Chiropractic Sympathectomy:

Carotid Artery Dissection with Oculosympathetic Palsy after Chiropractic Manipulation of the Neck

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Abstract

The association between carotid artery dissection and oculosympathetic palsy is well-known. However, the occurence of this combination with chiropractic manipulation of the cervical neck is rare. We describe the case of a 54-year-old Caucasian American male who underwent cervical manipulation for neck pain. The following day he noticed drooping of his left eyelid, with an unequal pupil size. Imaging later confirmed carotid artery dissection. Only three previous cases (one from the United States), of an association between carotid artery dissection and chiropractic sympathectomy (oculosympathetic palsy after chiropractic manipulation of the neck) have been reported. Pictures of the oculosympathetic palsy, computed tomography of the head and magnetic resonance imaging of the dissection are presented.

Key Words: Chiropractic manipulation, carotid artery dissection, sympathectomy, oculosympathetic palsy.

Introduction

THE ASSOCIATION between cervical manipulation and carotid arterial dissection has been reported several times in the literature, with increasing frequency over the last twenty years. This coincides with the increasing popularity of chiropractic treatment (1, 2).

Although the general consensus is that the overall complication rate from cervical manipulation is low, growing controversy has occurred over the risks and benefits of manipulation of the neck (3). Fatal complications have been described in the literature, and complications have been reported with chiropractic cervical manipulation (4–7).

This report documents a case of oculosympathetic palsy with carotid artery dissection after chiropractic manipulation of the neck. Only three previous cases have been reported in the literature.

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Case Report

A 56-year-old Caucasian male with medical history of borderline hypertension (managed without medications) had back neck pain for three days prior to his admission.

The patient went to see a chiropractor three days prior to admission to the hospital, for treatment of this neck pain. This pain was 8/10 in intensity, dull to throbbing in character, located at the left para-cervical level, radiating to the upper back of his neck and aggravated when he moved his neck sideways. After chiropractic treatment of this pain with repeated neck movements, the pain eased only slightly.

The following morning, he woke up to find his left eyelid drooping. That evening his wife noticed that his pupils were unequal in size, the right one larger than the left. There was minimal blurring of his left eye vision, which was transient, lasting a few hours and resolving spontaneously. By this time, his neck pain had improved markedly.

He denied any other symptoms, such as weakness, numbness, tingling and changes in his speech, bowel or bladder functions.

On examination, both pupils were reactive to light and accommodation, with the right one reacting to light from 3–2.5 mm and the left one from

1.5 – 1 mm. Mid-position lid droop of the left eye was also noticed (Fig. 1).

Mild para-spinal tenderness was noticed on the back of his left lower neck. According to neurological examination, the cranial nerves, face and extremities were normal. Plain x-rays of the cervical spine and an initial admission non-contrast computed tomography (CT) of the head (Fig. 2) also showed normal features. However, results of the magnetic resonant imaging (MRI), (Figs. 3 and 4) revealed left carotid artery dissection at the levels of C1 and C2 with weak intensity of the left internal carotid artery.

The patient was admitted to the hospital and anticoagulated with heparin, which was later changed to warfarin. He was discharged without any further complications. He remained asymptomatic during his three-month follow-up, with resolution of his dissection revealed by repeated MRI.

Fig. 1. Left eye droop of the patient, with left pupil constricted more than the right.

Fig. 2. CT scan of the head with normal findings.

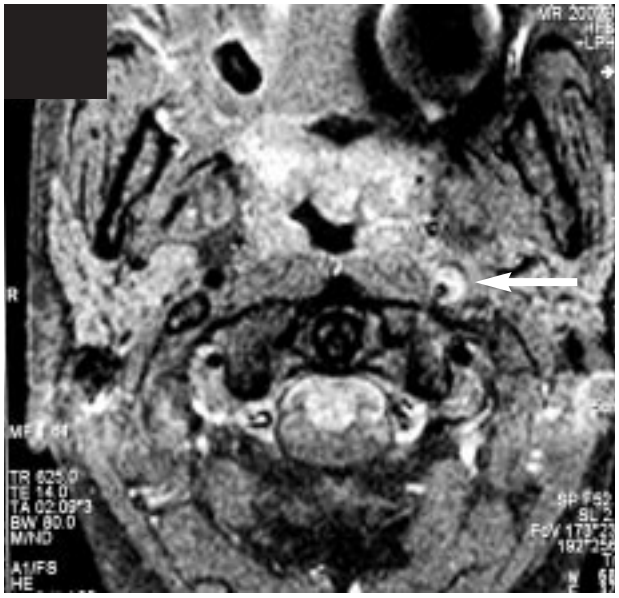

Fig. 3. MRI cross section showing left-carotid dissection (arrow).

