Supplementary Online Content

Lapergue B, Blanc R, Gory B, et al; ASTER Trial Investigators. Effect of endovascular contact aspiration vs stent retriever on revascularization in patients with acute ischemic stroke and large vessel occlusion: the ASTER randomized clinical trial. *JAMA*. doi:10.1001/jama.2017.9644

This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix. Supplemental Methods

Statistical analysis

Secondary binary outcomes were also analyzed with mixed logistic regression models adjusted for stratification variables and are reported as adjusted ORs with their 95%CIs. Similar to methods used for the primary outcome, adjusted absolute and relative risk differences (RD) were estimated from the marginal probabilities derived from the mixed logistic regression models using the method described by Austin. 95% confidence intervals of absolute and relative RD were estimated using bootstrap methods (2000 bootstrap samples) 1.. The secondary ordinal outcome (distribution of 90-day mRs, after combining scores of 5 and 6) was analyzed using a mixed ordinal logistic regression model (including treatment groups and prior use of IV thrombolysis as fixed effects and center as a random effect) and reported as adjusted common OR. Change in NIHSS score at 24 hours from admission was analyzed using the constrained longitudinal data analysis (cLDA) model[2], adjusted for randomization stratification variables. This model was used in view of the potential advantages of the cLDA compared to the conventional longitudinal analysis of covariance (ANCOVA) model.[3] In the cLDA, both the baseline and post-baseline values are modeled as dependent variables using a linear mixed model (an unstructured covariance pattern model), and the true baseline means are constrained to be the same for the 2 treatment groups. Hence, the cLDA provides an adjustment for the observed baseline difference in estimating the treatment effects, using all available baseline and post-baseline values. The between-group mean differences in 24-hour change in NIHSS was estimated by the time-by-arm interaction as treatment effect size. Normality of model residuals was checked and satisfied. The times to achieve primary outcome (mTICI 2/b at the end of the endovascular procedure) from groin puncture and clot contact and the total number of passes with endovascular revascularization devices were compared between the two-treatment groups using the Mann-Whitney U test. For these secondary outcomes, effect size was estimated through the calculation of standardized differences[4] on rank-transformed data; 95%CIs were estimated using bootstrap methods (2000 bootstrap samples).

No imputation procedure was applied to handle missing data (including loss to follow-up) for secondary outcomes, except for reperfusion scores (mTICI) where missing mTICI score due to groin access failure (n=4) were treated as failures (mTICI 0) and those due to no core laboratory reading

(n=20 for mTICI score at end of procedure and 22 for mTICI score after first-line procedure) were replaced by the study site evaluation regardless of treatment group.

References:

1.Austin PC. Absolute risk reductions, relative risks, relative risk reductions, and numbers needed to treat can be obtained from a logistic regression model. J Clin Epidemiol. 2010;63(1):2-6

2. Liang KY ZS. Longitudinal data analysis of continuous and discrete responses for pre–post designs. The Indian Journal of Statistics (Series B) 2000;62:134-48.

3. Liu GF, Lu K, Mogg R, Mallick M, Mehrotra DV. Should baseline be a covariate or dependent variable in analyses of change from baseline in clinical trials? Stat Med 2009;28(20):2509-30

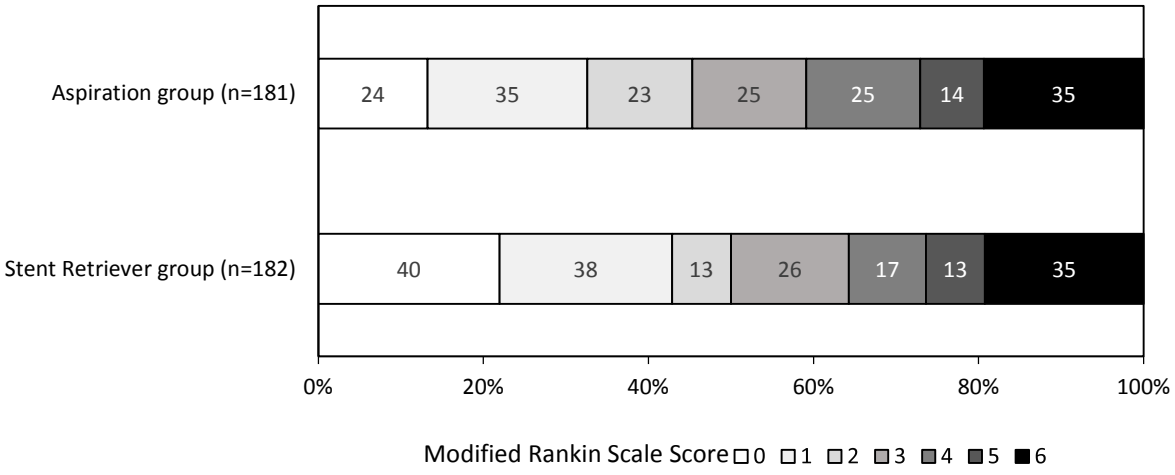
4. Cohen J. A power primer. Psychol Bull. 1992;112(1):155-159.

