SUPPLEMENT

Mechanical Thrombectomy for the Treatment of Anterior Cerebral Artery Occlusions: A Systematic Review of Literature

Search Terms

Pubmed: (“ischemic stroke” OR “cerebrovascular accident”) OR (“thrombectomy*”) AND (“anterior cerebral artery” OR “ACA”) [329 results]

Web of Science: (“ischemic stroke” OR “cerebrovascular accident”) OR (“thrombectomy*”) AND (“anterior cerebral artery” OR “ACA”) [159 results]

Ovid Medline: (“ischemic stroke” OR “cerebrovascular accident”) OR (“thrombectomy*”) AND (“anterior cerebral artery” OR “ACA”) [305 results]

Date of Search: March 4, 2022

Inclusion: patients with ACA territory occlusion treated with mechanical thrombectomy, outcomes data specific to mechanical thrombectomy, English language

Exclusion: cerebral occlusions not localized to ACA, ACA stroke without mechanical thrombectomy treatment, no clinical or outcome results related to mechanical thrombectomy

Supplement Table 1. PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Pg 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Pg 1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Pg 3
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Pg 3
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Pg 4
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Pg 4
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Supplement Pg 2
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Pg 4-5
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Pg 4-5
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Pg 4-5
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Pg 4-6
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Pg 6
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Pg 6
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Pg 4-6
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Pg 4-6
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Pg 4-6
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Pg 6
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Pg 6
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Pg 6
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Pg 6
Certainty	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Pg 6

Section and Topic	Item #	Checklist item	Location where item is reported
assessment			
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Figure 1
Study characteristics	17	Cite each included study and present its characteristics.	Pg 7-9, Tables 1-5
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Supplement Table 2
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Pg 7-9, Tables 1-5
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Supplement Table 2
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Pg 7-9
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Supplement Table 2
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Pg 7-9
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Supplement Table 2
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Pg 7-9
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pg 10
	23b	Discuss any limitations of the evidence included in the review.	Pg 13
	23c	Discuss any limitations of the review processes used.	Pg 13
	23d	Discuss implications of the results for practice, policy, and future research.	Pg 12
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Pg 4
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	NA
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	NA
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Pg 14
Competing interests	26	Declare any competing interests of review authors.	Pg 14
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Pg 14-16

Supplement Table 2. Procedure characteristics of included studies

Author (Year)	MT Technique (n)	Devices Used (n)	ACA Occlusion Types (n)	Post-Procedural Complications (n)	Intracranial Bleeding (n)
Miszczuk (2022)	Stent-retriever mediated (34) Direct aspiration first pass technique-ADAPT (7)	Stent Retrievers Trevo (11) Preset Lt (18) Solitaire (3) Catch Mini (1) Catheters for ADAPT 3/4 Max (4) ACE 64 (1) SOFIA 5/6 (2)	Primary ACA occlusion, primary isolated occlusions (5) Primary ACA occlusion, carotid-T occlusion or combined occlusions (17) Secondary ACA occlusion, embolization in new territory during MCA MT or after bridging i/v/ lysis (19) *individual data based on type of occlusion (primary v secondary) not reported	ICH, clinically silent regional convexity and/or parafalcine SAH (4)	ICH, clinically silent regional convexity and/or parafalcine SAH (4)
Filioglo (2022)	Stentriever-based thrombectomy Direct aspiration Combined techniques *EVT strategy chosen based on interventionalist's judgement	not specified	Primary ACA occlusion, acute isolated ACA occlusion (92)	ICH, unspecified (1)	ICH, unspecified (1)
Nogueira (2021)	Stent-retriever mediated (9)	Stent Retrievers Trevo (9)	Primary ACA embolus, acute isolated ACA occlusion (10)	No complications	No complications
Kim (2021)	Hybrid MT with catheter aspiration and stent retrievers simultaneously (12)	Stent Retrievers Trevo (12) Catheter SOFIA (12)	Primary ACA occlusion, dual occlusion of ACA and MCA (12)	ICH, unspecified (3)	ICH, unspecified (3)
Hudson (2021)	Stent retriever-mediated manual aspiration thrombectomy (4) Manual aspiration (5)	Stent Retrievers Solitaire (3) Trevo (1) Catheter Sofia (5)	Primary ACA occlusion, only ACA involvement (3) Primary ACA occlusion, combined M1 and ACA occlusion (2) Secondary ACA occlusion, emboli from initial intracranial ICA occlusion (4)	No complications	No complications
Uno (2019)	Stent retriever (7) Direct aspiration first pass technique (2)	Stent Retreiver (7) Solitaire Trevo Aspiration Catheter Penumbra (2)	Primary ACA occlusion without involvement of other cerebral arteries (1) Primary ACA occlusion with multiple occlusions in contralateral ACA or ipsilateral MCA (4)	ICH, unspecified in MCA territory (2) ICH, SAH in MCA territory (1)	ICH, unspecified in MCA territory (2) ICH, SAH in MCA territory (1)

