Carotid Artery Dissections: Time from strangulation to stroke

Bill Smock, MD
Police Surgeon: Louisville Metro Police Department
Chair, National Medical Advisory Committee
Training Institute on Strangulation Prevention
San Diego
Carotid Artery Dissections are the #1 Cause of Strokes in Patients Under 45

- Medical literature reports that the time between neck trauma (including strangulation) with an induced traumatic carotid artery dissection and the patient’s presentation with an acute stroke can be hours to years post assault.*
Carotid Artery Injury and Delayed Stroke Presentation

- 1989 Pozzati et al: 2 weeks, 1 month, 2 months, 5 months, 6 months
- 1991 Hori et al: 6 days
- 1992 Noguchi et al: 2 years
- 1995 Thomas et al: 4 months
- 1998 Martin et al: 5 months
- 1999 Okada et al: 2 days, 7 months, 2 years, 2 years, 10 years
- 1999 Bejjani et al: 1 day, 8 days, 2 weeks, 3 months
- 2000 Malek et al: 3 months, 3 months, 6 months
- 2006 Chokyu et al: 1 day
- 2012 Sethi et al: 1 day
### Table 1 Literature review of carotid artery dissection.

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Authors and Year</th>
<th>Age/SEX</th>
<th>Etiology of Dissection</th>
<th>Side</th>
<th>Treatment</th>
<th>Time Interval after Onset</th>
<th>Initial Symptoms</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Anne et al., 2002</td>
<td>24/f</td>
<td>motor vehicle accident</td>
<td>bilateral</td>
<td>anticoagulation</td>
<td>1 day</td>
<td>GCS 8, Lt hemiplegia</td>
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<td>25/f</td>
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<td>anticoagulation</td>
<td>6 days</td>
<td>Drowsiness, Rt hemiparesis, Rt Honer</td>
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<tr>
<td>3</td>
<td>Bejjani et al., 1999</td>
<td>53/m</td>
<td>direct blow</td>
<td>rt</td>
<td>stenting</td>
<td>3 months</td>
<td>Lt hemiparesis</td>
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<tr>
<td>4</td>
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<td>18/m</td>
<td>gunshot</td>
<td>rt</td>
<td>stenting</td>
<td>8 days</td>
<td>Lt hemiparesis</td>
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<tr>
<td>5</td>
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<td>33/f</td>
<td>motor vehicle accident</td>
<td>lt</td>
<td>stenting</td>
<td>1 day</td>
<td>Rt hemiplegia</td>
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<tr>
<td>6</td>
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<td>55/f</td>
<td>lift a heavy load</td>
<td>rt</td>
<td>stenting</td>
<td>2 weeks</td>
<td>Lt neck pain, headache</td>
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<td>7</td>
<td>Doi et al., 2004</td>
<td>21/m</td>
<td>motor vehicle accident</td>
<td>rt</td>
<td>stenting</td>
<td>2 hours</td>
<td>NBCS 20, Lt hemiparesis</td>
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<td>8</td>
<td>Duncan et al., 2000</td>
<td>39/m</td>
<td>motor vehicle accident</td>
<td>bilateral</td>
<td>anticoagulation</td>
<td>a few hours</td>
<td>Lt hemiplegia</td>
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<tr>
<td>9</td>
<td>Fabrizio et al., 2004</td>
<td>17/m</td>
<td>motor vehicle accident</td>
<td>bilateral</td>
<td>stenting</td>
<td>?</td>
<td>Lt hemiparesis</td>
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<td>41/f</td>
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<td>anticoagulation</td>
<td>1 day</td>
<td>Lt lower limb paresis</td>
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<td>11</td>
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<td>37/f</td>
<td>domestic abuse</td>
<td>bilateral</td>
<td>stenting</td>
<td>3 months</td>
<td>Rt hand weakness and numbness</td>
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<td>43/f</td>
<td>domestic abuse</td>
<td>bilateral</td>
<td>stenting</td>
<td>3 months</td>
<td>Lt hemiparesis</td>
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<td>24/f</td>
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<td>anticoagulation</td>
<td>6 months</td>
<td>JCS 300</td>
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<tr>
<td>14</td>
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<td>hanging injury</td>
<td>lt</td>
<td>stenting</td>
<td>3 months</td>
<td>Rt hemiparesis, leg numbness, and dysphagia</td>
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<td>44/f</td>
<td>motor vehicle accident</td>
<td>lt</td>
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<td>4 months</td>
<td>Dysphasia, Rt arm weakness, and numbness</td>
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<td>50/f</td>
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<td>rt</td>
<td>carotidendoartectomy</td>
<td>2 years</td>
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<td>30/f</td>
<td>motor vehicle accident</td>
<td>lt</td>
<td>bypass surgery</td>
<td>7 months</td>
<td>Rt hemiparesis</td>
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<td>18</td>
<td>Okada et al., 1999</td>
<td>42/f</td>
<td>motor vehicle accident</td>
<td>rt</td>
<td>bypass surgery</td>
<td>2 days</td>
<td>Lt hemiparesis</td>
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<tr>
<td>19</td>
<td>Okada et al., 1999</td>
<td>58/f</td>
<td>motor vehicle accident</td>
<td>rt</td>
<td>bypass surgery</td>
<td>10 years</td>
<td>Lt hemiparesis</td>
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<tr>
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<td>Okada et al., 1999</td>
<td>41/f</td>
<td>hanging injury</td>
<td>rt</td>
<td>bypass surgery</td>
<td>2 years</td>
<td>Dizziness</td>
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<tr>
<td>21</td>
<td>Okada et al., 1999</td>
<td>42/m</td>
<td>direct blow</td>
<td>rt</td>
<td>bypass surgery</td>
<td>2 years</td>
<td>Lt hemiparesis</td>
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<tr>
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<td>Okuchi et al., 1999</td>
<td>29/m</td>
<td>motor vehicle accident</td>
<td>rt</td>
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<td>11 days</td>
<td>JCS 200</td>
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<tr>
<td>23</td>
<td>Scavee et al., 2001</td>
<td>53/m</td>
<td>motor vehicle accident</td>
<td>rt</td>
<td>stenting</td>
<td>6 weeks</td>
<td>Dizziness, neck pain</td>
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<td>24</td>
<td>Stahlfeld et al., 2002</td>
<td>39/m</td>
<td>ride on a roller coaster</td>
<td>rt</td>
<td>anticoagulation</td>
<td>3 weeks</td>
<td>Headache, Lt eye pain, Lt temporoparietal numbness</td>
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</tbody>
</table>
Bilateral Internal Carotid Artery Dissections In a 36 year-old Strangulation Victim Diagnosed On CTA 6 Days Post Assault
Traumatic Bilateral Common Carotid Artery Dissection Due to Strangulation: A Case Report

