

Table S1: Other pathological components in the C-SCLC.

Pathology	N (%)
Adenocarcinoma	2 (6.06)
Large cell carcinoma	1 (3.03)
Non-small cell lung cancer	1 (3.03)
Squamous	1 (3.03)

Table S2: Chemotherapy regimens for neoadjuvant group patients.

Chemotherapy	N (%)
AC	1 (3.03)
PC	1 (3.03)
EC	26 (78.79)
EN	2 (6.06)
EP	2 (6.06)
IP	1 (3.03)

AC: Pemetrexed disodium + Carboplatin; PC: Paclitarel + Carboplatin; EC: Etoposide + Carboplatin; EN: Etoposide + Nedaplatin; EP: Etoposide + Cisplatin; IP: Irinotecan + Cisplatin.

Table S3: Specific immune checkpoint inhibitors for neoadjuvant group patients.

ICI	N (%)
ADE	6 (18.18)
ATE	5 (15.15)
BEN	14 (42.42)
CAM	1 (3.03)
Unknown	1 (3.03)
SER	1 (3.03)
SIN	1 (3.03)
TIS	3 (9.09)
TOR	1 (3.03)

ADE: Adebrelimab; ATE: Atezolizumab; BEN: Benmelstobart; CAM: Camrelizumab; SER: Serplulimab; SIN: Sintilimab; TIS: Tislelizumab; TOR: Toripalimab.

Table S4: Chemotherapy regimens for chemoradiotherapy group patients.

Regimens, n(%)	Total (n = 82)
PN	1 (1.22)
EC	48 (58.54)
EC+IO	2 (2.44)
EL	8 (9.76)
EN	6 (7.32)
EP	15 (18.29)
EP+IO	1 (1.22)
IC	1 (1.22)

PN: Paclitarel + Nedaplatin; EC: Etoposide + Carboplatin; IO: Immunotherapy; EL: Etoposide + Lobaplatin; EN: Etoposide + Nedaplatin; EP: Etoposide + Cisplatin; IC: Irinotecan + Carboplatin.

Table S5: Surgery summary in the neoadjuvant group.

Variables	Total (n = 33)
Residual viable tumor, Mean ± SD	26.80 ± 32.96
Percentage of necrosis, Mean ± SD	7.03 ± 17.41
Mesenchyme percentage, Mean ± SD	67.15 ± 34.45
Extent of surgery, n(%)	
Lobectomy	33 (100.00)
Surgical approach, n(%)	
RATS	2 (6.06)
Thoracotomy	3 (9.09)
VATS	28 (84.85)
R0 resection, n(%)	
Yes	25 (75.76)
No	8 (24.24)
Pathologic T stage, n(%)	
0	11 (33.33)
1a	5 (15.15)
1b	10 (30.30)
1c	5 (15.15)
3	2 (6.06)
Pathologic N stage, n(%)	
0	24 (72.73)
1	3 (9.09)
2	6 (18.18)
Pathologic M stage, n(%)	
0	33 (100.00)
Inflammation level, n(%)	
Mild	15 (45.45)

Moderate	14 (42.42)
Unknown	4 (12.12)
Pleural infiltration, n(%)	
No	33 (100.00)
Nerve infiltration, n(%)	
No	32 (96.97)
Yes	1 (3.03)
Intravascular cancer embolus, n(%)	
No	29 (87.88)
Yes	4 (12.12)
Vascular invasion, n(%)	
No	32 (96.97)
Yes	1 (3.03)
Surgical margin, n(%)	
Negative	33 (100.00)

SD: standard deviation; RATS: robot-assisted thoracic surgery; VATS: video-assisted thoracoscopic surgery.

Table S6: Summary of adjuvant therapy in the neoadjuvant group

Variables	No. of patient (%)
Adjuvant regimens, n(%)	
CT	3 (9.09)
CT+ICI	28 (84.85)
No	2 (6.06)
Adjuvant cycle, n(%)	
1	1 (3.03)
2	21 (63.64)
3	7 (21.21)
4	2 (6.06)
No	2 (6.06)
ICI maintenance, n(%)	
No	8 (24.24)
Yes	24 (72.73)
Unknown	1 (3.03)

CT: chemotherapy; ICI: immune checkpoint inhibitor.

