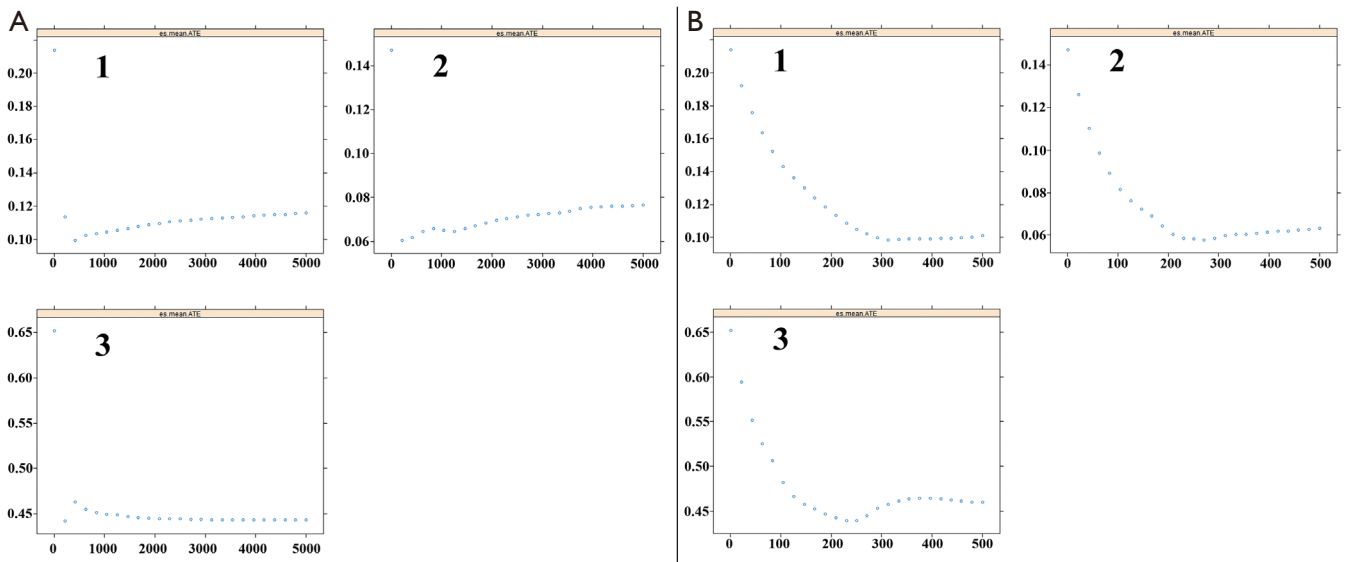
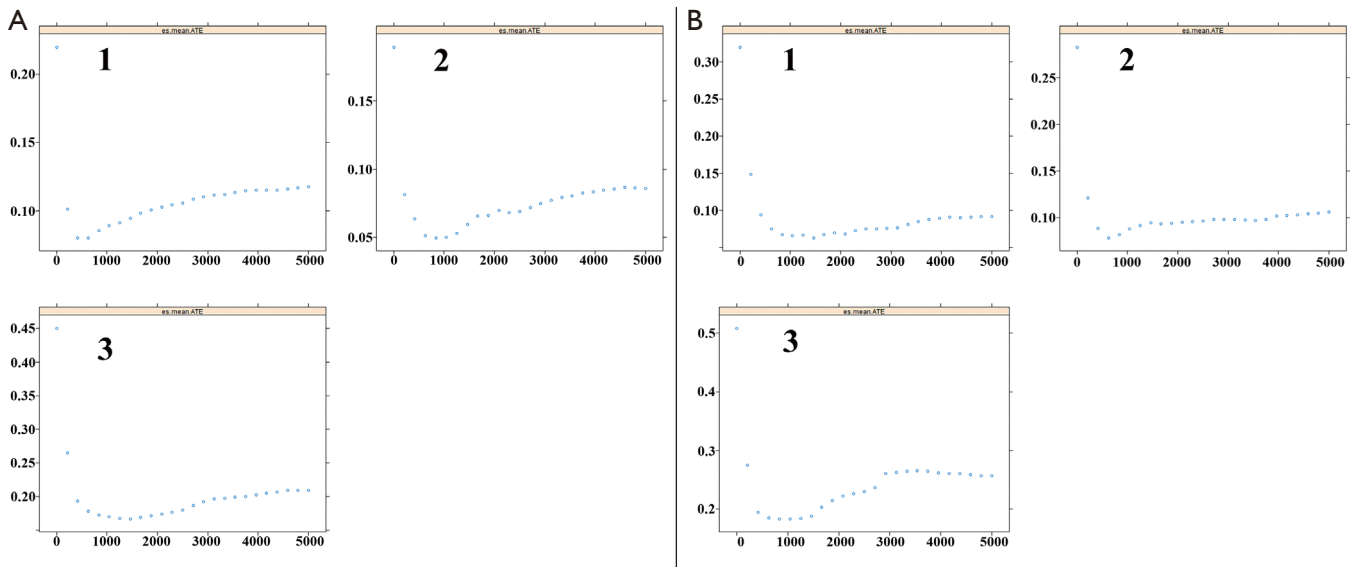


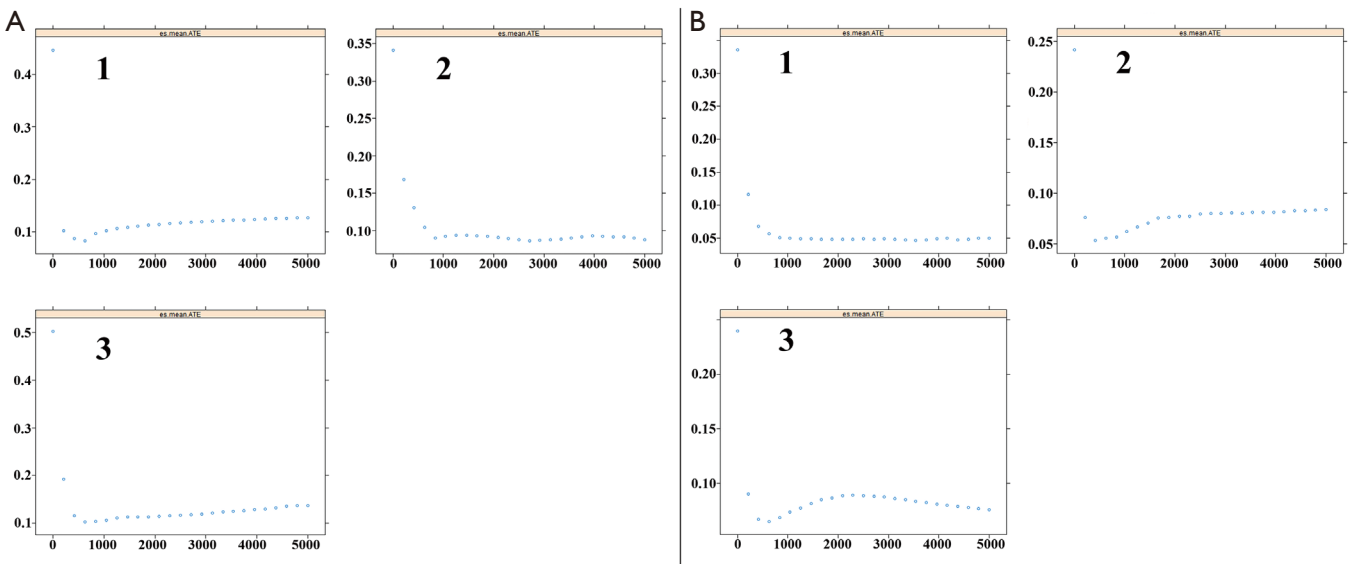
**Figure S1** For the entire cohort, generalized boosted model to obtain the optimal balance of the propensity score among groups of the IPTW model associated with mRS score (A) and mortality rates (B). Horizontal axis represents the iteration times and vertical axis represents the balance measure. 1, Balance for EE against others. 2, Balance for SA against others. 3, Balance for OC against others. IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.



