UNIVERSITY OF PADOVA
DEPARTMENT OF VASCULAR AND ENDOVASCULAR SURGERY
Director: Prof. F. GREGO

ASYMPTOMATIC PATIENTS: SURGERY, ANTIPLATELETS, OR ANGIOPLASTY AND STENTING?

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INTRODUCTION

European Journal of Vascular & Endovascular Surgery

Eur J Vasc Endovasc Surg. 2018 Jan;55(1):3-81. doi: 10.1016/j.ejvs.2017.06.021. Epub 2017 Aug 26.

Editor's Choice - Management of Atherosclerotic Carotid and Vertebral Artery Disease: 2017 Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS).

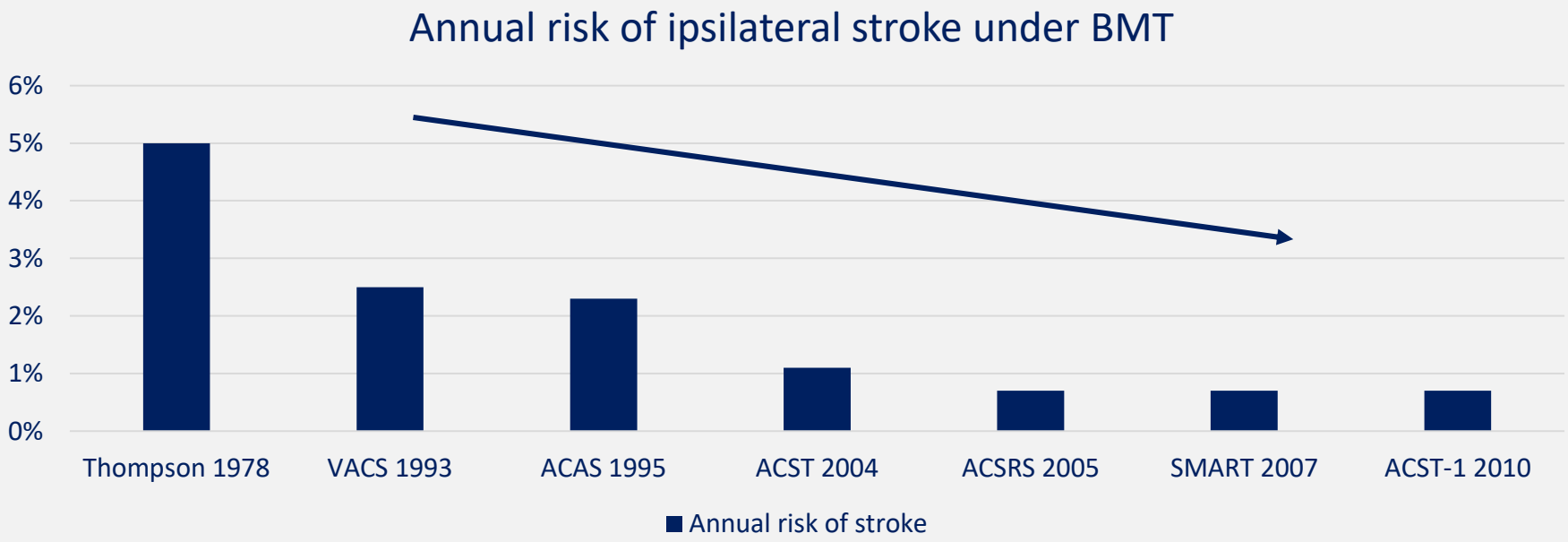
- Life expectancy > 5 years
- For those at increased risk of stroke even under BMT
- Perioperative stroke risk <3%

Recommendation 17	Class	Level	References
In "average surgical risk" patients with an asymptomatic 60—99% stenosis, carotid endarterectomy should be considered in the presence of one or more imaging characteristics that may be associated with an increased risk of late ipsilateral stroke,[a] provided documented perioperative stroke/death rates are <3% and the patient's life expectancy exceeds 5 years	IIa	B	13,35,54,84—94, 96,97

A.R. Naylor et al., Management of Atherosclerotic Carotid and Vertebral Artery Disease: 2017 Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS) . EJVES 2017

