

Table S1 Clinical characteristics of all patients enrolled

Clinical characteristics	All (n=150)
Age, median (range)	62 (26-89)
Sex, n (%)	
Male	122 (81.3)
Female	28 (18.7)
Smoking history, n (%)	
Current/former	70 (46.7)
Never	80 (53.3)
Clinical stage, n (%)	
Stage II	3 (2.0)
Stage III	97 (64.7)
Stage IV	50 (33.3)
Pathological category, n (%)	
Squamous cell carcinoma	84 (56.0)
Adenocarcinoma	26 (17.3)
Small cell lung cancer	7 (4.7)
Adenocystic carcinoma	11 (7.3)
Mucoepidermoid carcinoma	1 (0.7)
Malignancy with other or unspecific types	21 (14.0)
Interventional surgery, n (%)	
Electrocoagulation alone	76 (50.7)
Stent alone	25 (16.7)
Laser alone	3 (2.0)
Electrosurgical snare	1 (0.7)
Combined therapy	45 (30.0)
*Lesion site, n (%)	
Trachea	51 (34.0)
Carina	15 (10.0)
Right principal bronchus	47 (31.3)
Right middle bronchus	18 (12.0)
Left principal bronchus	46 (30.7)
Lobar bronchus	14 (9.3)
Airway stenosis classification, n (%)	
External compression type	13 (8.7)
Intraluminal type	36 (24.0)
Mixed stenosis	101 (67.3)

The “*” indicates patients with more than one surgical site.

Table S2 Clinical characteristics of the cohort for studying short and intermediate efficacy

Clinical characteristics	Dataset (n=98)
Age, median (range)	62 (26-89)
Sex, n (%)	
Male	78 (79.6)
Female	20 (20.4)
Smoking history, n (%)	
Current/former	45 (45.9)
Never	53 (54.1)
Clinical stage, n (%)	
Stage I	0 (0.0)
Stage II	2 (2.0)
Stage III	66 (67.3)
Stage IV	30 (30.6)
Pathological category, n (%)	
Squamous cell carcinoma	60 (61.2)
Adenocarcinoma	16 (16.3)
Small cell lung cancer	3 (3.1)
Adenocystic carcinoma	8 (8.2)
Mucoepidermoid carcinoma	0 (0.0)
Malignancy with other or unspecific types	11 (11.2)
Interventional surgery, n (%)	
Electrocoagulation alone	50 (51.0)
Stent alone	14 (14.3)
Laser alone	3 (3.1)
Electrosurgical snare	1 (1.0)
Combined therapy	30 (30.6)
*Lesion site, n (%)	
Trachea	28 (28.6)
Carina	13 (13.3)
Right principal bronchus	32 (32.7)
Right middle bronchus	13 (13.3)
Left principal bronchus	31 (31.6)
Lobar bronchus	13 (13.3)
Airway stenosis classification, n (%)	
External compression type	8 (8.2)
Intraluminal type	19 (19.4)
Mixed stenosis	71 (72.4)

The “*” indicates patients with more than one surgical site.

Table S3 Regression analysis for short and intermediate benefits

Variables	Univariate		
	Odds ratio	95% CI	P value
Age (<65 y vs. ≥65 y)	2.040	0.860-4.837	0.106
Sex (female vs. male)	0.825	0.293-2.328	0.717
Smoking status (nonsmoker vs. smoker)	1.398	0.595-3.284	0.442
Clinical stage (II-III vs. IV)	2.124	0.863-5.230	0.101
Stenosis classification			0.395
Endobronchial vs. mix	1.522	0.491-4.717	0.467
Extrinsic vs. mix	3.804	0.443-32.697	0.223
Interventional bronchoscopy			0.520
Stenting vs. electrocoagulation	4.000	0.807-19.818	0.090
Electrocoagulation + stenting vs. electrocoagulation	1.778	0.420-7.522	0.434
Electrocoagulation + electrosurgical snare vs. electrocoagulation	1.111	0.348-3.543	0.859
Electrocoagulation + stenting + electrosurgical snare vs. electrocoagulation	1076983228.567	0.000-undefined	0.999