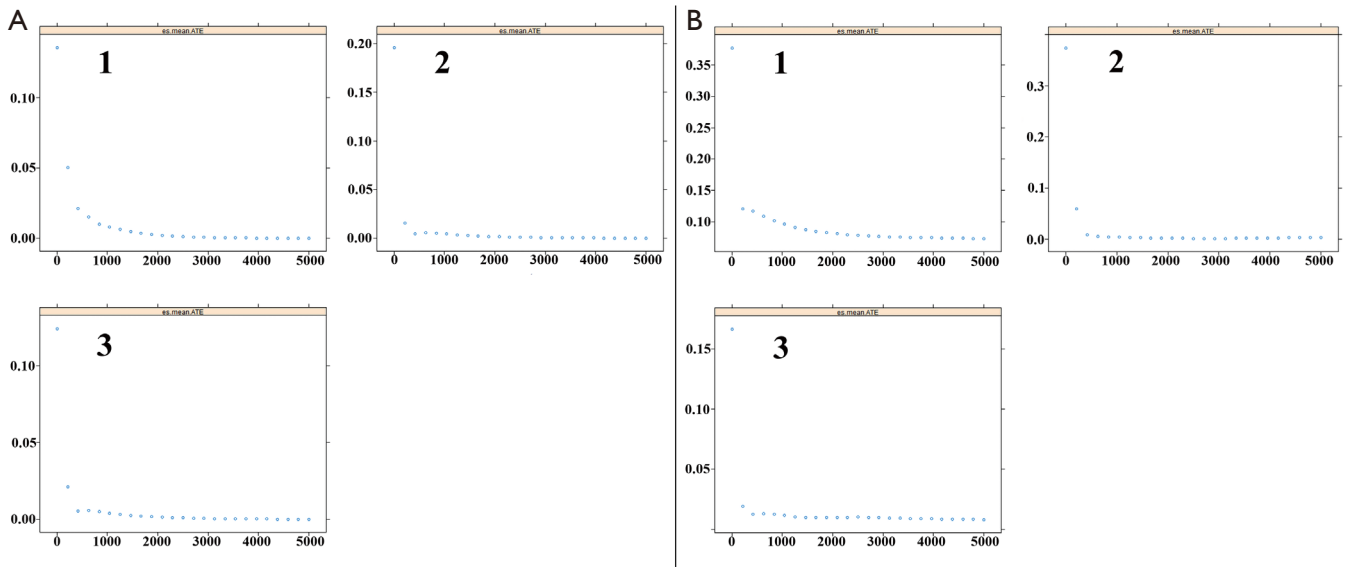
**Figure S2** For the subgroup of hematoma volume of 20–40 mL, generalized boosted model to obtain the optimal balance of the propensity score among groups of the IPTW model associated with mRS score (A) and mortality rates (B). Horizontal axis represents the iteration times and vertical axis represents the balance measure. 1, Balance for EE against others. 2, Balance for SA against others. 3, Balance for OC against others. IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.



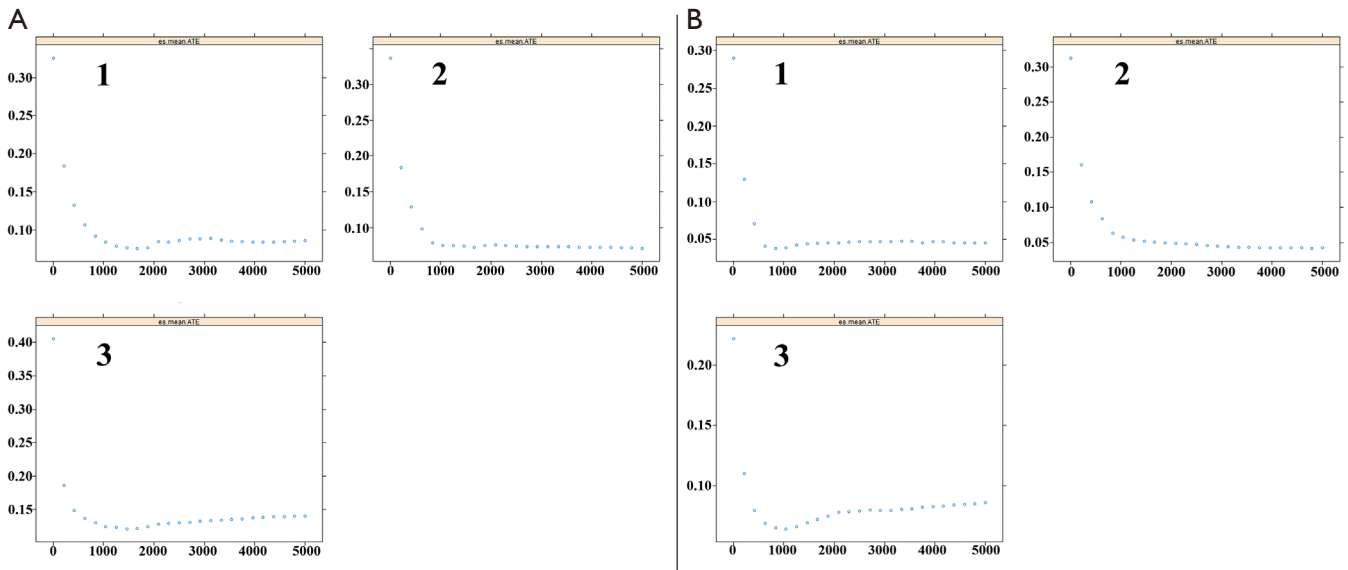
**Figure S3** For the subgroup of hematoma volume of 40–80 mL, generalized boosted model to obtain the optimal balance of the propensity score among groups of the IPTW model associated with mRS score (A) and mortality rates (B). Horizontal axis represents the iteration times and vertical axis represents the balance measure. 1, Balance for EE against others. 2, Balance for SA against others. 3, Balance for OC against others. IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.