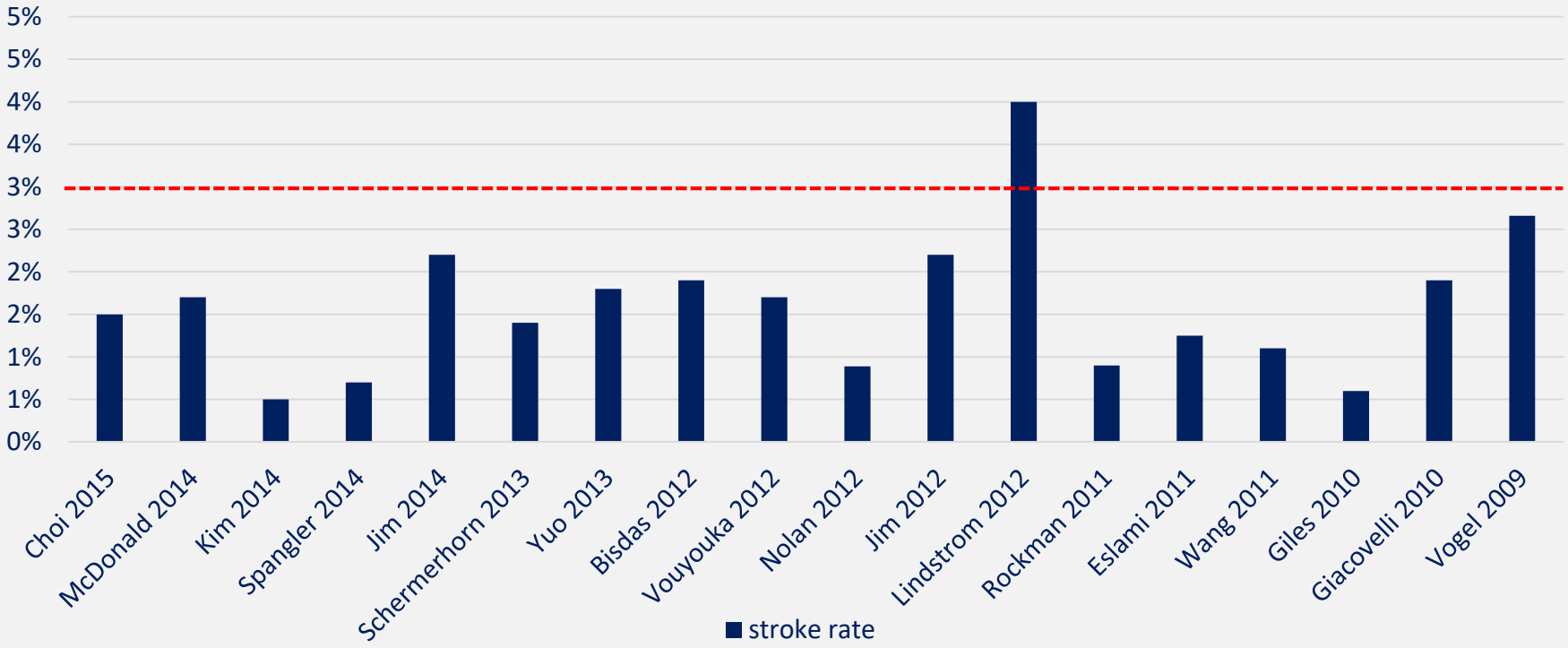
INTRODUCTION

- During the last years, the outcomes of medical treatment has improved



INTRODUCTION

Stroke risk of CEA in asymptomatic patients



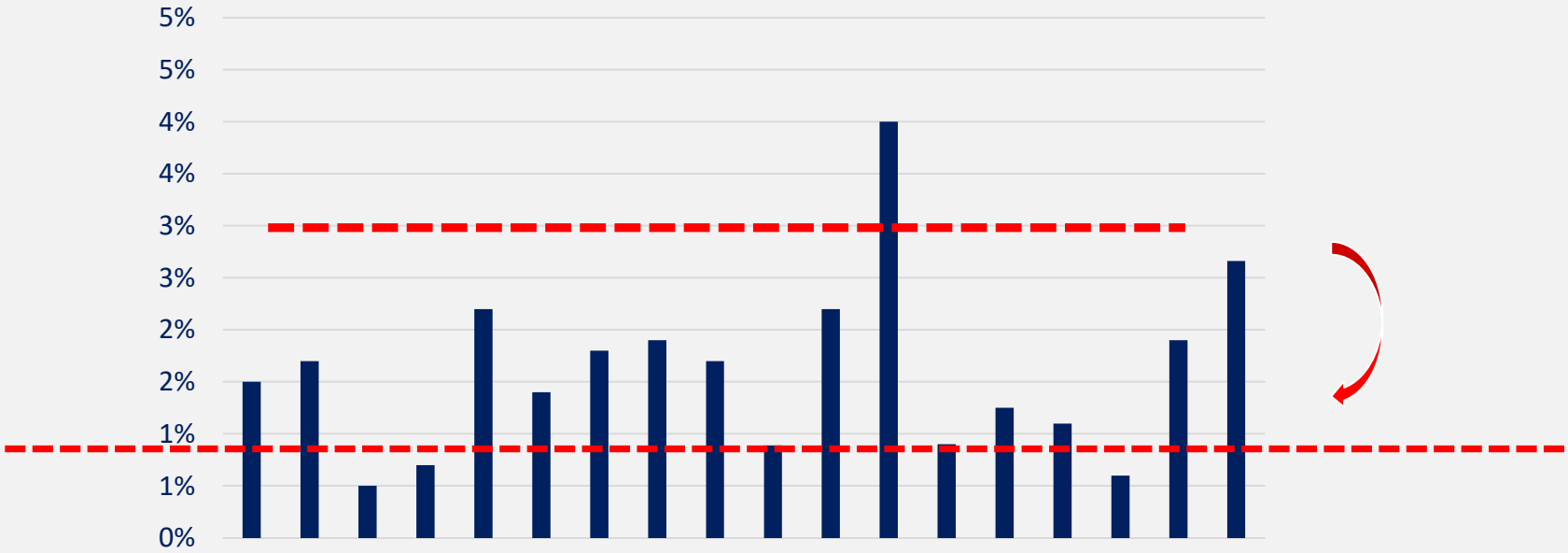
Paraskevas et al., Stroke/Death Rates Following Carotid Artery Stenting and Carotid Endarterectomy in Contemporary Administrative Dataset Registries: A Systematic Review. EJVES 2016

INTRODUCTION

