

ON-LINE APPENDIX

Supplemental Methods

For whole-brain CT perfusion/dynamic CTA, first a contrast bolus of 50 mL of iomeprol (Iomeron 400; Bracco, Milan, Italy) was injected using a Stellant CT Injector (Medrad, Indianola, Pennsylvania) with a flow rate of 4.5–5.5 mL/s, followed by 35–50 mL of saline with a flow rate of 3.5–5.0 mL/s, depending on the weight of the patient. Seven seconds after contrast injection, the first volume was imaged with a full dose of 310 mA. Three seconds later, 4 volumes were obtained every 2 seconds with 160 mA,

intended to visualize the early arterial phase. Subsequently, 6 volumes were imaged with 300 mA, to visualize the mid-arterial phase, followed by 3 volumes with 160 mA to visualize the late arterial phase. These volumes were also obtained every 2 seconds. Finally, 5 volumes were imaged at 130 mA every 5 seconds to image the venous phase. In total, 19 volumes were obtained during 1 minute, with a maximum total effective dose of 8.4 mSv. Postprocessing was performed on a Vitrea fx, Version 1.0, workstation (Vital Images, Minnetonka, Minnesota).

On-line Table 1: Baseline characteristics (N = 61)

	No. (%) ^a
Baseline:	
Age (yr) (mean) (SD)	67 (13)
Female sex	27 (44%)
NIHSS score (median) (IQR)	15 (12–19)
Premorbid mRS score of 0–2	58 (95%)
History of stroke/TIA	8 (13%)
History of hypertension	28 (46%)
History of diabetes mellitus	9 (15%)
Stroke onset to study CT time (min) (median) (IQR)	64 (40–110)
Occlusion site:	
MCA, M1 segment	39 (64%)
MCA, M2 segment	8 (13%)
Tandem occlusion (MCA + ICA)	14 (23%)
Treatment:	
No intravenous thrombolysis, no endovascular treatment	7 (11%)
IV thrombolysis alone	37 (61%)
Mechanical thrombectomy alone	3 (5%)
IV thrombolysis and mechanical thrombectomy	14 (23%)

Note:—IQR indicates interquartile range.

^aAll values are given as No. (%), unless otherwise indicated.

On-line Table 2: Risk of poor radiologic outcome at follow-up (infarct volume ≥ 70 mL) in relation to other clinical and radiologic parameters (N = 61)

Characteristics	Poor Outcome/Characteristic Present (n/N) (%)	Poor Outcome/Characteristic Absent (n/N) (%)	Risk Ratio (95% CI)
Age 60 years or older	28/46 (61%)	5/15 (33%)	1.8 (0.8–3.9)
Female sex	11/27 (41%)	22/34 (65%)	0.6 (0.4–1.1)
NIHSS score > 15	16/29 (55%)	17/32 (53%)	1.0 (0.7–1.6)
M1 MCA segment	21/39 (54%)	12/22 (55%)	1.0 (0.6–1.6)
M2 MCA segment	3/8 (38%)	30/53 (57%)	0.7 (0.3–1.7)
Middle cerebral and internal carotid arteries ^a	9/14 (64%)	24/47 (51%)	1.3 (0.8–2.0)
IVT only	19/37 (51%)	14/24 (58%)	0.9 (0.6–1.4)
IA treatment	9/17 (53%)	24/44 (55%)	1.0 (0.6–1.6)
No treatment	5/7 (71%)	28/54 (52%)	1.4 (0.8–2.4)
ASPECTS ^b ≤ 5	7/8 (88%)	26/53 (49%)	1.8 (1.2–2.6)
Clot burden score ^c < 7	23/37 (62%)	10/24 (42%)	1.5 (0.9–2.6)

Note:—IVT indicates intravenous thrombolysis; IA, intra-arterial.

^aCarotid terminus or tandem occlusion.

^bASPECTS is an imaging measure of the extent of ischemic stroke. Scores range from 0 to 10, with lower scores indicating a larger infarct core.

^cThe clot burden score is a grading system of the extent of arterial occlusion in patients with acute anterior circulation ischemic stroke. Scores range from 0 to 10, with lower scores indicating more occluded vessel segments.

On-line Table 3: Number of patients with poor or good collaterals on dynamic CTA among patients receiving IA treatment (either with or without IVT) or non-IA treatment (IVT only or no treatment) (N = 61)^a

	Poor Collaterals	Good Collaterals
IA treatment (No.)	6	11
Non-IA treatment (No.)	11	33
Total (No.)	17	44

Note:—IA indicates intra-arterial.