			Secondary ACA occlusion during endovascular procedure (4) Cervical carotid a. stent (1) Direct aspiration first pass (3)		
Chung (2017)	Manual aspiration (16)	Aspiration Catheter Penumbra (16)	Primary ACA occlusion with involvement of both M1 and A2 (5) Secondary ACA occlusion, occlusions of distal ICA (11)	Brain Edema, Herniation (4) ICH, parenchymal hemorrhage in basal ganglia non-ACA territory (5)	ICH, parenchymal hemorrhage in basal ganglia non-ACA territory (5)
Pfaff (2016)	Stent retriever (30) *failure of SR deployment in 5 (placement of guideline, occlusion)	Stent retriever Aperio (1) Capture (1) Catch Mini (3) ERIC (1) Revive (6) Solitaire (12) Trevo (1)	Primary ACA occlusion with involvement of other cerebral vessels (17) Secondary ACA occlusion (13)	Dissection of distal ACA (1) ICH, parenchymal hemorrhage in ACA territory (1) ICH, occult SAH in MCA territory (4)	ICH, parenchymal hemorrhage in ACA territory (1) ICH, occult SAH in MCA territory (4)
Kurre (2013)	Stent retriever (5)	Stent retriever Solitaire (3) pREset (2)	Secondary ACA occlusion, ACA emboli due to M1 recanalization (5)	ICH, SAH in MCA territory (1) New infarcts (2)	ICH, SAH in MCA territory (1)

Definitions:

Post-procedural complications: Includes complications that occurred after the procedure and can be attributed to the procedure; this includes technical events with the device as well as thromboembolic events, intracranial hemorrhage, reperfusion injury

Procedural Failure: Inability of device deployment, specifically concerning stent-retrievers, due to placement of guidewire or placement of microcatheter

Primary Isolated ACA occlusion: Includes acute isolated ACA occlusions not extending or found in conjunction with other vessels of cerebrum; occlusion must not be result of thrombectomy or thrombolytic therapy

Primary Combined ACA occlusion: Includes acute ACA extending or found in conjunction with other vessels of cerebrum; occlusion must not be result of thrombectomy or thrombolytic therapy

Secondary ACA occlusion: Includes occlusions of the ACA territory (either isolated or in conjunction/with extension to other cerebral vessels) occurring after and attributable to thrombectomy procedure or thrombolytic therapy

Good Outcome: Defined as having mRS < 2-3 (depending on how mRS scores are grouped in individual included studies) after thrombectomy procedure

Poor Outcome: Defined as having mRS > 2-3 (depending on how mRS scores are grouped in individual included studies) after thrombectomy procedure

Abbreviations:

ADAPT=direct aspiration first pass technique, ACA=anterior cerebral artery, DAWN= Diffusion-Weighted Imaging or CTP Assessment With Clinical Mismatch in the Triage of Wake-Up and Late Presenting Strokes Undergoing Neurointervention With Trevo, EVT=endovascular therapy, ICA=intracerebral hemorrhage, ICH=intracranial hemorrhage, IVT=intravenous thrombolysis, MCA=middle cerebral artery, MT=mechanical thrombectomy, PRISMA= Preferred Reporting Items for Systematic Reviews and Meta-Analyses, SAH=subarachnoid hemorrhage, sICH=symptomatic intracranial hemorrhage, TICI=Thrombolysis in cerebral infarction

Supplement Table 3. Newcastle-Ottawa Quality Assessment Form for Cohort Studies Using Clinical Follow-up

	Selection				Comparability	Outcome			
Study, Year	Q1	Q2	Q3	Q4	Q1	Q1	Q2	Q3	Σ
Miszczuk (2022)	*	0	*	0	*	*	*	0	5
Filioglo (2022)	*	0	*	0	*	*	*	*	6
Nogueira (2021)	*	0	*	0	*	*	*	*	6
Kim (2021)	*	0	*	0	*	*	*	*	6
Hudson (2021)	*	0	*	0	*	*	*	*	6
Uno (2019)	*	0	*	0	*	*	*	*	6
Chung (2017)	*	0	*	0	*	*	*	*	6
Pfaff (2016)	*	0	*	0	*	*	*	*	6
Kurre (2013)	*	0	*	0	*	0	0	0	3

Points were assigned for each criterion in the checklist for each included study. The maximum total number of points is 9, with a higher number of points indicating higher study quality.

Supplement Table 4. Patient Demographics and Stroke Characteristics of Included Studies

						Clinical Presentation		Stroke Etiology			Stroke Location					Type of Occlusion		
Author (Year)	**Patients, n**	**Average Age Mean (SD)/Median (range), years**	**Female, n (%)**	**Average (SD)/Median (range) NIHSS Admission**	**Median ASPECT score (range)**	**speech disturbance, n (%)**	**hemiparesis, n (%)**	**AS, n (%)**	**Cardiogenic, n (%)**	**Other, n (%)**	**A1, n (%)**	**A2, n (%)**	**A3, n (%)**	**A4, n (%)**	**A5, n (%)**	**Primary Isolated ACA Occlusion, n (%)**	**Primary Combined ACA Occlusion, n (%)**	**Secondary ACA Occlusion, n (%)**
Miszczuk (2022)[5]	41	73 (62-82)	24/41 (59)	17 (15-21)	--	--	--	14/41 (34)	21/41 (51)	6/41 (15)	0/41 (0)	19/41 (46)	4/41 (10)	16/41 (39)	2/41 (5)	5/41 (13)	17/41 (41)	19/41 (46)
Filioglo (2022)[6]	37	77 (69-83)	17/37 (46)	10 (7-15)	--	--	--	4/37 (11)	9/37 (24)	24/37 (65)	16/37 (43)	21/37* (57)	0/37 (0)	0/37 (0)	0/37 (0)	37/37 (100)	0/37 (0)	0/37 (0)
Nogueira (2021)[7]	9	65.9 (12.8)	3/9 (33)	17.5 (12-20)	--	--	--	--	--	--	--	--	--	--	--	9/9 (100)	0/9 (0)	0/9 (0)
Kim (2021)[8]	12	80 (66-85)	6/12 (50)	18 (16-20)	8 (7-9)	--	--	--	--	--	1/12 (8)	3/12 (25)	6/12 (50)	2/12 (17)	0/12 (0)	0/12 (0)	12/12 (100)	0/12 (0)
Hudson (2021)[9]	9	73 (52-91)	3/9 (33)	23 (15-30)	--	9/9 (100)	9/9 (100)	--	--	--	--	--	--	--	--	3/9 (33)	2/9 (22)	4/9 (44)
Uno (2018)[10]	9	75 (56.5-80.5)	1/9 (11)	24 (19-28.5)	8.5 (5.75-9.75)	5/9 (56)	8/9 (89)	2/9 (22)	6/9 (67)	1/9 (11)	1/9 (11)	4/9 (44)	3/9 (33)	1/9 (11)	0/9 (0)	1/9 (11)	4/9 (44)	4/9 (44)
Chung (2017)[11]	16	74 (55-88)	7/16 (44)	15 (14-17)	--	--	--	--	--	--	--	--	--	--	--	0/16 (0)	5/16 (31)	11/16 (69)
Pfaff (2016)[12]	30	64 (13)	16/30 (53)	18 (13-23)	7 (7-9)	--	--	--	--	--	0/30 (0)	7/30 (23)	16/30 (53)	7/30** (23)	--	17/30 (57)	0/30 (0)	13/30 (43)
Kurre (2013)[13]	5	75 (10-94)	--	14 (8-20)	--	--	--	--	--	--	0/5 (0)	3/5 (60)	0/5 (0)	2/5 (40)	0/5 (0)	0/5 (0)	0/5 (0)	5/5 (100)
Crude Estimate (%)/(range)	**168**	**74 (64-80)**	**77/163 (47)**	**17.5 (10-24)**	**8 (7-8.5)**	**14/18 (78)**	**17/18 (94)**	**20/87 (23)**	**36/87 (41)**	**31/87 (36)**	**18/134 (13)**	**57/134 (43)**	**29/134 (22)**	**28/134 (21)**	**2/134 (1)**	**72/168 (43)**	**40/168 (24)**	**56/168 (33)**

