CASE REPORT

Spontaneous free floating carotid artery thrombosis

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SUMMARY

A 64-year-old man, with no history of trauma, presented with transient visual loss. He was diagnosed with amaurosis fugax and started on dipyridamole and simvastatin. An inconclusive ultrasound (US) Doppler was followed by CT angiogram (CTA) and MRI, which demonstrated free floating intraluminal thrombus in the distal right common carotid artery. ECG showed sinus rhythm and an echocardiogram showed no cardiac thrombus. Following discussion at the vascular multidisciplinary team the decision was made to treat with intravenous heparin followed by warfarin. He has been regularly followed up with CTA/USS, the most recent (Oct 2012) showing no evidence of thrombus. He has had no further symptoms. Despite no initial aetiology being found we suggest that his undiagnosed oesophageal carcinoma (diagnosed 5 months after initial presentation) could have been responsible for a hypercoagulability state giving an increased risk of thrombosis and leading to the thrombus in the common carotid artery.

BACKGROUND

Free floating thrombus (defined as 'an elongated thrombus attached to the arterial wall with circumferential blood flow at its distal most aspect')¹ in the carotid artery is uncommon with less than 150 cases reported in the literature.²⁻³ Some literatures report the need for urgent surgical management,²⁻⁴⁻⁷ while

others recommend medical management¹⁻⁸⁻⁹ and others suggest there is no difference in the outcome with either form of management.³

Unrecognised carotid artery thrombosis will likely result in stroke. Diagnosis and early antithrombotic treatment are important to help reduce the overall number of strokes and therefore the associated morbidity and mortality.

Thrombosis was identified as a complication of cancer by Trousseau in 1865. Arterial and, more commonly, venous thrombosis is a frequent complication of cancer and sometimes a harbinger of occult cancer.¹⁰

CASE PRESENTATION

A 64-year-old man presented to the rapid access transient ischaemic attack (TIA) clinic in March 2009 with symptoms of transient total loss of vision in the right eye 3 weeks previously. At the time of his review he was symptom free and his neurology examination was normal. He was diagnosed with amaurosis fugax and sent for further investigations described below.

He had no history of blunt cervical trauma or atherosclerotic carotid disease. He had a medical history of hypertension and type II diabetes and was later diagnosed with oesophageal neuroendocrine carcinoma in August 2009.

INVESTIGATIONS

Initial laboratory results were normal. He did not have a coagulation screen performed on admission,

Figure 1 Multidetector CT angiogram (16 slice) showing intraluminal thrombus arising from the anteromedial wall and extending distally as an intraluminal filling defect with a length of 5.8 cm in the right common carotid artery.

Figure 2 Multidetector CT angiogram (64 slice) showing moderate thrombus now more adherent to the vessel wall in the right common carotid artery.

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Figure 3 Multidetector CT angiogram (64 slice) showing almost complete resolution of thrombus in the right common carotid artery.

therefore we have no evidence of a hypercoagulable state. An ultrasound (US) Doppler on 7 May 2009 suggested a large soft plaque at the bifurcation of the carotid artery on the right side (an inconclusive study). He then had a CT angiogram (CTA, multidetector, 16 slice) on 8 May 2009 which demonstrated intraluminal thrombus within the distal right common carotid artery (CCA) with a length of 5.8 cm (figure 1). At the vascular multidisciplinary team (MDT) it was felt that no definite decision could be made regarding management using only the CTA; therefore, he had an MR angiography (MRA) on the 12 May 2009 which confirmed a long eccentric filling defect in the right CCA almost originating from the root of the neck extending to the carotid bifurcation. There was no suggestion of carotid artery dissection in either the CTA or MRA. An ECG on the 15 May 2009 was in sinus rhythm and an ECHO the same day showed no obvious intracardiac thrombus therefore displaying no obvious source of embolism. A follow-up CTA

(multidetector, 64 slice) on 3 March 2010 showed moderate mural thrombus at the distal part of the right CCA which was more adherent to the vessel wall (figure 2). A further follow-up CTA (multidetector, 64 slice) on 7 October 2011 showed near total resolution of the eccentric filling defect (figure 3). A carotid duplex on 16 October 2012 showed no evidence of thrombus/filling defect (figure 4).

DIFFERENTIAL DIAGNOSIS

- ▶ Atherosclerotic carotid artery disease
- ▶ Blunt trauma carotid artery injury
- ▶ Haematological disorder leading to hypercoagulation states
- ▶ Cancers with thrombotic tendencies

TREATMENT

He was started on dipyridamole and simvastatin at his initial review. Based on the recommendation of our MDT a decision was taken to medically manage the patient with anticoagulation medication. He was therefore admitted to the ward for 1 week for intravenous heparin followed by warfarin to maintain international normalised ratio at 2.5.

The MDT suggested a long course of warfarin would be needed but initially gave no absolute time course. The plan was for regular follow-up with CTA/US Doppler to assess progress. Recent discussion has suggested the warfarin should be stopped if there is still no evidence of thrombus at next follow-up.

