

**Table S1** Baseline characteristics between uniportal and three-port group in patients with simple, complex and combined segmentectomies

Characteristics	Simple			Complex			Combined		
	Uniportal [123]	Three-port [370]	P	Uniportal [181]	Three-port [566]	P	Uniportal [96]	Three-port [264]	P
Age at surgery (years)			0.67			0.56			0.87
Mean ± SD	53.90 (11.23)	54.41 (11.54)		50.67 (11.79)	51.24 (11.29)		53.71 (10.92)	53.48 (11.14)	
Median [IQR]	54.00 [47.50, 61.50]	54.00 [46.00, 63.00]		51.00 [42.00, 58.00]	51.00 [43.00, 58.00]		53.00 [46.75, 61.25]	54.00 [46.00, 62.00]	
Sex			0.75			0.46			0.11
Female	88 (71.54)	257 (69.46)		123 (67.96)	403 (71.20)		79 (82.29)	194 (73.48)	
Male	35 (28.46)	113 (30.54)		58 (32.04)	163 (28.80)		17 (17.71)	70 (26.52)	
FEV1%			0.67			0.75			0.65
Mean ± SD	106.49 (16.85)	107.30 (17.12)		106.80 (12.59)	107.23 (15.23)		109.28 (15.87)	108.38 (15.93)	
Median [IQR]	106.10 [97.80, 117.00]	106.40 [97.25, 117.70]		106.40 [98.10, 115.00]	106.60 [97.90, 116.60]		107.95 [99.10, 117.55]	108.30 [98.55, 116.90]	
DLCO%			0.035			0.64			0.13
Mean ± SD	98.67 (13.82)	102.21 (15.57)		102.53 (16.00)	101.86 (15.57)		104.37 (13.33)	101.59 (14.81)	
Median [IQR]	98.15 [88.30, 107.53]	101.60 [91.20, 110.47]		100.95 [92.25, 112.78]	100.15 [91.27, 110.53]		101.40 [95.65, 112.90]	100.65 [91.10, 111.10]	
Tumor size (cm)			0.38			0.65			0.72
Mean ± SD	1.15 (0.55)	1.20 (0.58)		1.10 (0.42)	1.08 (0.46)		1.16 (0.52)	1.14 (0.46)	
Median [IQR]	1.00 [0.80, 1.30]	1.00 [0.80, 1.50]	0.61	1.00 [0.80, 1.40]	1.00 [0.80, 1.30]	0.32	1.00 [0.80, 1.40]	1.00 [0.80, 1.40]	0.92
Clinical stage			>0.99			0.46			0.60
IA	122 (99.19)	367 (99.19)		181 (100.00)	561 (99.12)		95 (98.96)	264 (100.00)	
IB	1 (0.81)	3 (0.81)		0 (0.00)	5 (0.88)		1 (1.04)	0 (0.00)	
Development of pulmonary fissure			0.37			0.68			0.093
Well	67 (54.92)	217 (60.11)		110 (61.11)	354 (63.21)		69 (71.88)	160 (61.54)	
Incomplete	55 (45.08)	144 (39.89)		70 (38.89)	206 (36.79)		27 (28.12)	100 (38.46)	
Missing	1 (0.81)	9 (2.55)		1 (0.58)	6 (1.06)		0 (0.00)	4 (1.52)	
Pleural adhesions			0.064			0.38			0.29
No	44 (35.77)	98 (26.49)		63 (35.20)	175 (31.31)		26 (27.08)	89 (33.71)	
Yes	79 (64.23)	272 (73.51)		116 (64.80)	384 (68.69)		70 (72.92)	175 (66.29)	
Missing	0 (0.00)	0 (0.00)		2 (1.10)	7 (1.23)		0 (0.00)	0 (0.00)	
Histology			0.80			0.21			0.32
AAH	0 (0.00)	4 (1.13)		1 (0.58)	9 (1.64)		0 (0.00)	5 (3.40)	
AIS	4 (3.42)	10 (2.83)		8 (4.68)	19 (3.46)		3 (4.76)	5 (3.40)	
MIA	57 (48.72)	155 (43.91)		81 (47.37)	308 (56.10)		36 (57.14)	72 (48.98)	
Invasive adenocarcinoma	52 (44.44)	170 (48.16)		75 (43.86)	200 (36.43)		21 (33.33)	59 (40.14)	
Others*	1 (0.81)	5 (1.42)		0 (0.00)	0 (0.00)		1 (1.59)	0 (0.00)	
Missing	3 (2.56)	9 (2.55)		6 (3.51)	13 (2.37)		2 (3.17)	6 (4.08)	
Surgeon volume			0.34			0.67			0.022
Low	76 (61.79)	248 (67.03)		111 (61.33)	359 (63.43)		76 (79.17)	174 (65.91)	
High	47 (38.21)	122 (32.97)		70 (38.67)	207 (36.57)		20 (20.83)	90 (34.09)	
Year of surgery			0.93			0.53			0.033
2014–2017	19 (15.45)	54 (14.59)		27 (14.92)	72 (12.72)		2 (2.08)	25 (9.47)	
2018–2021	104 (84.55)	316 (85.41)		154 (85.08)	494 (87.28)		94 (97.92)	239 (90.53)	