Table S7: Fisher's exact test of pathologic remission differences between CPR, MPR, and N-MPR across subgroups.

Variables	Total (n = 32)	CPR (n = 10)	MPR (n = 8)	N-MPR (n = 14)	Statistic	p-value
Sex, n(%)					-	0.226
Female	5 (15.62)	1 (10.00)	0 (0.00)	4 (28.57)		
Male	27 (84.38)	9 (90.00)	8 (100.00)	10 (71.43)		
Median age, n(%)					-	0.17
<Median	16 (50.00)	7 (70.00)	2 (25.00)	7 (50.00)		
≥Median	16 (50.00)	3 (30.00)	6 (75.00)	7 (50.00)		
Smoking, n(%)					-	0.595
No	14 (43.75)	5 (50.00)	2 (25.00)	7 (50.00)		
Yes	18 (56.25)	5 (50.00)	6 (75.00)	7 (50.00)		
ECOG PS, n(%)					-	0.896
0	21 (65.62)	6 (60.00)	6 (75.00)	9 (64.29)		
1	11 (34.38)	4 (40.00)	2 (25.00)	5 (35.71)		
Histology, n(%)					-	0.226
C-SCLC	5 (15.62)	1 (10.00)	0 (0.00)	4 (28.57)		
P-SCLC	27 (84.38)	9 (90.00)	8 (100.00)	10 (71.43)		
Clinical T stage, n(%)					-	0.568
1	6 (18.75)	1 (10.00)	2 (25.00)	3 (21.43)		
2	5 (15.62)	1 (10.00)	1 (12.50)	3 (21.43)		
3	4 (12.50)	0 (0.00)	1 (12.50)	3 (21.43)		
4	17 (53.12)	8 (80.00)	4 (50.00)	5 (35.71)		
Clinical N stage, n(%)					-	0.489
0	2 (6.25)	0 (0.00)	1 (12.50)	1 (7.14)		
1	8 (25.00)	3 (30.00)	3 (37.50)	2 (14.29)		
2	22 (68.75)	7 (70.00)	4 (50.00)	11 (78.57)		
Clinical stage, n(%)					-	0.244
IIB	2 (6.25)	0 (0.00)	2 (25.00)	0 (0.00)		
IIIA	18 (56.25)	5 (50.00)	4 (50.00)	9 (64.29)		
IIIB	12 (37.50)	5 (50.00)	2 (25.00)	5 (35.71)		
Neoadjuvant cycle, n(%)					-	0.414
2_3	7 (21.88)	1 (10.00)	1 (12.50)	5 (35.71)		
4	23 (71.88)	8 (80.00)	6 (75.00)	9 (64.29)		
5_6	2 (6.25)	1 (10.00)	1 (12.50)	0 (0.00)		
Regimens of chemotherapy, n(%)					-	0.756
AC	1 (3.12)	0 (0.00)	0 (0.00)	1 (7.14)		
PC	1 (3.12)	0 (0.00)	0 (0.00)	1 (7.14)		
EC	26 (81.25)	9 (90.00)	6 (75.00)	11 (78.57)		
EN	2 (6.25)	1 (10.00)	1 (12.50)	0 (0.00)		
EP	1 (3.12)	0 (0.00)	0 (0.00)	1 (7.14)		
IP	1 (3.12)	0 (0.00)	1 (12.50)	0 (0.00)		
ICI type, n(%)					-	0.516
PD-1	6 (19.35)	1 (10.00)	1 (12.50)	4 (30.77)		
PD-L1	25 (80.65)	9 (90.00)	7 (87.50)	9 (69.23)		

-: Fisher exact; C-SCLC: combined small cell lung cancer; P-SCLC: pure small cell lung cancer; ICI: immune checkpoint inhibitor; AC: Pemetrexed disodium + Carboplatin; PC: Paclitarel + Carboplatin; EC: Etoposide + Carboplatin; EN: Etoposide + Nedaplatin; EP: Etoposide + Cisplatin; IP: Irinotecan + Cisplatin; PD-1: programmed cell death 1; PD-L1: programmed cell death-ligand 1.

Table S8: Fisher's exact test of pathologic remission differences between MPR and N-MPR across subgroups.

