

Supplementary Table 1. Quality assessment of included studies

Study	Retrospective (R) or prospective (P)	Included all patients (A), consecutive patients (B), or selected sample (C)	Angiographic/clinical follow-up confirmed all outcomes (Yes/No)	Clearly reported outcomes (Yes/No)	Interventionalists treated patients and assessed angiographic outcomes (Yes/No)	Interventionalists treated patients and assessed clinical outcomes (Yes/No)	Multicenter (M) or single center (S) study
Abbas et al. ³	R	A	Y	Y	Y	Y	M
Goertz et al. ¹	R	C	Y	Y	Y	Y	M
Hendrix et al. ⁴	R	A	Y	Y	Y	Y	M
Wen et al. ¹⁵	R	A	Y	Y	Y	Y	M
Clausen et al. ¹³	R	A	Y	Y	Y	Y	S
Roy et al. ¹⁴	R	A	Y	Y	Y	Y	M
Vollherbst et al. ⁵	R	A	Y	Y	Y	Y	M
Cherednychenko ¹²	P	A	Y	N	N	N	S
Guimaraens et al. ²	P	C	Y	Y	Y	N	M

Supplementary Table 2. Antiaggregation and antiplatelet therapies of studies

Study, year	Pre-procedure antiplatelets	Antiaggregation test	Intra-procedure anticoagulants/antiplatelets	Post-procedure antiplatelets
Abbas et al. ³	Patients were started on dual antiplatelet therapy (DAPT) of aspirin 81 mg and clopidogrel 75 mg once daily for 10 days prior to the procedure	VerifyNow (accumetrics)	Activated clotting time was preserved at 2–3 times the patient's baseline through heparin flushes (100 U/kg)	DAPT was maintained for at least 6 months postoperatively
Goertz et al. ¹	Dual antiplatelet therapy was initiated 5–7 days before the procedure with 100 mg aspirin and 75 mg clopidogrel, 5 mg prasugrel, or 2 × 90 mg ticagrelor	VerifyNow (accumetrics) light transmission aggregometry	Heparin was administered with an initial bolus of 5000 IU followed by subsequent aliquots of 1000 IU/h	DAPT was maintained for at least 6 months postoperatively
Hendrix et al. ⁴	Dual antiplatelet therapy (aspirin and a P2Y12 inhibitor) for 6months with pre-procedure platelet function testing was standard of care	Yes (not specified)	All patients received intraprocedural intravenous heparin, with 78.2% guided by activated clotting time	DAPT was maintained for at least 6 months postoperatively
Wen et al. ¹⁵	NA	Yes (not specified)	NA	DAPT was maintained for at least 6 months postoperatively
Clausen et al. ¹³	Scheduled surgery for incidental non-ruptured aneurysms involved pre-treatment with DAPT (ASA and ticagrelor) for 1 week prior to intervention. Patients with ruptured aneurysms received a DAPT loading dose after EVD stabilization (24–48 hours). For patients requiring thrombectomy, ASA was administered per rectum, and a cangrelor drip was started upon ICU arrival	Yes (not specified)	The procedure was performed under systemic heparinization (target ACT 250–300 s) and general anesthesia administered by a anesthesiologist	DAPT was maintained for at least 6 months postoperatively
Roy et al. ¹⁴	Patients started on DAPT with aspirin 81 mg and clopidogrel 75 mg once daily for 10 days prior to the procedure	P2Y12 assay (VerifyNow, accumetrics)	Activated clotting time was preserved at 2–3 times the patient's baseline through heparin flushes (100 U/kg)	DAPT was maintained for at least 6 months postoperatively
Vollherbst et al. ⁵	In all patients, the flow diverter was implanted on the DAPT	Platelet reactivity testing	NA	DAPT was maintained for at least 6 months postoperatively
Cherednychenko et al. ¹²	In all patients, the flow diverter was implanted on the DAPT (ticagrelor and acetylsalicylic acid)	NA	NA	DAPT was maintained for at least 6 months postoperatively
Guimaraens et al. ²	Patients were initiated on dual antiplatelet therapy (DAPT) comprising aspirin (300 mg once daily) and clopidogrel (75 mg once daily), starting 5 days before the intervention	VerifyNow	At the beginning of the procedure, all patients received IV heparin (50IU/kg), followed by an additional bolus of 1000 IU during the intervention to maintain a clotting time >250–300 s	After the procedure, patients continued DAPT for 6 months, consisting of aspirin (300 mg once daily) and clopidogrel (75 mg once daily). Subsequently, the aspirin dosage was adjusted to 100 mg once daily while the clopidogrel dosage remained at 75 mg once daily up to the 1-year follow-up

All antiplatelet doses were administered orally and reported as daily amounts. ASA, acetylsalicylic acid (aspirin); IV, intravenous; NA, not applicable; EVD, external ventricular drainage; ICU, intensive care unit; ACT, activated clotting time; IU, international unit.

