Supplementary Table 1 Search strategy

Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions(R) 1946 to April 15, 2022

#No.	Results	Searches
1	278043	cerebrovascular disorders/ or basal ganglia cerebrovascular disease/ or exp brain ischemia/ or carotid artery diseases/ or carotid artery thrombosis/ or intracranial arterial diseases/ or cerebral arterial diseases/ or exp "intracranial embolism and thrombosis"/ or exp stroke/
2	90748	(isch?emi$ adj5 (stroke$ or apoplex$ or cerebral vasc$ or cerebrovasc$ or cva or attack$) or TIA$1).tw.
3	127895	((brain or cerebr$ or cerebell$ or vertebrobasil$ or hemispher$ or intracran$ or intracerebral or infratentorial or supratentorial or middle cerebr$ or MCA$ or anterior circulation or posterior circulation or basilar artery or vertebral artery or space-occupying or basal ganglia) adj5 (isch?emi$ or infarct$ or thrombo$ or emboli$ or occlus$ or hypoxi$)).tw.
4	349440	Or/1-3
5	24	(Embotrap or Embo trap or Embo-trap).tw.
6	22	4 and 5
7	22	limit 6 to (english language and yr="2015 - 2022")

Cochrane Central Register of Controlled Trials (CENTRAL) from 1946 to April 15, 2022

#No.	Results	Searches
1	1456	MeSH descriptor: [Cerebrovascular Disorders] this term only
2	11	MeSH descriptor: [Basal Ganglia Cerebrovascular Disease] this term only
3	3886	MeSH descriptor: [Brain Ischemia] explode all trees
4	499	MeSH descriptor: [Carotid Artery Diseases] this term only
5	20	MeSH descriptor: [Carotid Artery Thrombosis] this term only
6	12	MeSH descriptor: [Intracranial Arterial Diseases] this term only
7	27	MeSH descriptor: [Cerebral Arterial Diseases] this term only
8	329	MeSH descriptor: [Intracranial Embolism and Thrombosis] explode all trees
9	10955	MeSH descriptor: [Stroke] explode all trees
10	17241	(isch?emi* NEAR/5 (stroke* or apoplex* or cerebral vasc* or cerebrovasc* or cva or attack*) or TIA*1):ti,ab,kw
11	28179	((brain or cerebr* or cerebell* or vertebrobasil* or hemispher* or intracran* or intracerebral or infratentorial or supratentorial or middle cerebr* or mca* or anterior circulation or posterior circulation or basilar artery or vertebral artery or space‐occupying or basal ganglia) NEAR/5 (isch?emi* or infarct* or thrombo* or emboli* or occlus* or hypoxi*)):ti,ab,kw
12	43865	Or/1-11
13	5	embotrap or embo trap or embo-trap
14	5	12 and 21
15	5	#14 with Publication Year from 2015 to 2022, in Trials

Embase from 1947 to April 15, 2022

#No.	Results	Searches
1	829,118	'cerebrovascular disease'/de OR 'basal ganglion hemorrhage'/de OR 'brain ischemia'/exp OR 'carotid artery disease'/de OR 'cerebral artery disease'/de OR 'arterial thromboembolism'/exp OR 'cerebrovascular accident'/de OR 'ischemic stroke'/exp
2	146,813	(isch$emi* NEAR/5 (stroke* OR apoplex* OR 'cerebral vasc*' OR cerebrovasc* OR cva OR attack*) or TIA$1):ti,ab,kw
3	135,482	((brain OR cerebr* OR cerebell* OR vertebrobasil* OR hemispher* OR intracran* OR intracerebral OR infratentorial OR supratentorial OR 'middle cerebr*' OR mca* OR 'anterior circulation' OR 'posterior circulation' OR 'basilar artery' OR 'vertebral artery' OR 'space‐occupying' OR 'basal ganglia') NEAR/5 (isch?emi* OR infarct* OR thrombo* OR emboli* OR occlus* OR hypoxi*)):ti,ab,kw
4	860,982	Or/1-3
5	75	Embotrap OR 'embo trap'
6	74	4 and 5
7	74	#6 AND [english]/lim AND [2015-2022]/py

characteristics of included studies and patients

Study	Bala et al	Bourcier et al	Brinjikji et al	Brouwer et al	Kabbasch et al	Mattle et al	Srivatsan et al	Valente et al	Zaidat et al
Publication time	2021	2018	2021	2018	2016	2019	2021	2019	2018
Country	France	Ireland	USA	Sweden	Europe	Europe	USA	Italy	Europe and USA
Center	Single Center	Multicenter	Multicenter	Single Center	Multicenter	Multicenter	Multicenter	Single Center	Multicenter
Device	EmboTrap II	The Embotrap System	EmboTrap II	EmboTrap II	The Embotrap System	The Embotrap System	EmboTrap II	EmboTrap II	EmboTrap II
Demographic characteristics									
Number of included patients	225	80	318	201	40	40	70	29	227
Age (years), Mean ± SD, Median (range)	71.5(14.5)	72(34-93)	68.5(14.6)	67.2(12.7)	NA	64(4.4)	69.9(16.5)	77(9.39)	68(13.0)
Gender, male, n (%)	100(44.4)	44(55.0)	154(48.4)	114(56.7)	NA	25(62.0)	36(51.4)	11(38.0)	104(45.8)
Admission NIHSS, Mean ± SD, Median (range)	17.4(6.65)	15(5-30)	NA	15(2-30)	16(5-25)	15.5(1.4)	16.3(6.6)	18.5(5.4)	15.8(5.0)
Admission ASPECTS score, Mean ± SD, Median (range)	NA	8(1-10)	NA	NA	NA	NA	NA	8.1(1.5)	9.2(1.5)
Occlusion location									
ICA, n (%)	39(17.3)	19(23.7)	NA	31(15.5)	10(25.0)	6(15.0)	18(25.7)	4(14.0)	35(15.4)
MCA, n (%)	155(68.9)	79(98.7)	NA	123(61.2)	25(62.5)	34(84.0)	51(72.9)	25(86.0)	183(80.6)
M1, n (%)	122(54.2)	NA	NA	NA	23(57.5)	29(72.0)	38(54.3)	22(76.0)	126(55.5)
M2, n (%)	33(14.7)	NA	NA	NA	2(5.0)	5(12.0)	13(18.6)	3(10.0)	57(25.1)
Posterior cerebral/Basilar /Vertebral artery, n (%)	NA	NA	NA	24(11.9)	5(12.5)	NA	1(1.4)	NA	9(4.0)
Intervention characteristics									
IV thrombolysis, n (%)	123(71.9)	45(56.2)	96(30.2)	95(47.3)	26(65.0)	31(78.0)	24(34.4)	21(72.0)	120(52.9)

Onset to recanalization, Mean ± SD, Median (range)	NA	238(104-685)	NA	NA	290(111)	275(58.2)	NA	306(172)	243(184-308)
Onset to puncture, Mean ± SD, Median (range)	NA	198(60-230)	NA	NA	223(113)	249(57.5)	445(310.4)	262(153)	214(155.0-266.0)
Puncture to revascularization, Mean ± SD, Median (range)	39.9(23.1)	35(8-161)	NA	NA	38(32)	76(15.8)	54(36.0)	59(46)	45(24-61)
Number of attempts, median (range)	NA	1(1-9)	NA	NA	NA	NA	2.2(1.6)	1.86(1.16)	NA
Use of BGC	142	37	NO	NA	YES	YES	27	23	167

SD standard deviation, *NIHSS* National Institutes of Health Stroke Scale, *MI* myocardial infarction, *ASPECTS* Alberta Stroke Program Early CT Score, *ICA* Internal carotid artery, *MCA* middle cerebral artery, *IV* intravenous, *NA* not available, *BGC* balloon guide catheter, *NO* did not use BGC, *YES* used BGC but the concrete number is unknow

Subgroup analysis of the EmboTrap System and EmboTrap II Recanalization Device

	The EmboTrap System			EmboTrap II			
Outcomes	ES (95% CI)	I^2	P value*	ES (95% CI)	I^2	P value*	P value **
Favorable outcome at 90d	0.55 (0.39, 0.71)	70.5%	0.034	0.51 (0.38, 0.65)	92.2%	< 0.0001	0.358
Rate of successful recanalization	0.88 (0.78, 0.97)	70.1%	0.035	0.88 (0.83, 0.94)	82.3%	< 0.0001	0.142
Rate of complete recanalization	0.48 (0.29, 0.66)	74.6%	0.047	0.60 (0.49, 0.70)	81.0%	0.022	0.043
mFPE (mTICI score≥2b)		NA		0.43 (0.35, 0.51)	63.7%	0.041	NA
Rescue rate	0.19 (0.04, 0.33)	71.8%	0.060	0.13 (0.05, 0.21)	90.8%	< 0.0001	0.287
90d mortality		NA		0.14 (0.08, 0.19)	82.3%	< 0.0001	NA
Any ICH	0.22 (0.14, 0.29)	0.0%	0.876	0.19 (0.15, 0.23)	29.0%	0.245	NA
Symptomatic ICH	0.04 (0.01, 0.08)	4.6%	0.306	0.05 (0.00, 0.09)	89.8%	< 0.0001	0.624
Procedure-related complications	0.08 (0.04, 0.12)	0.0%	0.525	0.06 (0.04, 0.08)	0.0%	0.374	0.222

CI confidence interval, I^2 the variation attributable to heterogeneity, *mTICI* modified Thrombolysis in Cerebral Infarction, *mRS* modified Rankin Score, *FPE* first-pass effect, *mFPE* modified first-pass effect, *ICH* Intracerebral hemorrhage, * P value indicate the significance of heterogeneity. ** P value indicate the significance of difference between The EmboTrap System and EmboTrap II

Supplementary Table 2 Inclusion and exclusion criteria of patients in included studies