eTable. Detail of Thrombectomy Devices Used in Frontline and Rescue Strategies According to the Assigned Groups

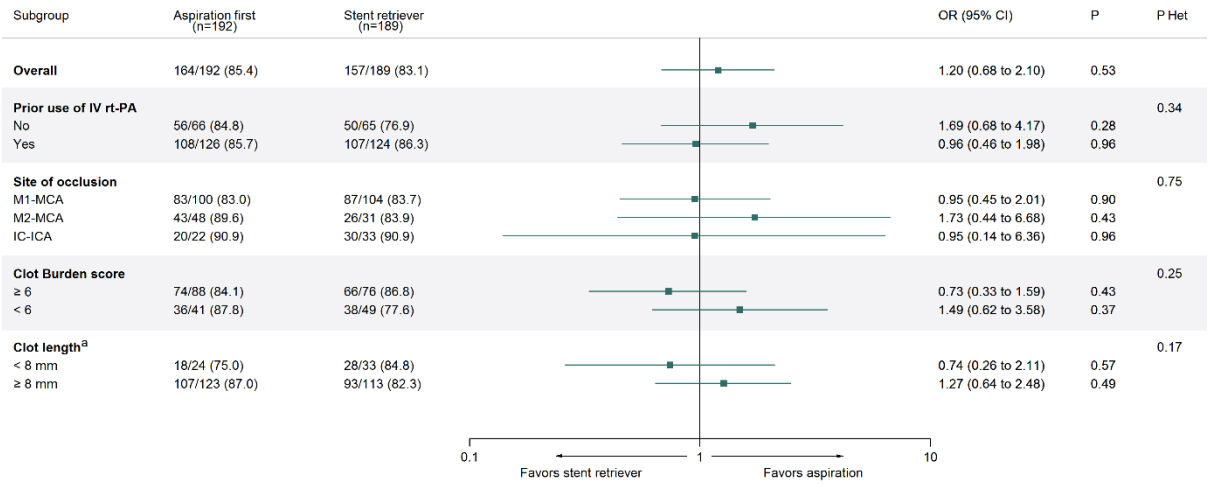
	Aspiration First	Stent Retriever First
Frontline Strategy	**(n=174)**	**(n=175)**
ACE 64	65	1
ACE 60	12	0
ACE68	1	0
3 MAX	5	1
4 MAX	10	0
5 MAX	63	2
SOFIA	17	1
ARC 6F	1	0
SOLITAIRE FR	0	101
TREVO	0	56
EMBOTRAP	0	9
EMBOLYS 5*21	0	1
CATCH 3*15	0	1
ERIC	0	3
PHENOX	0	8
REVIVE	0	2
Rescue Strategy	**(n=63)**	**(n=45)**
ACE 64	7	10
ACE 60	0	0
3 MAX	3	2
4 MAX	3	0
5 MAX	8	13
SOFIA	2	9
SOLITAIRE FR	23	16
TREVO	24	16
EMBOTRAP	1	1
ERIC	7	5
PHENOX	5	1
MAVERICK	0	1
REVIVE	1	0

eFigure 1. Distribution of Modified Rankin Scale (mRS) Scores at 3 Months

0 indicates no symptoms, 1 no clinically relevant disability, 2 slight disability (able to look after own affairs without assistance but not to the full extent), 3 moderate disability (requires some help but able to walk unassisted), 4 moderately severe disability (requires assistance and unable to walk unassisted, 5 severe disability (requires constant nursing care), and 6 dead. P-Values for comparison in the mRS scores between the two groups=0.15 calculated in a mixed ordinal logistic regression model adjusted for center and prior use of intravenous thrombolysis (common odds ratio for contact aspiration relative to stent retriever group=0.76; 95%CI, 0.53 to 1.10).



eFigure 2. Treatment Effect Size (Aspiration vs. Stent Retriever) on Successful Revascularization at the End of All Endovascular Procedures (Primary Outcome) According to Key Subgroups



Values expressed as no./total no. (%) unless otherwise as indicated.

ICA=internal carotid artery; MCA=middle cerebral artery; rt-PA=recombinant tissue plasminogen activator.

Primary outcome was defined as modified treatment in cerebral infarction score (mTICI) of 2b/3assessed by core laboratory; missing mTICI values due to groin access failure (n=4) were treated as failures (mTICI 0) and missing mTICI values due to no core laboratory reading (n=20) were replaced by the study site evaluation.

The clot burden score (CBS) is a semiquantitative CT angiography or Magnetic resonance angiography-based scale, which assesses the number of arterial segments exhibiting a visible clot. Score range of 0 to 10 (higher clot burden translates as a lower CBS).

[a] unplanned subgroup analysis. *P* het indicates *P*-values for heterogeneity in treatment effect size across subgroups.