Supplementary figure 1: Examples of measurements of aortic arch elongation, take-off angle of supra-aortic vessels and tortuosity of supra-aortic vessels on graphic interpretations of the aortic arch and supra-aortic vessels.

CCA – common carotid arteries; IA – innominate artery.

A) Graphic example of the division of aortic arch elongation into three types. On an adjusted projection showing all supra-aortic arteries simultaneously, lines are drawn on the most cranial point of the outer and inner curvatures of the aortic arch. In a type I aortic arch, the origin of all supra-aortic arteries is seen on or above the upper line, as represented by the dark red colored IA in the graphic example. The light red colored IA’s are graphic examples of, respectively, a type II and type III arch. In type II, at least one of the supra-aortic arteries arises completely between the outer and inner curvature of the aortic arch. In type III, at least one supra-aortic artery arises either partially or completely below the level of the inner curvature of the arch. B) Graphic example of measurement of the take-off angle from the aortic arch to the IA and C) the take-off angle from the aortic arch to the left CCA. For both take-off angles, an adjusted projection is chosen that shows the take-off angle maximally. A first line is drawn along the center of the aortic arch, distal to the origin of the IA or left CCA, and a second line in the center of the IA or left CCA, respectively. The angle is measured at the asterisk and represents the deviation from the first line to the second line. D) Graphic example of the measurement of two angles in the left CCA. Measurements are performed on double oblique multiplanar reconstruction images. For each individual angle, adjusted oblique projections are chosen in such a way that the angle is observed maximally. A line is drawn in the center and along the course of the vessel segment proximal to the turning point of the angle, and a second line is drawn in the center of the vessel segment distal to the angle. The first angle indicated by one asterisk, represents an angle of $\geq 90^\circ$, and the second angle indicated by two asterisks, an angle of $< 90^\circ$. 
**Supplementary table 1:** Variables used for multiple imputation with number of missing values and percentage of total number of patients (N=887).

| Variables                                      | Missing values (%) |
|------------------------------------------------|--------------------|
| Age                                            | 0 (0%)             |
| Sex                                            | 0 (0%)             |
| Previous stroke                                | 6 (0.7%)           |
| Diabetes mellitus                              | 7 (0.8%)           |
| Hypertension                                   | 13 (1.5%)          |
| Atrial Fibrillation                            | 15 (1.7%)          |
| Systolic blood pressure                        | 27 (3.0%)          |
| Pre-stroke mRS                                 | 16 (1.8%)          |
| NIHSS at baseline                              | 21 (2.4%)          |
| NIHSS at 24-48h follow-up                      | 93 (10.5%)         |
| Location of occlusion                          | 13 (1.5%)          |
| Pre-intervention eTICI                         | 91 (10.3%)         |
| Collateral score                               | 34 (3.8%)          |
| ASPECTS                                        | 17 (1.9%)          |
| CBS                                            | 125 (14.1%)        |
| IVT administered                                | 0 (0%)             |
| Symptom onset to groin puncture                | 0 (0%)             |
| Procedural duration                            | 89 (10.0%)         |
| mRS after 3 months                             | 73 (8.2%)          |
| Post-EVT eTICI                                 | 10 (1.1%)          |
| Failed transfemoral approach                   | 0 (0%)             |
| Aortic Arch Elongation                         | 2 (0.2%)           |
| Take-off angle                                 | 9 (1.0%)           |
| Aortic Variants                                | 5 (0.6%)           |
| Number of angles in IA/CCA ≥90°               | 28 (3.2%)          |
| Number of angles in ICA ≥90°                  | 182 (20.5%)        |
| Atherosclerosis in the origin of the IA        | 49 (5.5%)          |
| Atherosclerosis in the origin of the CCA       | 82 (9.2%)          |
| ICA presence of atherosclerosis                | 72 (8.1%)          |
| ICA stenosis by NASCET                         | 117 (13.2%)        |
| intracranial ICA atherosclerosis (including stenosis) | 222 (25.0%) |

ASPECTS – Alberta Stroke Program Early CT Score; CBS – clot burden score; CCA – common carotid arteries; eTICI - extended Thrombolysis in Cerebral Infarction; EVT – endovascular treatment; IA – innominate artery; ICA – internal carotid artery; IVT – intravenous thrombolysis; mRS – modified Rankin Scale; NASCET – North American Symptomatic Carotid Endarterectomy Trial; NIHSS – National Institutes of Health Stroke Scale.
Supplementary table 2. Baseline and outcome characteristics of inclusions (N = 887) and exclusions (N = 601).

