

# Post-coital Internal Carotid Artery Dissection Associated with Acute Cerebral Infarction in a Filipino Female: A Case Report

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## ABSTRACT

Carotid arterial dissections may result from spontaneous or traumatic causes. Postcoital arterial dissections have been reported in both the vertebral and coronary arteries. We report a rare case of spontaneous dissection on the extracranial internal carotid artery in a Filipino female after sexual intercourse, leading to a fulminant middle cerebral artery (MCA) territory infarct. Although postcoital carotid artery dissection is a very rare cause of neck vessel dissections, its rapid progressive course can lead to massive cerebral infarction and prompt management must be initiated.

**Key words:** *Post-coitus, cerebral infarction, stroke in the young, carotid artery*

## INTRODUCTION

Cervical artery dissections (CAD) result from either a primary intimal tear with secondary dissection into the medial layer, or from a primary intramedial hemorrhage. The intramural hematoma resulting from the intimal tear may compromise the original vessel lumen, can lead to thrombus formation, and eventually to cerebral infarction.<sup>1</sup>

The pathogenesis of the arterial tear remains unclear in most cases and several potential risk factors have been proposed<sup>2</sup> such as intrinsic factors like connective tissue disorders and generalized arteriopathy, mild mechanical traumas, including cervical manipulative therapy<sup>3</sup>, or sudden neck movements and stretching.

A recent history of a respiratory tract infection is also considered a risk factor for spontaneous dissections of the carotid or vertebral artery, however, an infection with *Chlamydia pneumoniae* or mechanical factors such as coughing or vomiting do not appear to be the cause.<sup>4</sup> The possibility of an infectious

trigger is supported by the finding of a seasonal variation in the incidence of spontaneous dissections of the carotid and vertebral arteries, with a peak incidence in the fall.<sup>5</sup> Atherosclerosis is uncommon in patients with a dissection of the carotid or vertebral artery, however, a potential link with common risk factors for vascular disease, such as tobacco use, hypertension, and the use of oral contraceptives, has not been systematically evaluated.<sup>6</sup> One case-control study suggested migraine as a risk factor for dissection.<sup>7</sup>

In the previously published literatures, there were some case series which reported arterial dissections following sexual intercourse, including dissection involving the aorta, coronary, vertebra and middle cerebral arteries (MCA).<sup>8</sup> Postcoital carotid artery dissection has been reported and it may be resulting from strenuous action of the neck during sexual activity, although it has been reported to be rare.<sup>9</sup> Cerebral or retinal ischemic symptoms are reported in 50 to 95 percent of patients with a spontaneous dissection of the carotid artery, although this frequency has decreased over the years as the condition is diagnosed in more patients with less obvious manifestations.<sup>10</sup> A case with postcoital internal carotid artery (ICA) dissection in a patient referred with cerebral ischemia is presented.

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## CASE REPORT

A 33-year-old Filipino female, with no known co-morbidities, came in due to severe right neck pain followed by left-sided weakness, twelve hours following sexual intercourse with noted hyper-extension of the neck during coitus. On arrival, blood pressure was 100/70 with a regular pulse rate of 86 beats/min, respiration was 20 breaths/min and temperature was at 36.7 degrees Celsius. Patient was awake, conscious, oriented, with intact fluency and repetition and was able to follow commands. On further neurologic examination, patient had constructional apraxia, complete homonymous hemianopsia on the left, 50% sensory deficit on the left trigeminal nerve distribution, left central facial palsy, moderate dysarthria, left hemiplegia, 50% sensory deficit on the left extremities, hyperreflexia on the left and Babinski sign on the left. No Horner's sign was noted. Initial National Institute of Health Stroke Scale (NIHSS) score was 18. Emergent brain CT angiogram showed an acute infarct on the right parieto-temporal lobe with associated cerebral edema (Fig. 1A), filling defect on the right internal carotid artery that may relate to thrombus formation and a secondary delayed filling of the M2 segment of the right MCA probably due to a thrombus (Fig. 1B-C). With a consideration of a possible internal carotid artery dissection, anticoagulation was initiated. First intravenous heparin was given, and then Dabigatran was started. A follow up Digital Subtraction Angiography (DSA) was done which revealed a long tapered eccentric area of marked stenosis involving the right cervical ICA, distal to the carotid bulb to consider cervical internal carotid artery dissection and with good cross-filling to the right ACA and RMCA through a patent ACOM and Right PCOM. No evidence of aneurysm or arteriovenous malformation was noted (Fig. 1D-E). During this admission, the laboratory studies, including hemogram, biochemistry and coagulation profiles were all within normal limits (Table 1). The patient received

