

11-12 SEPT. **2025**

- Radiologie Interventionnelle
- Chirurgie Vasculaire
- Chirurgie cardio-vasculaire et thoracique
- Médecine vasculaire

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CASELAST NEWS AND RESULTS

(A nother Cinderella Story)

Laura Capoccia

Vascular and Endovascular Surgery Division , Department of Advanced Diagnosis and Technology, «Fabrizio Spaziani» Hospital, Frosinone, ITALY

DISCLOSURE

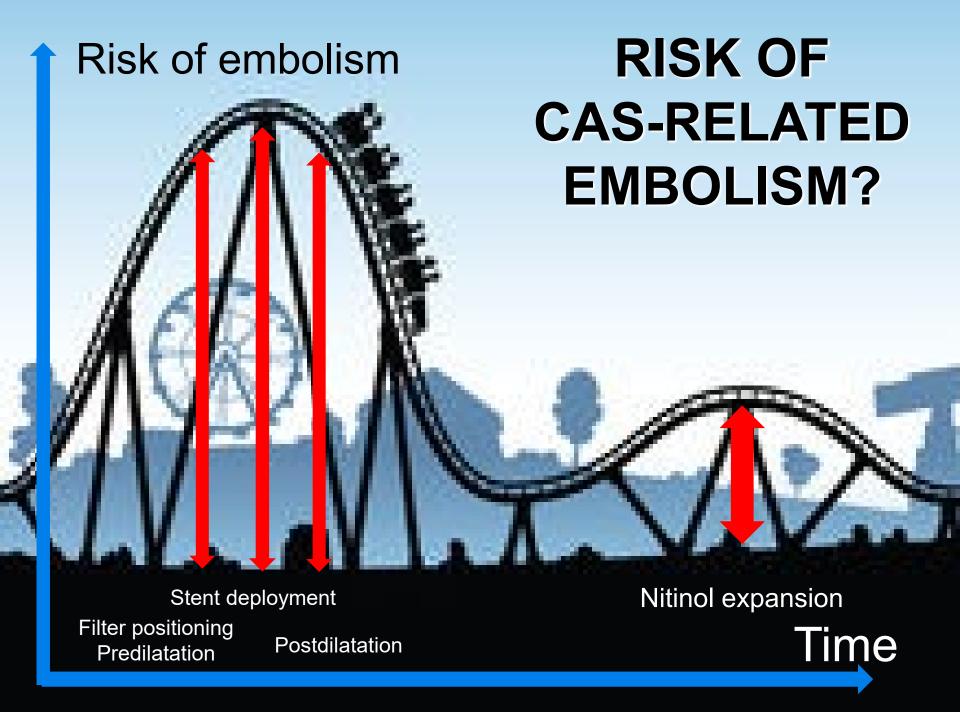
No financial conflict of interest to disclose

Main limitation of CAS is that the plaque is not taken off...



CAS RATIONALE





QUE HEALING

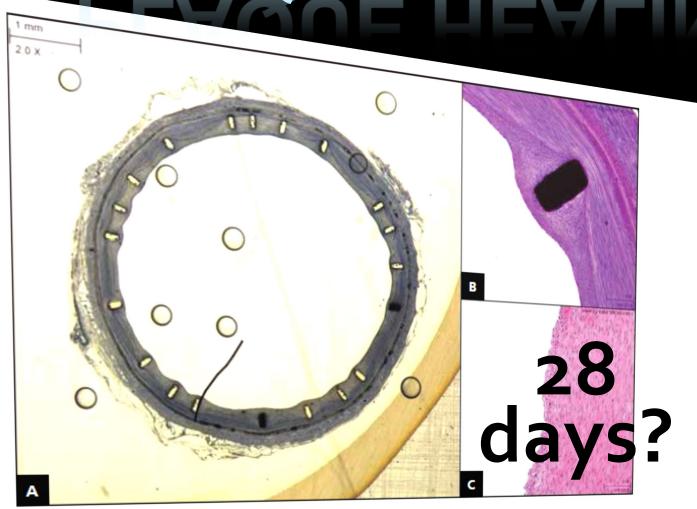


Figure 2. Representative microscopic section of carotid artery 28 days after MER® stent implantation; ×2, VVG (A). Stent strut compressing media, internal elastic lamina layer intact (injury 0); ×20, H & E (B). Normal, mature and endothelialised neointima;

×20, H & E (**C**)

Trusted evidence. Informed decisions. Better health.