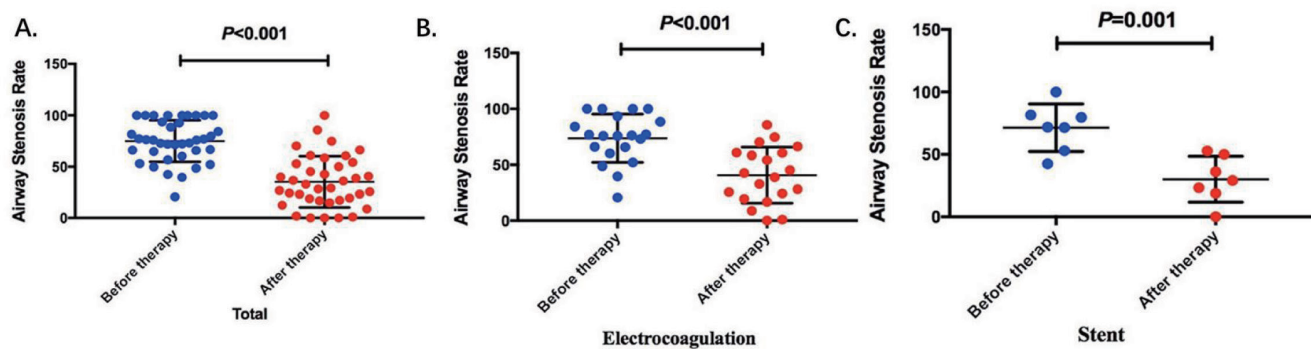


Figure S1 Short-term benefit. A significant difference of stenosis rate was observed before and after receiving treatment of (A) interventional bronchoscopy, (B) electrocoagulation, and (C) stenting in 38 MAO patients. MAO, malignant airway obstruction.

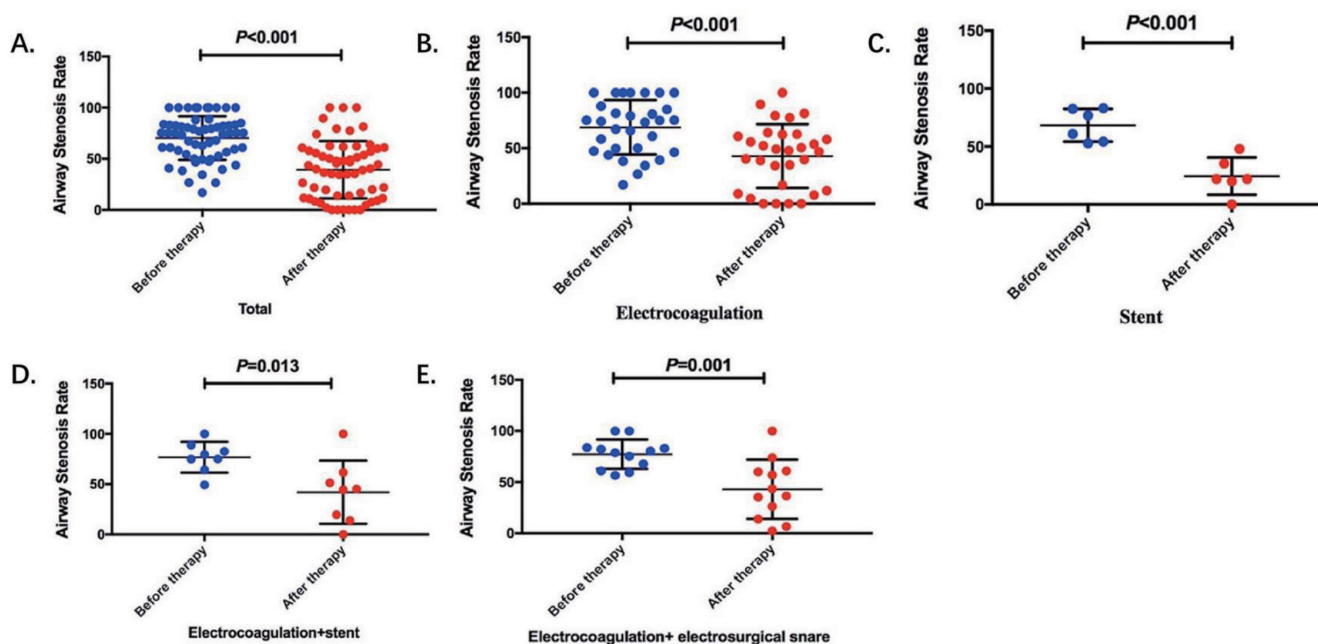


Figure S2 Intermediate benefit. A significant difference of stenosis rate was observed before and after receiving treatment of (A) interventional bronchoscopy, (B) electrocoagulation, (C) stenting, (D) electrocoagulation + stenting, and (E) electrocoagulation + electrosurgical snare in 60 MAO patients. MAO, malignant airway obstruction.