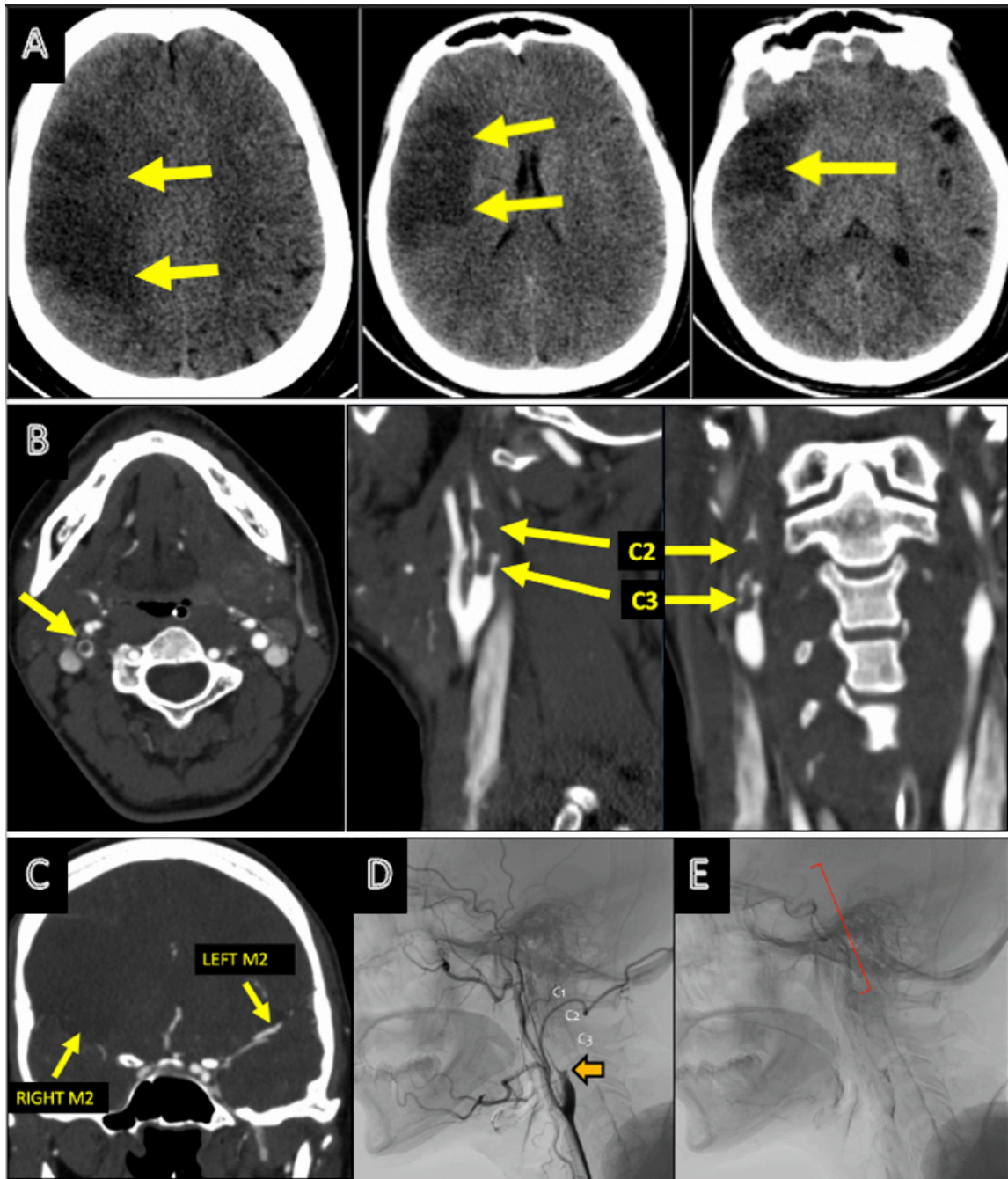
rehabilitation therapy and was then discharged two weeks from admission with left hemiparesis, Modified Rankin Score of 3, and NIHSS of 14. A prominent improvement was noted in clinical findings during three months of follow-up period with noted good functional outcome (MRS of 2).