Title

Cochrane Reviews Trials -Clinical Answers About ▼ Help ▼

Cochrane Database of Systematic Reviews

Percutaneous transluminal balloon angioplasty and stenting for carotid artery stenosis

Cochrane Systematic Review - Intervention | Version published: 12 September 2012 see what's new https://doi.org/10.1002/14651858.CD000515.pub4 3

Conclusions changed New search



Used in 5 guidelines View article information

Leo H Bonati | Philippe Lyrer | Jörg Ederle | Roland Featherstone | Martin M Brown View authors' declarations of interest

In patients with symptomatic carotid stenosis at standard surgical risk, endovascular treatment was associated with a higher risk of the following outcome measures occurring between randomisation and 30 days after treatment than endarterectomy: death or any stroke (the primary safety outcome) (OR 1.72, 95% CI 1.29 to 2.31, P = 0.0003; I² = 27%), death or any stroke or myocardial infarction (OR 1.44, 95% CI 1.15 to 1.80, P = 0.002; $I^2 = 7\%$), and any stroke (OR 1.81, 95% CI 1.40 to 2.34, P < 0.00001; $||^2 = 12\%$).

Bonati L, Lyrer P, Ederle J, Featherstone R, Brown MM 2012

So CAS is continued to be looked at as a poor maid...



European Society for Vascular Surgery (ESVS) 2023 Clinical Practice Guidelines on the Management of Atherosclerotic Carotid and Vertebral Artery Disease

Ross Naylor a,*, Barbara Rantner a, Stefano Ancetti a, Gert J. de Borst a, Marco De Carlo a, Alison Halliday a, Stavros K. Kakkos a, Hugh S. Markus a, Dominick J.H. McCabe a, Henrik Sillesen a, Jos C. van den Berg a, Melina Vega de Ceniga a, Maarit A. Venermo a, Frank E.G. Vermassen a

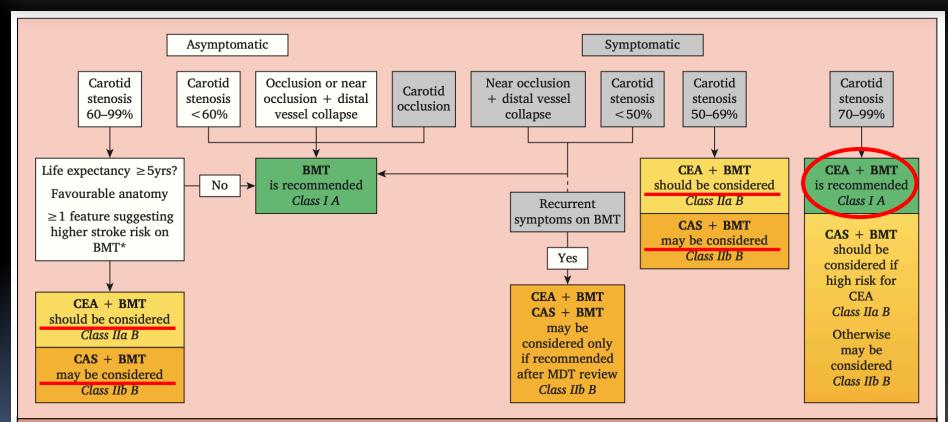


Figure 2. Management of "average risk" patients with asymptomatic and symptomatic carotid stenoses with best medical therapy (BMT), carotid endarterectomy (CEA), and/or carotid artery stenting (CAS). *See Table 8 for imaging/clinical criteria that confer an increased risk of stroke on BMT.

MINIMALLY-INVASIVE GRAND BALL had been called...





BURDEN OF STROKE IN THE WORLD

Age-standardized global prevalence rates of ischemic stroke per 100000, both sexes, 2020



< 510 - 888 # 1142 to < 1500 # 1142 to < 150

Of all strokes, 87% are ischemic, 10% are ICHs, and 3% are SAHs

In 2020 global incidence of stroke was 11.71 million people Ischemic stroke was 7.59 million

Deaths attributable to stroke were 7.08 million

HISTORY OF BRAIN TX

Acute stroke management

1995 Intra-venous Thrombolysis: NINDS

1996 Intra-arterial Thrombolysis: PROACT II

2008 IATX vs IVT

2015 MR CLEAN

ESCAPE

EXTEND -IA

SWIFT PRIME

REVASCAT

2018 DAWN

DEFUSE

RCTs

MT+IVT vs IVT

extended time window

ROKE TREAT

There is an overwhelming need for stroke procedures



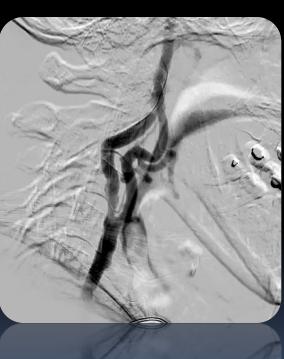
Figure 4 Meta-analysis of the randomized trials on endovascular stroke treatment (data summary from Ref. 7). BMT, best medical treatment (including thrombolysis whenever indicated); EVT, endovascular treatment; ICH, intra-cranial haemorrhage; mRS, modified Rankin scale.