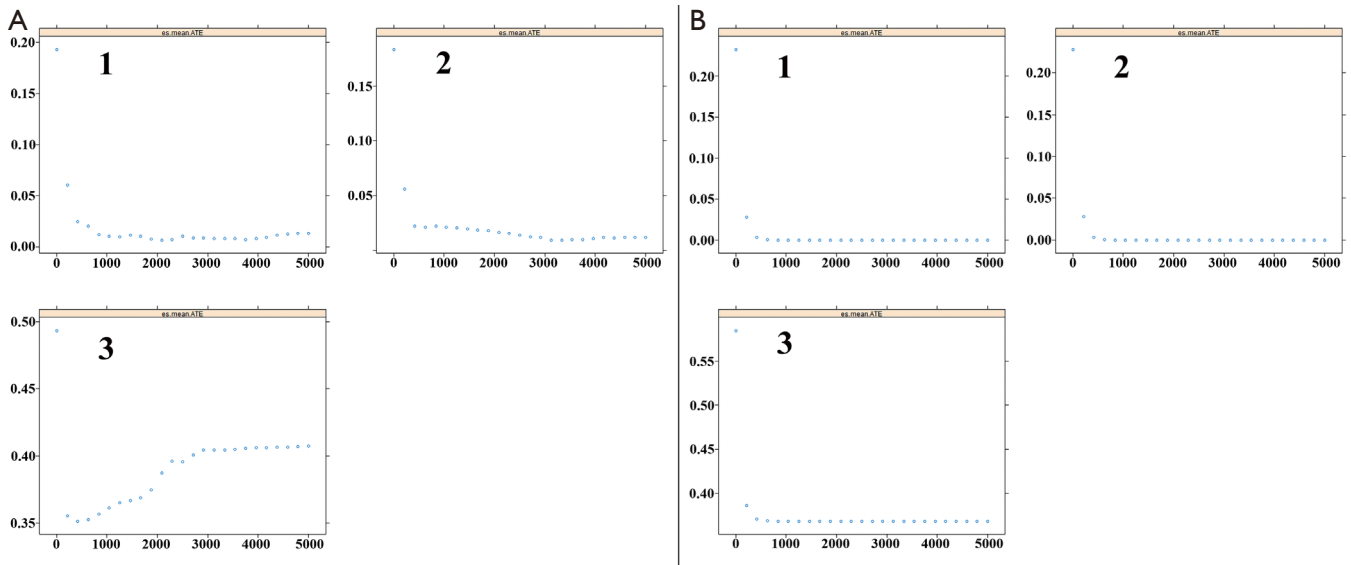
**Figure S4** For the subgroup of hematoma volume of  $\geq 80$  mL, generalized boosted model to obtain the optimal balance of the propensity score among groups of the IPTW model associated with mRS score (A) and mortality rates (B). Horizontal axis represents the iteration times and vertical axis represents the balance measure. 1, Balance for EE against others. 2, Balance for SA against others. 3, Balance for OC against others. IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.



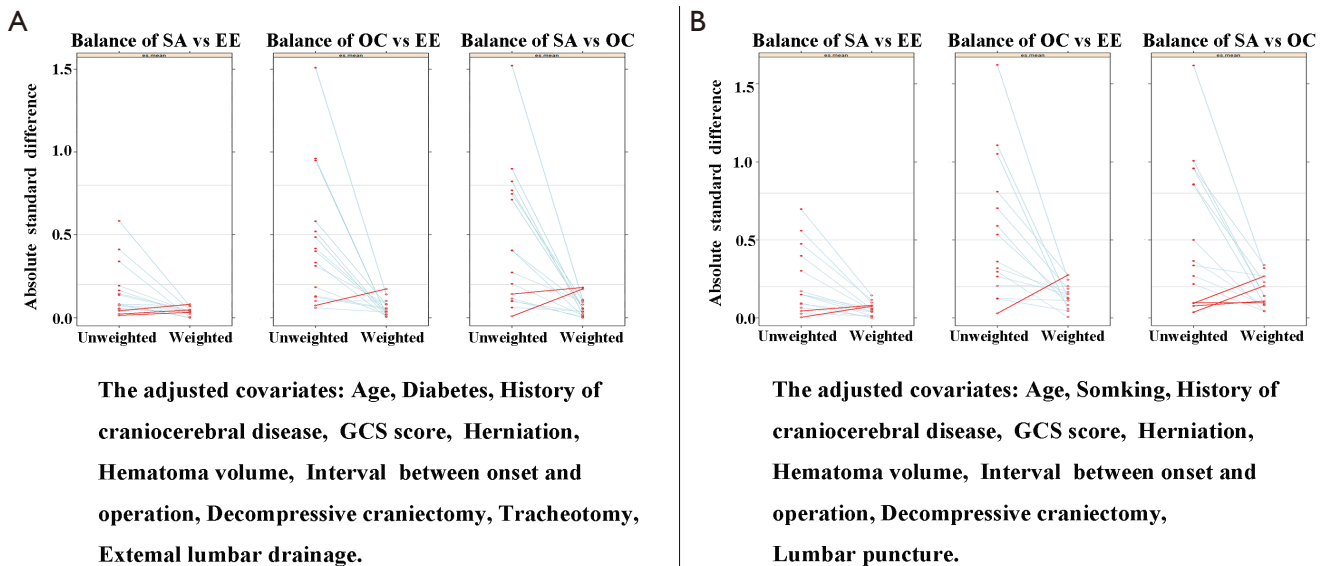
**Figure S5** For the subgroup of Glasgow Coma Scale score 3–5, generalized boosted model to obtain the optimal balance of the propensity score among groups of the IPTW model associated with mRS score (A) and mortality rates (B). Horizontal axis represents the iteration times and vertical axis represents the balance measure. 1, Balance for EE against others. 2, Balance for SA against others. 3, Balance for OC against others. IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.



