Supplementary Table 1 Detailed distribution of treatment strategies, treatment lines, and subsequent therapies in the study population

Characteristic	ICI combination group (n=31)	Control group (n=92)
Treatment line		
First-line therapy	24 (77.4%)	70 (76.1%)
Second-line therapy	5 (16.1%)	16 (17.4%)
Third-line or later therapy	2 (6.5%)	6 (6.5%)
Chemotherapy backbone		
Oxaliplatin-based regimen	23 (74.2%)	70 (76.1%)
FOLFOX	14 (45.2%)	43 (46.7%)
CAPEOX	9 (29.0%)	27 (29.3%)
Irinotecan-based regimen (FOLFIRI)	8 (25.8%)	22 (23.9%)
Other regimens	0	0
Anti-angiogenic therapy		
Bevacizumab	31 (100%)	92 (100%)
Immune checkpoint inhibitor (ICI)		
Sintilimab	10 (32.26%)	-
Tislelizumab	3 (9.68%)	-
Toripalimab	2 (6.45%)	-
Camrelizumab	16(51.61%)	
Post-progression systemic therapy		

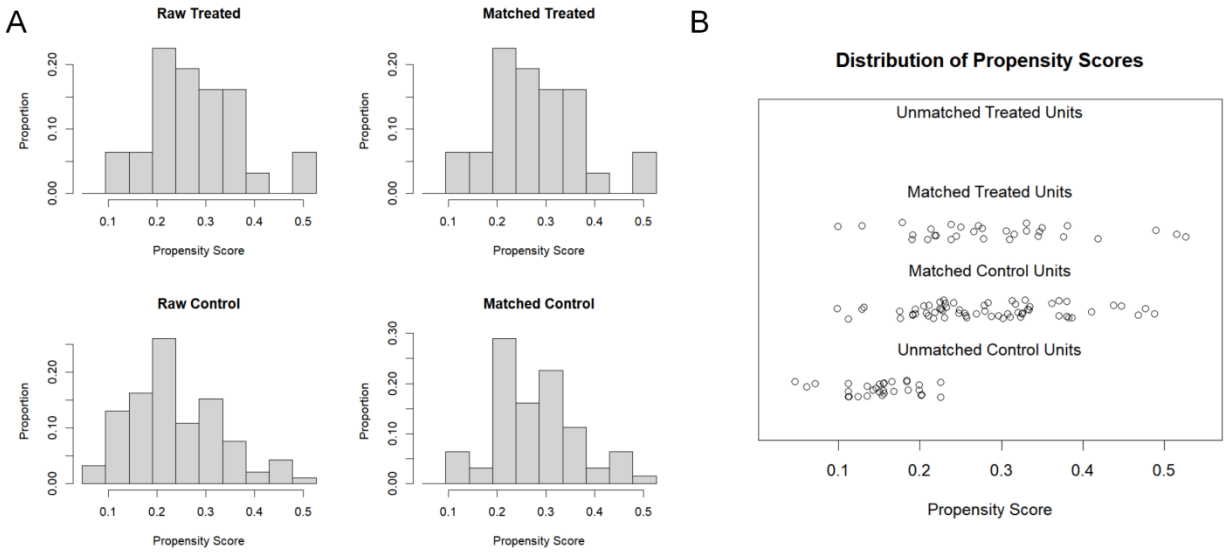
Characteristic	ICI combination group (n=31)	Control group (n=92)
Received subsequent treatment	20 (64.5%)	62 (67.4%)
Chemotherapy	13 (41.9%)	45 (48.9%)
Targeted therapy	5 (16.1%)	13 (14.1%)
Immunotherapy-containing regimen	2 (6.5%)	4 (4.3%)
Best supportive care only	11 (35.5%)	30 (32.6%)

Supplementary Table 2 the SMD of different variables before and after PSM

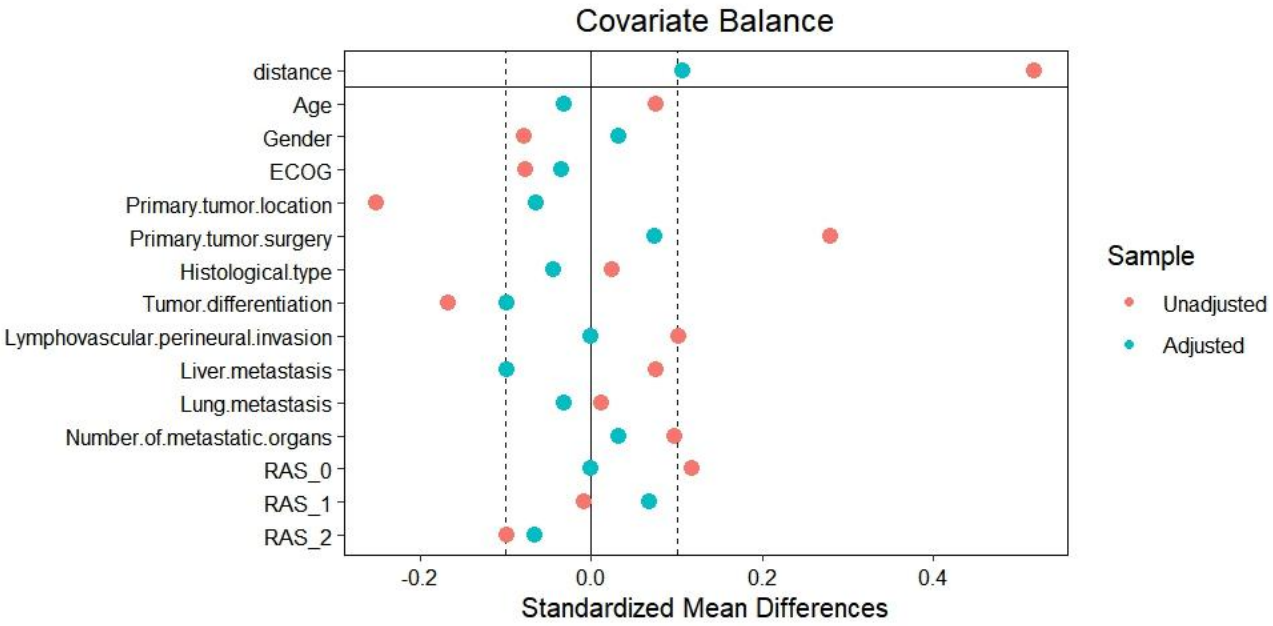
Variable	SMD -before PSM	SMD -after PSM
Overall	0.081	0.029
Age	0.075	0.032
Gender	0.080	0.033
ECOG PS	0.076	0.034
Primary tumor location	0.256	0.065
Primary tumor surgery	0.265	0.072
Histological type	0.025	0.043
Tumor differentiation	0.171	0.099
Lymphovascular perineural invasion	0.104	0.000
Liver metastasis	0.075	0.101
Lung metastasis	0.011	0.032
Number of metastatic organs	0.099	0.032
RAS	0.131	0.075

