

# Floating Carotid Thrombus Treated By Endoluminal Stent Reconstruction with Anticoagulation: A Case Report

Devendra Singh Bisht<sup>1\*</sup>, Anupam Jindal<sup>2</sup>

<sup>1</sup>Consultant Interventional Cardiologist, Mayo Healthcare, Punjab, India.

<sup>2</sup>Director and neurosurgeon, Mayo Healthcare, Punjab, India.

Received: January 1, 2018; Accepted: January 31, 2018; Published: March 02, 2018

\*Corresponding author: Devendra Singh Bisht, Consultant cardiologist, Mayo Healthcare, Sector 69, Mohali, Punjab, India, Tel: +918427464246; Email: bisht2416@gmail.com

## Abstract

We present case of a 44 year-old male with ischemic stroke caused by thrombo-embolism from floating thrombus most probably caused by an atherosclerotic plaque rupture. Thrombus was detected during ultrasound imaging of carotid vessels. Computed tomography angiography of neck vessels confirmed the presence of atherosclerotic plaque rupture with evidence of thrombus in proximal internal carotid. After discussion with the neurosurgical team, our case was treated with anticoagulation and Endoluminal stent reconstruction of ruptured carotid plaque.

**Keywords:** carotid artery disease; cerebrovascular accident;

## Introduction

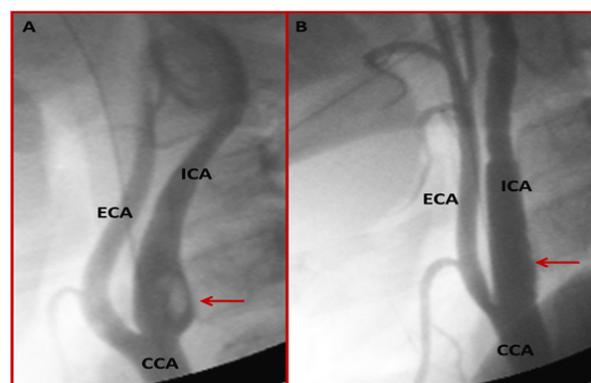
Floating thrombus (FT) is usually detected in the cardiac chambers or in the pulmonary circulation, [1, 2] but their presence in the carotid circulation is a rare diagnosis. Their presence is thought to be related with atherosclerotic plaque rupture, [3] or other conditions like trauma, dissection, aneurysm, and hyper coagulability or cocaine usage [4-8]. FT is almost always symptomatic. The treatment of floating internal carotid artery (ICA) thrombus is based on expert opinions. It can be treated with conservative management alone (anticoagulation and/or ant platelet therapy), carotid endarterectomy (CEA), or carotid artery stenting (CAS) [3, 5].

Here, we present a case of a symptomatic floating ICA thrombus, which was discovered by ultrasound and was treated successfully with CAS.

## Case Report

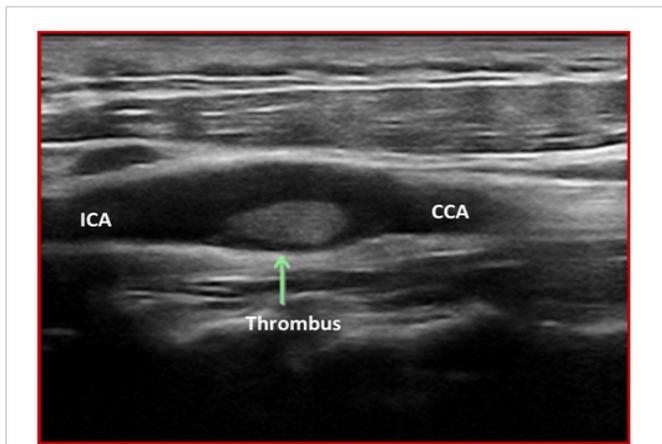
A 44 year-old diabetic, right-handed man presented with sudden onset dysarthria, plegia of the right arm, and severe paresis of the right leg. He also had history of fall prior to developing weakness. He didn't complain of any abdominal or chest symptoms, and there was no history of headache, nausea, vomiting, bladder-bowel incontinence or abnormal body movements. The past, personal and family history was noncontributory. On general physical examination patient was