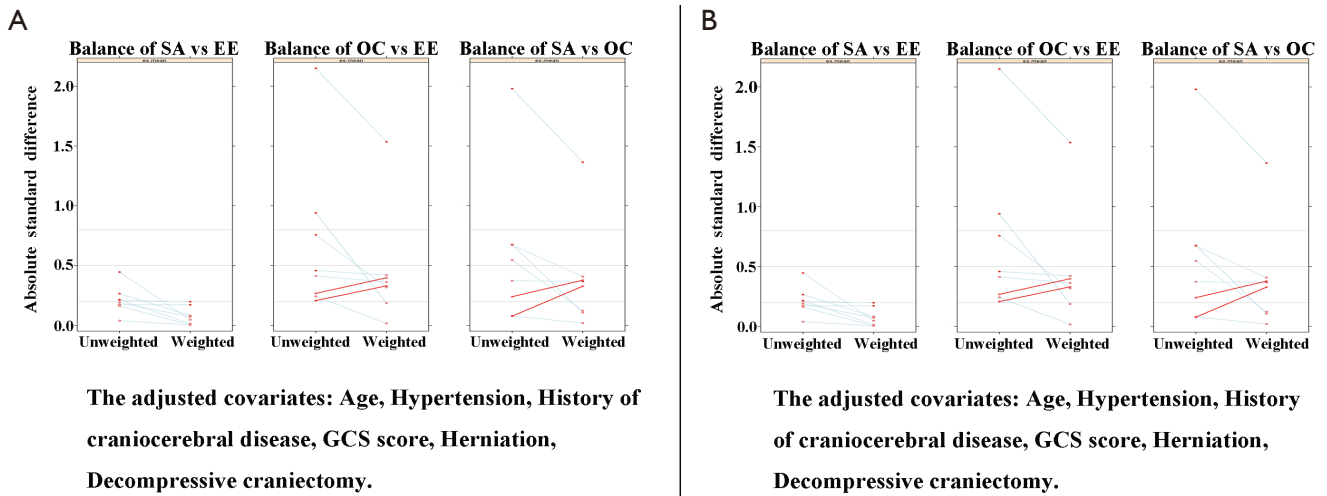
**Figure S6** For the subgroup of Glasgow Coma Scale score 6–8, generalized boosted model to obtain the optimal balance of the propensity score among groups of the IPTW model associated with mRS score (A) and mortality rates (B). Horizontal axis represents the iteration times and vertical axis represents the balance measure. 1, Balance for EE against others. 2, Balance for SA against others. 3, Balance for OC against others. IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.



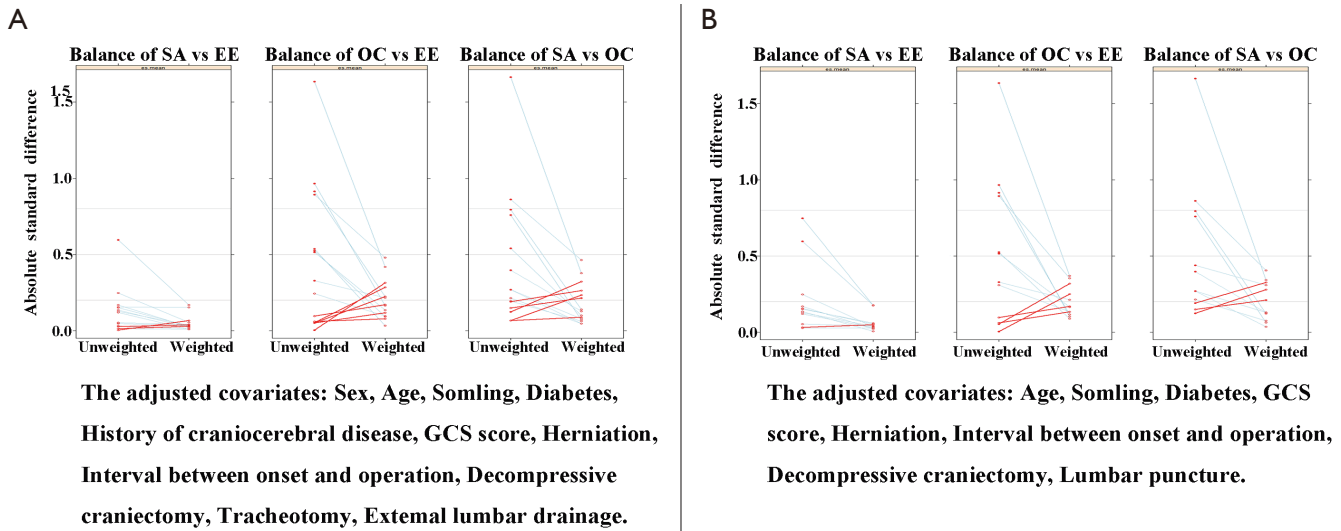
**Figure S7** For the subgroup of Glasgow Coma Scale score 9–14, generalized boosted model to obtain the optimal balance of the propensity score among groups of the IPTW model associated with mRS score (A) and mortality rates (B). Horizontal axis represents the iteration times and vertical axis represents the balance measure. 1, Balance for EE against others. 2, Balance for SA against others. 3, Balance for OC against others. IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.



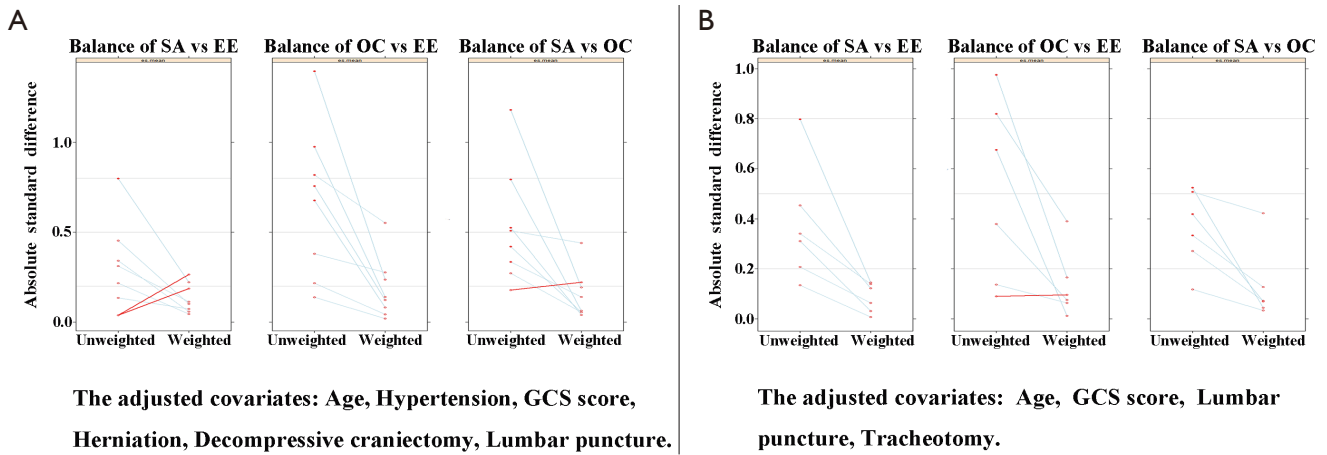
**Figure S8** For the entire cohort, results of the standardized mean differences to evaluate the effect of weights on the magnitude of each confounding factors of the IPTW model associated with mRS score (A) and mortality rates (B). IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy; GCS, Glasgow Coma Scale.