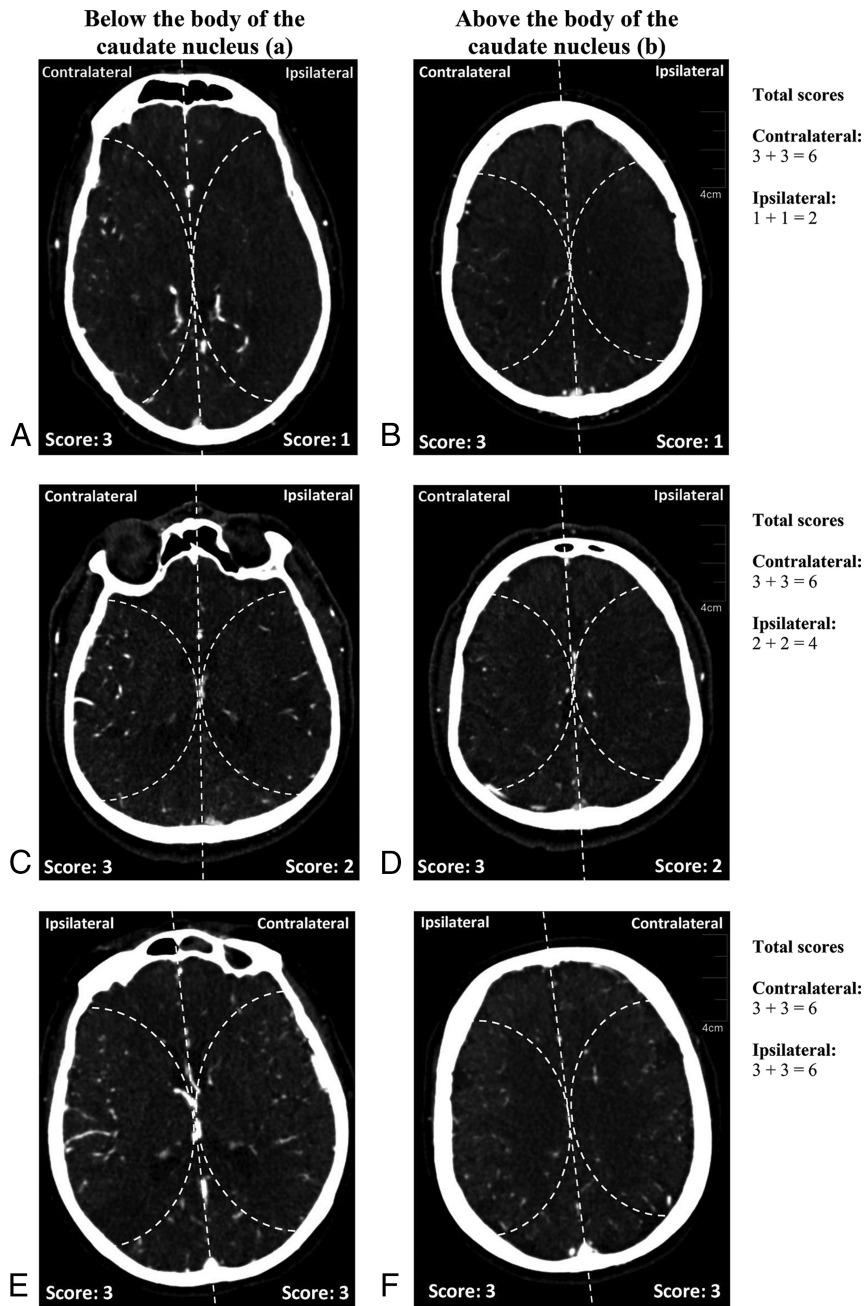
^aThe relative risk of receiving IA treatment given poor-versus-good collateral status is 1.4 (95% CI, 0.6–3.2).

On-line Table 4: Number of patients with poor or good collaterals on dynamic CTA among patients with poor or good reperfusion after receiving IA treatment (either with or without IVT) (n = 17)^a

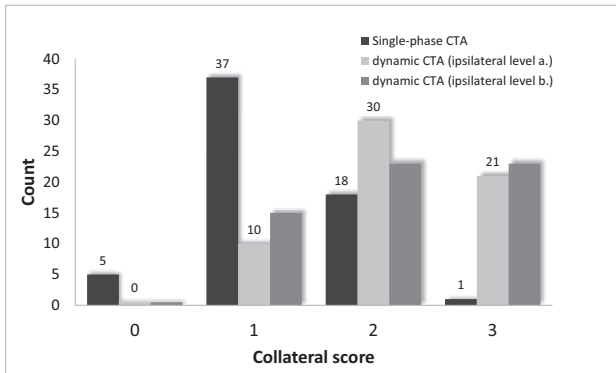
	Poor Collaterals	Good Collaterals
Poor reperfusion (No.)	4	7
Good reperfusion (No.)	2	4
Total (No.)	6	11

Note:—IA indicates intra-arterial.