Supplementary Table 3. Summary of complications

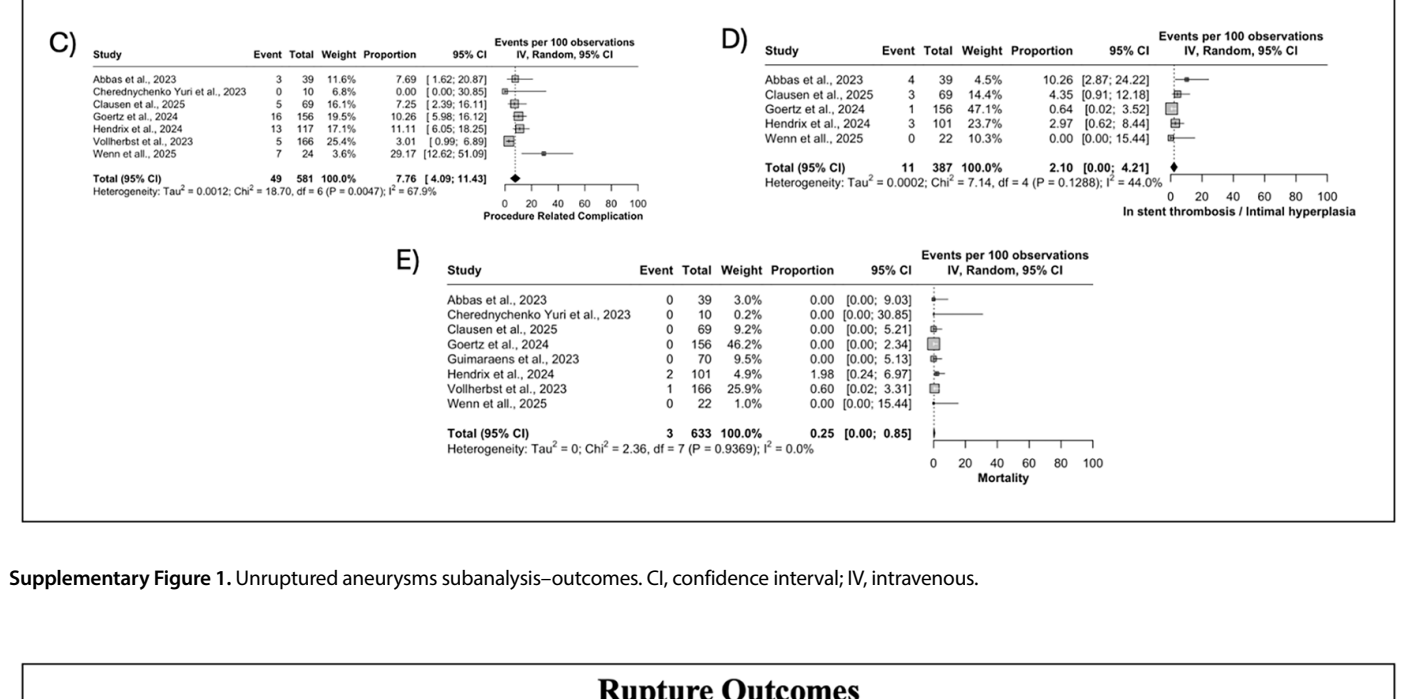
Study	Procedure-related complications (n)	Device deployment complications (n)	Major complications (n)	Minor complications (n)	Ischemic/ thrombotic complications (n)	Hemorrhagic complications (n)
Abbas et al. ³	Access site complication (1), transient ischemic attack (2), ischemic stroke in the treated territory (1)	Access site complication (1)	Ischemic stroke in the treated territory (1)	TIA (2)	TIA (2), ischemic stroke (1)	None
Goertz et al. ¹	Access site complication (3), contrast related complication (1), thromboembolic event (4), hemorrhagic event (1), vasospasm (2), ischemic event (1), minor stroke (1)	Access site complication (3), contrast related complication (1)	Vasospasm (2)	Minor stroke (1), ischemic event (1)	Minor stroke (1)	Hemorrhagic events (1)
Hendrix et al. ⁴	Intraprocedural stent thrombosis (1), stent thrombosis <24 hours (1), periprocedural minor stroke (<30 days) (3), delayed stent thrombosis (>180 days) (1), microwire vessel perforation (1), delayed subarachnoid hemorrhage (1), periprocedural seizure (<30 days) (1), device related events (2), access site complications (2)	Device related events (2), access site complications (2)	Intraprocedural stent thrombosis (1), stent thrombosis <24 hours (1)	Delayed SAH (1)	Intraprocedural stent thrombosis (1), stent thrombosis <24 hours (1), periprocedural minor stroke (<30 days) (3), delayed stent thrombosis (>180 days) (1)	Microwire vessel perforation (1), delayed subarachnoid hemorrhage (1)
Wen et al. ¹⁵	Left MCA infarction (1), asymptomatic events (2), ICA dissection during the procedure (1), femoral pseudoaneurysm (1), transient neurological symptoms (2)	ICA dissection during the procedure (1)	Left MCA infarction (1)	Femoral pseudoaneurysm (1), transient neurological symptoms (2)	Left MCA infarction (1)	None
Clausen et al. ¹³	Acute stent narrowing (1), radial oozing/hematoma (4)	None	Acute stent narrowing (1)	Radial oozing/ hematoma (4)	None	None
Roy et al. ¹⁴	The total number of complications was 16 (10.6%), 11 (68.8%) of which occurred on the day of the procedure and 4 (25%) within 6 months of the postoperative period	1 failed deployment (0.7%)	5 neurological complications (4.1%), including 2 deaths	6 access site complications (4.0%), 2 TIAS (1.3%)	4 ischemic strokes in treated territory (3.2%)	2 intracranial hemorrhages (1.3%)
Vollherbst et al. ⁵	5 technical complications (3.1%) including stent shortening, kinking, insufficient opening, and coil migration	None reported, 100% successful implantation	5 major adverse events (3.1%) including 2 ischemic strokes, 1 intracerebral hemorrhage, 1 mass effect, and 1 vasospasm	21 minor adverse events (13.0%) including 9 neurological events (5.6%)	8 thrombotic events in 7 patients (4.3%), including 4 intra-procedural and 4 post-procedural in-stent thromboses	1 intra cerebral hemorrhage
Cherednychenko et al. ¹²	No major technical difficulties reported in FRED X deployment	One case required balloon angioplasty for FD opening optimization	Not reported	Not reported	Not reported	Not reported
Guimaraens et al. ²	2 complications (2.35%), both non-symptomatic	NA	None reported in the FREDX group	None reported in the FREDX group	None reported in the FREDX group	None reported in the FREDX group