Variables	Total (n = 32)	MPR (n = 18)	N-MPR (n = 14)	Statistic	p-value
Sex, n(%)				-	0.142
Female	5 (15.62)	1 (5.56)	4 (28.57)		
Male	27 (84.38)	17 (94.44)	10 (71.43)		
Median age, n(%)				-	1
<Median	16 (50.00)	9 (50.00)	7 (50.00)		
≥Median	16 (50.00)	9 (50.00)	7 (50.00)		
Smoking, n(%)				-	0.721
No	14 (43.75)	7 (38.89)	7 (50.00)		
Yes	18 (56.25)	11 (61.11)	7 (50.00)		
ECOG PS, n(%)				-	1
0	21 (65.62)	12 (66.67)	9 (64.29)		
1	11 (34.38)	6 (33.33)	5 (35.71)		
Histology, n(%)				-	0.142
C-SCLC	5 (15.62)	1 (5.56)	4 (28.57)		
P-SCLC	27 (84.38)	17 (94.44)	10 (71.43)		
Clinical T stage, n(%)				-	0.323
1	6 (18.75)	3 (16.67)	3 (21.43)		
2	5 (15.62)	2 (11.11)	3 (21.43)		
3	4 (12.50)	1 (5.56)	3 (21.43)		
4	17 (53.12)	12 (66.67)	5 (35.71)		
Clinical N stage, n(%)				-	0.603
0	2 (6.25)	1 (5.56)	1 (7.14)		
1	8 (25.00)	6 (33.33)	2 (14.29)		
2	22 (68.75)	11 (61.11)	11 (78.57)		
Clinical stage, n(%)				-	0.54
IIB	2 (6.25)	2 (11.11)	0 (0.00)		
IIIA	18 (56.25)	9 (50.00)	9 (64.29)		
IIIB	12 (37.50)	7 (38.89)	5 (35.71)		
Neoadjuvant cycle, n(%)				-	0.147
2_3	7 (21.88)	2 (11.11)	5 (35.71)		
4	23 (71.88)	14 (77.78)	9 (64.29)		
5_6	2 (6.25)	2 (11.11)	0 (0.00)		
Regimens of chemotherapy, n(%)				-	0.253
AC	1 (3.12)	0 (0.00)	1 (7.14)		
PC	1 (3.12)	0 (0.00)	1 (7.14)		
EC	26 (81.25)	15 (83.33)	11 (78.57)		
EN	2 (6.25)	2 (11.11)	0 (0.00)		
EP	1 (3.12)	0 (0.00)	1 (7.14)		
IP	1 (3.12)	1 (5.56)	0 (0.00)		
ICI type, n(%)				-	0.208
PD-1	6 (19.35)	2 (11.11)	4 (30.77)		
PD-L1	25 (80.65)	16 (88.89)	9 (69.23)		

-: Fisher exact; C-SCLC: combined small cell lung cancer; P-SCLC: pure small cell lung cancer; ICI: immune checkpoint inhibitor; AC: Pemetrexed disodium + Carboplatin; PC: Paclitarel + Carboplatin; EC: Etoposide + Carboplatin; EN: Etoposide + Nedaplatin; EP: Etoposide + Cisplatin; IP: Irinotecan + Cisplatin; PD-1: programmed cell death 1; PD-L1: programmed cell death-ligand 1.

Table S9: Fisher's exact test of pathologic remission differences between CPR and N-CPR across subgroups.

