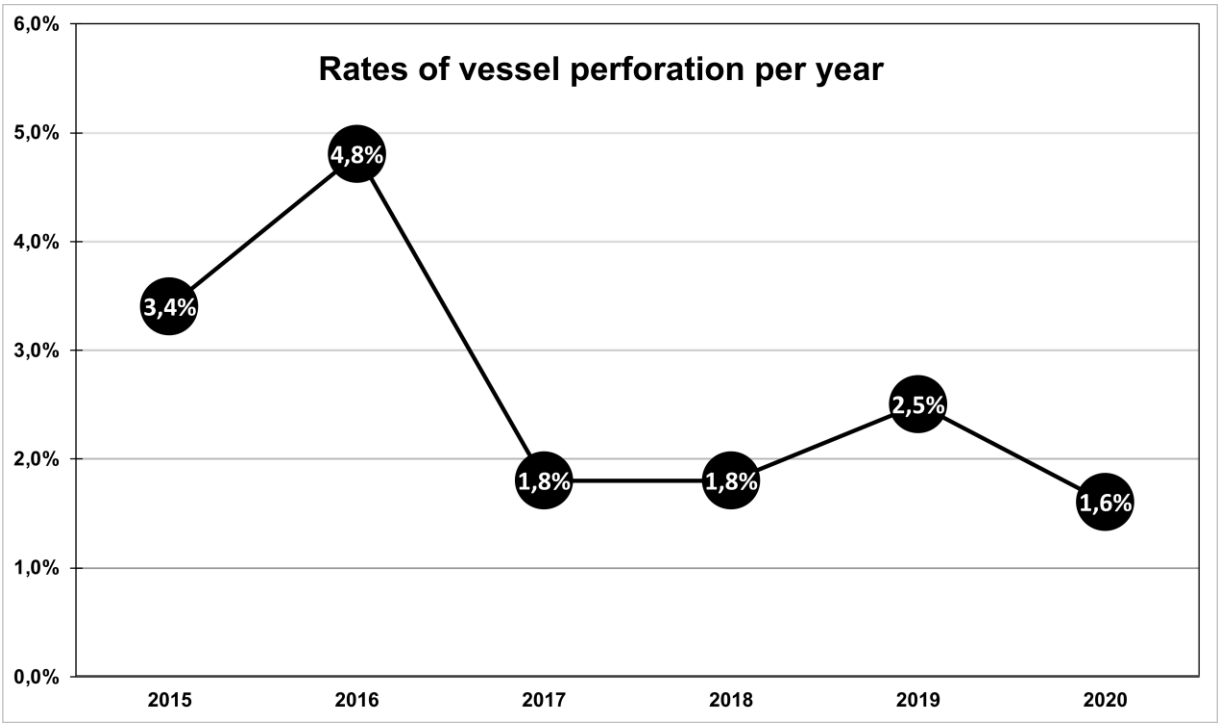
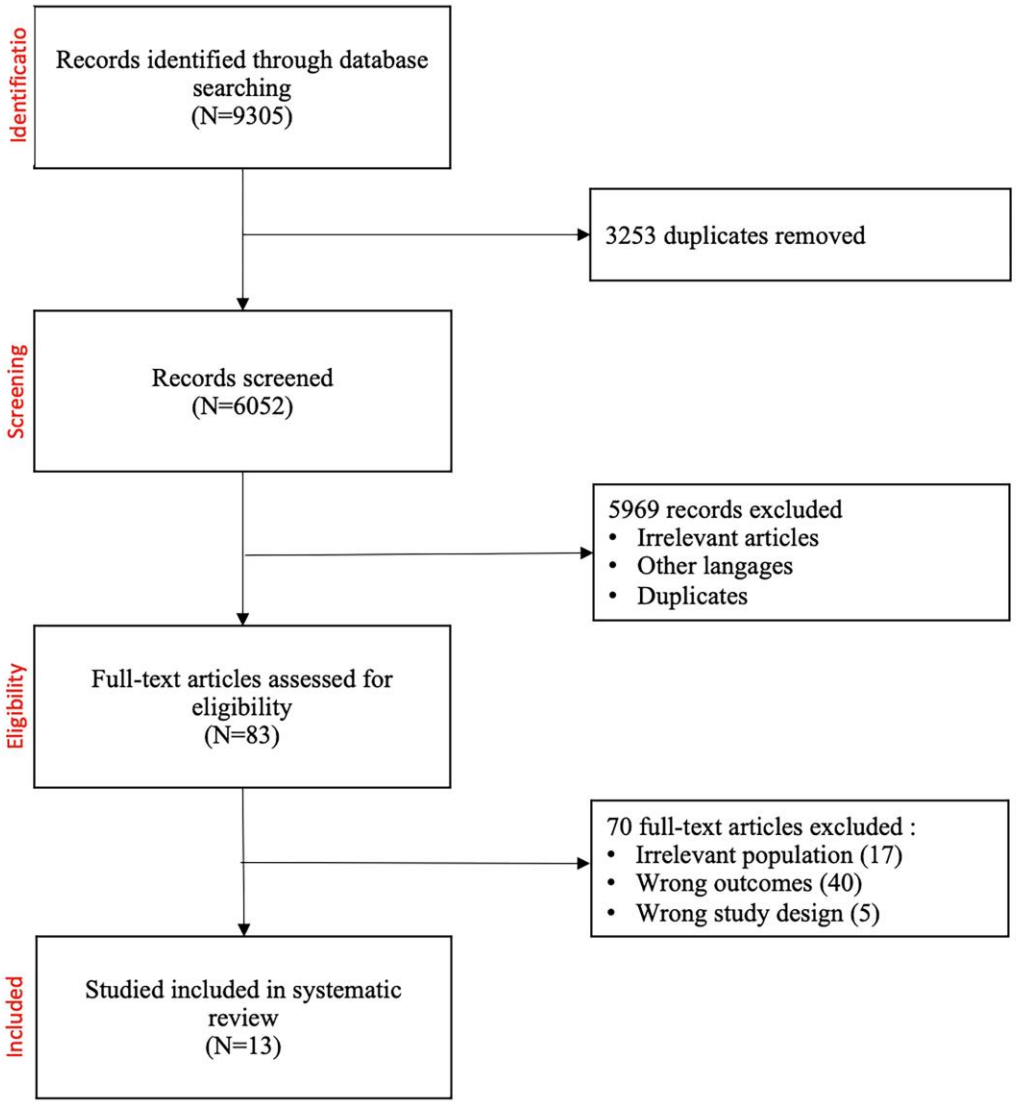
Supplemental Data