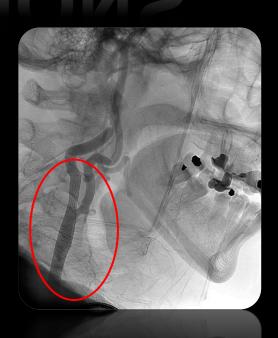
(including thrombolysis whenever indicated); EV I, endovascular treatment; ICH, intra-cranial haemorrhage; mRS, modified Rankin scale. Figure 4 Meta-analysis of the randomized trials on endovascular stroke treatment (data summary from Ref."). BM1, best medical treatment

Data demonstrate superiority of **EVT+BMT** vs BMT alone in stroke pts

TANDEM LESIONS







CAS performed in urgent cases together with intracranial MT

Endovascular Therapy of Anterior Circulation Tandem Occlusions

Pooled Analysis From the TITAN and ETIS Registries

Tandem occlusions (concurrent intracranial and extracranial) constitute 10% to 20% of all large vessel occlusion strokes

	No stent	Stent	IPTW adjusted*			
	(n=262)	(n=341)	OR (95%CI)	p-value		p-het
Overall	118/262 (45.0)	194/341 (57.0)	1.09 (1.01 to 1.19)	0.036	-	
Subgroups						
IVT						
No	37/96 (38.5)	63/127 (49.6)	1.40 (0.95 to 2.07)	0.091		0.88
Yes	81/166 (48.8)	131/214 (61.2)	1.46 (1.05 to 2.03)	0.027	_ -	
Etiology						
Atherosclerosis	68/175 (38.9)	151/264 (57.2)	1.74 (1.30 to 2.35)	<0.001	_ 	0.013
Dissection	50/87 (57.5)	43/77 (55.8)	0.88 (0.55 to 1.40)	0.59		
Procedural antiplatelet						
No	100/223 (44.8)	15/34 (44.1)	0.96 (0.42 to 2.20)	0.92		0.87
Yes	18/39 (46.2)	179/307 (58.3)	1.05 (0.59 to 1.85)	0.87		
Age						
<75	104/211 (49.2)	164/267 (61.4)	1.44 (1.09 to 1.91)	0.010	- - -	0.94
≥75	14/51 (27.4)	30/74 (41.1)	1.48 (0.84 to 2.62)	0.18	+-	
NIHSS score						
<10	20/32 (61.1)	57/65 (87.0)	3.93 (1.49 to 10.34)	0.006	-	0.01
≥10	98/230 (42.8)	137/276 (49.9)	1.21 (0.94 to 1.57)	0.14	 -	
ASPECTS score						
<8	65/164 (39.7)	70/153 (46.1)	1.26 (0.90 to 1.77)	0.18	+•	0.21
8-10	53/98 (54.0)	124/188 (65.8)	1.72 (1.18 to 2.51)	0.005		
Onset to puncture time						
<180	42/82 (51.1)	105/168 (62.6)	1.53 (1.04 to 2.26)	0.031	-	0.45
≥180	76/180 (42.2)	89/173 (51.5)	1.27 (0.91 to 1.75)	0.16	+-	
Study						
ETIS	62/133 (46.6)	43/78 (55.1)	1.22 (0.78 to 1.89)	0.38		0.31
TITAN	56/129 (43.4)	151/263 (57.4)	1.59 (1.18 to 2.14)	0.002		
					0.50 1.0 2.0 4.0 8.0	
					0.50 1.0 2.0 4.0 8.0 OR (95%CP	
				favo	ors no stent favors stent	

Figure 3. Comparisons in favorable outcome (90-d modified Rankin Scale score, 0-2) rate according to me use of cervical internal carotid artery stent and key subgroups before and after inverse probability treatment weighting (IPTW).

CAS favourable outcomes in pts with intracranial and carotid >90% stenosis/occlusion

Jacquin et al. Stroke 2019 Anadani et al. Stroke 2021

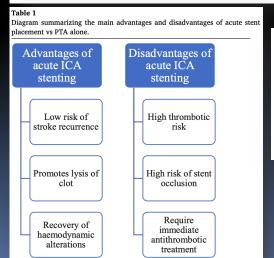
Original Investigation | Neurology

Functional and Safety Outcomes of Carotid Artery Stenting and Mechanical Thrombectomy for Large Vessel Occlusion Ischemic Stroke With Tandem Lesions

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional study included consecutive patients with acute anterior circulation TLs admitted across 17 stroke centers in the US and Spain between January 1, 2015, and December 31, 2020. Data analysis was performed from August 2021 to February

RESULTS Of 685 patients, 623 (mean [SD] age, 67 [12.2] years; 406 [65.2%] male) were included in the analysis, of whom 363 (58.4%) were in the CAS group and 260 (41.6%) were in the nonstenting group. The CAS group had a lower proportion of patients with atrial fibrillation (38 [10.6%] vs 49

CONCLUSIONS AND RELEVANCE In this multicenter, international cross-sectional study, CAS of the cervical lesion during MT was associated with improvement in functional outcomes and reperfusion rates without an increased risk of sICH and mortality in patients with TLs.