Variables	Total (n = 32)	CPR (n = 10)	N-CPR (n = 22)	Statistic	p-value
Sex, n(%)				-	1
Female	5 (15.62)	1 (10.00)	4 (18.18)		
Male	27 (84.38)	9 (90.00)	18 (81.82)		
Age median, n(%)				-	0.252
<Median	16 (50.00)	7 (70.00)	9 (40.91)		
≥Median	16 (50.00)	3 (30.00)	13 (59.09)		
Smoking, n(%)				-	0.712
No	14 (43.75)	5 (50.00)	9 (40.91)		
Yes	18 (56.25)	5 (50.00)	13 (59.09)		
ECOG PS, n(%)				-	0.703
0	21 (65.62)	6 (60.00)	15 (68.18)		
1	11 (34.38)	4 (40.00)	7 (31.82)		
Histology, n(%)				-	1
C-SCLC	5 (15.62)	1 (10.00)	4 (18.18)		
P-SCLC	27 (84.38)	9 (90.00)	18 (81.82)		
Clinical T stage, n(%)				-	0.265
1	6 (18.75)	1 (10.00)	5 (22.73)		
2	5 (15.62)	1 (10.00)	4 (18.18)		
3	4 (12.50)	0 (0.00)	4 (18.18)		
4	17 (53.12)	8 (80.00)	9 (40.91)		
Clinical N stage, n(%)				-	1
0	2 (6.25)	0 (0.00)	2 (9.09)		
1	8 (25.00)	3 (30.00)	5 (22.73)		
2	22 (68.75)	7 (70.00)	15 (68.18)		
Clinical stage, n(%)				-	0.491
IIB	2 (6.25)	0 (0.00)	2 (9.09)		
IIIA	18 (56.25)	5 (50.00)	13 (59.09)		
IIIB	12 (37.50)	5 (50.00)	7 (31.82)		
Neoadjuvant cycle, n(%)				-	0.438
2_3	7 (21.88)	1 (10.00)	6 (27.27)		
4	23 (71.88)	8 (80.00)	15 (68.18)		
5_6	2 (6.25)	1 (10.00)	1 (4.55)		
ICI type, n(%)				-	0.634
PD-1	6 (19.35)	1 (10.00)	5 (23.81)		
PD-L1	25 (80.65)	9 (90.00)	16 (76.19)		
Regimens of chemotherapy, n(%)				-	1
AC	1 (3.12)	0 (0.00)	1 (4.55)		
PC	1 (3.12)	0 (0.00)	1 (4.55)		
EC	26 (81.25)	9 (90.00)	17 (77.27)		

EN	2 (6.25)	1 (10.00)	1 (4.55)
EP	1 (3.12)	0 (0.00)	1 (4.55)
IP	1 (3.12)	0 (0.00)	1 (4.55)

-: Fisher exact; C-SCLC: combined small cell lung cancer; P-SCLC: pure small cell lung cancer; ICI: immune checkpoint inhibitor; AC: Pemetrexed disodium + Carboplatin; PC: Paclitarel + Carboplatin; EC: Etoposide + Carboplatin; EN: Etoposide + Nedaplatin; EP: Etoposide + Cisplatin; IP: Irinotecan + Cisplatin; PD-1: programmed cell death 1; PD-L1: programmed cell death-ligand 1.

Table S10: Univariate and multivariate Cox regression analyses of the EFS across subgroups defined by various clinicopathologic characteristics in the neoadjuvant group.

Characteristic	Univariable					Multivariable				
	N	Event N	HR ¹	95% CI ¹	p-value	N	Event N	HR ¹	95% CI ¹	p-value
Sex										
Male	28	8	—	—		24	5	—	—	
Female	5	0	0	0.00, Inf	0.995	4	0	0	0.00, Inf	>0.999
Median age										
≥Median	17	4	—	—		15	2	—	—	
<Median	16	4	1.08	0.22, 5.33	0.922	13	3	9.24 ×10^06	0.00, Inf	>0.999
Smoking										
Yes	18	5	—	—		16	3	—	—	
No	15	3	0.65	0.13, 3.33	0.605	12	2	3.14	0.00, Inf	>0.999
ECOG PS										
0	21	3	—	—		20	3	—	—	
1	12	5	4.29	0.80, 22.92	0.089	8	2	0	0.00, Inf	>0.999
Histology										
P-SCLC	28	8	—	—		23	5	—	—	
C-SCLC	5	0	0	0.00, Inf	0.995	5	0	6.49 ×10^07	0.00, Inf	>0.999
Clinical stage										
IIB	2	0	—	—		2	0	—	—	
IIIA	19	7	2.48 ×10^07	0.00, Inf	0.995	15	5	6.14 ×10^22	0.00, Inf	>0.999
IIIB	12	1	3.87 ×10^06	0.00, Inf	0.996	11	0	3.32 ×10^06	0.00, Inf	>0.999
Pathologic stage										
0	10	1	—	—		9	0	—	—	
I	13	3	2.7	0.24, 30.84	0.424	12	3	1.57 ×10^16	0.00, Inf	>0.999
II	3	1	4.5	0.19, 106.81	0.352	2	0	5.08 ×10^21	0.00, Inf	>0.999
III	7	3	6.75	0.53, 86.55	0.142	5	2	2.57 ×10^16	0.00, Inf	>0.999
Neoadjuvant cycle										
2_3	8	2	—	—		4	0	—	—	
4	23	6	1.06	0.17, 6.74	0.952	22	5	0.01	0.00, Inf	>0.999
5_6	2	0	0	0.00, Inf	0.995	2	0	0	0.00, Inf	>0.999
ICI type										
PD-1	7	1	—	—		6	0	—	—	
PD-L1	25	7	2.33	0.24, 23.04	0.468	22	5	0	0.00, Inf	>0.999
Adjuvant regimens										
No	2	0	—	—		2	0	—	—	
CT	3	0	1	0.00, Inf	>0.999	3	0	0	0.00, Inf	>0.999