Study	Bala Q, et al [31]	Bourcier et al [30]	Brinjikji et al [11]	Brouwer et al [12]	Kabbasch et al [13]	Mattle et al [28]	Srivatsan et al [27]	Valente et al [14]	Zaidat et al [15]
Time window	IVT alone within 4.5 h of symptom discovery or ET within 24 h of symptom onset or last known well;	IVT alone within 4.5 h of symptom discovery or ET within 12 h of symptom onset or last known well;	ND	IVT alone within 4.5 h of symptom discovery and ET regardless of time of onset;	IVT alone within 4.5 h of symptom discovery or ET within 24 h of symptom onset or last known well;	IVT alone within 5 of symptom discovery or ET within 24 h of symptom onset or last known well;	ND	ND	IVT alone within 3h of symptom discovery and ET within 8 hours of symptom onset;
Baseline neurologic evaluation	Pretreatment NIHSS score ≥2	ND	ND	ND	Pretreatment NIHSScore of ≥5	preictal mRS score of 0–1; a National Institutes of Health stroke scale (NIHSS) score of 8-25	Pretreatment ASPECTS of 6–10	Pretreatment ASPECTS from 6–10; baseline mRS < 2	prestroke modified Rankin Scale(mRS) ≤1, baseline National Institutes of Health stroke scale (NIHSS) score ≥8 and ≤25, Alberta Stroke Program early computed tomography (ASPECT) score ≥6

Imaging Evaluation	MRI;If presenting a magnetic resonance contraindication, computed tomography (CT) and CT angiography were used.	brain CT;cervical and intracranial angiography; brain MRI	ND	large vessel occlusions confirmed by CT,Patients with ischemic areas seen on CT perfusion but no loss of cortex on unenhanced CT scans	CT or magnetic resonance imaging indicated salvageable brain parenchyma, e.g., CT perfusion mismatch.	the stroke volume was less than 30mL on magnetic resonance imaging (MRI) (diffusion restriction) or computed tomography (CT) (low cerebral blood volume) and perfusion reduction indicated mismatch.	CTA:moderateto-good collaterals ; ischemic penumbra of .50% of the total hypoperfused area identified by CTP	moderate to good collaterals on the multiphase CT angiography;ischaemic penumbra/infarct core mismatch largerthan 50% of the total hypoperfused area identified by visual inspection on CTP maps;	CAT proved occlusion (mTICI, 0–1);ore infarct volume<50 mL on MRI or CT (for anterior circulation strokes)
Exclusion criteria	patients with basilar artery occlusion; patients with stroke related to an anterior circulation occlusion who did not undergo MT because of recanalization either spontaneously or after intravenous r-tPA.	patients with occlusions in the posterior circulation	patients treated in combination with other stent retrievers；Patients who had a primary or secondary diagnosis of AIS in any setting in the PHD in the 12 months before index admission; patients used other stent retreivers	patients with signs of manifest infarction and show loss of cortex on unenhanced CT scans	patients with cerebral hemorrhage or acute infarction greater than one-third of the middle cerebral artery (MCA) territory on the pre-interventional CT scan；Patients with pre-procedure imaging revealed	patients age >80	ND	patients with occlusions in the posterior circulation	patients>85,stenosis or any occlusion in a proximal vessel requiring treatment or preventing access to the thrombus

	other EmboTrap	than	large areas of brainstem infarcts.

ND no documentation; *mRS* modified Rankin Scale; *MRA* MR angiography; *ASPECTS* Alberta Stroke Program Early CT Score; *NIHSS* National Institute of Health Stroke Scale; *CTP* CT perfusion; *ICH* intracranial hemorrhage; *FLAIR* fluid attenuated inversion recovery

MINORS Criteria[a]

1. A clearly stated aim: the question addressed should be precise and relevant in the light of available literature

2. Inclusion of consecutive patients: all patients potentially fit for inclusion (satisfying the criteria for inclusion) have been included in the study during the study period (no exclusion or details about the reasons for exclusion)

3. Prospective collection of data: data were collected according to a protocol established before the beginning of the study

4. Endpoints appropriate to the aim of the study: unambiguous explanation of the criteria used to evaluate the main outcome which should be in accordance with the question addressed by the study. Also, the endpoints should be assessed on an intention-to-treat basis.

5. Unbiased assessment of the study endpoint: blind evaluation of objective endpoints and double-blind evaluation of subjective endpoints. Otherwise the reasons for not blinding should be stated

6. Follow-up period appropriate to the aim of the study: the follow-up should be sufficiently long to allow the assessment of the main endpoint and possible adverse events

7. Loss to follow up less than 5%: all patients should be included in the follow up. Otherwise, the proportion lost to follow up should not exceed the proportion experiencing the major endpoint

8. Prospective calculation of the study size: information of the size of detectable difference of interest with a calculation of 95% confidence interval, according to the expected incidence of the outcome event, and information about the level for statistical significance and estimates of power when comparing the outcomes

Additional criteria in the case of comparative study

9. An adequate control group: having a gold standard diagnostic test or therapeutic intervention recognized as the optimal intervention according to the available published data

10. Contemporary groups: control and studied group should be managed during the same time period (no historical comparison)

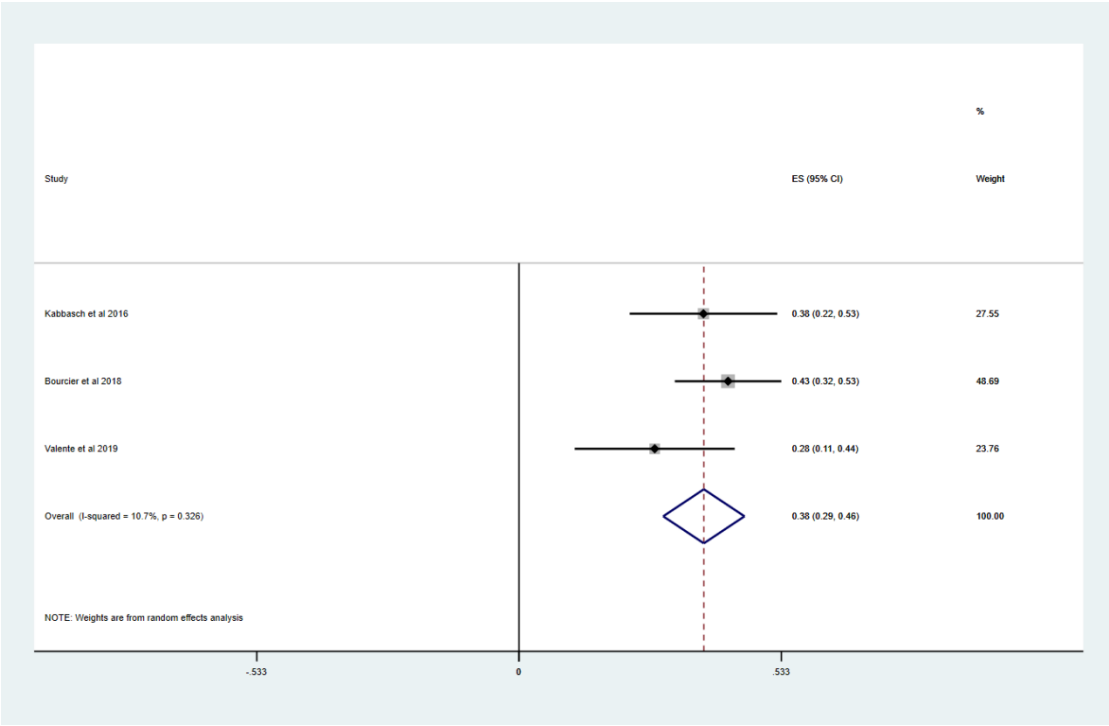
11. Baseline equivalence of groups: the groups should be similar regarding the criteria other than the studied endpoints. Absence of confounding factors that could bias the interpretation of the results

12. Adequate statistical analyses: whether the statistics were in accordance with the type of study with calculation of confidence intervals or relative risk

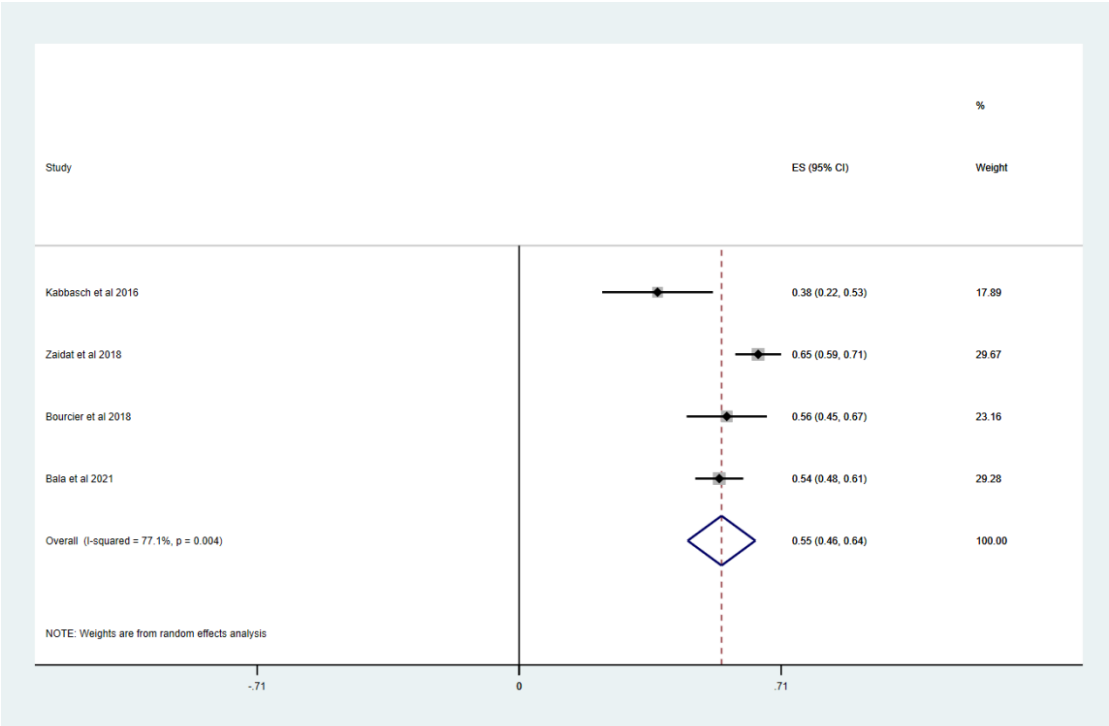
MINORS, methodological index for non-randomized studies.
[a]The items are scored 0 (not reported), 1 (reported but inadequate) or 2 (reported and adequate). The global ideal score being 16 for non-comparative studies and 24 for comparative studies.

