Supplemental material

BMJ Publishing Group Limited (BMJ) disclaims all liability and responsibility arising from any reliance placed on this supplemental material which has been supplied by the author(s)

J NeuroIntervent Surg

Supplemental Data

Table e-1. Summary of studies included in the systematic review

Author, Year, Reference country	Study design	Population	Cervical ICA lesion	ASPECTS	IV tPA	Intervention (Order of c-ICA stenting and EVT, stent type)	Comparison (c-ICA management in control group)	Follow-up (months)
Wang, 2003, USA[13]	Retrospective cohort study	6 adults, median age 59.5 years, 3 female, NIHSS not specified	6 atherosclerotic	Not specified	Not specified	Stenting after EVT, Stent type not specified	Angioplasty or CEA	2-7
Srinivasan, 2006, Canada[12]	Retrospective cohort study	7 adults, median age 54 years, 4 female, median NIHSS 17	1 dissection, 6 atherosclerotic	Not specified	Not specified	Stenting after EVT, Wallstent	No intervention	1 - 40
Li, 2012, Taiwan[11]	Retrospective cohort study	7 adults, median age 65 years, 4 female, median NIHSS 23	Type of lesion not specified	Not specified	Not specified	Not specified	Angioplasty or no intervention	1
Machi, 2012, France[18]	Cohort study, data from prospectively collected database	10 adults, median age 69.5 years, 6 female,	1 dissection, 9 atherosclerotic	Data for AS and NAS groups not specified	7/10	Order of stenting and EVT not specified, Xact, LEO	Thromboaspiration	3

		median NIHSS 19						
Fahed, 2016, France[17]	Cohort study, prospectively collected database	70 adults, mean age 62.6 years, 21 female, median NIHSS 16	13 dissections, 38 atherosclerotic, 13 embolic	Data for AS and NAS groups not specified	52/70	Order of stenting and EVT not specified, Wallstent	Angioplasty	3
Sallustio, 2017, Italy[20]	Cohort study, prospectively collected database	72 adults, mean age 65.6 years, 28 female, mean NIHSS 19	Type of lesion not specified	Data for AS and NAS groups not specified	39/72	Not specified	Angioplasty or no intervention	3
Akpinar, 2018, Turkey[9]	Retrospective cohort study	8 adults, median age 59 years, 2 female, median NIHSS 19	3 dissections, 5 atherosclerotic	Not specified	Not specified	Stenting before EVT, Wallstent	Not specified	3
Assis, 2018, Canada[25]	Post-hoc analysis of RCT subgroup	30 adults, median age 66.2 years, 10 female, median NIHSS 16	Type of lesion not specified	Data for AS and NAS groups not specified	Not specified	50% stenting before EVT, 50% stenting after EVT, Stent type not specified	Angioplasty, CEA or thromboaspiration	3
Blassiau, 2018, France[16]	Cohort study, prospectively collected database	35 adults, mean age 64.6 years, 5 female,	10 dissections, 25 atherosclerotic	Data for AS and NAS groups not specified	23/35	Not specified	Angioplasty, CEA or delayed stenting	3

		mean NIHSS 17.3						
Bricout, 2018, France[8]	Prospective cohort study	83 adults, median age 61 years, 25 female, median NIHSS 18	19 dissections, 51 atherosclerotic, 13 other/unknown	Not specified	71/83	Not specified	Angioplasty or no intervention	3
Eker, 2018, France[14]	Retrospective cohort study	121 adults, median age 72 years, 31 female, median NIHSS 17	121 atherosclerotic	Not specified	Not specified	Order of stenting and EVT not specified, Wallstent, Precise, Critallo ideale, Xact, Casper	Angioplasty or deferred stenting (defined as 2 to 5 days after stroke)	3
Labeyrie, 2018, France[10]	Retrospective cohort study	42 adults, median age 63 years, 12 female, median NIHSS 15	17 dissections, 21 atherosclerotic, 4 embolic	Data for AS and NAS groups not specified	30/42	Order of stenting and EVT not specified, Wallstent	Coil occlusion, thrombectomy, angioplasty or thromboaspiration	3
Li, 2018, China[7]	Prospective cohort study	37 adults, median age 61 years, 10 female, median NIHSS 15	15 dissections, 22 atherosclerotic	Median AS group: 9 NAS group: 8 p=non-significant	12/37	Order of stenting and EVT not specified, Precise, Acculink, Wallstent	Angioplasty	3
Papanagiotou, 2018, Multinational[15]	Retrospective cohort study	482 adults, mean age 63.8 years,	105 dissections, 329	Mean 1.AS+antiplatelet therapy 8.2±1.6	296/482	Not specified	Angioplasty or no intervention	3

Supplemental material

BMJ Publishing Group Limited (BMJ) disclaims all liability and responsibility arising from any reliance placed on this supplemental material which has been supplied by the author(s)