IIB	2	0	—	—		2	0	—	—	
IIIA	19	2	1.01 ×10^08	0.00, Inf	0.999	15	2	0	0.00, Inf	>0.999
IIIB	12	0	1	0.00, Inf	>0.999	11	0	0.01	0.00, Inf	>0.999
Pathologic stage										
0	10	0	—	—		9	0	—	—	
I	13	1	7.12 ×10^07	0.00, Inf	0.997	12	1	0	0.00, Inf	>0.999
II	3	0	1	0.00, Inf	>0.999	2	0	0	0.00, Inf	>0.999
III	7	1	1.42 ×10^08	0.00, Inf	0.997	5	1	3.62 ×10^21	0.00, Inf	>0.999
Neoadjuvant cycle										
2_3	8	0	—	—		4	0	—	—	
4	23	2	2.99 ×10^07	0.00, Inf	0.996	22	2	0	0.00, Inf	>0.999
5_6	2	0	1	0.00, Inf	>0.999	2	0	0	0.00, Inf	>0.999
ICI type										
PD-1	7	0	—	—		6	0	—	—	
PD-L1	25	2	2.73 ×10^07	0.00, Inf	0.997	22	2	3.17 ×10^48	0.00, Inf	>0.999
Adjuvant regimens										
No	2	0	—	—		2	0	—	—	
CT	3	0	1	0.00, Inf	>0.999	3	0	0	0.00, Inf	>0.999
CT+ICI	28	2	2.42 ×10^07	0.00, Inf	0.998	23	2	1.54 ×10^16	0.00, Inf	>0.999
ICI maintenance										
No	8	0	—	—		6	0	—	—	
Yes	24	2	2.86 ×10^07	0.00, Inf	0.996	22	2	0	0.00, Inf	>0.999
Surgical approach										
VATS	28	2	—	—		23	2	—	—	
RATS	2	0	0	0.00, Inf	0.998	2	0	0	0.00, Inf	>0.999
Thoracotomy	3	0	0	0.00, Inf	0.998	3	0	0	0.00, Inf	>0.999
RECIST										
SD	2	0	—	—		2	0	—	—	
PR	21	2	3.31 ×10^07	0.00, Inf	0.998	18	2	1.25 ×10^27	0.00, Inf	>0.999
CR	9	0	1	0.00, Inf	>0.999	8	0	1.96 ×10^27	0.00, Inf	>0.999
Pathological response										
N-MPR	14	1	—	—		11	1	—	—	
MPR	8	1	1.86	0.10, 34.44	0.678	8	1	2.44 ×10^17	0.00, Inf	>0.999
CPR	10	0	0	0.00, Inf	0.996	9	0			
Inflammation level										
Mild	15	0	—	—		15	0	—	—	
Moderate	14	2	1.42 ×10^08	0.00, Inf	0.997	13	2	6.32 ×10^29	0.00, Inf	>0.999

¹HR: Hazard Ratio; CI: Confidence Interval; C-SCLC: combined small cell lung cancer; P-SCLC: pure small cell lung cancer; ICI: immune checkpoint inhibitor; CT: chemotherapy; CR: complete response; PR: partial response; SD: stable disease; VATS: video-assisted thoracoscopic surgery; RATS: robot-assisted thoracic surgery; CPR: complete pathological response; MPR: major pathological response; N-MPR: non-major pathological response.

Table S12: Univariate and multivariate Cox regression analyses of the OS across subgroups defined by various clinicopathologic characteristics in all enrolled patients before PSM.

