



## Vertebral Artery Dissection following Neck Massage

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### **Learning Objectives**

- Identify the risks and side effects of massage therapy
- Explain very severe and rare example.

### **Safety of Massage therapy**

People think of Massage therapy as safe therapy.

Of course, it mostly is

But things can go wrong or at least a bit sour.

### **What is Massage Therapy?**

Press, Rub, Manipulate of muscles and soft tissue

They most often use their hands and fingers

But may use forearms, elbow or feet

### **What are Massage Therapy Benefits?**

Relieve pain

Rehabilitate sport injuries

Reduce stress, increase relaxation

Address anxiety and Depression

Aid general wellness

### **What are Massage Side effects?**

Minor side effects are common like temporary pain, swelling, bruising

Post massage soreness and malaise PMSM

Sensitivity or Allergy to massage oil

### **What are Massage Therapy Risks?**

Serious side effects are extremely rare if used appropriately and provided by trained massage professionals.

- Severe headache,
- Fracture,
- Vertigo and Dizziness
- Rhabdomyolysis,
- Sensory injury from painful massage
- Radial nerve injury by aggressive massage of inner upper arm,
- Spinal Accessory nerve injury led to scapular sticking out and droopy shoulder, as a result of Trapezius muscle injury,
- Neck arteries are a little bit fragile and some poorly trained or incompetent therapist can cause two main injuries

1- Instability of upper cervical spine

2- Stroke caused by tearing of vertebral arteries

### **Case Presentation:**

37 Y/O Male, Philippine came to ER June 16/2019 at 9.00 AM complaining of:

- R limbs weakness 7.15 AM
- L side mild, dull, on/off chest pain, shoulder, L arm pain 2 days after massage,

Past Medical History: Migraine

Physical exam

R limbs strength normal

L shoulder tenderness

Muscle, L arm elevation weak

No sensory loss

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Normal Reflexes

Vital Signs:

BP=134/80, P=90, T=37.4, Sat =96%, RR=19

**Management:**

Neurologist informed that we have a case of Transient Ischemic Attack with chest pain

Agreed for admission

Given NS 500

Paracetamol 1000 mg IV

**CT Brain**

**INTERPRETATION:**

- ❖ No CT evidence intracranial hemorrhage.
- ❖ Posterior fossa arachnoid cyst/mega cisterna magna 22 mm.
- ❖ Asymmetry of para-sellar regions could be positional? Lesion further MRI/MRA is suggested.

**Investigations:**

**Admission**

- Guest admitted to ICU as a case of Transient Ischemic Attack after giving him Aspirin 300 mg
- ICU doctor informed advised for doing C Spine X Ray, not done
- Neurologist informed

**Hospital inpatient Course**

**16/06/2019**

- Review showed Stable hemodynamics and vitals.

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- Complain of Neck pain mainly right preauricular.
- Gradually progressed to Flaccid Tetraplegia over next 24hours.
- Weakness progressed from right leg to right arm and left arm and leg.
- Urine incontinence.

### **Hospital inpatient Course**

#### **Neurological examination**

- Well alert and oriented
- Normal speech and HMF.
- PERLA
- Fundoscopy Normal
- Cranial Nerves intact
- Motor system revealed Flaccid tetraplegia.
- Power of I/5 in Left and 0/5 in Right Upper and lower limbs.

### **Hospital inpatient Course**

#### **Neurological assessment**

- Diminished reflexes.
- Plantars response bilateral Upgoing.
- Sensory system revealed Impaired Pain and temperature sensations upto the level of the neck with Sensory level C5.
- Joint position and vibration sensations intact.

### **Differential Diagnosis??**

- Acute Cervical Myelopathy /Myelitis ?
- Demyelinating disease MS or Devic Disease ?
- Vertebrobasillar stroke ?

### **MRI/MRA Brain**

#### **Conclusion**

- No flow detected in the V3 and the proximal V4 segments of the right vertebral artery. Previous MRA done in April, 2019 shows patent and normal right vertebral artery.
- Findings are highly suggestive of recent occlusion of the V3 and the proximal V4 segments of the right vertebral artery (Thrombosis/ dissection).

