Standardization and short-term results of robot-assisted thoracoscopic esophagectomy

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Background and Aims

Surgical cases of robot-assisted thoracoscopic esophagectomy (RAMIE) is increasing because of the advantages of robotic system. We introduced RAMIE in 2019 and standardized the surgical procedure. The usefulness of RAMIE was examined by classifying surgical cases into early and late periods and comparing the surgical results.

Methods

Esophageal cancer patients

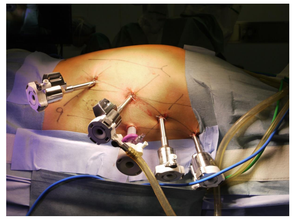
- Between Aug. 2019 and Dec. 2021
- Underwent RAMIE by qualified surgeon of JSES
- R0 and 3F LN dissection with gastric tube reconstruction via retrosternal route
- First half: n = 26
- Second half: n = 28

Comparison between the groups

- Clinicopathological findings
- Surgical outcomes: operation time, blood loss, post operative complications, No. of LN dissected, etc

Surgical procedure

Port site



Prone position

Surgical procedures

Preceding anterior approach

First half: Initial introduction	Second half: After modification
Right RLN nodes	Transection of azygous arch
↓	↓
Transection of azygous arch	Right RLN nodes
↓	↓
Left RLN nodes	Left RLN nodes
↓	↓
Ventral side middle to lower esophagus	Ventral side middle to lower esophagus
↓	↓
Dorsal side middle to lower esophagus	Dorsal side middle to lower esophagus

Results

Patient clinical characteristics

	Initial introduction (n = 26)	After modification (n = 28)	p
Age (median; y) (range)	71 (48-83)	71 (51-82)	0.99
Sex (male : female)	20 : 6	23 : 5	0.44
BMI	22.2 (14.8-29.0)	22.5 (17.6-30.8)	0.30
ASA-PS (1 / 2 / 3)	1 / 23 / 2	1 / 24 / 3	0.92
Location (U / M / L / EGJ)	1 / 12 / 10 / 3	6 / 12 / 7 / 3	0.25
cT category			
T1 / T2 / T3	14 / 4 / 8	8 / 7 / 13	0.16
cN category			
N0 / N1 or more	14 / 12	8 / 20	0.05
c Mediastinal LN meta (yes)	8 (30.8%)	18 (64.3%)	0.01
cStage			
I / II or more	14 / 12	5 / 23	0.006
Preoperative Tx. (yes)	11 (42.3%)	21 (75.0%)	0.01

Surgical outcome

	Initial introduction (n = 26)	After modification (n = 28)	p
Total ope time (median; min) (range)	683 (565-850)	647 (493-835)	0.24
Chest ope time (median; min) (range)	304 (223-427)	266 (184-468)	0.08
Total blood loss (median; mL) (range)	241 (49-853)	288 (24-912)	0.84
Chest blood loss (median; mL) (range)	30 (4-140)	42 (5-143)	0.23
No. of dissected LN (median) (range)	55 (20-84)	47 (20-91)	0.76
No. of chest LN (median) (range)	23 (9-38)	18 (10-835)	0.06
Resection of thoracic duct (yes)	4 (15.4%)	12 (42.9%)	0.02
LN dissection D2 / D3	11 / 15	3 / 25	0.009
Postope. complication (yes)	15 (57.7%)	17 (60.7%)	0.52
Respiratory (yes)	6 (23.1%)	4 (14.3%)	0.490
RLNP (yes)	3 (11.5%)	5 (17.9%)	0.70
Anastomotic leakage (yes)	1 (3.8%)	4 (14.3%)	0.35
Hospital stay (median; day) (range)	20 (14-176)	17 (13-53)	0.001

Discussion

Summary

1. Tumor staging	First half < Second half
2. Operation time	First half = Second half
3. Blood loss	First half = Second half
4. RLNP	First half = Second half
5. Hospital stay	First half > Second half

1. Results in the MIE cases were better than those in all RAMIE cases in terms of operative time, blood loss, and RLNP.
2. Improvements in surgical outcomes were observed with the standardization of the RAMIE procedures.
3. On the other hand, postoperative hospital stay consistently shorter in RAMIE cases.
4. Reduction of surgical staff did not affect surgical outcomes in the RAMIE.

Conclusions

Thorough mediastinal LN dissection by RAMIE could be safely performed by standardizing and improving the surgical procedures. Cost reduction effects of RAMIE will be expected in terms of the number of participants in surgery and the length of hospital stay after surgery.

Disclosure

We have no financial conflicts of interest to disclose concerning the presentation.

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