THE GOAL FOR MODERN CEA:

1- guarantee a stroke risk well below 3% after CEA.

2- identify and treat patients considered at «high risk for stroke»



Paraskevas et al., Stroke/Death Rates Following Carotid Artery Stenting and Carotid Endarterectomy in Contemporary Administrative Dataset Registries: A Systematic Review. EJVES 2016

INTRODUCTION

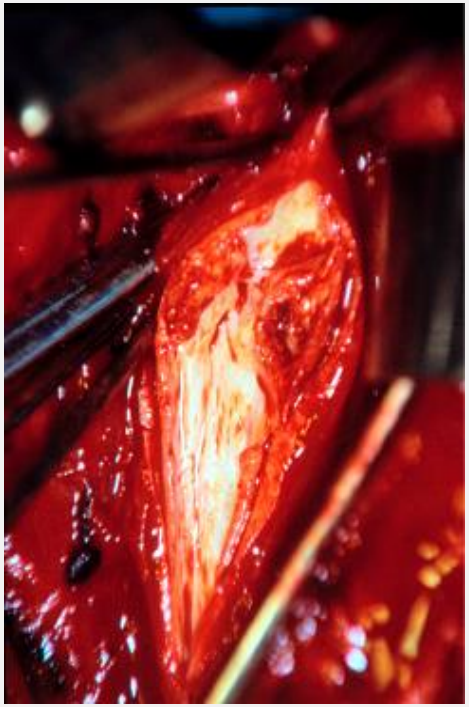
HOW TO DECLINE AND MANTAIN
A REALLY LOW PROCEDURAL RISK?