TIA, transient ischemic attack; SAH, subarachnoid hemorrhage; MCA, middle cerebral artery; ICA, internal carotid artery; FRED, flow re-direction endoluminal device.

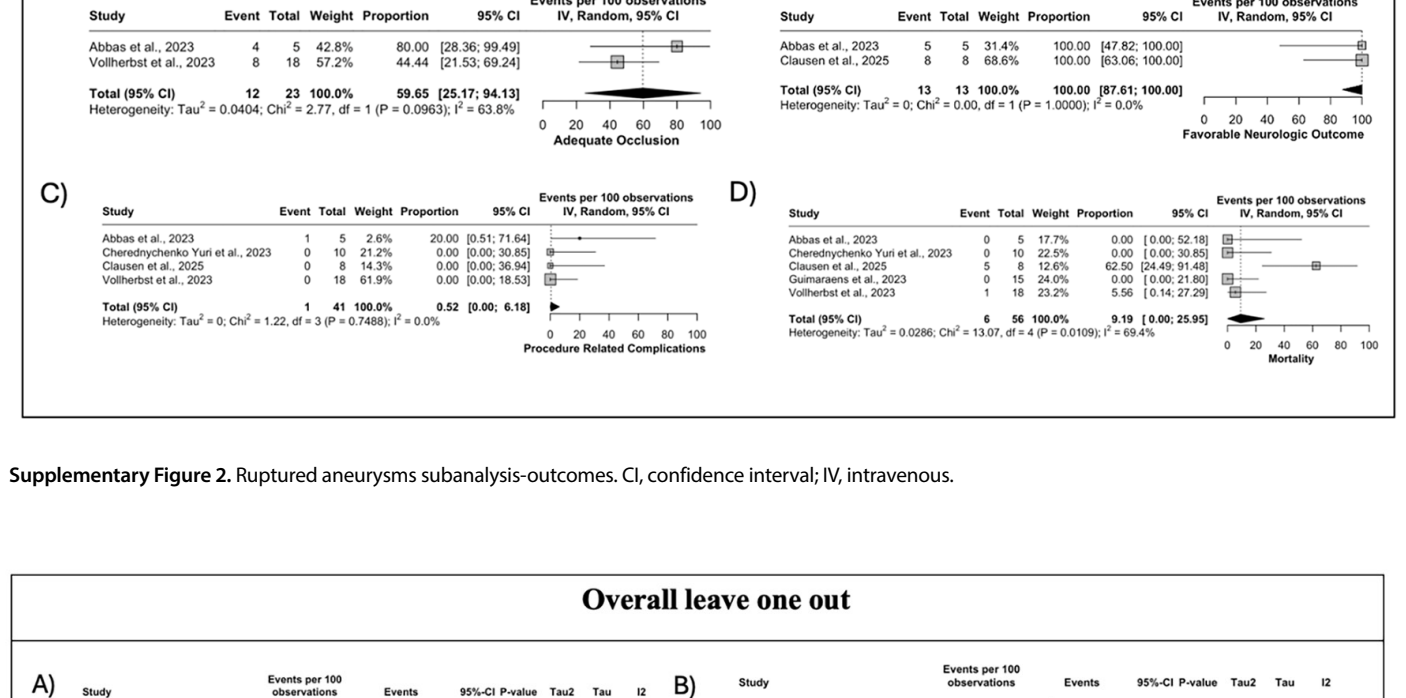
Supplementary Table 4. Management and outcomes of complications

Study	Description of complications (n)	Management of complications	Outcome of complication	Immediate angiographic outcome of covered vessel by FD (n)	Angiographic outcome of covered vessels by FD at last follow-up (n)
Abbas et al. ³	Access site complication (1), transient ischemic attack (2), ischemic stroke in the treated territory (1)	NA	Patients discharged with mRS scores 0	Patent (28/46)	15 branches arising from the aneurysm sac/neck, without angiographic follow-up mentioned
Goertz et al. ¹	Access site complication (3), contrast related complication (1), thromboembolic event (4), hemorrhagic event (1), vasospasm (2), ischemic event (1), minor stroke (1)	IV tirofiban	Patients fully recovered	Patent (69/156)	4 branch involvement with adjunctive coiling and jailing, without angiographic follow-up mentioned
Hendrix et al. ⁴	Intraprocedural stent thrombosis (1), stent thrombosis <24 hours (1), periprocedural minor stroke (<30 days) (3), delayed stent thrombosis (>180 days) (1), microwire vessel perforation (1), delayed subarachnoid hemorrhage (1), periprocedural seizure (<30 days) (1), device related events (2), access site complications (2)	IV tirofiban, IV eptifibatide	The symptoms resolved spontaneously; however, two deaths occurred due to parent vessel occlusion	Patent (1/101)	NA
Wen et al. ¹⁵	Left MCA infarction (1), Asymptomatic events (2), ICA dissection during the procedure (1), femoral pseudoaneurysm (1), Transient neurological symptoms (2)	ICA dissection was managed with the insertion of an additional stent, while femoral pseudoaneurysm was treated with manual compression	The symptoms resolved in all patients except for one, who experienced a persistent symptom	NA	NA
Clausen et al. ¹³	Acute stent narrowing (1), radial oozing/hematoma (4)	Angioplasty	The mean mRS score at discharge was 0 (IQR: 0), with no worsening in condition attributed to the procedure performed	NA	NA
