

# SPONTANEOUS INTRACRANIAL INTERNAL CAROTID ARTERY DISSECTION

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## ABSTRACT

Spontaneous intracranial internal carotid artery dissection is an uncommon cause of cerebral infarction, particularly when compared to internal carotid artery dissection in the cervical portion. Although thromboembolism is supposed to be the main stroke mechanism in ICA dissection, haemodynamic change can also play an important role, especially in cases of intracranial dissection. We present the case of a 64-years-old female with no medical history and no signs of trauma who was admitted to our clinic for a cerebral ischemic stroke due to dissection of the left internal carotid artery in its intracranial part.

**Key words:** stroke, internal carotid artery, spontaneous intracranial dissection

## BACKGROUND

Internal carotid artery (ICA) dissection is responsible for less than 2,5% of all ischemic strokes, and for 10–20% of strokes in young and middle-aged patients, with a peak incidence in the fifth decade.

Dissection of the ICA can occur spontaneously without an identified etiology or in the context of trauma or physical exertion as trivial as lifting a heavy object, coughing or in cases of cervical manipulations.

The etiology of spontaneous intracranial ICA dissection is not well understood, but environmental and genetic risk factors have been implicated such as: hereditary connective tissue disorders including Ehlers-Danlos syndrome type IV, Marfan syndrome, autosomal dominant polycystic kidney disease, and osteogenesis imperfecta, an underlying vasculopathy such as fibromuscular dysplasia, cystic medial necrosis, an intimal fibroelastic aberration, atherosclerosis,  $\alpha$ 1-antitrypsin deficiency, and hyperhomocystinuria, extreme vessel tortuosi-

ty as well as hypertension, migraine, the use of oral contraceptives, alcohol use and recent infections.

Spontaneous ICA dissection usually occurs unilaterally, but may occasionally occur synchronously in both carotid arteries. It can occur intra or extracranially.

Spontaneous intracranial internal carotid artery dissection is an uncommon cause of cerebral infarction, particularly when compared to ICA dissection in the cervical portion. The immobility of the petrous portion fixed in the carotid canal makes the intrapetrous internal carotid artery dissection a rare event. Cerebral ischemia is due either to embolism from thrombosis at the site of dissection, or to local internal carotid occlusion by such a thrombus. Although thromboembolism is supposed to be the main stroke mechanism in ICA dissection, hemodynamic change can also play an important role, especially in cases of intracranial dissection. Spontaneous intracranial ICA dissection should be considered in the differential diagnosis of intracranial ICA stenosis or occlusion, especially in young patients.

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## CASE STUDY

We present the case of a 64-year-old caucasian female who was admitted to our clinic for abrupt onset of language disorder and muscle weakness on her right side. The patient had no medical history.

At the admission to our clinic the neurologic exam revealed right central facial palsy, right hemiparesis, Babinski reflex on her right side and predominantly expressive aphasia, the patient was conscious but somnolent.

Diagnostic evaluation included extensive laboratory blood tests (hematologic screening, routine biochemical profile, urine analysis), that were normal except for a mild dyslipidemia with hypercholesterolemia, and chest roentgenography, 12-lead electrocardiography, transthoracic echocardiography that were normal.