1)Correct indications

2)Pre-operative risk stratification

3)Treatment selection

4) Surgical technique



INDICATIONS IN ASYMPTOMATIC PATIENTS

INCLUSION CRITERA:

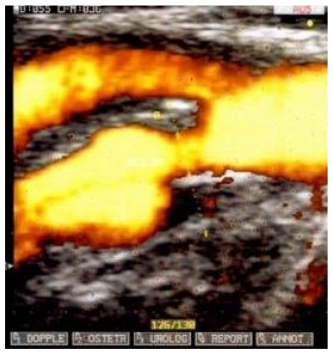
- ≥ 70% STENOSIS with life-expectancy >5 years
- > 60% STENOSIS with contralateral carotid occlusion
- > 60% STENOSIS with ulcerated plaque or intra-plaque hemorrage

EXCLUSION CRITERIA:

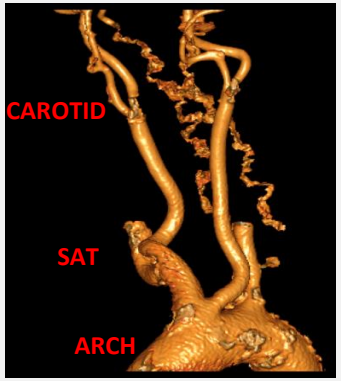
- SEVERE CEREBRAL-COGNITIVE DISEASE
- SEVERE STENOSIS/OCCLUSION of ipsilateral intracranial vessel
- RECENT STROKE
- PREVIOUS MAJOR STROKE with severe residual neurologic deficit

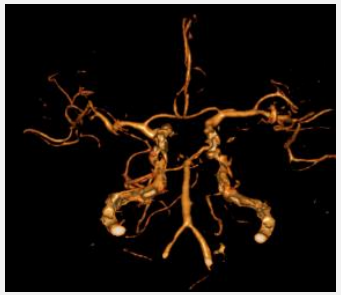
PREOPERATIVE RISK STRATIFICATION

- Clinical examination and cardiologic evaluation → Stratify medical operative risk
- Eco-color-doppler and CT scan of SAT → Stratify surgical/neurological risk



Gray-Weale Classification		Geroulakis Classification	
Type	*Description*	*Type*	*Description*
1	Echolucent	1	Uniformly echolucent Bright echoes occupy <15% of plaque
2	Predominantly echolucent	2	Mainly echolucent Bright echoes occupy 15%-50% of plaque
3	Predominantly echogenic	3	Mainly echogenic Bright echoes occupy 50%-85% of plaque
4	Echogenic	4	Uniformly echogenic Bright echoes occupy >85% of plaque
		5	Calcified cap (>15% of cap) with acoustic shadow