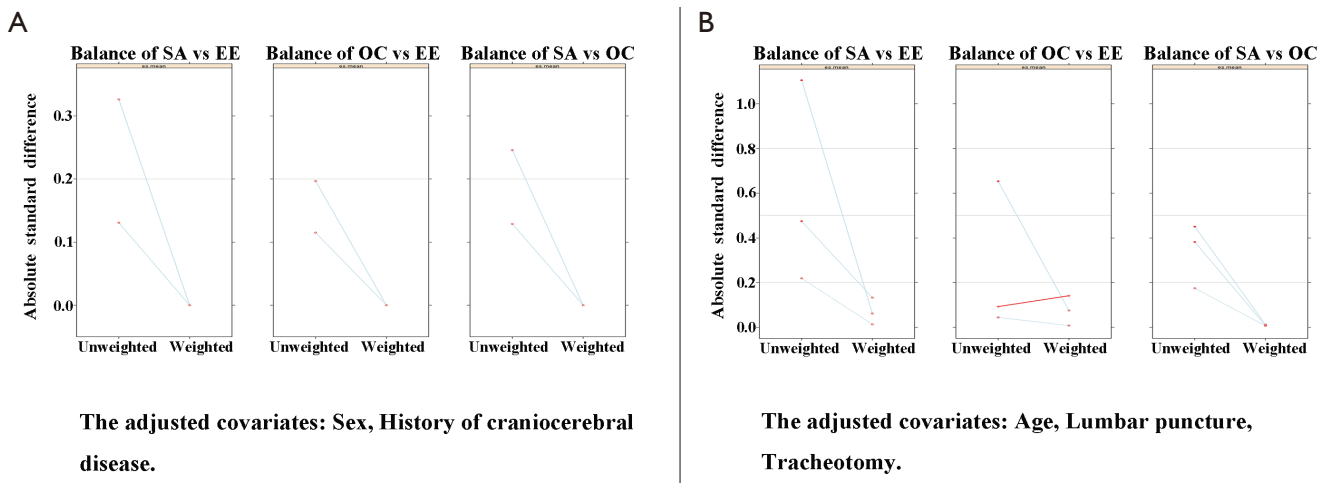
**Figure S9** For the subgroup of hematoma volume of 20–40 mL, results of the standardized mean differences to evaluate the effect of weights on the magnitude of each confounding factors of the IPTW model associated with mRS score (A) and mortality rates (B). IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy; GCS, Glasgow Coma Scale.



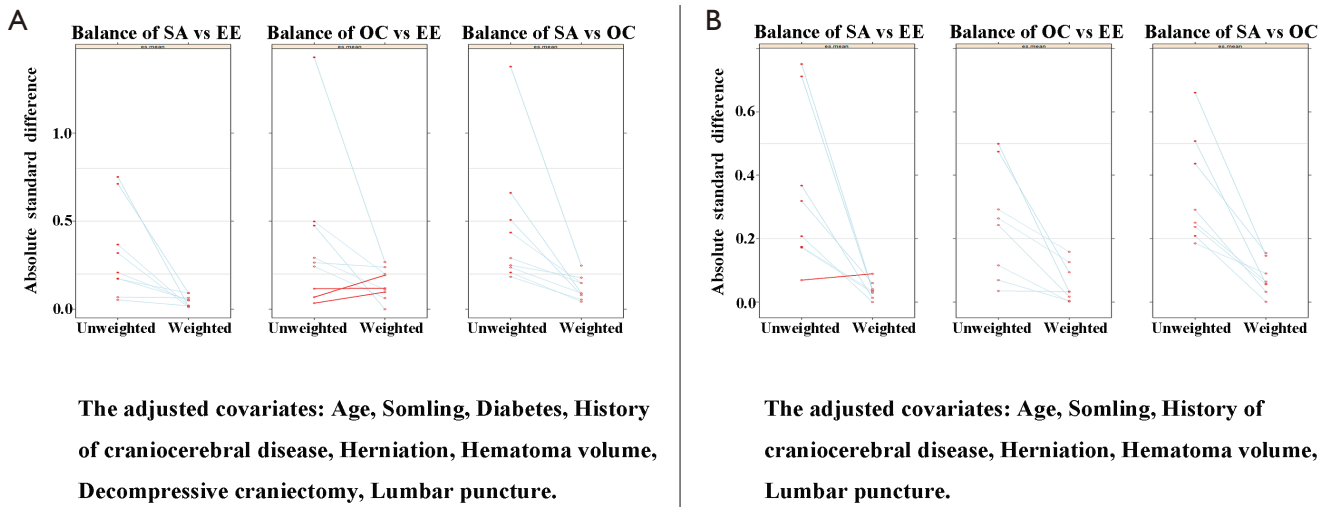
**Figure S10** For the subgroup of hematoma volume of 40–80 mL, results of the standardized mean differences to evaluate the effect of weights on the magnitude of each confounding factors of the IPTW model associated with mRS score (A) and mortality rates (B). IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy; GCS, Glasgow Coma Scale.



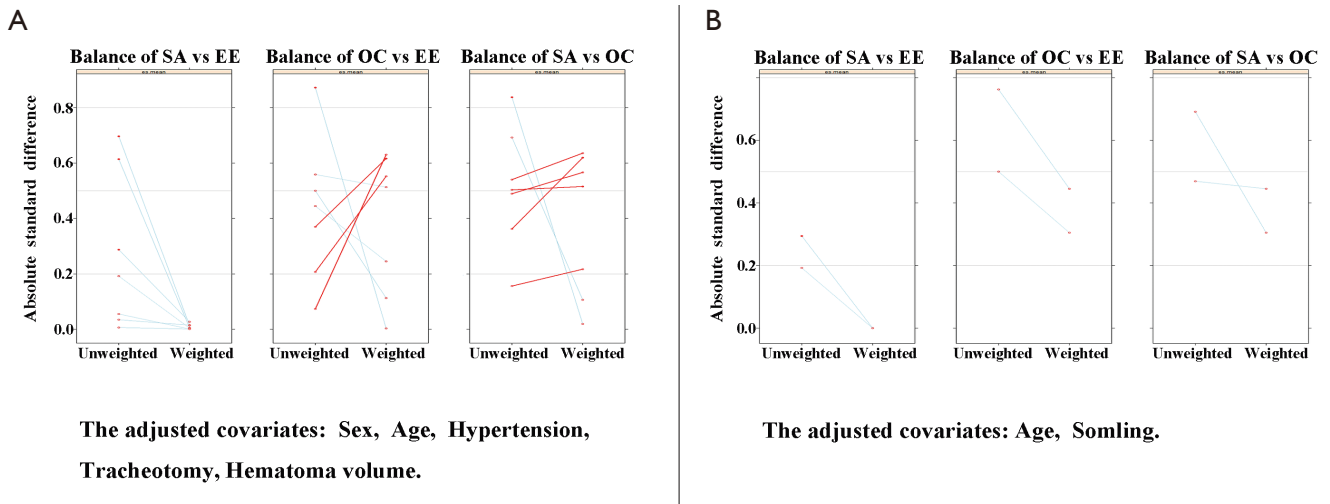
**Figure S11** For the subgroup of hematoma volume of  $\geq 80$  mL, results of the standardized mean differences to evaluate the effect of weights on the magnitude of each confounding factors of the IPTW model associated with mRS score (A) and mortality rates (B). IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy; GCS, Glasgow Coma Scale.