J NeuroIntervent Surg

		169 female, mean NIHSS 15.9	atherosclerotic, 48 embolic	2.AS+no antiplatelet therapy 7.3±1.9 3.Angioplasty 7.5±1.7 4. EVT alone 7.2±2.1 p<0.001 for group 1 vs 4 Others non-significant				
Sadeh-Gonik, 2018, France[19]	Cohort study, prospectively collected database	46 adults, mean age 69.5 years, 14 female, mean NIHSS 15.9	17 dissections, others not specified	Data for AS and NAS groups not specified	35/46	Stenting after EVT, Stent type not specified	Not specified	3
Jadhav, 2019 USA[1]	Retrospective cohort study	147 adults, mean age 63.3 years, number of females not specified, mean NIHSS 17	Type of lesion not specified	Mean AS group 7.8±1.7 NAS group 7.8±1.8 p=0,988	109/147	Not specified	Angioplasty or no intervention	3
Kang, 2019, Republic of Korea[22]	Cohort study, prospectively collected database	62 adults, median age 69 years, 8 female,	62 atherosclerotic	Median overall 8.0 (6.0-8.0) p=0.714 between groups	25/62	PTA before EVT in all, 9 stented before EVT, Wallstent, Acculink	Angioplasty alone	3

		median NIHSS 15		(ASPECTS-DWI)				
Poppe, 2019, Canada[26]	Randomized controlled pilot trial	24 adults, 11 female, median age and NIHSS unavailable	23 atherosclerotic, 1 embolic	Median AS group 8±4 NAS group 8±2	18/24	2/13 stented before EVT, Stent type not specified	Angioplasty or no intervention	3
Wallocha, 2019, Germany[24]	Cohort study, prospectively collected database	163 adults, mean age 67.6years, 45 female, mean NIHSS 14.6	163 atherosclerotic	Not specified	90/163	Not specified	Angioplasty	3-60
Hernandez-Fernandez, 2020, Spain[21]	Cohort study, prospectively collected database	40 adults, mean age 66.7 years, 7 female, median NIHSS 17	5 dissections, 27 atherosclerotic, 3 embolic	Data for AS and NAS groups not specified	14/40	Order of stenting and EVT not specified, Xact	Angioplasty	3
Kim, 2020, Republic of Korea[23]	Cohort study, prospectively collected database	75 adults, mean age 68 years, 16 female, median NIHSS 14	Type of lesion not specified	Median AS group 8±2 NAS group 8±1 p=0.197	42/75	Order of stenting and EVT not specified, Wallstent, Acculink, Precise	Angioplasty	3

CEA=Carotid endarterectomy, EVT=Endovascular thrombectomy, c-ICA=Cervical internal carotid artery, IV tPA=Intravenous tissue plasminogen activator, ASPECTS= Alberta Stroke Program Early CT Score, AS=Acute c-ICA stenting, NAS=No Acute c-ICA stenting

Supplemental material

BMJ Publishing Group Limited (BMJ) disclaims all liability and responsibility arising from any reliance placed on this supplemental material which has been supplied by the author(s)

J NeuroIntervent Surg

Table e-2. Risk of bias assessment of studies included in the systematic review

	Wang (2003)	Srinivasan (2006)	Li (2012)	Machi (2012)	Fahed (2016)	Sallustio (2017)	Akpinar (2018)	Assis (2018)	Blassiau (2018)	Bricout (2018)	Eker (2018)	Labeyrie (2018)	Li (2018)	Papanigiotou (2018)	Sadeh-Gonik (2018)	Jadhav (2019)	Kang (2019)	Poppe (2019)	Wallocha (2019)	Hernandez-Fernandez (2020)	Kim (2020)
Patient group formation (Selection bias)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	?	-	-	-
Blinding of intervention (Performance bias)	-	-	-	-	-	-	-	-	-	?	-	-	?	-	-	-	-	-	-	-	-
Subjective outcome assessement (mRS) (Detection bias)	-	-	-	?	?	?	?	+	?	?	+	?	+	?	?	?	?	-	-	?	?
Objective outcome assessment (mortality, SICH) (Detection bias)	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+
Incomplete outcome data (Attrition bias)	?	?	+	+	+	-	+	+	+	+	+	?	-	+	+	?	+	+	?	?	-
Selective reporting (Reporting bias)	?	?	?	?	?	?	?	-	?	?	?	?	?	?	?	?	?	?	?	?	?