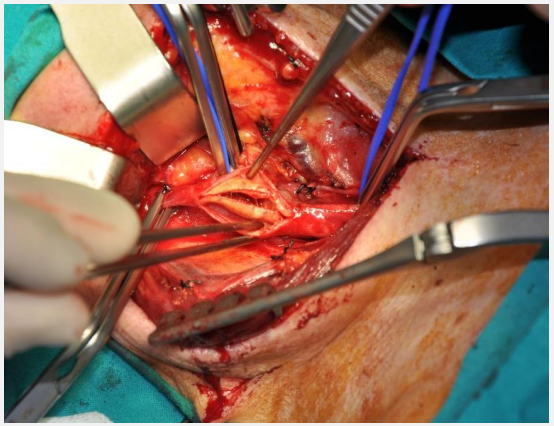


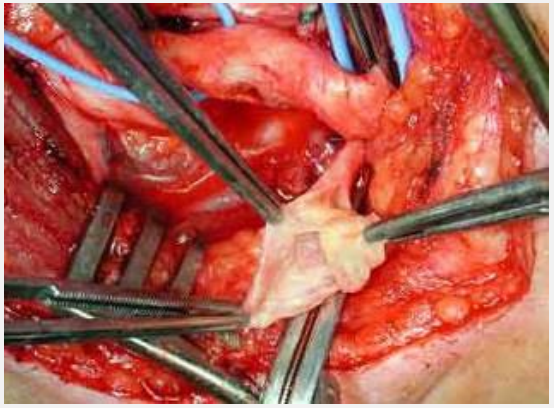
INTRACRANIC VESSELS

TREATMENT OPTIONS

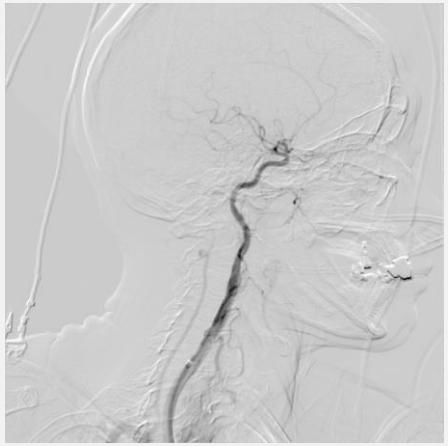
What to chose?

CAROTID ENDOARTERECTOMY





CAROTID ARTERY STENTING (CAS)



IT IS NOT FEASIBLE IN EVERY CASE:

- Ring-like heavy calcification of the carotid bifurcation
- Aortic arch anomaly
- Complex lesion: stenosis associated with ICA elongation and tortuosity
- Intraluminal thrombus

TREATMENT SELECTION

A. CRITERIA FOR CEA ARE :

- **LOW TO MODERATE RISK*** patients
- All symptomatic and asymptomatic cases if
  - inclusion criteria for revascuarization are adequate.
  - have not CAS criteria.

B. CRITERIA FOR CAS ARE :

- **HIGH RISK*** patients
- Recurrent stenosis, only in cases with fibrous plaque.
- Previous radical neck dissection or cervical irradiation
- Previous peripheral cranial nerve injuries

PREOPERATIVE RISK STRATIFICATION

HIGH RISK FOR CEA: DEFINITION

Table II. Significant comorbidities that define high risk for carotid endarterectomy[a]

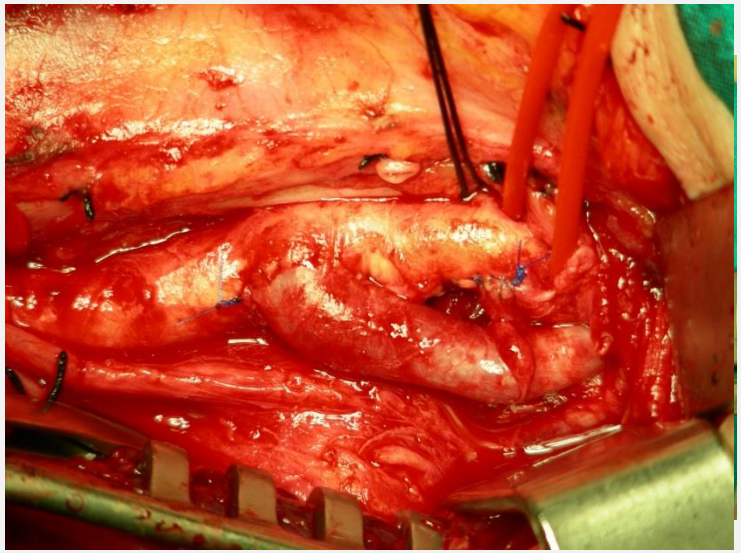
Clinically significant cardiac disease
Congestive heart failure (NYHA class III/IV)
Left ventricular ejection fraction <30%
Unstable angina (CCS class III or IV)
Two or more diseased coronary arteries with >70% stenosis
Recent myocardial infarction (>24 hours and <4 weeks)
MI within 30 days and need carotid revascularization
Abnormal stress test
Need open heart surgery within 30 days
Severe pulmonary disease
Severe COPD defined as the need for home oxygen or PO_2 <60 on room air
Forced expiratory volume in 1 s (FEV_1) <30% (predicted)
Dialysis-dependent renal failure

CCS, Canadian Cardiovascular Society; *COPD*, chronic obstructive pulmonary disease; *MI*, myocardial infarction; *NYHA*, New York Heart Association.