Supplementary Table 3. MINORS Scores

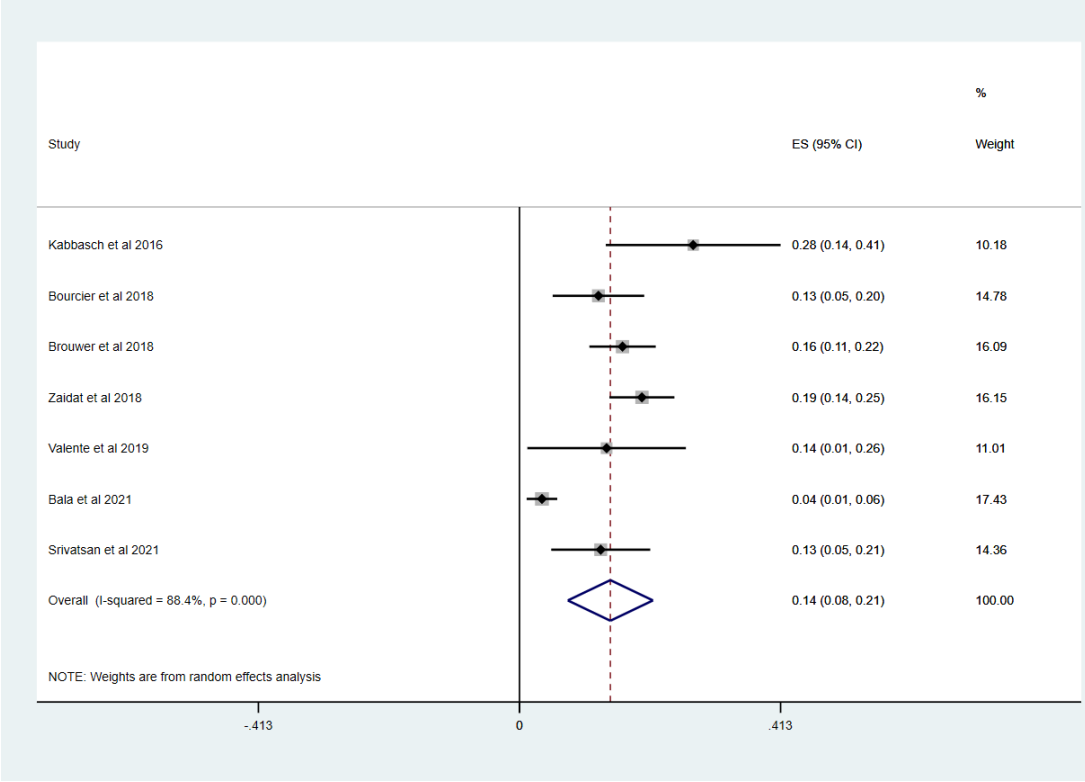
Author et al.	Bala	Bourcier	Brinjikji	Brouwer	Kabbasch	Mattle	Srivatsan	Valente	Zaidat
1.	2	2	2	2	2	2	2	2	2
2.	2	1	0	2	2	2	2	2	2
3.	2	2	1	2	1	2	0	2	1
4.	2	2	1	2	2	2	2	2	2
5.	2	2	2	2	2	2	2	2	0
6.	2	2	2	2	2	2	2	2	2
7.	2	2	2	2	2	2	2	2	2
8.	2	2	2	2	2	2	2	2	0
Total Score	16	15	12	16	15	16	14	16	16



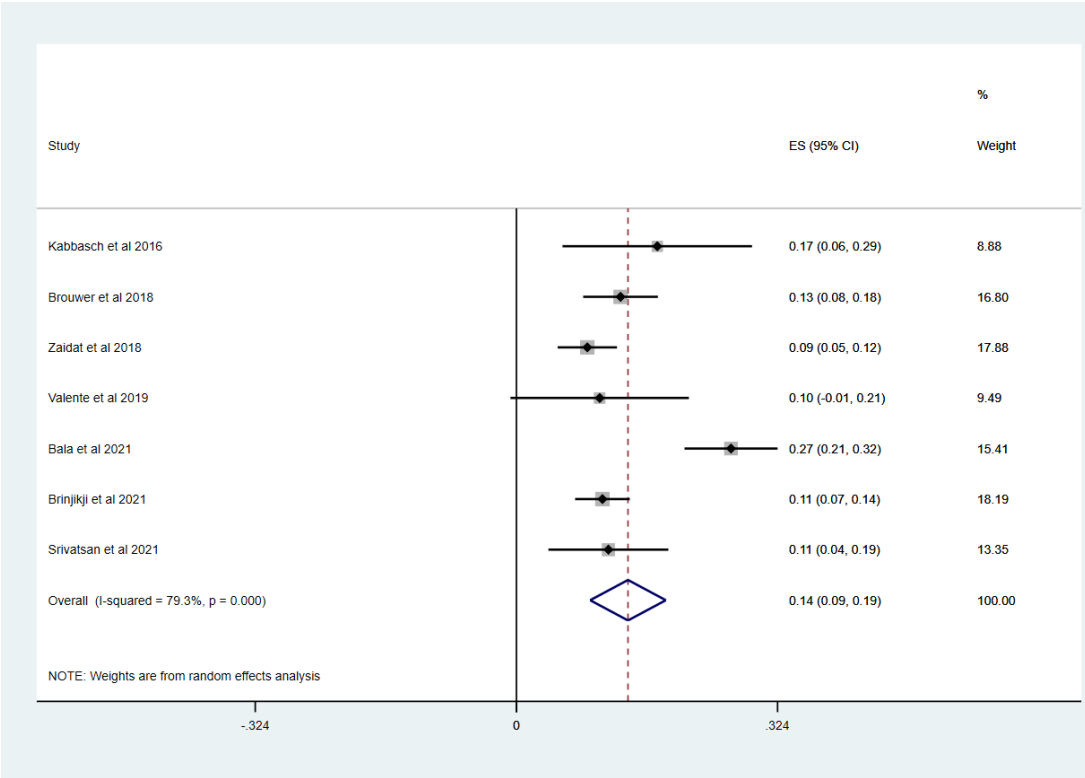
Supplementary Fig.1 Forest plot for meta-analyses of FPE (first-past effect).



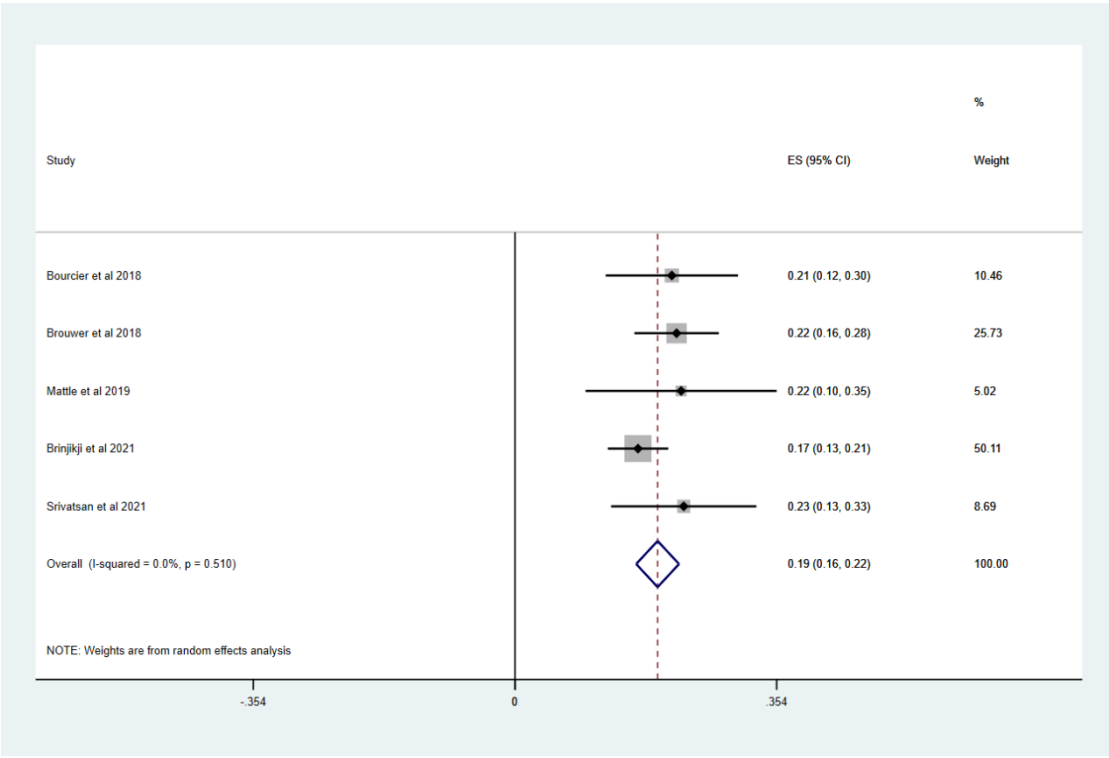
Supplementary Fig.2 Forest plot for meta-analyses of Complete recanalization (mTICI 2c-3).



