



**Supplementary Figure 1: Patient Selection Process**

AIS, acute ischemic stroke; MT, mechanical treatment; SVS, susceptibility vessel sign; SWI, susceptibility-weighted imaging.

	<b>Patients with assessable SVS</b>	<b>Patients excluded due to un-assessable SVS</b>	<b><i>P</i>-Value</b>
Age	74.2 (61.9–81.8)	71.2 (61.1–79.7)	0.446
NIHSS on admission	12 (7–17)	15 (11–19)	0.106
DWI-ASPECTS	8 (6–9)	7 (6–8)	0.089
NIHSS at 24 hours	5	6 (3.3–11)	0.341
Successful reperfusion	83.0% (479)	70.3% (26)	0.999
Functional independence	53.4 (308)	43.2% (16)	0.438
Mortality	18.5% (107)	24.3% (9)	0.260

**Supplementary Table 1:** Key results for patients with assessable versus un-assessable SVS.

	<b>Patients with MRI</b>	<b>Patients with CT</b>	<b><i>P</i>-Value</b>
Age	74.2 (61.9–81.8)	74.1 (62.0–82.4)	0.680
NIHSS on admission	12 (7–17)	17 (13–21)	<0.001
DWI-ASPECTS	8 (6–9)	8 (6–9)	0.073
NIHSS at 24 hours	5	11 (4–18)	<0.001
Successful reperfusion	83.0% (479)	78.2% (499/638)	0.034
Functional independence	53.4 (308)	29.9 (191/638)	<0.001
Mortality	18.5% (107)	32.4% (207/638)	<0.001

**Supplementary Table 2:** Key results for patients with admission MRI versus admission CT.

	<b>Data available for (n; [%])</b>	<b>All patients (n=577)</b>	<b>SVS<math>\oplus</math> (87.5%; n=505)</b>	<b>SVS<math>\ominus</math> (12.5%; n=72)</b>	<b>P- Value</b>
Age	577/777 (100%)	74.2 (61.9–81.8)	74.2 (61.9–81.5)	74.4 (62.1–84.8)	0.588
Sex, female	577/577 (100%)	51.3% (296)	49.7% (251)	62.5% (45)	0.042 <sup>a</sup>
<b>Risk factors</b>					
Hypertension	577/577 (100%)	65.7% (379)	65.3% (330)	68.1% (49)	0.651
Smoking	576/577 (99.8%)	25.5% (147)	25.5% (129)	25.0% (18)	0.914
Diabetes mellitus	577/577 (100%)	14.4% (83)	12.5% (63)	27.8% (20)	0.001 <sup>a</sup>
Dyslipidemia	575/577 (99.7%)	57.7% (333)	57.2% (289)	61.1% (44)	0.557
Previous stroke	577/577 (100%)	11.3% (65)	10.7% (54)	15.3% (11)	0.250
Pre-stroke mRS >2	576/577 (99.8%)	8.3% (48)	7.1 % (36)	16.7% (12)	0.005 <sup>a</sup>
<b>Antiplatelet therapy</b>	575/577 (99.7%)				0.076
None		67.4% (389)	68.1% (344)	62.5% (45)	
Mono		30.2% (174)	29.9% (151)	31.9% (23)	
Dual		2.1% (12)	1.6% (8)	5.6% (4)	
<b>Anti-coagulant</b>	573/577 (99.3%)				0.490
None		88.2% (509)	88.3 (446)	87.5 (63)	
Vitamin-K-antagonist		5.5% (32)	5.7% (29)	4.2 (3)	