[a]Based on conditions that were used to determine patients at high risk for carotid endarterectomy in carotid stenting trials and registries, such as ARCHER, CABERNET, CREATE, SAPPHIRE, and BEACH.

SURGICAL TECHNIQUE: CEA

1. **GENERAL ANESTHESIA**
2. **CONTINUOUS EEG MONITORING**
3. **ROUTINE DELAYED SHUNT INSERTION**
4. **PATCH CLOSURE**
5. **EVERSION TECHNIQUE (IF CS + KINKING)**



CEA: RESULTS

Early Outcomes of Routine Delayed Shunting in Carotid Endarterectomy for Asymptomatic Patients

Michele Piazza *, **Marco Zavatta, Margherita Lamaina, Jacopo Taglialavoro, Francesco Squizzato, Franco Grego, Michele Antonello**

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1745 CEAs for asymptomatic carotid stenosis in a 10 years period

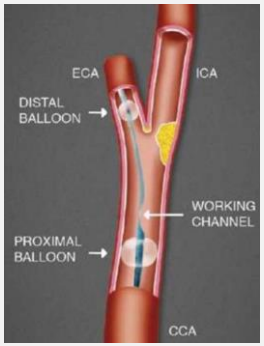
Overall Stroke/death: 0.6%

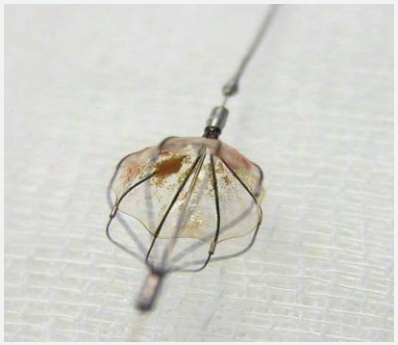
Independent from:

- Time period
- Operator's volume
- Operator's experience

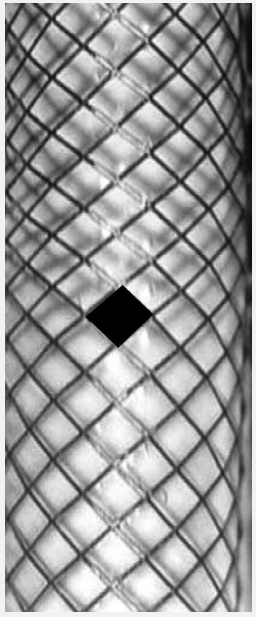
SURGICAL TECHNIQUE: CAS

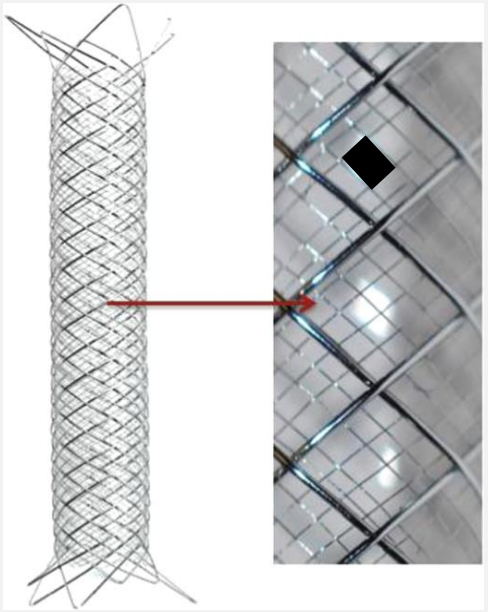
1. Embolic Protection device
   - Distal filters
   - Proximal occlusion
   - Flow- reversal





