Endovascular Reconstruction of Extracranial Traumatic Internal Carotid Artery Dissections: a Systematic Review

GEORGE KOULLIAS, MD, PhD
Associate Professor
Division of Vascular and Endovascular Surgery,
Stony Brook University Hospital
Stony Brook, New York, USA

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Disclosures

Speaker name: George Koullias MD, PhD

I do NOT have any potential conflict of interest relevant to this presentation
George Koullias MD PhD¹, Pavlos Texakalidis MD², Theofilos Karasavvidis MS³, Stefanos Giannopoulos MD⁴, Andreas Tzoumas MS³, Nektarios Charisis MD¹, Theofilos Machinis MD⁵, John Reavey-Cantwell MD⁵

Affiliations:
¹Department of Surgery, Stony Brook University, Stony Brook, NY, USA
²Department of Neurosurgery, Emory University, Atlanta, GA, USA
³Medical School Aristotle University of Thessaloniki, Thessaloniki, Greece
⁴251 HAF and VA Hospital, Athens, Greece
⁵Department of Neurosurgery, Virginia Commonwealth University, Richmond, VA, USA
Background

- **Internal carotid artery dissection (ICAD)**
  - Defined as intimal splitting that can allow blood to enter the artery wall cleft and lead to aneurysmal dilatation, mural hematoma, stenosis, thrombosis, obstruction, or embolization.
  - It is either **spontaneous** or **traumatic**
  - Clinical presentation varies from asymptomatic to symptomatic (including stroke, transient ischemic attack (TIA), headache, face or neck pain and Horner syndrome)

- ICAD accounts for approximately 20% of strokes for patients younger than 45 years old

- Treatment options:
  - medical management with early systemic anticoagulation or antiplatelet therapy where indicated
  - endovascular repair if traumatic or medical management is contraindicated or has failed
Objective

The aim in this study was to systematically review the literature of published traumatic (ie trauma and iatrogenic) carotid dissection cases treated with an endovascular approach (either with CAS or PED) in order to better define patient presentation, typical indications, and treatment outcomes.
Methods

- This systematic review was performed according to the PRISMA guidelines.
- The review protocol has been registered in the PROSPERO International Prospective Register of systematic reviews.
- Risk of bias was assessed using Cochrane tool for observational studies (ACROBAT).
- Grading of Recommendations Assessment, Development and Evaluation (GRADE).
Flow Diagram

Studies retrieved through PubMed (n=505)

Records after duplicates removed (n=506)

Records excluded from title and abstract screening as irrelevant (n=351)

Studies retrieved through Cochrane (n=30)

Records after irrelevant articles removed (n=155)

Studies excluded based on abstracts (n=48)
Animal studies: n=48

Full-text articles evaluated for eligibility (n=107)

Total paper excluded after full-text screening (n=83)
Case reports (n=46)
Secondary review papers (n=31)
Studies not reporting on clinical or radiographic outcomes (n=6)

Studies meeting the eligibility criteria (n=24)

Studies included in the systematic review (n=24)

191 patients
Different mechanisms of blunt trauma causing carotid artery dissections

- Motor Vehicle Accident: 52%
- Outdoor Activities/Sport: 14%
- Strike with Door: 14%
- Strangulation: 5%
- All Terrain Vehicle/Motorcycle Accident: 10%
- Assault: 5%
Symptomatic patients in the carotid artery stenting (CAS) group (n=179)

- Stroke: 56.9%
- TIA: 31.9%
- Horner: 4.2%
- Head/neck pain: 4.2%
- Vertigo: 1.4%
- Tinnitus: 1.4%
Symptomatic patients in the flow diversion group (n=12)
Highlights

• Internal Carotid Artery Dissection was traumatic (82.2%) or iatrogenic (17.8%)
• The majority of traumatic dissection was induced by blunt neck trauma (94.3%)
• Concomitant pseudoaneurysms were identified in >60% of lesions
• Endovascular approach has 100% technical success
• CAS: CVA rate was 1.1% at 30 days (28.9 months f/u-NO CVA during F/U)
• PED: NO CVA at 30 days or at F/U
Conclusion

• Endovascular reconstruction of traumatic or iatrogenic ICAD when medical treatment is contraindicated is a safe and feasible treatment strategy.

• This approach demonstrated acceptable short and long-term clinical and radiographic outcomes with either the stenting technique or with flow diversion.

• Prospective cohorts or RCTs specifically designed for this patient population are lacking in the literature and can further help validate our results.
Thank you
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