Variables	Univariable					Multivariable				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
Treatment										
CT+RT					1.00 (Reference)					1.00 (Reference)
Neoadjuvant chemoimmunotherapy+surgery	-1.83	0.72	-2.52	0.012	0.16 (0.04 ~ 0.66)	-1.99	0.75	-2.64	0.008	0.14 (0.03 ~ 0.60)
Sex										
Female					1.00 (Reference)					1.00 (Reference)
Male	0.86	0.47	1.83	0.068	2.36 (0.94 ~ 5.93)	1.29	0.53	2.44	0.015	3.64 (1.29 ~ 10.28)
Median age										
<Median					1.00 (Reference)					1.00 (Reference)
≥Median	0.28	0.27	1.02	0.31	1.32 (0.77 ~ 2.24)	-0.18	0.31	-0.57	0.571	0.84 (0.45 ~ 1.55)
Smoking										
No					1.00 (Reference)					1.00 (Reference)
Yes	0.01	0.29	0.03	0.977	1.01 (0.58 ~ 1.76)	-0.42	0.33	-1.27	0.202	0.66 (0.34 ~ 1.25)
ECOG PS										
0					1.00 (Reference)					1.00 (Reference)
1	0.38	0.28	1.37	0.172	1.47 (0.85 ~ 2.55)	0.65	0.34	1.94	0.052	1.92 (0.99 ~ 3.70)
Clinical T stage										
1					1.00 (Reference)					1.00 (Reference)
2	0.45	0.64	0.71	0.48	1.57 (0.45 ~ 5.45)	0.56	0.69	0.81	0.416	1.76 (0.45 ~ 6.81)
3	-0.05	0.64	-0.08	0.936	0.95 (0.27 ~ 3.33)	0.07	0.77	0.09	0.929	1.07 (0.24 ~ 4.80)
4	0.36	0.61	0.58	0.56	1.43 (0.43 ~ 4.77)	0.9	0.72	1.26	0.209	2.46 (0.60 ~ 10.01)
Clinical N stage										
0					1.00 (Reference)					1.00 (Reference)
1	-0.89	0.81	-1.11	0.268	0.41 (0.08 ~ 1.99)	-0.7	0.86	-0.81	0.415	0.49 (0.09 ~ 2.69)
2	-0.29	0.73	-0.41	0.685	0.74 (0.18 ~ 3.10)	-0.17	0.78	-0.22	0.823	0.84 (0.18 ~ 3.86)
RECIST										
CR					1.00 (Reference)					1.00 (Reference)
PD	0.85	0.79	1.08	0.281	2.33 (0.50 ~ 10.88)	0.58	0.8	0.72	0.47	1.78 (0.37 ~ 8.59)
PR	0.53	0.37	1.43	0.153	1.70 (0.82 ~ 3.54)	0.69	0.39	1.78	0.075	2.00 (0.93 ~ 4.27)
SD	1.07	0.49	2.18	0.029	2.92 (1.11 ~ 7.64)	1.18	0.56	2.11	0.035	3.26 (1.09 ~ 9.76)

HR: Hazard Ratio, CI: Confidence Interval; CR: complete response; PR: partial response; SD: stable disease; PD: progressive disease.

Table S13: Characteristics of patients before and after propensity score matching.

