At present, there is limited understanding of chronic total carotid artery occlusion (CTO) of the internal carotid artery (ICA).

Cerebral vessels may form collateral circulation immediately or gradually following CTO of the ICA. The natural history of CTO of the ICA includes a variety of outcomes, all of which are biased toward a non-benign progressive process and are characterized by insufficient cerebral perfusion, embolus detachment and cognitive dysfunction.

**Classification**

**Symptomatic carotid occlusion.**

**Asymptomatic carotid occlusion.**

**Anatomical classification**

**Rules Classification**

see [Rules Classification](https://operativeneurosurgery.com/)

Hasan et al., propose a radiographic classification of Chronically occluded internal carotid artery (COICA) that can be used as a guide to determine the technical success and safety of endovascular revascularization for symptomatic COICA and to assess the changes in systemic blood pressure following successful revascularization.

The radiographic images of 100 consecutive subjects with COICA were analyzed. A new classification of COICA was proposed based on the morphology, location of occlusion, and presence or absence of reconstitution of the distal ICA. The classification was used to predict successful revascularization in 32 symptomatic COICAs in 31 patients, five of whom were female (5/31 [16.13%]). Patients were included in the study if they had a COICA with ischemic symptoms refractory to medical therapy. Carotid artery occlusion was defined as 100% cross-sectional occlusion of the vessel lumen as

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documented on CTA or MRA and confirmed by digital subtraction angiography.

Four types (A-D) of radiographic COICA were identified. Types A and B were more amenable to safe revascularization than types C and D. Recanalization was successful at a rate of 68.75% (22/32 COICAs; type A: 8/8; type B: 8/8; type C: 4/8; type D: 2/8). The perioperative complication rate was 18.75% (6/32; type A: 0/8 [0%]; type B: 1/8 [12.50%]; type C: 3/8 [37.50%], type D: 2/8 [25.00%]). None of these complications led to permanent morbidity or death. Twenty (64.52%) of 31 subjects had improvement in their symptoms at the 2-6 months' follow-up. A statistically significant decrease in systolic blood pressure (SBP) was noted in 17/21 (80.95%) patients who had successful revascularization, which persisted on follow-up (p = 0.0001). The remaining 10 subjects in whom revascularization failed had no significant changes in SBP (p = 0.73).

The pilot study suggested that the proposed classification of COICA may be useful as an adjunctive guide to determine the technical feasibility and safety of revascularization for symptomatic COICA using endovascular techniques. Additionally, successful revascularization may lead to a significant decrease in SBP postprocedure. A Phase 2b trial in larger cohorts to assess the efficacy of endovascular revascularization using this COICA classification is warranted.

**Diagnosis**

Ultrasonography, magnetic resonance imaging and contrast angiography are useful diagnostic tests, and functional imaging of the brain (eg, with positron emission tomography) helps to understand haemodynamic factors involved in the pathophysiology of brain ischaemia.

**Treatment**

see Common carotid artery occlusion treatment.

**Outcome**

A complete occlusion of the internal carotid artery (ICA) is an important cause of cerebrovascular disease.

A never-symptomatic ICA occlusion has a relatively benign course, whereas symptomatic occlusion increases future risk of strokes.

The overall risk of ischemic stroke from a chronically occluded internal carotid artery (COICA) is around 5%-7% per year despite receiving the best available medical therapy.
