



Stroke Research Directory

Carotid Dissection Associated With a Handheld Electric Massager “Stroke”

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Abstract and Introduction

Abstract

The extracranial internal carotid artery (ICA) is susceptible to injury and dissection from external shear forces applied to the neck. Traumatic ICA dissection usually occurs in the setting of a sudden, high amplitude force causing significant distortion of surrounding soft tissues. Weaker, repetitive forces applied for longer intervals may also pose a risk for ICA dissection. A 38-year-old woman with no significant stroke risk factors had sudden onset of severe dysarthria and left hemiparesis several days after receiving an approximately 20-minute neck massage with a handheld electric massager. The moving elements consisted of two approximately 2-cm-diameter spheres that percuss the skin with low amplitude and high frequency. Magnetic resonance imaging and angiography demonstrated acute infarction in the right middle cerebral artery territory and dissection of the extracranial right ICA. Handheld electric massager units may cause ICA dissection and disabling stroke.

Introduction

Carotid and vertebral artery dissection account for 10% to 25% of strokes in otherwise low-risk patients younger than 45 years of age,[1] and outcome is generally worse with dissection occlusion than with atherosclerotic occlusion.[2] Not surprisingly, carotid dissection has been associated with many sources of nonpenetrating neck trauma, including strangling, seatbelts, whiplash, horse hoof,[3] and softballs.[4] Even presumably safe therapeutic interventions such as chiropractic manipulation have on rare occasions been associated with carotid or vertebral artery dissection,[5,6] and two cases of sympathectomy without stroke caused by internal carotid artery (ICA) dissection were attributed to neck massage with a shiatsu-type electric massage chair.[7] We report a case of ICA dissection and massive stroke associated with use of a handheld electric massager.

Case Report

A 38-year-old woman with a history significant only for migraine headaches and smoking 3 cigarettes per day for 15 years had a stereotypical unilateral right-sided headache with pain extending into the neck. Nonprescription analgesics provided little relief. After several days of continuing pain, she underwent an approximately 20-minute neck massage with a handheld electric massager consisting of two spherical massage elements about 2 cm in diameter that percuss the skin with low amplitude and high frequency (3,000 pulses/min). A friend without any medical training held the device at the area of greatest discomfort, described as being below the angle of the jaw and over the sternocleidomastoid muscle. Five days later, the patient awoke from a nap with dysarthria and severe left-sided hemiparesis. There was no evidence of Horner syndrome. Neuroimaging confirmed a large ischemic stroke in the right middle cerebral artery territory (Figure, left). Angiography demonstrated dissection of the right extracranial ICA (Figure, right). The left ICA was tortuous, but there was no evidence of fibromuscular dysplasia, vasculitis, or any other vascular abnormality. Echocardiography was unremarkable, and the erythrocyte sedimentation rate was 6 mm/h.



Figure 1. Magnetic resonance image and carotid angiogram indicating acute right middle cerebral artery stroke and right internal carotid artery dissection. Left, trace of diffusion-weighted MR axial image of the brain at the level of the basal ganglia. There is a large wedge-shaped area of restricted diffusion in the right hemisphere consistent with a middle cerebral artery infarction. Right, lateral view of right common carotid angiogram. There is a rapid tapering of the internal carotid branch beginning approximately 2 cm distal to the bifurcation. There is no distal run-off, consistent with occlusion at a site where dissection is common.

Discussion

Between the carotid bulb and base of the skull, the ICA is vulnerable to traumatic injury from force applied to the neck. In particular, shear forces can tear the intimal wall and precipitate dissection.[1] The shiatsu-type electric massage chair implicated in two prior cases of ICA dissection had a massage element fixed at the level of the neck that moved slowly but with considerable excursion to provide a deep, pressure point massage.[7] In the present case, two spherical elements pulsated at low amplitude and high frequency, with the device applied to a limited region of the neck corresponding well to the location of the right ICA. The 5-day interval between the massage and the onset of symptoms is not unusual in traumatic ICA dissection,[7] and there were no other risk factors for carotid injury. This case underscores the vulnerability of the extracranial carotid artery to traumatic injury from relatively small but repetitive and sustained shearing forces.

Neck pain is common, as are many styles of electric massagers. A limited review of web sites selling handheld electric massagers revealed several photographs showing the devices being applied to the lateral neck region, although instruction manuals generally advise to keep the unit moving and caution against holding it in any one location for more than a few minutes. Unfortunately, these widely used devices are generally considered harmless, and such instructions are easily ignored. Perhaps a specific warning of the risk of stroke and injury to critical blood vessels would prompt more cautious use of electric massagers on the neck. Tragically, in this instance a device intended to relieve pain appears to have resulted in a disabling stroke in an otherwise healthy young woman.

Conclusion

A middle-aged woman with no significant stroke risk factors had an ICA dissection and large middle cerebral artery ischemic stroke in association with use of a handheld electric massager on her neck. The massager consisted of two spherical elements that percuss the skin with low amplitude but very high frequency. Used around the world for treatment of muscle tension and ache, electric massagers can have devastating neurologic consequences when used improperly on the neck.

References

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