I. CHOKYU, T. TSUMOTO, T. MIYAMOTO, H. YAMAGA, T. TERADA, T. ITAKURA
Department of Neurological Surgery, Wakayama Medical University, Wakayama, Japan

Case Report

Delayed Stroke following Blunt Neck Trauma: A Case Illustration with Recommendations for Diagnosis and Treatment

Best Anyama,¹,² Daniela Treitl,¹,² Jeffery Wessell,³ Rachele Solomon,² and Andrew A. Rosenthal²

¹Mount Sinai Medical Center, 4300 Alton Road, Miami Beach, FL 33140, USA
²Memorial Regional Hospital, Division of Acute Care Surgery and Trauma, 3501 Johnson Street, Hollywood, FL 33021, USA
³Nova Southeastern University, College of Osteopathic Medicine, 3301 College Avenue, Fort Lauderdale, FL 33314, USA

Correspondence should be addressed to Andrew A. Rosenthal; anrosenthal@mhs.net

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Delayed Left Anterior and Middle Cerebral Artery Hemorrhagic Infarctions After Attempted Strangulation

A Case Report

Prahlad K. Sethi, MD,* Nitin K. Sethi, MD,† Josh Torgovnick, MD,‡ and Edward Arsura, MD§

Blunt Traumatic Carotid Dissection With Delayed Symptoms

Eugenio Pozzati, MD, Giuliano Giuliani, MD, Massimo Poppi, MD, and Alessandro Faenza, MD

Traumatic internal carotid artery dissection

Shun-Tai Yang, Yin-Cheng Huang, Chi-Cheng Chuang, Peng-Wei Hsu *

Department of Neurosurgery, Chang Gung Memorial Hospital, 5 Fu-Shin St., Kwei-Shan County, Taoyuan, Taiwan, ROC

Received 6 December 2004; accepted 28 February 2005
Internal Carotid Artery Dissection in Brazilian Jiu-Jitsu

Zeferino Demartini Jr, Maxweyd Rodrigues Freire, Roberto Oliver Lages, Alexandre Novicki Francisco, Felipe Nanni, Luana A. Maranha Gatto, Gelson Luis Koppe

