



Figure S1 Rate of VATS surgery and surgical time for VATS and thoracotomy from 2013 to 2017 over time. VATS, video-assisted thoracic surgery.

Table S1 Postoperative complications before and after PSM

Variables	Before PSM, n (%)			After PSM, n (%)		
	Thoracotomy (n=570)	VATS (n=119)	P	Thoracotomy (n=103)	VATS (n=103)	P
Any complications	73 (12.8)	16 (13.4)	0.180	10 (9.7)	12 (11.7)	0.652
Air leakage	52 (9.1)	13 (10.9)	0.541	8 (7.8)	10 (9.7)	0.622
Arrhythmia	3 (0.5)	2 (1.7)	0.177	1 (1.0)	2 (1.9)	0.561
Bleeding	6 (1.1)	1 (0.8)	0.834	0	1 (1.0)	0.316
BPF	6 (1.1)	0	0.261	0	0	>0.99
Chylothorax	3 (0.5)	0	0.428	1 (1.0)	0	0.316
Pulmonary infection or pyothorax	3 (0.5)	1 (0.8)	0.682	1 (1.0)	1 (1.0)	>0.99
Pleural effusion	5 (0.9)	0	0.305	1 (1.0)	0	0.316
Others	2 (0.4)	0	0.518	0	0	>0.99
Reoperation	2 (0.4)	0	0.518	0	0	>0.99
Readmission	2 (0.4)	0	0.518	0	0	>0.99

PSM, propensity score matching; VATS, video-assisted thoracic surgery; n, number; BPF, bronchopleural fistula.

Table S2 Baseline characteristics of primary cohort between conversion to thoracotomy and VATS

Variables	VATS (n=111)	Conversion to thoracotomy (n=8)	P
Gender			0.651
Male	90 (81.1)	7 (87.5)	
Female	21 (18.9)	1 (12.5)	
Age (years)	63.8±9.1	71.8±8.4	0.017
Smoking history			0.342
No	80 (72.1)	7 (87.5)	
Yes	31 (27.9)	1 (12.5)	
BMI (kg/m ²)	23.3±3.4	24.9±2.3	0.196
FEV1 (%)	94.7±71.9	77.5±20.6	0.502
DLCO (%)	84.6±18.7	71.9±15.8	0.062
Comorbidity			0.464
No	104 (93.7)	8 (100.0)	
Yes	7 (6.3)	0	
Central location			0.002
No	104 (93.7)	5 (62.5)	
Yes	7 (6.3)	3 (37.5)	
Tumor location			0.779
RUL	26 (23.4)	3 (37.5)	
RML	5 (4.5)	0	
RLL	32 (28.9)	1 (12.5)	
LUL	24 (21.6)	2 (25.0)	
LLL	24 (21.6)	2 (25.0)	
Tumor size (mm)	6.4±1.3	6.6±1.5	0.669
Surgical procedure			0.665
Lob	102 (91.9)	7 (87.5)	
Others	9 (8.1)	1 (12.5)	
Pathology			0.398
SCC	39 (35.1)	4 (50.0)	
Non-SCC	72 (64.9)	4 (50.0)	

Table S2 (continued)

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Variables	VATS (n=111)	Conversion to thoracotomy (n=8)	P
Pathological T stage			0.370
pT3	85 (76.6)	5 (62.5)	
pT4	26 (23.4)	3 (37.5)	
Pathological N stage			0.892
pN0	69 (62.2)	5 (62.5)	
pN1	20 (18.0)	1 (12.5)	
pN2	22 (19.8)	2 (25.0)	
Surgical margin			0.585
R0	107 (96.4)	8 (100.0)	
R1	4 (3.6)	0	
Grade			0.183
Well/moderate	70 (63.1)	3 (37.5)	
Poor	41 (36.9)	5 (62.5)	
PI			0.593
No	38 (34.2)	2 (25.0)	
Yes	73 (65.8)	6 (75.0)	
LVI			0.584
No	103 (92.8)	7 (87.5)	
Yes	8 (7.2)	1 (12.5)	
ACT			0.011
No	46 (41.4)	7 (87.5)	
Yes	65 (58.6)	1 (12.5)	
ART			0.702
No	109 (98.2)	8 (100.0)	
Yes	2 (1.8)	0	

Data are presented as n (%) or mean ± SD. VATS, video-assisted thoracic surgery; BMI, body mass index; FEV1, forced expiratory volume in 1 second; DLCO, diffusing capacity of the lung for carbon monoxide; RUL, right upper lobe; RML, right middle lobe; RLL, right lower lobe; LUL, left upper lobe; LLL, left lower lobe; Lob, lobectomy; SCC, squamous cell carcinoma; PI, pleural invasion; LVI, lymphovascular invasion; ACT, adjuvant chemotherapy; ART, adjuvant radiotherapy; SD, standard deviation.

