

Carotid artery dissection

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- [New approaches to preventing venous thromboembolism, prognostication in stroke and myocardial infarction, and antiplatelet therapy after spontaneous coronary artery dissection](#)
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Arterial [dissection](#) of the [carotid artery](#) occurs when a small tear forms in the innermost lining of the arterial wall (known as the tunica intima). Blood can then enter the space between the inner and outer layers of the vessel, causing narrowing (stenosis) or complete occlusion.

Classification

Carotid artery dissection (CAD) can be classified based on various criteria including **etiology**, **location**, **extent**, and **imaging characteristics**.

1. Etiological Classification

- **Spontaneous Carotid Dissection (sCAD):**
 - Occurs without a known traumatic cause.
 - Associated with connective tissue disorders (e.g., Ehlers-Danlos, Marfan) or fibromuscular dysplasia.
- **Traumatic Carotid Dissection (tCAD):**
 - Caused by direct or indirect trauma (e.g., cervical hyperextension, blunt trauma, penetrating injury).

2. Anatomic Location Classification

- **Extracranial CAD (ECAD):**
- see [Cervical carotid artery dissection](#)

see [External carotid artery dissection](#).

- Involves the cervical portion of the **internal carotid artery (ICA)**.
- Most common (~80% of cases).
- **Intracranial CAD (ICAD):**
- Affects the petrous, cavernous, or supraclinoid segments of the ICA.
- Higher risk of subarachnoid hemorrhage (SAH).

3. Extent and Severity Classification

- **Localized Dissection:** Confined to a short segment.
- **Extensive Dissection:** Involves a long segment, possibly extending extracranially to intracranially.
- **Stenotic vs. Aneurysmal Dissection:**
 - **Stenotic Type:** False lumen compresses the true lumen, causing vessel narrowing and ischemia.
 - **Aneurysmal Type:** Pseudoaneurysm formation due to vessel wall weakening.

4. Imaging-Based Classification (Modified Schievink)

Type	Description
I	Narrowing of the lumen with an intimal flap or double lumen.
II	Irregular lumen narrowing without an apparent intimal flap.
III	Pseudoaneurysm formation due to vessel wall weakening.
IV	Complete occlusion due to thrombosis in the false lumen.
V	Dissection extending into distal branches.

5. Clinical Severity and Prognosis

- **Mild:** No neurological deficits, incidental finding.
- **Moderate:** Transient ischemic attack (TIA) or minor stroke.
- **Severe:** Major ischemic stroke, SAH (if intracranial dissection), or significant mass effect.

see [Internal carotid artery dissection](#).

Epidemiology

The incidence rate of Spontaneous [Cervical Artery Dissection](#) increased nearly 4-fold over 19 years from 2002 to 2020. The incidence rate in women rose over 12-fold. The increase in incidence rates likely reflects the increased use of noninvasive vascular imaging ¹⁾

Diagnosis

[Photon-Counting Detector computed tomography angiography](#) ²⁾

Angiographic features

Luminal stenosis (65%), occlusion (28%), pseudoaneurysm (28%), luminal irregularity (13%), embolic distal branch occlusion (13 %), intimal flap (12 %) and slow ICA - MCA flow (11 %) ³⁾.

Management

[Endovascular technique](#) of [acute ischemic stroke](#) (AIS) in the setting of [carotid artery dissection](#) (CAD) is a feasible, safe, and promising strategy ⁴⁾.

Endovascular therapy was associated with better outcomes and higher cost-recovery than IV [thrombolysis](#) in patients with large vessel strokes ⁵⁾.

The initial management in the absence of [ICH](#) is intravenous [heparin](#) for 7 days followed by warfarin ⁶⁾.

The goal aPTT with heparin is 1.5 – 2.0 times the control value (50–80 sec). Warfarin is continued for 3–6 months with target INR range of 2.0 – 3.0. If anticoagulation is contraindicated, antiplatelet therapy is a consideration. In pregnant individuals, obtain obstetric consultation prior to initiating anticoagulation or anti-platelet therapy.

Indications for endovascular intervention

- Persistent ischemic symptoms despite anticoagulation therapy.
- Flow-limiting lesion with hemodynamic compromise

Contraindication to anticoagulation and/or anti-platelet therapy

- Impending risk of stroke
- Expanding pseudoaneurysm formation
- Iatrogenic dissection during endovascular procedure where flow compromise is apparent

Stenting with/without coiling

The endovascular treatment for carotid dissection is stenting. In case of intimal flap, the stent will appose the flap back to the arterial wall. Pseudoaneurysms have also been successfully occluded with stenting. Both uncovered and covered stents have been used successfully ⁷⁾

JoStent is a PTFE covered stent that is available in US. A vein covered stent has also been used ⁸⁾. In case of a pseudoaneurysm that continues to show significant residual filling after stenting, coiling of the pseudoaneurysm will cause occlusion ⁹⁾

After stenting, the patient remains on dual antiplatelet therapy (ASA+Plavix) for at least a month and ASA alone indefinitely.

Follow-up

Follow-up should be arranged for patients on warfarin (e.g., "Coumadin clinic").

Follow-up study in 3–6 months, which could be CTA, Doppler ultrasonography or catheter angiogram.

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