**Figure S12** For the subgroup of Glasgow Coma Scale score 3–5, results of the standardized mean differences to evaluate the effect of weights on the magnitude of each confounding factors of the IPTW model associated with mRS score (A) and mortality rates (B). IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.



**Figure S13** For the subgroup of Glasgow Coma Scale score 6–8, results of the standardized mean differences to evaluate the effect of weights on the magnitude of each confounding factors of the IPTW model associated with mRS score (A) and mortality rates (B). IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.



**Figure S14** For the subgroup of Glasgow Coma Scale score 9–14, results of the standardized mean differences to evaluate the effect of weights on the magnitude of each confounding factors of the IPTW model associated with mRS score (A) and mortality rates (B). IPTW, inverse probability of treatment weighted; mRS, modified Rankin Scale; SA, stereotactic aspiration; EE, endoscopic evacuation; OC, open craniotomy.

**Table S1** The inter-group balance tests of possible confounding factors among different surgical techniques in different hematoma volume subgroups

Characteristic	Classification	Hematoma volume (20–40 mL)					Hematoma volume (40–80 mL)					Hematoma volume (≥80 ml)				
		Total (n=195)	SA (n=151)	EE (n=38)	OC (n=6)	P value	Total (n=353)	SA (n=149)	EE (n=134)	OC (n=70)	P value	Total (n=155)	SA (n=43)	EE (n=40)	OC (n=72)	P value
Sex	Male	112 (57.44%)	90 (59.60%)	19 (50.00%)	3 (50.00%)	0.5259	212 (60.06%)	91 (61.07%)	85 (63.43%)	36 (51.43%)	0.2377	122 (78.71%)	31 (72.09%)	31 (77.50%)	60 (83.33%)	0.3540
Age (years)	>60	55 (58.21%)	45 (29.80%)	8 (21.05%)	2 (33.33%)	0.5412	146 (41.36%)	69 (46.31%)	52 (38.81%)	25 (35.71%)	0.2485	60 (38.71%)	20 (46.51%)	16 (40.00%)	24 (33.33%)	0.3663
GCS score	3–5	20 (10.26%)	17 (11.26%)	1 (2.63%)	2 (33.33%)	0.0281*	64 (18.13%)	21 (14.09%)	9 (6.72%)	34 (48.57%)	<0.0001*	92 (59.35%)	23 (53.49%)	13 (32.50%)	56 (77.78%)	<0.0001*
	5–8	53 (27.18%)	35 (23.18%)	16 (42.11%)	2 (33.33%)		152 (43.06%)	59 (39.60%)	61 (45.52%)	32 (45.71%)		53 (34.19%)	16 (37.21%)	21 (52.50%)	16 (22.22%)	
	9–14	122 (62.56%)	99 (65.56%)	21 (55.26%)	2 (33.33%)		137 (38.81%)	69 (46.31%)	64 (47.76%)	4 (5.71%)		10 (6.45%)	4 (9.30%)	6 (15.00%)	0 (0.00%)	
Smoking	Yes	114 (58.56%)	93 (61.59%)	18 (47.37%)	3 (50.00%)	0.2578	210 (59.49%)	108 (72.48%)	60 (44.78%)	42 (60.00%)	<0.0001*	84 (54.19%)	31 (72.09%)	17 (42.50%)	36 (50.00%)	0.0161*
Diabetes	Yes	13 (6.67%)	12 (7.95%)	1 (2.63%)	0 (0.00%)	0.4024	24 (6.80%)	12 (8.05%)	9 (6.72%)	3 (4.29%)	0.5858	11 (7.10%)	3 (6.98%)	4 (10.00%)	4 (5.56%)	0.6799
Hypertension	Yes	154 (78.97%)	121 (80.13%)	28 (73.68%)	5 (83.33%)	0.6600	292 (82.72%)	125 (83.89%)	112 (83.58%)	55 (78.57%)	0.5898	129 (83.23%)	37 (86.05%)	35 (87.50%)	57 (79.17%)	0.4452
History of craniocerebral disease	Yes	23 (11.79%)	18 (11.92%)	5 (13.16%)	0 (0.00%)	0.6465	40 (11.33%)	16 (10.74%)	15 (11.19%)	9 (12.86%)	0.8972	26 (16.77%)	8 (18.60%)	4 (10.00%)	14 (19.44%)	0.4095
Herniation	Yes	8 (4.10) %	7 (4.64%)	0 (0.00%)	1 (16.67%)	0.1260	51 (14.45%)	16 (10.74%)	6 (4.48%)	29 (41.43%)	<0.0001*	69 (44.52%)	11 (25.28%)	11 (27.50%)	47 (65.28%)	<0.0001*
Interval between onset and operation (hours)	<12 hours	70 (35.90%)	58 (38.41%)	10 (26.32%)	2 (33.33%)	<0.0001*	157 (44.48%)	64 (42.59%)	49 (36.57%)	44 (62.86%)	0.0025*	114 (73.55%)	31 (72.09%)	26 (65.00%)	57 (79.17%)	0.4942
	12–24 hours	82 (42.05%)	62 (41.06%)	19 (50.00%)	1 (16.67%)		137 (38.81%)	55 (36.91%)	65 (48.51%)	17 (24.29%)		35 (22.58%)	11 (25.58%)	12 (30.00%)	12 (16.67%)	
	≥24 hours	43 (22.05%)	31 (20.53%)	9 (23.68%)	3 (50.00%)		59 (16.71%)	30 (20.13%)	20 (14.93%)	9 (12.86%)		6 (3.87%)	1 (2.33%)	2 (5.00%)	3 (4.17%)	
Rehabilitation treatment	PRT	96 (49.23%)	73 (48.34%)	18 (47.37%)	5 (83.33%)	0.0584	146 (41.36%)	52 (34.90%)	67 (50.00%)	27 (38.57%)	0.0002*	42 (27.10%)	6 (13.95%)	16 (40.00%)	20 (27.78%)	0.0003*
	NPRT	46 (23.59%)	31 (20.53%)	15 (39.47%)	0 (0.00%)		86 (24.36%)	39 (26.17%)	34 (25.37%)	13 (18.57%)		20 (12.90%)	4 (9.30%)	9 (22.50%)	7 (9.72%)	
	NRT	23 (11.79%)	20 (13.25%)	3 (7.89%)	0 (0.00%)		27 (7.65%)	8 (5.37%)	16 (11.94%)	3 (4.29%)		19 (12.26%)	1 (2.33%)	6 (15.00%)	12 (16.67%)	
	mortality	30 (15.38%)	27 (17.88%)	2 (5.26%)	1 (16.67%)		94 (26.63%)	50 (33.56%)	17 (12.67%)	27 (38.57%)		74 (47.74%)	32 (74.42%)	9 (22.50%)	33 (45.83%)	
Decompressive craniectomy	Yes	9 (4.62%)	6 (3.97%)	0 (0.00%)	3 (50.00%)	<0.0001*	71 (20.11%)	7 (4.70%)	8 (5.97%)	56 (80.00%)	<0.0001*	80 (51.61%)	12 (27.91%)	7 (37.50%)	61 (84.72%)	<0.0001*
Tracheotomy	Yes	27 (13.94%)	21 (13.91%)	5 (13.16%)	1 (16.67%)	0.9726	68 (19.26%)	22 (14.77%)	20 (14.93%)	26 (37.14%)	0.0001*	51 (32.90%)	12 (27.91%)	15 (37.50%)	24 (33.33%)	0.6456
Lumbar puncture	Yes	52 (26.67%)	32 (21.19%)	18 (47.37%)	2 (33.33%)	0.0046*	111 (31.44%)	24 (16.11%)	63 (47.01%)	24 (34.29%)	<0.0001*	44 (28.39%)	5 (11.63%)	18 (45.00%)	21 (29.17%)	0.0034*
External lumbar drainage	Yes	16 (8.21%)	12 (7.95%)	4 (10.53%)	0 (0.00%)	0.6632	40 (11.33%)	16 (10.74%)	15 (11.19%)	9 (12.86%)	0.8972	22 (14.19%)	7 (16.28%)	7 (17.50%)	8 (11.11%)	0.5844
Re-operation	Yes	11 (5.64%)	9 (5.96%)	2 (5.26%)	0 (0.00%)	0.8196	14 (3.97%)	8 (5.37%)	3 (2.24%)	3 (4.29%)	0.3988	10 (6.45%)	3 (6.98%)	1 (2.50%)	6 (8.33%)	0.4778

