Cervical Dissections: Medical Management, Pseudoaneurysms and Indications for Treatment

Mouhammad A. Jumaa M.D.
Assistant Professor
Vascular and Interventional Neurology
University of Toledo Medical Center
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Introduction

• Cervical Artery Dissection occurs by a rupture within the arterial wall leading to an intra-mural Hematoma.
• It can lead to acute occlusion of the vessel inducing a high risk for local thrombus or distal embolization.
• Incidence: 2.5%, Under the age of 45, the incidence is much higher at 10-20% (Bogousslavsky and Pierre, 1992)
• Incidence is 2.6 per 100000 based on a community study (Schievink et al., 1993)
Introduction

- Most common sites: ICA 2-3 cm distal to the bifurcation and at the skull base
- VA: V3 between the C1 and C2 of the atlas loop before entering the dura, V1- V2 Junction.
Symptoms

- Unusual and unilateral sharp neck pain: ICA: antero-lateral neck radiating to the mandible and ear (20-40%), VA: dorsal neck (50%)
- HA (80%)
- Pulsatile tinnitus (10-15%, more common in ICA dissection)
- Transient monocular blindness (10-15% in ICA dissection)
- TIA (10-20%)
- Metallic taste
Signs

- Horner’s syndrome (40-50% in ICA dissections, VA dissection: 20% central Horner’s)
- Cranial nerve deficit (ICA dissection: 5-12% III-XII)
- Lower cranial deficits are more common in VA dissection
- Stroke syndrome
Diagnosis: Doppler

Diagnosis

Semi-lunar shape hematoma is present from D#3 to 6M (Seinke et al., 1994)

Diagnosis: MRI

Diagnosis: CTA
Diagnosis: DSA
Pathogenesis

• Mild mechanical stress: coughing, head turning, sport activity
• Chiropractic maneuvers or direct trauma (Saver et al., 1992)
• FMD up to 15% of patients
• Heritable connective tissue disease: EDS, OI and Marfan’s
• Iatrogenic
• Primary arteriopathy: Abnormal skin biopsy in up to 50% of patients.
Prognosis

• Recanalization rate is high with up to 85% normalization within 6 weeks to 3 months (Steinke et al. 1994)

• Pseudoaneurysms develop in 5-40 %, do not increase the risk of distal embolus (Guillon et al. 1999)

• Recurrence is low with <10% varying from 4 to 8 % (Mokri et al. 1987), up to 50 % in familial cases.
Medical Management of CAD: CADISS-NR

• One patient in each group had recurrent ischemic stroke (antiplatelet 1/59 [1.69%], anticoagulation 1/28 [3.57%]).

• At the primary endpoint of 3 months, 3 (5.08%) antiplatelet patients had recurrent TIA, compared with none in the anticoagulation group.

• For meta-analysis, there were data from 40 nonrandomized studies including 1,636 patients. There was no significant difference between the 2 treatments in recurrent stroke risk (antiplatelet 13/499 [2.6%), anticoagulant 20/1,137 [1.8%], odds ratio [OR] 1.49) or risk of death (antiplatelet 5/499 [1.00%], anticoagulant 9/1,137 [0.80%], OR 1.27).

Kennedy et al. Neurology August 2012
1- Management of CAD in acute stroke patients

- Priority is for treatment of Intracranial Lesion
- Risk of hemorrhagic complications versus benefit of stenting: case to case basis
Sudden onset left sided weakness – NIHSS 18

R MCA occlusion
PRE EMBOLLECTOMY

RIGHT MCA OCCLUSION

RICA DISSECTION
POST CLOT RETRIEVAL

POST EMBOLECTOMY
55 yo man with aphasia and right HP with NIHSS of 26. Received IV tPA – no improvement
After Treatment
FOLLOW UP

• Patient improved on the table
• Discharged home
• mRs is 0 at 90 days
2- Delayed Stroke: Cervical Artery Dissection and Ischemic Stroke Patients CADISP

• Occlusive cervical artery dissection, multiple cervical artery dissection, and vertebral artery dissection were associated with an increased risk for delayed stroke.

• Is there a role for stenting in high risk patients?

A systematic review of endovascular management of internal carotid artery dissections

- A total of 201 patients in 23 articles

- Of the 201 patients, the causes of the carotid dissections were traumatic in 69 (34.3%), spontaneous in 115 (57.2%) and iatrogenic in 17 (8.5%).

- The technical success rate was 99.1%.

- The overall rate of major cardiovascular events in the perioperative period was 4%.

- No procedure-related deaths occurred.

- Imaging follow-up data (mean follow-up time 16.5 months) demonstrated that only 3.3% of patients had intimal hyperplasia or in-stent restenosis or occlusion of a treated vessel.

- Clinical follow-up data (mean follow-up period 20.9 months) showed that only 2.1% of patients had a recurrent transient ischemic attack in the territory of the treated vessel.

Huang Xianjun and Zhou Zhiming, Interv. Neurol. September 2013
3. Pseudo-aneurysms: Extracranial traumatic aneurysms due to blunt cerebrovascular injury

- Prospective clinical and radiographic follow-up averaged 15.8 months and 22.0 months respectively.
- Ten (38.5%) of 26 aneurysms were not visualized on last follow-up, 10 (38.5%) were smaller, 1 (3.8%) was unchanged, and 5 (19.2%) were larger.
- Saccular aneurysms were more likely to enlarge than fusiform aneurysms (33.3% vs 11.8%).

Foreman et al. Journal of Neurosurgery, July 2014
Endovascular treatment of Pseudo-aneurysms associated with CAD

- Treatment indications: Symptomatic lesion despite medical management, aneurysm growth.

- Treatment options: Covered stent, coil embolization, Parent vessel sacrifice, flow diversion
Covered stent

Ivan Vulev MD. and Andrej Klepanec MD.
Thank you