Data were presented as mean (SD), median [IQR] or number (percentage). IQR, interquartile range; FEV1%, predicted forced expiratory volume in 1 second; DLCO%, predicted carbon monoxide diffusing capacity; LUL, left upper lobe; LLL, left lower lobe; RUL, right upper lobe; RML, right middle lobe; RLL, right lower lobe; AAH, atypical adenomatous hyperplasia; AIS, adenocarcinoma in situ; IA, invasive adenocarcinoma; MIA, minimally invasive adenocarcinoma. \*Others including large cell carcinoma, undifferentiated cancers, neuroendocrine tumor, salivary gland tumor and adenosquamous carcinoma.

**Table S2** Perioperative outcomes between uniportal and three-port group in patients with simple, complex and combined segmentectomies

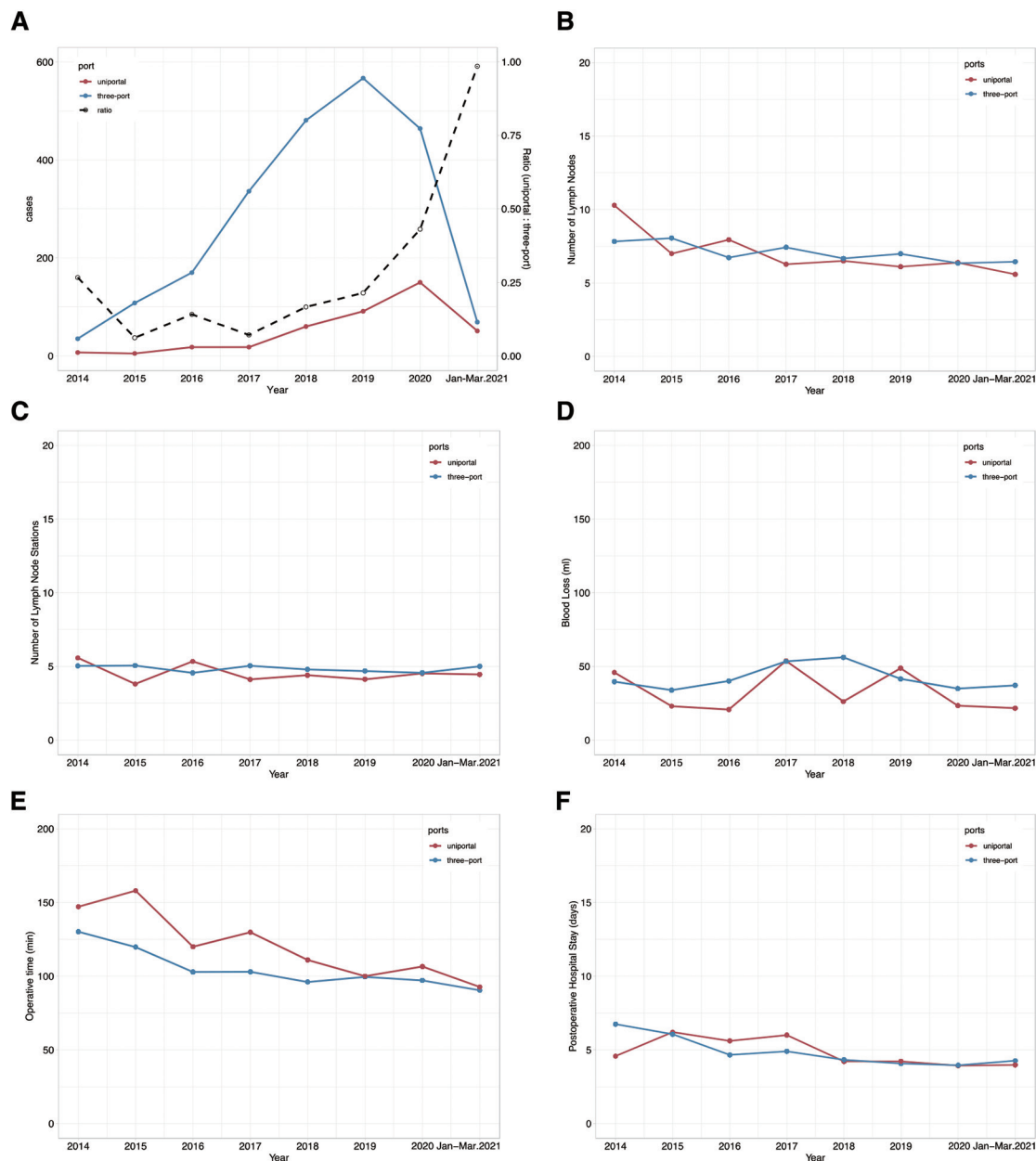
	Simple			Complex			Combined		
	Uniportal [123]	Three-port [370]	P	Uniportal [181]	Three-port [566]	P	Uniportal [96]	Three-port [264]	P
Convert to thoracotomy	0 (0.00)	2 (0.54)	>0.99	0 (0.00)	2 (0.36)	>0.99	0 (0.00)	2 (0.76)	0.96
Number of LNs harvested			0.018			0.91			0.59
Mean (SD)	6.17 (3.03)	7.01 (3.48)		6.35 (2.79)	6.38 (3.37)		6.71 (3.22)	6.95 (3.87)	
Median [IQR]	5.00 [4.00, 8.00]	6.00 [5.00, 9.00]		6.00 [5.00, 8.00]	6.00 [4.00, 8.00]		6.00 [4.00, 9.00]	6.00 [4.75, 9.00]	