NOAC		5.5% (32)	5.1% (26)	8.3 (6)	
Other medication					
Statin	574/577 (99.5%)	25.6% (148)	24.8% (125)	31.9% (23)	0.201
Other clinical data					
Systolic BP, mmHG	565/577 (97.9%)	155 (134– 174)	155 (134– 174)	152 (135– 175)	0.914
Diastolic BP, mmHG	566/577 (98.1%)	81 (71–95)	81.5 (71–95)	79 (70–94)	0.199
Admission glucose, mmol/L	566/577 (98.1%)	6.5 (5.8–7.6)	6.5 (5.8–7.5)	6.7 (5.75– 9.0)	0.133
Admission NIHSS	577/577 (100%)	12 (7–17)	12 (7–18)	9 (5.25– 16.75)	0.057
TOAST	575/577 (99.7%)				0.397
Large-artery atherosclerosis		11.3% (65)	10.7% (54)	15.3% (11)	
Cardioembolic		43.8% (253)	43.2% (218)	48.6% (35)	
Other determined causes		6.1% (35)	6.1% (31)	5.6% (4)	
Undetermined		38.5% (222)	39.6% (200)	30.6% (22)	
Non-cardioembolic	575/577 (99.7%)	55.8% (332)	56.4% (285)	51.4 (37)	0.399
Field strength	577/577 (100%)				0.457
1.5 Tesla		66.4% (383)	66.9% (338)	62.5% (45)	
3 Tesla		33.6% (194)	33.1% (167)	37.5% (27)	

Time to imaging/treatment					
Time SO/LSW to admission (min)	565/577 (97.8%)	127.0 (71.5–286.0)	126.0 (73.0–285.0)	145.5 (69.0–324.5)	0.827
IV lysis prior to MRI	577/577 (100%)	7.3% (42)	6.5% (33)	12.5% (9)	0.068
IV lysis prior to MT	577/577 (100%)	39.0% (225)	39.4% (199)	36.1% (26)	0.592
Time to IV lysis (min)	211/577 (36.6%)	140.0 (110.0–180.0)	140.0 (110.0–180.0)	136.0 (98.5–180.0)	0.698
Time SO/LSW to GP (min)	568/577 (98.4%)	235.0 (165.3–395.8)	234.0 (168.0–391.0)	268.0 (155.5–438.0)	0.685
Time to reperfusion (min)	548/577 (95.0%)	42.0 (28.0–65.0)	42.0 (27.0–65.0)	43.5 (29.25–78.75)	0.198
Primary site of occlusion	577 /577 (100%)				0.013 <sup>a</sup>
Intracranial ICA		15.4% (89)	16.4% (83)	8.3% (6)	
MCA (M1)		52.7% (304)	53.1% (268)	50.0% (36)	
MCA (M2)		21.8% (126)	21.4% (108)	25.0% (18)	
MCA (M3)		0.7% (4)	0.6% (3)	1.4% (1)	

MCA and ACA involved		0.9% (5)	1.0% (5)	1.4% (1)	
ACA		0,9% (5)	0.4% (2)	0.0% (0)	
Posterior circulation		7.6% (44)	7.1% (36)	11.1% (8)	
Tandem occlusion		17.5% (101)	19.2% (97)	5.6% (4)	0.004 <sup>a</sup>
Infarcted territory					
DWI-APECTS score	529/577 (91.7%)	8 (6–9)	8 (6–9)	8 (7–9)	0.006 <sup>a</sup>
Number of passes	577/577 (100%)	1 (1–2)	1 (1–2)	1 (1–3)	0.552
≤ 3		91.3% (527)	91.7% (463)	88.8% (64)	
4–5		7.6% (44)	7.7% (39)	7.0% (5)	
≥ 6		1% (6)	0.6% (3)	4.2% (3)	
Reperfusion/outcome					
Final eTICI <sub>≥2b</sub>	577/577 (100%)	83.0% (479)	84.6% (427)	72.2% (52)	0.009 <sup>a</sup>
First-pass eTICI <sub>≥2b</sub>	524/577 (90.8%)	57.6% (313/543)	58.5% (276/472)	52.1% (37/71)	0.312
NIHSS 24h after MT	510/577 (88.4%)	5 (2–12)	5 (2–11)	7 (2–16)	0.078
NIHSS IMP 24h after MT	510/577 (88.4%)	–4 (–9 to 0)	–4 (–9 to –1)	–2 (–7 to 4)	0.001 <sup>a</sup>
mRS at 90 days	556/577 (96.4%)	2 (1–4)	2 (1–4)	3.5 (1–6)	0.005 <sup>a</sup>
Post-stroke mRS <sub>≤2</sub> at 90 days	556/577 (96.4%)	53.4% (308)	55.4% (280)	38.9% (28)	0.004 <sup>a</sup>

