

**COULD STAGED CAROTID STENTING
WITH CABG BE NON-INFERIOR TO
COMBINED CAROTID ENDARTERECTOMY
AND CABG FOR CAROTID AND
CORONARY REVASCULARIZATION?
A META-ANALYSIS**

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Disclosures

** None of the authors have a conflict of interest in relation to this presentation*

Background

Carotid stenting (CAS) is considered to be non-inferior to carotid endarterectomy (CEA) for treatment of symptomatic carotid disease

Short-term:

- **CAS might be associated with more strokes and less MI**
- **No difference in disabling stroke or death**

Long term:

- **CAS is associated with higher stroke and death only in elderly population (>68 years)**

Ann Vasc Surg 2012;26:576–90
Stroke 2011;42:687–92

Background

Staged CAS followed by CABG

Short-term:

- **Stroke: 1 - 2 %**
- **All-cause Death: 3 - 6%**
- **MI: 3 - 6 %**

Am J Cardiol 2005;96:519–523

European Journal of Cardio-Thoracic Surgery (2014) 1–6

Hypothesis/Plan

- We aimed to evaluate the non-inferiority of staged CAS compared to combined CEA and CABG
- Systematic review and meta-analysis of outcomes of clinical studies

Methods

- PubMed, Scopus and Cochrane Central Register of clinical studies
- 1990 to September 2014
- “Carotid” OR “Stenting” OR “CEA” AND CABG

Methods

Inclusion criteria:

- 1. Cohort studies and randomized clinical studies directly comparing combined CEA and CABG with staged CAS and CABG**
- 2. Primary and secondary outcomes reported**

Methods

Exclusion criteria:

- 1. Studies that used only one approach**
 - 2. Did not specify the used approach**
 - 3. Did not report a comparison among approach used**
 - 4. Did not report the outcomes of interest**
- Potential patient overlapping data: the study with the greater number of patients were included**

Methods

1. Primary Outcome:

- 30 day TIA/stroke

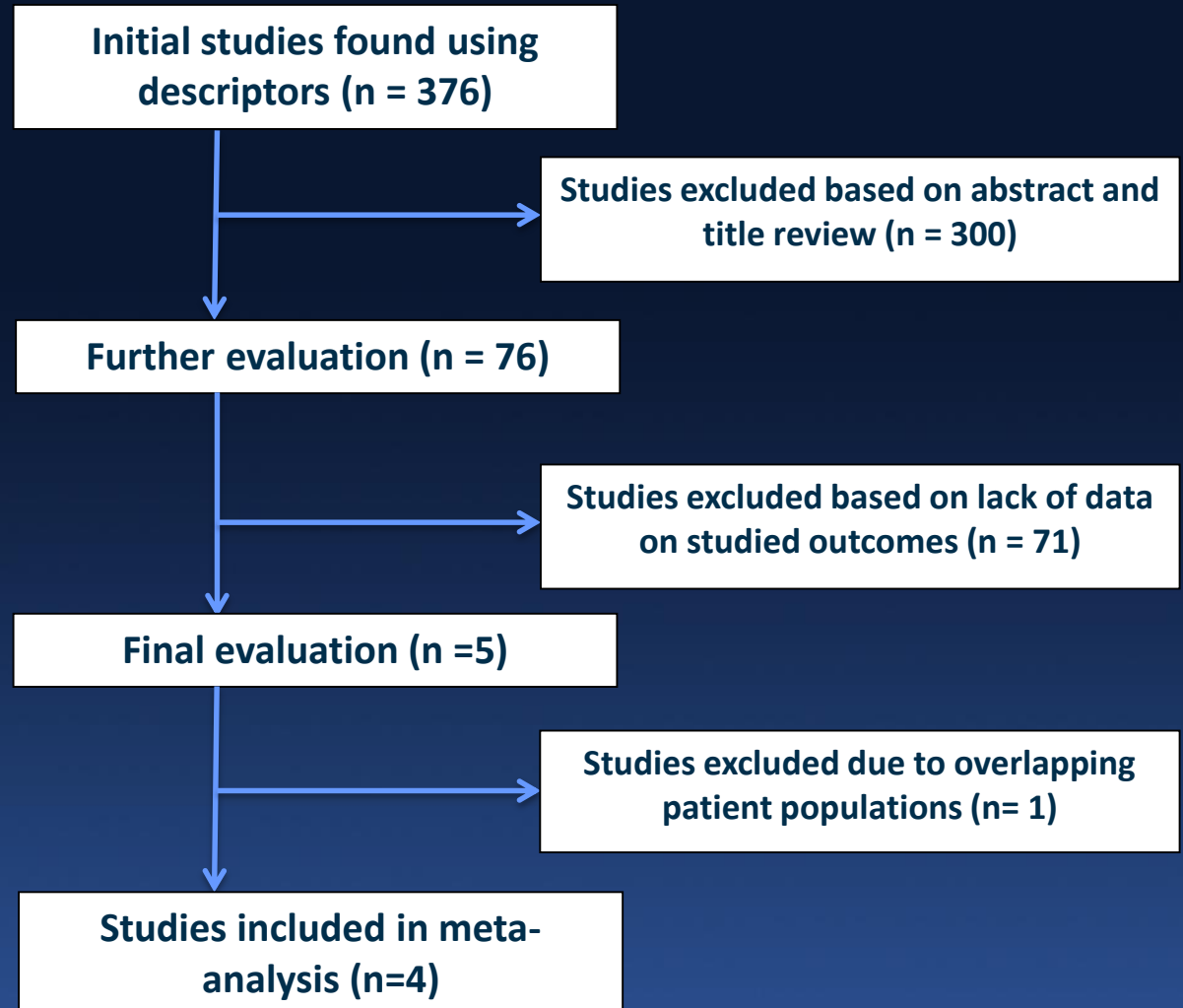
2. Secondary Outcome:

- 30 day all-cause death

Methods

- Pooled treatment effects - odds ratio (OR) -Mantel–Haenszel method
- Heterogeneity: Cochran Q tests and I^2 statistic
- Fixed effect analysis when I^2 was less than 25% or p value ≤ 0.10

Results

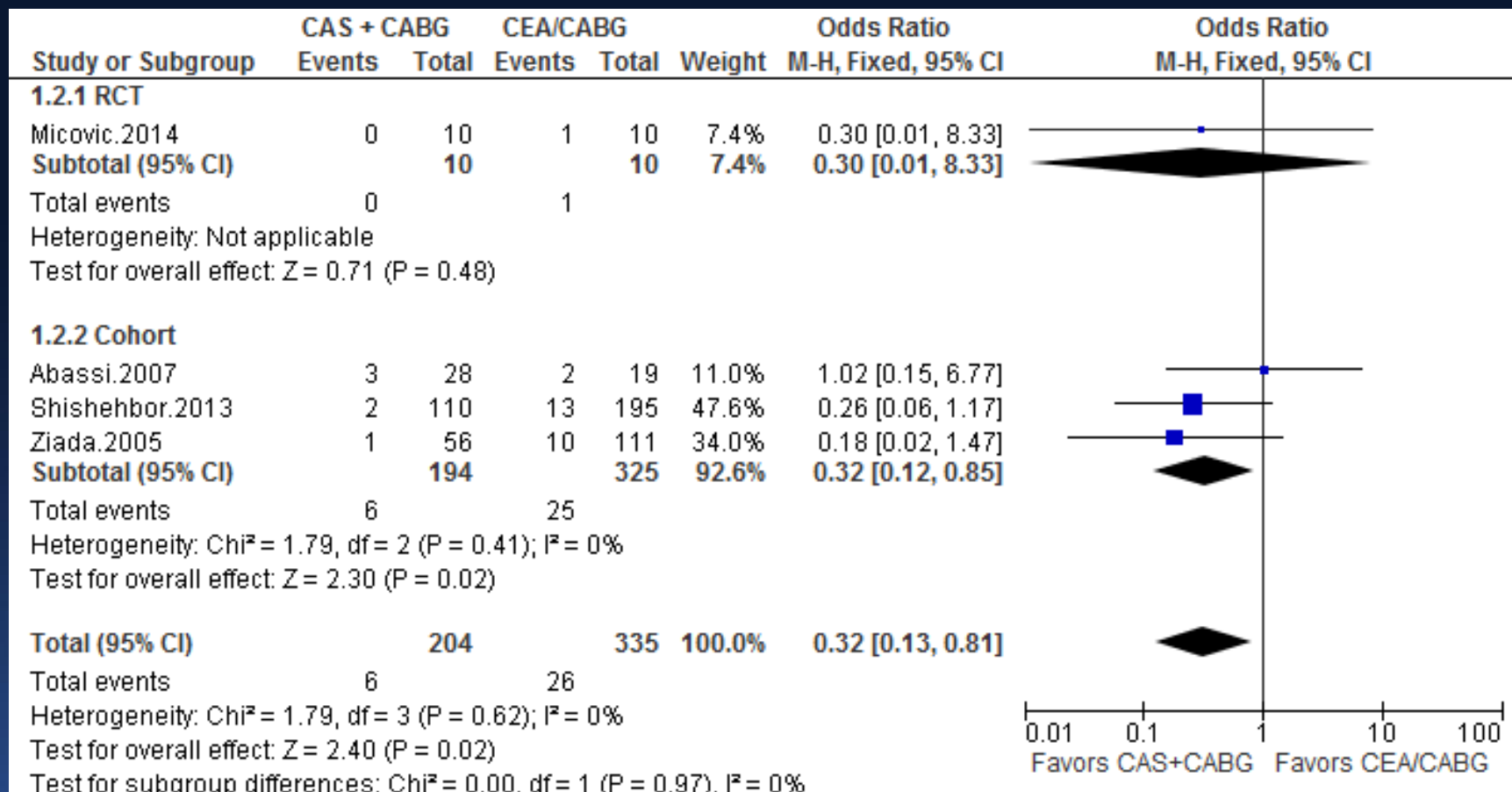


Author	Stenosis Evaluation	Inclusion Criteria	Exclusion Criteria	CEA + CABG	CAS + CABG
Abassi 2007	- Carotid Doppler - MRA	- CS > 70% with or without symptoms - ACS requiring CABG	- Previous major CVA - Significant bilateral CS - Intracranial lesions	- Procedures were done at the same time - ASA and heparin use	- CABG done 1 to 2 months after stenting - ASA, heparin and Clopidogrel - Wall or Precise Stent - Filter Protection Device
Micovic 2014	- Carotid Doppler - Multidetector row CT (MDCT)	-Asymptomatic CS >80% -Symptomatic CS > 50% - Triple vessel or left main disease	- Urgent carotid/coronary treatment - Severe HF with LVEF ≤20 % or NYHA class IV - Ischemic CVA 6 months prior	- Procedures were done at the same time - No anti-platelet regimen used	- CABG done 3 hours after stenting - ASA, heparin and clopidogrel - XACT stent - Angioguard RX distal filter protection
Shishehbor 2013	- Carotid Doppler	- Severe CS with or without symptoms - CAD presenting with ACS requiring CABG	NA	- Procedures were done at the same time - ASA use only	- CABG done 3-4 weeks after stenting - ASA, Clopidogrel use - Filter Protection Device
Ziada 2005	NA	- Asymptomatic CS >80% - Symptomatic CS > 70% - No description of CAD presentation	NA	- Procedures were done at the same time	- CABG done within 3 months of stenting - ASA, Clopidogrel use - Filter protection was <u>infrequently</u> used