### **MRI Cervical Spine**

#### **Conclusion**

- T2 bright signal intensity in the anterior aspect of the cervical cord opposite C2-3 through C7 vertebra. Swelling of the cord is also seen in the involved region.
- Localized loss of signal void of the right vertebral artery in T2-weighted images.
- In view of the given clinical data, findings are highly suggestive of anterior spinal artery infarction.

### **Final Diagnosis**

Anterior Spinal Cord infarction following Vertebral artery Dissection.

### **Hospital inpatient Course**

On 18/06/2019

#### **Specific treatment:**

- To improve spinal cord ischemia started Blood pressure augmentation with norepinephrine over 48 hours.
- Aspirin 100mg OD.
- DVT Prophylaxis LMWH
- Skin, bladder and bowel care.
- Regular Physiotherapy.

### **Hospital inpatient Course**

**On 25/06/2019**

- Insurance rejection
- Transferred to HMC Rehabilitation institute.
- Showed Improvement in muscle strength with power of 3/5 in Left and 1/5 in Right UE and LE.
- Discharged on Regular Aspirin 100mg OD.
- Physical therapy and rehabilitation.
- Follow up in Neurology Clinic.

### **Vertebral Artery Dissection**

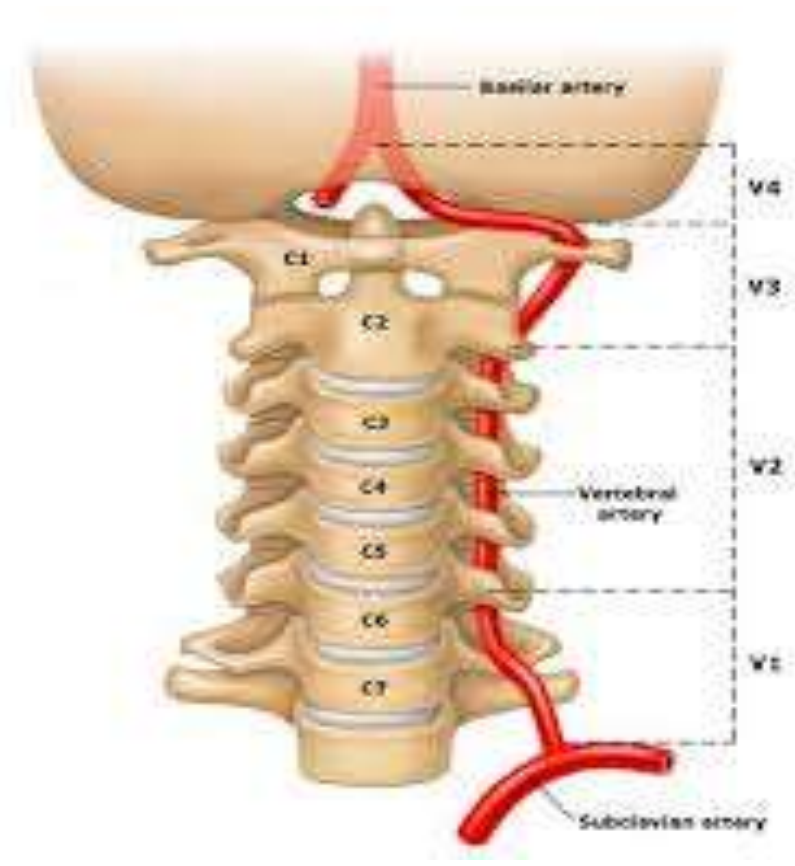
- Vertebral artery dissection is an increasingly recognized cause of stroke in patients younger than 45 years.
- Spontaneous vertebral artery dissection (VAD) is the term used to describe all cases that do not involve trauma as a precipitating factor.

