Reminder of important clinical lesson

Carotid artery dissection causing hypoglossal nerve palsy

Elliot Epstein,¹ Muhammed Azeem Khan,² David Francis,³ Priyo Sada,⁴ Makarand Thuse⁴¹Stroke Medicine, Walsall Manor Hospital, Walsall, UK;²Stroke Medicine, Manor Hospital, Walsall, UK;³Neurology Department, Manor Hospital, Walsall, UK;⁴Imaging Department, Manor Hospital, Walsall, UKCorrespondence to Dr Elliot Epstein, elliott.epstein@walsallhealthcare.nhs.uk**Summary**

A 45-year-old man was admitted with a 4 day history of right facial pain and on examination, there was atrophy of the right side of the tongue. Magnetic resonance angiography demonstrated carotid artery dissection and aspirin was commenced.

BACKGROUND

Acute onset of unilateral facial pain is an important symptom of carotid artery dissection. If suspected non-invasive imaging should be requested, for example, CT angiography (CTA) or magnetic resonance angiography (MRA).

This case is a reminder that this condition should be suspected in the absence of trauma.

CASE PRESENTATION

A 45-year-old man was admitted with a 4 day history of slurred speech, right-sided ear ache, right facial pain and difficulty swallowing. He also had gradual onset of difficulty moving his tongue. Ten days before, he stated that he developed flu like symptoms and a dry cough. There was no significant medical history and he was taking no medication.

On examination, there was atrophy of the right side of the tongue (figure 1) but no other focal neurological deficit. There was no evidence of Horner's syndrome.

INVESTIGATIONS

Initially unenhanced CT brain scan was performed and was reported as normal. T1 and T2 weighed MRI brain scan was also reported as normal (images not shown). MRA of the carotid artery showed evidence of localised dissection and mural haematoma (figures 2 and 3). Urea and electrolytes, liver function tests and full blood count were all unremarkable. 12 lead resting ECG showed sinus rhythm and no abnormalities.

DIFFERENTIAL DIAGNOSIS

In view of ear pain, otitis media was initially suspected; however, auroscopy was unremarkable. The differential diagnosis includes trigeminal neuralgia.

TREATMENT

The patient was given aspirin and discharged.

OUTCOME AND FOLLOW-UP

Upon follow-up 2 months later the patient reported that speech had improved but was not back to normal.

DISCUSSION

Carotid artery dissection is thought to be a consequence of a tear in the tunica intima, resulting in an intramural haematoma and creation of a false lumen.¹ Thrombus formation and distal embolisation may lead to ischaemic stroke.¹ Alternatively, the dissection plane separates the tunica media from the tunica adventitia, resulting in aneurysmal dilatation.¹ This may result in compression of neighbouring structures, for example lower cranial nerves.^{1–4} The XII (hypoglossal) nerve passes close to the carotid artery hence may be compressed in carotid artery dissection, leading to hypoglossal nerve palsy.^{2–4}

Carotid artery dissection is thought to be an uncommon cause of stroke; however, with advanced imaging techniques the number of recorded cases may rise.¹ Carotid artery dissection accounts for a high proportion of stroke in younger people.¹

Carotid artery dissection is frequently associated with neck trauma, for example, following a road traffic accident or assault.¹ Conversely the trauma may be mild, for example, coughing, sneezing, hiccups or neck manipulation.¹ Grau *et al* postulate that there is a link with carotid artery dissection and infection, such as upper respiratory tract

Figure 1 Atrophy of the right side of the tongue due to hypoglossal nerve palsy.

Figure 2 Magnetic resonance time of flight image of brain. At this level, the right carotid artery has a crescent shaped appearance (arrow). This is consistent with intramural haematoma consequent upon dissection of the right carotid artery (arrow).

infection.⁵ Connective tissue disease is sometimes implicated; however, not infrequently, no cause is apparent.¹ In this patient it is postulated that coughing or infection may have triggered the carotid artery dissection.

The onset of symptoms may be non-specific hence a high index of suspicion is required. In the history it is important to enquire about recent trauma. The patient may complain of ipsilateral facial and head pain.^{1-4,6} On examination, Horner's syndrome may be present and lower cranial nerves may be involved.^{1,6} There may be other evidence of focal neurological deficit.¹

CT brain scan is frequently the first-line choice of imaging in patients with suspected stroke⁶; however, is unlikely to show evidence of carotid artery dissection.

Carotid Doppler is frequently requested in patients with suspected ischaemic stroke⁶ and may detect abnormal flow patterns in patients with carotid artery dissection.¹ For this patient, carotid artery dissection was strongly suspected and consequently MRA requested. The clinicians therefore considered carotid Doppler unnecessary.

If carotid artery dissection is suspected MRA or CTA should be considered⁶ and these are both non-invasive imaging modalities. The combination of axial non-contrast non-fat-suppressed T1-weighted, fat-suppressed T1-weighted,¹ and T2-weighted spin-echo MRI is the method of choice

Figure 3 Magnetic resonance angiography of carotid artery. The intramural haematoma causes narrowing of the lumen of the carotid artery (arrow).

in identifying an intramural hematoma. Fat-suppressed images were not performed for this patient as the imaging department considered this not necessary to reach a diagnosis (personal communication imaging department).

The Royal College of Physicians stroke guidelines support the use of anticoagulation or antiplatelet therapy in the treatment of carotid artery dissection⁶ and the final choice is usually made by the attending physician. Schievink¹ recommends anticoagulation as the first line treatment of carotid artery dissection; however, there are no randomised controlled trials supporting this. Schievink¹ acknowledges that antiplatelet therapy is a reasonable alternative to anticoagulation if there are no signs of ischaemia. In this case the patient had mild residual neurological signs and aspirin was chosen in preference to anticoagulation.

The authors are interested that atrophy of the tongue occurred over the course of a few days. Usually muscle atrophy develops over weeks or months following the initial insult. Case reports have suggested that signs of hypoglossal nerve palsy may develop within 6 days^{3,7,8}; therefore, it is conceivable that signs of atrophy of the tongue may occur more rapidly than previously thought.

This is a reminder of an important clinical lesson. The presence of ipsilateral facial pain of recent onset should prompt consideration of carotid artery dissection. A careful neurological examination should be undertaken and in particular it is important to identify Horner's syndrome, lower cranial nerve palsies or other focal neurological deficit. There are other case reports of XII nerve palsy as a consequence of carotid artery dissection²⁻⁴; however, this is a rare phenomenon and this case serves as a reminder for physicians of the need to recognise and treat this important condition.

Learning points

- ▶ Acute onset of ipsilateral facial pain, with associated lower cranial nerve palsies, should prompt consideration of carotid artery dissection.
- ▶ If carotid artery dissection is suspected then MRA or CTA should be considered.

Competing interests None.

Patient consent Obtained.

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Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Epstein E, Khan MA, Francis D, Sada P. Carotid artery dissection causing hypoglossal nerve palsy. *BMJ Case Reports* 2012;10.1136/bcr.01.2012.5636, Published XXX

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