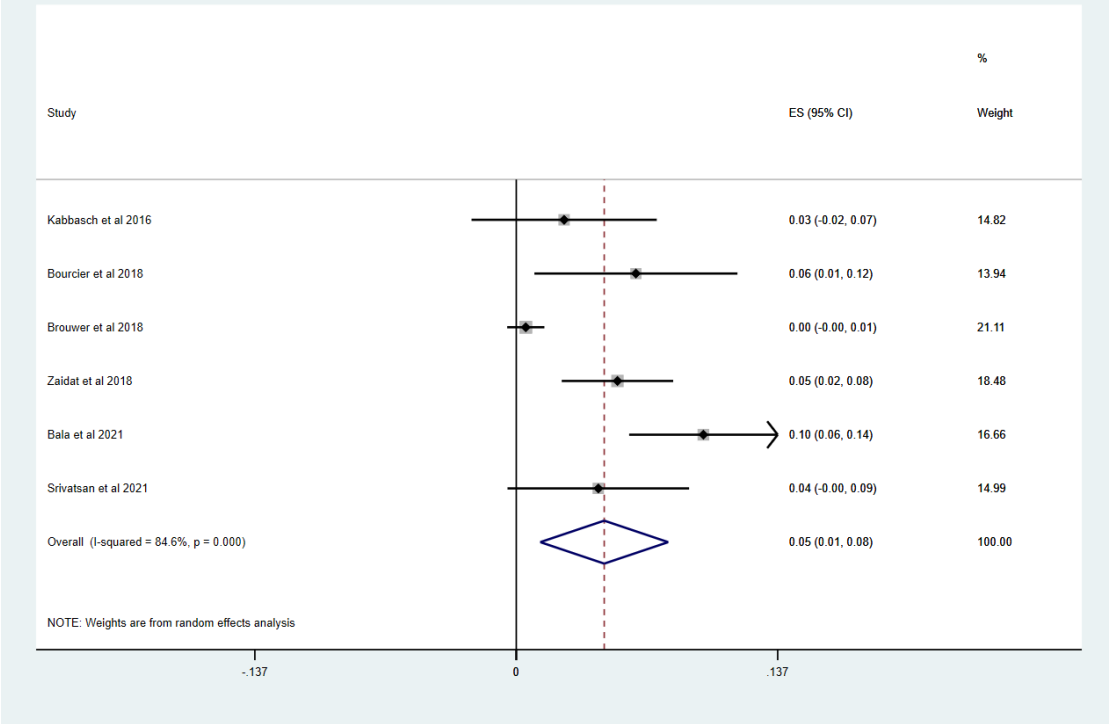
Supplementary Fig.3 Forest plot for meta-analyses of Rescue rate.



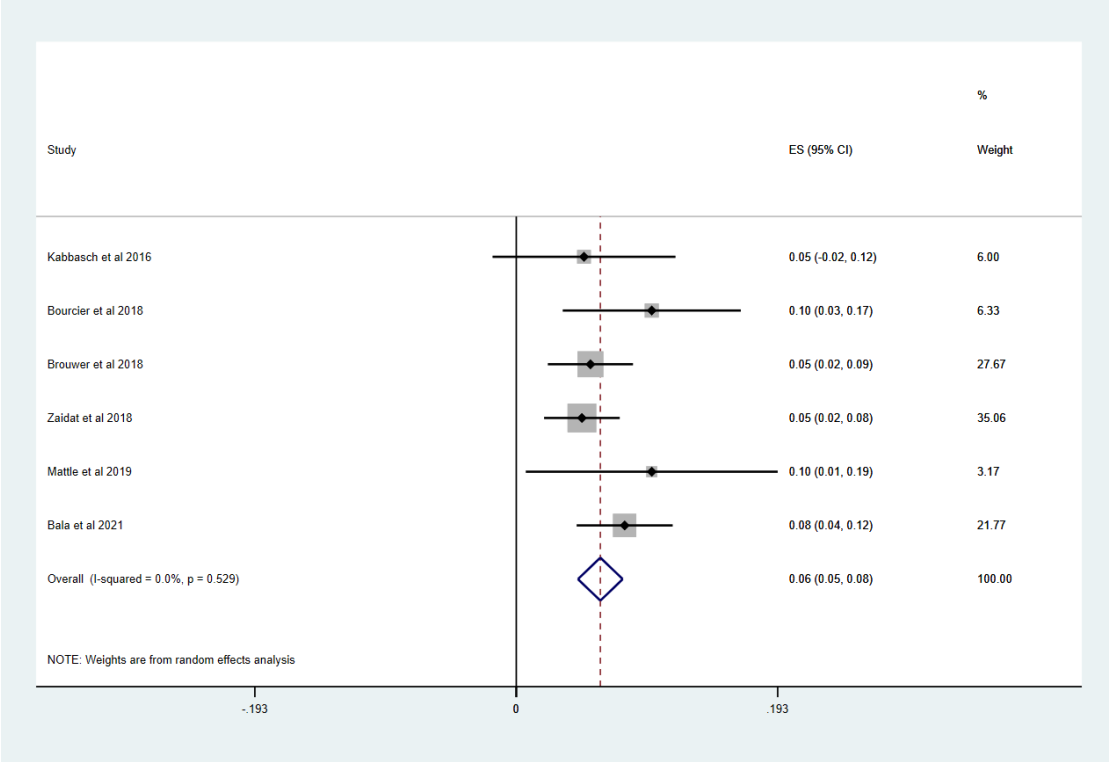
Supplementary Fig.4 Forest plot for meta-analyses of 90d mortality.



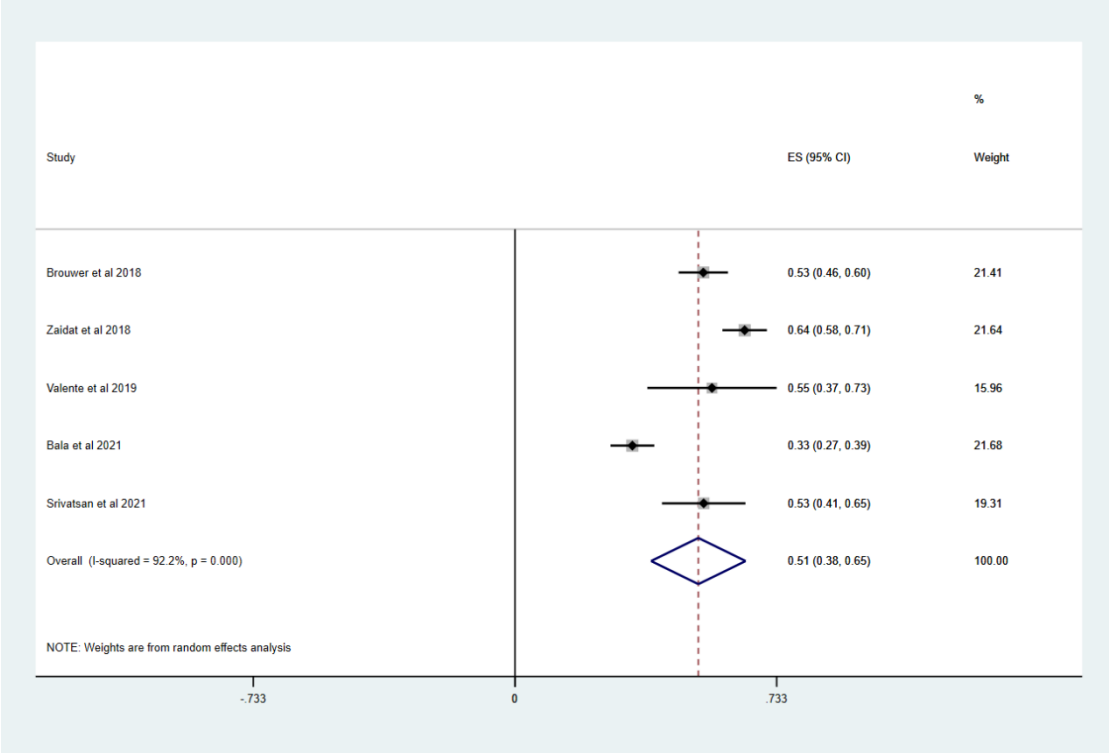
Supplementary Fig.5 Forest plot for meta-analyses of Intracerebral hemorrhage (ICH).



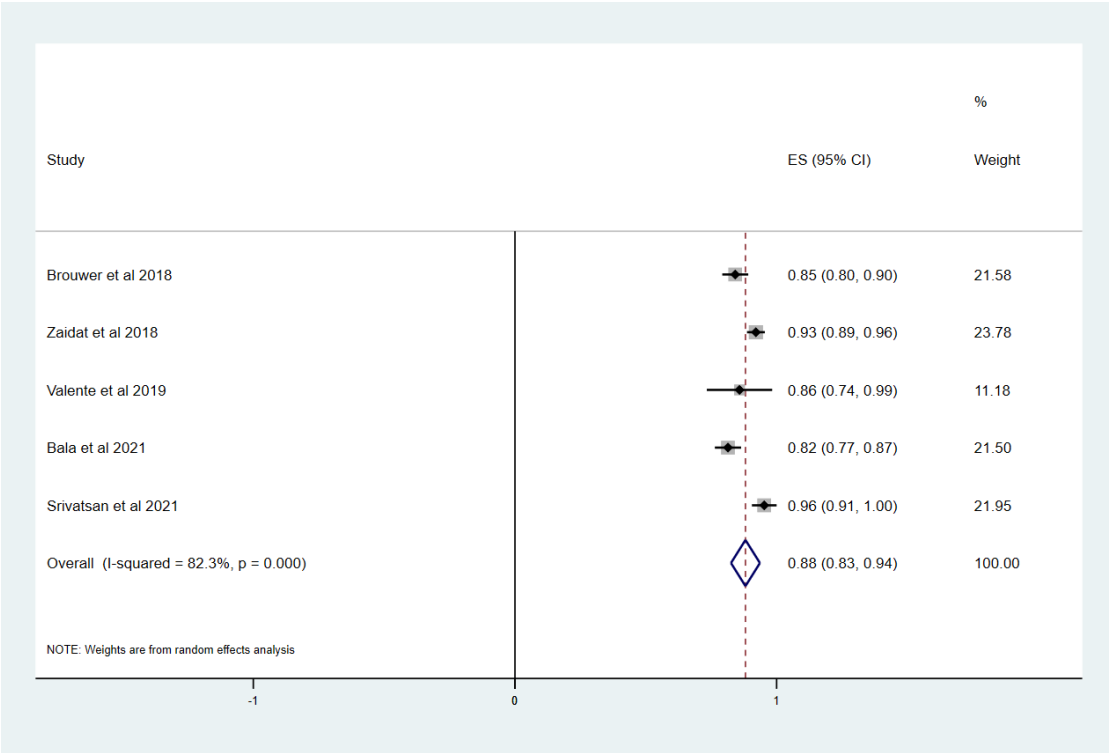
Supplementary Fig.6 Forest plot for meta-analyses of Symptomatic intracranial hemorrhage (sICH).