Diagnosis and management of tandem occlusion in acute ischemic stroke

Antonio Di Donna ^a, Gianluca Muto ^c, Flavio Giordano ^a, Massimo Muto ^a, Gianluigi Guarnieri ^a, Giovanna Servillo ^b, Antonio De Mase ^b, Emanuele Spina ^b, Giuseppe Leone ^{a,*}

^a Unit of Interventional Neuroradiology, Department of Advanced Diagnostic and Therapeutic Technologies, A.O.R.N. Antonio Cardarelli Hospital, Via Cardarelli 1, Naples 80131, Italy

b Unit of Neurorology and Stroke Unit, Department of Emergency and Acceptance, A.O.R.N. Antonio Cardarelli Hospital, Via Cardarelli 1, Naples 80131, Italy

^c Division of Diagnostic and Interventional Neuroradiology, Geneva University Hospitals, 1205 Geneva, Switzerland

TANDEM OCCLUSION/STENOSIS IN STROKE TREATMENT

Despite some uncertainty, based on the available evidence, the American Heart Association/American Stroke Association considered the treatment of cervical ICA during EVT as reasonable (level IIb evidence)

8. Treatment of tandem occlusions (both extracranial and intracranial occlusions) when performing mechanical thrombectomy may be reasonable.

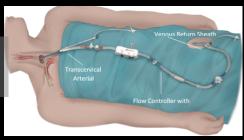


Tandem occlusions were included in recent endovascular trials that showed benefit of mechanical thrombectomy over medical management alone. In the HERMES meta-analysis, 122 of 1254 tandem occlusions (RR, 1.81 [95% CI, 0.96–3.4]) and 1132 of 1254 nontandem occlusions (RR, 1.71 [95% CI, 1.40–2.09]) were reported compared with medical management. In THRACE, 24 of 196 tandem occlusions (RR, 1.82 [95% CI, 0.55–6.07]) and 172 of 196 nontandem occlusions (RR, 1.34 [95% CI, 0.87–2.07]) were treated compared with IV alteplase alone. In HERMES, there is heterogeneity of treatment methods directed to the proximal extracranial carotid occlusion (no revascularization of the proximal lesion versus angioplasty versus stenting). A retrospective analysis of pooled data from 18 centers examined 395 patients with AIS caused by tandem lesion of the anterior circulation who underwent mechanical thrombectomy (TITAN [Thrombectomy in Tandem Lesions]). mTICl grade 2b/3 was achieved in 76.7% of patients. At 90 days, 52.2% achieved an mRS score of 0 to 2, 13.8% had parenchymal hematoma, and 13.2% were dead. Multiple retrospective reports detail the technical success of mechanical thrombectomy for tandem occlusions but do not provide specifics on comparative approaches. No conclusions about the optimum treatment approach for patients with tandem occlusions are therefore possible.

While the vascular community goes (quite pompously) on discussing non-inferiority of CAS...





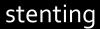


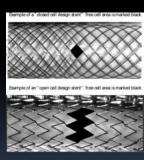


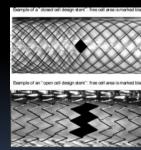
Distal embolic protection device



embolic protection









ballooning





CAROTID REVASCULARIZATION HOW?



KEY POINTS FOR CAS SUCCESS

- ✓ Adjuvant medical therapy
- ✓ Access route
- ✓ Stent design
- ✓ Pre and post-dilation
- ✓ Cerebral protection device
- ✓ Hospital/operator volumes and experience



REVIEW

Editor's Choice — Overview of Primary and Secondary Analyses From 20 Randomised Controlled Trials Comparing Carotid Artery Stenting With Carotid Endarterectomy

Andrew J. Batchelder, Athanasios Saratzis, A. Ross Naylor

The Leicester Vascular Institute, Glenfield Hospital, Leicester, UK

CREST-1
ACT-1
CAVATAS
EVA-3S
ICSS
LEICESTER
LEXINGTON-1
LEXINGTON-II
SPACE-1
SAPPHIRE

BACASS TESC Liu WANG

After CEA, 93% were ipsilateral, with 7% contralateral or vertebrobasilar.

After CAS, 91% were ipsilateral, with 9% contralateral/vertebrobasilar.

The risk of "immediate" stroke (day of procedure) was 4.7% after CAS vs.1.9% after CEA (OR.2.6, 95% CI 1.9-3.8).

Delayed stroke (days 1-30) was 2.5% after CAS

vs. 2% after CEA (OR 1.3, 95% CI 0.9-1.9).