seen to be anxious. The heart rhythm was regular with a rate of 80 beats per minute; the blood pressure was 114/70 mm of mercury and respiration was abdomino-thoracic with a rate of 20 breaths per minute. Findings from review of the systems, other than as reported above were normal. Patient was admitted in the neurology intensive care unit and kept on daily therapy with aspirin (75 mg), low-molecular weight heparin (LMWH) and atorvastatin (40 mg). 2D echocardiography was unremarkable and cranial CT scan showed a left middle cerebral artery territory infarct. A carotid duplex study showed a hyper-echoic mobile plaque at the origin of the left ICA [Figure 1]. CT-angiography (CTA) of neck vessels confirmed the presence of atherosclerotic plaque ruptures with evidence of thrombus in proximal ICA.



**Figure 1:** longitudinal ultrasound images of the left internal carotid artery demonstrate floating thrombus within the lumen (arrow).

After discussion with neurosurgery team and patient's family; End luminal stent reconstruction of symptomatic, ruptured carotid plaque was decided in addition to anticoagulation and ant platelet therapy. The patient remained clinically stable, and uncomplicated left ICA angioplasty with 7-9 x 40 mm RX Acculink stent (Abbott Vascular, Santa Clara, CA, USA) was done [Figure 2]. Afterwards patient was kept on Aspirin and Warfarin with international normalized ration (INR) target of 2-3. Patient was transferred to inpatient stroke rehabilitation unit for physical therapy, where he continued to make improvements.



**Figure 2:** Common carotid artery injections before (A, left) and after (B, right) carotid stenting, displaying preoperative floating thrombus (arrow) and postoperative endoluminal reconstruction of the vessel.

## Discussion

FT is a rare entity with variable incidence rate based on imaging modality used for diagnosis. Arning and Herrmann [9] reported an incidence of 0.05% in a retrospective study based on ultrasound, whereas Buchan et al [10] reported an incidence as high as 1.45% based on angiograms. Atherosclerosis with ruptured atherosclerotic plaque is reported to be the most important factor in the etio-pathogenesis of FT. Carotid stenosis with altered flow dynamics across the site of stenosis further increases the risk of developing FT. Acute ischemic stroke is the most common presentation of FT. [10] Transient ischemic attacks (TIA) may be the likely clinical manifestations of developing FT. Due to availability, CTA of neck vessels appears to be the most common imaging modality used for the diagnosis. American heart association also recommends CTA as the preferred modality for imaging the vasculature in acute stroke or TIA. We diagnosed our case in duplex ultrasound of neck vessels, which was further confirmed by CTA of neck vessels.

FT in the extra-cranial carotid circulation portends on therapeutic dilemma. Randomized trials on anticoagulation by heparin or heparinoids in the setting of acute ischemic stroke failed to demonstrate mortality or morbidity benefit. However, anecdotal evidence favors heparin therapy in certain conditions of hypercoagulable states, extra-cranial arterial dissection and intra-luminal arterial thrombus, to prevent stroke recurrence. [11, 12] Aspirin dosing need to be individualized according to indication and bleeding risk. In the stroke of stroke, low doses (50mg daily) are adequate for some patients, while other requires higher doses (160-325 mg per day) [13, 14]. We have kept our patient on both antiplatelet and anticoagulant considering arterial dissection and superimposed thrombosis.

FT can be treated medically, carotid end-arterectomy or endovascular stenting [3, 5]. Till date no randomized control trial exists to support surgical (CAS, CEA or carotid bypass) versus medical management (anti-platelets and or anticoagulation). Our patient was treated both with LMWH and CAS. He experienced a favorable outcome with no recurrence of neurological deficit over 3 months of follow up.

