Supplementary

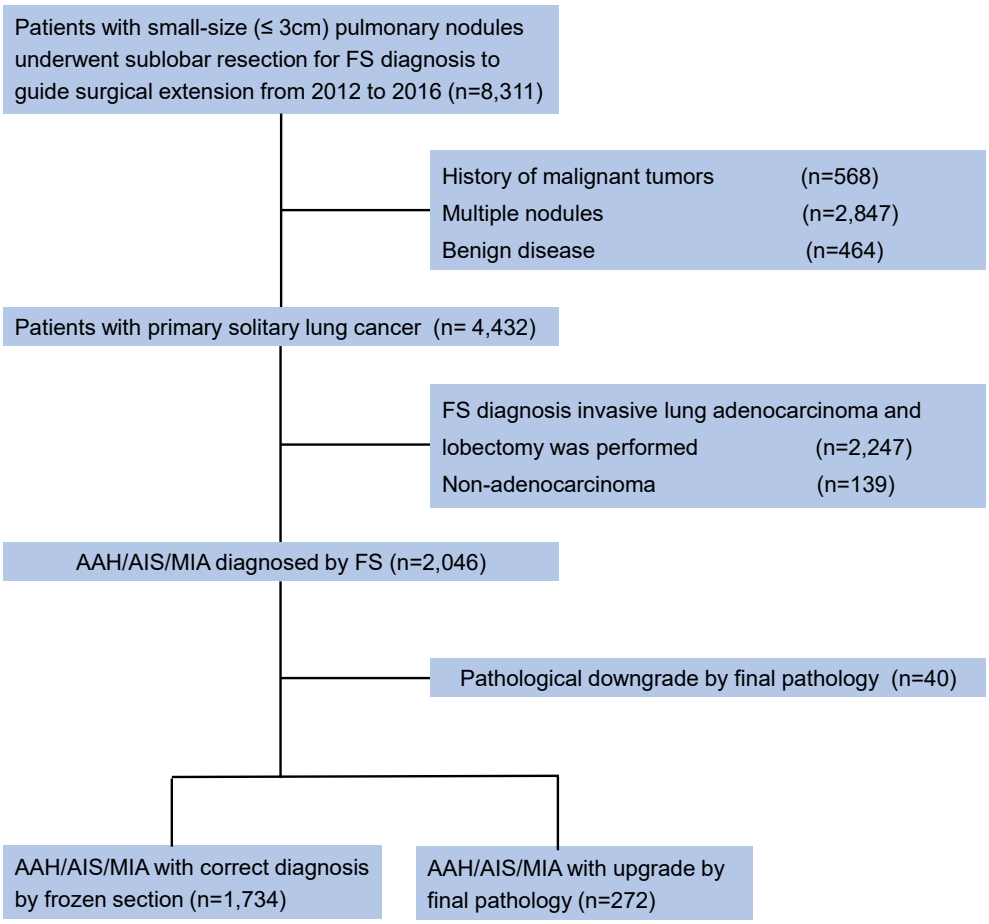

Figure S1 The flowchart of the patient's selection. A total of 8,311 patients with pulmonary nodules who underwent sublobar resection for frozen section (FS) diagnosis to guide surgical extension were identified from January 2012 to December 2016. After exclusion, 2006 patients were included in this study.

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Table S1 The comparison of clinicopathological features between invasive adenocarcinomas with correct diagnosis by FS and 63 invasive adenocarcinomas with underestimation by FS.