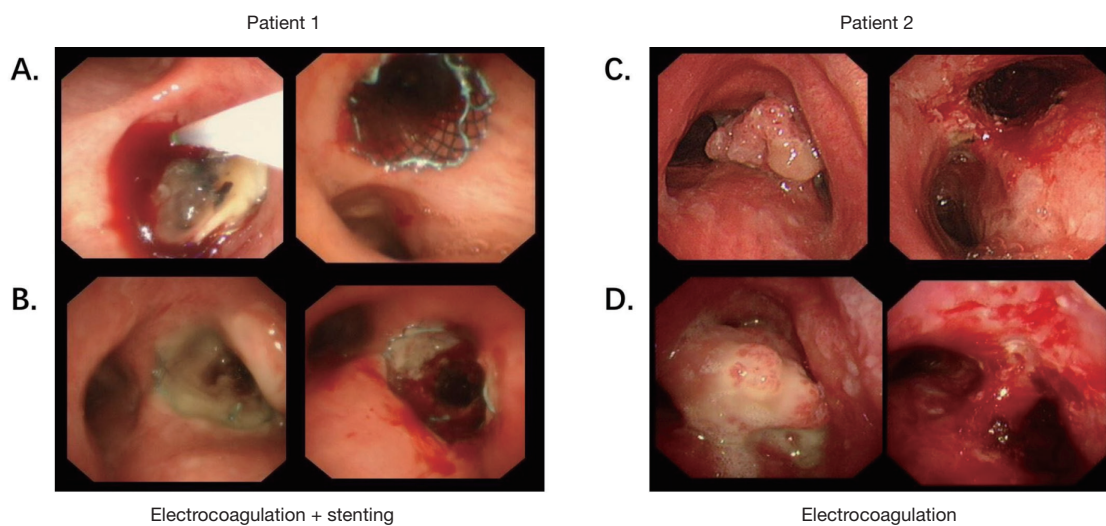


Figure S3 Lumen restenosis. For patient 1 and 2, Figure (A and C) were the diagrams before and after the first bronchoscopy treatment, which showed that the operations were very successful (A,C). However, with continuous follow-up, lumen restenosis was observed, and the second therapy was further performed (B and D).

Table S4 Correlation of clinical factors and OS in MAO (n=112)

Characteristic	Log-rank (Mantel-Cox)		Median survival	
	Chi square	P value	value	95% CI
Age	8.297	0.004	614.000	269.876-958.124
<65			1065.000	Undefined
≥65			288.000	121.514-454.486
Gender	1.778	0.182	614.000	269.876-958.124
Female			905.000	277.026-1532.974
Male			469.000	281.883-656.117
Smoking status	7.945	0.005	614.000	269.876-958.124
Non-smoker			905.000	555.485-1254.515
Smoker			396.000	212.888-579.112
Stage	0.535	0.465	614.000	269.876-958.124
Stage II-III			618.000	216.379-1019.621
Stage IV			614.000	83.877-1144.123
Stenosis site	3.664	0.056	614.000	269.876-958.124
Trachea and carina			905.000	593.269-1216.731
Bronchus			411.000	231.062-590.938
Airway stenosis classification	5.964	0.051	614.000	269.876-958.124
Endobronchial			1065.000	Undefined
Extrinsic			248.000	179.803-316.197
Mixed			532.000	321.001-742.999
Preoperative stenosis rate	7.410	0.006	614.000	269.876-958.124
Low			836.000	520.704-1151.296
High			235.000	123.874-346.126
Preoperative stenosis length	2.537	0.111	614.000	269.876-958.124
Low			816.000	465.171-1166.829
High			428.000	77.834-778.166
Respiratory failure before bronchoscopy	0.023	0.880	614.000	269.876-958.124
Yes			396.000	Undefined
No			614.000	269.443-958.557
Chemotherapy after interventional bronchoscopy	0.099	0.753	614.000	269.876-958.124
Yes			836.000	234.825-1437.175
No			614.000	363.274-864.726
Radiotherapy after interventional bronchoscopy	2.071	0.150	614.000	269.876-958.124
Yes			836.000	421.277-1250.723
No			428.000	154.464-701.536
Targeted therapy after interventional bronchoscopy	1.860	0.173	614.000	269.876-958.124
Yes			Undefined	Undefined
No			614.000	278.940-949.060
Immunotherapy after interventional bronchoscopy	2.110	0.146	614.000	269.876-958.124
Yes			178.000	167.735-188.265
No			816.000	451.647-1180.353