## DISCUSSION

Coital activity may result to an increase in intrathoracic, central venous and right atrial pressure which is similar to the Valsalva maneuver and may cause paradoxical embolism through a patent foramen ovale. Moreover, transient vasoconstriction of intracranial arteries associated with cerebral infarct during orgasm, as well, as migraine variant have also been reported (8). In this patient, neither a history of migraine nor coital cephalgia was noted before and patent foramen ovale was not found in echocardiographic studies. However, angiographic finding of a dissection of the right extracranial internal carotid artery with a large infarction of the right middle cerebral artery territory were noted. The coital activity elicited hours prior to the onset of neurologic deficits may have been the precipitating event as the strenuous sexual activity-related mechanical stress, associated with increased intra-arterial pressure during orgasm may cause stress in the injured intima, the resulting to carotid artery dissection. Moreover, the reported hyper-extension of the neck during the sexual activity may also be a precipitating factor (2). To the best of our knowledge, this is the first reported case of postcoital dissection involving the extracranial internal carotid artery resulting to a fulminant right MCA territory infarct in a young Filipino patient.

CAD is an identified cause of stroke and accounts for 20% of strokes in the young. In such cases, the mechanism was found to be thromboembolic in 85% of cases, hemodynamic failure in 12%, and due to a mixed mechanism in 3% of patients (11).

**Figure 1.** A) Head computed tomography shows acute infarct at the right middle cerebral artery territory, with associated cerebral edema and no midline shift. (B) Brain CT angiogram shows a filling defect on the right internal carotid artery that may relate to thrombus formation at the level of C2, C3 vertebrae and (C) a secondary delayed filling of the M2 segment of the right MCA probably due to a thrombus. (D) Digital Subtraction Angiography (DSA) shows a long, tapered eccentric area of marked stenosis, distal to the carotid bulb



**Table 1.** Laboratory Examinations

	Result	Normal range
<b>Hemogram</b>		
Hgb	15 g/L	13 - 17 d/dL
WBC	17.67 10 <sup>9</sup> /L	3.8 - 10.4 10 <sup>9</sup> /L
Platelet	338 10 <sup>9</sup> /L	140 - 400 10 <sup>9</sup> /L
<b>Biochemistry</b>		
Sodium	135 mmol/L	135 - 148 mmol/L
Potassium	3.98 mmol/L	3.5 - 5.3 mmol/L
AST	20-39 U/L	<37 U/L
BUN	32.10 mg/dL	7-22 mg/dL
Creatinine	0.52 mg/dL	0.7 - 1.2 mg/dL
ESR	24 mm/hr	0- 10 mm/hr
Triglyceride	71.68 mg/dL	
LDL cholesterol	72.97 mg/dL	<100 mg/dL
HDL cholesterol	124.71 mg/dL	40-60 mg/dL
<b>Coagulation profile</b>		
PT	11.20 sec	8-12 seconds
INR	0.84	
APTT	25 sec	32.46 seconds
D-dimer	0.48	<0.50 ug/mL

The management strategy of this type of arterial dissection is dependent on changes in the clinical course of each individual patient. Conservative medical management with anticoagulant or antiplatelet agents may be used in stable or asymptomatic patients with a non-fluctuating course (12). Emergent angioplasty and stenting should be performed in patients with impending stroke or when medical treatment fails resulting to persistence or progression of symptoms. Endovascular treatment with stenting is technically safe and effective in management of CAD with a favorable clinical outcome in some cases.<sup>13</sup>

In conclusion, we report a rare case of ICA dissection in a Filipino female after sexual activity with a large MCA infarct. Although postcoital CAD is a rare cause of neck vessel dissections, its rapid progressive course can lead to massive cerebral infarction. In addition to the conservative medical treatment with anticoagulants or antiplatelet agents, angioplasty or stenting can be used to re-open the dissected vessels.

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## DISCLOSURE

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Conflict of interest: Nil

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