Supplemental Figure I: Rates of vessel perforation per year in our comprehensive stroke center.



Supplemental Figure II: PRISMA Diagram



Supplemental Table I: Baseline characteristics and outcomes for all patients and according to reperfusion status. Values are presented as n(%), mean±SD or median [IQR].

Characteristics	All patients N=32	mTICI < 2b N = 16	mTICI ≥ 2b N= 16	P value
Female sex	16 (50)	7 (43.8)	9 (56.3)	0.6
Age	67.0±14.2	68.9±14.6	65.2±14.0	0.6
Past medical history				
Hypertension	17 (53.1)	12 (75.0)	5 (31.3)	0.019
Dyslipidemia	14 (43.8)	7 (43.8)	7 (43.8)	0.8
Type 2 diabetes	6 (18.8)	4 (25.0)	2 (12.5)	0.6
Active smoking	8 (25.0)	4 (25.0)	4 (25.0)	0.9
Coronary artery disease	7 (21.9)	4 (25.0)	3 (18.8)	0.6
Previous Stroke or TIA	5 (15.6)	2 (12.5)	3 (18.8)	0.7
Previous antithrombotic medications	11 (34.4)	5 (31.3)	6 (37.5)	0.8
Current stroke event				
Initial NIHSS	19.5 [15 – 24.8]	19.5 [15.8 – 23.4]	19 [13.8 - 25]	0.8
Site of occlusion				0.6
ICA	10 (31.3)	6 (37.5)	4 (25.0)	
M1 or M2	22 (68.8)	10 (62.5)	12 (75.0)	
ASPECTS	9 [8 – 10]	9 [8 – 10]	9 [8 – 9.5]	0.7
IV Thrombolysis	19 (59.4)	9 (56.3)	10 (62.5)	0.9
Door to needle (min)	39.5 [27.3 – 70.3]	45.7 [32.1 – 82.6]	36.0 [27.2 – 68.1]	0.5
Door to groin puncture (min)	125.9 [58.1 – 175.2]	128.3 [78.0 – 176.7]	123.5 [58.1 – 162.1]	0.7
Door to end of procedure (min)	185 [110 -248]	200 [122 – 258]	165 [81 – 224]	0.4
Groin puncture to end of procedure (min)	55 [35.5 – 77.5]	73 [56 – 100]	41 [23 – 53]	0.001
Onset-to-recanalization (min)	252 [182 -331.5]	258 [217 – 315]	230 [166 – 342]	0.5
Endovascular procedure				
General Anesthesia	5 (15.6)	5 (33.3)†	0 (0)	0.02
Technique				
Stent retriever	23 (71.9)	12 (75.0)	11 (68.8)	0.8
Contact aspiration	7 (21.9)	4 (25.0)	3 (18.8)	0.6