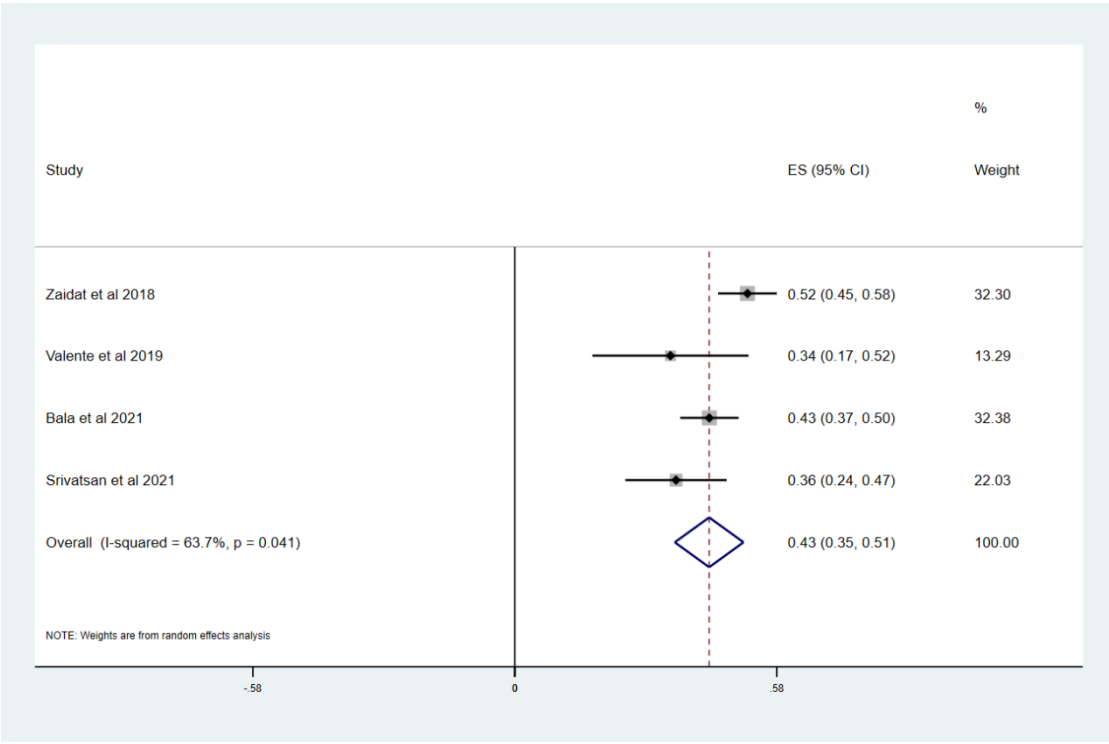
Supplementary Fig.7 Forest plot for meta-analyses of Procedural complications.



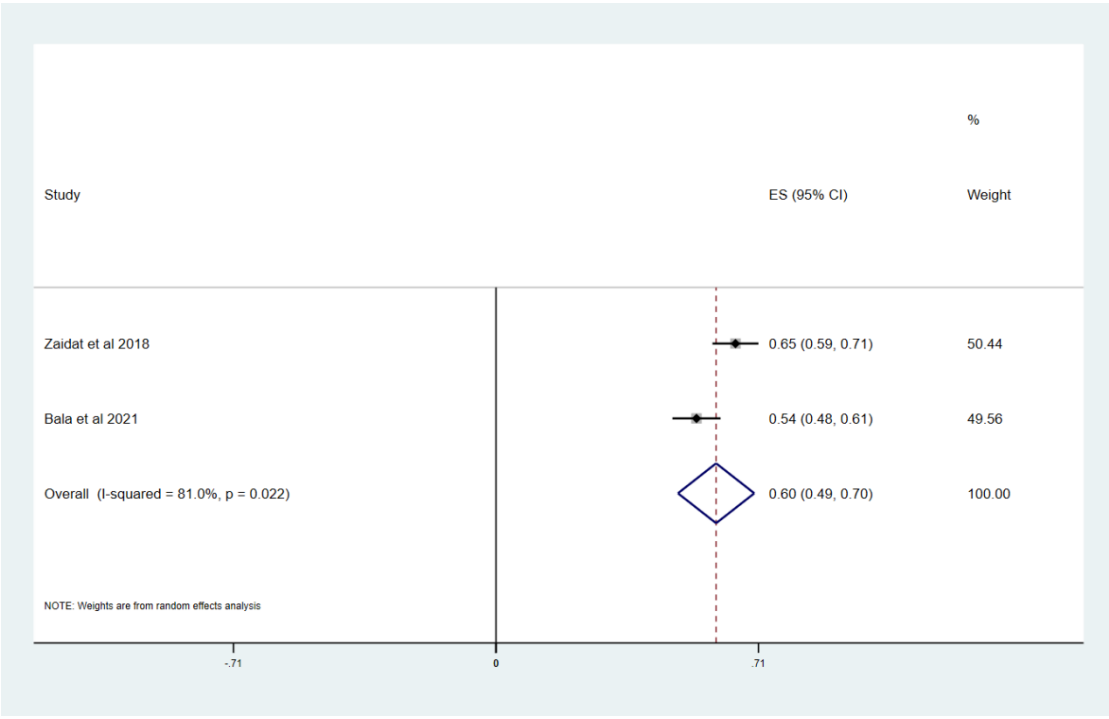
Supplementary Fig.8 Forest plot of Favorable outcome for subgroup analysis of EmboTrap II.



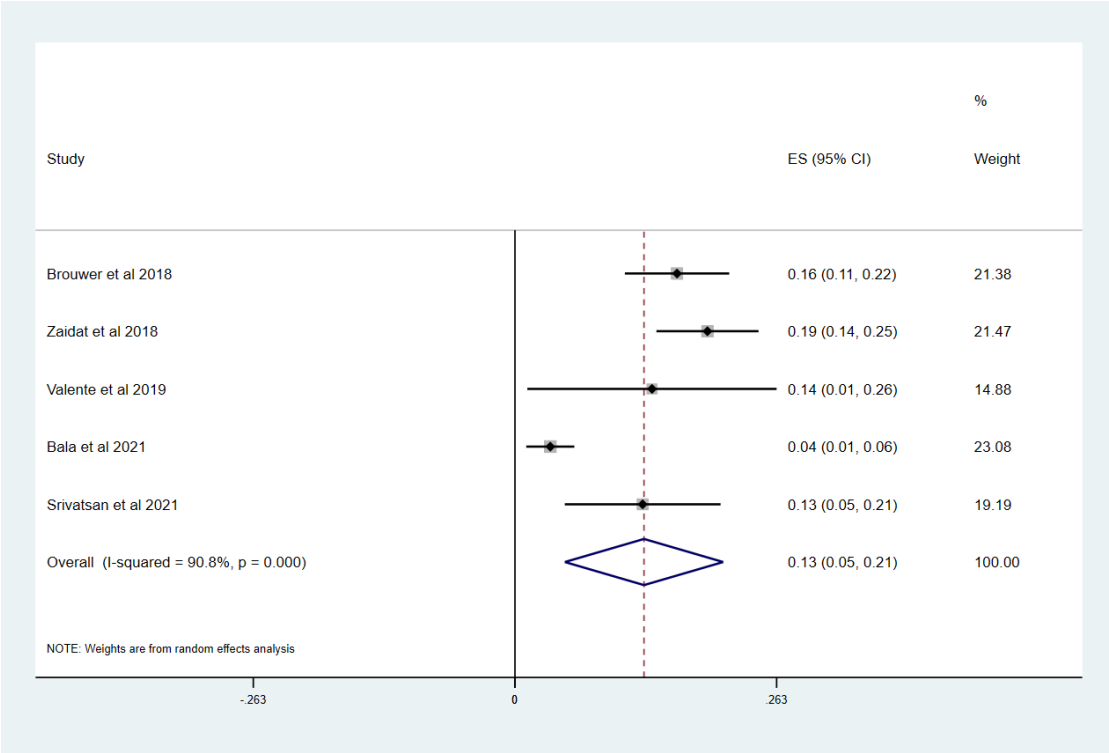
Supplementary Fig.9 Forest plot of Successful recanalization for subgroup analysis of EmboTrap II.