ACA=anterior cerebral artery, AS=atherosclerosis, ASPECT=Alberta Stroke Program Early CT Score, NIHSS=NIH stroke scale, SD=standard deviation

* Filioglo et al. group A2-5 and these are reported here as A2

** Pfaff et al. group A4-5 and these are reported here as A4

Supplement Table 5. Thrombectomy Procedural Data for Included Studies

		MT Technique							
Author (Year)	**patients given i.v. tPA, n (%)**	**stent-retriever mediated, n (%)**	**Aspiration only, n (%)**	**hybrid, n (%)**	**Procedural Failure, n (%)**	**Average (SD)/Median (range) Time from Onset to Recanalization, minutes**	**Average (SD)/Median (range) Procedural Time, minutes**	**Average (SD)/Median (range) Number of Passes, n**	**mTICI 2b/3, n (%): numerator**
Miszczuk (2022)[5]	19/41 (46)	34/41 (83)	7/41 (17)	0/41 (0)	0/41 (0)	234 (103)	72 (31)	1 (1-1)	34/41 (83)
Filioglo (2022)[6]	0/37 (0)	--	--	--	0/37 (0)	260 (214)	--	--	24/37 (65)
Nogueira (2021)[7]	6/9 (67)	9/9 (100)	0/9 (0)	0/9 (0)	0/9 (0)	132 (130-300)	49 (30)	1 (1-2)	9/9 (100)
Kim (2021)[8]	--	0/12 (0)	0/12 (0)	12/12 (100)	0/12 (0)	--	--	--	10/12 (83)
Hudson (2021)[9]	1/9 (11)	0/9 (0)	5/9 (56)	4/9 (44)	0/9 (0)	--	--	--	7/9 (78)
Uno (2018)[10]	7/9 (78)	7/9 (78)	2/9 (22)	0/9 (0)	0/9 (0)	229 (183-346)	66 (41-169)	1	9/9 (100)
Chung (2017)[11]	4/16 (25)	0/16 (0)	16/16 (100)	0/16 (0)	0/16 (0)	242 (165-305)	45 (35-65)	1 (1-3)	15/16 (94)
Pfaff (2016)[12]	25/30 (83)	30/30 (100)	0/30 (0)	0/30 (0)	5/30 (17)	--	--	--	22/30 (73)
Kurre (2013)[13]	--	5/5 (100)	0/5 (0)	0/5 (0)	0/5 (0)	--	--	--	4/5 (80)
Crude Estimate (%)	**62/151 (41)**	**85/131 (65)**	**30/131 (23)**	**16/131 (12)**	**5/168 (3)**	**219 (50)**	**58 (13)**	**1**	**134/168 (80)**

i.v. tPA=intravenous tissue plasminogen activator, MT=Mechanical Thrombectomy, mTICI=modified treatment in cerebral ischemia, SD=standard deviation