+ Low risk of bias ? Unclear risk of bias - High risk of bias

Figure e-1. Funnel plots for (A) mRS at 90-days and (B) sICH as outcomes showing no asymmetry
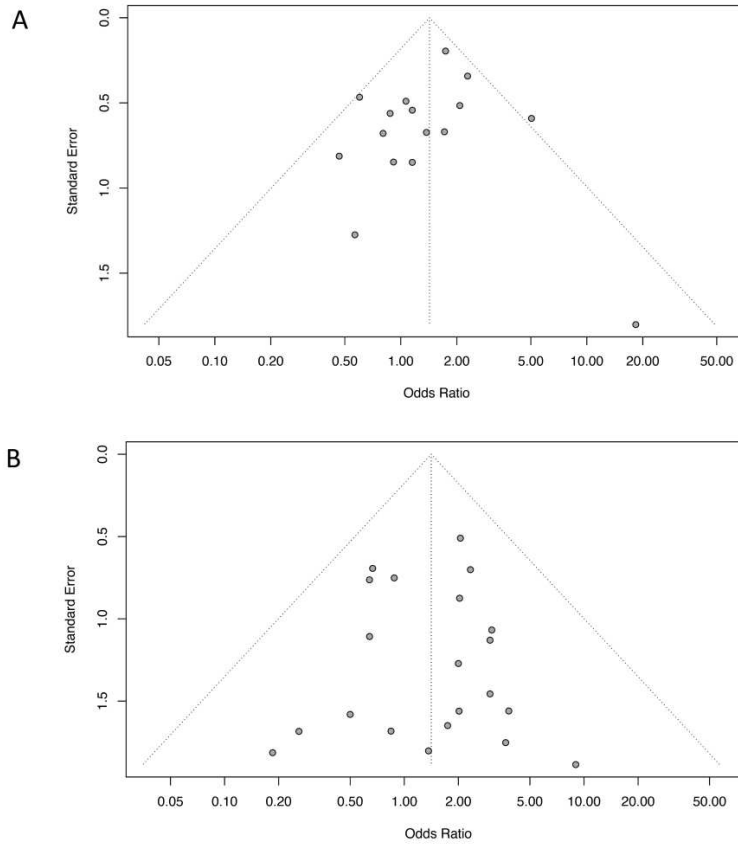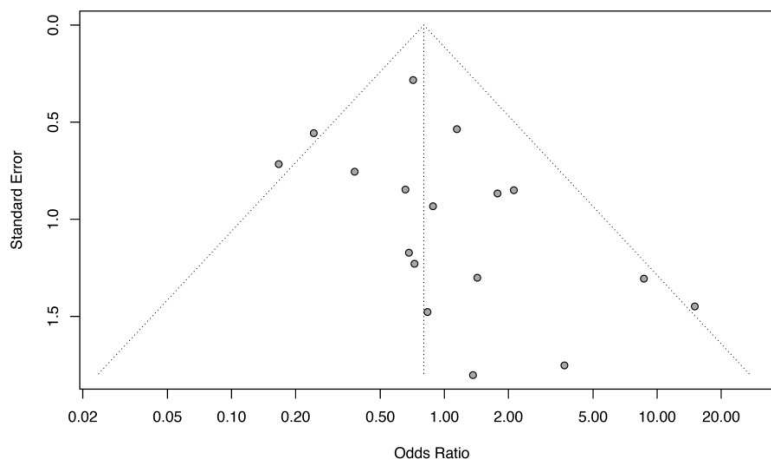

Figure e-2. Funnel plot for mortality at 90-days showing asymmetry and possible bias

Appendix e-1: Detailed search strategy for systematic review

Database

Database	MEDLINE
Interface	PubMed
Research date	February 19st, 2020
Filters	-

Syntax

[MeSH Terms]	Medical Subject Heading
OR, AND	Boolean operators
*	Truncation
[Title/Abstract] / [tiab]	Title, Abstract
[Other Term] / [ot]	Author key words

Search strategy

"Carotid Artery, Internal"[Mesh] **OR** ICA[tiab] **OR** ICA[ot] **OR** "Carotid Artery Thrombosis"[Mesh] **OR** "Carotid Stenosis"[Mesh] **OR** "Carotid Artery, Internal, Dissection"[Mesh] **OR** carotid[tiab] **OR** carotid[ot]

AND

"Thrombectomy"[Mesh] **OR** thromboendarterectom*[Title/Abstract] **OR** thromboendarterectom*[Other Term] **OR** thrombectom*[Title/Abstract] **OR** thrombectom*[Other Term] **OR** thrombolys*[Title/Abstract] **OR** thrombolys*[Other Term]

AND

"Stents"[Mesh] **OR** Stent*[tiab] **OR** Stent*[ot] **OR** angioplast*[tiab] **OR** angioplast*[ot] **OR** "Angioplasty"[Mesh] **OR** "Angioplasty, Balloon"[Mesh]

Total: 703 references

Database	
Database	Ovid MEDLINE(R) ALL 1946 to February 18, 2020
Interface	OvidSP
Research date	February 19st, 2020
Filters	-