Roy et al. ¹⁴	Ischemic stroke in treated territory (n = 4)-transient ischemic attack (= 2)- intracranial hemorrhage (n = 2)-access site complications (n = 6)-two deaths due to complications (one from ICH, one from aneurysm rupture post-treatment)	Balloon angioplasty and stenting for vessel occlusion, decompressive hemicraniectomy for ICH, conservative management for mild in-stent stenosis, and comfort care for severe cases	Most neurological complications resolved within 3 months. Two in-hospital deaths 95.9% of patients functionally independent at 12 months	66% of aneurysms showed >90% contrast stasis -100% had good wall apposition and complete neck coverage	Complete occlusion (RROC I) in 63.5% of cases at 12 months residual neck (RROC II) in 20% Residual aneurysm (RROC III) in 16.5% - in-stent stenosis reduced over time (mild 9.5%, moderate 1.2%, severe 1.2%)
Vollherbst et al. ⁵	Minor adverse events occurred in 13.0% of the patients. Nine of 21 of these events were neurologic, resulting in a minor neurologic adverse event rate of 5.6%. Major adverse events (2 ischemic strokes, 1 intracerebral hemorrhage, 1 mass effect of the aneurysm, and 1 case of vasospasms caused by a pre-interventional aneurysmal SAH) were observed in 5 patients (3.1%), leading to neurologic morbidity in 3 (1.9%) and death in 2 patients (1.2%)	Tirofiban administered for thrombotic events- balloon angioplasty for in-stent stenosis conservative management for mild cases	3 patients had neurological morbidity (1.9%) - 2 deaths (1.2%) due to mass effect and stent occlusion following SAH	Successful deployment in all cases-good or very good vessel wall apposition in 98.8% of cases	Complete occlusion (RROC I) in 66.2% of cases -residual neck (RROC II) in 16.9% - residual aneurysm (RROC III) in 16.9% -in-stent stenosis observed in 10.6% of patients (mostly mild)
Cherednychenko et al. ¹²	In our study, we managed to avoid thrombotic complications, postoperative neurological morbidity and mortality	NA	No neurological morbidity or mortality reported in the FRED X group-all patients discharged in stable condition with no neurological deficits	100% successful implantation with good vessel wall apposition in FRED X cases	No ischemic events observed in FRED X patients Follow-up imaging confirmed satisfactory FD positioning and aneurysm occlusion
Guimaraens et al. ²	2 cases of non-symptomatic complications: 1 stent misplacement and 1 intimal hyperplasia-induced stenosis	Conservative management for the cases of stenosis and stent misplacement	No neurological morbidity or mortality in the FRED X group	100% successful deployment with good vessel wall apposition	79.4% complete occlusion at 1-year follow-up, significantly higher than FRED (59.3%)