Table S3 Intraoperative and postoperative outcomes between conversion to thoracotomy and VATS

Variables	VATS (n=111)	Conversion to thoracotomy (n=8)	P
Intraoperative outcomes			
Operative time (minutes)	139.7±53.5	187.8±37.8	0.014
Harvested LNs	13.3±6.4	13.0±6.9	0.906
Harvested positive LNs	1.1±2.3	1.8±3.0	0.439
Blood loss (mL)	110.9±81.6	362.5±231.1	<0.001
Postoperative outcomes			
LOS (days)	7.1±5.3	10.5±6.0	0.085
Chest drainage duration (days)	5.0±5.0	8.8±5.6	0.047
Postoperative complications	14 (12.6)	2 (25.0)	0.321
In-hospital mortality	1 (0.9)	0	0.787

Data are presented as n (%) or mean ± SD. VATS, video-assisted thoracic surgery; LN, lymph node; LOS, length of hospital stay; SD, standard deviation.

Table S4 Postoperative complications between conversion to thoracotomy and VATS

Variables	VATS (n=111), n (%)	Conversion to thoracotomy (n=8), n (%)	P
Any complications	14 (12.6)	2 (25.0)	0.321
Air leakage	12 (10.8)	1 (12.5)	0.882
Arrhythmia	2 (1.8)	0	0.702
Bleeding	1 (0.9)	0	0.787
BPF	0	0	>0.99
Chylothorax	0	0	>0.99
Pulmonary infection or pyothorax	2 (1.8)	1 (25.0)	0.062
Pleural effusion	0	0	>0.99
Others	0	0	>0.99
Reoperation	0	0	>0.99
Readmission	0	0	>0.99

VATS, video-assisted thoracic surgery; n, number; BPF, bronchopleural fistula.

Table S5 Univariable and multivariable logistic analysis for the risk factors of conversion to open thoracotomy

Variables	Univariable		Multivariable	
	P	OR	95% CI	P
Gender (female vs. male)	0.651	–	–	–
Age (per years)	0.018	5.934	1.029–34.207	0.046
Smoking history (yes vs. no)	0.342	–	–	–
BMI (per kg/m ²)	0.193	–	–	–
FEV1% (per %)	0.498	–	–	–
DLCO% (per %)	0.061	–	–	–
Comorbidity (yes vs. no)	0.464	–	–	–
Central location (yes vs. no)	0.008	1.117	1.001–1.248	0.049
Tumor location (vs. RUL)				
RML	0.799	–	–	–
RLL		–	–	–
LUL		–	–	–
LLL		–	–	–
Surgical procedure (others vs. Lob)	0.665	–	–	–
Tumor size (per mm)	0.666	–	–	–
Pathology (non-SCC vs. SCC)	0.746	–	–	–
Pathological T stage (pT4 vs. pT3)	0.370	–	–	–
Pathological N stage (vs. pN0)				
pN1	0.869	–	–	–
pN2		–	–	–
Surgical margin (R1 vs. R0)	0.999	–	–	–
Grade (poor vs. well/moderate)	0.152	–	–	–
PI (yes vs. no)	0.593	–	–	–
LVI (yes vs. no)	0.584	–	–	–

OR, odds ratio; CI, confidence interval; BMI, body mass index; FEV1, forced expiratory volume in 1 second; DLCO, diffusing capacity of the lung for carbon monoxide; RUL, right upper lobe; RML, right middle lobe; RLL, right lower lobe; LUL, left upper lobe; LLL, left lower lobe; SCC, squamous cell carcinoma; PI, pleural invasion; LVI, lymphovascular invasion.