PERIPHERAL ARTERY DISEASE

A CASE REVIEW

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• 61 year old male with PMHx of HIV (since 1986), HTN, Hypertriglyceridemia, CKD, ongoing heavy tobacco abuse (1PPD for 43 years) moderate to heavy alcohol abuse and occasional crystal meth use.

• C/O pain and achiness of the Left shoulder ongoing for a couple of years. Aggravated by activity and relieved by rest.

• Also had some discoloration of the fingers and occasional numbness of the hands. Worse with activity. Some heaviness in the chest. Cardiac/GI work up negative.

• ASA, Lisinopril, Fenofibrate, Alprazolam, Anti retroviral
• Systolic BP: RUE 170 mmHg LUE 110 mmHg

• Left subclavian bruit

• Arterial Duplex of LUE: Proximal occlusion vs high grade stenosis of Left Subclavian artery. Monophasic flow in Left Axillary and Brachial arteries.

• Triphasic flow in the Right. No stenosis identified on the right.
PRE-INTERVENTION ANGIOGRAM
POST STENT ANGIOGRAM
Arteriogram: Proximal Subclavian artery significant stenosis. Stented with a Boston Scientific Express LD 7 x 27 mm stent.

1 week f/u: Complete resolution of symptoms. RUE systolic pressure 145 mmHg and LUE systolic pressure of 139 mmHg. Pressure gradient dropped from 60 mmHg pre intervention to 6 mmHg post stenting of Left subclavian artery stenosis.

Etiology:

- **Atherosclerosis** is the most common cause of ischemic upper extremity disease.

- Less commonly-arterial injury, arterial dissection

- Thrombosed aneurysm, thromboembolism

- Arteritis (e.g., Takayasu disease, giant cell arteritis), Vasculitis

- Repetitive arterial injury (thoracic outlet syndrome, crutch injury)

- Occupational injury and sequela of radiation therapy.
Diagnosis:

Most patients with upper extremity peripheral arterial disease are asymptomatic.

Less commonly, stenosis or occlusion of the proximal upper extremity arteries can lead to symptoms of arm pain with exertion.

Evidence of thromboembolism (cerebrovascular, distal), acute limb ischemia, or chronic ischemic symptoms (ischemic rest pain, digit ulceration).
In extreme cases, patients who develop dizziness, or even syncope, during arm exertion may have retrograde blood flow in the ipsilateral vertebral artery to supply the demand of the arm skeletal muscle in the setting of reduced subclavian artery blood flow due to a proximal occlusion. This is referred to as "subclavian steal syndrome."
Subclavian artery occlusion or a hemodynamically significant stenosis proximal to the origin of the vertebral artery results in lower pressure in the distal subclavian artery. As a result, blood is "stolen" from the cerebral circulation to perfuse the arm. Blood flows up the contralateral vertebral artery to the basilar artery, and retrograde down the ipsilateral vertebral artery away from the brainstem.
In coronary-subclavian steal, severe stenosis or occlusion of the left subclavian artery proximal to the origin of a left internal mammary-to-coronary artery bypass graft may cause “steal” from the coronary graft to maintain perfusion to the arm via the left subclavian artery during upper extremity exercise.
During routine physical examination, upper extremity systolic blood pressure difference of $\geq 10$ mmHg is associated with upper extremity peripheral arterial disease, more commonly Subclavian artery stenosis.

Wrist-brachial index — The wrist-brachial index (WBI) is used to identify the level and extent of upper extremity arterial occlusive disease. Normal value of WBI is 1.

**Ultrasonography** is used to evaluate the location and extent of vascular disease, arterial hemodynamics, and lesion morphology.

CT angiography or MR angiography may help in establishing the diagnosis.

**Contrast arteriography** remains the “gold standard”. 
Treatment:

Asymptomatic patients do not require intervention.

Options for the treatment of symptomatic subclavian stenosis or occlusion include surgical revascularization (e.g., carotid-subclavian bypass, subclavian transposition)

Percutaneous transluminal angioplasty and stenting.

Percutaneous catheter-based treatment is less invasive and associated with lower complication rates, and shorter hospitalization.
Secondary preventive measures include:

- Control of hypertension
- Lipid modification
- Glycemic control in diabetes
- Smoking cessation
- Therapeutic lifestyle changes
- Antithrombotic therapy