VEITH SYMPOSIUM

Best Devices Selection For CAS: What Stent Type And Design, What Type of Cerebral Protection, What Approach And Delivery System: A Review Of The Evidence

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Faculty Disclosure

Disclosure

Speaker name: Francesco Setacci, MD

I have the following potential conflicts of interest to report:

- ❑ Consulting
- ❑ Employment in industry
- ❑ Shareholder in a healthcare company
- ❑ Owner of a healthcare company
- ❑ Other(s)
- ✓ I do not have any potential conflict of interest

Background

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THE PRESENT AND FUTURE

JACC STATE-OF-THE-ART REVIEW

Carotid Artery Stenting

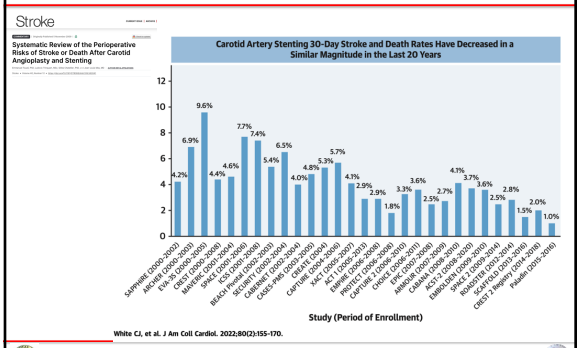
JACC State-of-the-Art Review

Christopher J. White, MD,[a] Thomas G. Brott, MD,[b] William A. Gray, MD,[c] Sean P. Lyden, MD,[d] David Christopher Metzger, MD,[e] Kenneth Rosenfie Ravish Sachar, MD,[f] Adnan Siddiqui, MD[g]

HIGHLIGHTS

- Improved patient selection, technological advances, and refined techniques have improved the results of CAS.
- Carotid stenting has achieved parity with carotid surgery for stroke prevention.
- The data support updating the national coverage decision for carotid stenting from the Centers for Medicare and Medicaid Services to equal coverage for carotid surgery.

Background

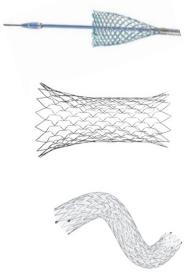


White CJ, et al. J Am Coll Cardiol. 2022;80(2):155-170.

What Stent Type and Design

CAS can be broadly categorized into 3 designs:

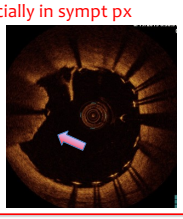
- **Open Cell**
- **Closed Cell**
- **Dual layered**



What Stent Type and Design

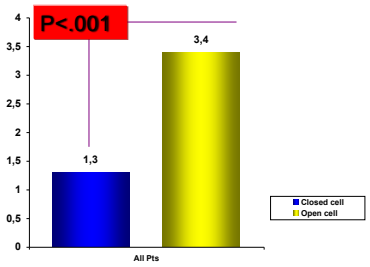
Open cell

Some studies have suggested that stent designs with higher free cell areas may result in worse outcome do to a higher risk of plaque protrusion expecially in sympt px



What Stent Type and Design

- Sample 3179 Pts -

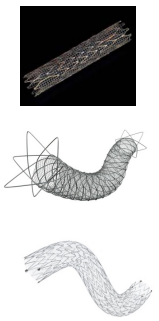


M. Bosiers, C Setacci et al *EJVES 2007*

New Stents

In order to reduce the risk of plaque protrusion 3 types of dual layered stents have been developed:

- Scaffold
- Roadsaver
- CGuard



New Stents

Clinical Trial > JACC Cardiovasc Interv. 2018 Dec 10;11(23):2396-2404.
doi: 10.1016/j.jcin.2018.07.040.

A First-in-Human Evaluation of a Novel Mesh-Covered Stent for Treatment of Carotid Stenosis in Patients at High Risk for Endarterectomy: 30-Day Results of the SCAFFOLD Trial

Peter A Schneider [1], Elad Levy [2], J Michael Bacharach [3], D Christopher Metzger [4], Bryan Randall [5], Andrew Garcia [6], Adnan Siddiqui [6], Claudio Schonholz [7], William Gray [8]

30-day stroke rate 2.9%

> EuroIntervention. 2018 Nov 20;14(10):1144-1146. doi: 10.4244/EIJ-D-18-00230.