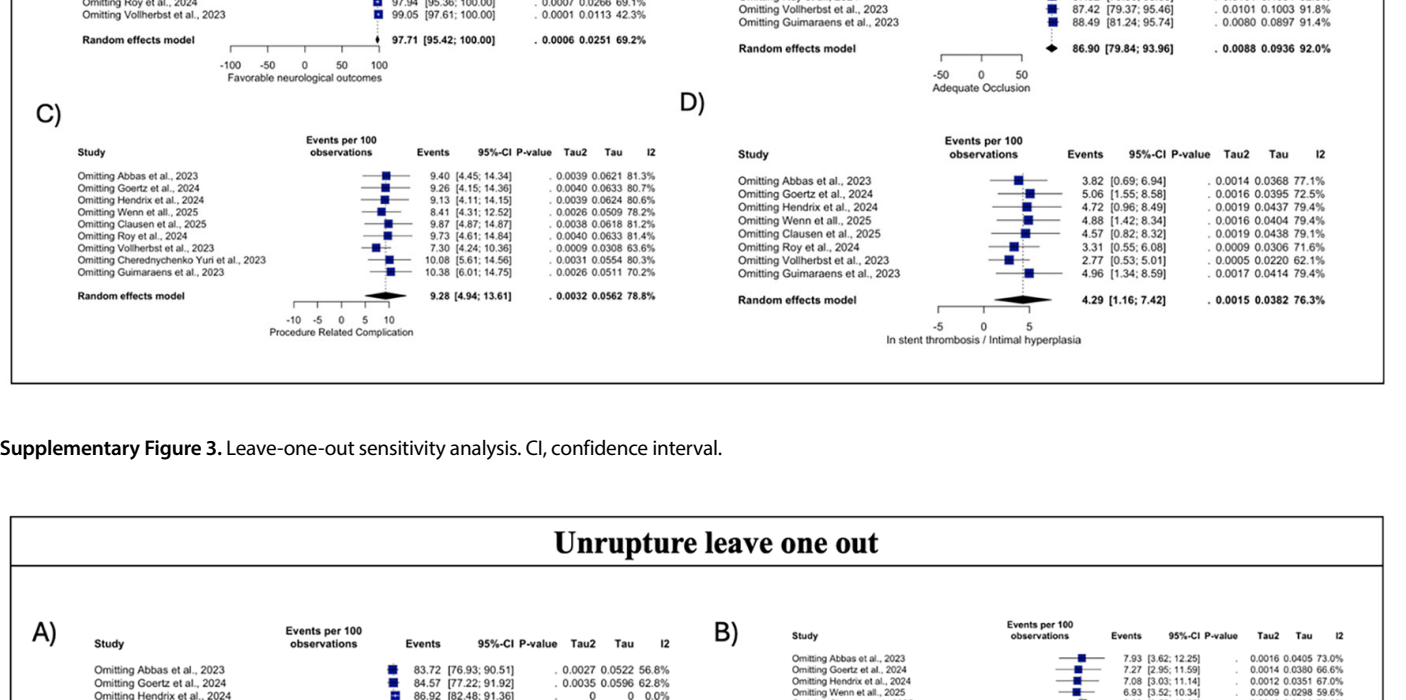
NA, not applicable; mRS, modified Rankin Scale; MCA, middle cerebral artery; ICA, internal carotid artery; IQR, interquartile range; FRED, flow re-direction endoluminal device; FD, flow diverter; IV, intravenous; ICH, intracerebral hemorrhage; SAH, raymond-roos occlusion infarction; IQR, subarachnoid hemorrhage.



