Comparison Of Different Surgical Approaches For Ascending Aortic Surgery: Right Anterior Minithoractomy And Conventional Median Sternotomy

Fatih Gumus[a], Mustafa Serkan Durdu[b]
[a]Department of Cardiovascular Surgery, Bartın State Hospital, Bartın, Turkey.
[b]Department of Cardiovascular Surgery, Memorial Ankara Hospital, Ankara, Turkey.

OBJECTIVES:

Minimally invasive approach for cardiac surgery has been steadily developing since the early 1990s . Minimally invasive approaches to the aortic root and ascending aorta are increasingly being performed. We aimed to present our initial clinical experience and show the feasibility and safety of RAT approach for ascending aorta surgery with or without aortic valve involvement.

MATERIAL AND METHODS:

This single center study was included 112 patients who underwent ascending aortic replacement with or without aortic valve intervention, between September 2018 and April 2022. RAT was performed for 48 (42.9%) patients (RAT Group) and conventional median sternotomy was performed for 64 (57.1%) patients (CS Group). The primary endpoints included operative variables, reoperation for bleeding, transfusion requirements, time to extubation, length of ICU and hospital stay and postoperative complications.

RESULTS:

Mean age of patients was 67.63±6.67 years, and 65.1% of patients were male. Mean logistic EuroScore II was 2.24±0.81. There was no significant difference between two groups in demographic data. Total operating time was statistically significant lower in favor of RAT group (237.84±24.87 min vs 259.57±27.41 min, respectively, p=0.0001). Mean ventilation time (12.73±2.96 hours versus 19.43±4.21 hours) and the mean ICU length of stay (1.71±0.86 days versus 3.6±1.71 days) were both shorter in the RAT group (p<0.0001 for both). wound infection was significantly lower in RAT group. While length of hospital was significantly shorter in RAT group compared to sternotomy group (7.48±0.91 days versus 10.6±1.43 days, p<0.0001), hospital mortality was similar between two groups.

CONCLUSION:

Right anterolateral minithoracotomy is a novel and promising approach for ascending aortic surgery with or without aortic valve involvement. This study suggests that this approach is both feasible and safe. Furthermore, it has the advantages of better wound healing, less ICU and hospital stay, less blood transfusion, and quicker extubation period.

Variable	All Patients (n=112)	RAT group (n=48)	CS group (n=64)	p value
Age	67.63±6.67	67.25±6.51	67.82±6.74	0.65
Male gender	73 (65.1%)	31 (64.6%)	42 (65.6%)	1.00
BMI, kg/m^2	27.19±2.41	27.06±2.21	27.32±2.58	0.54
Maximun aortic (asc./root) diameter, mm	58.92±3.01	59.46±3.04	58.76±2.97	0.22
EF(%)	54.96±5.71	54.84±5.63	55.2±5.81	0.56
Aortic valve pathology				
Bicuspid aortic valve	25 (21.4%)	10 (20.8%)	15 (23.4%)	0.82
Isolated aortic stenosis	28 (25%)	11 (22.9%)	17 (26.6%)	0.83
Isolated aortic insufficency	48 (42.9%)	20 (41.6%)	28 (43.8%)	0.84
Combined aortic stenosis and insufficiency	15 (13.4%)	7 (14.6%)	8 (12.5%)	0.79
Additional disease				
Coronary artery disease	23 (20.5%)	9 (18.7%)	14 (21.9%)	0.81
Hypertension	89 (79.4%)	37 (77.1%)	52 (81.2%)	0.64
Diabetes mellitus	18 (16.1%)	7 (14.5%)	11 (17.1%)	0.79
Cerebrovascular disease	9 (8.1%)	3 (6.25%)	6 (9.3%)	0.73
COPD	13 (11.6%)	5 (10.4%)	8 (12.5)	0.77
Peripheral arterial disease	10 (8.9%)	4 (8.3%)	6 (9.4%)	1.00
Chronic kidney disease	3 (2.7%)	1 (2.1%)	2 (3.1%)	1.00
Logistic EuroScore II	2.24±0.81	2.18±0.75	2.29±0.82	0.46

Postoperative outcome	All patients (n=112)	RAT group (n=48)	CS group (n=64)	p value
Time to extubation (hours)	16.58±3.64	12.73±2.96	19.43±4.21	0.0001
ICU stay (days)	2.86±1.37	1.71±0.86	3.6±1.71	0.0001
ICU readmission	10 (8.9%)	3 (6.2%)	7 (10.9%)	0.51
Reoperation for bleeding	5 (4.5%)	1 (2.1%)	4 (6.3%)	0.38
Number of units of packed red blood cells transfused	3.41±1.58	2.27±1.14	4.28±1.83	0.0001
Postoperative Complications				
Myocardial infarction	0 (0%)	0 (0%)	0 (0%)	1.00
Atrial fibrilation	13 (11.6%)	6 (12.5%)	7 (10.9%)	1.00
Delirium	15 (13.4%)	7 (14.6%)	8 (12.5%)	0.78
Stroke	3 (2.7%)	1 (2.1%)	2 (3.1%)	1.00
Acute renal failure	1 (0.9%)	0 (0%)	1 (1.6%)	1.00
Wound infection	6 (5.4%)	0 (0%)	6 (9.3%)	0.0365
Multisystem organ failure	4 (3.6%)	1 (2.1%)	3 (4.7%)	0.63
Hospital stay (days)	9.27±1.17	7.48±0.91	10.6±1.43	0.0001
Hospital mortality	4 (3.6%)	1 (2.1%)	3 (4.7%)	0.63