### **Etiology:**

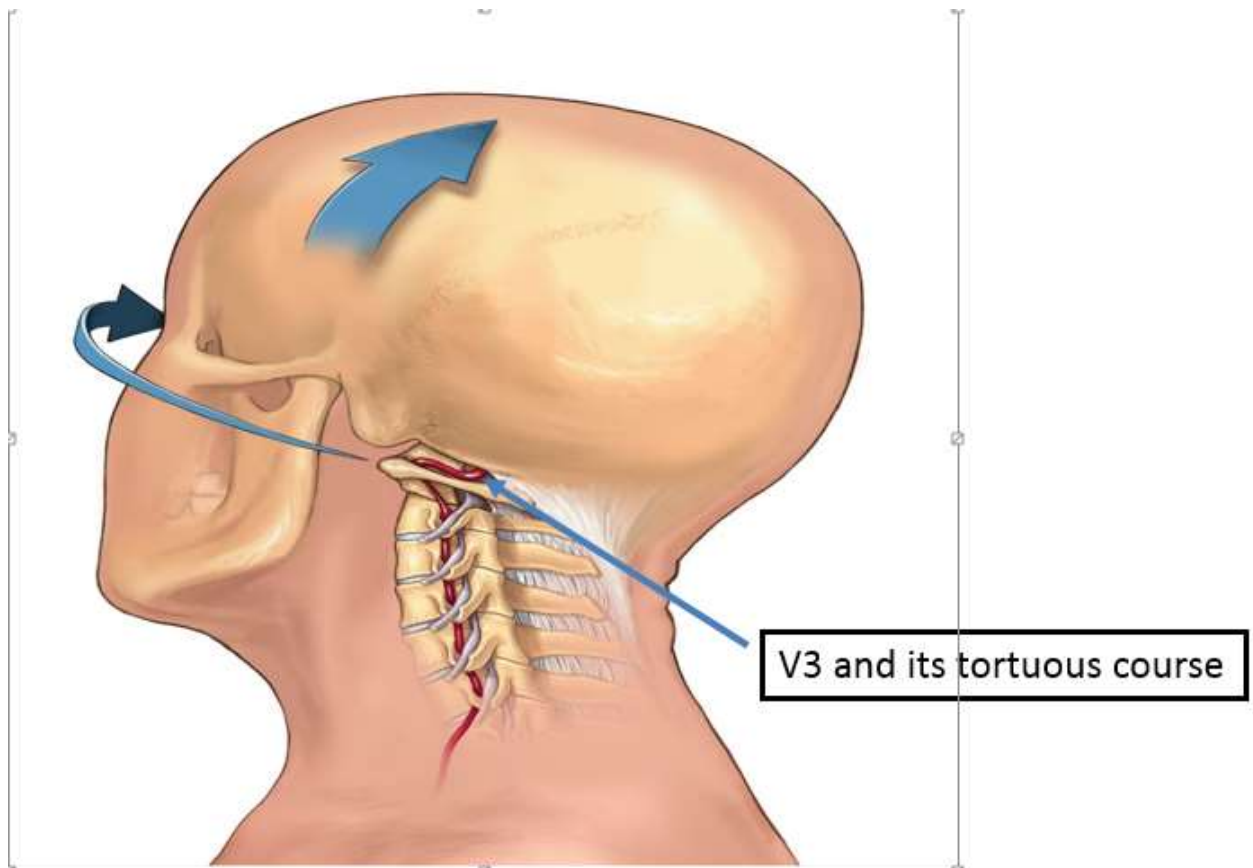
Common risk factors have been associated . These include the following:

- Cervical manipulation
- Vertebral artery hypoplasia
- Fibromuscular dysplasia
- Hypertension
- Nose blowing
- The VA run through the transverse foramina of C1-C6 vertebra.
- Four segments are recognized : the prevertebral segment (V1), cervical segment (V2), atlantal segment (V3), and intracranial segment (V4).
- The V3 segment is the most vulnerable segment and takes a tortuous course as it enters the skull base through the foramen magnum and exposed mainly on lateral rotation and lateral flexion of head.