| Patient characteristics | Inclusion N = 887 | Exclusion N = 601 | p-value |
|-------------------------|------------------|------------------|---------|
| Age (mean, SD)          | 68.7 (14.4)      | 68.5 (14.5)      | 0.580   |
| Men (n, %)              | 461 (52%)        | 333 (55%)        | 0.193   |
| Previous stroke (n, %)  | 159 (18%)        | 90 (15%)         | 0.131   |
| Diabetes mellitus (n, %)| 136 (15%)        | 119 (20%)        | 0.027   |
| Hypertension (n, %)     | 446 (51%)        | 299 (50%)        | 0.770   |
| Atrial Fibrillation (n, %)| 202 (23%)      | 125 (21%)        | 0.338   |
| Pre-mRS ≥1 (n, %)       | 286 (33%)        | 184 (31%)        | 0.516   |
| NIHSS at baseline (median, IQR) | 16 (12 – 20) | 16 (11 – 20) | 0.748   |

| Radiological characteristics | Inclusion | Exclusion | p-value |
|------------------------------|-----------|-----------|---------|
| Pre-intervention eTICI ≥1 (n, %) | 83 (10%) | 160 (29%) | 0.000   |
| Collateral score ≥50% (n, %) | 512 (60%) | 311 (59%) | 0.675   |
| ASPECTS ≤7 (n, %)            | 256 (29%) | 178 (32%) | 0.689   |
| CBS ≤7 (n, %)                | 548 (72%) | 333 (70%) | 0.475   |

| Intervention characteristics | Inclusion | Exclusion | p-value |
|------------------------------|-----------|-----------|---------|
| IVT administered (n, %)      | 683 (77%) | 478 (80%) | 0.044   |
| EVT under general anesthesia (n, %) | 231 (27%) | 148 (27%) | 0.915   |
| Symptom onset to groin puncture, min (median, IQR) | 210 (159 – 265) | 205 (160 – 268) | 0.613   |

| Outcome characteristics | Inclusion | Exclusion | p-value |
|-------------------------|-----------|-----------|---------|
| Procedural duration, min (median, IQR) | 65 (45 – 90) | 60 (35 – 90) | 0.001   |
| eTICIa                  |           |           | 0.029   |
| 0                       | 171 (19%) | 93 (16%)  |         |
| 1                       | 32 (4%)  | 16 (3%)   |         |
| 2A                      | 192 (22%)| 114 (19%) |         |
| 2B                      | 162 (18%)| 109 (18%) |         |
| 2C                      | 85 (10%) | 53 (9%)   |         |
| 3                       | 235 (27%)| 205 (35%) |         |
| mRS after 3 months 3-6  | 504 (62%)| 342 (62%) | 0.813   |

ASPECTS – Alberta Stroke Program Early CT Score; CBS – clot burden score; eTICI - extended Thrombolysis in Cerebral Infarction; EVT – endovascular treatment; IQR – interquartile range; IVT – intravenous thrombolysis; mRS – modified Rankin Scale; SD – standard deviation.

P-values were calculated using Pearson Chi-Squared test for categorical variables and Mann-Whitney U test for continuous variables.

aPre-intervention eTICI and outcome variable eTICI are related to the exclusion criteria, as the largest number (n = 119) of exclusions was due to spontaneous reperfusion occurring prior to EVT and this, in general, results in a pre- and postintervention eTICIs ≥1.

bProcedural duration is related to the exclusion criteria of a patient, as patients without full EVT procedure were excluded, leading to an average shorter duration in the excluded group.
**Supplementary table 3.** Number of patients with procedural duration ≥60 minutes (n=828) and non-successful revascularization (eTICI 0-2A) (n=887) in the presence versus absence of extracranial vascular characteristics.