Number of LN stations harvested			0.007			0.24			0.66
Mean (SD)	4.20 (1.39)	4.67 (1.72)		4.42 (1.51)	4.61 (2.03)		4.74 (1.68)	4.85 (2.17)	
Median [IQR]	4.00 [3.00, 5.00]	5.00 [3.00, 6.00]		4.00 [3.00, 5.00]	4.00 [3.00, 6.00]		4.00 [4.00, 6.00]	5.00 [3.75, 6.00]	
Intraoperative blood loss (mL)			<0.001			<0.001			<0.001
Mean (SD)	33.01 (12.45)	44.02 (8.46)		31.85 (12.39)	44.22 (8.59)		26.73 (8.84)	42.52 (8.31)	
Median [IQR]	26.16 [23.38, 48.75]	41.48 [34.86, 56.14]		23.38 [23.38, 48.75]	41.48 [34.86, 56.14]		23.38 [23.38, 23.38]	41.48 [34.86, 53.32]	
Operative time (min)			0.62			<0.001			0.75
Mean (SD)	99.85 (33.17)	97.91 (38.83)		109.25 (32.62)	93.32 (33.54)		111.78 (28.73)	110.25 (43.36)	
Median [IQR]	93.00 [75.00, 120.00]	90.00 [70.00, 116.50]		105.00 [86.50, 125.00]	90.00 [69.00, 110.00]		114.00 [93.50, 132.00]	102.50 [75.75, 135.00]	
Postoperative hospital stay (days)			0.57			0.003			0.095
Mean (SD)	4.23 (1.92)	4.38 (2.74)		4.39 (2.24)	3.90 (1.84)		4.02 (1.73)	4.47 (2.40)	
Median [IQR]	4.00 [3.00, 5.00]	4.00 [3.00, 5.00]		4.00 [3.00, 5.00]	3.00 [3.00, 4.00]		3.00 [3.00, 4.25]	4.00 [3.00, 5.00]	
Hospitalization cost (kUSD)			0.92			<0.001			0.10
Mean (SD)	7.20 (1.30)	7.18 (7.18)		7.28 (1.18)	6.82 (1.15)		8.56 (1.65)	8.27 (1.68)	