Supplement Table 6. Post-procedural Complications and Follow-up Data for Included Studies

							Mortality		mRS scores			
Author (Year)	**Post-procedural complication, overall, n (%)**	**Post-procedural complication, symptomatic, n (%)**	**Intracranial Bleeding, n (%)**	**Intracranial bleed, symptomatic, n (%)**	**Mean (SD)/Median (range) Clinical Follow-up, months**	**Patients at Follow-up, n**	**Mortality, 3 mo, n (%)**	**Mortality, overall, n (%)**	**mRS, 3mo (scores 0-2), n (%)**	**mRS, 3mo (scores ≥3), n (%)**	**mRS, overall (scores 0-2), n (%)**	**mRS, last f/u (scores ≥3), n (%)**
Miszczuk (2022)[5]	4/41 (10)	0/41 (0)	4/41 (10)	0/41 (0)	3	26	0/26 (0)	6/41 (15)	4/26 (15)	22/26 (85)	7/41 (17)	34/41 (83)
Filioglo (2022)[6]	1/37 (3)	1/37 (3)	1/37 (3)	1/37 (3)	3	37	6/37 (16)	6/37 (16)	18/37 (49)	19/37 (51)	18/37 (49)	19/37 (51)
Nogueira (2021)[7]	0/9 (0)	0/9 (0)	0/9 (0)	0/9 (0)	3	9	2/9 (22)	2/9 (22)	4/9 (44)	5/9 (56)	4/9 (44)	5/9 (56)
Kim (2021)[8]	3/12 (25)	3/12 (25)	3/12 (25)	3/12 (25)	3	12	2/12 (17)	2/12 (17)	3/12 (25)	9/12 (75)	3/12 (25)	9/12 (75)
Hudson (2021)[9]	0/9 (0)	0/9 (0)	0/9 (0)	0/9 (0)	3	9	6/9 (67)	6/9 (67)	2/9 (22)	7/9 (78)	2/9 (22)	7/9 (78)
Uno (2018)[10]	3/9 (33)	3/9 (33)	3/9 (33)	3/9 (33)	3	9	2/9 (22)	2/9 (22)	1/9 (11)	8/9 (89)	1/9 (11)	8/9 (89)
Chung (2017)[11]	9/16 (56)	9/16 (56)	5/16 (31)	5/16 (31)	3	16	4/16 (25)	4/16 (25)	5/16 (31)	11/16 (69)	5/16 (31)	11/16 (69)
Pfaff (2016)[12]	6/30 (20)	2/30 (7)	5/30 (17)	1/30 (3)	3	30	--	--	11/30 (37)	19/30 (63)	11/30 (37)	19/30 (63)
Kurre (2013)[13]	3/5 (60)	1/5 (20)	1/5 (20)	1/5 (20)	--	--	--	2/5 (40)	--	--	--	--
Crude Estimate (%)	**29/168 (17)**	**19/168 (11)**	**22/168 (13)**	**14/168 (8.3)**	**3**	**148**	**22/118 (19)**	**30/138 (22)**	**48/148 (32)**	**100/148 (68)**	**51/163 (31)**	**112/163 (69)**

mRS=modified Rankin score, SD=standard deviation

Supplement Table 7. Procedural, Complications, and Clinical Follow-up Data Based on ACA Embolus Type