- The V3 segment runs adjacent to the atlanto-axial junction (C1-C2) where most rotation occurs, is most susceptible to injury.







### **Clinical Presentation**

- Typical presentation is severe occipital headache and neck pain.
- Focal neurologic signs due to ischemia of the brainstem, cerebellum or spinal cord develop in 85% of patients.
- Latent period as long as 3 days between the onset of pain and the development of neurological symptoms can be seen.
- Most commonly reported neurological symptoms includes lateral medullary dysfunction (ie, Wallenberg syndrome).

### **Neuroimaging**

- MRI and MR Angiography
- CT and CT Angiography
- MR studies have the advantage of demonstrating the dissection, false lumen thrombus as well as the IS not usually seen early on the CT.

- Treatment
- Treatment is focused on reducing stroke episodes and damage from a distending artery.
- Aspirin and anticoagulation (heparin followed by warfarin) are equally effective in reducing the risk of further stroke or death.
- Anticoagulation may be relatively unsafe in presence of large stroke due to risk of hemorrhagic transformation.
- The data indicates that thrombolysis is safe, but its place in the treatment of VAD is uncertain.
- Surgical treatment includes Angioplasty and Stenting.
- Surgery carries a high risk of complications and only used in exceptional cases.

### **Anterior Spinal artery syndrome**

- Anterior spinal cord infarction is caused by ischemia of the anterior spinal artery.
- Resulting in loss of function of the anterior two-thirds of the spinal cord.
- The region affected includes the descending corticospinal tract, ascending spinothalamic tract, and autonomic fibers.
- The anterior spinal cord is at increased risk for infarction because it is supplied by the single anterior spinal artery, which has few collateral unlike the posterior spinal cord which is supplied by two posterior spinal arteries.

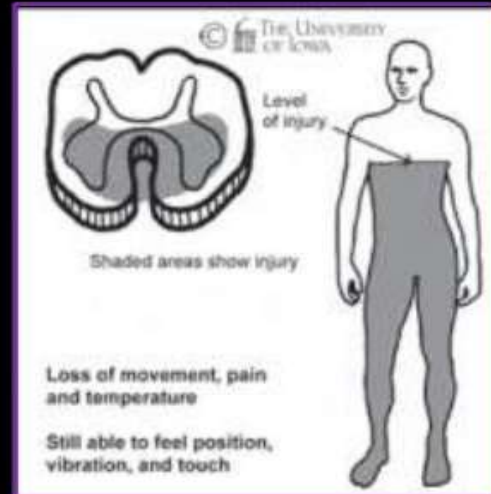
### **Clinical Presentation**

- Spinal cord infarction is usually marked by an acute onset, sudden and severe spinal (back) pain.
- Complete motor paralysis below the level of the lesion due to interruption of the corticospinal tract.
- Loss of pain and temperature sensation at and below the level of the lesion due to interruption of the spinothalamic tract.
- Retained proprioception and vibratory sensation due to intact dorsal column.

**Areflexia and urinary retention.**

## **ANTERIOR CORD SYNDROME**

- Sudden onset of paralysis (quadriparesis/paraparesis) below the level of lesion.
- Pain and temperature loss.
- Dorsal column is preserved.
- Prognosis is poor.



### **Etiologies**

- Aortic aneurysms
- Arterial Dissections
- Atherosclerosis.
- Vasculitis
- Acute disc herniation
- Cervical spondylosis

### **Diagnosis**

- Laboratory Studies

Routine CBC; fasting serum glucose; erythrocyte sedimentation rate (ESR)

Tests for vascular risk factors, especially diabetes mellitus, coagulopathies, and systemic lupus erythematosus and vasculitis.

- Imaging Studies

Spinal MRI is used to identify a mass or space-occupying lesion that is compressing the circulation of the spinal cord or is within the cord tissue .

## **Management**

### **Medical Treatment**

- The standard drug therapy is aspirin.
- This is based upon the consensus recommendation for acute treatment of ischemic stroke at any site.
- Rehabilitation

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