Median [IQR]	7.06 [6.36, 7.64]	7.00 [6.21, 7.89]		7.15 [6.63, 7.64]	6.77 [6.12, 7.52]		8.38 [7.54, 9.52]	8.05 [7.23, 9.14]	
Chest tube drainage (mL)									
Within the first 3 postoperative days			0.79			0.40			0.89
Mean (SD)	362.51 (213.43)	354.79 (295.40)		310.92 (211.21)	294.01 (238.95)		418.51 (247.65)	422.76 (268.74)	
Median [IQR]	330.00 [215.00, 455.00]	300.00 [180.00, 478.75]		270.00 [140.00, 420.00]	250.00 [112.50, 400.00]		390.00 [220.00, 565.00]	360.00 [240.00, 600.00]	
Total drainage			0.81			0.33			0.15
Mean (SD)	426.59 (399.47)	439.74 (541.82)		384.81 (388.68)	350.94 (405.17)		449.87 (296.19)	603.90 (1011.08)	
Median [IQR]	340.00 [210.00, 503.00]	305.00 [180.00, 521.50]		280.00 [157.50, 455.00]	250.00 [115.00, 420.00]		400.00 [220.00, 590.00]	380.00 [240.00, 660.00]	
Postoperative complications	6 (4.88)	18 (4.86)	>0.99	8 (4.42)	20 (3.53)	0.75	3 (3.12)	18 (6.82)	0.29
Pulmonary infection	1 (0.81)	4 (1.08)	>0.99	3 (1.66)	4 (0.71)	0.48	2 (2.08)	4 (1.52)	>0.99
Persistent air leakage	4 (3.25)	7 (1.89)	0.59	4 (2.21)	5 (0.88)	0.30	0 (0.00)	7 (2.65)	0.24
Chylothorax	0 (0.00)	2 (0.54)	>0.99	1 (0.55)	3 (0.53)	>0.99	0 (0.00)	3 (1.14)	0.69
Others	2 (1.63)	7 (1.89)	>0.99	2 (1.10)	6 (1.06)	>0.99	1 (1.04)	6 (2.27)	0.75