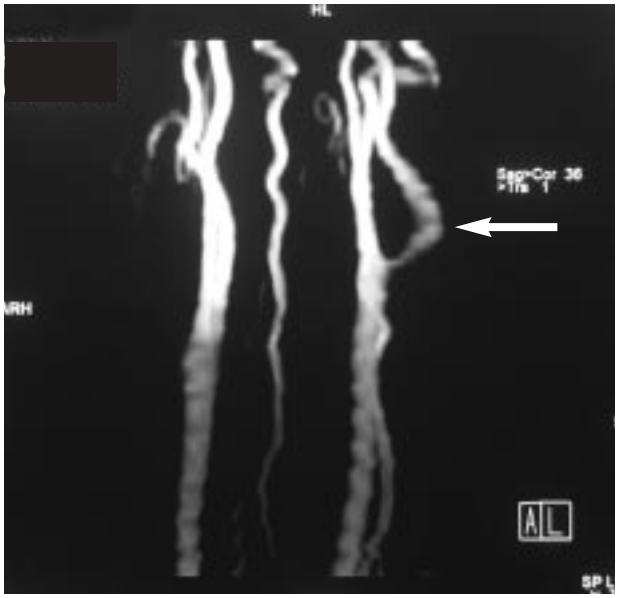

Fig. 4. MRI sagittal section showing left-carotid dissection (arrow).

Discussion

Carotid artery dissection typically presents with pain on one side of the face or neck and with partial Horner's syndrome (oculosympathetic palsy) (8 – 12). The sympathetic lesion of oculosympathetic palsy is post-ganglionic. This dissection, if progressive, results in cerebral or retinal ischemia. Recognition of this triad (pain, Horner's syndrome and ischemia) is critical, though it occurs in only one-third of the patients. Prompt recognition can lead to early diagnosis, treatment

and prevention of progression of symptoms (13, 14).

The sympathetic pathways are composed of three neuron chains. The first-order neuron (hypothalamus to level of C8–T2) synapses with the second-order neuron (sympathetic chain in the neck to the level of C2 in the posterior carotid sheath). From here, the third order neuron ascends along the internal carotid artery into the skull and eye, ultimately dilating the papillary sphincter muscles. The cervical sympathetic trunk is embedded in the posterior carotid sheath, a condensation of deep cervical fascia with the internal jugular vein, vagus nerve, and common and internal carotid arteries. It is here that the sympathetic chain is vulnerable to injury from the carotid artery.

Carotid artery dissection can be spontaneous or it can be caused by trauma. It is characterized by damage to the tunica media by an intimal tear (4, 12–17). Brandt and Grond-Ginsbach showed it to be more prevalent in individuals with abnormal collagen bundles on dermal biopsies and that it had a genetic predisposition (18). Others have shown that vomiting and blunt injury can cause carotid dissection (19, 20).

Daniel Palmer, in 1895, reported one of the first beneficial effects of cervical manipulation when he described the resulting partial relief of a patient's deafness (21). It was not until 1927 that the first case of vascular accident was described with cervical manipulation, and in 1945 the first case of spinal cord injury was reported (22–25). Although cervical manipulation is generally considered to be safe, complications range from transient discomfort (20, 26) to dissection of the vertebral artery (27) or internal carotid artery (3), stroke (28, 29) and even death (2, 30–33). Chiropractic manipulation of the cervical spine is associated more frequently with vertebral artery dissection than with cervical artery dissection (5, 31, 34).

Grayson, in 1987, reported the first case of Horner's syndrome after manipulation of the neck (35). Since then, two other cases have been reported (36, 37). In the second and third cases the symptoms of the patients were noticed several days after chiropractic manipulation of the neck. However, in our case and Grayson's case, the resulting sympathectomy (chiropractic sympathectomy) was noticed the following day, suggesting its immediate association with the chiropractic manipulation.

To prevent thromboembolic complications, anticoagulation with intravenous heparin followed by warfarin is usually recommended for cervical artery dissection, unless there are contraindications (13, 14, 17). No randomized trials have been reported for the validity of such treatment or for comparing antiplatelets with anticoagulation (38). Still the target range of international normalization ratio (INR) is considered between 2 and 3, with treatment for three to six months. Others suggest repeating the magnetic resonance angiogram after three months and looking for luminal irregularities. Further treatment with anticoagulation can be continued or a switch to antiplatelet therapy can be made subsequently. Surgery with balloon angioplasty or stenting is recommended in cases of failed medical treatment (39, 40).

Conclusion

Patients, chiropractors and physicians should all be aware of potential neurological adverse outcomes following cervical manipulation. Early recognition of these adverse effects is critical and prompt treatment important. We also suggest that patients with neck pain be examined and neuro-imaged in order to exclude possible underlying pathologies before receiving any manipulation of the neck.

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