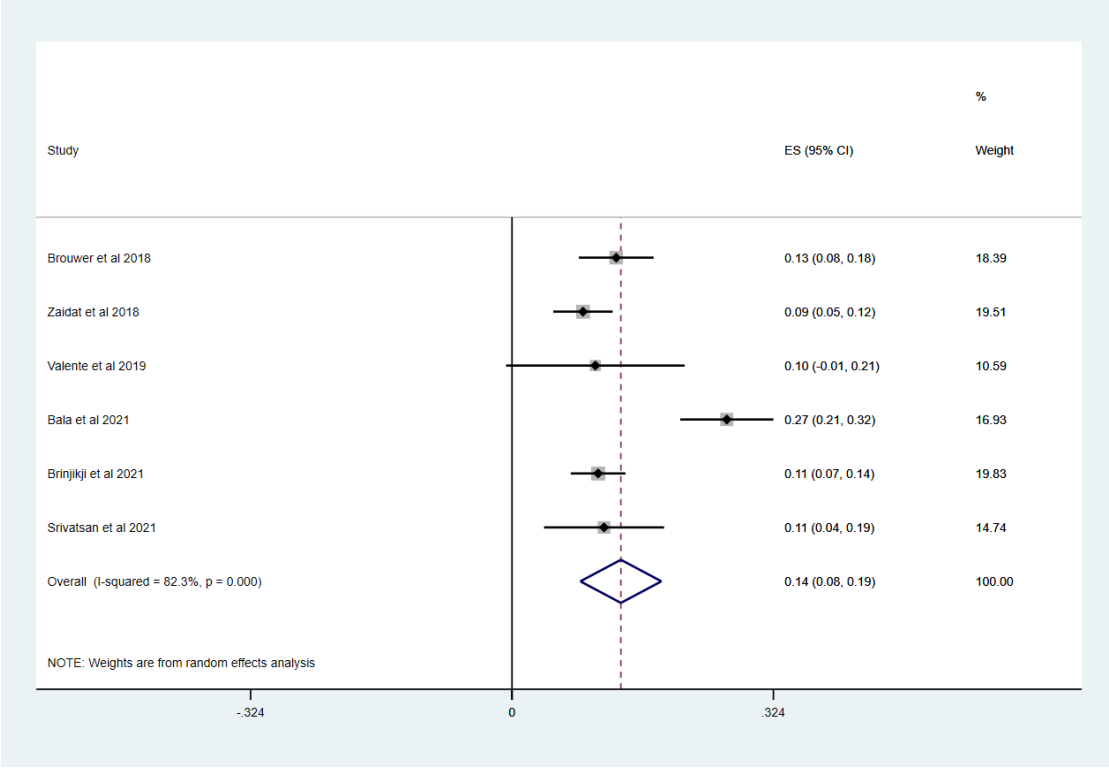
Supplementary Fig.10 Forest plot of mFPE (mTICI score≥2b) for subgroup analysis of EmboTrap II.



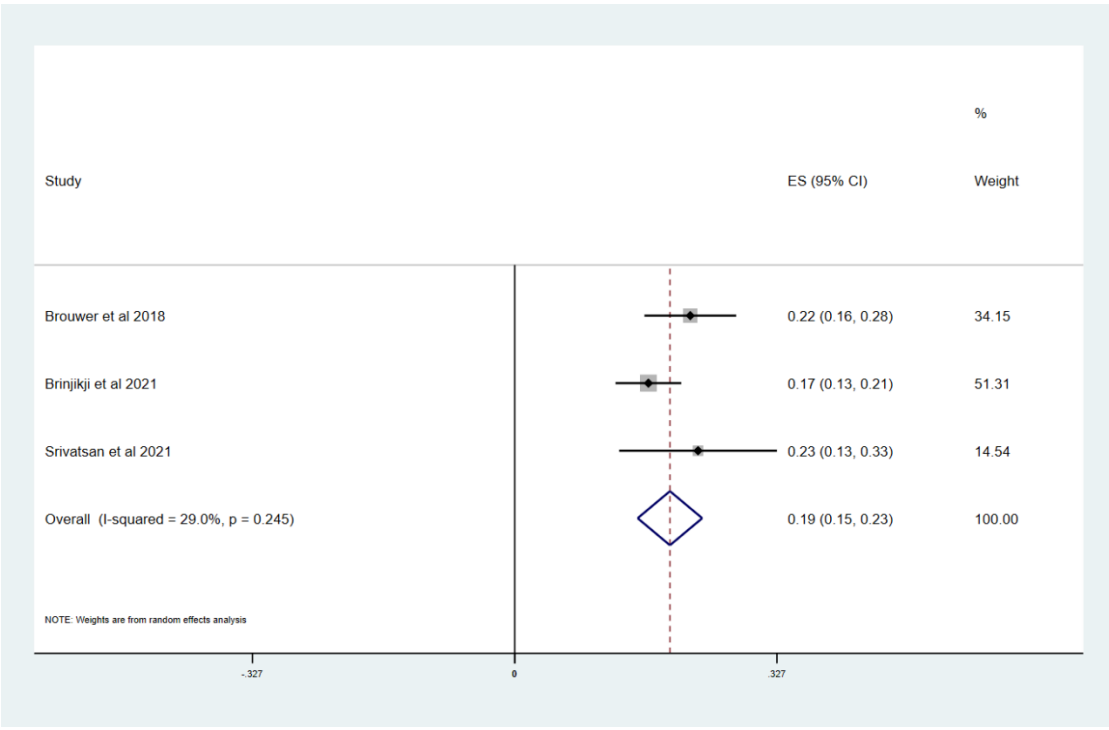
Supplementary Fig.11 Forest plot of Complete recanalization (mTICI 2c-3) for subgroup analysis of EmboTrap II.



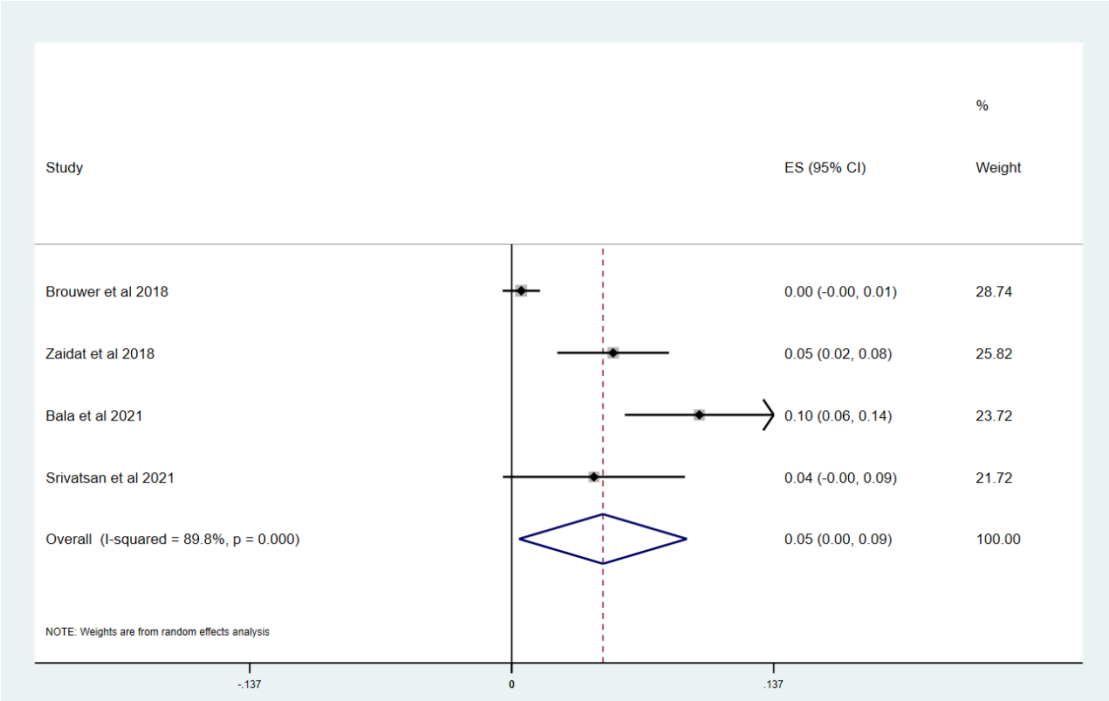
Supplementary Fig.12 Forest plot of Rescue rate for subgroup analysis of EmboTrap II.



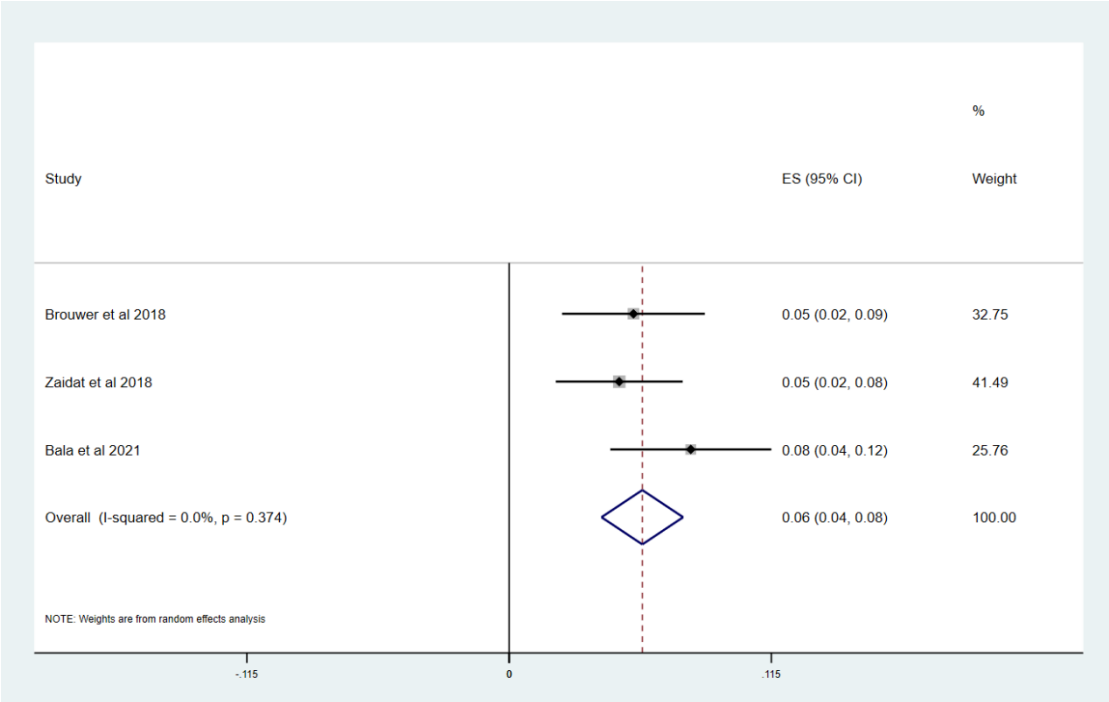
Supplementary Fig.13 Forest plot of 90d mortality for subgroup analysis of EmboTrap II.