REVIEW

Editor's Choice — Overview of Primary and Secondary Analyses From 20 Randomised Controlled Trials Comparing Carotid Artery Stenting With Carotid Endarterectomy

Andrew J. Batchelder, Athanasios Saratzis, A. Ross Naylor

The Leicester Vascular Institute, Glenfield Hospital, Leicester, UK

Significant benefit favouring CEA

	Death	Stroke	Death/ Stroke	Disabling Stroke	Death/ Disabling stroke	MI	Death/ Stroke/MI
	7 RCTs	8 RCTs	8 RCTs	5 RCTs	In sufficient	5 RCTs	5 RCTs
	n = 2286	n = 3467	n = 3467	n = 2918	data	n = 2948	n = 2948
CEA	0.7%	1.9%	2.1%	0.5%	In sufficient	1.8%	3.1%
	(0.3–1.8)	(1.3-2.9)	(1.5-3.1)	(0.2-1.2)	data	(1.1-2.8)	(2.2-4.3)
CAS	0.7%	3.0%	3.1%	0.5%	Insufficient	0.8%	3.3%
	(0.3-1.7)	(2.3-3.8)	(2.4-4.0)	(0.3-1.0)	data	(0.5-1.4)	(2.5-4.2)
OR	1.02	1.73	1.64	1.57	Insufficient	0.53	1.14
(95% CI)	(0.18-5.90)	(1.06-2.84)	(1.02-2.64)	(0.40-6.19)	data	(0.24-1.16)	(0.72–1.81)

No significant difference between CAS and CEA

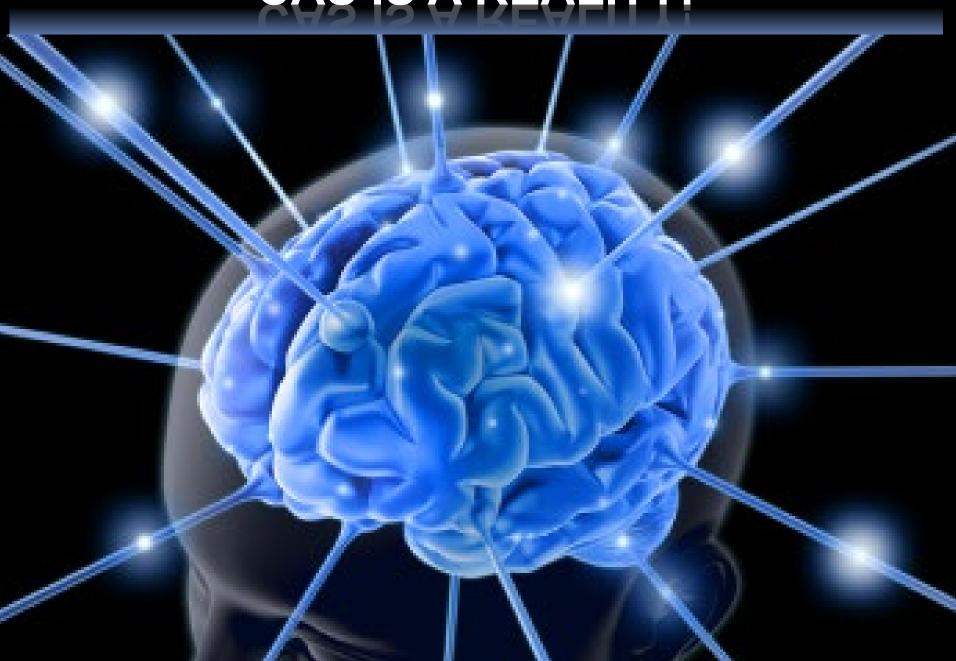
Figure 2. Thirty day outcomes after carotid artery stenting (CAS) vs. carotid endarterectomy (CEA) in 3467 asymptomatic patients randomised within seven randomised controlled trials (RCTs). 10,12,28,65,101,105,106 OR = odds ratio; CI = confidence interval; MI = myocardial infarction.

3467 asympt

7 RCTs



CAS IS A REALITY!

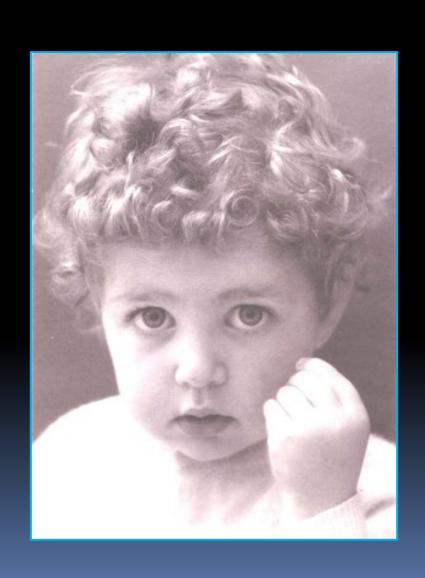


Optimised medical therapy alone versus optimised medical therapy plus revascularisation for asymptomatic or low-to-intermediate risk symptomatic carotid stenosis (ECST-2): 2-year interim results of a multicentre randomised trial