Syntax	
/	Exact Subject Heading
*/	Focus on Exact Subject Heading
tw	Text word field in MEDLINE includes Title (TI) and Abstract (AB)
kw	Keywords
sh	Subject Heading
oa	Other Abstract
kf	Keyword Heading Word
or, and	Boolean operators
adj2	The Adjacent operator
*	Truncation

Search strategy

1	Carotid Artery, Internal, Dissection/ or Carotid Artery Thrombosis/ or Carotid Stenosis/ or Carotid Artery, Internal/	30864
2	(ICA or carotid).tw,kf,sh,kw,oa.	127589
3	1 or 2	132275
4	Thrombectomy/	6391
5	(thromboendarterectom* or thrombectom* or thrombolys*).tw,kf,sh,kw,oa.	35121
6	4 or 5	35121
7	Stents/	65661

8	Angioplasty, Balloon/ or Angioplasty/	24304
9	(stent* or angioplast*).tw,kf,sh,kw,oa.	158879
10	7 or 8 or 9	158879
11	3 and 6 and 10	700

Database	
Databases	EBM Reviews - Cochrane Database of Systematic Reviews 2005 to February 11, 2020, EBM Reviews - ACP Journal Club 1991 to January 2020, EBM Reviews - Database of Abstracts of Reviews of Effects 1st Quarter 2016, EBM Reviews - Cochrane Clinical Answers January 2020, EBM Reviews - Cochrane Central Register of Controlled Trials January 2020, EBM Reviews - Cochrane Methodology Register 3rd Quarter 2012, EBM Reviews - Health Technology Assessment 4th Quarter 2016, EBM Reviews - NHS Economic Evaluation Database 1st Quarter 2016
Interface	OvidSP
Research date	19st February, 2020
Filters	-

Syntax	
/	Exact Subject Heading
kw	Keywords
tw	Text word includes : (TI), Abstract (AB), Caption Text (CT), and Full Text (TX) fields
or, and	Boolean operators
*	Truncation
adj2	The Adjacent operator

Search strategy	
1	internal carotid artery/	172
2	carotid artery thrombosis/	18
3	carotid artery/	577

4	carotid artery obstruction/	0
5	carotid artery injury/	15
6	(ICA or carotid).af.	9825
7	or/1-6	9825
8	thrombectomy/	262
9	(thromboendarterectom* or thrombectom* or thrombolys*).af.	6773
10	or/8-9	6773
11	stent/	3277
12	angioplasty/	331
13	(stent* or angioplast*).af.	24037
14	carotid angioplasty/	0
15	or/11-14	24037
16	7 and 10 and 15	146

Database

Databases	CINAHL Complete
Interface	EBSCO
Research date	19st February, 2020
Filters	-

Syntax

MH	Exact Subject Headings
S (1, 2, 3…)	Search
OR, AND	Boolean operators

Search strategy

#	Question	Résultats
S1	((MH "Carotid Artery Dissections") OR (MH "Carotid Artery Thrombosis") OR (MH "Carotid Arteries")) OR (ICA or carotid)	21,951

S2	(MH "Thrombectomy") OR (thromboendarterectom* or thrombectom* or thrombolys*)	8,603
S3	((MH "Stents") OR (MH "Angioplasty") OR (MH "Angioplasty, Balloon")) OR (stent* or angioplast*)	37,759
S4	**S1 AND S2 AND S3**	**163**

Database

Database	Embase 1974 to 2020 February 18
Interface	OvidSP
Research date	February 19st, 2020
Filters	-

Syntax

/	Exact Subject Heading
*/	Focus on Exact Subject Heading
tw	Text word field in EMBASE includes Title (TI), Abstract (AB) and Drug Trade Name (TN).
kw	Keywords
sh	Subject Heading
or, and	Boolean operators
adj2	The Adjacent operator
*	Truncation

Search strategy

1	internal carotid artery/	20851
2	carotid artery thrombosis/	2125
3	carotid artery obstruction/	27387
4	carotid artery/	47871
5	carotid artery injury/	4534
6	(ICA or carotid).tw,sh,kw.	171933
7	or/1-6	185568

8	thrombectomy/	12728
9	(thromboendarterectom* or thrombectom* or thrombolys*).tw,sh,kw.	60000
10	or/8-9	60000
11	stent/	87965
12	angioplasty/	24753
13	(stent* or angioplast*).tw,sh,kw.	229318
14	carotid angioplasty/	646
15	or/11-14	229438
16	7 and 10 and 15	1532

Web of Science

# 4	1074	#3 AND #2 AND #1 Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 3	246,264	TS=(stent* OR angioplast*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 2	57,880	TS=(thrombectom* OR thromboendarterectom* OR thrombolys*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years
# 1	200,951	TS=(carotid) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=All years