| Duration ≥60 min. with Characteristic Present (N) (%) | Duration ≥60 min. with Characteristic Absent (N) (%) | eTICI 0–2A with Characteristic Present (N) (%) | eTICI 0–2A with Characteristic Absent (N) (%) |
|--------------------------------------------------------|------------------------------------------------------|---------------------------------------------|---------------------------------------------|
| **Aortic Arch Elongation**                              |                                                      |                                            |                                            |
| Type II vs. I                                          | 297/489 (61%)                                        | 80/137 (58%)                                | 241/554 (44%)                              | 70/154 (46%)                               |
| Type III vs. I                                         | 78/126 (62%)                                        | 80/137 (58%)                                | 84/167 (50%)                               | 70/154 (46%)                               |
| Take-off angle ≥135°                                   | 38/57 (67%)                                         | 413/690 (60%)                               | 36/69 (53%)                                | 356/799 (45%)                              |
| **Aortic Vectors**                                     |                                                      |                                            |                                            |
| Variant B vs. A                                        | 60/99 (61%)                                         | 341/568 (60%)                               | 48/120 (40%)                               | 287/648 (44%)                              |
| Variant C vs A                                         | 52/84 (62%)                                         | 341/568 (60%)                               | 56/104 (54%)                               | 287/648 (44%)                              |
| **Tortuosity right IA and CCA, or left CCAa, b**       |                                                      |                                            |                                            |
| Presence of ≥1 angles ≥90°                             | 175/279 (63%)                                       | 266/453 (59%)                               | 165/335 (49%)                              | 216/515 (42%)                              |
| Presence of ≥2 angles ≥90°                             | 65/104 (63%)                                        | 376/628 (60%)                               | 63/124 (51%)                               | 318/726 (44%)                              |
| **Tortuosity cervical ICAb**                           |                                                      |                                            |                                            |
| Presence of ≥1 angles ≥90°                             | 206/323 (64%)                                       | 131/282 (46%)                               | 183/371 (49%)                              | 124/325 (38%)                              |
| Presence of ≥2 angles ≥90°                             | 107/154 (69%)                                       | 230/451 (51%)                               | 92/183 (50%)                               | 215/513 (42%)                              |
| **Atherosclerosis**                                    |                                                      |                                            |                                            |
| IA/CCA origin stenosis ≥50%                            | 12/12 (100%)                                        | 395/674 (59%)                               | 11/14 (79%)                                | 342/778 (44%)                              |
| ICA stenosis ≥99%                                      | 54/65 (83%)                                         | 336/596 (56%)                               | 44/86 (51%)                                | 300/675 (44%)                              |
| Intracranial stenosis ≥50%                             | 50/89 (56%)                                         | 265/481 (55%)                               | 54/109 (50%)                               | 231/547 (42%)                              |

CCA – common carotid arteries; eTICI - extended Thrombolysis in Cerebral Infarction; IA – innominate artery; ICA – internal carotid artery.

Numbers might not add up due to missing values.

aThe IA and left or right CCA were measured ipsilateral to the side of the intracranial vessel occlusion.

bPresence of ≥1 angles ≥90° was compared with no angle ≥90°; presence of ≥2 angles ≥90° was compared with no or 1 angle ≥90°.
**Supplementary table 4.** Regression coefficients of characteristics included in the final model for prediction of procedural duration ≥60 minutes (N=828).

| Characteristic                  | Regression coefficient (β) | P value |
|---------------------------------|-----------------------------|---------|
| Age                             | -0.005                      | 0.334   |
| Hypertension                    | 0.273                       | 0.113   |
| CBS                             |                             |         |
| 0 reference                     |                             |         |
| 1                               | 0.002                       | 0.998   |
| 2                               | -0.166                      | 0.808   |
| 3                               | -0.488                      | 0.469   |
| 4                               | -0.778                      | 0.150   |
| 5                               | -0.718                      | 0.222   |
| 6                               | -0.883                      | 0.086   |
| 7                               | -0.950                      | 0.087   |
| 8                               | -0.981                      | 0.061   |
| 9                               | -0.360                      | 0.517   |
| 10                              | -1.191                      | 0.152   |
| Tortuosity cervical ICA*        | 0.676                       | 0.000   |
| ICA stenosis ≥99%               | 1.162                       | 0.001   |
| **Intercept**                   | 0.909                       | 0.142   |

CBS – clot burden score; ICA – internal carotid artery.

