INTRODUCTION
This article reports a case of posterior circulation stroke due to vertebral artery dissection after a low energy whiplash injury in a 31 year old female.

Vertebral artery dissection is rare and often misdiagnosed pathology that can occur spontaneously or following trauma. This article focuses on traumatic dissections and discusses whether a systematic screening protocol for vertebral artery dissection is warranted following minor neck trauma.

Prevention of misdiagnosis by raising awareness for this rare complication can improve outcome.

of this case is that common whiplash injuries without serious initial complications can result in sudden onset stroke days to weeks post-trauma without any warning signs.

CASE REPORT
A 31 year old female came to the emergency department with mild cervical pain. While suffering from headaches of nausea. There were no neurological deficits, there were no signs of visual impairment or vertigo. Standard radiographs (antero-posterior, lateral and oblique) of the cervical spine were normal.

Ten days after the initial trauma she had an acute episode of vertigo and nausea, followed by a short loss of consciousness. She mentioned a tension-like frontal headache and photophobia. Her speech appeared dysarthric and impaired difficulty with motor coordination was observed. Other neurological abnormalities included numbness over the left side of the body, decreased strength in the left arm and spontaneous left-sided horizonto-rotatory nystagmus.

Subsequent MRI showed dissection of the left vertebral artery (VAD) causing ischemia of the left cerebellum.

The patient were prescribed anticoagulation therapy for 6 months. She was transferred for rehabilitation to a specialized center where intensive physical therapy was started. 12 months after she was diagnosed with VAD she still suffers from nausea, vertigo and is easily fatigued. A remaining coordination deficit. MRI, 5 months after initial trauma, showed no signs of recanalization.

DISCUSSION
In the case of whiplash trauma neck pain, stiffness and headache are the most common symptoms as was the case in our patient. Patients can also present with dizziness, paraesthesia or memory and concentration problems which makes it harder to differentiate from neurological pathologies.

In young patients (age 15 to 49) cervical dissection is the cause of stroke in approximately 15%–20%. Dissections are spontaneous in two-thirds of all cases and posttraumatic in one-third. Spontaneous dissections occur most often in older populations while traumatic dissections are frequent in younger patients. They cause tears in the intima and inner media of the arterial wall whereby the blood flow creates a false lumen in this space. Increased blood flow in the false lumen causes stenosis or even complete occlusion of the true lumen.

However, most strokes due to dissection are caused by thromboembolism. When the dissection causes complete occlusion of the vessel the blood flow slows and allows for formation of clots which cannot move distantly due to obstruction of the vessel. Days to months later the process of recanalization is initiated and the blood clot can travel distally and cause ischaemia. This also explains the delayed onset of symptoms. In our case the patient developed a stroke 10 days after initial trauma. Time until stroke varies from immediately following trauma to 4 months later. It is not possible to predict if a dissection is present without angiographic imaging.

Even if dissections are present they will not necessarily lead to stroke due to strong collateral circulation provided by the Circle of Willis.

The true incidence of post-traumatic vertebral and carotid injuries is unknown. Studies suggest that vertebral artery dissection occurs in approximately 15 per 1 million. However patients with whiplash injury have a much higher incidence of cervical artery dissection. Different studies suggest incidences ranging from 0.01% to 0.67% following blunt trauma. Incidences for minor blunt trauma such as whiplash injuries are unknown. VAD are more common than previously thought due to their often asymptomatic nature. The vertebrobasilar artery supplies blood to the brain stem, cerebellum, occipital lobes, posterior temporal lobes and the thalamus. Of primary importance in diagnosis is evaluation of patient history and neurological examination of the patient. If stroke or TIA is suspected patients should undergo neuroimaging. For the posterior circulation MRI is preferred over computed tomography (CT) for visualising the infarction, since the latter has less complete coverage. CT angiography is also useful in identifying and differentiating from neurological pathologies.

Even if dissections are present they will not necessarily lead to stroke due to strong collateral circulation provided by the Circle of Willis.

Treatment for vertebrobasilar disease has not been evaluated in a randomized trial thus the same guidelines are used for carotid artery disease. Anticoagulation is employed for a short period of time, usually 3-6 months. Most dissections heal within 2-3 months with more than 90% resolution of the stenosis.