OUTCOME AND FOLLOW-UP

Following medical management with warfarin, regular CTAs showed near total resolution of the filling defect. Most recently an US duplex of the carotids showed no evidence of thrombus in the right CCA. He is currently being followed up with yearly imaging followed by clinic reviews.

DISCUSSION

Free floating thrombus in the carotid artery is very rare with less than 150 cases reported in the literature.²⁻³ Around 1 in 2000 is the estimated prevalence in asymptomatic individuals.⁴ One centre had an incidence of 0.9% over a 10-year period.¹ Often no aetiology is found.⁸ Early diagnosis and treatment of carotid artery thrombosis is important to help reduce the morbidity and

Figure 4 Carotid ultrasound duplex showing no evidence of thrombus or other filling defect in the right common carotid artery.

mortality associated with stroke. Some literature recommends urgent endarterectomy, embolectomy or carotid angioplasty and stenting^{2 4-7} while other literature suggests patients can be successfully managed with anticoagulation therapy.^{1 8 9}

Lane *et al*² had six cases who all underwent surgical thromboendarterectomy with good result while Alurkar *et al*⁸ had four cases all managed successfully with anticoagulation therapy. Hill and Brozyna⁹ presented a patient with a floating thrombus and clinical and CT evidence of stroke. They chose conservative approach of anticoagulation followed by operative intervention several weeks later.

Stewart *et al*¹¹ reported a patient similar to our own patient who presented with a mobile lesion in the internal carotid artery and a visual loss. Urbano *et al*¹² presented a case of a 64-year-old man with a subacute ischaemic infarction on brain MRI. He was originally discharged on anticoagulation but was readmitted within 3 weeks with symptoms of TIA. An US Doppler suggested a floating thrombus and he underwent an emergency endarterectomy. Sallustio *et al*¹³ described the use of heparin as controversial in a patient with a floating thrombus and evidence of ischaemic stroke. Following review of 145 cases in which both medical and surgical management have been used Bhatti *et al*³ suggested neither was clearly superior.

The most common cause of carotid artery thrombosis is atherosclerotic disease. Extracranial cerebrovascular injury is believed to be an important cause of neurological injury in patients who have suffered blunt trauma resulting in an embolic event.¹⁴

Thrombosis was identified as a complication of cancer by Trousseau in 1865. Arterial and, more commonly, venous thrombosis is a frequent complication of cancer and sometimes a harbinger of occult cancer.¹⁰

It is important to do 'global' coagulation testing in patients with compound presentations to identify coexisting plasma hypercoagulability which may lead to spontaneous thrombosis.¹⁵

In our case despite no initial aetiology being found we suggest that his undiagnosed oesophageal carcinoma (diagnosed 5 months after initial presentation) could have been responsible for a hypercoagulability state giving an increased risk of thrombosis and leading to the thrombus in the CCA.

Most primary malignant neoplasms of the oesophagus are squamous cell carcinoma and adenocarcinoma. Primary neuroendocrine carcinoma of the oesophagus is very rare representing 1–2.8% of oesophageal cancer cases¹⁶

Gastrointestinal cancers are associated with a high incidence of thromboembolic events. In a review of over 1 million Medicare patients hospitalised with a diagnosis of malignancy, gastrointestinal cancers (pancreas, stomach, liver, colon and rectum) were among the top 10 cancers with the highest rate of deep vein thrombosis (DVT) or pulmonary embolism (PE). Oesophageal cancer had a DVT/PE rate of 43 per 10 000 which is lower than other gastrointestinal cancers.¹⁷

A large retrospective study¹⁸ and an extensive systematic review¹⁹ showed thromboembolic events are important predictors of cancer. Cancer in these populations was diagnosed within a year in the majority of patients. Either premalignant change promotes thrombosis, or cancer and thrombosis share common risk factors. Cancer screening in patients without identifiable risk factors for thrombosis could be helpful for early detection, diagnosis and management of cancer.^{18 19}

Learning points

- ▶ Spontaneous carotid artery thrombosis is a rare condition.
- ▶ Medical management with regular follow-up under the multidisciplinary team is likely to be safe and effective.
- ▶ Follow-up for carotid free floating thrombosis can be with either CT angiogram or ultrasound duplex.
- ▶ Aetiology may not be immediately obvious and will require extensive investigation.
- ▶ Cancer screening in patients without identifiable risk factors for thrombosis could be helpful for early detection, diagnosis and management of cancer.

Contributors RG did a literature review on free floating carotid thrombus including risks and management of the condition. RG reviewed the case notes and patient imaging. RG did a literature review on oesophageal cancer and thrombosis. RG discussed the information with the vascular consultant and radiology consultant before writing the case report. MB provided help with all areas of patient data collection, discussion of the literature and editing following comments.

Competing interests None.

Patient consent Obtained.

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