Data were presented as mean (SD), median [IQR] or number (percentage).

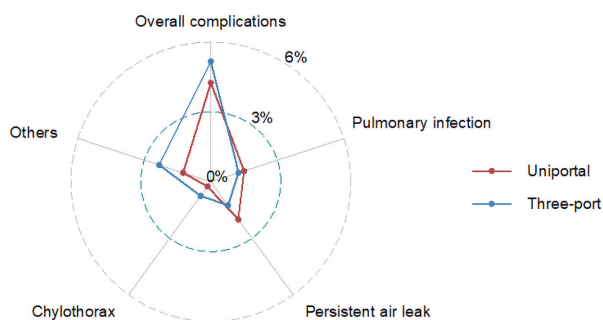
**Table S3** Perioperative outcomes among three types of segmentectomies

Outcomes	Simple (493)	Complex (747)	Combined (360)	P value
Convert to thoracotomy	2 (0.41)	2 (0.27)	2 (0.56)	0.76
Number of LNs harvested				
Mean (SD)	6.80 (3.39)	6.37 (3.24)	6.88 (3.70)	0.024
Median [IQR]	6.00 [4.00, 9.00]	6.00 [4.00, 9.00]	6.00 [4.00, 8.00]	0.019
Number of LN stations harvested				
Mean (SD)	4.55 (1.65)	4.57 (1.92)	4.82 (2.05)	0.071
Median [IQR]	4.00 [3.00, 6.00]	5.00 [4.00, 6.00]	4.00 [3.00, 6.00]	0.021
Intraoperative blood loss (mL)				
Mean (SD)	41.28 (10.72)	41.22 (11.00)	38.31 (10.96)	<0.001
Median [IQR]	41.28 (10.72)	38.31 (10.96)	41.22 (11.00)	<0.001
Operative time (min)				
Mean (SD)	98.39 (37.47)	97.18 (33.99)	110.65 (39.98)	<0.001
Median [IQR]	90.00 [70.00, 117.00]	105.00 [80.00, 135.00]	92.00 [70.50, 119.00]	<0.001
Postoperative hospital stay (days)				
Mean (SD)	4.34 (2.56)	4.02 (1.96)	4.35 (2.25)	0.016
Median [IQR]	4.00 [3.00, 5.00]	4.00 [3.00, 5.00]	3.00 [3.00, 4.00]	0.001
Hospitalization cost (kUSD)				
Mean (SD)	7.18 (1.48)	6.93 (1.17)	8.35 (1.67)	
Median [IQR]	7.04 [6.29, 7.82]	8.15 [7.32, 9.29]	6.85 [6.24, 7.55]	<0.001
Chest tube drainage (mL)				<0.001
Within the first 3 postoperative days				
Mean (SD)	356.71 (277.12)	298.12 (232.48)	421.63 (262.96)	<0.001
Median [IQR]	305.00 [190.00, 470.00]	360.00 [240.00, 600.00]	250.00 [120.00, 410.00]	<0.001
Total drainage				
Mean (SD)	436.47 (509.82)	359.18 (401.23)	562.79 (881.25)	<0.001
Median [IQR]	315.00 [190.00, 512.50]	380.00 [240.00, 650.00]	260.00 [130.00, 430.00]	<0.001
Postoperative complications	24 (4.87)	28 (3.75)	21 (5.83)	0.28
Pulmonary infection	5 (1.01)	7 (0.94)	6 (1.67)	0.54
Persistent air leakage	11 (2.23)	9 (1.20)	7 (1.94)	0.36
Chylothorax	2 (0.41)	4 (0.54)	3 (0.83)	0.71
Others	9 (1.83)	8 (1.07)	7 (1.94)	0.41