*Presence of ≥1 angles ≥90°.
Supplementary table 5. Regression coefficients of characteristics included in the final model for prediction of non-successful revascularization (eTICI 0–2A) (N=887).

| Characteristic                          | Regression coefficient (β) | P value |
|----------------------------------------|-----------------------------|---------|
| Age                                    | 0.000                       | 0.992   |
| Hypertension                           | -0.057                      | 0.714   |
| Collateral score                       |                             |         |
| Absent collaterals                     | reference                   |         |
| Filling ≤50%                           | -0.167                      | 0.579   |
| Filling >50% but <100%                 | -0.546                      | 0.068   |
| Filling 100%                           | -0.375                      | 0.253   |
| CBS                                    |                             |         |
| 0 reference                            |                             |         |
| 1                                       | 0.168                       | 0.726   |
| 2                                       | 0.293                       | 0.580   |
| 3                                       | 0.072                       | 0.885   |
| 4                                       | -0.313                      | 0.485   |
| 5                                       | 0.124                       | 0.803   |
| 6                                       | -0.194                      | 0.643   |
| 7                                       | 0.192                       | 0.696   |
| 8                                       | 0.033                       | 0.940   |
| 9                                       | 0.121                       | 0.789   |
| 10                                      | 0.331                       | 0.664   |
| Pre-intervention eTICI                 |                             |         |
| 0 reference                            |                             |         |
| 1                                       | 0.070                       | 0.863   |
| 2A                                      | -0.033                      | 0.947   |
| 2B-3                                    | -0.035                      | 0.949   |
| IVT                                     | -0.165                      | 0.341   |
| Take-off angle ≥135°                    | 0.537                       | 0.065   |
| Aortic Variants                         |                             |         |
| Variant A reference                    |                             |         |
| Variant B                              | -0.292                      | 0.221   |
| Variant C                              | 0.450                       | 0.045   |
| Tortuosity right IA and CCA, or left CCA\(^a\) | 0.217 | 0.184 |
| Tortuosity cervical ICA\(^b\)          | 0.405                       | 0.009   |
| IA/CCA origin stenosis ≥50%            | 1.217                       | 0.108   |
| ICA stenosis ≥99%                      | 0.324                       | 0.196   |
| Intercept                              | -0.152                      | 0.797   |

CBS – clot burden score; CCA – common carotid arteries; eTICI - extended Thrombolysis in Cerebral Infarction; IA – innominate artery; ICA – internal carotid artery; IVT – intravenous thrombolysis.

\(^{a}\)The IA and left or right CCA were measured ipsilateral to the side of the intracranial vessel occlusion.

\(^{b}\)Presence of ≥1 angles ≥90°.
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MR CLEAN Registry Investigators – group authors

Executive committee
Diederik W.J. Dippel1; Aad van der Lugt2; Charles B.L.M. Majoie3; Yvo B.W.E.M. Roos4; Robert J. van Oostenbrugge5; Wim H. van Zwam6; Jelis Boiten14; Jan Albert Vos8

Study coordinators
Ivo G.H. Jansen3; Maxim J.H.L. Mulder1,2; Robert Jan B. Goldhoorn5,6; Kars C.J. Compagne2; Manon Kappelhof9

Local principal investigators
Wouter J. Schonewille7; Jan Albert Vos8; Charles B.L.M. Majoie3; Jonathan M. Coutinho4; Marieke J.H. Wermer9; Marianne A.A. van Walderveen10; Julie Staals5; Wim H. van Zwam6; Jeannette Hofmeijer11; Jasper M. Martens12; Geert J. Lycklama à Nijeholt13; Jelis Boiten14; Bob Roozenbeek1; Bart J. Emmer2; Sebastiaan F. de Bruijn3; Lukas C. van Dijk4; H. Bart van der Worp5,7; Rob H. Lo18; Ewoud J. van Dijk19; Hieronymus D. Boogaarts20; Paul L.M. de Kort21; Julia van Tuijl21; Jo J.P. Peluso26; Jan S.P. van den Berg27; Boudewijn A.A.M. van Hasselt23; Leo A.M. Aerden24; René J. Dallinga25; Maarten Uyttenboogaart28; Omid Eshghi29; Reinoud P.H. Bokkers29; Tobien H.C.M.L. Schreuder30; Roel J.J. Heijboer31; Koos Keizer32; Lonneke S.F. Yo33; Heleen M. den Hertog34,35; Emiel J.C. Sturm35