OS, overall survival; MAO, malignant airway obstruction.

Table S5 Clinical characteristics of the external validation cohort

Clinical characteristics	All (n=33)
Age, median (range)	65 (45-83)
Sex, n (%)	
Male	27 (81.8)
Female	6 (18.2)
Smoking history, n (%)	
Current/former	25 (75.8)
Never	8 (24.2)
Clinical stage, n (%)	
Stage I	0 (0.0)
Stage II	1 (3.0)
Stage III	17 (51.5)
Stage IV	15 (45.5)
Pathological category, n (%)	
Squamous cell carcinoma	21 (63.6)
Adenocarcinoma	6 (18.2)
Small cell lung cancer	1 (3.0)
Large cell lung cancer	2 (6.1)
Sarcoma	2 (6.1)
Mucoepidermoid carcinoma	1 (3.0)
Interventional surgery, n (%)	
Electrocoagulation alone	10 (30.3)
Stent alone	2 (6.1)
Laser alone	1 (3.0)
Combined therapy	20 (60.6)
*Lesion site, n (%)	
Trachea and carina	8 (24.2)
Bronchus	31 (93.9)
Airway stenosis classification, n (%)	
External compression type	2 (6.1)
Intraluminal type	17 (51.5)
Mixed stenosis	14 (42.4)
Chemotherapy after interventional bronchoscopy, n (%)	
Yes	11 (33.3)
No	22 (66.7)
Radiotherapy after interventional bronchoscopy, n (%)	
Yes	3 (9.1)
No	30 (90.9)
Targeted therapy after interventional bronchoscopy, n (%)	
Yes	3 (9.1)
No	30 (90.9)
Immunotherapy after interventional bronchoscopy, n (%)	
Yes	3 (9.1)
No	30 (90.9)

The “*” indicates patients with more than one surgical site.

Table S6 Correlation of clinical factors and OS in the external validation cohort

Characteristic	Log-rank (Mantel-Cox)		Median survival	
	Chi square	P-value	value	95% CI
Age	1.406	0.236		
<65			115	0.000-333.966
≥65			122	0.000-271.372
Gender	2.061	0.151		
Female			72	0.000-171.960
Male			160	26.328-293.672
Smoking status	0.036	0.850		
Non-smoker			115	9.378-220.622
Smoker			122	0.000-307.022
Clinical stage	0.022	0.882		
II-III			183.000	0.000-415.516
IV			94.000	0.000-196.500
Airway stenosis classification	8.080	0.018		
Intraluminal type			270	90.328-449.672
External compression type			13	undefined
Mixed stenosis			115	0.000-266.933
Stenosis rate	2.405	0.121		
Low			55	14.820-95.180
High			160	26.328-293.672
Stenosis length	5.991	0.014		
Low			313	137.132-488.868
High			65	0.000-161.295
Chemotherapy after interventional bronchoscopy	0.003	0.959		
Yes			223.000	0.000-482.190
No			115.000	0.000-233.320
Radiotherapy after interventional bronchoscopy	1.252	0.263		
Yes			55.000	Undefined
No			160.000	11.759-308.241
Targeted therapy after interventional bronchoscopy	0.179	0.672		
Yes			325.000	Undefined
No			122.000	18.700-225.300
Immunotherapy after interventional bronchoscopy	1.134	0.287		
Yes			55.000	19.793-90.207
No			160.000	58.321-261.679

OS, overall survival.