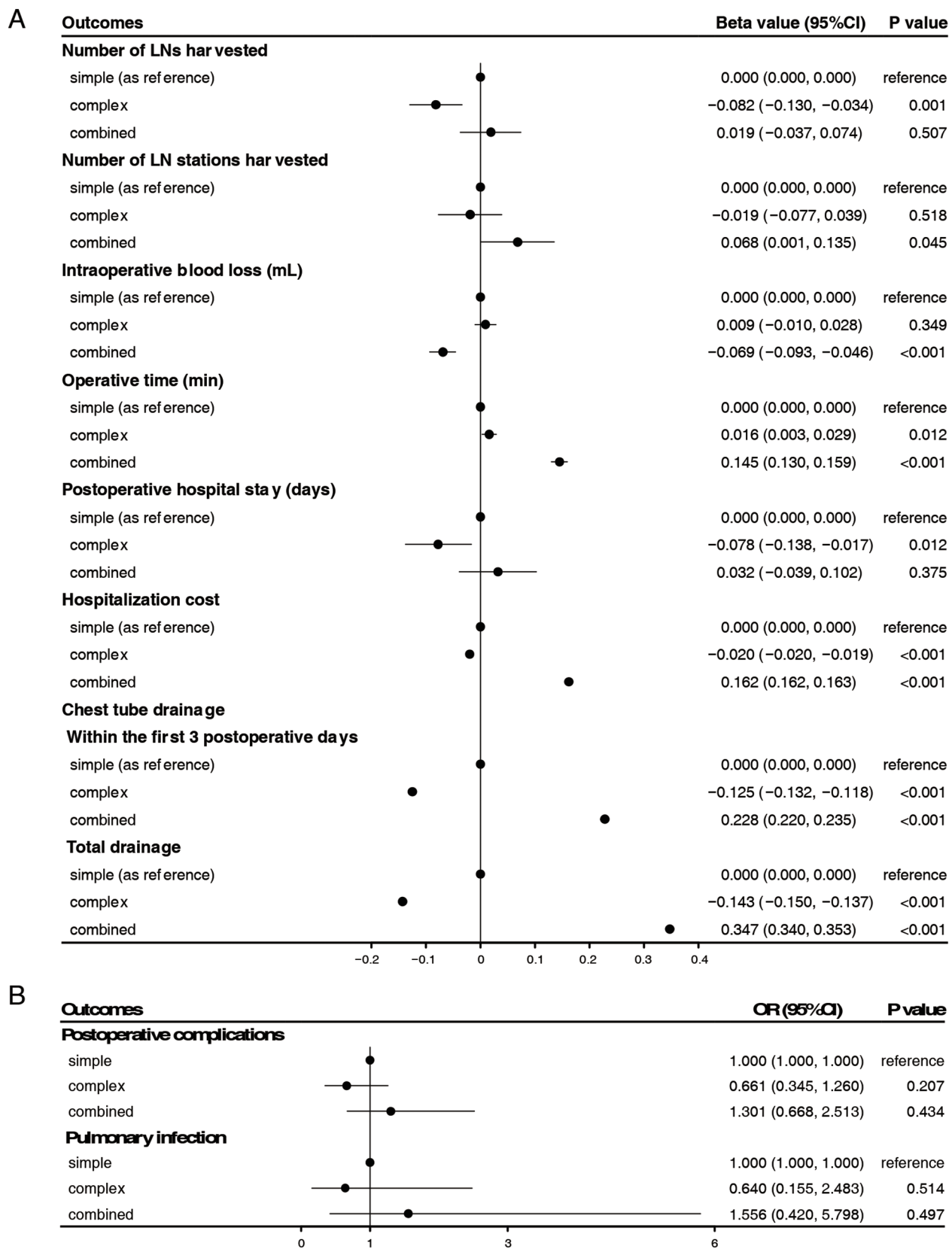
Data were presented as mean ± SD or number (percentage %). LNs, lymph nodes.