Characteristics	IA underestimated by FS (n=63)	IA correctly diagnosed by FS (n=2153)	P
Age, years, No. (%)			0.538
<60	36 (57.1)	1313 (60.9)	
≥60	27 (42.9)	840 (39.1)	
Gender, No. (%)			0.957
Male	27 (42.9)	930 (43.2)	
Female	36 (57.1)	1223 (56.8)	
Smoking history, No. (%)			0.785
Ever/current	10 (15.9)	370 (17.2)	
Never	53 (84.1)	1783 (82.8)	
Preoperative CEA			0.719
≤5 ng/mL	55 (87.3)	1845 (85.7)	
>5 ng/mL	8 (12.7)	308 (14.3)	
Radiologic measurements (on CT)			
Whole tumor size, cm	1.47±0.45	1.58±0.35	0.044
Solid component size, cm	0.71±0.46	0.83±0.34	0.036
CTR	0.48±0.26	0.53±0.17	0.063
Primary tumor location, No. (%)			0.486
Upper and Middle lobe	37 (58.7)	1169 (54.3)	
Lower lobe	26 (41.3)	984 (45.7)	
Pathological tumor size, cm	1.17±0.45	1.25±0.33	0.103
Total LN removed	3.69±4.85	4.34±2.46	0.044
VATS, No. (%)			0.617
Yes	57 (90.5)	1985 (92.2)	
No	6 (9.5)	168 (7.8)	
VPI, No. (%)			0.068
Yes	2 (3.2)	219 (10.2)	
No	61 (96.8)	1934 (89.8)	
STAS, No. (%)			0.177
Yes	1 (1.6)	118 (5.5)	
No	62 (98.4)	2035 (94.5)	
LN positive, No. (%)			0.143
Yes	0 (0)	71 (3.3)	
No	63(100)	2082 (96.7)	
Postoperative chemotherapy, No. (%)			0.575
Yes	7 (11.1)	292 (13.6)	
No	56 (88.9)	1861 (86.4)	

IA, invasive adenocarcinoma; CT, computed tomography; LN, lymph node; CTR, consolidation-to-tumor ratio; VATS, video-assisted thoracic surgery; VPI, visceral pleural invasion; STAS, tumor spread through air space.

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Table S2 The characteristics and outcomes of thirteen patients received complementary treatment

Patients	Age	Gender	FS diagnosis	Tumor size, pathological	Pathological characteristics	Surgical procedure	Complementary treatment	Recurrence
1	56	Male	MIA	1.3 cm	Lepidic-pre, MP (+)	Segmentectomy	Lobectomy and systematic LN dissection	No
2	60	Male	AIS	1.1 cm	Lepidic-pre	Wedge resection	Lobectomy and systematic LN dissection	No
3	53	Female	MIA	0.9 cm	Lepidic-pre	Wedge resection	Lobectomy and systematic LN dissection	No
4	64	Male	MIA	0.9 cm	Lepidic-pre	Segmentectomy	Lobectomy and systematic LN dissection	No
5	63	Female	MIA	1.2 cm	Acinar-pre; MP (+)	Wedge resection	Lobectomy and systematic LN dissection	No
6	71	Female	MIA	1.0 cm	Lepidic-pre	Wedge resection	Two cycles chemotherapy, carboplatin combined with pemetrexed	No
7	61	Female	MIA	1.4 cm	Papillary-pre; VPI (+)	Segmentectomy	Two cycles chemotherapy, carboplatin combined with pemetrexed	No
8	59	Male	MIA	1.2 cm	Lepidic-pre	Wedge resection	Two cycles chemotherapy, carboplatin combined with pemetrexed	No
9	56	Male	MIA	1.3 cm	Lepidic-pre;	Wedge resection	Two cycles chemotherapy, carboplatin combined with pemetrexed	No
10	68	Female	MIA	0.8 cm	Lepidic-pre	Wedge resection	Two cycles chemotherapy, carboplatin combined with paclitaxel	No
11	65	Female	AIS	0.9 cm	Lepidic-pre	Wedge resection	Two cycles chemotherapy, carboplatin combined with vinorelbine	No
12	70	Female	MIA	1.6 cm	Lepidic-pre	Segmentectomy	Two cycles chemotherapy, carboplatin combined with paclitaxel	No
13	52	Male	MIA	1.3 cm	Lepidic-pre	Segmentectomy	Two cycles chemotherapy, carboplatin combined with vinorelbine	No

AIS, adenocarcinoma in situ; MIA, minimally invasive adenocarcinoma; pre, predominant; LN, lymph node; MP, micropapillary; VPI, visceral pleural invasion; pre, predominant.

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