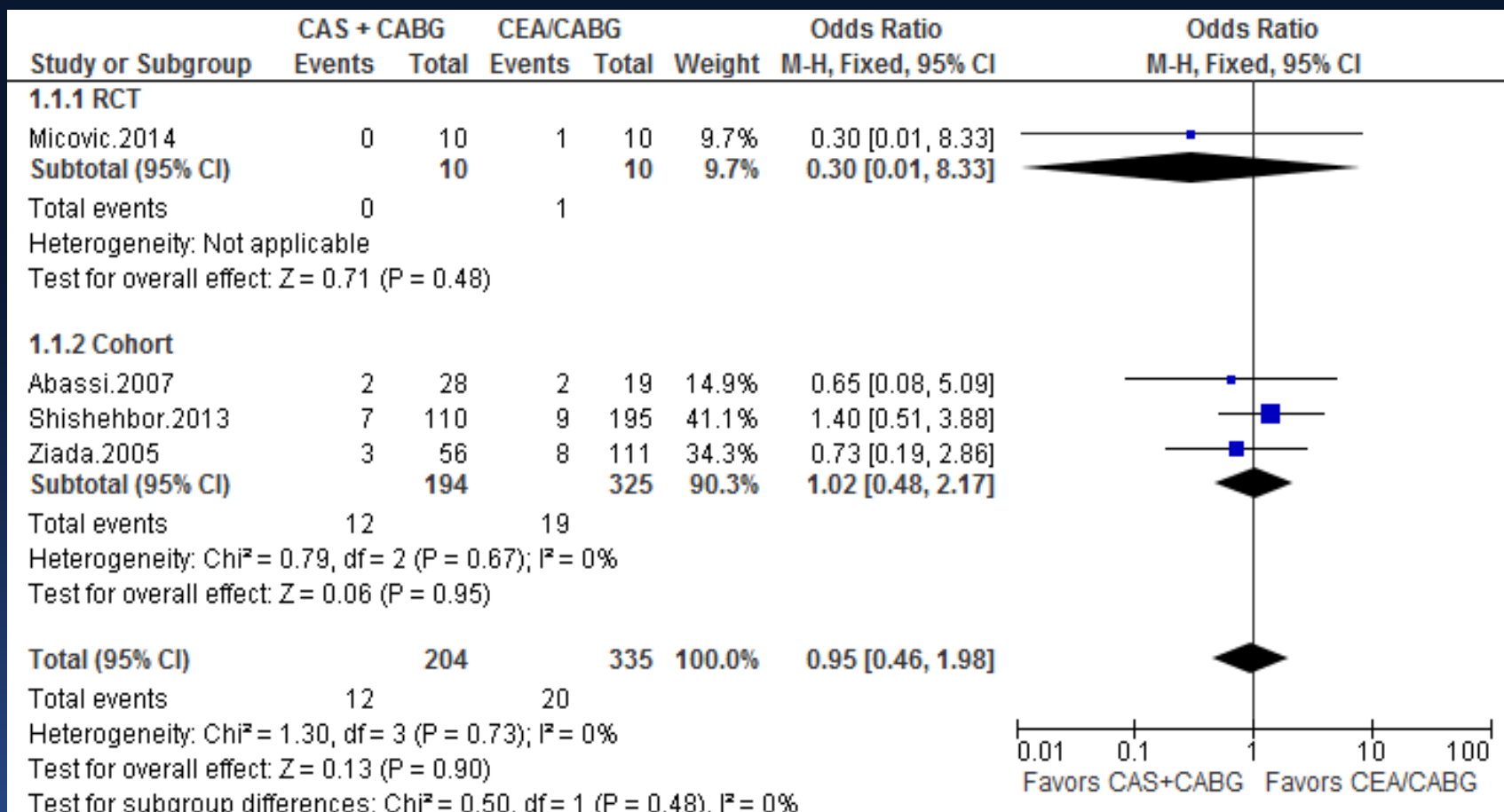
Baseline characteristics

	<i>Abassi et al. 2007</i>			<i>Micovic et al. 2012</i>			<i>Shishehbor. 2013</i>			<i>Ziada et al. 2005</i>		
	CEA + CABG	CAS + CABG	<i>p</i>	CEA + CABG	CAS + CABG	<i>p</i>	CEA + CABG	CAS + CABG	<i>p</i>	CEA + CABG	CAS + CABG	<i>p</i>
Age, median ±SD	67 ± 7.09	65 ± 8.13	0.43	70 ± 7	65 ± 7	0.19	70 ± 8	71 ± 9	0.11	69 ± 9	70 ± 10	0.48
Male, n (%)	11 (57.9)	13 (46.4)	0.55	5 (50)	8 (80)	0.35	138 (71)	79 (72)	0.8	78 (70.2)	39 (69.6)	0.93
Transient ischemia, stroke, n (%)	3 (15.8)	10 (35.7)	0.18	3 (30)	2 (20)	0.96	64 (33)	51 (47)	0.6	25 (23)	26 (46)	0.002
LVEF, mean ± SD (%)	48.59 ± 8.09	51.96 ± 10.83	0.3	43.4 ± 13.3	44.3 ± 12.4	0.86	48 ± 12	48 ± 11	0.48	-	-	-
Bilateral carotid stenosis, n (%)	5 (26.3)	6 (21.4)	0.73	5 (50)	4 (40)	0.97	22 (11)	6 (6)	0.13	31 (28)	6 (11)	0.01

30-day TIA/stroke



30-day mortality



Limitations

- **Size**
- **Publication bias**
- **Lack of randomized clinical studies**
- **Most studies were Cohort:
Selection bias**
- **Only short-term comparison**

Conclusions

- **Staged CAS and CABG might not be inferior to combined CEA and CABG**
- **Lower prevalence of TIA/Stroke**
- **No difference in short-term mortality**
- **Randomized studies are warranted**

Future

- **Hybrid Procedure: Interventional Cardiologists and Cardiothoracic Surgeons**
- **Study comparing Proximal vs. Distal Protection device for staged CAS and CABG**



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