Update on the CEA vs CAS trials for asymptomatic carotid stenosis

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Session: Status update: Carotid interventions 2023
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9:05 AM – 9:10 AM
Disclosure

Speaker name: Alison Halliday

☑️ I do not have any potential conflict of interest
CEA vs CAS trials for asymptomatic carotid stenosis

The trials:
ACT-1 – completed, 5-year results
ACST-2 – completed, 5 year results  10-year results due 2026
SPACE-2 – completed, 5 year results

ECST-2 – completed, new results
CREST-2 – ongoing, results expected
French trials - ongoing
CEA vs CAS trials for asymptomatic carotid stenosis

**ACST-2 (3625 patients)**
5-year results published August 2021 strokes (mRS 2+) from CEA = CAS
mRS 0,1, (non-disabling) CAS>CAS
10-year results expected 2026

2 current studies:
- Restenosis – data on 3000 patients expected shortly (2023) looking at 1-month, < 2 years and long-term restenosis/occlusion for CEA and CAS
- MRI sub-study ...
MRI substudy in ACST-2

- 6 centres
- **Primary outcome:**
  Comparison of CAS and CEA patients with at least one new DWI lesion
- **Secondary outcomes:**
  Total new lesions (lesion count), total lesion volume and clinical outcome events
172 patients randomised

93 allocated to carotid stenting

- 8 MRI scanner unavailable before treatment
- 7 MRI contraindicated
- 3 did not consent to MRI substudy
- 2 reason unknown
- 1 had no procedure

- 72 had pre-treatment scan and completed carotid stenting

- 2 MRI scanner unavailable after treatment

- 70 had post-treatment scan

- 1 insufficient DWI quality

- 69 included in primary analysis

79 allocated to carotid endarterectomy

- 7 MRI scanner unavailable before treatment
- 4 MRI contraindicated
- 6 did not consent to MRI substudy
- 3 reason unknown

- 59 had pre-treatment scan and completed carotid endarterectomy

- 1 MRI scanner unavailable after treatment

- 58 had post-treatment scan

- 58 included in primary analysis
Primary outcome: ≥ 1 new DWI lesion

<table>
<thead>
<tr>
<th>Type of new DWI lesion</th>
<th>Stenting (n=69)</th>
<th>Endarterectomy (n=58)</th>
<th>Odds ratio of DWI positive [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ipsilateral</td>
<td>38 (55.1)</td>
<td>11 (19.0)</td>
<td>5.24 [2.33-11.77]</td>
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<tr>
<td>Contralateral</td>
<td>18 (26.1)</td>
<td>3 (5.2)</td>
<td>6.47 [1.80-23.28]</td>
</tr>
<tr>
<td>Vertebrobasilar</td>
<td>13 (18.8)</td>
<td>1 (1.7)</td>
<td>13.23 [1.68-104.56]</td>
</tr>
<tr>
<td>Any DWI lesion</td>
<td>40 (58.0)</td>
<td>12 (20.7)</td>
<td>5.29 [2.39-11.71]</td>
</tr>
</tbody>
</table>

p < 0.001

Favours stenting

Favours endarterectomy
Secondary outcome: number of brain lesions

- All lesion
  - Stenting: 5.45 (10.99) vs 0.91 (3.66); p = 0.002
  - Endarterectomy: 0.57 (1.92) vs 0.03 (0.26); p = 0.026

- Ipsilateral
  - Stenting: 4.13 (8.79) vs 0.55 (1.49); p = 0.001

- Contralateral
  - Stenting: 0.75 (2.22) vs 0.33 (2.24); p = 0.285

- Vertebrobasilar
  - Stenting: 0.57 (1.92) vs 0.03 (0.26); p = 0.026
Secondary outcome: total lesion volume (dm$^3$)

No difference in lesion volume between CAS and CEA

p = 0.65
ACST-2 MRI sub-study conclusion

• Higher number of CAS patients with at least 1 new DWI lesion
• No clinical differences between small groups (strokes, redo procedures) but CEA group 1 had MI, 6 had cranial n. palsy

• DWI may be a useful surrogate outcome marker

• But, clinical significance of single silent DWI lesions and their impact on long-term outcome is not known
Carotid endarterectomy or stenting or best medical treatment alone for moderate-to-severe asymptomatic carotid artery stenosis: 5-year results of a multicentre, randomised controlled trial


Summary
Background The optimal treatment for patients with asymptomatic carotid artery stenosis is under debate. Since best medical treatment (BMT) has improved over time, the benefit of carotid endarterectomy (CEA) or carotid artery stenting (CAS) is unclear. Randomised data comparing the effect of CEA and CAS versus BMT alone are absent. We aimed to directly compare CEA plus BMT with CAS plus BMT and both with BMT only.

Methods SPACE-2 was a multicentre, randomised, controlled trial at 36 study centres in Austria, Germany, and Switzerland. We enrolled participants aged 50–85 years with asymptomatic carotid artery stenosis at the distal common carotid artery or the extracranial internal carotid artery of at least 70%, according to European Carotid Surgery Trial criteria. Initially designed as a three-arm trial including one group for BMT alone (with a randomised allocation ratio of 1:1:1).
SPACE 2 results at 5 years

cumulative risk of any stroke (ischaemic and haemorrhagic)
CEA vs CAS trials for asymptomatic carotid stenosis

ECST-2 – interim results - ESOC (May 2023)
Planned 2,000 patients, recruited 429
Randomised to intervention (mostly CEA, some CAS) vs medical treatment alone

For Entry: 50% + stenosis; low-to-intermediate estimated 5-year risk of stroke (Carotid Artery Risk (CAR) score of less than 20%). About 40% symptomatic

Full 2-year data not yet available: for stroke, no significant difference between medical therapy and revascularization (6.0% vs 8.1%; HR 0.68; 95% CI 0.32-1.42)
Plan - Patients to be followed to 5 years
CEA vs CAS trials for asymptomatic carotid stenosis

CAR score, example from website https://www.sealedenvelope.com/car/:
70 yr old male, minor stroke 30 d ago, plaque not ulcerated, diabetic, hypertensive CAR score = 9%  and advice - ‘consider enrolling in ESCT-2’

A clear indication of patients to whom this trial applies is needed
CEA vs CAS trials for asymptomatic carotid stenosis

- 144 CREST-2 Centres have enrolled a total of 2,273 of 2,480 planned CREST-2 Participants

CREST-2 Randomized Clinical Trial (C2LOE)
- Longer-term follow up (was 4 yrs max)
- Will be extended to 2026
For now, there remains no clear difference between CEA and CAS for non-procedural strokes.