Simone J A Donners, Twan J van Velzen, Suk Fun Cheng, John Gregson, Audinga-Dea Hazewinkel, Francesca B Pizzini, Bart J Emmer, Robert Simister, Toby Richards, Philippe A Lyrer, Marina Maurer, Gemma Smith, Gareth Tervit, Laurine van der Steen, Gwynedd E Pickett, Gordon Gubitz, Bob Roozenbeek, Maaike Scheele, John M Bamford, M Eline Kooi, Gert J de Borst, Hans Rolf Jäger*, Martin M Brown*, Paul J Nederkoorn*, Leo H Bonati*, on behalf of the ECST-2 investigators†



What's new?







Home

Randomisation

Patient Information

Investigator Section

Participating Centres

ACST-2 Recruitment



Asymptomatic Carotid Surgery Trial (ACST-2)

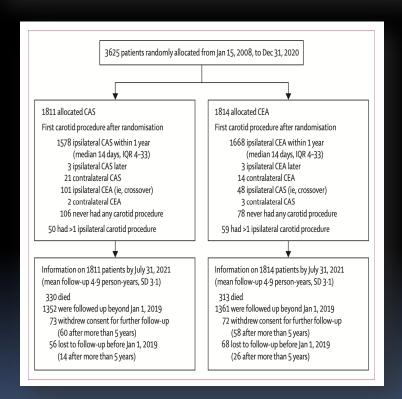
3625 pts randomized to CEA or CAS

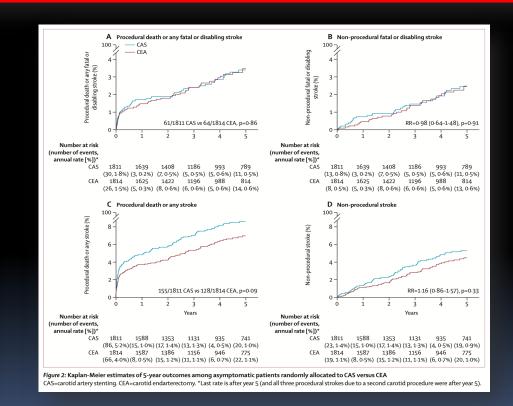
Second asymptomatic carotid surgery trial (ACST-2): a randomised comparison of carotid artery stenting versus carotid endarterectomy



Alison Halliday*, Richard Bulbulia*, Leo H Bonati, Johanna Chester, Andrea Cradduck-Bamford, Richard Peto†, Hongchao Pan†, for the ACST-2 Collaborative Group‡







«With ACST-2 included, there is now as much evidence among asymptomatic as among symptomatic patients, ... with CAS about as effective as CEA at reducing the annual risk of stroke, at least for the first few years»

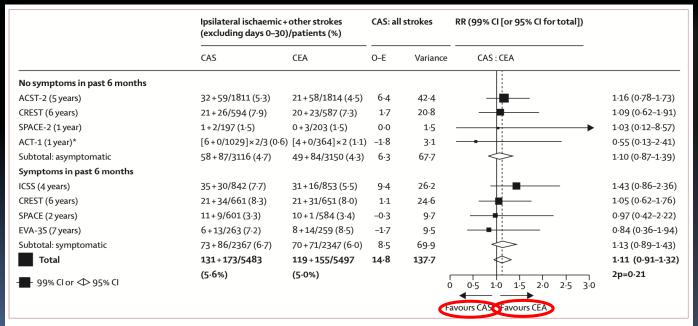
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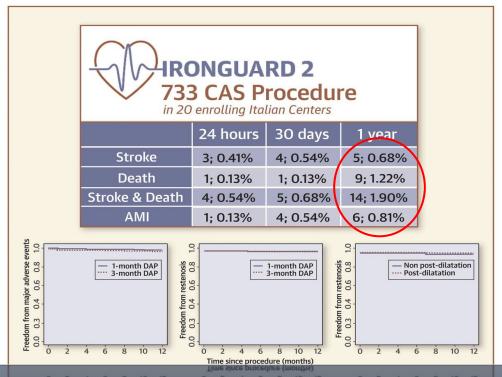


The trials of CAS versus CEA now provide better evidence than existed before that both procedures carry similar risks and provide comparable benefits