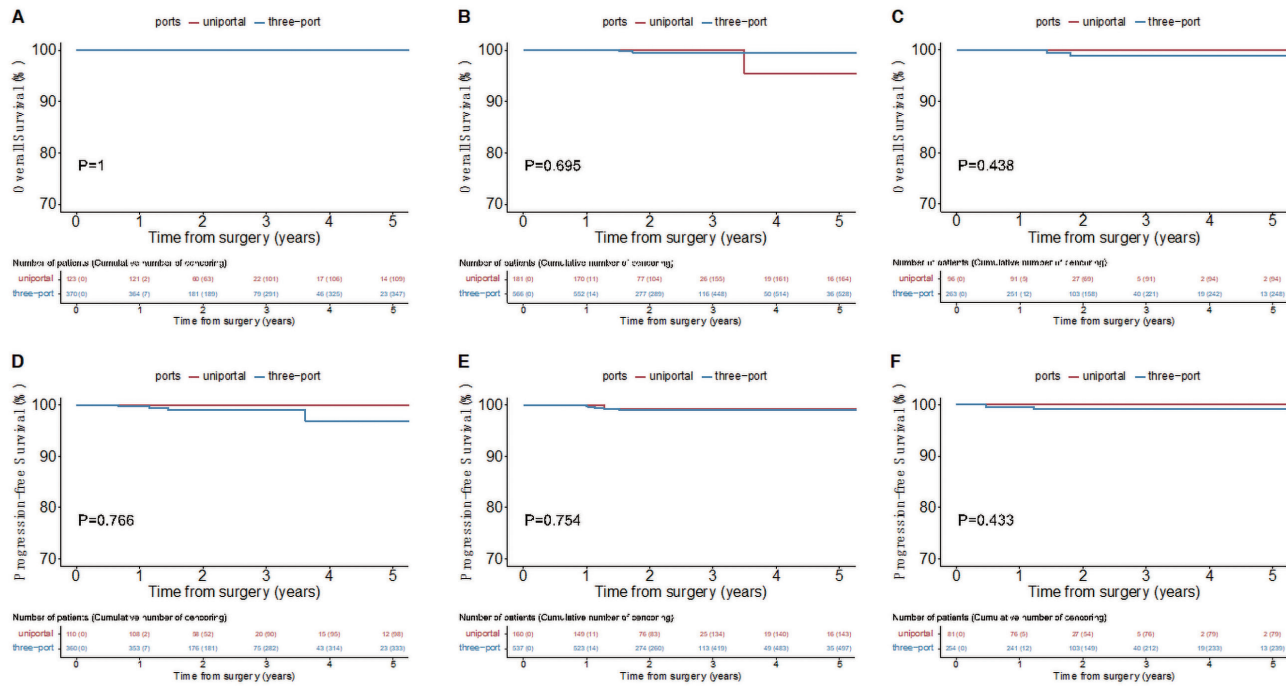
**Figure S1** Trend in operation related variables by year. Red solid line indicated uniportal thoroscopic segmentectomy, blue solid line indicated three-port segmentectomy. Black dotted line represented proportion of uniportal thoroscopic segmentectomies to thoroscopic segmentectomies. (A) Number of cases, ratio of uniportal cases to overall cases. (B) Mean number of lymph nodes dissected. (C) Mean number of lymph node stations dissected. (D) mean intraoperative blood loss. (E) mean operative time. (F) mean postoperative hospital stay.



**Figure S2** Incidence of complications in uniportal and three-port groups. Red solid line represented uniportal thoroscopic segmentectomy, blue solid line represented three-port segmentectomy. Overall incidence of complications, incidence of pulmonary infection, persistent air leakage, chylothorax, and other complications had no significant difference between the two groups.



**Figure S3** Forest plot showing the association between segmentectomy subtypes and perioperative outcomes, adjusting age, sex, percentage of predicted forced expiratory volume in one second, predicted carbon monoxide diffusing capacity, tumor size, pleural adhesion, development of intralobular fissures, surgeons, and surgery date (year). LNs, lymph nodes.



**Figure S4** Survival curves in subgroups of simple, complex, and combined segmentectomies. Red solid line represented uniportal thoracoscopic segmentectomy, blue solid line represented three-port segmentectomy. (A-C) Overall survival curves in subgroups of simple, complex, and combined segmentectomy. (D-F) Progression-free survival curves in subgroups of simple, complex, and combined segmentectomy. Confidence limit, 95%.