Imaging assessment committee
Charles B.L.M. Majoie3 (chair); Wim H. van Zwam6; Aad van der Lugt2; Geert J. Lycklama à Nijeholt13; Marianne A.A. van Walderveen10; Marieke E.S. Sprengers3; Sjoerd F.M. Jenniskens27; René van den Berg3; Albert J. Yoo37; Ludo F.M. Beenen3; Alida A. Postma6; Stefan D. Roosendaal3; Bas F.W. van der Kallen13; Ido R. van den Wijngaard13; Adriaan C.G.M. van Es2; Bart J. Emmer2,3; Jasper M. Martens12; Lonneke S.F. Yo33; Jan Albert Vos8; Joost Bot36; Pieter-Jan van Doormaal2.

Writing committee
Diederik W.J. Dippel1 (chair); Aad van der Lugt2; Charles B.L.M. Majoie3; Yvo B.W.E.M. Roos4; Robert J. van Oostenbrugge5; Wim H. van Zwam6; Geert J. Lycklama à Nijeholt13; Jelis Boiten14; Wouter J. Schonewille7; Jeannette Hofmeijer11; Jasper M. Martens12; H. Bart van der Worp17; Rob H. Lo18

Adverse event committee
Robert J. van Oostenbrugge5 (chair); Jeannette Hofmeijer11; H. Zwenneke Flach23

Trial methodologist
Hester F. Lingsma38

Research nurses / local trial coordinators
Nazha el Ghannouti1; Martin Sterrenberg1; Corina Puppels7; Wilma Pellikaan7; Rita Sprengers4; Marjan Elfrink11; Joke de Meris14; Tamara Vermeulen6; Annet Geerlings19; Gina van Vemde22; Tiny Simons30; Cathelijne van Rijnswijk21; Gert Messchendorp28; Hester Bongenaar32; Karin Bodde34; Sandra Kleijn34; Jasmijn Lodico34; Hanneke Droste34; M. Wollaert5; D. Jeurrissen5; Ernas Bos9; Yvonne Drabbe15; Nicoline Aaldering11; Berber Zweedijk17; Mostafa Khalilzada15.

PhD / Medical students:
Esmee Venema38; Vicky Chalos1,38; Ralph R. Geuskens3; Tim van Straaten19; Salilha Ergezen1; Roger
R.M. Harmsma; Daan Muijres; Anouk de Jong; Wouter Hinsenveld; Olvert A. Berkhemer; Anna M.M. Boers; J. Huguet; P.F.C. Groot; Marije A. Mens; Katinka R. van Kranendonk; Kilian M. Treurniet; Manon L. Tolhuizen; Heitor Alves.

**List of affiliations**

Department of Neurology, Radiology, Public Health, Erasmus MC University Medical Center; Department of Radiology and Nuclear Medicine, Neurology, Biomedical Engineering & Physics, Amsterdam UMC, University of Amsterdam, Amsterdam; Department of Neurology, Radiology, Maastricht University Medical Center and Cardiovascular Research Institute Maastricht (CARIM); Department of Neurology, Radiology, Sint Antonius Hospital, Nieuwegein; Department of Neurology, Radiology, Leiden University Medical Center; Department of Neuroscience, Radiology, Rijnstate Hospital, Arnhem; Department of Radiology, Neurology, Haaglanden MC, the Hague; Department of Neurology, Radiology, HAGA Hospital, the Hague; Department of Neurology, Radiology, University Medical Center Utrecht; Department of Neurology, Neurosurgery, Radiology, Radboud University Medical Center, Nijmegen; Department of Neurology, Radiology, Elisabeth-TweeSteden ziekenhuis, Tilburg; Department of Neurology, Radiology, Isala Klinieken, Zwolle; Department of Neurology, Radiology, Reinier de Graaf Gasthuis, Delft; Department of Neurology, Radiology, University Medical Center Groningen; Department of Neurology, Radiology, Atrium Medical Center, Heerlen; Department of Neurology, Radiology, Catharina Hospital, Eindhoven; Department of Neurology, Radiology, Medical Spectrum Twente, Enschede; Department of Radiology, Amsterdam UMC, Vrije Universiteit van Amsterdam, Amsterdam; Department of Radiology, Texas Stroke Institute, Texas, United States of America.