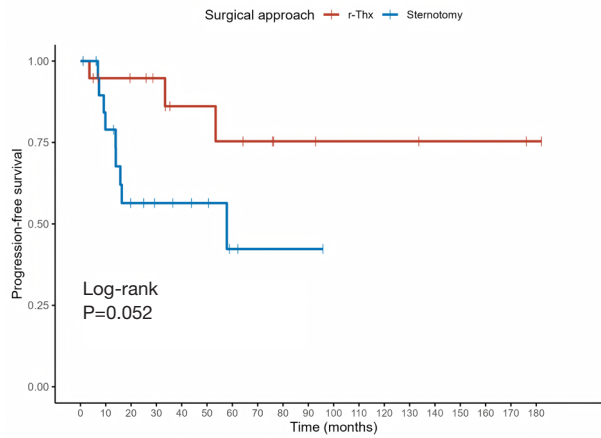


**Figure S1** Flow diagram of participant inclusion/exclusion and grouping. TNM, tumor-node-metastasis.



**Figure S2** Kaplan-Meier for the PFS stratified by surgical approach. These curves are provided for descriptive purposes only. Due to baseline imbalances between groups, these results should not be interpreted as comparative effectiveness data. P value from log-rank test is shown for reference only.

**Table S1** Risk factors for progression-free survival: univariate and multivariable Cox analysis

Characteristic	N [%]			Univariate			Multivariable		
	0 (N=29)	1 (N=12)	N	HR	95% CI	P value	HR	95% CI	P value
Group			41						
r-Thx	17 [59]	3 [25]		–	–		–	–	
Sternotomy	12 [41]	9 [75]		3.44	0.92, 12.9	0.066	1.48	0.24, 9.21	0.67
Gender			41						
Female	11 [38]	4 [33]		–	–				
Male	18 [62]	8 [67]		1.36	0.41, 4.54	0.61			
Age (years) <sup>†</sup>	54 [45, 67]	56 [44, 65]	41	1.00	0.96, 1.04	0.95			
Neoadjuvant chemotherapy	11 [38]	5 [42]	41	1.39	0.43, 4.51	0.58			
Tumor diameter group			37						
<5 cm	10 [40]	4 [33]		–	–				
≥5 cm	15 [60]	8 [67]		1.32	0.39, 4.39	0.66			
MG	14 [48]	2 [17]	41	0.27	0.06, 1.26	0.096	0.41	0.05, 3.33	0.41
Masaoka stage			41						
IIA	4 [14]	0 [0]		–	–				
III	14 [48]	6 [50]		225,026,278	0.00, Inf	0.99			
IV (IVA + IVB)	11 [38]	6 [50]		254,716,011	0.00, Inf	0.99			
WHO risk			41						
High (B2-C)	24 [83]	11 [92]		–	–				
Low (A-B1)	5 [17]	1 [8.3]		0.52	0.07, 4.06	0.54			
TNM stage			41						
II	14 [48]	4 [33]		–	–				
IIIA	3 [10]	2 [17]		2.65	0.47, 15.1	0.27			
IVA	4 [14]	3 [25]		4.60	1.02, 20.9	0.048			
IVB	8 [28]	3 [25]		1.57	0.35, 7.03	0.56			
R1 resection	8 [30]	9 [75]	39	4.57	1.20, 17.4	0.026	3.77	0.94, 15.1	0.06
Postoperative RT			41						
0	13 [45]	6 [50]		–	–				
1	16 [55]	6 [50]		0.58	0.18, 1.86	0.36			
Postoperative CT	3 [10]	2 [17]	41	1.61	0.35, 7.39	0.54			

<sup>†</sup>, median [Q1, Q3]. These results are provided for reference only. Due to baseline imbalances between groups and limited sample size, these estimates should not be interpreted as comparative effectiveness data. CI, confidence interval; HR, hazard ratio

**Table S2** Characteristics of patients who underwent a conversion

Case	Gender	Age (years)	Neoadjuvant chemo	Tumor size (cm)	WHO histology	TNM stage	Suspected invasion in surgery	Reasons for conversion	Margin status
1	F	28	1	6	B2	II	Lung	Local invasion	R0
2	M	73	0	7.7	B3	II	Lung, pericardial, left phrenic nerve	Bleeding of the brachiocephalic vein	R0
3	F	66	0	6	C	IVA	brachiocephalic vein	Local invasion	R1

F, female; M, male; WHO, World Health Organization; TNM, tumor-node-metastasis.