Combined technique	14 (43.8)	7 (43.8)	7 (43.8)	0.9
Number of passes	2 [1 – 3]	3 [2 – 4]	2 [1 – 3]	0.07
Number of passes before perforation‡	1 [0 – 1.75]	1 [0.8 – 2]	1 [0 – 1]	0.3
Site of perforation				0.5
Intracranial ICA	2 (6.3)	2 (13.3)	0 (0)	
M1	7 (21.9)	4 (25.0)	3 (21.4)	
M2	18 (56.3)	9 (56.3)	9 (64.3)	
ACA	3 (9.4)	1 (6.3)	2 (14.3)	
Cause of perforation				0.02
Microwire	14 (43.8)	5 (31.3)	9 (56.3)	
Micro-catheter	9 (28.1)	8 (50.0)	1 (6.3)	
Unknown	9 (28.1)	3 (18.8)	6 (37.5)	
Rescue therapy				0.2
Vessel occlusion	5 (15.6)	4 (25.0)	1 (6.3)	
Inflation of intracranial balloon	3 (9.4)	1 (6.3)	0 (0)	
Microcatheter trapping	1 (3.1)	2 (12.5)	1 (6.3)	
No specific therapy	23 (71.9)	9 (56.3)	14 (87.5)	

†Three patients were intubated before starting EVT and two patients were converted to GA during EVT.
‡ a pass is defined as an attempt of recanalization using device (stent-retriever, contact aspiration or combined therapy)

Supplemental Table I: Description and outcomes of 29 patients for whom complete angiographic studies were available

	Number of patients (n=29)	**mRS at 90 days (median, IQR)**	**Death at 90 days (n, %)**
Perforation identified only on microcatheter injection	16 (55.2%)	5 [2-6]	7 (46.7%)
Perforation identified only on ICA injection	13 (44.8%)	4 [1-6]	4 (30.8%)
Perforation viewed on multiple injections	13 (44.8%)	4[1-6]	5 (38.5%)
Number of runs before hemostatic intervention (median, IQR)	2[1.5-3]	-	-
Number of runs before spontaneous resolution (median, IQR)	1[1-2]	-	-