Department of Neurosurgery, Pontifical Catholic University of Paraná - PUCPR - Curitiba (PR), Brazil

Journal of Cerebrovascular and Endovascular Neurosurgery
pISSN 2234-8565, eISSN 2287-3139, http://dx.doi.org/10.7461/jcen.2017.19.2.111
Thrombosed Internal Carotid Artery
After Strangulation
No flow in victim’s left internal carotid artery 12 hours after strangulation.
Clinicians Must Understand the Morbidity and Mortality Associated with a Missed Arterial Dissection

“Early recognition of the injury and treatment is critical to avoid devastating complications, such as ischemic stroke leading to death or disability.”*

To prevent further complications, early recognition of this injury is important. A critical factor that hampers early diagnosis is the delay between the dissection and the onset of neurological symptoms. Therefore, some authors have proposed early aggressive screening …”

The National Medical Advisory Committee’s Recommendations for the Radiographic Imaging of Strangulated Patients Can be Downloaded From: Strangulationtraininginstitute.com

RECOMMENDATIONS for the MEDICAL/RADIOGRAPHIC EVALUATION of ACUTE ADULT, NON-FATAL STRANGULATION
Prepared by Bill Smock, MD and Sally Sturgess, RNR, RIANA
Office of the Public Defender, Louisville Metro Police Department
Endorsed by the National Medical Advisory Committee: Bill Smock, MD, Chief; Cathy Bateman, MD; William Sloan, MD; Deanna Tilley, MD; Ralph Roland, MD; Heather Rozier, MD; Steve Dapyczko, MD; Declan Sullivan, MD; Michael Weaver, MD

GOALS:
1. Evaluate carotid and vertebral arteries for injuries
2. Evaluate bony/cartilaginous and soft tissue neck structures
3. Evaluate brain for anoxic injury

Strangulation patient presents to the Emergency Department

- History of and/or physical exam with ANY of the following:
  - Loss of Consciousness (anoxic brain injury)
  - Visual changes: "spots", "flashing light", "tunnel vision"
  - Facial, intraoral or conjunctival petechial hemorrhage
  - Ligature mark or neck contusions
  - Soft tissue neck injury/swelling of the neck/carotid tenderness
  - Incontinence (bladder and/or bowel from anoxic injury)
  - Neurological signs or symptoms (LOC, seizue, mental status change, amnesia, visual change, cortical blindness, movement disorders, stroke-like symptoms)
  - Dysphonia/Aphonia (hematoma, laryngeal fracture, soft tissue swelling, recurrent laryngeal nerve injury)
  - Dyspnea (hematoma, laryngeal fractures, soft tissue swelling, phrenic nerve injury)
  - Subcutaneous emphysema (tracheal/laryngeal rupture)

- History of and/or physical exam with:
  - No LOC (anoxic brain injury)
  - No visual changes: "spots", "flashing light", "tunnel vision"
  - No petechial hemorrhage
  - No soft tissue trauma to the neck
  - No dyspnea, dysphonia or odynophagia
  - No neurological signs or symptoms (i.e. LOC, seizures, mental status change, amnesia, visual change, cortical blindness, movement disorder, stroke-like symptoms)
  - And reliable home monitoring

Recommended Radiographic Studies to Rule Out Life-Threatening Injuries* (including delayed presentations of up to 6 months)
- CT Angio of carotid/vertebral arteries
  (GOLD STANDARD for evaluation of vessels and bony/cartilaginous structures, less sensitive for soft tissue trauma) or
- CT neck with contrast (less sensitive than CT Angio for vessels, good for bony/cartilaginous structures) or
- MRA of neck (less sensitive than CT Angio for vessels, best for soft tissue trauma) or
- MRI of neck (less sensitive than CT Angio for vessels and bony/cartilaginous structures, best study for soft tissue trauma) or
- MRI/MRA of brain (most sensitive for anoxic brain injury, stroke symptoms and intercerebral petechial hemorrhage)
- Carotid Doppler Ultrasound (NOT RECOMMENDED: least sensitive study, unable to adequately evaluate vertebral arteries or proximal internal carotid)

Continued ED/Hospital Observation (based on severity of symptoms and reliable home monitoring)
- Consult Neurology/Neurosurgery/Trauma Surgery for admission
- Consider ENT consult for laryngeal trauma with dysphonia

References on page 2
Questions?

Strangulationtraininginstitute.com

Bill Smock, MD-Police Surgeon

bill.smock@louisvilleky.gov

502-574-7080