**Table S3** Comparison of patient characteristics between early period and late period in the r-Thx group

Characteristic	Early ( $\leq 2018-06-30$ ) (N=10)	Late ( $> 2018-06-30$ ) (N=10)	P value
<b>Gender, n [%]</b>			<b>&gt;0.99</b>
Female	5 [50]	4 [40]	
Male	5 [50]	6 [60]	
<b>Age (years)</b>			<b>0.13</b>
Mean [SD]	45 [17]	56 [12]	
Median [min, max]	45 [19, 73]	57 [35, 71]	
<b>MG, n [%]</b>	6 [60]	8 [80]	<b>0.63</b>
<b>Neoadjuvant chemotherapy, n [%]</b>	1 [10]	1 [10]	<b>&gt;0.99</b>
<b>Tumor diameter (cm)</b>			<b>0.27</b>
Mean [SD]	5.48 [2.43]	4.45 [1.67]	
Median [min, max]	5.75 [0.80, 9.00]	4.75 [1.50, 6.50]	
<b>WHO classification, n [%]</b>			<b>&gt;0.99</b>
A	1 [10]	0 [0]	
AB	0 [0]	1 [10]	
B2	3 [30]	2 [20]	
B3	5 [50]	5 [50]	
C	1 [10]	2 [20]	
<b>WHO risk, n [%]</b>			<b>&gt;0.99</b>
High (B2-C)	9 [90]	9 [90]	
Low (A-B1)	1 [10]	1 [10]	
<b>Masaoka stage, n [%]</b>			<b>0.82</b>
IIA	3 [30]	1 [10]	
III	5 [50]	7 [70]	
IV[IVA + IVB]	2 [20]	2 [20]	
<b>TNM stage, n [%]</b>			<b>0.12</b>
II	9 [90]	4 [40]	
IIIA	0 [0]	2 [20]	
IVA	1 [10]	3 [30]	
IVB	0 [0]	1 [10]	

P values were derived from Wilcoxon rank-sum test (continuous variables) and Chi-squared or Fisher's exact test (categorical variables). MG, myasthenia gravis; r-ThX, robotic-assisted thymectomy; SD, standard deviation; TNM, tumor-node-metastasis; WHO, World Health Organization.

**Table S4** Comparison of perioperative and oncological outcomes between early period and late period in the r-Thx group

Characteristic	Early ( $\leq 2018-06-30$ ) (N=10)	Late ( $> 2018-06-30$ ) (N=10)	P value
Conversion to open, n [%]	2 [20]	1 [10]	>0.99
Operative duration (minutes)			0.31
Mean [SD]	320 [73]	273 [103]	
Median [min, max]	326 [197, 411]	286 [138, 472]	
Drainage duration (days)			0.23
Mean [SD]	3.60 [1.26]	5.40 [3.31]	
Median [min, max]	3.50 [2.00, 6.00]	4.50 [2.00, 12.00]	
R1 resection <sup>†</sup> , n [%]	3 [30]	3 [33]	>0.99
Postoperative complications, n [%]	3 [30]	1 [10]	0.58
Postoperative RT, n [%]			0.35
0	2 [20]	5 [50]	
1	8 [80]	5 [50]	
Postoperative ChT, n [%]	1 [10]	1 [10]	>0.99
Recurrence, n [%]	2 [20]	1 [10]	>0.99
Overall survival, n [%]	10 [100]	10 [100]	>0.99

P values were derived from Wilcoxon rank-sum test (continuous variables) and Chi-squared or Fisher's exact test (categorical variables). Postoperative complications refer to those > grade I according to the Clavien-Dindo classification. <sup>†</sup>, there were one case not sure about the R1 resection status in the late period. ChT, chemotherapy; RT, radiotherapy; r-ThX, robotic-assisted thymectomy; SD, standard deviation.

**Table S5** Recurrence/death as PFS event in the r-ThX and sternotomy groups

Case	Surgical approach	Gender	Age (years)	Tumor size (cm)	WHO histology	TNM stage	Invasion	Neoadjuvant chemo	Margin status	PORT	POCT	Recurrence time (m)	Recurrence site/death
1	r-ThX	F	45	9	B2	II	Lung	0	R1	0	0	33.5	Local
2	r-ThX	M	19	4.5	B2	IIIA	Lung, pericardium	0	R1	1	1	53.5	Local
3	r-ThX	F	66	6	C	IVA	Left brachiocephalic vein	0	R1	1	1	3.6	Metastasis, bone
4	Sternotomy	M	73	8	B3	II	Lung, pericardium	0	R1	1	0	57.9	Metastasis, liver
5	Sternotomy	M	66	4	C	IVA	Pericardium, lymph node	0	R1	0	0	9.3	Metastasis, lymph node
6	Sternotomy	F	42	3.7	B2	IVB	Pleura	1	R1	1	0	13.9	Local
7	Sternotomy	M	40	4.5	B2	IVB	Lung, pericardium, diaphragm	1	R1	0	0	14.0	Local
8	Sternotomy	F	45	5.2	B3	IIIA	SVC, BCV, pericardium	1	R1	1	0	15.8	Metastasis, lung
9	Sternotomy	M	52	26	C	IVA	Lung, pericardium	1	R0	0	0	7.4	Local
10	Sternotomy	M	64	9.5	B3	IVB	Lung, pericardium, pleura	0	R1	1	0	6.9	Metastasis, left scapular
11	Sternotomy	M	62	12	C	II	Lung, pericardium	1	R0	0	0	9.9	Metastasis, pleura, lung
12	Sternotomy	M	60	11	A	IIIA	Lung	0	R0	0	0	No	Death of heart failure and pulmonary bleeding

BCV, brachiocephalic vein; F, female; M, male; POCT, postoperative chemotherapy; PORT, postoperative radiotherapy; r-ThX, robotic-assisted thymectomy; R0, margin-negative resection; R1, microscopically positive resection; SVC, superior vena cava; TNM, tumor-node-metastasis; WHO, World Health Organization.