ICA: internal carotid artery, mRS: modified Rankin scale

Supplemental Table II: Results of systematic review

Study N°ref	Type of study	Number of patients	NIHSS Median [IQR]	Clot location	IV tPA	General anesthesia	tools using during EVT	Site of perforation	Perforation cause	Rescue therapy	mTICI	mRS at 3 months	Death
Ref17	Case report	1	16	M1	N	Y	Aspiration	M1	Microcatheter	Procedure was aborted	0	6	1
Ref23	Cohort study	1	12	M1	-	-	SR	M2	-	Therapeutic oclusion (coils)	0	6	1
Ref11	Cohort study	1	35	ICA	-	-	SR	-	Microwire	NA	2a	6	1
Ref24	Case report	5	13 [10-14]	M1 ⇢ 1 Tandem ⇢ 3 Unknown ⇢ 1	Y ⇢ 2 Unknown ⇢ 3	-	SR	M1 ⇢ 4 Unknown ⇢ 1	-	-	0 ⇢ 1 2a ⇢ 1 2b/3 ⇢ 3	4 [4-6]	2/5
Ref19	Cohort study	1	NA	ICA	-	-	SR	-	-	-	-	1	0
Ref27	Cohort study	2	15.5 [13.75-17.25]	M1 ⇢ 1 Tandem ⇢ 1	-	-	SR	-	-	-	2b/3	1.5 [1.25-1.75]	0
Ref12	Cohort study	2	16.5 [13.75-19.25]	ICA ⇢ 1 M2 ⇢ 1	Y ⇢ 1 N ⇢ 1	-	Aspiration	M2 ⇢ 2	Microcatheter ⇢ 1 Microwire ⇢ 1	watchful waiting ⇢ 1 Therapeutic occlusion (glue) ⇢ 1	0 ⇢ 1 2b ⇢ 1	5 [4.5-5.5]	1/2
Ref5	Cohort study	16	17 [15–23]	ICA ⇢ 3 M1 ⇢ 4 M2 ⇢ 5 M3 ⇢ 1 BA ⇢ 3	Y ⇢ 5 N ⇢ 11	Y ⇢ 6 N ⇢ 10	SR ⇢ 15 Aspiration ⇢ 9 Combined ⇢ 1	M1 ⇢ 3 M2 ⇢ 6 M3 ⇢ 2 ACA ⇢ 1 ICA ⇢ 1 P1/P2 ⇢ 2 Vertebral ⇢ 1	Microcathter ⇢ 1 Microwire ⇢ 3 Unknown ⇢ 12	watchful waiting ⇢ 1 Procedure was aborted ⇢ 7 Inflation of intracranial balloon ⇢ 8 Therapeutic occlusion (coils) ⇢ 1	0 ⇢ 6 2a ⇢ 6 2b/3 ⇢ 4	6 [3.5-6]	9/16
Ref13	Case report	3	11 [11-11.5]	M1 ⇢ 2 BA ⇢ 1	-	Y	SR ⇢ 2 Aspiration ⇢ 1	M3 ⇢ 1 P1 ⇢ 1 Unknown ⇢ 1	Microcatheter ⇢ 1 Unknown ⇢ 2	Inflation of intracranial balloon ⇢ 2 Therapeutic occlusion (glue) ⇢ 1	0 ⇢ 1 2a ⇢ 1 2b/3 ⇢ 1	6	1/2
Ref14	Cohort study	1	19	M1 ⇢ 1	N	-	SR	-	Microwire	-	3	6	1
Ref22	Case report	1	15	Tandem ⇢ 1	-	-	None	ICA	Contrast injection	Therapeutic oclusion (coils)	0	6	1

Ref15	Cohort study	1	-	-	-	-	-	-	Microwire	-	3	6	1
Ref16	Case report	2	17 [16-18]	M1 ⇢ 1 BA ⇢ 1	Y ⇢ 1 N ⇢ 1	Y ⇢ 1 Unknown ⇢ 1	SR	P1 (thalamoperforating) ⇢ 1 M2 ⇢ 1	Microwire	Therapeutic occlusion (glue) ⇢ 1 Therapeutic occlusion (glue) ⇢ 1	2b/3	1.5 [1.25-1.75]	0
Our study	*Cohort study*	*32*	*19.5 [15 – 24.8]*	*ICA ⇢ 10* *M1 or M2 ⇢ 22*	*Y ⇢ 19*	*Y ⇢ 5*	*SR⇢ 23* *Aspiration ⇢ 7* *Combined ⇢ 14*	*M1 ⇢ 7* *M2 ⇢ 18* *ACA ⇢ 3* *ICA ⇢ 2*	*Microwire ⇢ 14* *Microcatheter ⇢ 9* *Unknown ⇢ 9*	watchful waiting ⇢ *23* *Inflation of intracranial balloon ⇢ 3* *Therapeutic occlusion (coils or glue) ⇢ 5*	*< 2b ⇢ 16* *≥ 2b ⇢ 16*	*4 [2 – 6]*	*11/32*

SR: Stent-Retriever; ICA: internal carotid artery; M1/M2/M3: different segment of middle cerebral artery; BA: basilar artery.