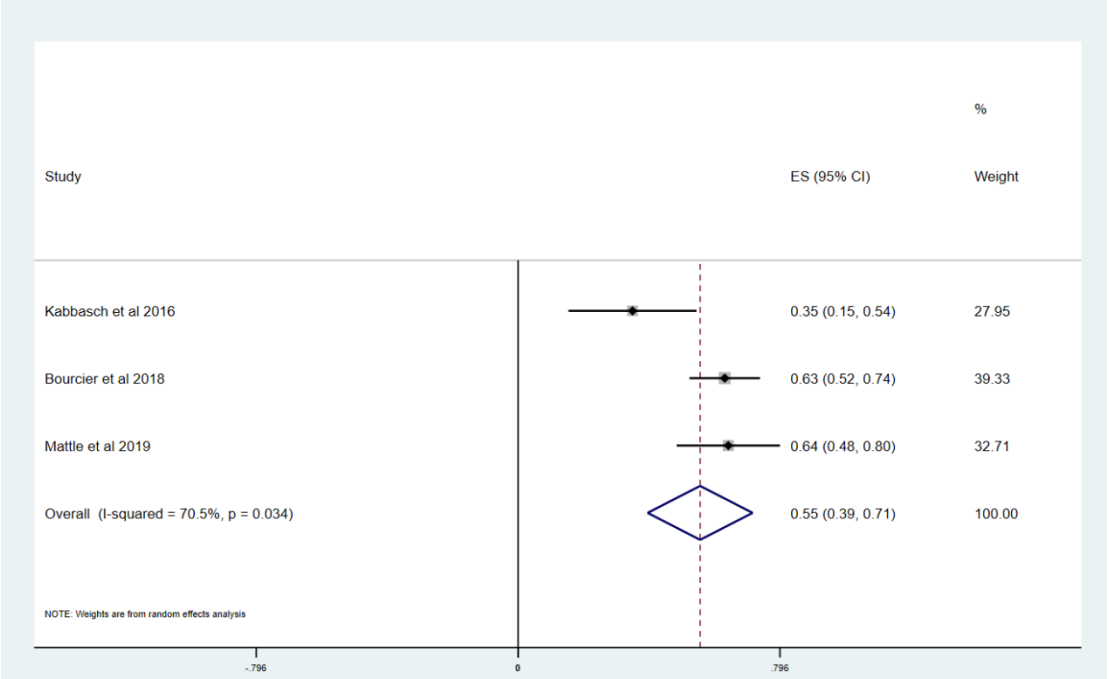
Supplementary Fig.14 Forest plot of Intracerebral hemorrhage (ICH) for subgroup analysis of EmboTrap II.



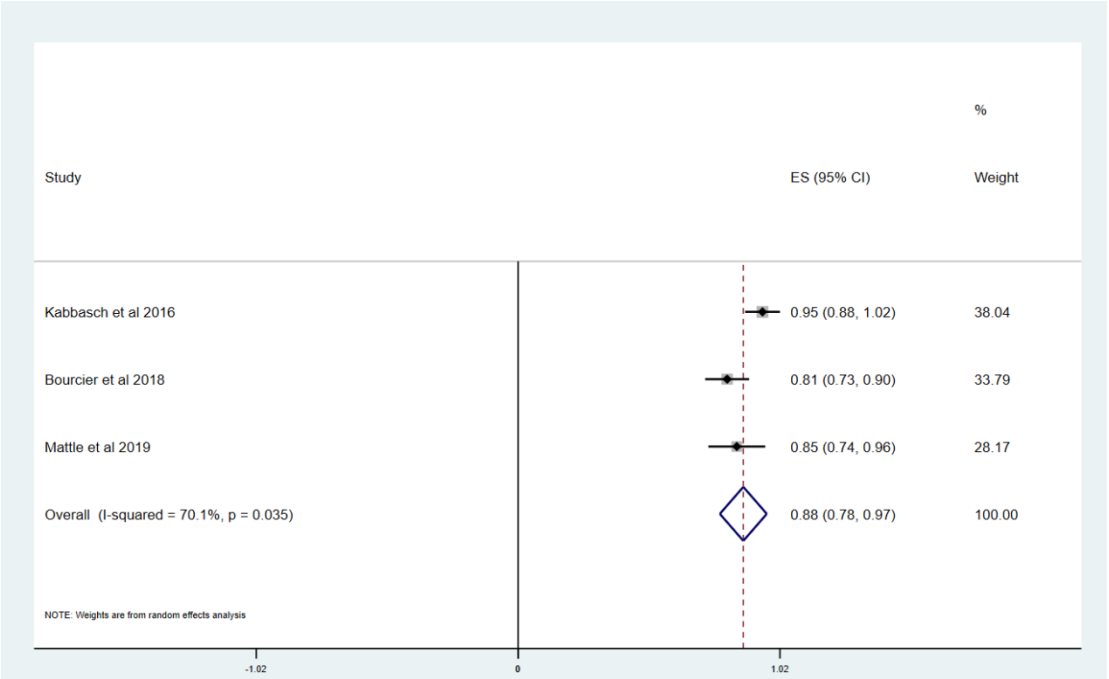
Supplementary Fig.15 Forest plot Symptomatic intracranial hemorrhage (sICH) for subgroup analysis of EmboTrap II.



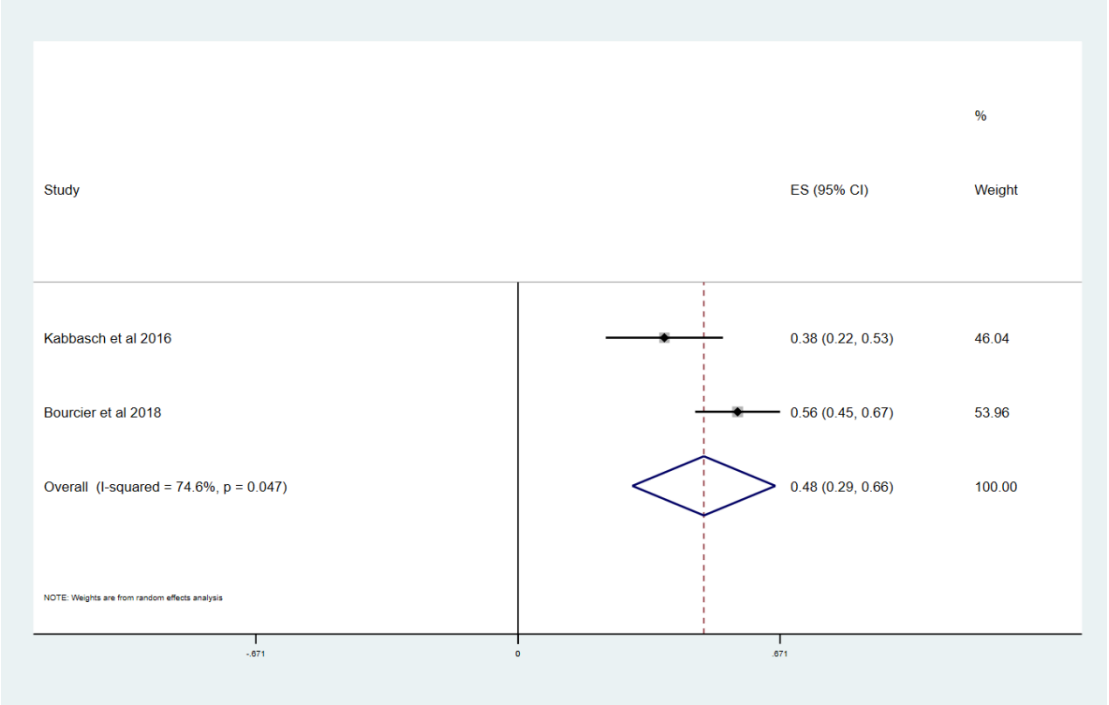
Supplementary Fig.16 Forest plot of Procedural complications for subgroup analysis of EmboTrap II.