Evaluation of a new dual-layer micromesh stent system for the carotid artery: 12-month results from the CLEAR-ROAD study

Marc Bosiers [1], Koen Deloose, Giovanni Torsello, Dierk Scheinert, Lieven Maene, Patrick Peeters, Stefan Müller-Hülsbeck, Horst Sievert, Ralf Langhoff, Joren Callaert, Carlo Setacci, Jeroen Wouters

30-day MAE rate 2.1%

Multicenter Study > JACC Cardiovasc Interv. 2021 Sep 13;14(17):1917-1923.
doi: 10.1016/j.jcin.2021.05.045. Epub 2021 Aug 11.

1-Year Results From a Prospective Experience on CAS Using the CGuard Stent System: The IRONGUARD 2 Study

1-year MAE rate of 1.9%

OCT for stent selection

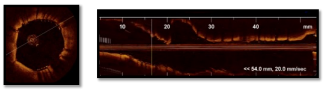
J ENDOVASC THER
2012;19:303-311

◆ CLINICAL INVESTIGATION ◆

Safety and Feasibility of Intravascular Optical Coherence Tomography Using a Nonocclusive Technique to Evaluate Carotid Plaques Before and After Stent Deployment

Carlo Setacci, MD; Gianmarco de Donato, MD; Francesco Setacci, MD; Giuseppe Galzerano, MD; Pasqualino Sirignano, MD; Alessandro Cappelli, MD; and Giancarlo Palasciano, MD

Department of Surgery, Vascular and Endovascular Surgery Unit, University of Siena, Italy.



Ideal Stent

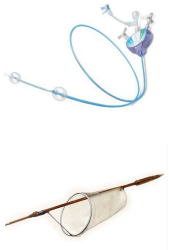
Open cell design	Closed cell design
Suboptimal plaque coverage	Good plaque coverage
Conforms to vessel anatomy	Suboptimally conforms to vessel anatomy

Double layer micromesh design
Optimal plaque coverage
Conforms to vessel anatomy

Cerebral Protection

There are 2 classes of EPDs in use today:

- proximal protection with flow-reversal
- distal umbrella-like filters



Cerebral Protection

CCI Catheterization & Cardiovascular Interventions

Peripheral Vascular Disease

Proximal balloon occlusion versus distal filter protection in carotid artery stenting: A meta-analysis and review of the literature

Jad Omran MD, Ehtisham Mahmud MD, Christopher J. White MD, Herbert D. Aronow MD, MPH, Douglas E. Drachman MD, William Gray MD, Obai Abdullah MD ... See all authors

First published: 12 November 2016 | https://doi.org/10.1002/ccd.26842 | Citations: 29

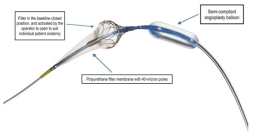
Two meta-analyses have concluded that EPD use during CAS resulted in a reduction in both stroke and death but there is no convincing clinical evidence of superiority of proximal embolic protection compared with distal embolic protection during CAS

Touze E, Trinquart L, Chatellier G, Mas JL. Systematic review of the perioperative risks of stroke or death after carotid angioplasty and stenting. Stroke. 2007;38(7):2283–2291.

Garg N, Karagiorgos N, Pisimisis GT, et al. Cerebral protection devices reduce periprocedural strokes during carotid angioplasty and stenting: a systematic review of the current literature. J Endovasc Ther. 2009;16(4):417–427.