Mortality within 90 days	556/577 (96.4%)	18.5% (107)	16.4% (83)	33.3% (24)	0.001 <sup>a</sup>
Complication					
Symptomatic intracranial hemorrhage	575/577 (99.7%)	4.3% (25)	4.2% (21)	5.6% (4)	0.591
Embolization in new territory	576/577 (99.8%)	3.8% (22)	4.2% (21)	1.4% (1)	0.250
PIC	576/577 (99.8%)	14.6% (84)	14.3% (72)	16.7% (12)	0.592

**Supplementary Table 3:** Results for SVS $\oplus$  and SVS $\ominus$

Data are expressed as percentage (n) or median (interquartile range 25–75%). ACA indicates anterior cerebral artery; BP, blood pressure; DWI-ASPECTS; diffusion-weighted Alberta programme early CT score; GP, groin puncture; ICA, internal carotid artery; IMP, improvement; IV, intravenous; LSW, last seen well; MCA, middle cerebral artery; NOAC, new oral anticoagulants; PIC, periinterventional complications (dissection, perforation or vasospasms); SO, symptom-onset; SVS, susceptibility vessel sign.

<sup>a</sup> statistically significant.

	<b>Data available for (n; [%])</b>	<b>All patients (n=577)</b>	<b>Tandem occlusion (n=101)</b>	<b>No tandem occlusion (n=476)</b>	<b>P-Value</b>
Age	577/777 (100%)	74.2 (61.9–81.8)	74.0 (63.0–81.6)	74.3 (61.7–81.8)	0.876
Sex, female	577/577 (100%)	51.3% (296)	35.6% (36)	54.6% (260)	0.001 <sup>a</sup>
<b>Risk factors</b>					
Hypertension	577/577 (100%)	65.7% (379)	58.4% (59)	67.2% (320)	0.090 <sup>a</sup>
Smoking	576/577 (99.8%)	25.5% (147)	38.6% (39)	22.7% (108)	0.001 <sup>a</sup>
Diabetes mellitus	577/577 (100%)	14.4% (83)	11.9% (12)	14.9% (71)	0.430
Dyslipidemia	575/577 (99.7%)	57.7% (333)	62.4% (63)	56.7% (270)	0.257
Previous stroke	577/577 (100%)	11.3% (65)	6.9% (7)	12.2% (58)	0.129 <sup>a</sup>
Pre-stroke mRS score>2	576/577 (99.8%)	8.3% (48)	3.0% (3)	9.5% (45)	0.032 <sup>a</sup>
<b>Antiplatelet therapy</b>	575/577 (99.7%)				0.200
None		67.4% (389)	74.3% (75)	66.0% (314)	
Mono		30.2% (174)	23.8% (24)	31.5% (150)	

Dual		2.1% (12)	1.0% (1)	2.3% (11)	
Anticoagulation	573/577 (99.3%)				0.093 <sup>a</sup>
None		88.2% (509)	94.1% (95)	87.0% (414)	
Vitamin-K- antagonist		5.5% (32)	3.0% (3)	6.1% (29)	
NOAC		5.5% (32)	2.0% (2)	6.3% (30)	
Other medication					
Statin	574/577 (99.5%)	25.6% (148)	20.8% (21)	26.7% (127)	0.229
Other clinical data					
Systolic BP, mmHG	565/577 (97.9%)	155 (134–174)	163 (140– 180)	153 (134–172)	0.015 <sup>a</sup>
Diastolic BP, mmHG	566/577 (98.1%)	81 (71–95)	86 (75–97)	80 (70–93)	0.064 <sup>a</sup>
Admission glucose, mmol/L	566/577 (98.1%)	6.5 (5.8–7.6)	6.7 (5.8–7.7)	6.5 (5.8–7.5)	0.279
Admission NIHSS	577/577 (100%)	12 (7–17)	14 (9–18)	11 (6–17)	0.008 <sup>a</sup>
TOAST	575/577 (99.7%)				0.391
Large-artery atherosclerosis		11.3% (65)	11.9% (12)	11.1% (53)	
Cardioembolic		43.8% (253)	50.5% (51)	42.4% (202)	