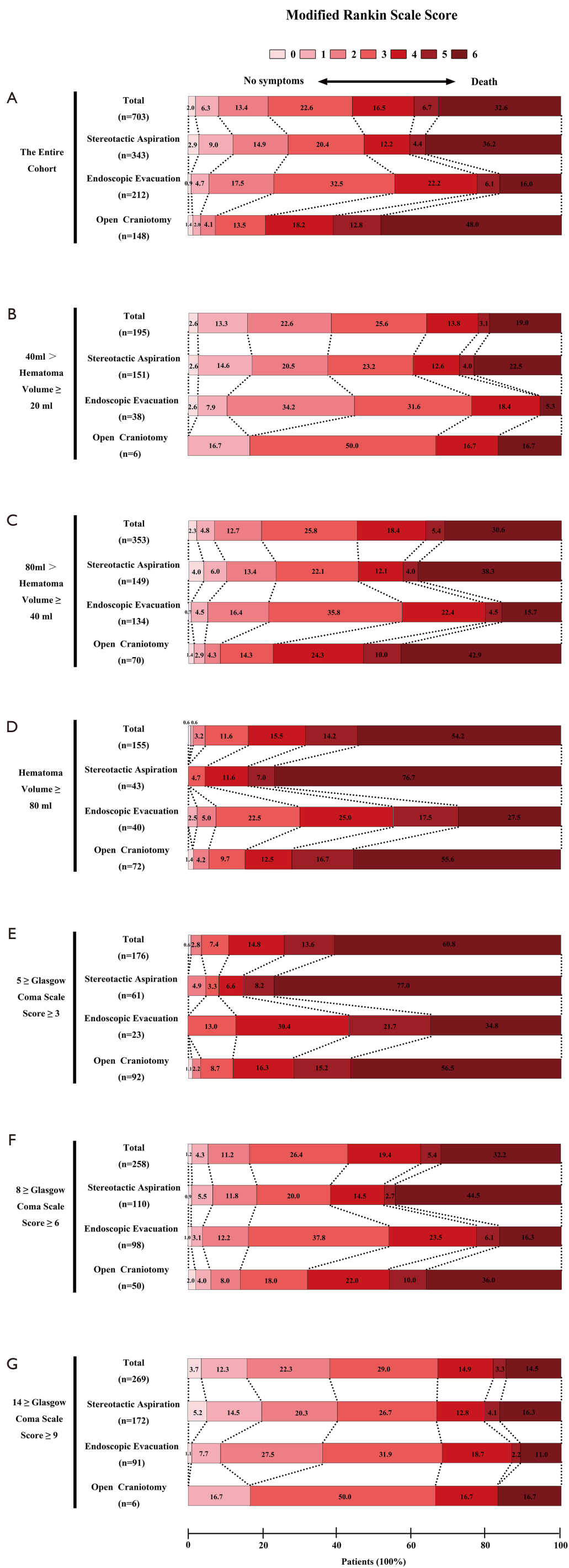
\*, The difference has statistical significance. SA, Stereotactic Aspiration; EE, Endoscopic Evacuation; OC, Open Craniotomy. GCS, Glasgow Coma Scale. PRT, Professional Rehabilitation Treatment, NPRT, Un-professional Rehabilitation Treatment, NRT, No Rehabilitation Treatment.



**Table S2** The inter-group balance tests of possible confounding factors among different surgical techniques in different GCS score subgroups.