2. Stent choice
   - Open cell
   - Closed cell
   - micromesh





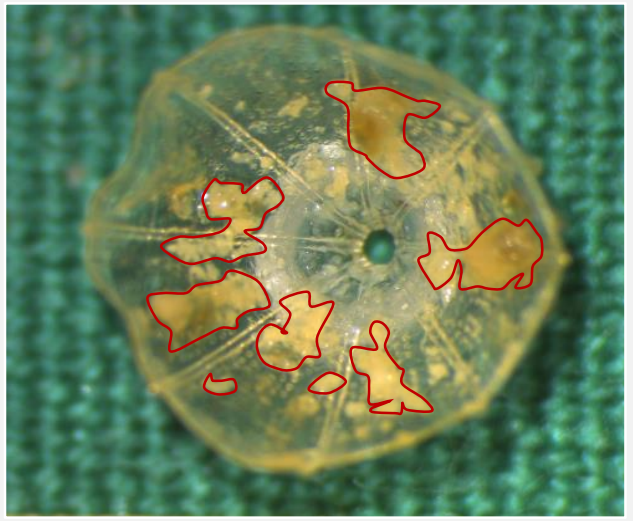
CAS: RESULTS

The rational for EPD use

Quantitative analysis and predictors of embolic filter debris load during carotid artery stenting in asymptomatic patients

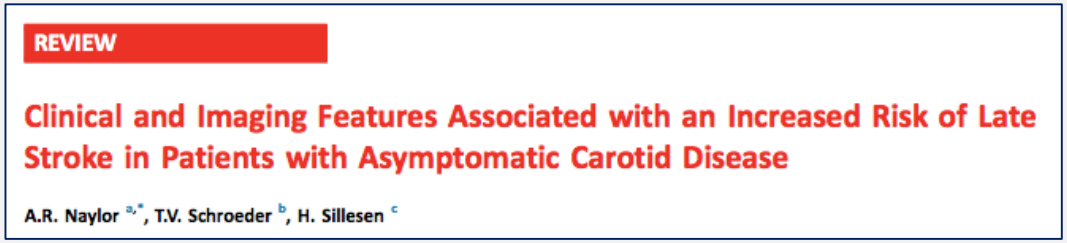
Michele Piazza, MD,[a] Francesco Squizzato, MD,[a] Chiara Chincarini, MD,[a] Marny Fedrigo, MD,[b] Chiara Castellani, MD,[b] Annalisa Angelini, MD,[b] Franco Grego, MD,[a] *and* Michele Antonello, MD,[a] *Padua, Italy*

- 278 asymptomatic patients treated with CAS in a 8 years period
- Stroke/death rate: 1.8%
- Embolic debris in 75% of filters
- Embolic filter debris load associated to:
  - Age >75 years
  - Pre-existing ipsilateral cerebral ischemic lesions
  - Hypo-echogenic plaque
  - Plaque length >15mm



BEST MEDICAL THERAPY

- Best medical therapy is indicated in all patients with asymptomatic carotid stenosis
- The aim of BMT is:
  - To reduce the rate of ipsilateral cerebrovascular events
  - To reduce the rate of overall cardiovascular events
- BMT was "rudimentary" at the time of ACST and ACAS
- The 5 year risk of ipsilateral stroke in asymptomatic patients with stenosis 50-99% has decreased from >10% to 3.5% in recent years
- The risk of any stroke showed a similar trend (from 17% to 7%)


REVIEW

Clinical and Imaging Features Associated with an Increased Risk of Late Stroke in Patients with Asymptomatic Carotid Disease

A.R. Naylor [a,*], T.V. Schroeder [b], H. Sillesen [c]


Management Strategies for Asymptomatic Carotid Stenosis

A Systematic Review and Meta-analysis

BEST MEDICAL THERAPY

Concerns regarding BMT:

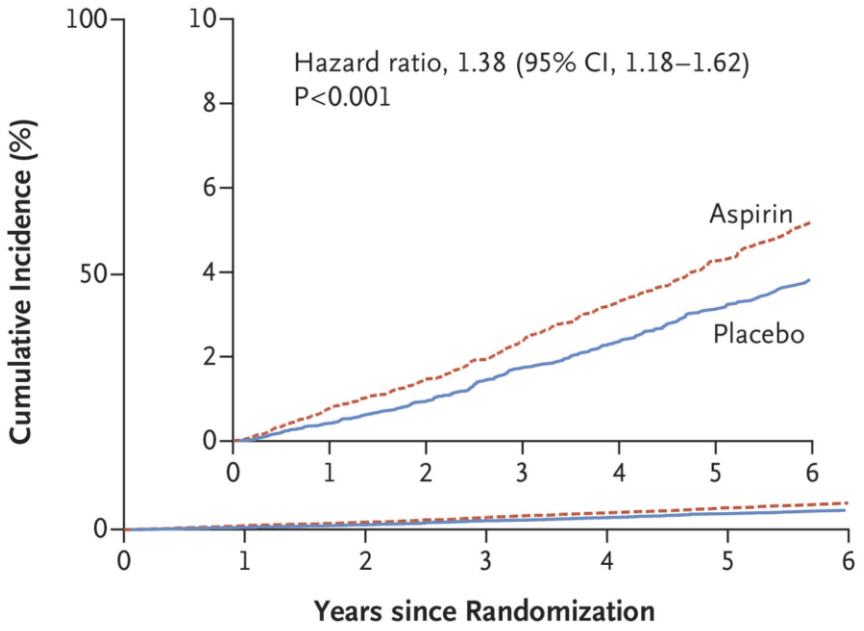
- 20% of patients have aspirin resistance
- Up to 50% of patients are clopidogrel low/non -responders
- 5% of patients discontinue statin therapy due to adverse effects
- Aspirin is associated to increased risk of major bleeding
- Drug interactions

Also medical therapy carries its own risk!

For medical therapy, also non-neurological risk has to be considered (bleeding, muscle and liver damage…)

EDITORIAL

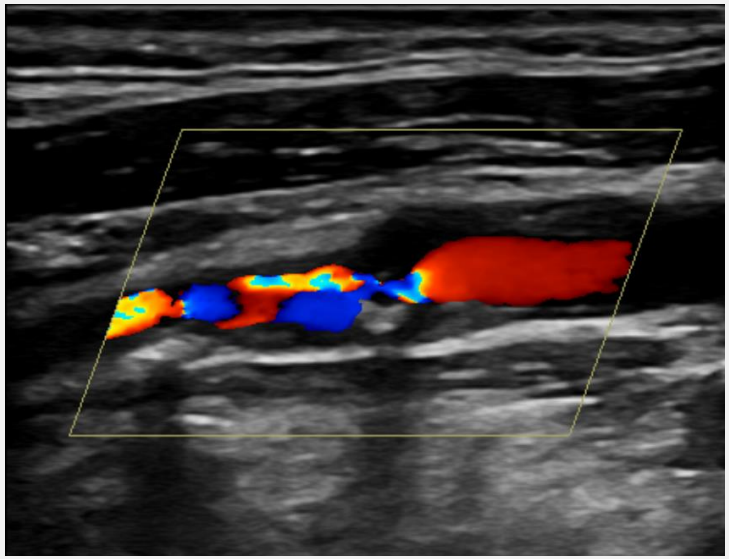
Should Aspirin Be Used for Primary Prevention in the Post-Statin Era?



IDENTIFICATION OF VULNERABLE PLAQUES

Recently have been described various factors able to identify plaques at risk for complications:

- Plaque morphology on ultrasound
- Plaque morphology on MRI
- Stenosis progression
- Plaque ulcerations, plaque area
- Microemboli
- Silent infarcts on cerebral CT
- Contralateral stenosis or occlusion



Clinical applications of these methods are not standardized yet, but may help in the identifications of patients at increased risk of stroke among asymptomatic patients.

CONCLUSIONS

- A careful preoperative risk stratification, appropriate indications, and proper surgical technique help to make CEA an almost completely safe procedure
- Today CAS is not an alternative to CEA, but has to be considered as a complementary method, that allows the treatment of challenging cases for CEA for medical or anatomical reasons
- BMT is indicated in all patients with asymptomatic carotid stenosis to reduce the risck of cerebrovascular events and overall cardiovascular events
- BMT carries its own risks of extra-neurological medical complications; furthermore, a non-negligible percentage of patients may be resistant to antiplatelet therapies
- BMT alone is not justified in case of high risk plaques and if the perioperative neurological risk provided by the treating center is low

IT IS BETTER BMT + CEA WITH A LOW NEUROLOGICAL RISK, RATHER THAN BMT ALONE AND KEEP FINGERS CROSSED

THANK YOU FOR THE ATTENTION

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