## Conclusions

We describe a middle aged man with an ischemic stroke due to FT on ulcerated plaque. This article highlights the concept that plaque morphology may be equally important in causing stroke as the stenosis severity. Selected patient with ischemic stroke may benefit from combined treatment of anticoagulation and endovascular intervention.

## References

1. Grzelakowski P, Lugowski T, Kurzyna M, Missima M, Maciejewski M, Balcerzak M, et al. Acute intermediate-risk pulmonary embolism with right-sided freefloating intracardiac thrombus, systemic inflammatory reaction syndrome, multiple organ dysfunction syndrome, disseminated intravascular coagulation and acute ischaemia of a limb. *Kardiol Pol.* 2010;68(10):1140–1144
2. Hou X, Liu W, Zhang Z, Li Z. Free-floating right atrial thrombus with acute pulmonary embolism. *Thorax.* 2009;64:736. [Doi.org/10.1136/thx.2008.108217](https://doi.org/10.1136/thx.2008.108217)
3. Parodi JC, Rubin BG, Azizzadeh A, Bartoli M, Sicard GA. Endovascular treatment of an internal carotid artery thrombus using reversal of flow: a case report. *J Vasc Surg.* 2005;41(1):146–150.
4. Akins PT, Glenn S, Nemeth PM, Derdeyn CP. Carotid artery thrombus associated with severe iron-deficiency anemia and thrombocytosis. *Stroke.* 1996;27(5):1002–1005.
5. Bhatti AF, Leon LR Jr, Labropoulos N, Rubinas TL, Rodriguez H, Kalman PG, et al. Free-floating thrombus of the carotid artery: literature review and case reports. *J Vasc Surg.* 2007;45:199–205.
6. Ferrero E, Gaggiano A, Ferri M, Nessi F. Mobile floating carotid plaque post-trauma. Diagnosis and treatment. *Interact CardiovascThorac Surg.* 2009;8(4):496–497. [Doi.org/10.1510/icvts.2008.198754](https://doi.org/10.1510/icvts.2008.198754)
7. Konzen JP, Levine SR, and Garcia JH. Vasospasm and thrombus formation as possible mechanisms of stroke related to alkaloidal cocaine. *Stroke.* 1995;26(6):1114–1118
8. Spiegel M, Kopp H, Treese N. Extensive aneurysm of the internal carotid artery with free floating round thrombus. *Vasa.* 1994;23(4):367–369.
9. C Arning, HD Herrmann. Floating thrombus in the internal carotid artery disclosed by B-mode ultrasonography. *Journal of Neurology.* 1988;235(7):425–427.
10. A Buchan, P Gates, D Pelz HJ M Barnett. Intraluminal thrombus in the cerebral circulation implications for surgical management. *Stroke.* 1988;19(6): PP 681–687.
11. Caplan LR. Resolved: heparin may be useful in selected patients with brain ischemia. *Stroke.* 2003;34:230-231. [doi.org/10.1161/01.STR.0000047036.77466.E8](https://doi.org/10.1161/01.STR.0000047036.77466.E8)
12. Hirsh J, Anand SS, Halperin JL, Fuster V. Mechanism of action and pharmacology of unfractionated heparin. *Arterioscler Thromb Vasc Biol.* 2001;21:1094-1096. [Doi.org/10.1161/hq0701.093686](https://doi.org/10.1161/hq0701.093686)
13. Ansara AJ, Nisly SA, Arif SA, Koehler JM, Nordmeyer ST. Aspirin dosing for the prevention and treatment of ischemic stroke: an indication-specific review of the literature. *Ann Pharmacother.* 2010;44(5):851-862. [Doi:10.1345/aph.1M346](https://doi.org/10.1345/aph.1M346)
14. Sandercock PA, Counsell C, Tseng MC, Cecconi E. Oral antiplatelet therapy for acute ischaemic stroke. *Cochrane Database Syst Rev.* 2014;26(3). DOI: 10.1002/14651858.CD000029