Characteristic	Classification	GCS 3-5					GCS 6-8					GCS 9-14				
		Total (n=176)	SA (n=61)	EE (n=23)	OC (n=92)	P value	Total (n=258)	SA (n=110)	EE (n=98)	OC (n=50)	P value	Total (n=269)	SA (n=172)	EE (n=91)	OC (n=6)	P value
Sex	Male	116 (65.91%)	36 (59.02%)	15 (65.22%)	65 (70.65%)	0.3302	151 (28.53%)	62 (56.36%)	60 (61.22%)	29 (58.00%)	0.7743	179 (66.54%)	114 (66.28%)	60 (65.93%)	5 (83.33%)	0.6770
Age (years)	>60	62 (35.23%)	25 (40.98%)	7 (30.43%)	30 (32.61%)	0.4981	98 (37.98%)	51 (46.36%)	30 (30.61%)	17 (34.00%)	0.0530	101 (37.55%)	58 (33.72%)	39 (42.86%)	4 (66.67%)	0.1143
Smoking	Yes	103 (58.52%)	43 (70.49%)	11 (47.83%)	49 (53.26%)	0.0569	154 (59.69%)	85 (77.27%)	42 (42.86%)	27 (54.00%)	<0.0001*	151 (56.13%)	104 (60.47%)	42 (46.15%)	5 (83.33%)	0.0335*
Diabetes	Yes	13 (7.39%)	7 (11.48%)	1 (4.35%)	5 (5.43%)	0.3145	21 (8.14%)	10 (9.09%)	9 (9.18%)	2 (4.00%)	0.4912	14 (5.20%)	10 (5.81%)	4 (4.40%)	0 (0.00%)	0.7484
Hypertension	Yes	145 (82.39%)	51 (83.61%)	20 (86.96%)	74 (80.43%)	0.7279	215 (83.33%)	94 (85.45%)	84 (85.71%)	37 (74.00%)	0.1428	215 (79.93%)	138 (80.23%)	71 (78.02%)	6 (100.00%)	0.4226
History of craniocerebral disease	Yes	30 (17.05%)	13 (21.31%)	2 (8.70%)	15 (16.30%)	0.3763	31 (12.02%)	11 (10.00%)	12 (12.24%)	8 (16.00%)	0.5548	28 (10.41%)	18 (10.47%)	10 (10.99%)	0 (0.00%)	0.6940
Herniation	Yes	105 (59.66%)	23 (37.70%)	13 (56.52%)	69 (75.00%)	<0.0001*	17 (6.59%)	8 (7.27%)	1 (1.02%)	8 (16.00%)	0.0022*	6 (2.23%)	3 (1.74%)	3 (3.30%)	0 (0.00%)	0.6711
Interval between onset and operation (hours)	<12 hours	128 (72.73%)	43 (70.49%)	15 (65.22%)	70 (76.09%)	0.8329	132 (51.16%)	56 (50.91%)	46 (46.94%)	30 (60.00%)	0.3070	81 (30.11%)	54 (31.40%)	24 (26.37%)	3 (50.00%)	0.4942
	12–24 hours	36 (20.45%)	14 (22.95%)	6 (26.09%)	16 (17.39%)		91 (35.27%)	38 (34.55%)	41 (41.84%)	12 (24.00%)		127 (47.21%)	76 (44.19%)	49 (53.85%)	2 (33.33%)	
	≥24 hours	12 (6.82%)	4 (6.56%)	2 (8.70%)	6 (6.52%)		35 (13.57%)	16 (14.55%)	11 (11.22%)	8 (16.00%)		61 (22.68%)	42 (24.42%)	18 (19.78%)	1 (16.67%)	
Hematoma volume (mL)	≥20–40	20 (11.36%)	17 (27.87%)	1 (4.35%)	2 (2.17%)	<0.0001*	53 (20.54%)	35 (31.82%)	16 (16.33%)	2 (4.00%)	0.0004*	122 (45.35%)	99 (57.56%)	21 (23.08%)	2 (33.33%)	<0.001*
	≥40–80	64 (36.36%)	21 (34.43%)	9 (39.13%)	34 (36.69%)		152 (58.91%)	59 (53.64%)	61 (62.24%)	32 (64.00%)		137 (50.93%)	69 (40.12%)	64 (70.33%)	4 (66.67%)	
	≥80	92 (52.27%)	23 (37.70%)	13 (56.52%)	56 (60.87%)		53 (20.54%)	16 (14.55%)	21 (21.43%)	16 (32.00%)		10 (3.72%)	4 (2.33%)	6 (6.59%)	0 (0.00%)	
Rehabilitation treatment	PRT	52 (29.55%)	15 (24.59%)	10 (43.48%)	27 (29.35%)	0.0027*	104 (40.31%)	36 (32.73%)	46 (46.94%)	22 (44.00%)	0.0014*	128 (47.58%)	80 (46.51%)	45 (49.45%)	3 (50.00%)	0.9372
	NPRT	17 (9.66%)	0 (0.00%)	5 (21.74%)	12 (13.04%)		55 (21.32%)	22 (20.00%)	27 (27.55%)	6 (12.00%)		80 (29.74%)	52 (30.23%)	26 (28.57%)	2 (33.33%)	
	NRT	16 (9.09%)	4 (6.56%)	2 (8.70%)	10 (10.87%)		25 (9.69%)	8 (7.27%)	12 (12.24%)	5 (10.00%)		28 (10.41%)	17 (9.88%)	11 (12.09%)	0 (0.00%)	
mortality		91 (51.70%)	42 (68.85%)	6 (26.09%)	43 (46.74%)		74 (28.68%)	44 (40.00%)	13 (13.27%)	17 (34.00%)		33 (12.27%)	23 (13.37%)	9 (9.89%)	1 (16.67%)	
Decompressive craniectomy	Yes	107 (60.80%)	13 (21.31%)	11 (47.83%)	83 (90.22%)	<0.0001*	44 (17.05%)	7 (6.36%)	4 (4.08%)	33 (66.00%)	<0.0001*	9 (3.35%)	5 (2.91%)	0 (0.00%)	4 (66.67%)	<0.001*
Tracheotomy	Yes	59 (33.52%)	13 (21.31%)	10 (43.48%)	36 (39.13%)	0.0407*	63 (24.42%)	27 (24.55%)	23 (23.47%)	13 (26.00%)	0.9434	24 (8.92%)	15 (8.72%)	7 (7.69%)	2 (33.33%)	0.1014
Lumbar puncture	Yes	52 (29.55%)	8 (13.11%)	14 (60.87%)	30 (32.61%)	<0.0001*	86 (33.33%)	22 (20.00%)	49 (50.00%)	15 (30.00%)	<0.0001*	69 (25.65%)	31 (18.02%)	36 (39.56%)	2 (33.33%)	<0.001*
External lumbar drainage	Yes	27 (15.34%)	9 (14.75%)	7 (30.43%)	11 (11.96%)	0.0879	34 (13.18%)	14 (12.73%)	14 (14.29%)	6 (12.00%)	0.9115	17 (6.32%)	12 (6.98%)	5 (5.49%)	0 (0.00%)	0.7280
Re-operation	Yes	16 (9.09%)	6 (9.84%)	2 (8.70%)	8 (8.70%)	0.9691	9 (3.49%)	5 (4.55%)	3 (3.06%)	1 (2.00%)	0.6883	10 (3.72%)	9 (5.23%)	1 (1.10%)	0 (0.00%)	0.2146

\*, The difference has statistical significance. SA, Stereotactic Aspiration; EE, Endoscopic Evacuation; OC, Open Craniotomy. GCS, Glasgow Coma Scale. PRT, Professional Rehabilitation Treatment, NPRT, Un-professional Rehabilitation Treatment, NRT, No Rehabilitation Treatment.



**Figure S15** Functional outcomes of patients in each group as assessed by modified Rankin Scale (mRS) score. The scores ranged from 0 to 6, with 0 indicating no symptoms; 1, no clinically significant disability; 2, slight disability; 3, moderate disability; 4, moderately severe disability; 5, severe disability; and 6, death. A score of 4–6 was recognized as a poor outcome. The percentages of patients by the score are shown in each cell. The mRS scores of (A) the entire cohort, (B) patients with a hematoma volume of 20–40 mL, (C) patients with hematoma volume of 40–80 mL, (D) patients with hematoma volume of ≥80 mL, (E) patients with GCS score 3–5, (F) patients with GCS score 6–8, (G) patients with GCS score 9–14. GCS, Glasgow Coma Scale.