Other determined causes		6.1% (35)	5.0% (5)	6.3% (30)	
Undetermined		38.5% (222)	31.7% (32)	39.9% (190)	
Field strength	577/577 (100%)				0.992
1.5 Tesla		66.4% (383)	66.3% (67)	66.4% (316)	
3 Tesla		33.6% (194)	33.7% (34)	33.6% (160)	
Time to imaging/treatment					
Time SO/LSW to admission (min)	565/577 (97.8%)	127.0 (71.5– 286.0)	141 (63–269)	125.5 (74– 287.5)	0.818
IV lysis prior to MT	577/577 (100%)	39.0% (225)	37.6% (38)	39.3% (187)	0.756
PSOC	577 /577 (100%)				0.000 <sup>a</sup>

**Supplementary Table 4:** Results for patients with and without tandem occlusion. Data are expressed as percentage (n) or mean (interquartile range 25–75%).

<sup>a</sup> Cofactors with  $P < 0.15$  were considered for the multivariable regression model examining the association between tandem occlusion and susceptibility vessel sign.

ACA, indicates anterior cerebral artery; BP, blood pressure; ICA, internal carotid artery; IV, intravenous; LSW, last seen well; MCA, middle cerebral artery; NOAC, new oral anticoagulants; PSOC, primary site of occlusion; SO, symptom-onset; SVS, susceptibility vessel sign.

Dependent Variable	Patient Group	aOR	95% CI Min.	95% CI Max.	P-value	Equivalent P-values for Rater 1 for comparison
Successful reperfusion	A	2.808	1.496	5.269	0.001	0.009
	-	-	-	-	-	
Functional independence	A	2.206	1.183	4.112	0.013	0.004
	B	2.250	1.131	4.479	0.021	0.043
Mortality	A	0.336	0.170	0.666	0.002	0.001
	B	0.361	0.169	0.768	0.008	0.012

**Supplementary Table 5:** Multivariable regression analyses for the association between successful reperfusion, functional independence at 90 days and mortality at 90 days with SVS for Rater 2 and equivalent P-values for Rater 1.

aOR indicates adjusted odds ratio; CI, confidence interval; A, all patients; B, patients with pre-stroke mRS  $\leq 2$ .

<b>Sensitivity Analyses</b>		<b>Adjusted odds ratio</b>	<b>95% CI min.</b>	<b>95% CI max.</b>	<b><i>P</i>-value</b>
1. regression model	functional independence	2.217	1.028	4.785	0.043
2. regression model	mortality	0.346	0.151	0.782	0.012

**Supplementary Table 6:** Association between susceptibility vessel sign (SVS) and functional independence (mRS $\leq$ 2; 1. regression model) as well as SVS and mortality (2. regression model) after excluding patients with pre-stroke mRS $>$ 2. Both models have been adjusted for all cofactors with  $P<0.15$  (see Table 1) as well as clinical predictors of good outcome (age, stroke subtype, bridging therapy, successful reperfusion and symptomatic ICH).

<b>Dependent variable</b>	<b>Patient Group</b>	<b>aOR</b>	<b>95% CI Min.</b>	<b>95% CI Max.</b>	<b>P- value</b>
Successful reperfusion	A	2.970	1.449	6.091	0.003
	B	3.719	1.724	8.020	0.001
Functional independence	A	2.234	1.100	4.535	0.026
	B	2.627	1.187	5.813	0.017
Mortality	A	0.342	0.161	0.782	0.005
	B	0.324	0.139	0.753	

**Supplementary Table 7:** Multivariable regression analyses for the association between successful reperfusion, functional independence at 90 days and mortality at 90 days with SVS after adjusting for first-line retrieval technique.

aOR indicating adjusted odds ratio, CI = confidence interval; A = all patients; B = patients with pre-stroke mRS  $\leq 2$