.5%)	0 (0%)	1 (0.5%)	1
Sternotomy	0 (0%)	0 (0%)	0 (0%)	-
Pneumoniae	2 (1%)	0 (0%)	2 (0.9%)	1
Mortality	1 (0.5%)	0 (0%)	1 (0.5%)	1

A history of PCI was significantly higher in Group L. There was no significant difference about post operative outcomes between two groups. There was no conversion to sternotomy and usage of CPB in Group L. (Table)

DISCUSSION

4/11 cases in Group L were dialysis cases due to diabetic nephropathy, and although Group L were young and had a history of PCI due to OMI. These are a MICS favor, because of concerns of deep sternal wound infection.

However, there was some difficulty for multi vessel MICS CABG, such as higher BMI and cardiomegaly in Group L. Although the number of anastomoses tends a little higher and the operation time tends a little longer, we have managed to shorten the time of surgery as much as possible to avoid complications.

CONCLUSION

Off-pump MICS CABG is feasible even in low EF cases including HD case. This study suggested that these low EF cases were favor for sternum preservation.