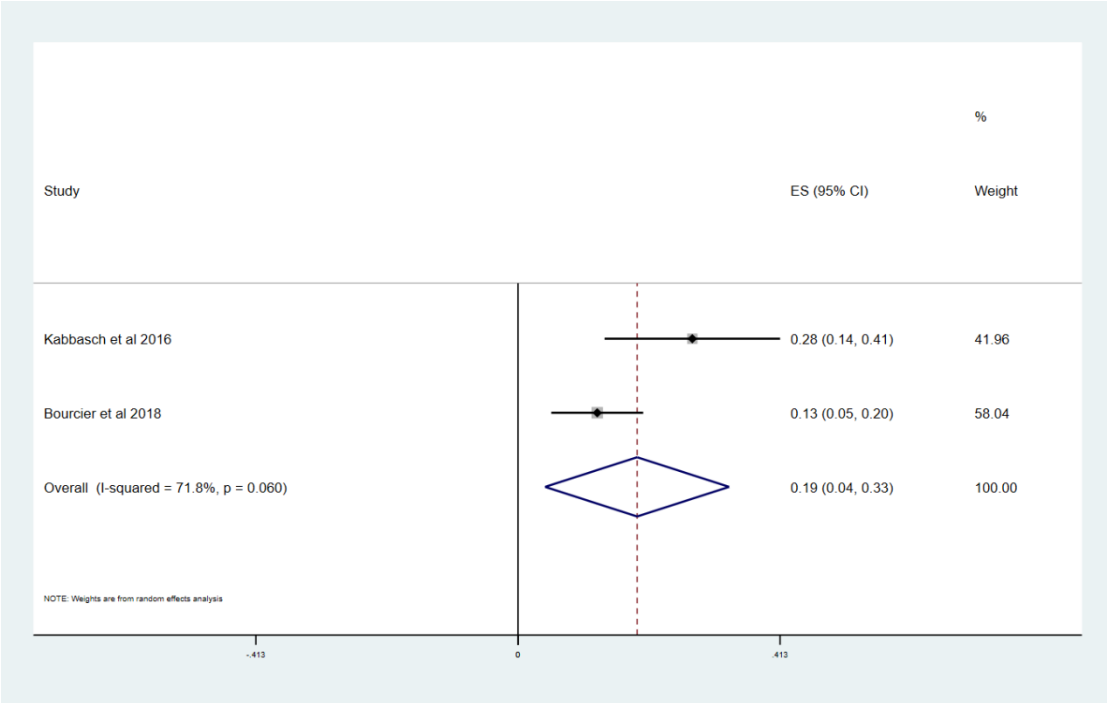
Supplementary Fig.17 Forest plot of Favorable outcome for subgroup analysis of The EmboTrap System.



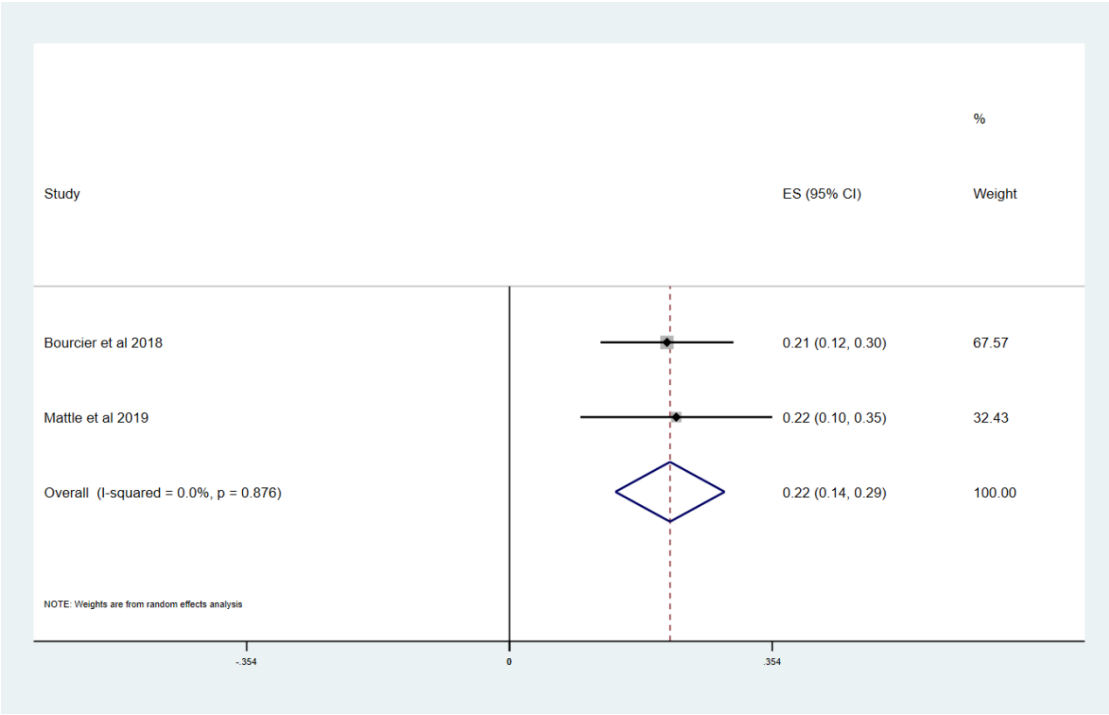
Supplementary Fig.18 Forest plot of successful recanalization for subgroup analysis of The EmboTrap System.



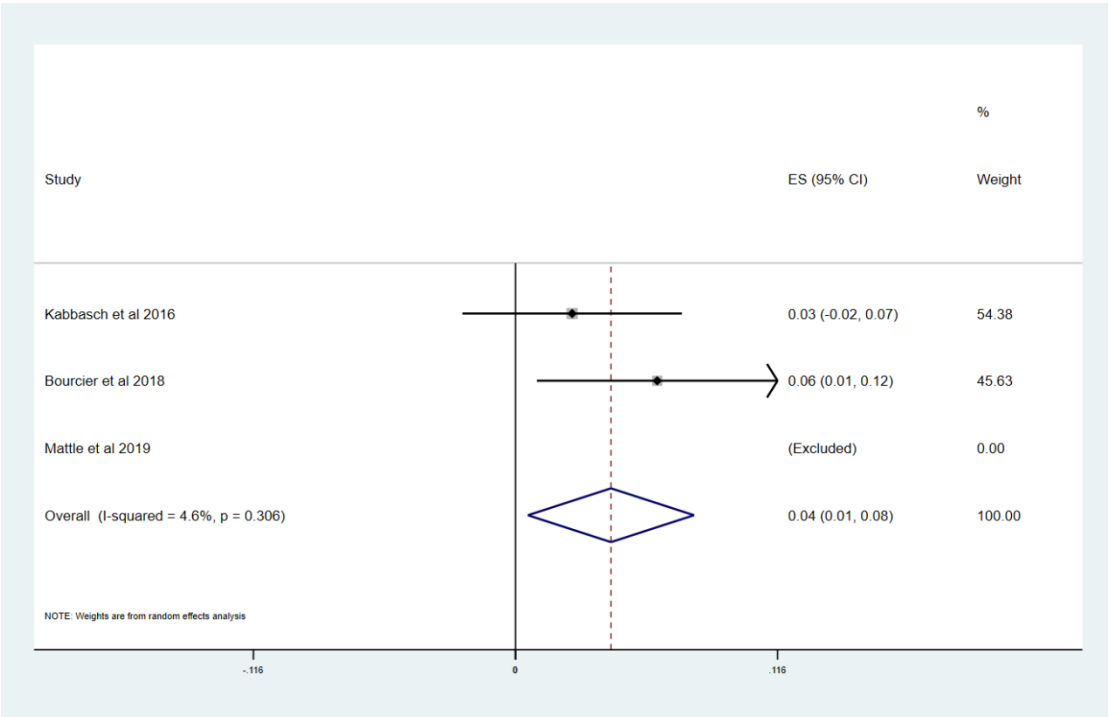
Supplementary Fig.19 Forest plot of complete recanalization for subgroup analysis of The EmboTrap System.



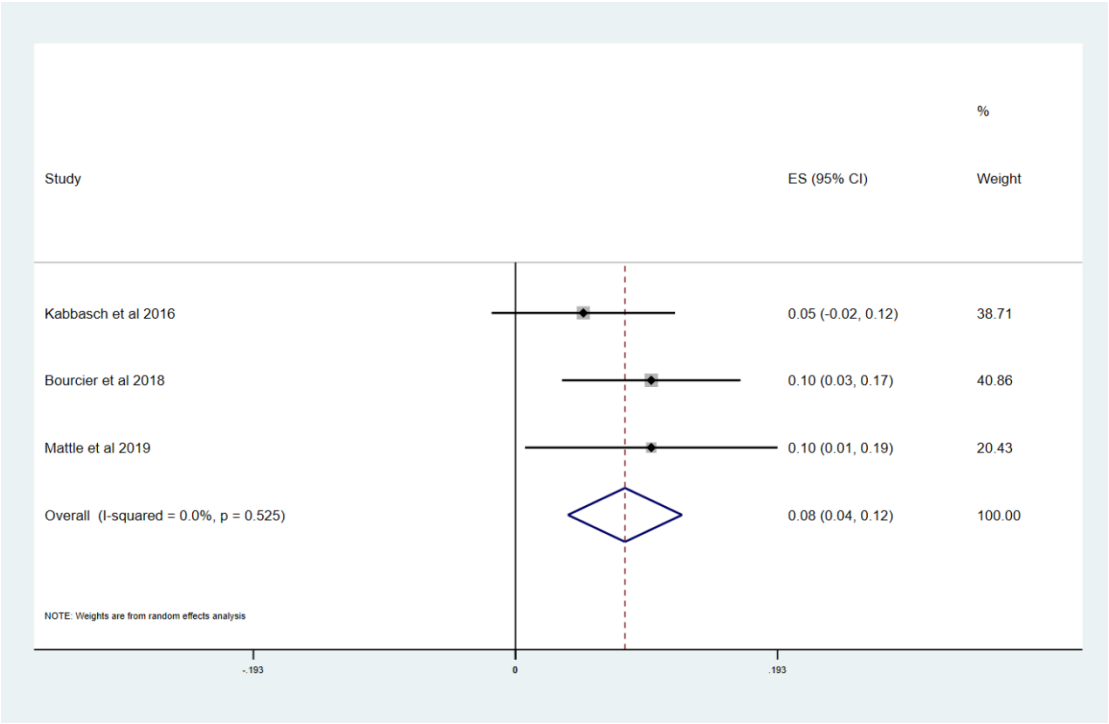
Supplementary Fig.20 Forest plot of rescue rate for subgroup analysis of The EmboTrap System.



Supplementary Fig.21 Forest plot of Any ICH for subgroup analysis of The EmboTrap System.



Supplementary Fig.22 Forest plot of Symptomatic ICH for subgroup analysis of The EmboTrap System.



Supplementary Fig.23 Forest plot of Procedure-related complications for subgroup analysis of The EmboTrap System.