Author (Year)	Average (SD)/Median (range) NIHSS Admission			Median ASPECT score (range)			mTICI 2b/3, n (%)			Post-procedural complication, symptomatic, n (%)			Intracranial bleed, symptomatic, n (%)			Mortality, overall, n (%)			mRS, overall (scores 0-2), n (%)			mRS, overall (scores ≥3), n (%)		
	primary, isolated	primary, combined	secondary	primary, isolated	primary, combined	secondary	primary, isolated	primary, combined	secondary	primary, isolated	primary, combined	secondary	primary, isolated	primary, combined	secondary	primary, isolated	primary, combined	secondary	primary, isolated	primary, combined	secondary	primary, isolated	primary, combined	secondary
Miszczuk (2022)[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Filioglo (2022)[6]	10 (7-15)	--	--	--	--	--	24/37 (65)	--	--	1/37 (3)	--	--	1/37 (3)	--	--	6/37 (16)	--	--	18/37 (49)	--	--	19/37 (51)	--	--
Nogueira (2021)[7]	17.5 (12-20)	--	--	--	--	--	9/9 (100)	--	--	0/9 (0)	--	--	0/9 (0)	--	--	2/9 (22)	--	--	4/9 (44)	--	--	5/9 (56)	--	--
Kim (2021)[8]	--	18 (16-20)	--	--	8 (7-9)	--	--	10/12 (83)	--	--	3/12 (25)	--	--	3/12 (25)	--	--	2/12 (17)	--	--	3/12 (25)	--	--	9/12 (75)	--
Hudson (2021)[9]	21 (15-29)	--	--	--	--	--	3/3 (100)	--	--	0/3 (0)	--	--	0/3 (0)	--	--	--	--	--	2/3 (67)	--	--	1/3 (33)	--	--
Uno (2018)[10]	19	28 (19-29)	24 (13-32)	10	9 (5-10)	8 (4-10)	1/1 (100)	4/4 (100)	4/4 (100)	--	--	--	--	--	--	0/1 (0)	0/4 (0)	2/4 (50)	0/1 (0)	1/4 (25)	0/4 (0)	1/1 (100)	3/4 (75)	4/4 (100)
Chung (2017)[11]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pfaff (2016)[12]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Kurre (2013)[13]	--	--	14 (8-20)	--	--	--	--	--	4/5 (80)	--	--	1/5 (20)	--	--	1/5 (20)	--	--	2/5 (40)	--	--	--	--	--	--
Crude Estimate (%)	**18 (10-21)**	**23 (18-28)**	**19 (14-24)**	**10**	**8.5 (8-9)**	**8**	**37/50 (74)**	**14/16 (88)**	**8/9 (89)**	**1/49 (2)**	**3/12 (25)**	**1/5 (20)**	**1/49 (2)**	**3/12 (25)**	**1/5 (20)**	**8/17 (47)**	**2/16 (13)**	**4/9 (44)**	**24/50 (48)**	**4/16 (25)**	**0/4 (0)**	**26/50 (52)**	**12/16 (75)**	**4/4 (100)**
Chi-Square (p-value)		**1.13[a] (0.57)**			**2.25[a] (0.33)**			**1.95 (0.38)**			**8.45 (0.01)**			**8.45 (0.01)**			**5.07 (0.08)**			**5.5 (0.06)**			**5.5 (0.06)**	

ASPECT=Alberta Stroke Program Early CT Score, mRS=modified Rankin score, mTICI=modified treatment in cerebral ischemia, NIHSS=NIH stroke scale

[a]Kruskal-Wallis statistic (p-value)