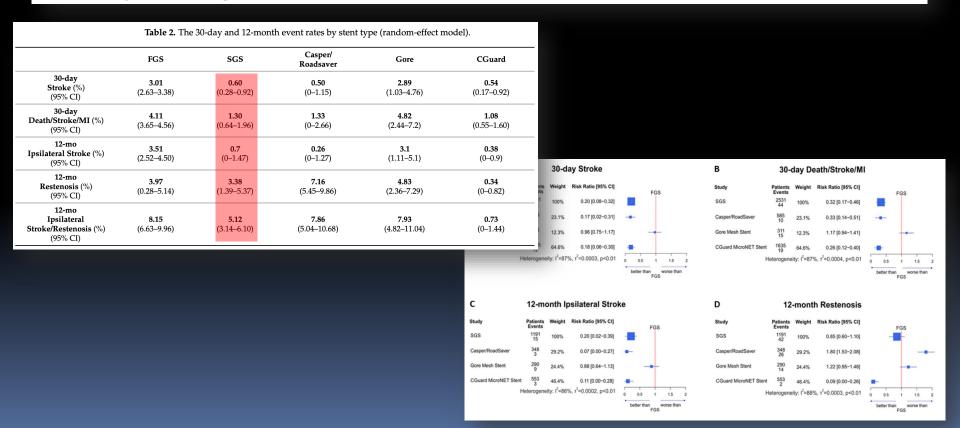
CENTRAL ILLUSTRATION: Event Rates in the IRONGUARD 2 Study



8 (1.09%) intraprocedural ECA occlusion 6 (0.82%) ICA restenosis at follow-up (2 occlusions, 4 asymptomatic in-stent restenoses)

Clinical Outcomes of Second- versus First-Generation Carotid Stents: A Systematic Review and Meta-Analysis

Adam Mazurek ^{1,*}, Krzysztof Malinowski ², Kenneth Rosenfield ³, Laura Capoccia ⁴, Francesco Speziale ⁴, Gianmarco de Donato ⁵, Carlo Setacci ⁵, Christian Wissgott ⁶, Pasqualino Sirignano ⁴, Lukasz Tekieli ⁷, Andrey Karpenko ⁸, Waclaw Kuczmik ⁹, Eugenio Stabile ¹⁰, David Christopher Metzger ¹¹, Max Amor ¹², Adnan H. Siddiqui ¹³, Antonio Micari ¹⁴, Piotr Pieniążek ^{1,7}, Alberto Cremonesi ¹⁵, Joachim Schofer ¹⁶, Andrej Schmidt ¹⁷ and Piotr Musialek ^{1,*,†} on behalf of CARMEN (CArotid Revascularization Systematic Reviews and MEta-aNalyses) Investigators



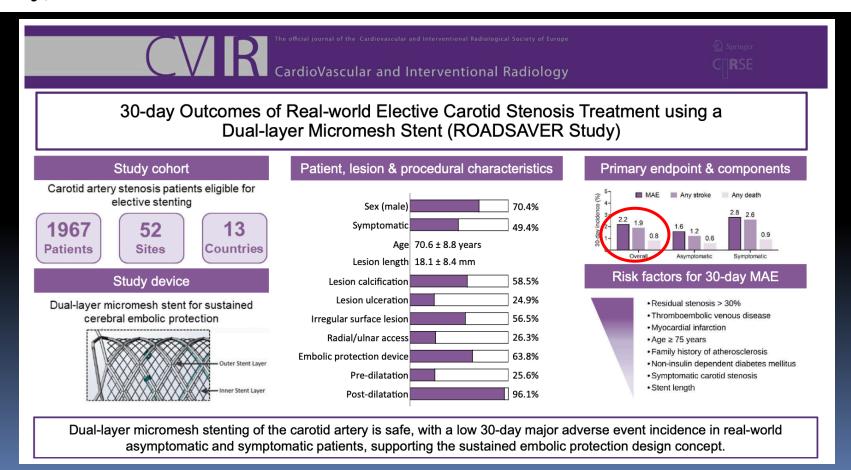




CLINICAL INVESTIGATION

ARTERIAL INTERVENTIONS

30-Day Outcomes of Real-World Elective Carotid Stenosis Treatment Using a Dual-Layer Micromesh Stent (ROADSAVER) Study)



A multi-center study of the MicroNET-covered stent in consecutive patients with acute carotid-related stroke: SAFEGUARD-STROKE*

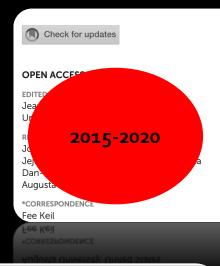
Lukasz Tekieli^{1,2,3}, Andrej Afanasjev⁴, Maciej Mazgaj⁵, Vladimir Borodetsky⁶, Kolja Sievert⁷, Zoltan Ruzsa⁸, Magdalena Knapik^{2,9}, Audrius Širvinskas⁴, Adam Mazurek^{1,2}, Karolina Dzierwa¹⁰, Thomas Sanczuk¹¹, Valerija Mosenko¹², Malgorzata Urbanczyk-Zawadzka¹³, Mariusz Trystula¹⁴, Piotr Paluszek^{1,14}, Lukasz Wiewiorka¹³, Justyna Stefaniak¹⁵, Piotr Pieniazek^{2,3,14}, Inga Slautaitė¹⁶, Tomasz Kwiatkowski¹⁴, Artūras Mackevičius¹⁷, Michael Teitcher¹⁸, Horst Sievert⁷, Iris Q. Grunwald^{19,20}, Piotr Musialek^{1,2}

