

Down the Rabbit Hole: Diagnosing Subclavian Steal Syndrome

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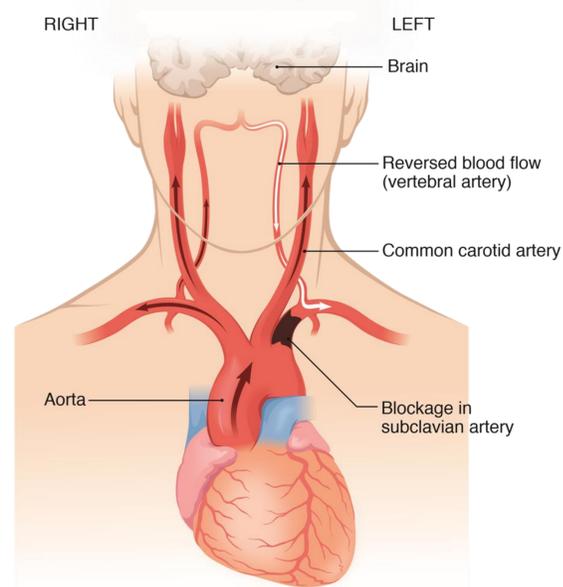


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Background

Subclavian steal syndrome (SSS) is a relatively rare condition with a reported prevalence of about 1-6% in the general population. Risk factors include increased age, sedentary lifestyle, smoking, hypertension, dyslipidemia, diabetes or family history of CV disease. Atherosclerosis is the primary culprit that manifests SSS, with blockages created within the subclavian or brachiocephalic artery. Patients present with vertigo, dizziness and syncope with possible arm claudication due to “stolen” blood flow from the vertebral artery distribution due to stenosis in the subclavian artery. On examination, a difference in brachial systolic blood pressure between the affected and normal arm of at least 15 mmHg can be noted. Concurrent palpation of both radial artery pulses may reveal a diminished amplitude and delay in arrival on the affected side. Diagnosis of SSS can be confirmed with doppler and duplex ultrasonography, computed tomography angiography (CTA) and magnetic resonance angiography (MRA). CTA is preferred over MRA due to cost effectiveness and greater availability. Once diagnosed, symptomatic patients can be treated successfully via balloon angioplasty, stenting or surgical revascularization comprising carotid-subclavian bypass, carotid transposition or axillo-axillary bypass.

Subclavian Steal Syndrome



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Case Presentation

52 year old female presented to hospital with chief complaints of dizziness, left sided headaches and associated paresthesia of left upper and left lower extremities for four days. Past medical history- atypical migraines, vertigo, current tobacco user, hyperlipidemia.

Day 0: Emergency Department evaluation- benign physical exam and vitals. EKG revealed normal sinus rhythm. Complete blood count, complete metabolic panel and troponins within normal limits.

CT brain- negative for acute findings

Patient treated with meclizine and Toradol that led to symptom resolution and she was discharged Home with close follow up,

Day 2: On outpatient follow up she was noted to have ataxia, reduced muscular strength of her left upper and left lower extremities. Patient complained of exacerbation of her dizziness..

She was advised to revisit the emergency room to undergo a full inpatient stroke evaluation.

Day 2 continued: Upon presentation to hospital, vitals within normal limits except for hypotension of 96/5 mmHg, on recheck was within normal limits. Her physical exam was benign with a NIH stroke scale of 0. She was admitted for evaluation by Neurology and cardiology. During admission, blood pressure and pulse fluctuation continued.

Brain MRI no acute findings, sinusitis

Carotid Ultrasound- no evidence of hemodynamically significant right carotid stenosis. 50-69% left internal carotid artery stenosis. Visually the degree of stenosis appears to be less than 50% ICA CCA ratio suggests degree of stenosis is less than 50%. Consider CTA or MRA to further evaluate

Echo- systolic function normal, EF 60%, mild tricuspid regurgitation

Discharged day 5 with plans for outpatient CTA and follow-up with cardiology for LINQ/LOOP recorder and stress test

Day 10: telephone encounter with continued dizziness and hypotension, hospital paperwork reviewed and patient sent BACK to the hospital...

Carotid US addendum added- blood pressure drop noted in left arm, retrograde flow in the left vertebral artery with decreased blood pressure in the right arm. Monophasic waveform in the left subclavian artery. Findings consistent with a proximal left subclavian artery stenosis or occlusion

Patient readmitted.

CTA- focal more than 90% short segment stenosis proximal left subclavian artery
Upon reevaluation fluctuating Blood Pressures were due to alternating between arms to measure. In addition, a slightly delayed left arm pulse appreciated.

Diagnosis of Subclavian Steal Syndrome made

Day 14- Angiogram conducted, left subclavian artery stent placed. Plavix and aspirin added to medication regimen.

Day 15- Patient discharged with complete resolution of symptoms

Discussion

This case highlights the importance of a thorough and refined physical exam, especially in light of vague neurological symptoms. Our patient was noted to have fluctuating blood pressure during her admission, however, with a previous history of hypertension and no consistent documentation of which arm the pressure was taken in, this finding was overlooked as a delay in administration of antihypertensive medication. A fine difference in the amplitude and timing of radial pulses was appreciated on exam only after the diagnosis had been made via imaging. In addition, the patient's history of atypical migraines and initial symptom resolution clouded the appropriate diagnosis.

While relatively rare, SSS is a condition defined by its classic presentation. However, the physical exam findings are often overlooked in a practical setting. In cases such as these, with a vague complaint and many differentials, a focused exam on only one or two systems may need to be abandoned in favor of maintaining a wider scope.



Conclusion

Subclavian steal syndrome is a relatively rare condition with classic clinical exam findings including a 15mmHg difference in blood pressure between the upper extremities, a decreased pulse amplitude in the affected side, and a bruit in the supraclavicular fossa

Ultimately, a CTA of the head and neck was the diagnostic tool used which had shown stenosis of the proximal subclavian artery.

Once diagnosed, symptomatic patients can be treated successfully via balloon angioplasty, stenting or surgical revascularization which, in our patient completely resolved symptoms

