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A "crick" in the neck followed by massage offered him a stroke: An uncommon case of vertebral artery dissection

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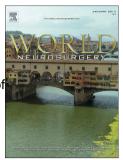
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A "crick" in the neck followed by massage offered him a stroke: An uncommon case of

vertebral artery dissection

Abstract:

We present an unusual case of vertebral artery dissection in a 30-year-old male patient

following an episode of neck massage. He developed headache, nausea, vomiting, blurred

vision, diplopia, dizziness, and ataxia following the procedure. We also discuss a review of

the pathology, diagnosis, symptomatology, treatment, prognosis, and occurrence of this rare

entity.

Keywords: Vertebral artery dissection; stroke; neck massage; aneurysm.

Introduction:

Stroke is a rare condition in the young adult population, with less than 5% of all strokes

occurring in adults younger than 45 years. Vertebral artery dissection (VAD) is an important

cause of stroke in the young and combined with cerebral arterial dissections, it may account

for 25 to 30 % of ischemic strokes in patients aged below 50 years. ^{1,2} We report on a patient

who developed posterior circulation symptoms following neck massage at the parlour, who

on further evaluation was also found harbouring an asymptomatic contralateral side

cavernous segment aneurysm. Literature review revealed only one such previously reported

case and the current case demonstrates the hazards associated with neck massage and the

potential for good outcomes in these patients if timely intervention is provided.

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Case report:

A 30-year-old male with no significant past medical history was seen in our outpatient department with complaints of headache, nausea, vomiting, blurred vision, diplopia, dizziness, and ataxia for 2 days. These symptoms started after he got a haircut along with a complimentary head and neck massage at a price that was too irresistible! But the 30-minute session proved costly for the patient. The salon employee massaged the patient's neck till he heard a crack in his neck. Instead of being alarmed, he thought it was an indication of a "successful" massage. When he started to walk back home, he realized something was amiss. He felt uneasy, dizzy and could not walk steadily. When his symptoms started increasing, he visited a local physician where he was given symptomatic treatment and then referred to our hospital.

When we examined the patient, he was conscious but drowsy. His temperature was 98F; heart rate, 78 beats per minute; blood pressure, 150/90 mm Hg; and respiratory rate, 20 breaths per minute. He was disoriented but followed simple commands. Nystagmus to the left was evident. Left upper and lower limb weakness was present (power 4-/5) with hyperreflexia. Cardiac, respiratory and abdominal examination as well as complete blood counts, electrolytes, renal and liver function tests were all within normal limits.

In view of acute onset neck pain following neck manipulation and progressive nature of the symptoms and his disoriented state, a cerebrovascular event was suspected. He was shifted to intensive care unit and supportive measures initiated. Intravenous heparin therapy was started. Non-contrast computed tomography (CT) of the brain was obtained which revealed well-defined wedge-shaped area of hypodensity involving the left cerebellar hemisphere (**Fig. 1-A**). Magnetic imaging resonance (MRI) brain revealed T2/FLAIR hyperintensities with

restricted diffusion in the left cerebellum involving vermis and left infero-lateral cerebellar hemisphere suggestive of acute infarct (Fig. 1-B).

An urgent diagnostic cerebral angiogram was performed which revealed narrowing and dilatation of the V3 segment of the left vertebral artery with narrowing of the V4 segment, consistent with dissection. Distal flow was seen hampered (**Fig. 1-C**). Right internal carotid angiogram showed 9X8 mm cavernous segment aneurysm directed postero-inferiorly (**Fig. 1-D**). Rest of the vessels were normal.

The patient underwent coiling of the cavernous aneurysm and medical management with aspirin and clopidogrel. He responded to the treatment and 6 months after his initial angiogram, repeat angiography revealed that the injured left vertebral artery had undergone complete healing and there was no evidence of persistent vessel injury (**Fig. 1-E**). His medical therapy was discontinued at this time. He was advised refraining from any kind of neck massage practice or chiropractic services and other circumstances in which he may undergo forced neck manipulation.