New EPD

Novel percutaneous transluminal angioplasty balloon with an integrated embolic filter with 40-mm pores showed a 30-day death, stroke, or MI rate of 1% (Paladin System)



JACC: CARDIOVASCULAR INTERVENTIONS
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Double Filtration During Carotid Artery Stenting Using a Novel Post-Dilation Balloon With Integrated Embolic Protection

Ralf Langhoff, MD,[a] Joachim Schofer, MD,[b] Dierk Scheinert, MD,[c] Andrej Schmidt, MD,[c] Gerald Sedgewick, BA,[d] Elizabeth Saylors, MSc,[e] Ravish Sachar, MD,[f] Horst Sievert, MD,[g,h] Thomas Zeller, MD[i]

What Access: Transradial CAS (TC)

European RCT compared TR with TF access for CAS in 260 consecutive patients (TF: 130, TR: 130) at high risk for CEA.44 Procedural success was achieved in all patients, with 10% of the TR group crossing over to TF and 1.5% of the TF group crossing over to TR

Comment > J Endovasc Ther. 2016 Aug;23(4):561-5. doi: 10.1177/1526602816648422.

Transradial/Transbrachial Carotid Artery Stenting With Proximal or Distal Protection: A Promising Technique for the Reduction of Vascular Complications and Stroke

Zoltán Ruzsa [1], Kedev Sasko [2]

What Access: Trans carotid artery revascularization (TCAR)

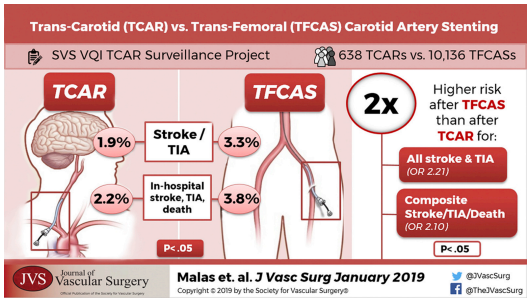
The major advantage of TCAR compared with TF CAS is avoiding catheter manipulation in the aortic arch with direct carotid artery access. There are no randomized trials directly comparing TCAR with any other method of carotid revascularization but only systematic reviews that report promising results.

TABLE 5 TCAR Versus TFCAS or CEA

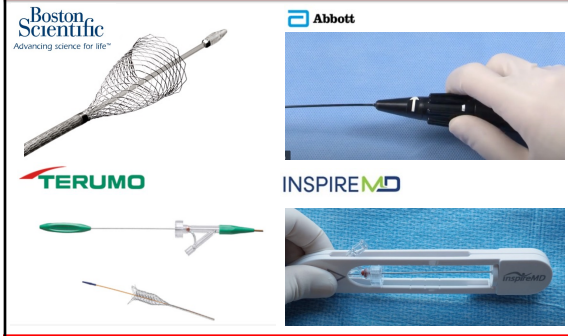
First Author, Year (Ref. #)	Type	N	Stroke/Death (%)			MI (%)			Stroke (%)			Death (%)		
			TCAR	CAS	CEA	TCAR	CAS	CEA	TCAR	CAS	CEA	TCAR	CAS	CEA
Schermerhorn et al, 2019[33]	VQI	TCAR = 5,251; TFCAS = 6,640	1.9[a]	3.7	NA	0.2	0.3	NA	1.3[a]	2.5	NA	0.8	1.5	NA
Malas et al, 2020[32]	VQI	TCAR = 638; TFCAS = 10,136	1.7	2.5	NA	NR	NR	NA	1.4	2	NA	0.5	0.65	NA
Schermerhorn et al, 2020[10]	VQI	TCAR = 1, 182; CEA = 10,797	1.6	NA	1.4	1.1	NA	0.6	1.4	NA	1.2	0.9	NA	0.4
Gao et al, 2021[31]	META	TCAR = 6,881; CEA = 7,319	2	NA	2.4	0.5[a]	NA	0.9	1.4	NA	1.3	0.4	NA	0.3
Malas et al, 2022[49]	VQI	CEA = 53,869; TCAR = 8,104	1.6	NA	1.6	0.5[a]	NA	0.9	1.4	NA	1.4	0.4	NA	0.3

[a]$P < 0.05$.
META = meta-analysis; NA = not applicable; NR = not reported; TCAR = transcarotid artery revascularization; TFCAS = transfemoral carotid artery stenting; VQI = Vascular Quality Initiative; other abbreviations as in Tables 1 and 2.

What Access: Trans carotid artery revascularization (TCAR)



What Delivery System



Final Consideration