

Results:

Prospective comparative study. Prospectively recruited 50 patients who had elective mitral valve surgery were divided into the MICS group and the Conventional group.

Baseline characteristics Prospective comparative study. Prospectively recruited 50 patients who had elective mitral valve surgery were divided into : MICS group (25 subjects , 12 male , 13 female , age (48.68 ± 12.77) , BMI (26.50 ± 4.31) . 20% of them were diabetic , 44% were hypertensive) Conventional group (25 subjects , 16 male , 9 female , age (49.08 ± 12.91) , BMI (26.41 ± 4.62) . 16% of them were diabetic , 48% were hypertensive)

Outcome measures

There were no significant differences in age, height, weight, or preoperative cardiac functioning across groups. (*table 1*). Postoperative rehabilitation information is provided inside table 2.

The MICS group recovered quicker than the conventional group (postoperative standing day at the bedside was 1.84 ± 0.37 vs. 2.28 ± 0.68 , $p < 0.01$) and postoperative 100-m independent walking was 3.24 ± 0.72 vs 5.08 ± 0.70 days, $p < 0.01$). In addition, there was a significant improvement in post-operative VAS in the MICS group, $p < 0.01$). In addition, there was a significant improvement in post-operative VAS in the MICS group, $p < 0.01$) Before and after surgery, the two groups' physical activity levels were measured and are shown in (Table 3). The preoperative daily step number was not significantly different between the groups. The number of daily steps grew significantly in the MICS group (preoperative $2,740 \pm 1,330$ vs. postoperative $3,536 \pm 1,885$). The variation in the groups' levels of physical activity is seen in Table 3. This suggests that the MICS group's rate of improvement in daily

steps was significantly higher than the another group (793.2 ± 543.2 vs. 181.9 ± 205 , $p < 0.01$). The pre and post-operative results of the 6MWT are shown in (Table 4). The preoperative test revealed no statistically significant difference between them. The MICS group scored significantly higher improvement (preoperative $2,740.4 \pm 1,330.2$ vs. postoperative $3,536.8 \pm 1,885.3$, $p < 0.01$).

Table (1) : Demographic data and the patient characteristics and surgical data

		Conventional group	MICS group	P-value	Sig.
		No. = 25	No. = 25		
Age	Mean \pm SD	49.08 ± 12.91	48.68 ± 12.77	0.913	NS
	Range	26 – 68	22 – 70		
Gender	Female	16 (64.0%)	12 (48.0%)	0.254	NS
	Male	9 (36.0%)	13 (52.0%)		
BMI	Mean \pm SD	26.41 ± 4.62	26.50 ± 4.31	0.947	NS
	Range	19.3 – 36	18.3 – 34		
DM	No	21 (84.0%)	20 (80.0%)	0.713	NS
	Yes	4 (16.0%)	5 (20.0%)		
HTN	No	13 (52.0%)	14 (56.0%)	0.777	NS
	Yes	12 (48.0%)	11 (44.0%)		
Liver disease	No	22 (88.0%)	22 (88.0%)	1.000	NS
	Yes	3 (12.0%)	3 (12.0%)		
LVEF	Mean \pm SD	59.08 ± 9.18	60.40 ± 8.86	0.607	NS
	Range	39 – 71	38 – 72		

LVDd (mm)	Mean \pm SD	51.56 \pm 9.01	52.88 \pm 7.37	0.573	NS
	Range	33 – 70	39 – 66		

P-value >0.05: Non significant (NS); P-value <0.05: Significant (S); P-value< 0.01: highly significant (HS)
 *:Chi-square test; •: Independent t-test

Table 2 : Postoperative rehabilitation data and VAS

		Conventional group	MICS group	P-value	Sig.
		No. = 25	No. = 25		
Standing at the bed side (Postoperative day)	Mean \pm SD	2.28 \pm 0.68	1.84 \pm 0.37	0.007	HS
	Range	1 – 3	1 – 2		
100 m independent walking (Postoperative day)	Mean \pm SD	5.08 \pm 0.70	3.24 \pm 0.72	<0.001	HS
	Range	4 – 6	2 – 5		
VAS score	Median (IQR)	4 (5 - 6)	4 (3 - 4)	<0.001	HS
	Range	4 – 8	3 – 6		

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant
 •: Independent t-test; ≠: Mann-Whitney test

Table 3: The amount of physical activity before and after surgery measured by triaxial accelerometer (steps/ day)

Amount of physical activity before surgery (steps/day)		Conventional group	MICS group	P-value	Sig.
		No. = 25	No. = 25		
Pre-operative	Mean \pm SD	2534.68 \pm 584.86	2418.60 \pm 418.41	0.424	NS
	Range	1348 – 3764	1853 – 3245		

Post-operative	Mean \pm SD	2716.64 \pm 584.53	3211.88 \pm 594.94	0.005	HS
	Range	1949 – 3876	1986 – 4001		
Difference	Mean \pm SD	181.96 \pm 205.00	793.28 \pm 543.29	<0.001	HS
	Range	1 – 632	88 – 1894		
Paired t-test		4.438	7.301		
P-value		<0.001 (HS)	<0.001 (HS)		

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant

*: Chi-square test

Table (4): The result of 6MWT in both groups before and after surgery

6MWT		Conventional group	MICS group	P-value	Sig.
		No. = 25	No. = 25		
Pre operative	Mean \pm SD	340.88 \pm 69.53	346.72 \pm 55.76	0.745	NS
	Range	209 – 493	289 – 488		
Post operative	Mean \pm SD	410.56 \pm 86.61	506.56 \pm 86.92	<0.001	HS
	Range	291 – 596	339 – 632		
Difference	Mean \pm SD	69.68 \pm 56.11	159.84 \pm 77.35	<0.001	HS
	Range	6 – 197	6 – 312		
Paired t-test		6.209	10.333		
P-value		<0.001 (HS)	<0.001 (HS)		

P-value > 0.05: Non significant; P-value < 0.05: Significant; P-value < 0.01: Highly significant

*: Chi-square test