Material and methods: Seventy-five patients (age 40-89 years, 26.7% women) were enrolled in 7 interventional stroke centers. **Results:** The median Alberta Stroke Program Early CT Score (ASPECTS) was 9 (6–10). Study stent use was 100% (no other stent types implanted); retrograde strategy predominated (69.2%) in tandem lesions. Technical success was 100%. Post-dilatation balloon diameter was 4.0 to 8.0 mm. 89% of patients achieved final modified Thrombolysis in Cerebral Infarction (mTICI) 2b-c/3. Glycoprotein IIb/IIIa inhibitor use as intraarterial (IA) bolus + intravenous (IV) infusion was an independent predictor of symptomatic intracranial hemorrhage (OR = 13.9, 95% CI: 5.1–84.5, p < 0.001). The mortality rate was 9.4% in-hospital and 12.2% at 90 days. Ninety-day mRS0-2 was 74.3%, mRS3-5 13.5%; stent patency was 93.2%. Heparin-limited-to-flush predicted patency loss on univariate (OR = 14.3, 95% CI: 1.5–53.1, p < 0.007) but not on multivariate analysis. Small-diameter balloon/absent post-dilatation was an independent predictor of stent patency loss (OR = 15.2, 95% CI: 5.7–73.2, p < 0.001).

Conclusions: This largest to-date study of the MicroNET-covered stent in consecutive CRS patients demonstrated a high acute angiographic success rate, high 90-day patency and favorable clinical outcomes despite variability in procedural strategies and pharmacotherapy (SAFEGUARD-STROKE NCT05195658).

75 pts, 7 stroke centers, 93.2% stent patency

Small-diameter balloon/absent post-dilatation was an independent predictor of stent patency loss (OR = 15.2, 95% CI: 5.7–73.2, p < 0.001)

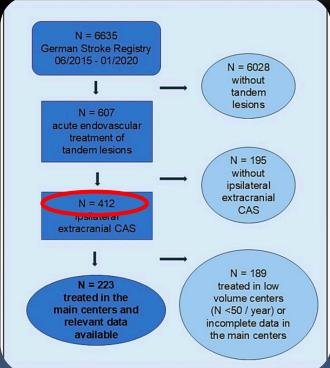


Safety, efficacy and timing of antithrombotic therapy in emergency stenting of acute stroke patients with tandem lesions, German multicenter data-analysis

data-analysis



«The use of DAPT within the first day after thrombectomy and CAS in tandem lesions led to better clinical outcome. Specifically, early DAPT was linked to a reduced rate of occlusive stent thrombosis without an increased risk of sICH»





Clinical Neurology and Neurosurgery



Volume 25 1 July 2025, 1)8930

Novel artificial intelligence approach in neurointerventional practice: Preliminary findings on filter movement and ischemic lesions in carotid artery stenting

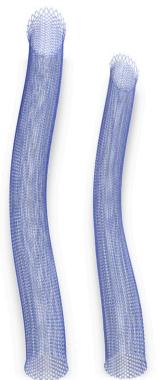
Hirotaka Sagawa ^{a 1}, Yuya Sakakura ^{b 1}, Ryoichi Hanazawa ^c, Satoru Takahashi ^a, Hikaru Wakabayashi ^a, Shoko Fujii ^a, Kyohei Fujita ^a, Sakyo Hirai ^a, Akihiko Hirakawa ^c, Kenichi Kono ^{d e}, Kazutaka Sumita ^a ス ⊠

Highlights

- A novel AI-based approach quantified filter movement during CAS in clinical practice.
- Increased filter movement during CAS was correlated with higher DWI lesion incidence.
- AI-based quantification may validate previously unproven endovascular recommendations.

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- Small pore size with plaque coverage
- Flexible low profile delivery system (0.068" OD)

Excellent visibility due to nitinol composite wires with

- platinum core
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CE mark approved for vessel diameters from 4.0 mm -

10.0 mm

Note:

The CARESTO® heal Stent is currently in Limited Market Release. Please contact your

Acandis® representative for product availability.



CONCLUSIONS

Systematic reviews, metanalysis, and guidelines still consider/prove CAS not equal to CEA

Nevertheless, CAS widespread is a reality, especially when performed by neurointerventionalists in combination with intracranial mechanical thrombectomy (tandem lesions)

Increase in endovascular Tx of carotid disease is expected since new techniques (TC- CAS), devices (mesh-covered stents, flow-modulator) and adjuncts (flow-reversal PDs) are available nowadays