Supplementary Table 3 Incidence of Any Grade ≥3 Adverse Events in the Two Groups

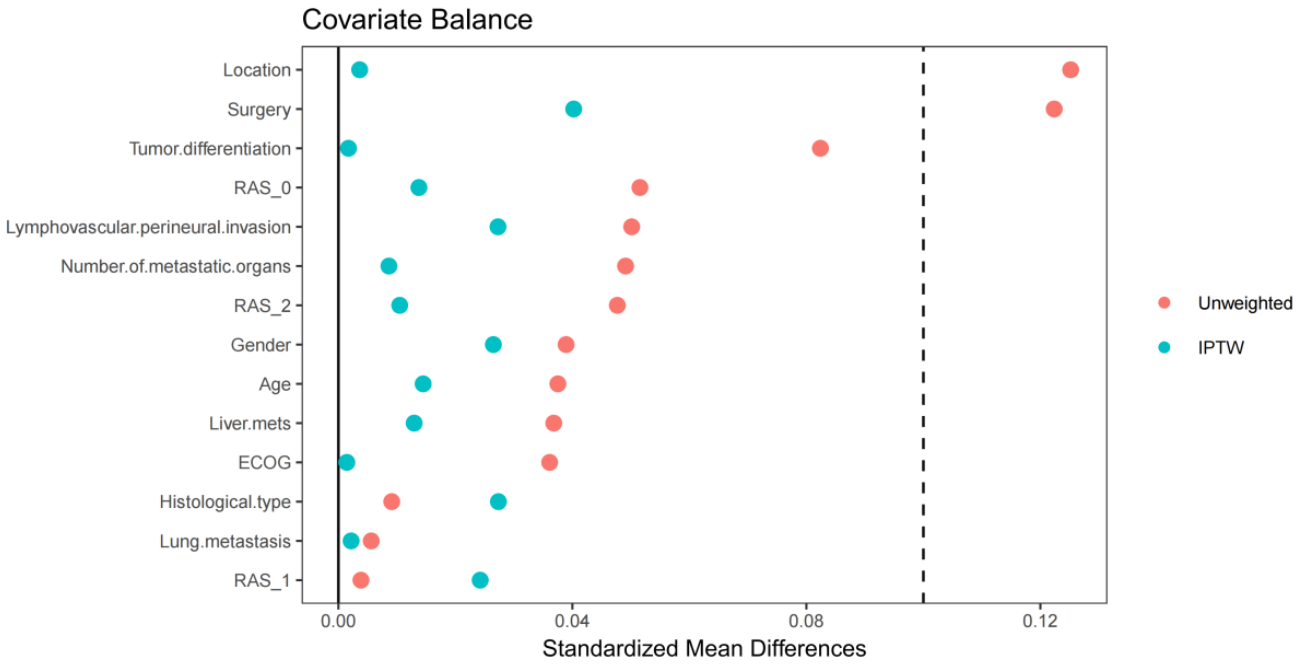
	Control group(n=92)	Experimental group(n=31)	P Value
Any ≥3AEs	16 (17.39%)	5 (16.13%)	1.000



Supplementary Figure 1 Distribution of propensity scores before and after propensity score matching (PSM). (A) Histograms showing the distribution of propensity scores in the treated and control groups before (raw) and after matching. (B) Dot plots illustrating the distribution of propensity scores for unmatched and matched treated and control units. After PSM, the distribution of propensity scores between the two groups became more balanced, indicating improved comparability between groups.



Supplementary Figure 2 Covariate balance before and after propensity score matching (PSM). Standardized mean differences (SMDs) of baseline variables are shown for the unadjusted (red) and adjusted (green) samples. The dashed vertical lines indicate the threshold of ±0.1. After matching, most covariates had SMDs below 0.1, indicating improved balance between the two groups.



Supplementary Figure 3 Covariate balance assessed by standardized mean differences before and after inverse probability of treatment weighting (IPTW). Love plot illustrating the distribution of standardized mean differences (SMDs) for baseline covariates between treatment groups before (unweighted) and after IPTW adjustment. The dashed vertical line denotes the threshold of SMD = 0.1, indicating acceptable covariate balance. IPTW substantially reduced baseline imbalances, with all covariates achieving adequate balance after weighting.