Supplement Table 8. Procedural and Complication Data Based on MT Technique

Author (Year)	mTICI 2b/3, n (%)			post-procedural complications, symptomatic, n (%)			procedural time (min)		
	stent	**aspiration**	**hybrid**	**stent**	**aspiration**	**hybrid**	**stent**	**aspiration**	**hybrid**
Miszczuk (2022)[5]	--	--	--	--	--	--	--	--	--
Filioglo (2022)[6]	--	--	--	--	--	--	--	--	--
Nogueira (2021)[7]	9/9 (100)	--	--	0/9 (0)	--	--	49	--	--
Kim (2021)[8]	--	--	12/12 (100)	--	--	3/12 (25)	--	--	--
Hudson (2021)[9]	--	--	--	--	--	--	--	--	--
Uno (2018)[10]	7/7 (100)	2/2 (100)	--	--	--	--	--	--	--
Chung (2017)[11]	--	15/16 (94)	--	--	9/16 (56)	--	--	45	--
Pfaff (2016)[12]	22/30 (73)	--	--	2/30 (7)	--	--	--	--	--
Kurre (2013)[13]	4/5 (80)	--	--	3/5 (60)	--	--	--	--	--
Crude Estimate (%)	**42/51 (82)**	**17/18 (94)**	**12/12 (100)**	**3/44 (7)**	**9/16 (56)**	**3/12 (25)**	**49**	**45**	**--**
Chi-Square (p-value)		**3.78 (0.15)**			**17.5 (<0.01)**				

mTICI=modified treatment in cerebral ischemia

PROSPERO Protocol

1. **Review Title:** Mechanical Thrombectomy for the Treatment of Anterior Cerebral Artery Occlusion: A Systematic Review of Literature
2. **Original Language Title:** Mechanical Thrombectomy for the Treatment of Anterior Cerebral Artery Occlusion: A Systematic Review of Literature
3. **Anticipated or Actual Start Date:** 01 March 2022
4. **Anticipated Completion Date:** 31 October 2022
5. **Stage of Review at Time of Submission:**

Review Stage	Started	Completed
Preliminary Searches	Yes	Yes
Piloting of Study Selection Process	Yes	Yes
Formal Screening of Search Results Against Eligibility Criteria	Yes	Yes
Data Extraction	Yes	Yes
Risk of Bias	Yes	Yes
Data Analysis	Yes	Yes

6. **Named Contact:** Panagiotis Mastorakos MD PhD
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8. **Named Contact Address:** Box 800212, Department of Neurosurgery, University of Virginia Health System Charlottesville, VA 22908
9. **Named Contact Phone Number:** 434-924-2735
10. **Organizational Affiliation of Review:** University of Virginia Health System
11. **Review Team Members and Organizational Affiliations:** Dr. Panagiotis Mastorakos, University of Virginia Health System, Virginia, USA. Ms. Nisha Dabhi, University of Virginia Health System, Virginia, USA
12. **Funding Sources/Sponsors:** Funding not provided.
13. **Conflicts of Interest:** No conflict of interest.
14. **Collaborators:** Dr. Jennifer Sokolowski, University of Virginia Health System, Virginia, USA. Dr. Ryan T. Kellogg, University of Virginia Health System, Virginia, USA. Dr. Min S. Park, University of Virginia Health System, Virginia, USA.
15. **Review Question:** In patients with anterior cerebral artery (ACA) occlusions, does mechanical thrombectomy (MT) provide a safe (ie. morbidity, mortality) and efficient (ie. rate of successful recanalization) treatment option relative to MT-treated large vessel occlusions and non-MT treated ACA occlusions?
16. **Searches:** Pubmed, Web of Science, Ovid Medline will be searched from inception until March 4, 2022 for published studies relaying outcomes related data concerning MT-treated ACA occlusions. All articles must be available in the English language.
17. **Search Strategy:** Please see Supplement, page 2. For full search terms.
18. **Condition or Domain Being Studied:** Anterior Cerebral Artery Occlusions. Safety and Efficacy of MT-treatment.
19. **Participants/Population:** Inclusion includes patients with ACA occlusions that were treated with mechanical thrombectomy with relevant clinical and outcomes data. Exclusion includes articles without data related to MT-treated ACA occlusions.