Variable	Before PSM						After PSM					
	Total (n = 124)	CT+RT (n = 91)	Neoadjuvant chemoimmunotherapy +surgery (n = 33)	Statistic	P	SMD	Total (n = 65)	CT+RT (n = 40)	Neoadjuvant chemoimmunotherapy +surgery (n = 25)	Statistic	P	SMD
Sex, n (%)				$\chi^2=0.009$	0.925					$\chi^2=0.000$	0.993	
Female	18 (15.65)	13 (15.85)	5 (15.15)			-0.02	14 (20.9)	9 (20.93)	5 (20.83)			-0.002
Male	97 (84.35)	69 (84.15)	28 (84.85)			0.02	53 (79.1)	34 (79.07)	19 (79.17)			0.002
Age median, n (%)				$\chi^2=2.257$	0.133					$\chi^2=0.361$	0.548	
<Median	57 (49.57)	37 (45.12)	20 (60.61)			0.317	33 (49.25)	20 (46.51)	13 (54.17)			0.154
≥Median	58 (50.43)	45 (54.88)	13 (39.39)			-0.317	34 (50.75)	23 (53.49)	11 (45.83)			-0.154
Smoking, n (%)				$\chi^2=1.014$	0.314					$\chi^2=0.017$	0.897	
No	44 (38.26)	29 (35.37)	15 (45.45)			0.203	30 (44.78)	19 (44.19)	11 (45.83)			0.033
Yes	71 (61.74)	53 (64.63)	18 (54.55)			-0.203	37 (55.22)	24 (55.81)	13 (54.17)			-0.033
ECOG PS, n (%)				$\chi^2=0.768$	0.381					$\chi^2=0.101$	0.751	
0	80 (69.57)	59 (71.95)	21 (63.64)			-0.173	49 (73.13)	32 (74.42)	17 (70.83)			-0.079
1	35 (30.43)	23 (28.05)	12 (36.36)			0.173	18 (26.87)	11 (25.58)	7 (29.17)			0.079
Clinical T stage, n (%)				$\chi^2=9.512$	0.023					-	0.844	
1	10 (8.7)	4 (4.88)	6 (18.18)			0.345	5 (7.46)	3 (6.98)	2 (8.33)			0.049
2	26 (22.61)	20 (24.39)	6 (18.18)			-0.161	18 (26.87)	13 (30.23)	5 (20.83)			-0.231
3	30 (26.09)	26 (31.71)	4 (12.12)			-0.6	7 (10.45)	4 (9.30)	3 (12.50)			0.097
4	49 (42.61)	32 (39.02)	17 (51.52)			0.25	37 (55.22)	23 (53.49)	14 (58.33)			0.098
Clinical N stage, n (%)				-	0.404					-	0.776	
0	5 (4.35)	3 (3.66)	2 (6.06)			0.101	3 (4.48)	2 (4.65)	1 (4.17)			-0.024
1	21 (18.26)	13 (15.85)	8 (24.24)			0.196	11 (16.42)	6 (13.95)	5 (20.83)			0.169
2	89 (77.39)	66 (80.49)	23 (69.70)			-0.235	53 (79.1)	35 (81.40)	18 (75.00)			-0.148
Clinical stage, n (%)				-	0.151					-	1	
IIB	6 (5.22)	4 (4.88)	2 (6.06)			0.05	1 (1.49)	1 (2.33)	0 (0.00)			-0.193
IIIA	51 (44.35)	32 (39.02)	19 (57.58)			0.375	35 (52.24)	22 (51.16)	13 (54.17)			0.06
IIIB	58 (50.43)	46 (56.10)	12 (36.36)			-0.41	31 (46.27)	20 (46.51)	11 (45.83)			-0.014
RECIST, n (%)				-	0.541					-	0.918	

CR	26 (22.81)	17 (20.73)	9 (28.12)	0.164	16 (23.88)	11 (25.58)	5 (20.83)	-0.117
PD	3 (2.63)	3 (3.66)	0 (0.00)	-0.23				
PR	72 (63.16)	51 (62.20)	21 (65.62)	0.072	46 (68.66)	29 (67.44)	17 (70.83)	0.075
SD	13 (11.4)	11 (13.41)	2 (6.25)	-0.296	5 (7.46)	3 (6.98)	2 (8.33)	0.049

CR: complete response; PR: partial response; SD: stable disease; PD: progressive disease.

Table S14: Univariate and multivariate Cox regression analyses of the OS across subgroups defined by various clinicopathologic characteristics in all enrolled patients after PSM.