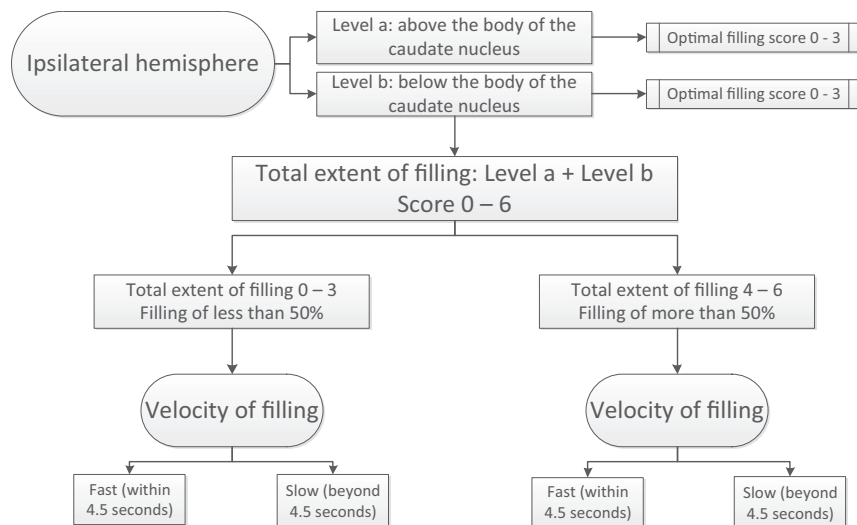
^aThe risk ratio for poor reperfusion status given poor-versus-good collateral status is 1.1 (95% CI, 0.5–2.2).



ON-LINE FIG 1. Examples of different extents of collateral filling on dynamic CT angiography. Examples of dynamic CTA volume sections (0.5 mm) with optimal filling in the unaffected (ie, contralateral) hemisphere, but different collateral flow grades in the affected (ie, ipsilateral) hemisphere in patient 1 (A and B), patient 2 (C and D), and patient 3 (E and F). All volumes were derived from patients with proximal middle cerebral artery M1 segment occlusions. Examples in the first column (A, C, and E) show the level below the body of the caudate nucleus (lower level *a*). Examples in the second column (B, D, and F) show the level above the body of the caudate nucleus (upper level *b*). Each level in each hemisphere is rated with a score of 0–3, depending on the amount of vessels filling in the MCA territory (bordered by *dashed lines*). The last column shows the total score for each hemisphere, calculated by adding the score of the lower level to that of the upper level.



ON-LINE FIG 2. Collateral filling scored on single-phase CTA with a collateral score by Tan et al,¹⁵ and collateral filling scored on dynamic CTA at 2 different levels (*a*, below the body of the caudate nucleus; *b*, above the body of the caudate nucleus) of the ipsilateral (ie, affected) hemisphere. Most cases received collateral scores of 1 or 2 when graded by using single-phase CTA, while the same cases received collateral scores 2 or 3 when graded by using dynamic CTA.



ON-LINE FIG 3. The flow chart shows 4 different patient groups by the extent of filling and the velocity of filling. The ipsilateral hemisphere was graded for 2 levels separately. Optimal filling of level *a*, with a score ranging from 0 to 3, included the area above the body of the caudate nucleus; and optimal filling of level *b* included the area below the body of the caudate nucleus. The total extent of filling was obtained by adding the score of level *a* to the score of level *b*, resulting in a score ranging from 0 to 6. This was divided into poor filling of <50% of the ischemic area, which included a total extent of filling of 0–3, and a good filling of >50%, including a total extent of filling from 4 to 6. The difference between the time (in seconds) until contralateral filling reached its maximal extent and until ipsilateral filling reached its maximal extent was calculated to assess the velocity of filling. When the difference between the ipsilateral and the contralateral hemispheres was <4.5 seconds, the velocity of filling was fast, and when this difference was ≥ 4.5 seconds, the velocity of filling was slow. The extent and velocity of filling resulted in 4 groups.