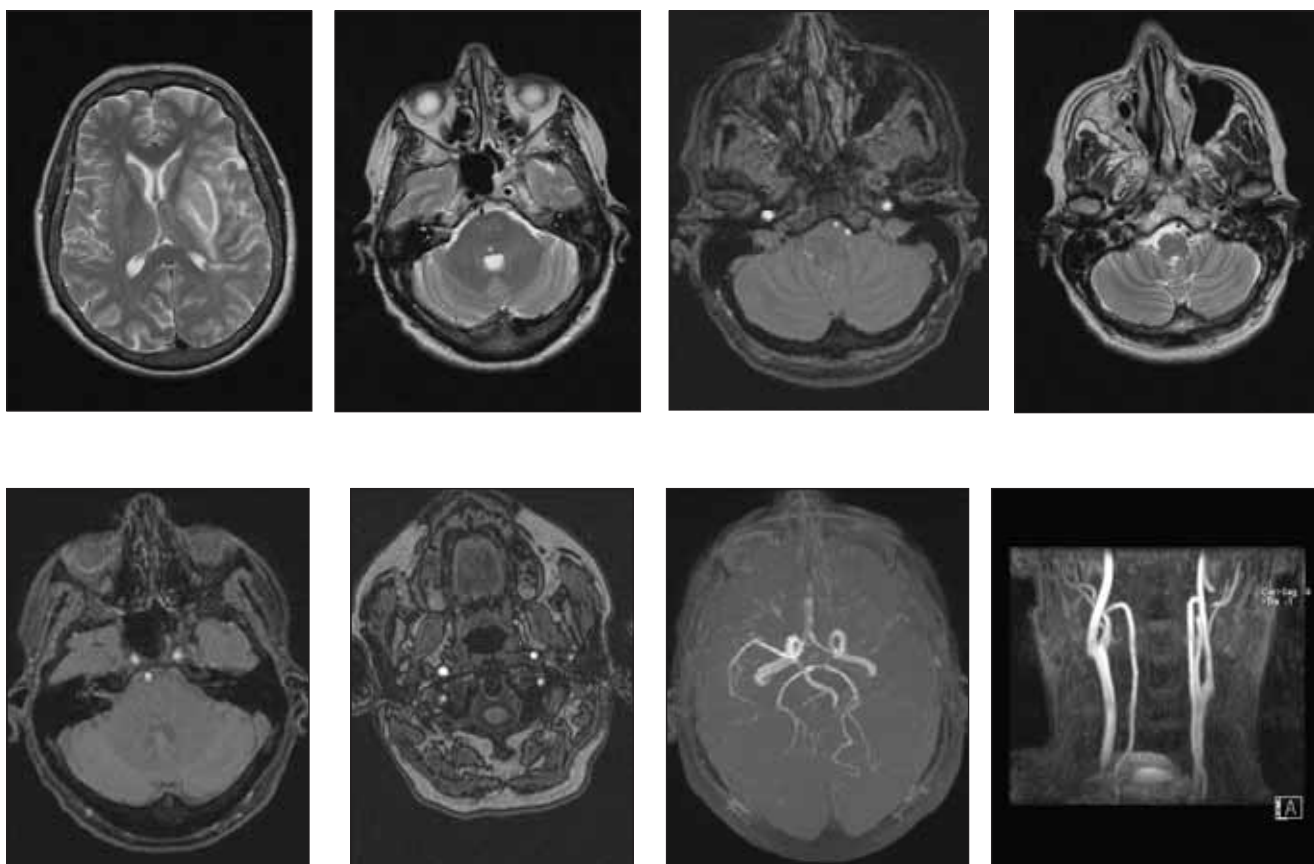
Native CT scan performed at the admission revealed capsular-lenticular hypodensity in the territory of deep branches of left middle cerebral artery.

The Doppler ultrasonography of the cervico-cerebral arteries performed the next day after the ad-

mission showed flow velocities of 10 cm/sec on the left ICA and 80 cm/sec on the right ICA with patterns that led us to suspect a left internal carotid artery dissection. The family denied any kind of trauma of the head or neck.

So, we continued the evaluation with a cerebral and cervical region MRI with MR-angiography of the cervico-cerebral arteries which showed capsular-lenticular hyperintensity on T2-weighted and FLAIR images with restriction on diffusion-weighted images in the territory of deep branches of left middle cerebral artery with displacement of the median structures to right with 3 mm.

The MRA sequences showed normal flow in all major cervical arteries including left internal carotid artery but with poor flow of the left internal carotid artery in the intracranial part (reduced with approximately 50%) from the entrance in the skull till the supraclinoidian segment with the presence of a circumferential intramural hematoma with thickness of 2-3 mm; and poor flow of the left sylvian artery visible only in first part of the M1 segment.



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