Variables	Univariable					Multivariable				
	β	S.E	Z	P	HR (95%CI)	β	S.E	Z	P	HR (95%CI)
Treatment										
CT+RT					1.00 (Reference)					1.00 (Reference)
Neoadjuvant chemoimmunotherapy+surgery	-2.19	1.02	-2.14	0.032	0.11 (0.02 ~ 0.83)	-2.48	1.04	-2.38	0.018	0.08 (0.01 ~ 0.65)
Sex										
Female					1.00 (Reference)					1.00 (Reference)
Male	1.24	0.61	2.01	0.044	3.44 (1.03 ~ 11.46)	1.45	0.7	2.06	0.04	4.25 (1.07 ~ 16.88)
Median age										
<Median					1.00 (Reference)					1.00 (Reference)
≥Median	0.26	0.38	0.69	0.493	1.30 (0.61 ~ 2.75)	0.03	0.46	0.08	0.939	1.04 (0.42 ~ 2.53)
Smoking										
No					1.00 (Reference)					1.00 (Reference)
Yes	0.13	0.38	0.33	0.741	1.14 (0.54 ~ 2.41)	-0.07	0.45	-0.15	0.878	0.93 (0.38 ~ 2.27)
ECOG PS										
0					1.00 (Reference)					1.00 (Reference)
1	0.31	0.42	0.74	0.458	1.37 (0.60 ~ 3.13)	0.36	0.52	0.69	0.488	1.44 (0.52 ~ 4.00)
Clinical T stage										
1					1.00 (Reference)					1.00 (Reference)
2	1.34	1.06	1.27	0.204	3.83 (0.48 ~ 30.44)	1.69	1.32	1.28	0.201	5.42 (0.41 ~ 72.31)
3	0.51	1.23	0.42	0.677	1.67 (0.15 ~ 18.64)	0.38	1.71	0.22	0.825	1.46 (0.05 ~ 41.49)
4	1.03	1.03	1	0.319	2.80 (0.37 ~ 21.26)	1.57	1.31	1.2	0.23	4.79 (0.37 ~ 61.90)
Clinical N stage										
0					1.00 (Reference)					1.00 (Reference)
1	0.02	1.1	0.02	0.986	1.02 (0.12 ~ 8.84)	0.51	1.24	0.41	0.682	1.67 (0.15 ~ 19.05)
2	0.03	1.03	0.03	0.975	1.03 (0.14 ~ 7.77)	0.27	1.11	0.25	0.804	1.32 (0.15 ~ 11.49)
RECIST										
CR					1.00 (Reference)					1.00 (Reference)
PR	0.89	0.54	1.64	0.101	2.43 (0.84 ~ 7.05)	1.35	0.57	2.36	0.018	3.84 (1.26 ~ 11.74)
SD	0.11	1.12	0.1	0.919	1.12 (0.12 ~ 10.06)	1.44	1.41	1.02	0.308	4.21 (0.26 ~ 66.91)

HR: Hazard Ratio, CI: Confidence Interval; CR: complete response; PR: partial response; SD: stable disease; CT+RT: chemotherapy plus radiotherapy.

Table S15: Summary of adverse events for neoadjuvant group patients.

Event	Neoadjuvant chemoimmunotherapy+surgery (N=33)			
	Grade 1–2	Grade 3	Grade 4	Grade 5
Treatment-related adverse events, No. (%)				
Any	33 (100.00)	9 (27.27)	6 (18.18)	0
Anemia	28 (84.48)	0	0	0
ALT/AST increased	24 (72.73)	0	0	0
White blood cell count decreased	20 (63.63)	3 (27.27)	0	0
Neutrophil count decreased	19 (57.58)	4 (12.12)	6 (18.18)	0
γ-Glutamyltransferase Increased	14 (42.42)	1 (3.03)	0	0
Platelet count decreased	11 (33.33)	1 (3.03)	1 (3.03)	0
Decreased appetite	9 (27.27)	0	0	0
Alopecia	6 (18.18)	0	0	0
Constipation	6 (18.18)	0	0	0
Lymphocyte count decreased	6 (18.18)	0	0	0
Nausea	5 (15.15)	0	0	0
Asthenia	5 (15.15)	0	0	0
Vomiting	4 (12.12)	0	0	0
Blood creatinine increased	2 (6.06)	0	0	0
Fatigue	2 (6.06)	0	0	0
Hypokalaemia	2 (6.06)	0	0	0
Diarrhea	2 (6.06)	0	0	0
Febrile neutropenia	0	0	2 (6.06)	0
Immune-mediated adverse events, No. (%)				
Pruritus	3 (9.09)	0	0	0
Rash	2 (6.06)	0	0	0
Hypothyroidism	0	2 (6.06)	0	0
Immune-related hepatitis	0	0	1 (3.03)	0
Polyneuropathy	0	0	1 (3.03)	0
Pneumonia	0	0	0	0
Surgery-related adverse events, No. (%)				
Hyponatraemia	0	0	0	0
Perioperative death	0	0	0	0
Postoperative pneumothorax	0	0	0	0
Pulmonary embolism	0	0	0	0