CONCLUSION
Whiplash is a frequent diagnosis made by emergency room doctors, primary care doctors and orthopaedic surgeons. The pathology is oftentimes benign and patients are encouraged to start mobilisation immediately.

Complications such as vertebral artery dissection can only be suspected if there is an aberrant neurological examination. However this often manifests itself days to weeks after the initial trauma. At the time of diagnosis there is most often no clinical sign of dissection which raises the question whether screening of the vertebral artery is necessary following every whiplash injury.

Unfortunately this is not a condition that can be prevented or predicted since not every dissection leads to stroke. CT angiography for the posterior circulation should be considered in patients with pacemakers, metallic foreign objects and claustrophobia, all of which are not compatible with MRI. Magnetic resonance angiography (MRA) or CT angiography can be used to identify the location and extent of occlusion in the posterior circulation.

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This article reports a case of posterior circulation stroke due to vertebral artery dissection after a low energy whiplash injury in a 31 year old female. Vertebral artery dissection is rare and often misdiagnosed pathology that can occur spontaneously or following trauma. This article focuses on traumatic dissections and discusses whether a systematic screening protocol for vertebral artery dissection is warranted following minor neck trauma.

Prevention of misdiagnosis by raising awareness for this rare complication can improve outcome. This case is that common whiplash injuries without serious initial complications can result in sudden onset stroke days to weeks post-trauma without any warning signs.

CASE REPORT

A 31 year old female came to the emergency department with mild cervical pain. While dancing on Rock Werchter festival, she slipped and fell on her knees. The clinical examination revealed muscular tenderness in the posterior cervical region. At this time she did not suffer from headaches or nausea. There were no signs of visual impairment or vertigo. Standard radiographs (antero-posterior, lateral and oblique) of the cervical spine were normal.

The patient was diagnosed with a minor whiplash injury. Ten days after the initial trauma she had an acute episode of vertigo and nausea, followed by a short loss of consciousness. She mentioned a tension-like frontal headache and photophobia.

Subsequent MRI showed dissection of the left vertebral artery (VAD) causing ischemia of the left cerebellum.

In young patients (age 15 to 49) cervical dissection is the cause of stroke in approximately 15%-20%. Dissections are spontaneous in two-thirds of all cases and posttraumatic in one-third. Spontaneous dissections occur most often in older populations while traumatic dissections are frequent in younger patients. They cause tears in the intima and inner media of the arterial wall whereby the blood flow creates a false lumen. Increased blood flow in the false lumen causes stenosis or even complete occlusion of the true lumen.

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Treatment for vertebrobasilar disease has not been evaluated in a randomized trial thus the same guidelines are used as for carotid artery disease. Anticoagulation is employed for a short period of time, usually 3-6 months. Most dissections heal within 2-3 months with more than 90% resolution of the stenosis.

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In the case of whiplash trauma neck pain, stiffness and headache are the most common symptoms as was the case in our patient. Patients can also present with dizziness, parasthesia or memory and concentration problems which makes it harder to differentiate from neurological pathologies.

In young patients (age 15 to 49) cervical dissection is the cause of stroke in approximately 15%-20%. Dissections are spontaneous in two-thirds of all cases and posttraumatic in one-third. Spontaneous dissections occur most often in older populations while traumatic dissections are frequent in younger patients. They cause tears in the intima and inner media of the arterial wall whereby the blood flow creates a false lumen in this space. Increased blood flow in the false lumen causes stenosis or even complete occlusion of the true lumen.

Unfortunately this is not a condition that can be prevented or predicted since not every dissection leads to stroke. CT angiography or MRI are the most sensitive examinations for detection of VAD but would raise the cost of treatment significantly if every patient with whiplash was screened.

We suggest informing patient of warning signs such as non-diminishing pain after 7-10 days or signs of posterior circulation stroke: nausea, vomiting, vertigo, parasthesia. If any of these symptoms develop the patient must immediately return to the hospital for further investigations and treatment.

CONCLUSION

Whiplash is a frequent diagnosis made by emergency room doctors, primary care doctors and orthopaedic surgeons. The pathology is most often benign and patients are encouraged to start mobilisation immediately.

Complications such as vertebral artery dissection can only be suspected if there is an aberrant neurological examination. However this often manifests itself days to weeks after the initial trauma. At the time of diagnosis there is most often no clinical sign of dissection which raises the question whether screening of the vertebral artery is necessary following every whiplash injury.

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