20. **Intervention/Exposure:** ACA occlusions were defined as acute ischemic strokes associated with thromboembolism that occur in the territory of the ACA vasculature, spanning from A1-A5. Mechanical thrombectomy was defined as endovascular technique focused on attempted retrieval/removal of occlusion by means of stent, aspiration, or hybrid methods.
21. **Comparator/Control:** There is no control in this systematic review. Instead, the literature will be searched to compare safety and efficacy of MT-treated large vessel occlusions as a relative standard of comparison in the discussion.
22. **Types of Study to be Included:** Studies eligible for review include primary articles with retrospective or prospective cohort studies or case-control studies related to MT-treated ACA occlusions in single or multi-centers. Excluded study types include case reports, systematic reviews, editorials/letters.
23. **Context:** Studies in single or multi-centers in which endovascular MT was performed.
24. **Main Outcome:** Primary outcomes were rate of successful recanalization, defined as mTICI 2b/3, following MT procedure and rate of good clinical outcome, defined as a modified Rankin score between 0-2 at last follow-up.
25. **Additional Outcomes:** Secondary outcome measures included rate of post-procedural complications. Post-procedural complications included complications that occurred after the procedure and can be attributed to the procedure; this includes technical events with the device as well as thromboembolic events, intracranial hemorrhage, reperfusion injury. Other secondary measures included mortality rate at last follow-up.
26. **Data Extraction:** Regarding study selection, two reviewers will be involved in applying the eligibility criteria and selecting studies ofr inclusion in the systematic review. One reviewer will screen and the other reviewer will confirm the first reviewer's decision. Disagreements between individual judgements will be resolved following careful review of the questioned article. Rayaan will be used for initial inclusion and exclusion of studies and to resolve duplicate studies. Regarding data extraction, each included article will be carefully reviewed to collect relevant data regarding baseline characteristics (ie. age, sex, NIHSS at admission, Alberta Stroke Program Early CT score, clinical presentation of stroke, stroke etiology, and ACA stroke location), procedural data (ie. type of MT technique, incidents of procedural failure, time from symptom onset to recanalization, procedural time, number of passes, mTICI score, and post-procedural complications), and clinical outcome (modified Rankin score, mortality, last clinical follow-up). One reviewer will initially collect data, which was verified by a second reviewer. Disagreements were resolved by carefully reviewing the article and discussing questioned data. Missing data will be recorded as "not found" and indicated appropriately on manuscript tables as such. Data will be recorded in excel spreadsheet.
27. **Risk of Bias:** Bias will be assessed using Newcastle-Ottowa Scale.
28. **Strategy for Data Synthesis:** For each included study, continuous variables were reported as medians and means with crude estimate for each variable computed as mean and median as well. Categorical variables were reported as proportions. Chi-Square Test of independence will be used to assess relationship between selected variables and ACA embolus type or MT technique, while Kruskal-Wallis test will be used to determine significant differences in ASPECT and NIHSS among ACA occlusion types.
29. **Analysis of Subgroup or Subsets:** Included studies which had reported individual baseline, procedural, or clinical outcomes data regarding ACA embolus type (ie. primary isolated, primary combined, or secondary) or MT technique (ie. stent, aspiration, hybrid) will be sub-stratified accordingly. These will be conveyed in separate tables with identical data synthesis procedure as listed above (no. 28).
30. **Type and Method of Review:** Type of review among listed in PROSPERO is systematic review. Health area of review is surgery.
31. **Language:** English
32. **Country:** USA
33. **Other Registration Details:** N/A
34. **Reference for Published Protocol:** N/A
35. **Dissemination Plans:** This review will be submitted to appropriate journals for publication.
36. **Keywords:** ischemic stroke, mechanical thrombectomy, anterior cerebral artery

37. **Details of Any Existing Review of Same Topic:** We have not published existing review of same topic.
38. **Current Review Status:** Review_Ongoing
39. **Additional Information:** N/A
40. **Details of Final Report/Publication:** N/A