Discussion:

In writing this case, the literature was searched to determine if neck massage has been published in relation to VAD. At present, it was determined that this is the second reported case of such association. In the previously reported case, the authors described eight cases of extracranial VAD, of them one had dissection following a neck massage. ⁸

VAD is a nontraumatic tear or disruption in the wall of the vertebral artery and comprises 2% of all ischemic strokes. ^{3,4} Recently, the incidence of VAD has increased, in part because of the higher use of modern diagnostic imaging studies rather than a true increase. ⁵ There is no clear sex predominance; however, women tend to develop this condition 5 years earlier than men. ³ Simultaneous damage of multiple vessels can occur in 30% of cases. ⁶ Vertebral artery

aneurysms and dissections are known complications of spinal manipulation procedures ⁷, however, dissection following a neck massage has rarely been described.

The extracranial vertebral artery is susceptible to dissection in 3 segments throughout its course: at its origin from the subclavian artery, through the spine within the intervertebral foramina, and at the dura when penetrating the cranium. ⁶ and this last segment is the most common location for dissection. ³ The risk for stroke following neck trauma/manipulation appears to be inherently dependent on the manipulation technique and the rotational forces applied to the neck. ⁹

Neurologic sequelae after VAD depend largely on the site of brain ischemia. Frequent patterns of ischemic brain damage are cerebellar infarction in the posterior inferior cerebellar artery territory and lateral medullary infarction. ³ Wallenberg syndrome may manifest as contralateral loss of pain and temperature sensation on the trunk with similar symptoms on the ipsilateral side of the face. ¹⁰ Other findings can include ipsilateral Horner syndrome as well as limb ataxia, vertigo, nystagmus, nausea, vomiting, and dysarthria. ¹¹

The diagnosis of vertebral artery dissection is usually established by MRI, MR or CT angiography but digital subtraction angiography is the gold standard for diagnosis. ⁶ Management of VAD focuses on antithrombotic therapy. Intravenous heparin infusion is commonly used in the acute phase followed by oral anticoagulation with warfarin for the next 3 months. ⁶ However, controversy does exist in the selection of treatment for VAD. A Cochrane review found no increased risk of ischemic events or intracranial bleeding with the use of either anticoagulants or antiplatelet agents. ¹²

Conclusion:

We describe a rare case of a young adult of VAD following neck massage who have no lifestyle disorders like diabetes or hypertension and who was fortunate enough to have survived the stroke. While the association between neck massage and VAD is rare, it has important clinical implications. Lack of proper training of the salon employees practicing neck massage especially in developing countries can be damaging. The association between these two entities implores further investigations to rule out VAD and stroke if a patient develops neck/occiptal pain, numbness and /or limb ataxia or weakness of limbs after the procedure. In our case, had it not been for timely diagnosis and treatment, the condition could have resulted in permanent disability or even death.

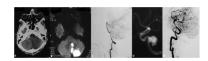
Figure Legends:

Fig. 1: A- Non-contrast CT brain showing hypodensity involving the left cerebellar hemisphere. **B-** DW-MRI brain showing acute infarct of the left cerebellum involving vermis and left infero-lateral cerebellar hemisphere. **C-** DSA brain showing narrowing and dilatation of the V3 segment of the left vertebral artery with narrowing of the V4 segment, consistent with dissection with poor distal flow. **D-** Right cavernous segment aneurysm directed postero-inferiorly. **E-** Cerebral angiogram 6-months after the episode showing complete healing of the left vertebral artery with good distal flow.

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Highlights:

- Vertebral artery dissection is an important cause of stroke in young.
- Inappropriate neck massage is an uncommon but important health hazard that may lead to vertebral artery dissection.
- Only one previously reported case of neck massage that lead to stroke following vertebral artery dissection.

VAD: Vertebral artery dissection

CT: Computed tomography

DSA: Digital subtraction angiography