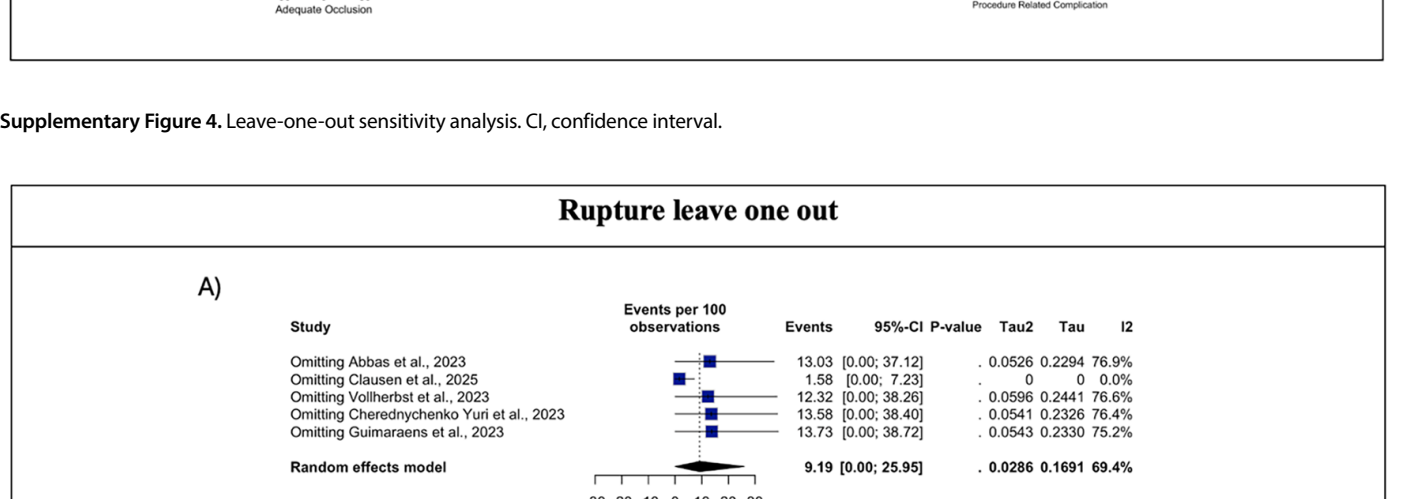
Supplementary Figure 1. Unruptured aneurysms subanalysis-outcomes. CI, confidence interval; IV, intravenous.



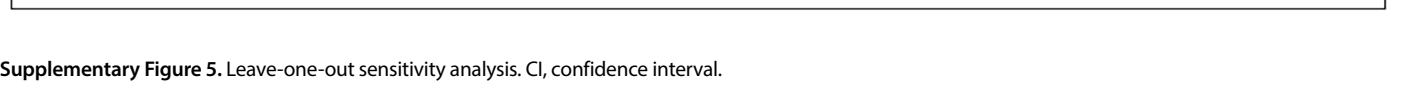
Supplementary Figure 2. Ruptured aneurysms subanalysis-outcomes. CI, confidence interval; IV, intravenous.



Supplementary Figure 3. Leave-one-out sensitivity analysis. CI, confidence interval.



Supplementary Figure 4. Leave-one-out sensitivity analysis. CI, confidence interval.



Supplementary Figure 5. Leave-one-out sensitivity analysis. CI, confidence interval.